Netherlands Enterprise Agency

Geophysical Survey - Operations and Processing Report - 3D UHRS Block in Site VI

IJmuiden Ver Wind Farm Zone – Site Gamma (Sites V-VI)

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Remark:
Recently, the IJmuiden Ver Wind Farm Sites V-VI have been renamed to IJmuiden Ver Wind Farm Zone Site *Gamma*. RVO's publications may still refer to the Wind Farm Sites V-VI.

Approval

Approval for public disclosure	Position
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Operations and Processing Report – Fugro Pioneer 3D Seismic

Phase 4 3D UHRS Survey at the IJmuiden Ver Wind Farm Sites V and VI (IJ56) | Dutch Sector, The Netherlands

F192961_REP_014 (03) | 27 June 2023

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Abbreviations

ADD	Acoustic deterrent device
3D UHRS	3 dimension ultra-high resolution seismic
APOS	Acoustic positioning operating station
BSB	Below seabed
C-O	Computed minus observed
COG	Centre of gravity

CRP	Common reference point
CTD	Conductivity, Temperature and Depth
DGPS	Differential global positioning system
DP	Dynamic positioning
EOL	End of line
EMSAT	European Mobile Satellite
EPSG	European Petroleum Survey Group
EVT	Equipment verification test
FA	Feather angle
FNLM	Fugro Netherlands Marine
GNSS	Global Navigation satellite systems
HF	High frequency
HV	High voltage
IHO	International Hydrographic Organization
LAT	Lowest astronomical tide
LF	Low frequency
MBES	Multibeam echosounder
MLSS	Multi-level sparker system
MMO	Marine mammal observation
NAP	Normaal Amsterdams Peil / Normal Amsterdam Level
OCR	Offshore client representative
PEP	Project execution plan
PPP	Precise point positioning
PPS	Ping per second
QC	Quality control / Quality check
RTK	Real-time kinematics
RVO	Rijksdienst voor Ondernemend Nederland
SBES	Singlebeam echosounder
SD	Standard deviation
SEG	Society of Exploration Geophysicists
SVP	Sound velocity probe
SVS	Sound velocity sensor
THU	Total horizontal uncertainty
TVU	Total vertical uncertainty
UHRS	Ultra high resolution seismic
USBL	Ultra short baseline
UTC	Universal Time Coordinated
UTM	Universal Transverse Mercator
VRF	Vessel reference frame

1. Introduction

Ministerie van Economische Zaken en Klimaat, Rijksdienst voor Ondernemend Nederland is developing an offshore wind farm in the Dutch North Sea, the IJmuiden Ver Wind Farm Zone (IJVWFZ). Site characterisation of IJmuiden sites V and VI is required to prepare for offshore wind development. The project area is located 60 kilometres off the west coast of the Netherlands, in expected water depths of 23-33 m LAT.

This report provides information relating to the operations and QC of data onboard the survey vessel Fugro Pioneer working on the project in relation to WP3 Phase 4 - 3D UHRS scope.

Vessel mobilisation and calibrations were undertaken between 14 April and 29 April 2023 in the port of Ijmuiden, NL, and at an offshore calibration site during the transit to the survey area. For further details, please refer to Fugro report F192961-REP-001 which is included in Appendix B.

All equipment was subject to rigorous testing, calibration and verification with reference to Fugro procedures. The calibration procedures were carried out in order to demonstrate effective and safe functionality of equipment and satisfy the requirements of Ministerie van Economische Zaken en Klimaat, Rijksdienst voor Ondernemend Nederland and the survey specification

Vessel operations were undertaken between 13 April and 4 June, with the details of these operations summarised in this following report.

Guidelines on the use of this report have been provided in Appendix A.

1.1 Survey Aims and Overview

The following sub-sections provide details about the main survey requirements and the scope of work for the Client's Work Package 3, Phase 4 (WP3); Geophysical 3D UHRS Survey at the IJmuiden Ver Wind Farm Sites V and VI (IJ56).

1.1.1 Survey Aims

The 3D UHRS data is required for the high potential of presence of tunnel valleys area, for the location of offshore wind turbines at the perimeter of the installable areas.

Upon temporary suspension of WP3, Fugro Pioneer was requested to recommence 3D UHRS acquisition across a series of tunnel valleys located in the north-western region of the site.

To be able to provide more detailed information in these areas, a 3D UHRS survey will be performed to enable the detection, interpretation and mapping of all significant subsurface horizons including formation interfaces, buried channel features and other relevant indicators of geohazards in high detail.

To achieve these objectives Fugro will:

- Acquire additional 3D UHRS (ultra-high resolution seismic) data migrated fully to a depth of 60 metres to determine the deeper sub-surface soil conditions across a series of tunnel valleys in the north-western region of the site;
- Ensure that the quality of the near surface data is comparable enough with the UHRS data acquired in Phase 3 to tie geological features;
- Utilise existing bathymetric data and other sub-seafloor data (WP2 and geotechnical) as available to assist in the interpretation.

1.1.2 Survey Overview

A summary of the main survey requirements for the geophysical survey operations is presented in Table 1.1.

Table 1.1: Survey Requirements Overview – 3D UHRS Operations

Equipment Method	RVO IJmuiden VER V and VI requirements
Vessel	Fugro Pioneer
Line Spacing	Lines are to be run at 12 m spacing, 3D UHRS survey footprint for each line has a nominal swath width of 16 m.
Survey Priority	Refer to F192961 PEP Ops Plan-13 for full details
Max Vessel Speed	Maximum of 4.0 knots (speed through water; ±10%)
Surface Positioning	Dynamic heading accuracy of ± 0.2° or better Static heading accuracy of ± 0.05° or better Horizontal uncertainty of the vessel of ± 0.5 m or better
3D UHRS	■ 2 x Fugro Multi-level Stacked Sparker Sources (MLSS) Fugro MLSS power supply (900 J) Each triple-plate multi-level sparker source has a total of 360 tips: • Top Array: 0.72m Depth, 160 Tips – 300 J • Middle Array: 0.87m Depth, 120 Tips - 300 J • Bottom Array: 1.12m Depth, 80 Tips - 300 J ■ 70 m HV cable ■ Sea ground cable ■ 4 x Geometrics LH16 Geo Eel streamers • 32 channels: 16 channels at 1.0m, 16 channels at 2.0m group interval ■ 8m Streamer Separation ■ 1.4 m flat tow ± 0.2 m ■ Geometrics CNT-2 ■ 4 x Fugro adaptive drogues on each streamer ■ Shot Point Interval 1.0 m per Source (0.5 m combined SPI) ■ Record length of ~156 ms ■ Sampling interval of 0.125 ms

Equipment Method	RVO IJmuiden VER V and VI requirements
	■ Recording format: SEG-D ■ 8 x navigation buoys ■ 10 x cross-streamer tethers ■ Fugro PBP v1.0 on Fugro Multi Level Stacked Sparker ■ Fugro PBP v1.0 on navigation buoys
Multibeam Echosounder/Backscatter	Multibeam echosounder data will be acquired and processed
SVP	The speed of sound in water shall be measured in the survey area. The Vertical Sound Velocity Profiles should be undertaken with a resolution of 0.1 m/s and an accuracy of ±0.15 m/s The Vertical Sound Velocity Profiles should be able to measure within the range 1,350-1,600 m/s

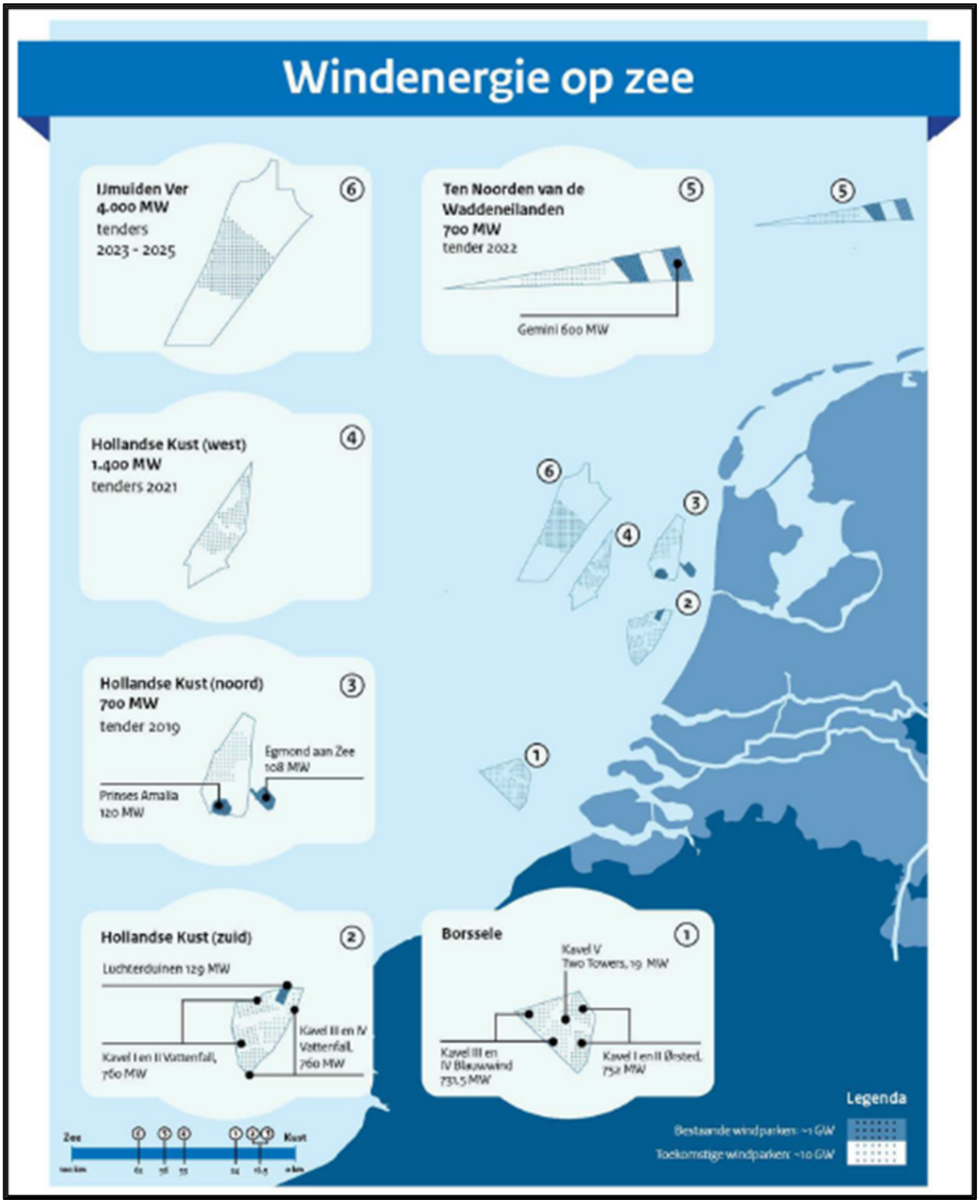


Figure 1.1: Project Location.

The project area is located 80 kilometres off the west coast of the Netherlands (Figure 1.1) in expected water depths of 23-33 m LAT.

1.2 Geodetic Parameters

The project geodetic and projection parameters are summarised in Table 1.2

Table 1.2: Project Geodetic Parameters

Name: ETRS89 / UTM zone 31N [ETRF2000-ITRF2014],LAT (NL) [NLLAT2018]		
EPSG Code	EPSG:25831	
Global Navigation Satellite System (GNSS) Geodetic Parameters*		
Datum	International Terrestrial Reference Frame 2014	EPSG:1165
Ellipsoid	GRS 1980	
Semi major axis	a = 6 378 137.00 m	
Inverse flattening	1/f = 298.257222101	
Local Geodetic Datum Parameters		
Datum	European Terrestrial Reference System 1989	EPSG:6258
Ellipsoid	GRS 1980	
Semi major axis	a = 6 378 137.00 m	
Inverse flattening	1/f = 298.257222101	
Datum Transformation Parameters from ITRF2014 to ETRS89		
X-axis translation 0.05605 m	X-axis rotation -0.0027942"	Scale difference 0.00360455 ppm
Y-axis translation 0.05355 m	Y-axis rotation -0.016903"	Coordinate Frame rotation
Z-axis translation -0.09974 m	Z-axis rotation 0.0273207"	FUGRO:41366
Local Projection Parameters		
Map projection	Transverse Mercator	
Grid system	UTM zone 31N	EPSG:16031
Latitude origin	00° 00′ 00.000" N	
Central meridian	003° 00′ 00.000" E	
Scale factor on central meridian	0.9996	
False easting	500 000 m	
False northing	0 m	
Project Vertical Parameters		
Vertical coordinate reference system	LAT (NL)	FUGRO:41043
Datum	LAT Datum (NL)	FUGRO:40917
Transformation	ETRS89 to LAT (2018)	FUGRO:41475
Notes * The geodetic datum of Fugro's global GNSS correction data is ITRF2014, epoch 2023.496 (7/1/2023)		

Table 1.3: GNSS Geodetic Parameters

Global Navigation Satellite System (GNSS) Geodetic Parameters	
Datum:	ETRS89 (European Terrestrial Reference System 1989).
EPSG Code:	25831
Semi major axis:	6 378 137.00 m
Reciprocal Flattening:	298.257222101
Project Projection Parameters	
Grid Projection:	Transverse Mercator
UTM Zone:	UTM zone 31N
Central Meridian:	003° 00′ 00.000" E
Latitude of Origin:	00° 00' 00.000" N
Longitude of Origin	003° 00′ 00.000" E

Global Navigation Satellite System (GNSS) Geodetic Parameters	
False Easting:	500 000 m
False Northing:	0.000 m
Scale factor on Central Meridian:	0.9996
EPSG Code:	16031
Units:	Metres

Unless stated otherwise, geodetic coordinates presented in this report are as per the datum in Table 1.2.

1.3 Geodetic Test Point

Fugro were required to validate the geodetic parameters entered into Starfix.NG online navigation system. The test coordinate is shown in Table 1.4. An image displaying the test result is presented in Figure 1.2.

Table 1.4: Project coordinate reference system validation calculation

ITRF2014	Test Point transformation	Validated Point transformation
Latitude	53° 32′ 37.50000″ N	53° 32′ 37.50000″ N
Longitude	004° 16′ 30.00000″ E	004° 16′ 30.00000″ E
Ellipsoidal height	0.000 m Ell	0.000 m Ell
ETRS89		
Latitude	53° 32′ 37.47991″ N	53° 32′ 37.47991″ N
Longitude	004° 16′ 29.96991″ E	004° 16′ 29.96991″ E
Ellipsoidal height	-0.023 m Ell.	-0.023 m Ell.
UTM zone 31N		
Easting	584 484.273 m	584 484.273 m
Northing	5 933 516.499 m	5 933 516.499 m
Chart datum height	-40.249 m	-40.249 m

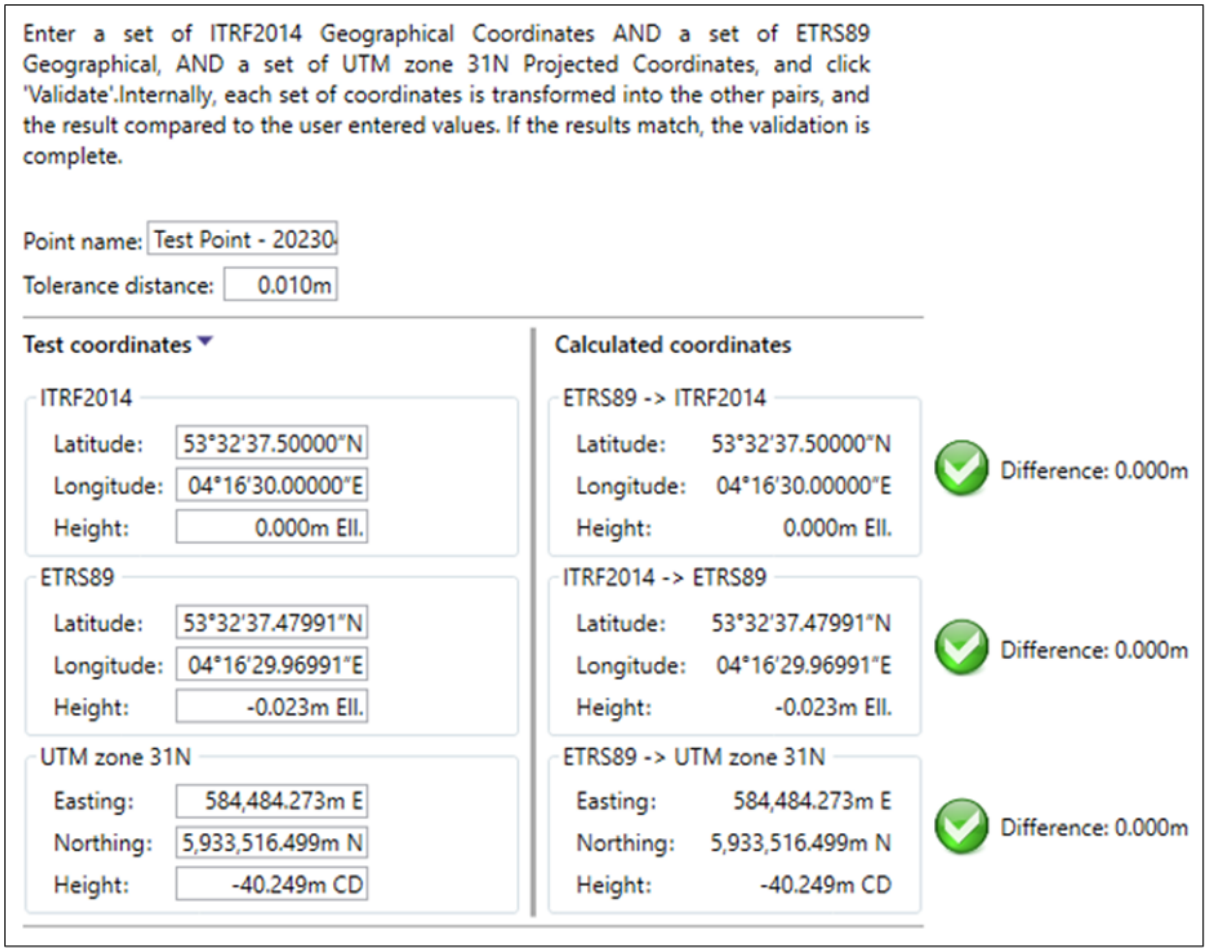


Figure 1.2: Validation calculation.

1.4 Vertical Datum

The vertical datum is lowest astronomical tide (LAT). All water depths will be referenced to LAT using post processed GNSS height data collected in real time on board the vessel. GNSS heights will be referenced to LAT by means of NL LAT2018 ellipsoidal to datum separation model. The NL LAT2018 model was issued by the Dienst Der Hydrografie in June 2020 and is considered the most accurate LAT reduction model for the Dutch continental shelf.

2. Operations

2.1 Mobilisation and Calibrations

The project commenced with the mobilisation of the 3D UHR seismic spread on Fugro Pioneer. The mobilisation and calibrations were undertaken between 14 April and 29 April 2023 in the port of Ijmuiden, NL, and at an offshore calibration site during the transit to the survey area.

Details of this are outlined in the Fugro Pioneer mobilisation and calibration report (Fugro Document No. F192961_REP_005 provided in Appendix B.

- Vessel dimensional control survey (April 2014 and March 2019);
- Absolute Depth Check (16 April 2023);
- MBES Calibration (17 April 2023);
- MBES Verification (17 April 2023);
- Positioning and heading verifications (15 April 2023);
- 3D UHRS system verifications (16 April – 29 April 2023).

2.2 Summary of Events

Geophysical operations on the Phase 4 3D UHRS Survey at the IJmuiden Ver Wind Farm Sites V and VI (IJ56) project commenced on 13 April 2023. Survey operations were run on a 24-hour operational basis with daily data uploads for onshore data processing. Geophysical survey operations were completed on 5 June 2023. The vessel demobilised in IJmuiden, The Netherlands.

A summary of key events has been provided in Table 2.1. A break-down of geophysical operational time for Fugro Pioneer is provided in Table 2.2, Figure 2.1 and Appendix C.

Table 2.1: Summary of Key Events

Event	Date
Commencement of Mobilisation of Fugro Pioneer (IJmuiden, The Netherlands)	13/04/2023
Project KOM	14/05/2023
Cabling Tests	16/04/2023
Sparker endurance test	16/04/2023
MBES Absolute depth check	16/04/2023
MBES Verification	16/04/2023
Positioning and heading verifications	17/04/2023
Positioning Comparison	17/04/2023
Streamer balancing	22/04/2023 – 23/04/2023
First crew change	25/04/2023
SVP Comparison	26/04/2023
Completion of Mobilisation and Verification Lines	29/04/2023

Event	Date
Transit to site and Commencement of 3D UHRS survey operations	30/04/2023
Mobilisation Completion Certificate Signed	04/05/2023
Second Crew change	23/05/2023
End of 3DUHR survey acquisition	05/06/2023
Milestone Completion Acceptance Certificate	05/06/2023
Alongside commencement of equipment demobilization	06/06/2023

Table 2.2: Project summary and breakdown of key events

Activity	Operational Time
Infills/Re-runs	121:15
General Mob	109:19
Equipment Cal	88:48
Transit to/from Site	36:00
Port Call	24:00
W/S in Port	112:00
W/S at Sea	317:43
Weather – Mob	160:30
Ops – Equipment Dep/Rec	52:38
Transit between locations	01:55
Data Acquisition	107:11
Line turns	99:05
Ops – Extended Line Turns	24:02
Downtime – Survey	17:34
Total	**1272:00**

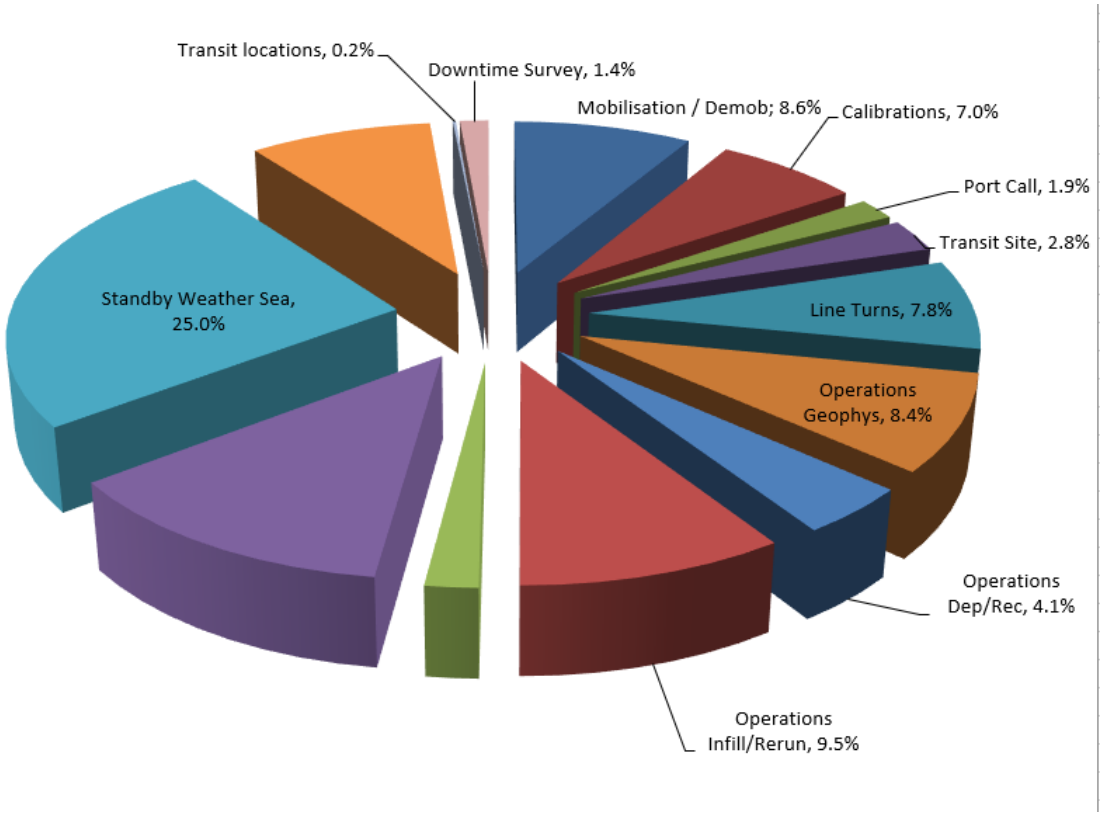


Figure 2.1: Fugro Pioneer project breakdown (%days).

2.2.1 Key Personnel

The key survey, management and processing personnel involved in the surveys onboard Fugro Pioneer are outlined in Table 1.1.

Table 2.3: Key Personnel

Position	Name	Dates on Project
Project Manager	James Colley	Full duration
Fugro Vessel Manager	James Colley	Full duration
Onshore Report Coordinator	Alexia Darbo	Full duration
Party Chiefs	Jaco de Beer Paul Miller	14/04/2023 – 25/04/2023 24/05/2023 – 05/06/2023 25/04/2023 – 24/05/2023
Technical Coordinator	Malcom Needham Garry Reynolds	14/04/2023 – 25/04/2023 24/05/2023 – 05/06/2023 25/04/2023 – 24/05/2023
Seismic Processor	Edward Favell Iain Walby Marcin Jankowski	14/04/2023 - 14/04/2023 – 25/04/2023 24/05/2023 – 05/06/2023 25/04/2023 – 24/05/2023
Surveyor	Silvia Nastasi Kris Bos Sylwester Hawryluk	14/04/2023 – 24/05/2023 14/04/2023 – 25/04/2023 24/05/2023 – 05/06/2023 25/04/2023 – 24/05/2023

Position	Name	Dates on Project
	Linda Videudo (Trainee) Matteo Lisi	25/04/2023 – 24/05/2023 24/05/2023 – 05/06/2023
Survey Engineer	Steve Turner Jack Skipper Joshua Handcock Rob Gunn Mark Gordon Gabriel Lima Adam Rogers Carlos de Gouvia (Trainee) Giorgio Focosi A. Kolasnikov Francisco Andrade	14/04/2023 – 25/04/2023 14/04/2023 – 25/04/2023 14/04/2023 – 25/04/2023 14/04/2023 – 25/04/2023 25/04/2023 – 24/05/2023 25/04/2023 – 24/05/2023 25/04/2023 – 24/05/2023 25/04/2023 – 24/05/2023 24/05/2023 – 05/06/2023 24/05/2023 – 05/06/2023 24/05/2023 – 05/06/2023
Data Processor	Jitendra Singh Carlos Luna	14/04/2023 – 25/04/2023 24/05/2023 – 05/06/2023 25/04/2023 – 24/05/2023
Geophysicist / Offshore Report Coordinator	Ryan Vitas Ariff Jeman	14/04/2023 – 25/04/2023 25/04/2023 – 24/05/2023
Offshore Client Representative	Terry Wiseman	14/04/2023 -05/06/2023

2.2.2 Equipment

The survey was conducted on board Fugro Pioneer and utilised the equipment presented in Table 2.4.

Table 2.4: Equipment List

Requirement	Equipment
Primary GNSS	Fugro StarPack GNSS receiver with StarFix.G4+ corrections
Secondary GNSS	Fugro StarPack GNSS receiver with StarFix.G4+ corrections
MRU and heading sensor	IXBlue Octans 3000 subsea, IXSea Hydrins
Multibeam echosounder	Dual Head Kongsberg EM2040
Sound velocity probe	2 x SAIV CDT 204
Sound velocity sensor	1x Valeport Mini SVS installed near MBES head, plus 2 spare
Tidal heights	Fugro StarPack GNSS receiver with Starfix.G2+ corrections
ADD	1 x ADD unit 1x Cable and Top Unit
3D UHRS	■ 2 x Fugro Multi-level Stacked Sparker Sources (MLSS) Fugro MLSS power supply (900 J) Each triple-plate multi-level sparker source has a total of 360 tips: • Top Array: 0.72m Depth, 160 Tips – 300 J • Middle Array: 0.87m Depth, 120 Tips - 300 J • Bottom Array: 1.12m Depth, 80 Tips - 300 J ■ 70 m HV cable ■ Sea ground cable

Requirement	Equipment
	■ 4 x Geometrics LH16 Geo Eel streamers • 32 channels: 16 channels at 1.0m, 16 channels at 2.0m group interval ■ 8m Streamer Separation ■ 1.4 m flat tow ± 0.2 m ■ Geometrics CNT-2 ■ 4 x Fugro adaptive drogues on each streamer ■ Shot Point Interval 1.0 m per Source (0.5 m combined SPI) ■ Record length of ~156 ms ■ Sampling interval of 0.125 ms ■ Recording format: SEG-D ■ 8 x navigation buoys ■ 10 x cross-streamer tethers ■ Fugro PBP v1.0 on Fugro Multi Level Stacked Sparker ■ Fugro PBP v1.0 on navigation buoys

2.3 Vessel Details

The Fugro Pioneer (Figure 2.2) is a 53 m vessel built at Damen Shipyards in 2014. Being purpose designed for the demanding environments in which Fugro's coastal fleet operate, the Fugro Pioneer has excellent weather capabilities and is an ideal platform for geophysical surveys.

Figure 2.2: Fugro Pioneer

The Fugro Pioneer has space for a maximum of 31 persons and is equipped for 24-hour operations. The Fugro Pioneer has a top speed of 10 knots allowing for fast and comfortable transits. Weather limitations for the Fugro Pioneer are detailed in Table 2.5. Further details of the vessel can be found in Appendix D.

Table 2.5: Weather Limitations of Fugro Pioneer

Mode of Operation	Significant Wave Height Hs [m]	Max Wind Speed [kts]	Max Current [kts]
Deployment and recovery of towed equipment	1.3 [1]	20.0	2.0 [2]
Geophysical Survey	1.3 [1]	20.0	2.0 [2]
Field Verifications	1.3 [1]	20.0	2.0 [2]
1. subject to wave heading 2. subject to current heading			

2.4 Survey Strategy

Following the decision on 16 September 2022 to temporarily suspend operations for inclement weather, Fugro Pioneer will continue the 3D UHRS survey in April 2023 over a series of tunnel valleys situated in the Northern region of the site.

Survey lines are planned in a North South direction, with a line spacing of 12.0 m, as highlighted below in Figure 2.3.

Coverage will be assessed in real-time with use of CoverPoint software.

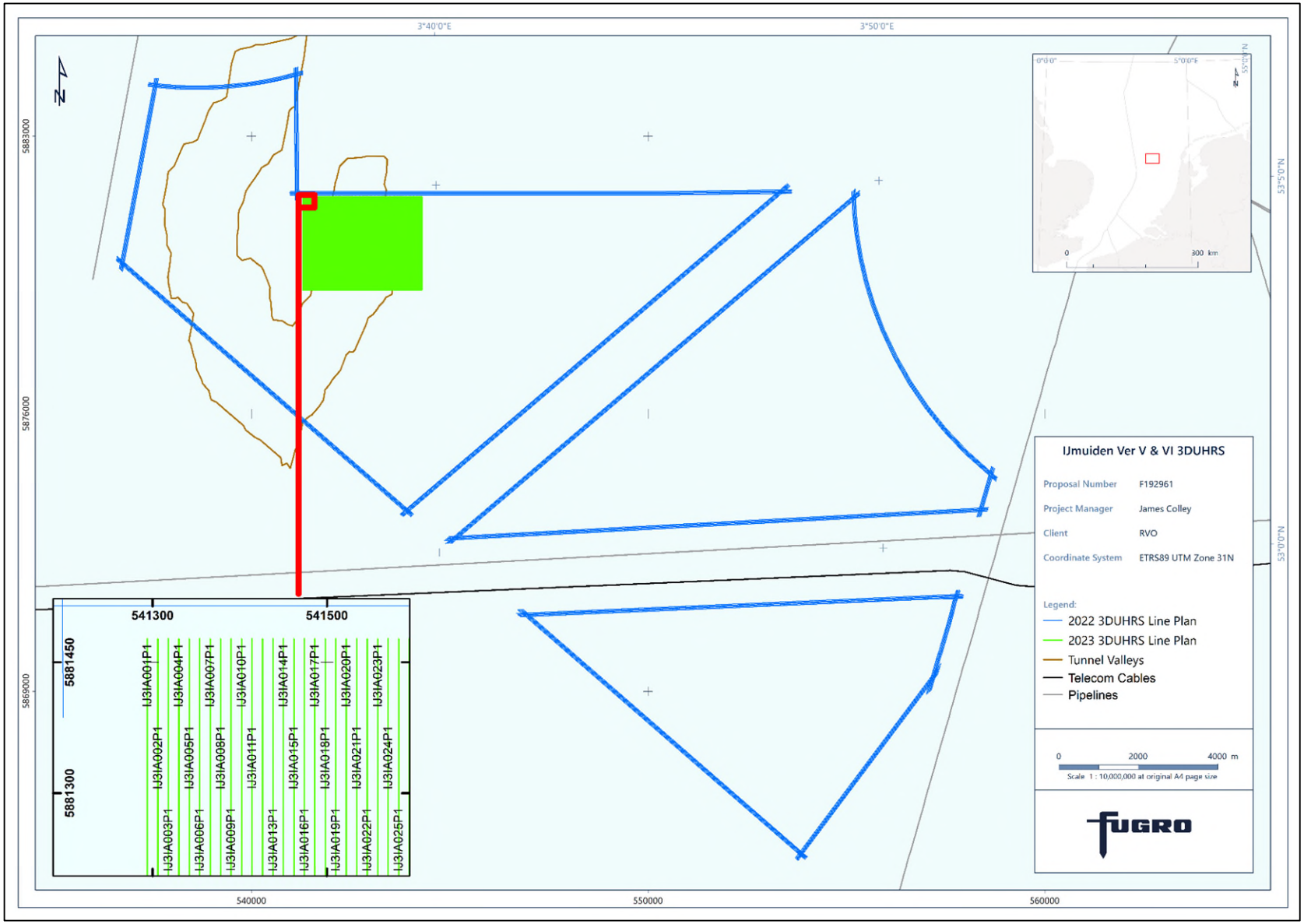


Figure 2.3: Survey location and 3D UHRS line plans for 2022 (Blue) and 2023 (Green).

2.5 Line Naming Convention

Survey run lines adhered to the following naming convention:

- IJ3IA123P1,
  Where:
  - IJ: RVO IJmuiden Ver;
  - 3: Work Package 3;
  - IA: Site identifier;
  - 123: Line number;
  - P1: Line type;
    - P: Primary;
    - J: Infill.

2.6 Survey Line Infills

Survey data was reviewed and infills acquired for areas where data quality or coverage was outside of the required specification as described in Table 1.1.

2.6.1 3D UHRS Seismic Infills and Re-Runs

P190 navigation files were imported into CoverPoint where flexed binning were used to assess final coverage.

- Bad shots and rejected data were removed;
- Data from streamer offset group were classed as near and far offsets as below:
  - Near offsets: Channels 1-16;
  - Far offsets: Channels 17-32.

Acceptance criteria: - Allowable gaps in binning:

- Flex-binning of 50% (per side) in the Inline direction and crossline direction:
  - Inline bin size:
    - Unflexed = 0.5 m
    - Flexed = 1.0 m
  - Crossline bin size:
    - Unflexed = 2.0 m
    - Flexed = 4.0 m
- For fold coverage for the near and far offsets:
  - Nears 8 @ 85% = >7
  - Fars 16 @ 75% = > 7
- The main basis of the infill requirement was fold outside of specification (fold count below required number, caused by underpopulated bins).
- Bins outside of specification for fold coverage requirement at both near and far offsets, inline were assessed onboard by Fugro and the RVO OCR.
- Bins were assessed, if 50% of a 20m inline section is low fold, then infill was acquired.

3. Field Procedures

3.1 Vessel Surface Offsets

All systems were mounted relative to the XYZ reference frame of the vessel. The Y-axis being the fore-aft centre line, the X-axis running perpendicular to the Y-axis through the common reference point (CRP), and the Z axis being positive upwards from the CRP. The online navigation software Starfix.NG uses this reference frame to correct vessel offsets for position.

The full dimensional control report can be found in Appendix B of the project mobilisation report (Fugro Report F192961-REP-001).

All instrument offsets have been presented below in Figure 3.1 and a corresponding vessel offsets table has been provided in Table 3.1.

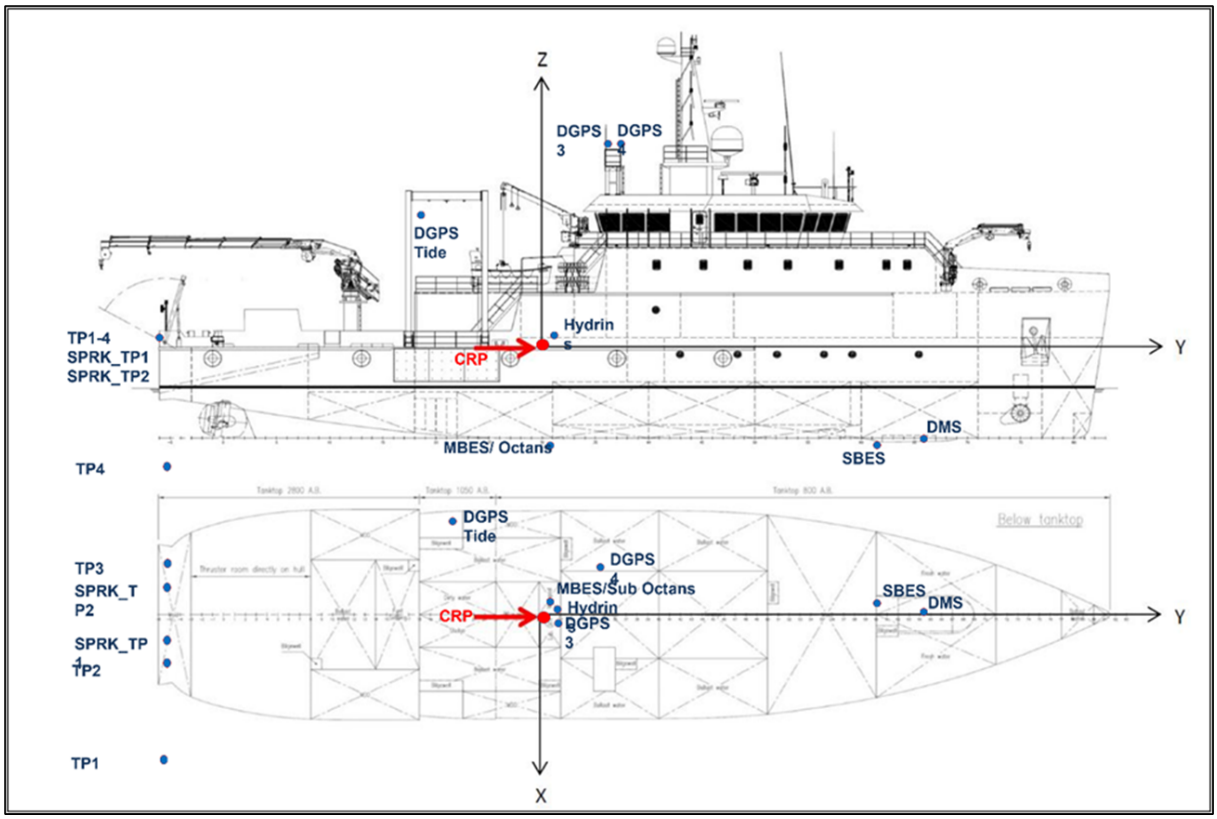


Figure 3.1: Fugro Pioneer Offsets.

The CRP on Fugro Pioneer has been defined in the survey navigation software, Starfix.NG, to be the starboard aft corner on the inside rim of the moonpool. The COG coordinates were introduced in the vessel's survey coordinate system (referred to CRP). The distance offsets, angular offsets and rotations were calculated, and Vessel Reference Frame (VRF) derived using 3D laser scan as part of the vessel dimensional control in April 2014.

To ensure that the moon pool cart was in the same position when deployed, two pistons and four guides are installed to ensure there was repeatability ensuring the offsets are

consistently repeated whenever deployment/recovery takes place. Figure 3.1shows calculated offsets used and Figure 3.1 shows the plan and profile views of the vessel.

Table 3.1: Fugro Pioneer Offsets

Point ID	Description	X [m] Stbd +ve	Y [m] Bow +ve	Z [m] Up +ve
1	CentreOfGravity	0.000	5.367	-0.905
2	CRP	0.000	0.000	0.000
3	DGPS_Tide	-5.825	-7.306	7.894
4	DGPS3_1	-0.754	3.995	12.134
5	DGPS4	-3.161	5.088	12.127
6	DMS25	-0.354	21.903	-4.585
7	DynCal_Bow	0.001	32.339	4.881
8	DynCal_Port	-5.926	-16.167	3.411
9	DynCal_Stbd	5.935	-16.186	3.398
10	Hydrins	0.388	0.767	0.455
11	Innomar	-1.487	0.424	-5.729
12	MBES_TX	-0.697	0.487	-6.045
13	Octans	-0.735	0.955	-5.334
14	SBES	-0.655	20.186	-5.789
15	SPK_PORT_TP	-2.000	-21.050	0.000
16	SPK_STBD_TP	2.000	-21.050	0.000
17	STR_1_TP	12.000	-21.050	0.000
18	STR_2_TP	4.000	-21.050	0.000
19	STR_3_TP	-4.000	-21.050	0.000
20	STR_4_TP	-12.000	-21.050	0.000

The offsets of the 3D UHRS equipment towed behind the vessel are presented on Table 3.2, Table 3.3, Table 3.4 and Table 3.5. Full diagram representing towed equipment configuration is presented in Figure 3.2 .

Table 3.2: Starboard Sparker Offsets

Offset Name	Starboard Positive (X) [m]	Forward Positive (Y) [m]	Up Positive (Z) [m]
CentreOfGravity	0.000	0.000	0.000
CommonReferencePoint	0.000	0.000	0.000
COS (Top array)	0.000	0.000	0.000
SPK_RTK_Bow	0.000	0.430	1.460
SPK_RTK_Stern	0.000	-0.430	1.460

Table 3.3: Port Sparker Offsets

Offset Name	Starboard Positive (X) [m]	Forward Positive (Y) [m]	Up Positive (Z) [m]
CentreOfGravity	0.000	0.000	0.000
CommonReferencePoint	0.000	0.000	0.000
COS (Top array)	0.000	0.000	0.000
SPK_RTK_Bow	0.000	0.430	1.450
SPK_RTK_Stern	0.000	-0.430	1.450

Table 3.4 Headbuoys Offsets

Offset Name	Starboard Positive (X) [m]	Forward Positive (Y) [m]	Up Positive (Z) [m]
CRP / COG	0.00	0.00	0.00
HB_RTKPod	0.00	0.00	0.70
HB_TP	0.00	0.00	-1.40

Table 3.5: Tailbuoys Offsets

Offset Name	Starboard Positive (X) [m]	Forward Positive (Y) [m]	Up Positive (Z) [m]
CRP / COG	0.00	0.00	0.00
TB_RTKPod	0.00	0.00	0.70
TB_TP	0.00	0.00	-1.40

3.2 Vessel Subsea Offsets

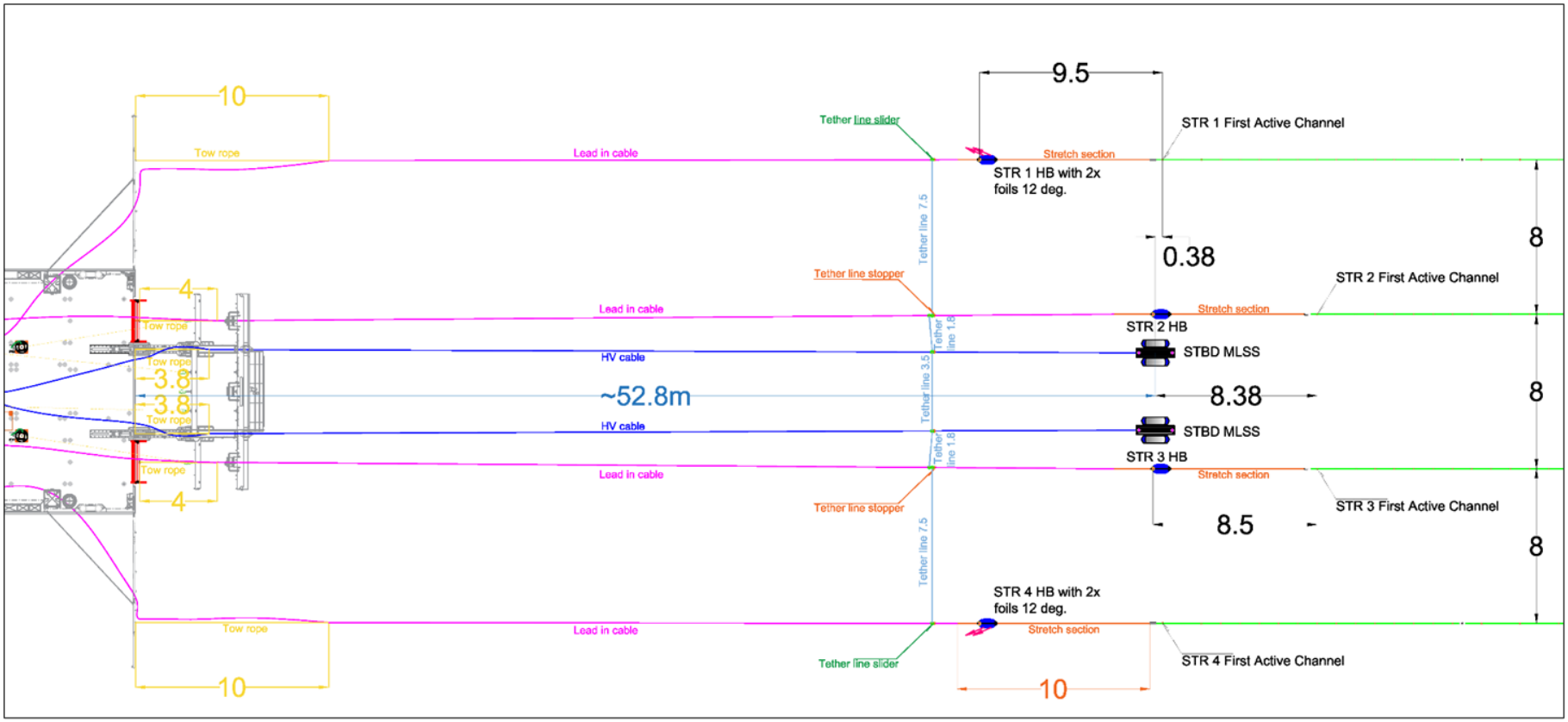


Figure 3.2: 3D UHRS Streamer offsets

3.3 Navigation and Vertical Control

Table 3.6: Vessel Navigation and Vertical Control

Vessel Navigation and Vertical Control	
Requirement	■ Horizontal: Accurate vessel positioning for all aspects of the marine survey. Vessel positioning will have a horizontal accuracy of better than ± 0.1 m and a vertical accuracy better than ± 0.2 m, as per Appendix B – Mobilisation Report ■ Vertical: To provide height information to on-board sensors to reduce final geophysical data to the required datum. Levels shall be relative to LAT using the NL NAP2018.
Equipment	■ Primary Positioning System: 2 x Fugro StarPack with Starfix G4+, G4, HP and XP corrections; ■ Vertical Control: Post-processed Fugro StarPack with Starfix G4+, G4, HP and XP corrections; ■ Heading and attitude: iXBlue Hydrins ■ Navigation Software: StarfixNG
Data Collection	■ All global navigation satellite system (GNSS) positions were acquired in geographic coordinates relative to the World Geodetic System 1984 (WGS84) datum. Subsequent positions were then converted within the acquisition software to the European Terrestrial Reference System 1989 (ETRS89) datum and projected to the Universal Transverse Mercator Zone 31 north (UTM Zone 31N) projection. ■ The GNSS system antennas were mounted at the top of the vessel mast for unrestricted hemispherical views and clear of any ships radar systems. ■ Starfix.G4+ utilised dual frequency carrier phase corrections from the Fugro network of precise point positioning (PPP) G4+ solution to aid convergence and provide sub-decimetre horizontal and vertical accuracy. Secondary positioning was setup to automatically become active if the primary system dropped out of the required specification. ■ The iXBlue Hydrins INS utilised a tightly coupled navigation solution, which incorporated both the IMU and GNSS antennas to resolve a heading. Hydrins was mounted close to the vessel centre line within the approximate centre of gravity (COG) and provided both heading and attitude.
Processing	■ All data for main lines and tie lines were processed according to Fugro standard procedures. ■ All depths were reduced to LAT using the NL LAT2018 model within Caris HIPS & SIPS. ■ Navigation, motion and Starfix.G4+ GNSS elevation data were processed using Fugro Starfix.VBAProc. ■ Ellipsoidal heights of the GNSS antennas were corrected for motion. ■ The heights were reduced to the water line using draught and dimensional offset measurements. ■ Waterline elevations were further reduced to the vertical datum (LAT) by means of NL LAT2018 LAT ellipsoidal to datum separation model. ■ A smooth tide curve was created to reduce MBES data to datum and apply trace-to-trace tidal corrections to SBP data.
Data Outputs	■ Navigation tracks of each sensor (.pos); ■ Tidal curve (.pos/.tid); ■ Tidal curve for SBP (.txt).

3.4 Multibeam Echosounder

Table 3.7: Multibeam Echosounder

Multibeam Echosounder	
Requirement	■ Data resolution sufficient for detection of seabed objects/features ≥ 1.0 m, in accordance with IHO Special Order ■ 100% coverage must be achieved ■ Minimum density: 7 soundings per 0.5 x 0.5 m cell, 95% of the survey area, see TQ003. ■ TVU threshold: IHO Special Order ■ THU threshold: IHO Special Order
Equipment	■ Kongsberg dual-head EM 2040 (0.4° at 400 kHz) multibeam echo sounder, with dual-swath functionality): ■ iXSea Hydrins INS motion reference unit (MRU); ■ iXBlue Octans 3000 motion reference unit (MRU); ■ Valeport mini Sound Velocity Sensor (SVS); ■ SAIV SD204 CTD probe with wireless controller; ■ Caris HIPS & SIPS processing software; ■ Starfix.VBAProc processing software.
Data Collection	■ Multibeam data were collected in accordance with Fugro's standard work instructions, a component of Fugro's quality management system, which complies with the requirements of ISO 9001:2015, ensuring that data is collected in accordance with the scope of work and Fugro NL Marine work instructions WI-207, WI-214, WI-215, WI-224, WI-227 and WI-229. ■ A dual-head Kongsberg EM 2040 400/200 kHz system was pre-mobilised and consists of a single transmit array and two separate receive arrays, with each receive array mounted on specific designed Kongsberg bracket in the moon pool. The depth resolution of the system is better than 1 cm. ■ The system was run in 400 kHz configuration with a maximum ping rate is 60 Hz at each head and each ping will produce 0.4° focused beams. Operating in high density equidistant mode, 400 sounding are generated per ping per multibeam head. The Kongsberg system is capable of multi-pings (Dual Swath) which enables a faster rate of sounding acquisition and a better density per sqm. ■ The iXBlue Octans supplied heading and attitude information directly to the Kongsberg SIS topside unit at a rate of 100 Hz. ■ A SAIV SD204 CTD was deployed by hand to measure the sound velocity of the water column, prior to the start of survey operations and at least once during each 12 hour period. The SVP has an accuracy of ±0.05 m/s. ■ A Valeport mini SVS is mounted near the transmit array to determine the speed of sound at the transducer face and account for ray bending at the acoustic source. Continuous speed of sound measurements was provided by the SVS to the multibeam system. The SVS has an accuracy of +/-0.02 m/s. ■ A real-time comparison was set up between the SVS and SVP readings as an indication of MBES refraction errors. If the comparison was greater than 2 m/s, the online surveyor assessed the raw data for refraction artefact or sent a sample of data to a Fugro processor for checking. If an unresolvable refraction error existed, another SVP cast was be taken and input to Starfix NG. ■ Fugro used best industry practice to achieve minimum required of 7 hits [See TQ003] per 0.5 m bin requirement in the first instance by operating the multibeam echosounder at full rate dual head mode. During survey operations multibeam settings were constantly monitored to ensure optimal performance. Swath angle and vessel speed was monitored and reduced in deeper waters to focus the same number of receive beams over a smaller

Multibeam Echosounder	
	seabed area to ensure hit count was maintained. The effect of reducing swath width was reduced seabed coverage and therefore reduced line spacing. ■ Prior to commencement of the survey a complete calibration was undertaken for the following variables: i) latency, ii) pitch, iii) roll, iv) yaw, v) pitch/roll correlation. The calibration data was processed before the start of the survey as described in Fugro work instruction WI-207 and WI-229. At intervals throughout the survey this was repeated to ensure there has been no change to the calibration parameters. Calibrations were described in a mobilisation report. ■ During vessel calibrations, a comparison of all SVP's was carried out with a simultaneous cast in a water depth similar to that expected during the survey. The hull mounted SVS was also included in the comparison. ■ Survey data was collected to the required survey specification and monitored using Starfix.NG online sounding grid and Caris HIPS&SIPS offline sounding grid QC statistics.
Processing	■ Main blocks were processed according to Fugro standard procedures. ■ CARIS HIPS files were corrected for any sound velocity refraction errors. ■ When required, data point cleaning was conducted in CARIS using the CUBE algorithm, which used site specific parameters to ensure no valid data were removed (noise was flagged only and remained within the raw data set). ■ The CUBE algorithm search radius did not exceed the specified bin size. Data was finally quality controlled again to ensure compliance to the specification.
Data Outputs	■ 0.5 m Caris CUBE grid (Depth attribute) ■ 0.5 m Caris Shoalest Depth, True position grid (Density, TVU, THU)

3.5 Marine Mammal Protocol

Table 3.8: Marine Mammal Protocol

Marine Mammal Protocol	
Requirement	■ Provide positioning information to towed seabed sensors
Equipment	■ Acoustic Deterrent Device (ADD)
Data Collection	■ The Acoustic Deterrent Device (ADD) also known as Marine Mammal Deterrent (MMD) consists of a surface unit or topside unit, an underwater unit and underwater cable. The underwater unit or scrammer is connected to the underwater cable, which in turn is connected to the topside unit. The topside unit is where all trigger control, system status and power reading can be displayed and operated. ■ A spare of each piece of equipment is stored on board for redundancy
Procedure	■ Deploy ADD ■ Before switching on ADD, confirm with the Bridge officers that no marine mammals are in sight within 1000 m of the vessel. When there is no mammal switch on ADD and sound for a period of 5 minutes. ■ Soft start may begin with SBP for 25 minutes ■ Thereafter, full power for survey operations.

3.6 3D UHRS

Table 3.9: 3D UHRS Summary and Specifications

3D UHRS	
Requirement	■ Resolution up to 40 m below seabed:

3D UHRS	
	• Inline bin spacing ≤ 1.0 m • Crossline bin spacing ≤ 2.0 m • Vertical resolution ≤ 0.5 m • Nominal penetration: ≥ 40 m ■ Resolution from 40 m below seabed to > 60 m below seabed: • Inline bin spacing ≤ 1.0 m • Crossline bin spacing ≤ 2.0 m • Vertical resolution ≤ 1.5 m • Nominal penetration: ≥ 100 m
Equipment	■ 2 x Fugro Multi-level Stacked Sparker Sources (MLSS) Fugro MLSS power supply (900 J) Each triple-plate multi-level sparker source has a total of 360 tips: • Top Array: 0.72m Depth, 160 Tips – 300 J • Middle Array: 0.87m Depth, 120 Tips - 300 J • Bottom Array: 1.12m Depth, 80 Tips - 300 J ■ 70 m HV cable. ■ Sea ground cable. ■ 4 x Geometrics LH16 Geo Eel streamers • 32 channels: First 16 channels at 1.0m, second 16 channels at 2.0m group interval ■ 8m Streamer Separation. ■ 1.4 m flat tow ± 0.2 m . ■ Geometrics CNT-2. ■ 4 x Fugro adaptive drogues on each streamer. ■ Shot Point Interval 1.0 m per Source (0.5 m combined SPI). ■ Record length of ~156 ms. ■ Sampling interval of 0.125 ms. ■ Recording format: SEG-D. ■ 8 x Navigation buoys. ■ 10 x Cross-streamer tethers. ■ 2 x Fugro PBP v1.0 on Fugro Multi Level Stacked Sparker. ■ 1 x Fugro PBP v1.0 on navigation buoys.
Data Collection	■ The 3D UHRS survey was executed using the following spread: • 4 x Geometrics LH 16 multichannel streamers (with 1 m / 2 m hybrid group interval) flat towed at 1.4 m. • 2 x Fugro MLSS sources with 360 tips @ 900 J were towed at 5 m separation. Power supplies CSP Nv with Rogowski coils were used to provide a power output of 900 J, per source. The sparker systems were positioned with RTK pods using moving base station RTK. A shot point interval of 1.0 m FLIP-FLOP was utilised. • The proposed 2 source - 4 streamer configurations resulted in a CDP swath width of 10 m, per sail line. The resultant acquisition bin size will be 1.0 m (Inline) x 2.0 m (Crossline). • The streamer tow depth of 1.4 m allows increased weather tolerance for the UHRS survey, increasing efficiency and productivity.
Processing	■ During survey operations, real time QC was conducted onboard and included: • Polarity checks • Electrical leakage and conductivity • Amplitude response and phase

3D UHRS	
	• Dead channels: No greater than 2 dead channels on one acquired line provided these 2 dead channels are not adjacent to each other and are not present within the first 6 channels. ■ A standard QC flow was performed onboard which included: • Input and geometry assignment • Gain recovery • Brute velocity and assignment • NMO • Mute • Band pass filter • Brute stacks • Navigation Merge using the P190 data • De-noise stacks ■ An end-of-line QC document was created (.pdf) for each line which included the following: • Shots display • Near trace display for the entire line • Brute stack of the entire line • Navigation Merge stacks • De-noise stacks • Amplitude spectrum measured from the near trace • RMS amplitude of the noise • RMS amplitude of the signal • Plot of source and receiver coordinates, extracted from the NAV P190 • Comparison of navigation computed offset and picked offset from the seismic data ■ Full data processing was completed in the Fugro Oslo office.
Data Outputs	■ EOL Seismic QC PDFs. ■ EOL Nav QC PDFs. ■ Raw Data sent ashore via B2B for full processing.

4. Quality

The survey was planned and carried out in conformance with Fugro's quality management system, which complies with the requirements of ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007. More detailed descriptions of specific survey techniques and procedures are contained within Fugro standard procedures (a component of Fugro's QHSE Manual - details of which can be inspected at the Fugro offices on request).

4.1 Documentation

Prior to the commencement of survey operations, a project execution plan (PEP) consisting of Project Overview, Operations Plan, Quality Plan, Health, Safety, Security and Environment Plan (HSSE) and Emergency Response Plan (ERP) were submitted to Ministerie van Economische Zaken en Klimaat, Rijksdienst voor Ondernemend Nederland as per Table 4.1. These documents formed the basis for all planning in relation to this project.

Table 4.1: Project Execution Plan Documents

Fugro Document	Revision	Revision Date
F192961_PEP-Overview	1	22 February 2022
F192961_PEP-Ops Plan	3	14 March 2022
F192961_PEP-Q-Plan	1	22 February 2022
F192961_PEP_ERP	4	18 March 2022
F192961_PEP_HSSE Plan	1	22 February 2022

A digital online survey log was completed during online operations and provided a detailed record of all activities and events that occurred onboard the survey vessel. Detailed information relating to each surveyed line was recorded. This included date, time, line name, instrument setup parameters and highlighted any events or data quality issues.

The performance of the survey instrumentation was constantly monitored by the online surveyor and online geophysicist. Any data quality issues were immediately highlighted and logged in the online logs. Upon review, remedial action could be performed, and a decision made as to whether any reruns were required. Data quality was also monitored by the offline processors soon after data acquisition.

Data storage, control and archiving of the data were undertaken in compliance with the PEP and Fugro's data management policy.

4.2 Quality Control

Information has been provided below on the quality control checks carried out during the operational geophysical phase of this project (Table 4.2).

Table 4.2: Summary of Geophysical Quality Control Checks Carried Out

Stage of Survey	Check
Mobilisation	■ GNSS Health Check of primary navigation system using third party processing. ■ Vessel draught check for MBES and navigation software. ■ Datum transformation verification from WGS84 to ED50 South of 62 N (EPSG 4230) ■ Validation of heading sensor using RTK derived baseline. ■ SVP and SVS comparison. ■ Check all instruments logging correctly. ■ 3D UHRS Source Endurance test. ■ 3D UHRS recording unit test. ■ 3D UHRS Streamer Hydrophone tap test. ■ 3D UHRS Navigation Recording test. ■ 3D UHRS Streamer depth verification and balancing. ■ Vessel draught check for MBES and navigation software.
On survey	■ Check MBES for data quality (power/gain/range, motion/weather artefacts, SVP vs SVS accuracy, feature resolution coverage, sounding density, noise interference, THU, TVU); ■ Check GNSS navigation quality. ■ 3DUHR Seismic System functionality and acquisition quality.
In Dock	■ Vessel draught check for MBES and navigation software. ■ Cross check of all sensor data quality and coverage to ensure specification has been met. ■ Back up data onto vessel server and hard drive for delivery to Fugro Norway office at soonest opportunity. ■ Send back data to Fugro Norway office.
Offline Processing	■ 3D UHRS files checked on a line-by-line basis. ■ 3D UHRS observer and Navigation Logs checked on a line-by-line basis, any problems noted and addressed. ■ 3D UHRS coverage assessed using CoverPoint software. ■ 3D UHRS offsets, noise levels, shot points and channel health checked on a line-by-line basis, with any problems noted and addressed. ■ 3D UHRS brute stack displays checked for overall data quality and noise assessment on a line-by-line basis. ■ 3D UHRS deliverables .pdf created for each acquired line and sent to client on a line-by-line basis. ■ Creation of required 3D UHRS QC and final deliverables. ■ Final QC of report and all charted deliverables.
Demobilisation	■ Confirm coverage and survey requirements have been achieved. ■ Confirm data backed up onto vessel server and hard drive.

4.3 Vessel Navigation

Position quality for the primary and secondary GNSS receivers was continually monitored throughout the project and all positioning criteria were met. A navigation comparison check was performed prior to the start of the survey and confirmed that both the primary and secondary StarPack antennas on both vessels were providing consistent position information. Vessel navigation was consistently maintained at an accuracy better than 0.1 m horizontally and vertically, through the StarPack primary and secondary systems.

4.4 Multibeam Echosounder

The multibeam bathymetry data collected were of good quality. Any noise present in the data was removed and the remaining data were corrected for variations in tidal height. The 2-sigma standard deviation was monitored throughout the entirety of the survey area for features including, but not limited to, boulders, debris items, wrecks, sand wave crests and very steep natural seabed slopes. This ensured all data adhered to project requirements as set out in the technical specifications.

Optimum power and gain settings were utilised during data acquisition to ensure high quality acquisition. Throughout the survey, changes in multibeam range were minimised to maintain the quality of the MBES data.

4.4.1 Multibeam Echosounder (Data Examples)

Multibeam echosounder data quality was within specification for the entire survey. Figures presenting good MBES data examples are shown below in Figure 4.1 (pre-swath editing) and in Figure 4.2 (post-swath editing) with corresponding cross profiles.

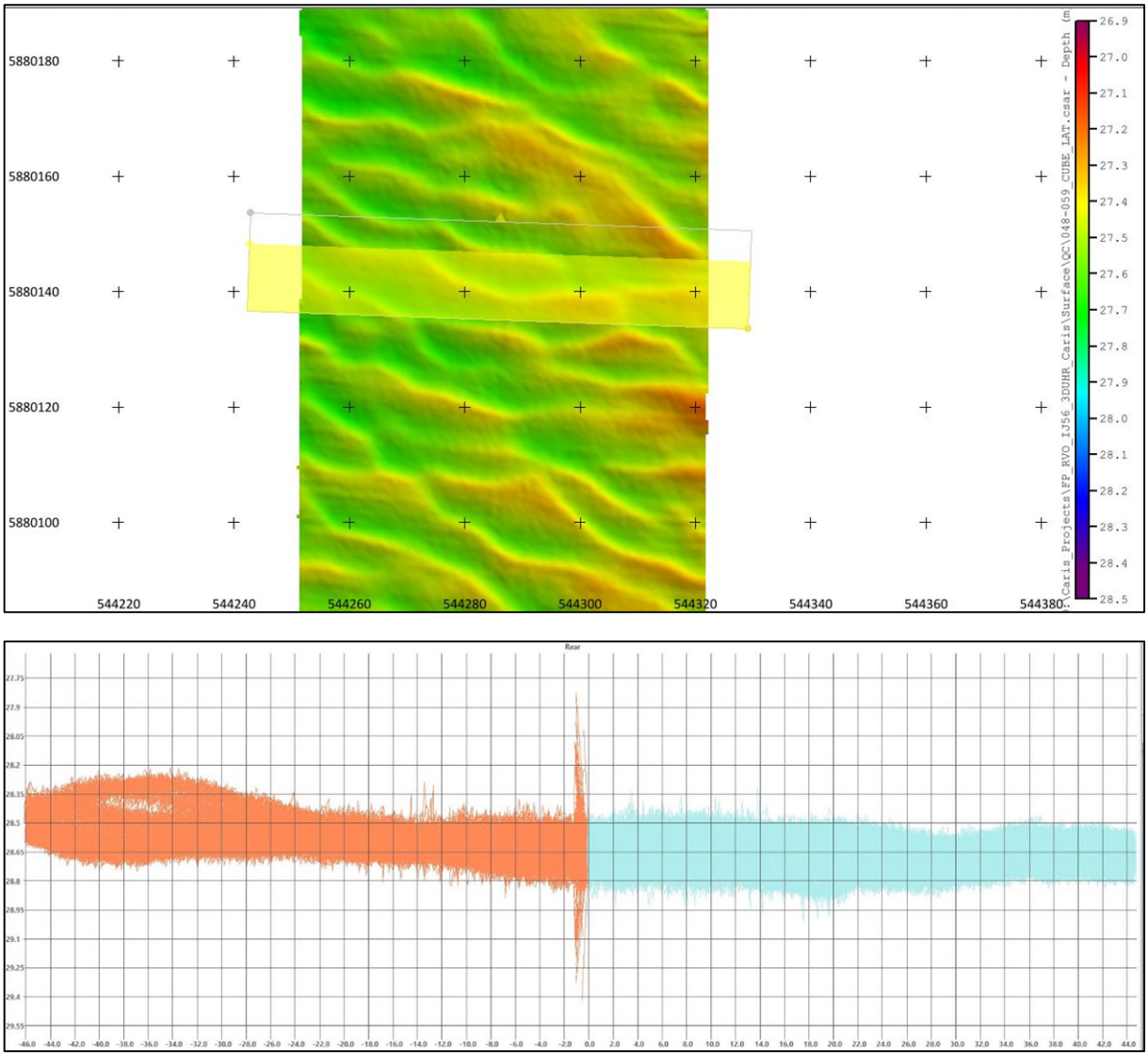


Figure 4.1: Data example presenting MBES data pre-swath editing.

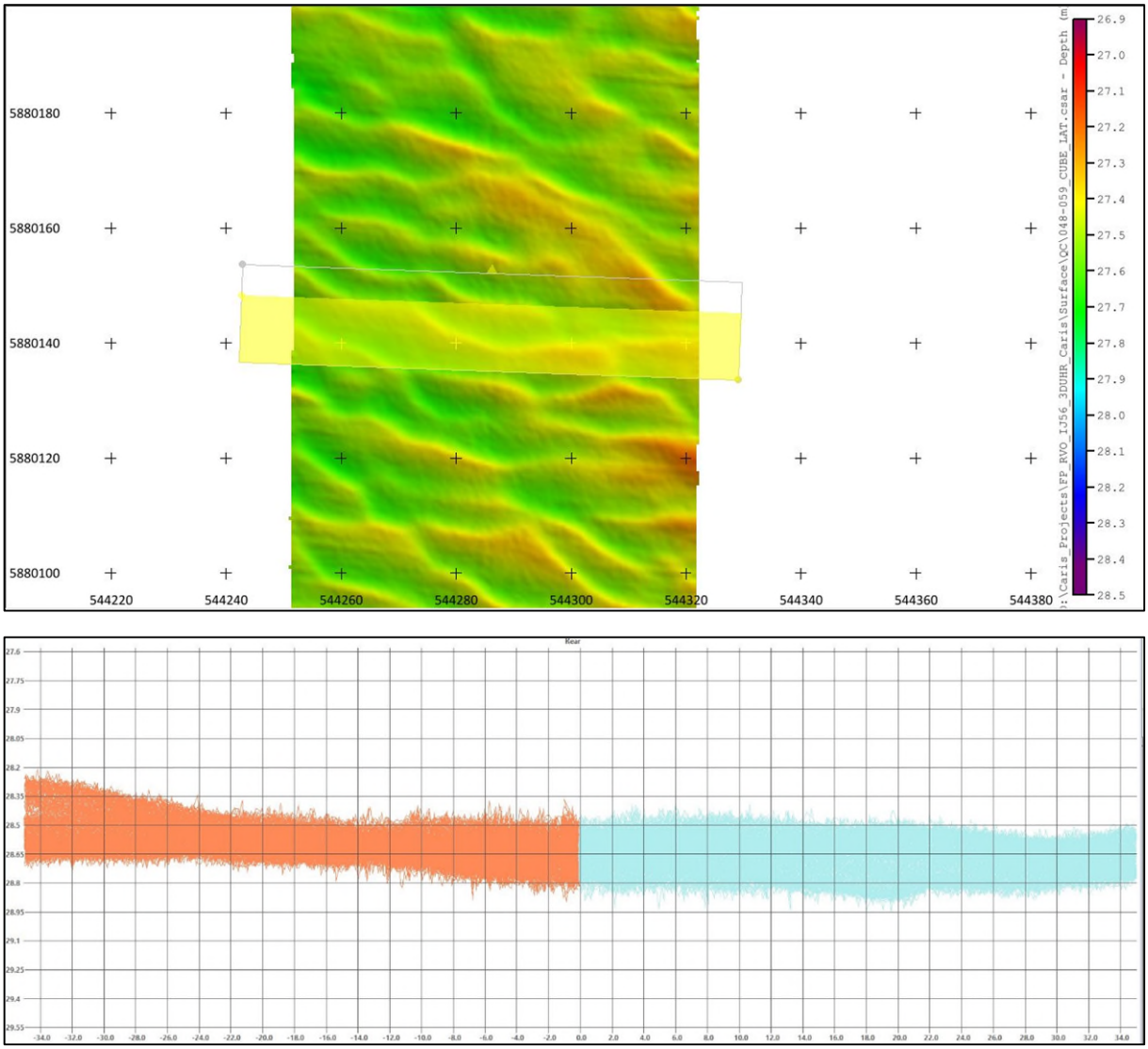


Figure 4.2: Data example presenting MBES data post-swath editing.

4.5 3D UHRS

Following the decision to temporarily suspend the 3D UHRS operations of WP3 on 16 September 2022, Fugro Pioneer commenced WP3 Phase 4 on 13 April 2023. The objective of Phase 4 was to investigate a series of tunnel valleys located in the northern section of the site.

The survey plan consisted of 251 lines of North-South orientation and a line spacing of 12.0 m as presented in Figure 4.3. A secondary line plan with line spacing of 14.0 m was also prepared, but was never implemented.

Real-time coverage was assessed with coverage reports generated with CoverPoint software.

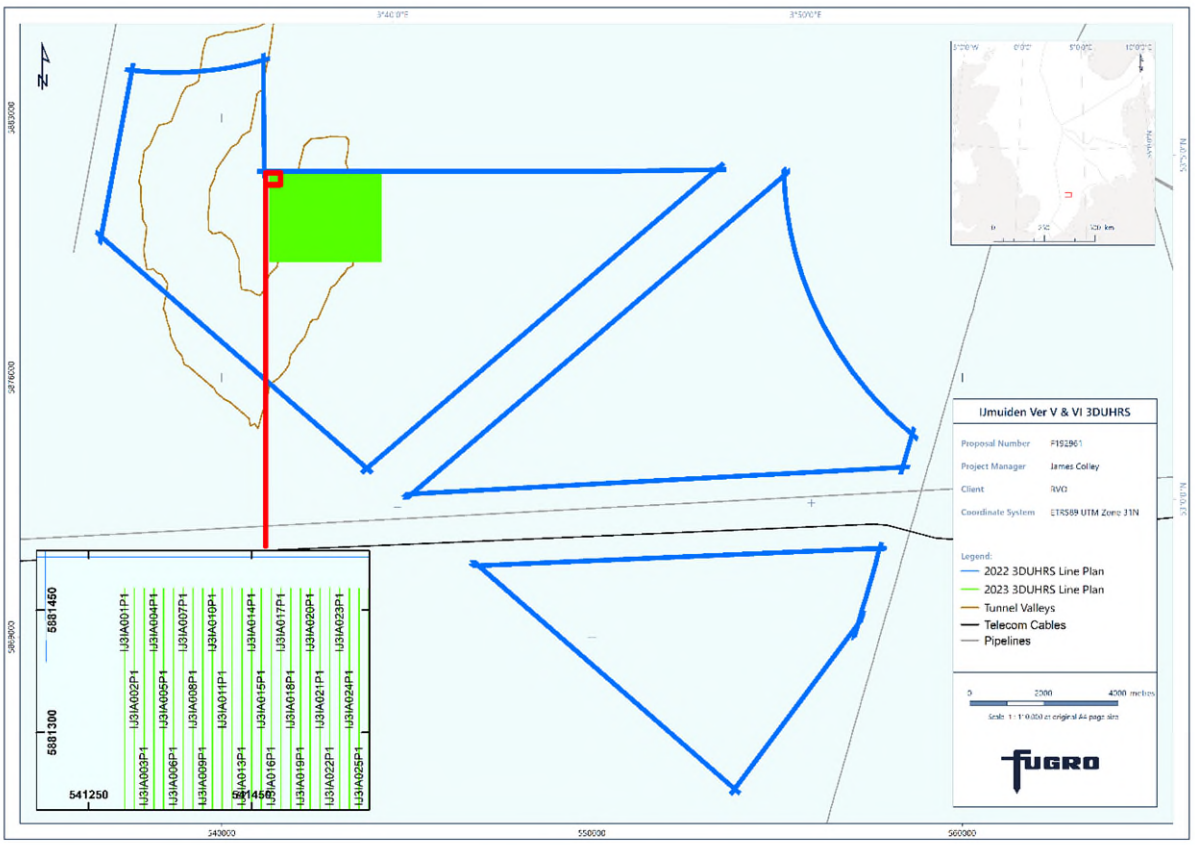


Figure 4.3: Phase 4 3D UHRS survey line plan (Green).

4.5.1 Data Quality Control

Data quality of the 3D UHRS surveys were monitored by checking shot records, near trace gathers, NMO CDP gathers, brute stacks, navigation merged stacks, and denoise stacks.

The acquired 3D UHRS data were reviewed onboard on a line-by-line basis. Observer and navigation logs were reviewed after acquisition, with any problems noted and immediately rectified.

A seismic processing QC log (See Appendix F) was continually updated during acquisition, and where any issues where noted under the 'Comments' column. All final field records, shot points, raw navigation data ranges, sea conditions, speed over ground (SOG), speed through water (STW), shot points lost, and noise levels for start of line (SOL) and end of line (EOL) were logged. An up to date copy of the QC log was made available to the OCR daily.

The 3D UHRS data were assessed and QC as per standard Fugro procedure. This procedure involved working through a series of on-board sequential processing flows, which included the analysis of: source signature, frequency content, near trace gathers, direct arrival (DA) picks, brute stacks, RMS noise plots, shot domain noise attenuation (denoise) stacks, , preliminary statics, shot NMO gathers, and data merge with processed navigation.

QC PDFs were produced for the end of each line, which included displays of near trace stacks (including RMS noise displays and plotted DA picks), shot NMO gathers, and stacks with, and

without final processed navigation. These QC PDFs were transferred to a designated folder accessible to the OCR.

Final processing of the data were to be conducted in Fugro's seismic processing centre in Oslo, Norway.

A breakdown of the on-board quality control procedure has been summarised in the section below, from 4.5.2 to 4.5.9.

4.5.2 Near Trace Gather

Near trace gathers were generated to analyse the source-receiver offset throughout the line, to assess the presence of bad shots due to recording system problems. Near trace gathers were also used to assess the presence of washouts due to marginal sea conditions and streamer movement.

Near trace gathers were assessed for each source-streamer combination.

Data examples of near trace gathers, one from each source, are presented below in Figure 4.4 and Figure 4.5.

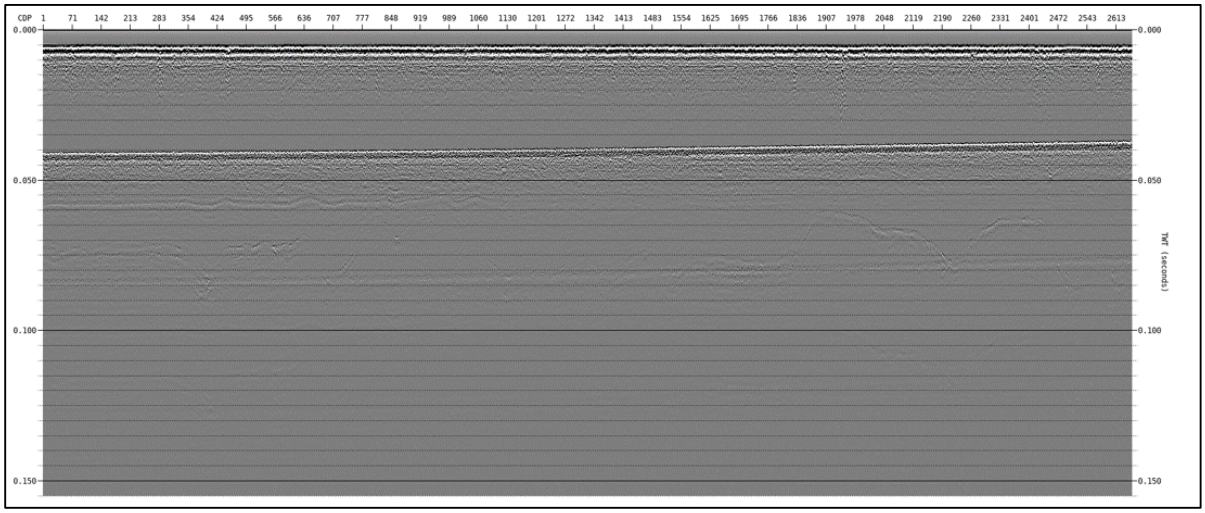


Figure 4.4: Near trace gather data example of IJ3IA117P1 Source 1 Streamer 2.

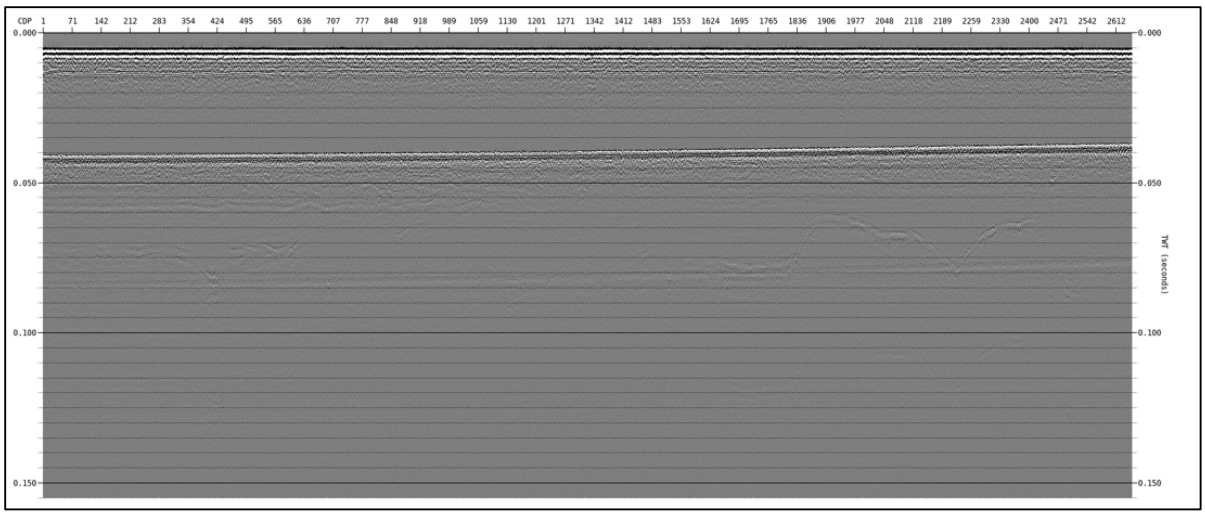


Figure 4.5: Near trace gather data example of IJ3IA117P1 Source 2 Cable 3.

4.5.3 Shot Records

Shot records were monitored during acquisition by the observer, and also analyzed post line completion by the seismic processor. This was to assess data quality, monitor noise levels, and identify any spiking/dead channels.

Shot records were assessed for each source-streamer combination.

Data examples of shot records, one from each source, are presented below in Figure 4.6 and Figure 4.7

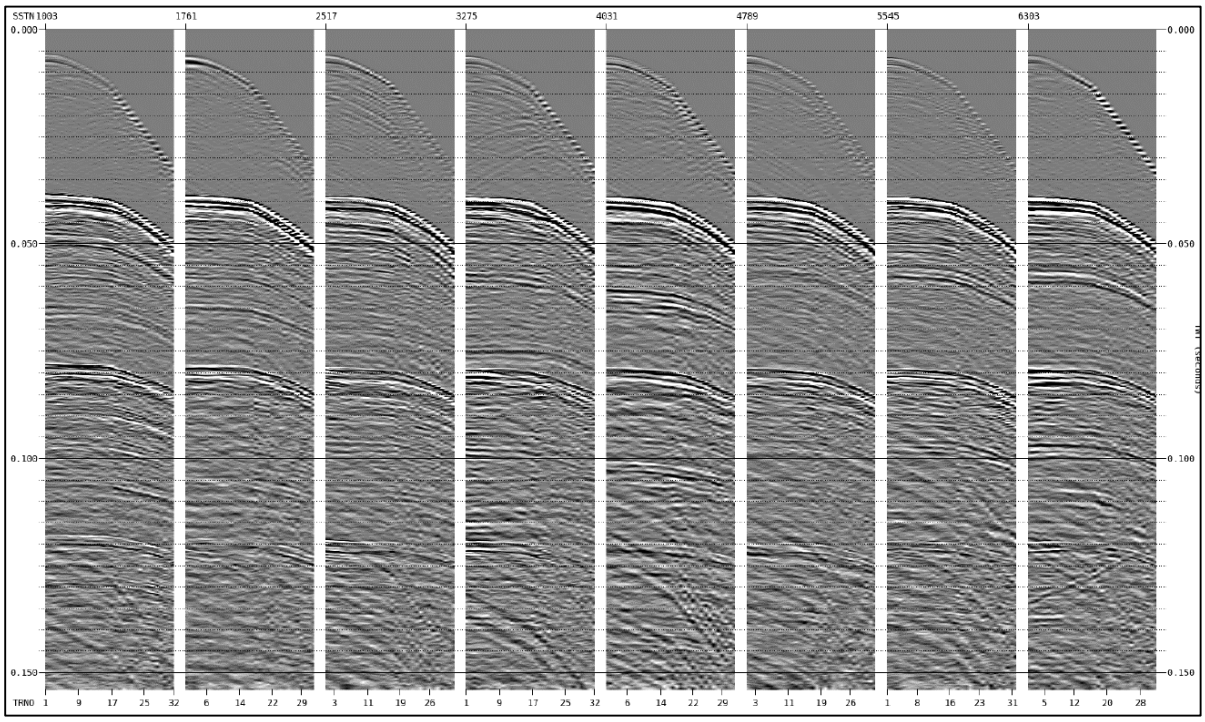


Figure 4.6: Shot record data example from IJ3IA182P1 Source 1 Streamer 1.

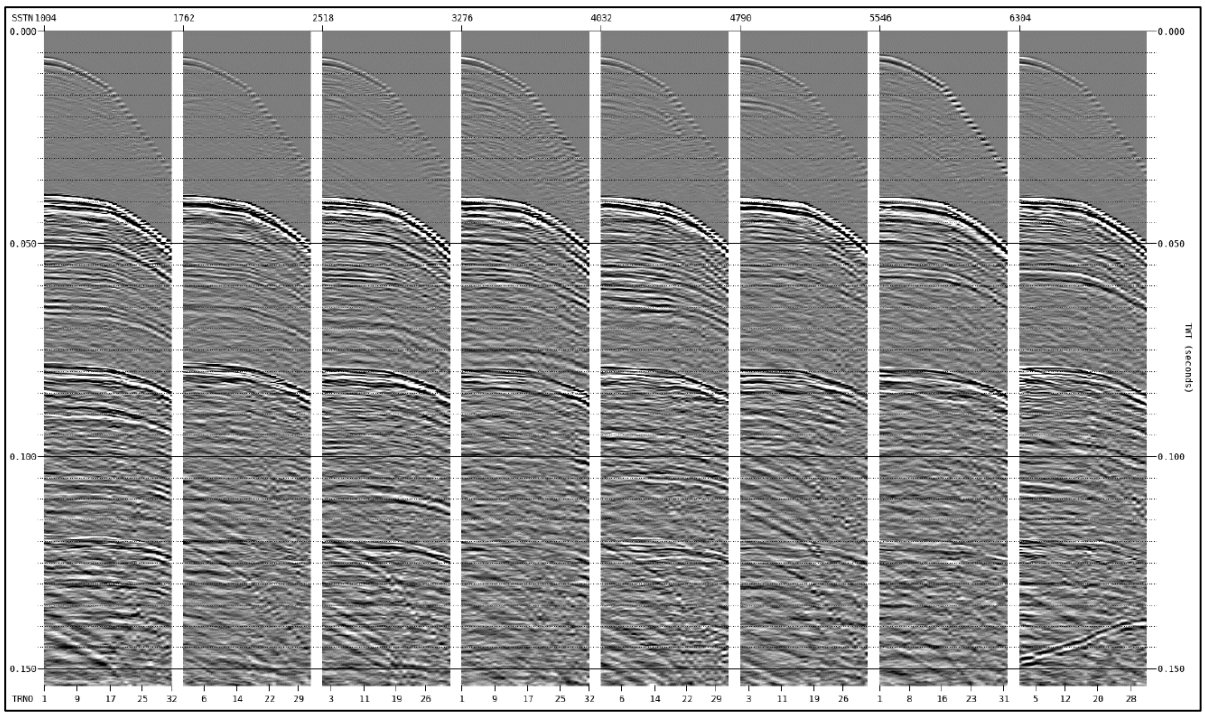


Figure 4.7: Shot record data example from IJ3IA182P1 Source 2 Streamer 4.

4.5.4 Brute Stacks

Brute stacks were generated to assess overall data quality, noise levels and depth of penetration.

Brute stacks were assessed for each source-streamer combination.

Data examples of brute stack, one for each source, are presented below in Figure 4.8 and Figure 4.9.

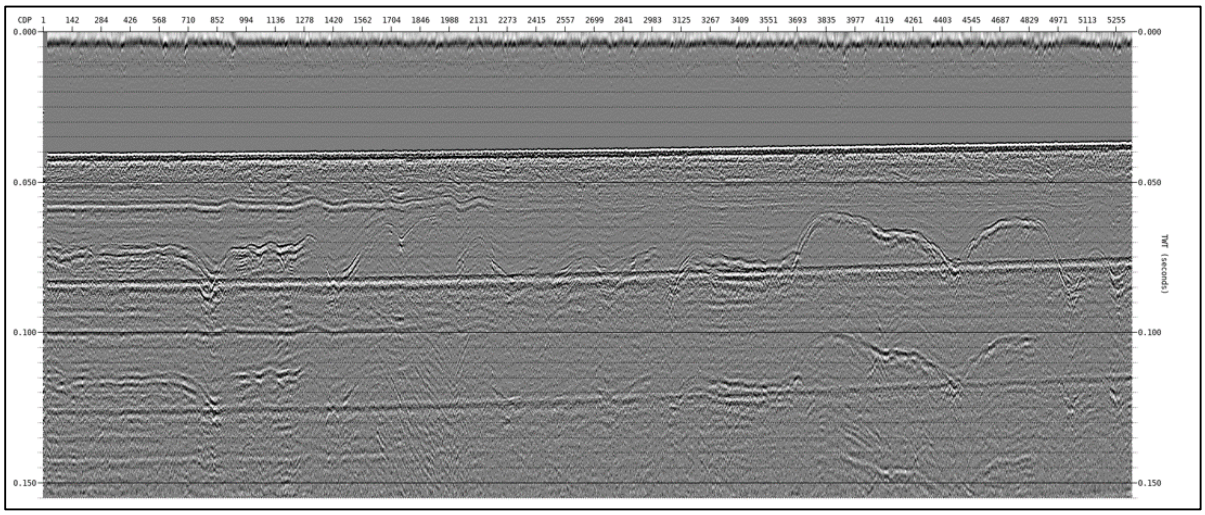


Figure 4.8: Brute stack data example from IJ3IA117P1 Source 1 Streamer 2.

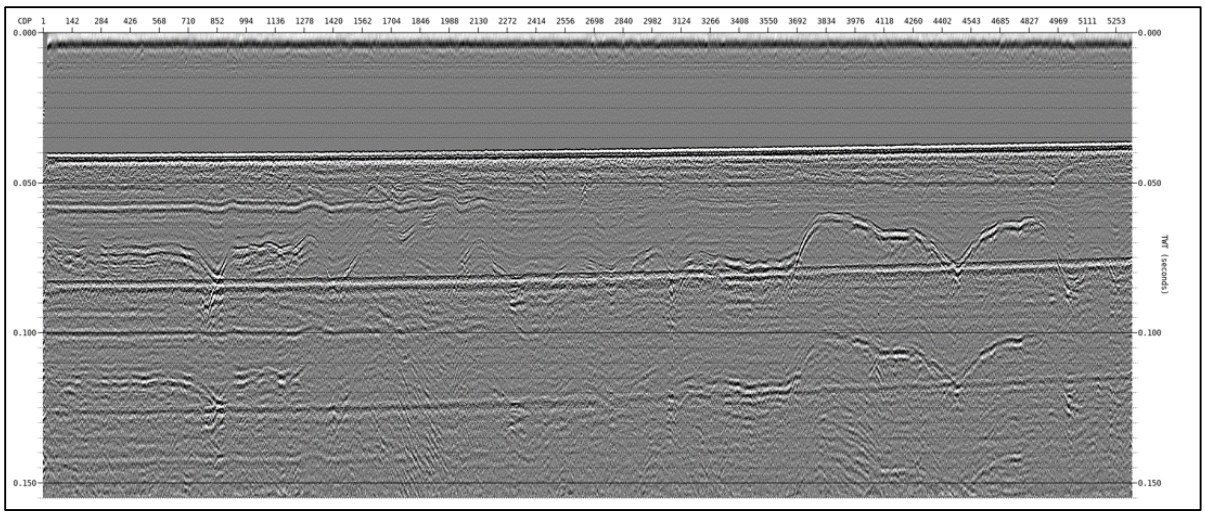


Figure 4.9: Brute stack data example from IJ3IA117P1 Source 2 Streamer 3.

4.5.5 RMS Signal/Noise Plots

RMS signal/noise plots use RMS amplitude analysis within two-time windows on recorded shots. Each shot is stacked to produce a one trace per shot display of the RMS amplitude along the entire line.

The signal RMS amplitude plots are calculated using a parabolic time window starting at the seabed, extending down to the first water bottom multiple in order to include the primary signal.

The noise RMS amplitude plots are calculated based on a time window located at the bottom of the shot record. For this survey, this time window was set to a length of 35 ms.

RMS signal/noise plots were assessed for each source-streamer combination.

Figure 4.10 presents an example of the RMS signal amplitude plot, and Figure 4.11 presents an example of the RMS noise amplitude plot.

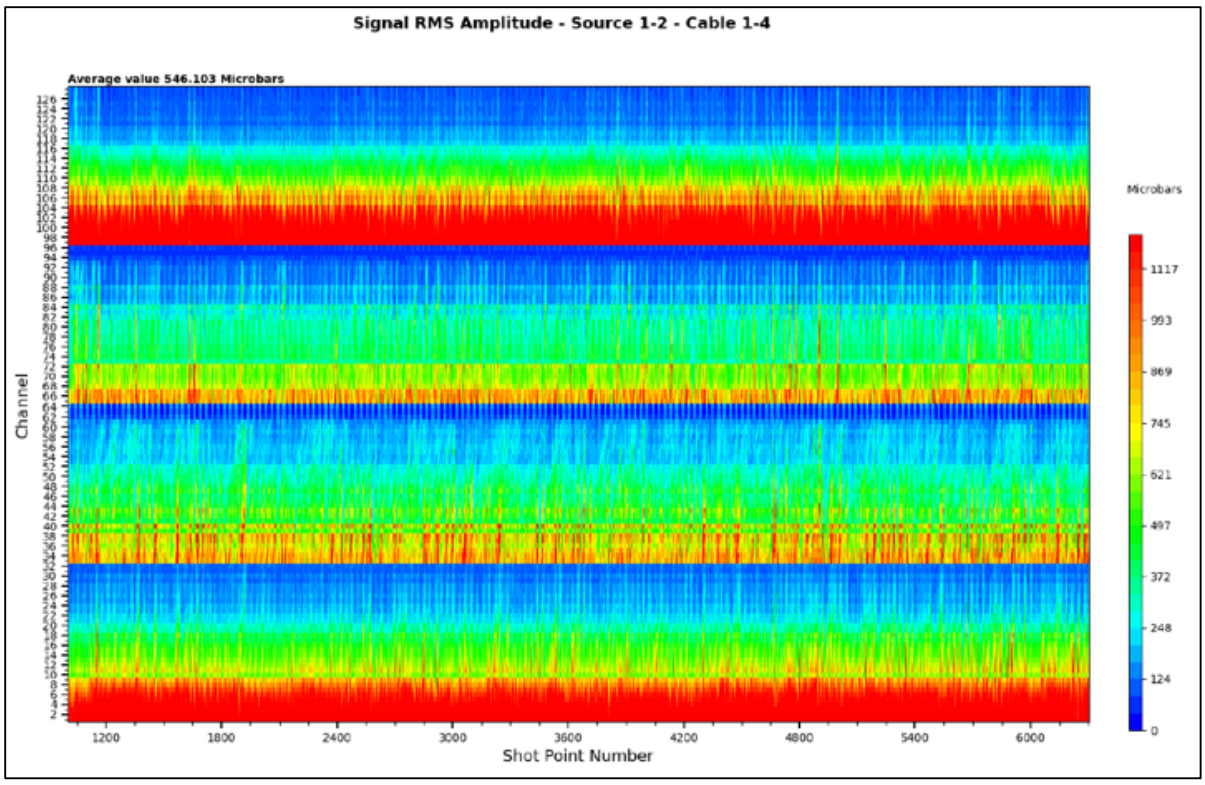


Figure 4.10: RMS Signal Plot from IJ3IA117P1 Source 1-2 Streamer 1-4 (32 Channels).

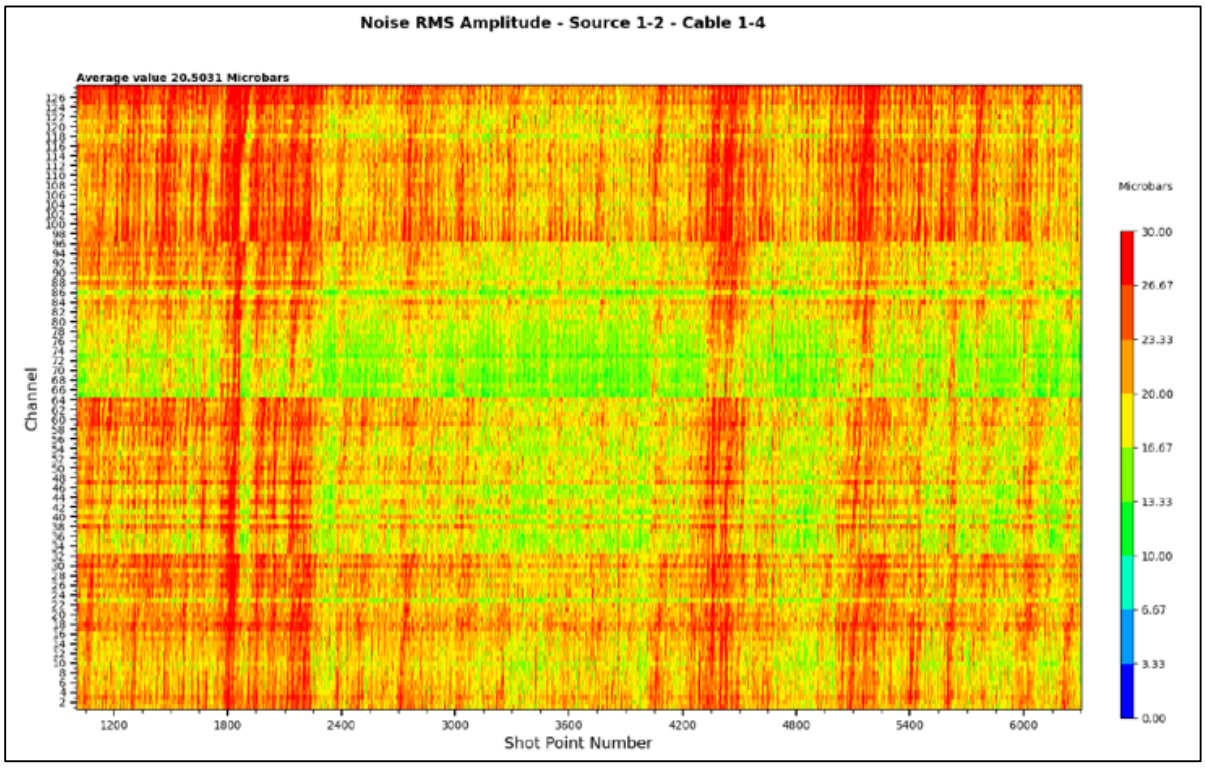


Figure 4.11: RMS Noise Plot from IJ3IA117P1 Source 1-2 Streamer 1-4 (32 Channels).

4.5.6 Navigation Merge

Navigation merge is used to apply navigation from the P190 files to the seismic data in order to apply geometry into the data.

CMP positions and navigation stacks were assessed for each source-streamer combination.

Data examples of navigation merged stacks, one from each source, are presented below in Figure 4.12 and Figure 4.13.

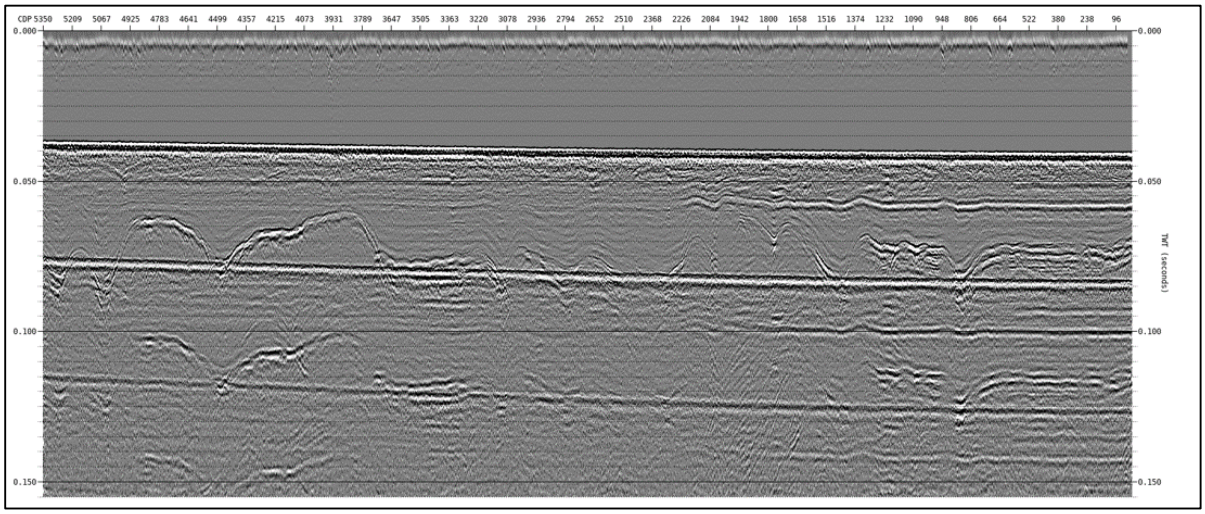


Figure 4.12: Navigation updated stack data example of IJ3IA117P1 Source 1 Streamer 2.

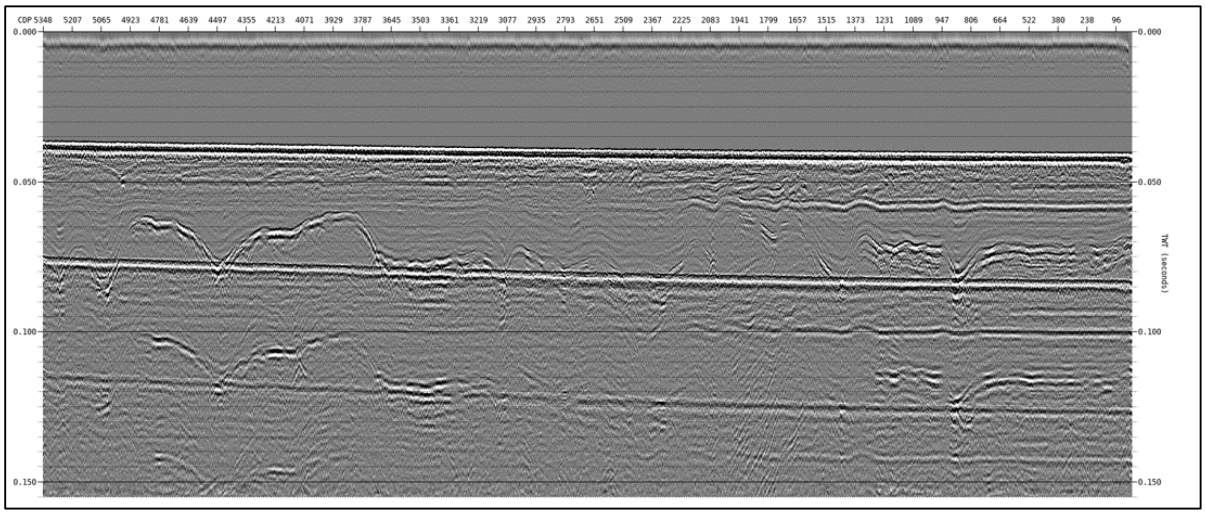


Figure 4.13: Navigation updated stack data example of IJ3IA117P1 Source 2 Streamer 3.

4.5.7 Shot Denoise

A shot domain denoise routine was applied to attenuate a variety of nonlinear noise present in the data. This standardized process utilises several denoise methods such as time frequency denoise (TFDN), swell denoise, and surface wave noise attenuation (SWNA).

The initial shot domain denoise was assessed both before and after application of the denoise routine on the navigation merged shot gathers, as presented in Figure 4.14 and Figure 4.15.

The impact of this shot domain denoise routine is analyzed by production of a denoise residual plot, which presents the difference calculated between the pre and post denoise shot records (Figure 4.16).

Data examples presenting the results of the denoise routine, one for each source, are presented in Figure 4.17 and Figure 4.18.

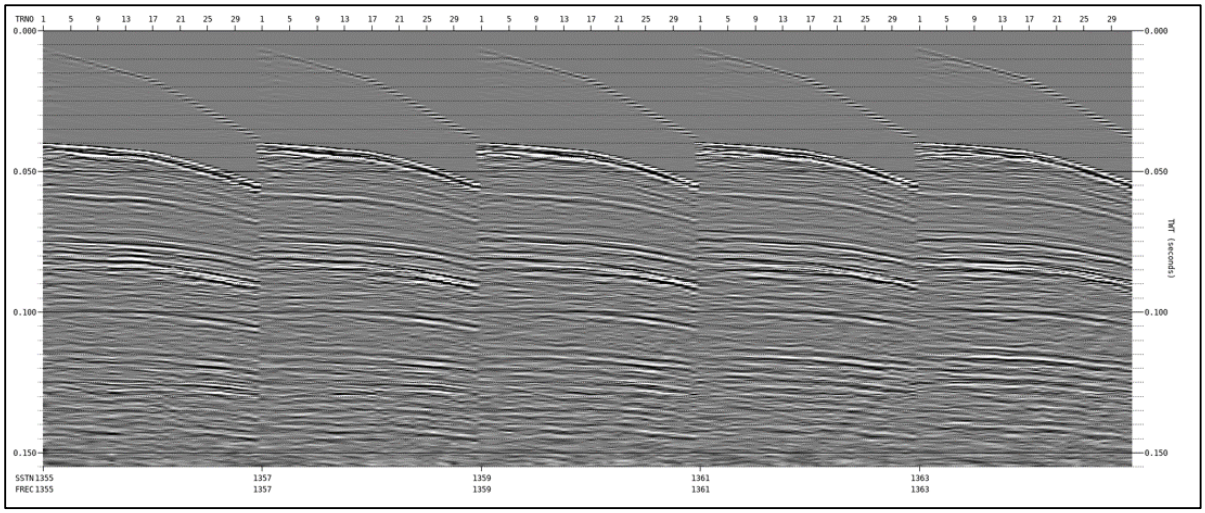


Figure 4.14: Pre-denoise shot record data examples from IJ3IA112P1 Source 1 Streamer 2.

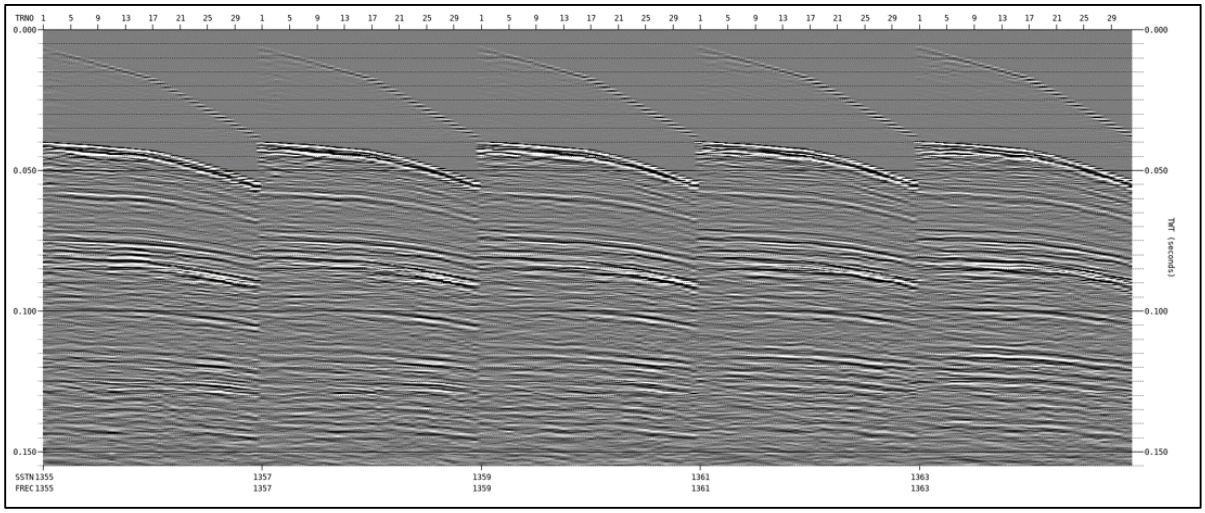


Figure 4.15: Post-denoise shot record data examples from IJ3IA112P1 Source 1 Streamer 2.

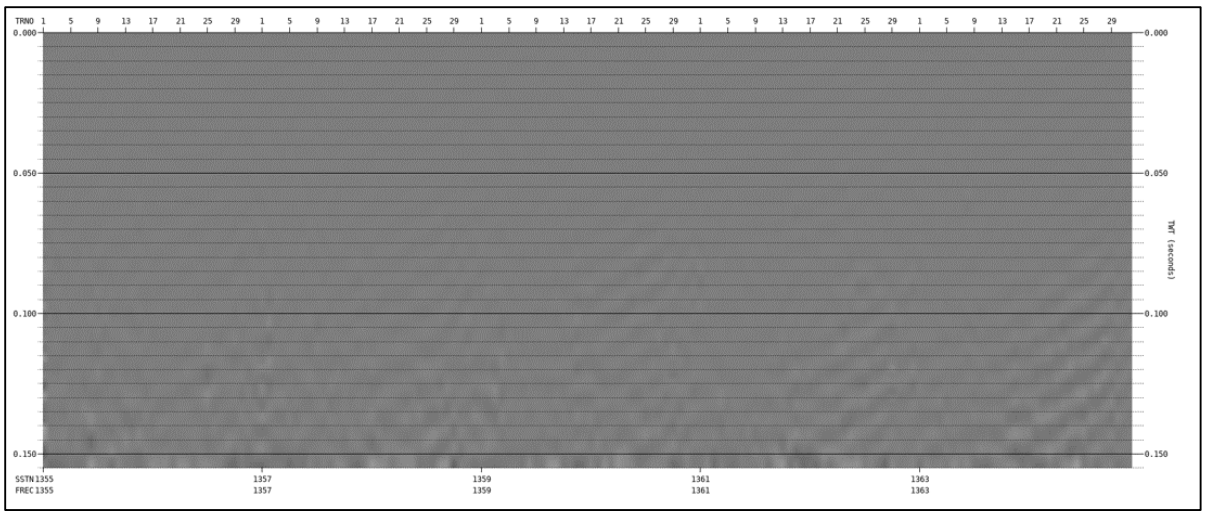


Figure 4.16: Residual plot of denoise routine from IJ3IA112P1 Source 1 Streamer 2.

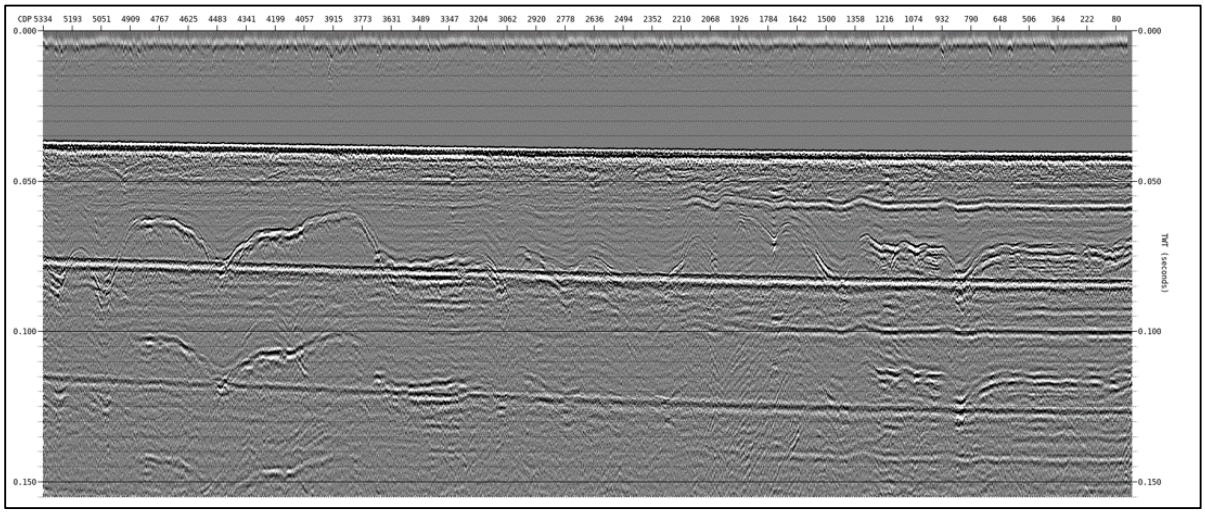


Figure 4.17: Denoise stack data example of IJ3IA117P1 Source 1 Streamer 2.

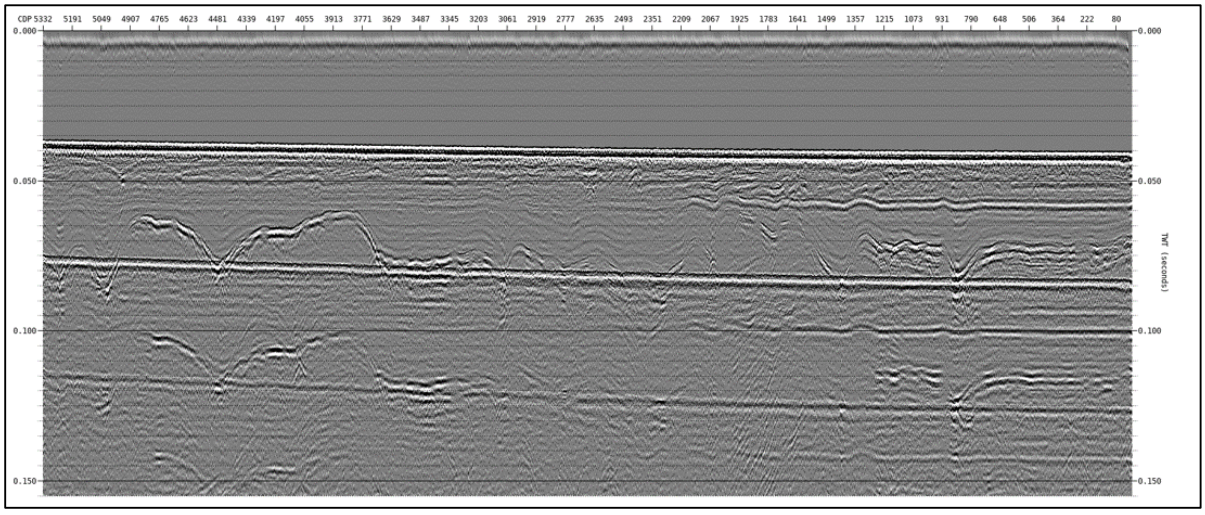


Figure 4.18: Denoise stack data example of IJ3IA117P1 Source 2 Streamer 3.

4.5.8 Offset Analysis

4.5.8.1 Direct Arrival Comparison

Direct arrivals were picked from common receiver data for every 8th channel, commencing with channel 1 (Ch1, Ch8, Ch16, Ch24 and Ch32). These were compared with the direct arrival computed from the processed P190 navigation data, and overlay onto a Channel 1 common receiver gather display.

Direct arrivals were assessed for each source-streamer combination.

Data examples of direct arrivals, one for each source, are presented below in Figure 4.19 and Figure 4.20.

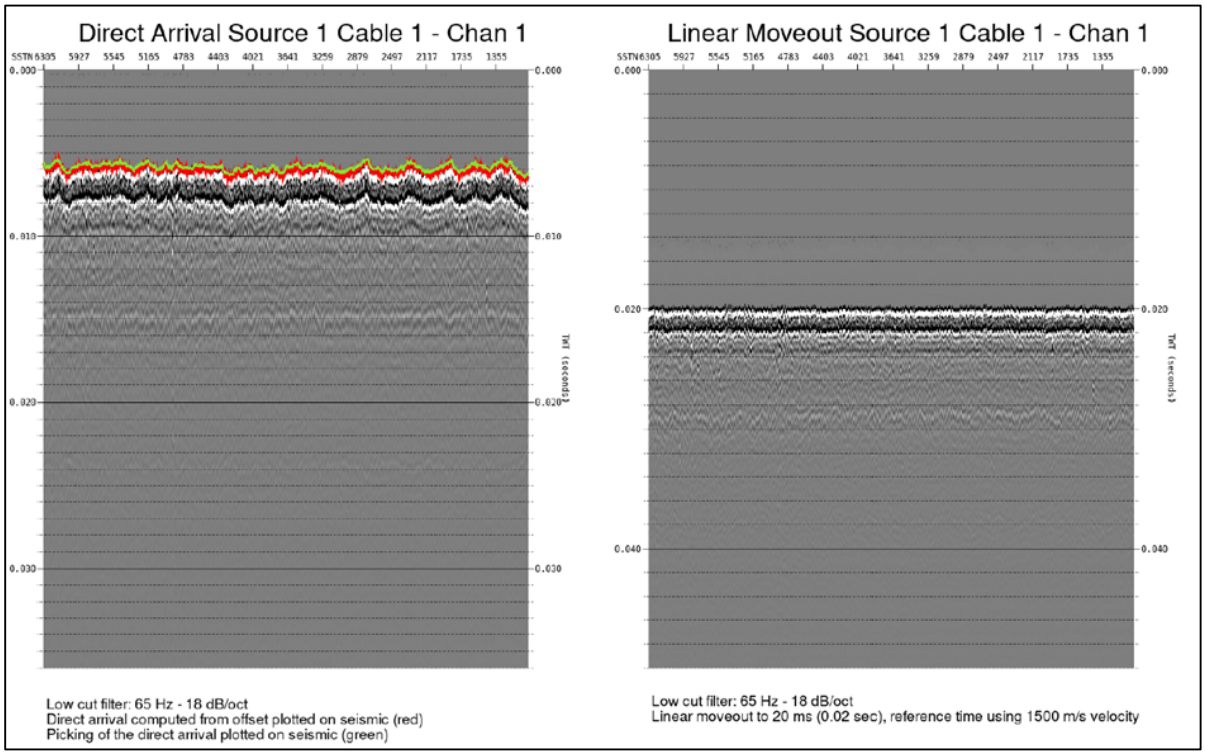


Figure 4.19: Plot of picked direct arrival (green) and P190 computed direct arrival (red) from Source 1 Streamer 1.

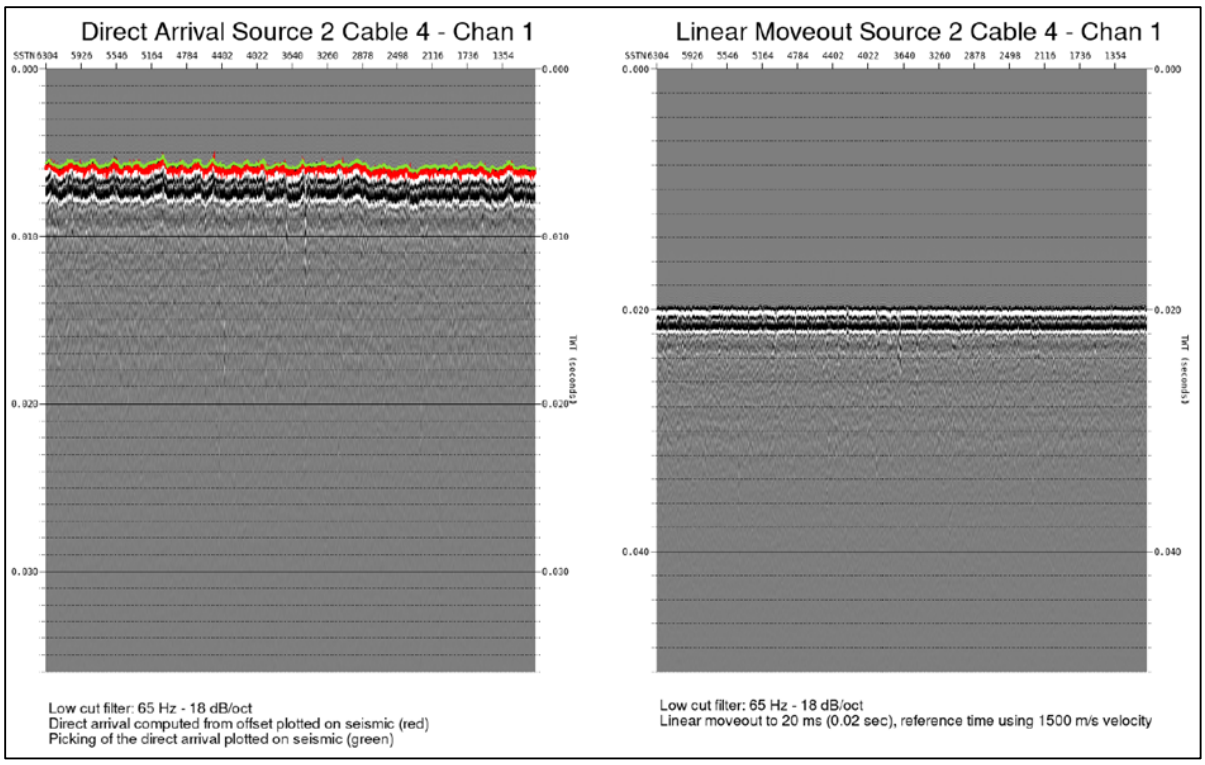


Figure 4.20: Plot of picked direct arrival (green) and P190 computed direct arrival (red) from Source 2 Streamer 4.

4.5.8.2 Direct Offset Comparisons

Direct offset comparisons between P190 computed and picked direct arrivals were plot and compared for each source cable combination using the same common receiver gathers combinations as the above direct arrival comparison (Ch1, Ch8, Ch16, Ch24 and Ch32).

Data examples of the direct offset comparison, one for each source, are presented below in in Figure 4.21 and Figure 4.22.

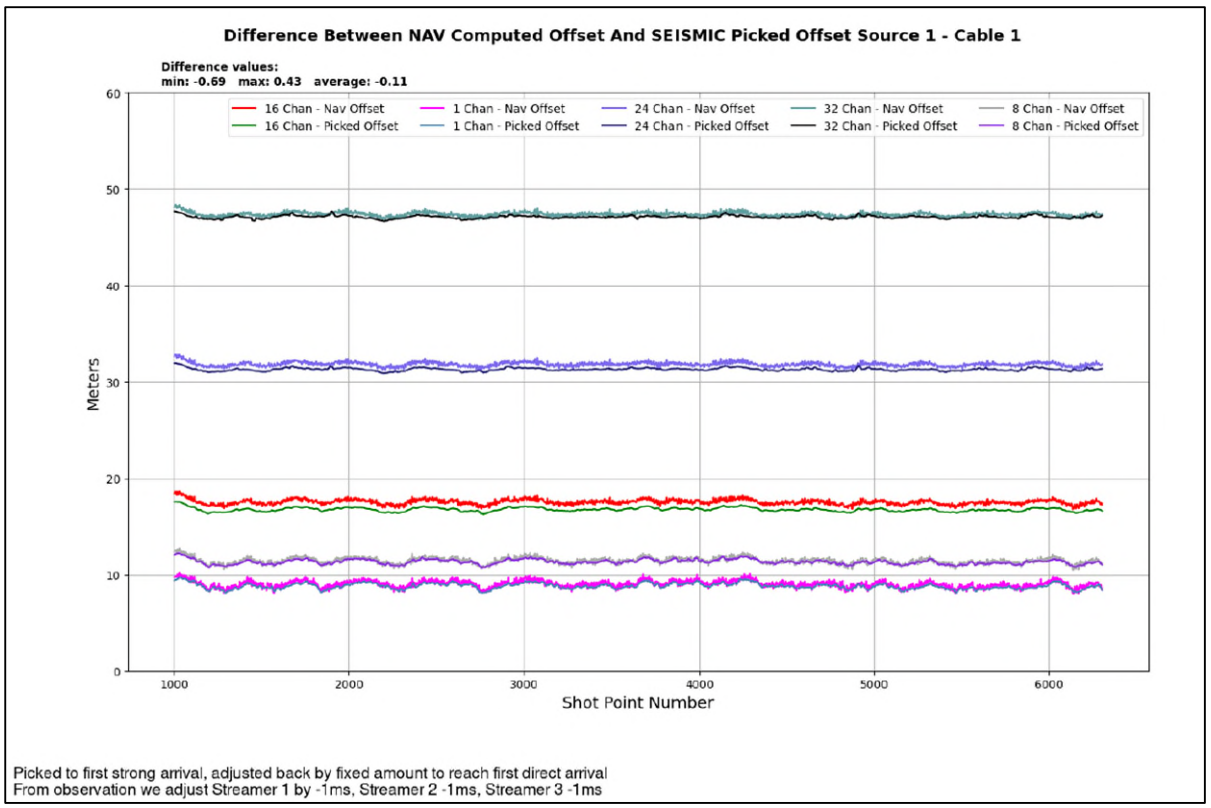


Figure 4.21: Computed vs. picked direct arrival for channels 1, 8, 16, 24 and 32 for Source 1 Streamer 1.

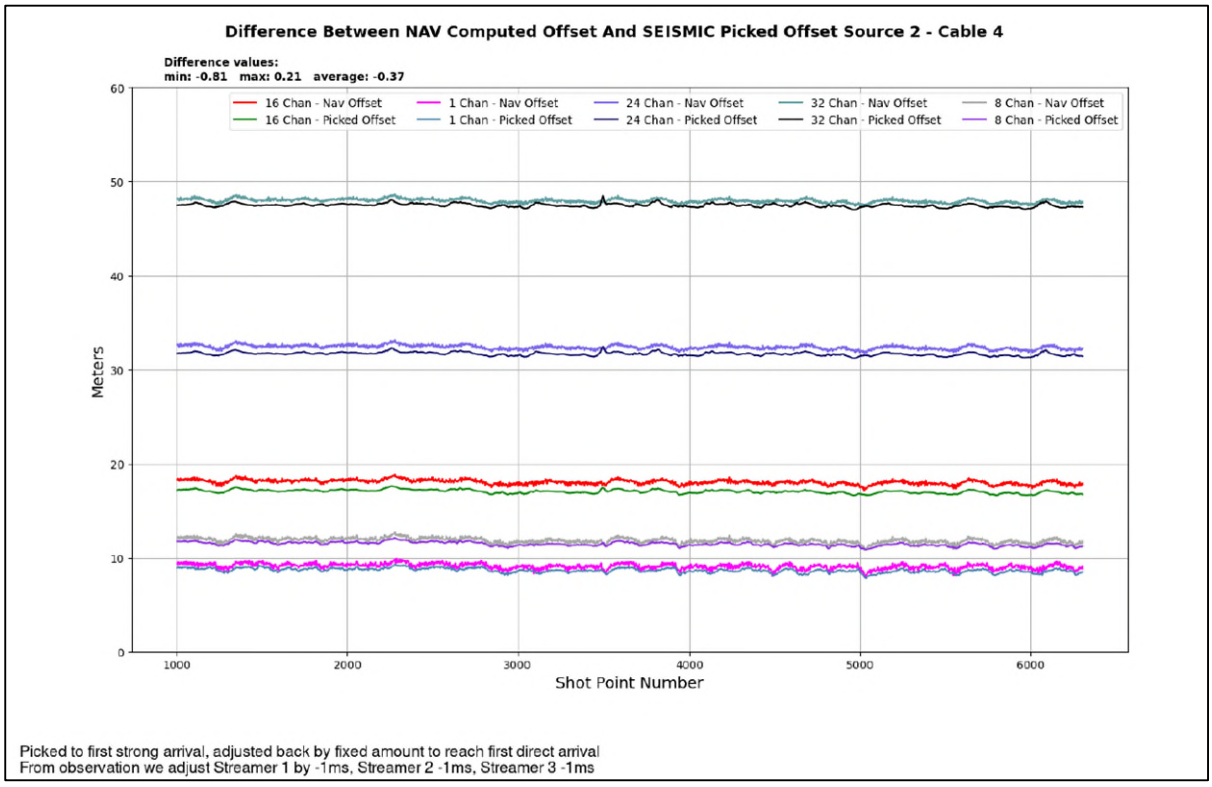


Figure 4.22: Computed vs. picked direct arrival for channels 1, 8, 16, 24 and 32 for Source 2 Streamer 4.

4.5.9 Coverage Plots

CoverPoint software was used to assess coverage of all acquired 3D UHRS data. All coverage plots produced by CoverPoint were flexed versions, i.e., with agreed BIN extension of 50% per side. These coverage analyses are based on acceptable coverage with corresponding thresholds per offset class, 7 for Nears and 7 for Fars (As per Section 2.6.1).

Final acceptance is driven by these two results.

Figure 4.23 below presents an example of the final seismic coverage visualisation created by CoverPoint.

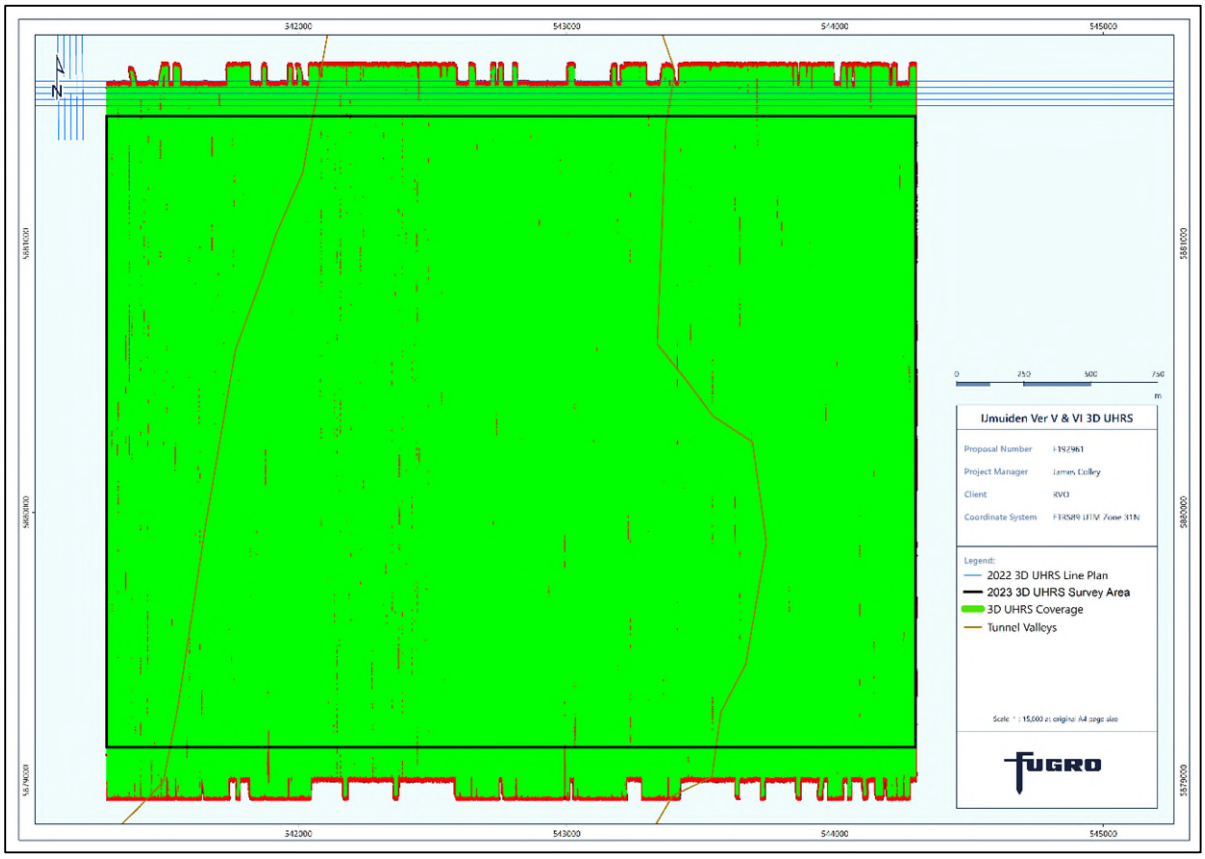


Figure 4.23: Overview of final 3D UHRS coverage from CoverPoint software.

5. Health, Safety and Environment

Fugro performed the survey operations with high regard for health and safety and the environment. A health, safety and environmental plan was completed prior to the start of the survey (refer to Table 4.1). This was produced in accordance with the company's Health Safety and Environmental Management System manual. All survey and crew members were required to read and sign this plan, to ensure they understood the work to be performed and the mitigating measures employed to minimise the identified risks.

During mobilisation and as required thereafter, safety briefings and toolbox talks were conducted to reiterate the risks relating to survey operations and steps taken to minimise these risks. After each crew change, the on-signing members held soundbite training on the 9 lifesaving rules, with focus on one of the rules per day. A full safety briefing was also undertaken after each crew change.

A summary of QHSE information is presented below in Table 5.1, and a summary of key QHSE event Table 5.2.

Table 5.1: Quality, Health, Safety and Environment

Safety Information	To Date
Quality related incident	0
Security incident	0
Environmental incident	1
Health and Safety incident	0
Vessel led Kick-off Meeting (KOM)	3
Two-Part HIRA	0
Toolbox TBT (led by others)	132
Sound bite training	13
Cross departmental Tours	6
Permit to Work	41
Vessel Drills	15
Toolbox Talk (TBT)	159
Safety Meetings	3
Audits / Inspections	6
Inductions	6
Hazard Observation Cards	87
Near Miss	1
Daily HOD Meetings	51
TRA Review	66
Stop, Look, Assess, Manage	2

Table 5.2: Summary of HSE Meetings Conducted

Date	Meeting
13/04/2023	Sound bite training – Mobilisation Progress
14/04/2023	Vessel led kick off meeting
20/04/2023	Vessel safety drill – Damage Control
20/04/2023	Sound bite training
21/04/2023	Cross departmental safety tour
21/04/2023	Health, hygiene and safety inspection
26/04/2023	First crew change and safety inductions
26/04/2023	Internal kick-off meeting
26/04/2023	Sound bite training – Start of rotation HSE reminders – Pioneer good practices
26/04/2023	Sound bite training – Survey equipment familiarisation
26/04/2023	Safety walkaround – back deck
27/04/2023	Sound bite training – correct management of UHRS containers and CSP's
27/04/2023	Vessel safety drills: Abandon ship, fire & ISPS drills
27/04/2023	SLAM Moment: 1. Shackle without colour code markings for use with fall arrestor.
30/04/2023	Cross departmental safety tour
01/05/2023	MOB Drill
02/05/2023	Sound bite training – Configuring RTK pods
06/05/2023	HODS monthly safety meeting
07/05/2023	Cross departmental safety tour
13/05/2023	Safety drill – Rescue from enclosed spaces
13/05/2023	Sound bite training – MBES user interface overview
14/05/2023	Cross departmental safety tour
14/05/2023	Sound bite training – HiPAP/APOS operations
20/05/2023	Incident report: Leaking hydraulic hose on T-Frame
20/05/2023	Monthly safety inspection
20/05/2023	Monthly health and hygiene inspection
20/05/2023	Monthly routine random alcohol tests
20/05/2023	Rescue at height drill
20/05/2023	Cross departmental safety tour
22/05/2023	Whole vessel safety meeting
22/05/2023	Cyber security drill
24/04/2023	Second crew change and safety inductions
25/05/2023	Vessel drills: Abandon ship, firefighting & ISPS
29/05/2023	Cross departmental safety tour
29/05/2023	Health, hygiene and safety inspection
31/05/2023	Vessel safety drill

Upon joining the vessels all members of crew were given a vessel safety induction tour by the vessel master. Vessel muster drills were performed approximately every two weeks depending on operations and weather.

All crew were required to wear lifejackets, hardhats, safety boots, safety glasses, and gloves for all back-deck operations.

During operations a hazard observation card (HOC) system was operated on board allowing crew to report unsafe acts, unsafe conditions, safe acts, or make HSE suggestions. In total 30 HOCs were submitted. The HOC register can be provided on request/is detailed in Appendix F.

There was 1 near misses reported during the project that has been presented in Table 5.3.

Table 5.3: Summary of Project Related Incidents and Near Misses

Date of Occurrence	Type	Fugro Ref #	Details
20/05/2023	Near Miss	PIO-INC-23-001	Small hydraulic leak to aft T-Frame was identified, corrected and contained.

Appendices

Appendix A	**Guidelines on Use of Report**
Appendix B	**Mobilisation Report**
Appendix C	**Daily Progress Reports**
Appendix D	**Fugro Pioneer Vessel Specifications**
Appendix E	**QC Logs**
Appendix F	**Hazard Observation Cards**
Appendix G	**Milestone Completion Acceptance Certificate**

Appendix A

Guidelines on Use of Report

This report (the "Report") was prepared as part of the services (the "Services") provided by Fugro for its client (the "Client") and in accordance with the terms of the relevant contract between the two parties (the Contract"). The Services were performed by Fugro in accordance with the obligations in the Contract and based on requirements of the Client set out in the Contract or otherwise made known by the Client to Fugro and any other information affecting the Services at the time; save that the extent to which Fugro relied on Client or third party information in carrying out the Services was set out in the Contract.

Fugro's obligations and liabilities to the Client or any other party in respect of the Services and this Report are limited to the extent and for the time period set out in the Contract (or in the absence of any express provision in the Contract as implied by the law of the Contract) and Fugro provides no other representation or warranty whether express or implied, in relation to the Services, or for the use of this Report, for any other purpose. Furthermore, Fugro has no obligation to update or revise this Report based on any future changes in conditions or information which emerge following issue of this Report unless expressly required by the provisions of the Contract.

The Services were performed by Fugro exclusively for the Client and any other party expressly identified in the Contract, and any use and/or reliance on the Report or the Services for purposes not expressly stated in the Contract, will be at the Client's sole risk. Any other party seeking to rely on this Report does so wholly at its own and sole risk and Fugro accepts no liability whatsoever for any such use and/or reliance."

Appendix B

Mobilisation Report

Appendix C

Daily Progress Reports

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	1	**Date:**	13/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Alongside IJmuiden; 52°27'N 04°35'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	0
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	6	/	6
Sound bite training	0	/	0
Cross Departmental Tours	0	/	0
Permit to Work	2	/	2
Vessel Drills	0	/	0
Toolbox Talk (TBT)	0	/	0
Safety Meetings	0	/	0
Audits / Inspections	0	/	0
Inductions	0	/	0
Hazard Observation Cards	0	/	0
Near Miss	0	/	0
Daily HOD Meetings	1	/	1
TRA Review	0	/	0
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	General Mob	Mobilisation alongside IJmuiden.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	24:00	/	24:00	100.00%
Total	24:00	/	24:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress

DOME

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	0	12	0	12
Client representative	0	1	0	1
Marine crew	0	14	0	14
Total	0	27	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	SW	WSW	SW	SW	
Wind Speed	Beaufort	5	4	4	4	
Sig Wave Height	m	-	-	-	-	

Weather Forecast

A low N of Scotland clears NNW across the Faroes, with associated weak showery troughs clearing N. Later today a weak ridge extends SSW across the North Sea, as another low drives frontal/showery troughs E-SE into the SW North Sea. These fill tonight as a col forms over much of the North Sea tomorrow, although a frontal trough does move W across Denmark into the E North Sea. This then dissipates on Sunday morning.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	230.30	0.00	0.80	229.50	0.80	m³
Water	44.00	0.00	4.00	40.00	4.00	m³
Lube oil	800.00	0.00	0.00	800.00	0.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will continue with the mobilisation alongside IJmuiden.
Once harbour calibrations are completed, Pioneer will perform the absolute bar check before steaming to site.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer
Fugro Pioneer Party Chief
14/04/2023

Client Representative

Terry Wiseman
RVO Client Representative
14/04/2023

DOME

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	2	**Date:**	14/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Alongside IJmuiden; 52°27'N 04°35'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	1	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	9	/	15
Sound bite training	1	/	1
Cross Departmental Tours	0	/	0
Permit to Work	4	/	6
Vessel Drills	0	/	0
Toolbox Talk (TBT)	0	/	0
Safety Meetings	0	/	0
Audits / Inspections	0	/	0
Inductions	0	/	0
Hazard Observation Cards	0	/	0
Near Miss	0	/	0
Daily HOD Meetings	1	/	2
TRA Review	7	/	7
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Sound bite training - Mobilisation progress

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	General Mob	Mobilisation activities ongoing. - Vessel led kick off meeting held on the bridge. - Continued with measuring offsets and setting hardware to work - Numerous other activities including lifting and working at heigh.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	24:00	/	48:00	100.00%
Total	24:00	/	48:00	

DOME

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	SW	WSW	SW	SW	
Wind Speed	Beaufort	5	4	4	4	
Sig Wave Height	m	-	-	-	-	

Weather Forecast

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	229.50	0.00	0.80	228.70	1.60	m^3
Water	40.00	80.00	5.00	115.00	9.00	m^3
Lube oil	800.00	0.00	0.00	800.00	0.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will continue with the mobilisation.

Client Representative Comments

Party Chief Comments

The lack of internet connectivity is hampering mobilisation efforts - we are unable to download and activate project critical software.

Fugro Representative

Jaco de Beer
Fugro Pioneer Party Chief
15/04/2023

Client Representative

Terry Wiseman
RVO Client Representative
15/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	3	**Date:**	15/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Alongside IJmuiden; 52°27'N 04°35'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	0	/	15
Sound bite training	1	/	2
Cross Departmental Tours	0	/	0
Permit to Work	1	/	7
Vessel Drills	0	/	0
Toolbox Talk (TBT)	3	/	3
Safety Meetings	0	/	0
Audits / Inspections	0	/	0
Inductions	1	/	1
Hazard Observation Cards	0	/	0
Near Miss	0	/	0
Daily HOD Meetings	1	/	3
TRA Review	0	/	7
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	General Mob	Alongside mobilisation ongoing. - Various activities connected to then mobilisation. - Lifting operations for lifting the stern rollers into place. - Streamer tests ongoing.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	24:00	/	72:00	100.00%
Total	24:00	/	72:00	

DOME

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	SW	WSW	SW	SW	
Wind Speed	Beaufort	5	4	4	4	
Sig Wave Height	m	-	-	-	-	

Weather Forecast

The remnants of a frontal trough fill over the eastern North Sea this morning whilst a slack pressure gradient exists over the central and N North Sea. A high over Norway builds a ridge SW over the North Sea this afternoon and the UK astern, persisting there tomorrow and then becoming orientated WSW through Tuesday.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	228.70	0.00	0.80	227.90	2.40	m^3
Water	115.00	0.00	5.00	110.00	14.00	m^3
Lube oil	800.00	0.00	0.00	800.00	0.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will continue the mobilisation and alongside calibrations.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer
Fugro Pioneer Party Chief
16/04/2023

Client Representative

Terry Wiseman
RVO Client Representative
16/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	4	**Date:**	16/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Alongside IJmuiden; 52°27'N 04°35'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	5	/	20
Sound bite training	0	/	2
Cross Departmental Tours	0	/	0
Permit to Work	0	/	7
Vessel Drills	0	/	0
Toolbox Talk (TBT)	4	/	7
Safety Meetings	0	/	0
Audits / Inspections	0	/	0
Inductions	0	/	1
Hazard Observation Cards	4	/	4
Near Miss	0	/	0
Daily HOD Meetings	1	/	4
TRA Review	2	/	9
Stop, Look, Assess, Manage	0	/	0

HSE Comments

4x HOCs
- HOC_23.170 - Unsafe Act - Using pallets instead of a ladder – 20230414
- HOC_23.171 - Unsafe Act - Contractor grinding without wearing gloves – 20230414
- HOC_23.172 - Unsafe Act - Contractor Working at height without eye wear or chinstrap – 20230414
- HOC_23.173 - Unsafe Condition - Rubber matting required near the seismic container - 20230414

Summary of Activities

Begin	End	Duration	Type	Description
00:00	17:10	17:10	General Mob	Alongside mobilisation.
17:10	18:40	01:30	Equipment Cal	Performing bar check in the IJmuiden lock.
18:40	22:00	03:20	Transit to/from Site	Transit to side tap P9-B to undertake the MBES patch test.
22:00	24:00	02:00	Equipment Cal	Undertaking the multi-beam patch test.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	17:10	/	89:10	92.88%
Equipment Cal	3:30	/	3:30	3.65%
Transit to/from Site	3:20	/	3:20	3.47%
Total	24:00	/	96:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	N	N	N	NNE	
Wind Speed	Beaufort	3	4	3	3	
Sig Wave Height	m	-	-	0.8	0.8	

Weather Forecast

A high over Norway extends a ridge SSW over the North Sea and England, becoming orientated WSW to Scotland through the day tomorrow and persisting there on Wednesday.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	227.90	0.00	0.80	227.10	3.20	m^3
Water	110.00	0.00	5.00	105.00	19.00	m^3
Lube oil	800.00	0.00	0.00	800.00	0.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will continue to Nederwiek Zuid site to continue the offshore mobilisation and calibrations.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer Fugro Pioneer Party Chief	17/04/2023

Client Representative

Terry Wiseman RVO Client Representative	16/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	5	**Date:**	17/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Side Tap P9-B; 52°34'N, 03°50'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	5	/	25
Sound bite training	0	/	2
Cross Departmental Tours	0	/	0
Permit to Work	0	/	7
Vessel Drills	0	/	0
Toolbox Talk (TBT)	2	/	9
Safety Meetings	0	/	0
Audits / Inspections	0	/	0
Inductions	0	/	1
Hazard Observation Cards	0	/	4
Near Miss	0	/	0
Daily HOD Meetings	0	/	4
TRA Review	2	/	11
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	04:00	04:00	Equipment Cal	Undertaking the multi-beam calibration.
04:00	09:30	05:30	Transit to/from Site	Transit to Nederwiek-Zuid to continue offshore calibrations.
09:30	11:28	01:58	Equipment Cal	Integrated system performance test.
11:28	24:00	12:32	Equipment Cal	Recording the pulse tests for both port and stbd sources.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	89:10	74.31%
Equipment Cal	18:30	/	22:00	18.33%
Transit to/from Site	5:30	/	8:50	7.36%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Total	24:00	/	120:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NNE	NNE	NNE	
Wind Speed	Beaufort	3	3	3	3	
Sig Wave Height	m	1.0	1.0	1.0	1.0	

Weather Forecast

A high over Norway extends a ridge SW-SSW across the North Sea and the UK. The high begins to slowly drift W, to lie just NE of Shetland this afternoon, with the ridge orientating S across the North Sea and SW across N Scotland. The high remains dominant through tomorrow, as it becomes centred N of Shetland and the ridge becomes orientated SSE across the North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	227.10	0.00	2.30	224.80	5.50	m^3
Water	105.00	0.00	6.00	99.00	25.00	m^3
Lube oil	800.00	0.00	0.00	800.00	0.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will go alongside in IJmuiden to shelter on weather.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer Fugro Pioneer Party Chief	18/04/2023

Client Representative

Terry Wiseman RVO Client Representative	18/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	6	**Date:**	18/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Nederwiek Zuid; 53°07'N, 03°09'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	0	/	20
Sound bite training	2	/	4
Cross Departmental Tours	0	/	0
Permit to Work	4	/	11
Vessel Drills	0	/	0
Toolbox Talk (TBT)	6	/	15
Safety Meetings	0	/	0
Audits / Inspections	0	/	0
Inductions	0	/	1
Hazard Observation Cards	2	/	6
Near Miss	0	/	0
Daily HOD Meetings	1	/	5
TRA Review	4	/	15
Stop, Look, Assess, Manage	0	/	0

HSE Comments

2x Sound bite training sessions
2x HOCs
- HOC_23.174 - Unsafe Condition - Rotting wooden deck is a trip hazard - 20230418
- HOC_23.175 - Unsafe Act - Ascending the monkey island without permission - 20230418

Summary of Activities

Begin	End	Duration	Type	Description
00:00	09:30	09:30	Weather - Mob	Transit to IJmuiden during inclement weather.
09:30	15:00	05:30	General Mob	Repeated the Integrated Systems Performance Test and undertook the streamer tap test.
15:00	24:00	09:00	Weather - Mob	Alongside IJmuiden, waiting on weather.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	5:30	/	94:40	65.74%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Equipment Cal	0:00	/	22:00	15.28%
Transit to/from Site	0:00	/	8:50	6.13%
Weather - Mob	18:30	/	18:30	12.85%
Total	24:00	/	144:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	E	E	E	E	
Wind Speed	Beaufort	6	6	6	6	
Sig Wave Height	m	1.5	-	-	-	

Weather Forecast

A high over S Norwegian Sea extends a ridge SSE across the North Sea. Meanwhile, low pressure over Iberia deepens a trough NNE across the S North Sea. These combine to create a strong NE-ENE'ly flow over the S North Sea. Tomorrow, a shallow low & associated troughs track W across the Low Countries and then into the SW North Sea from the afternoon, where they become slow-moving.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	224.80	0.00	2.50	222.30	8.00	m^3
Water	99.00	0.00	6.00	93.00	31.00	m^3
Lube oil	800.00	0.00	70.00	730.00	70.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will be waiting on weather alongside IJmuiden.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer **Fugro Pioneer Party Chief**	**19/04/2023**

Client Representative

Terry Wiseman **RVO Client Representative**	**19/04/2023**

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	7	**Date:**	19/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Nederwiek Zuid; 53°07'N, 03°09'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	0	/	20
Sound bite training	1	/	5
Cross Departmental Tours	0	/	0
Permit to Work	0	/	11
Vessel Drills	1	/	1
Toolbox Talk (TBT)	0	/	15
Safety Meetings	0	/	0
Audits / Inspections	0	/	0
Inductions	0	/	1
Hazard Observation Cards	0	/	6
Near Miss	0	/	0
Daily HOD Meetings	0	/	5
TRA Review	0	/	15
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Sound bite training
Vessel drill - Damage control

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	Weather - Mob	Alongside IJmuiden, waiting on weather.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	94:40	56.35%
Equipment Cal	0:00	/	22:00	13.10%
Transit to/from Site	0:00	/	8:50	5.26%
Weather - Mob	24:00	/	42:30	25.30%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Total	24:00	/	168:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	E	ENE	NE	NE	
Wind Speed	Beaufort	4	5	4	4	
Sig Wave Height	m	-	-	-	-	

Weather Forecast

A high centred S Norwegian Sea extends a ridge S over North Sea as low pressure over Iberia deepens a trough NNE over S North Sea today. These combine creating a firm NE-ENE'ly flow over S North Sea. Today, a shallow low & associated troughs track WSW from Germany, into SW North Sea in the afternoon, clearing WNW over England into tomorrow. Tomorrow the low tracks N over England & S/C North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	222.30	0.00	0.80	221.50	8.80	m^3
Water	93.00	0.00	4.00	89.00	35.00	m^3
Lube oil	730.00	0.00	0.00	730.00	70.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will be alongside IJmuiden, waiting on weather.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer Fugro Pioneer Party Chief	20/04/2023

Client Representative

Terry Wiseman RVO Client Representative	20/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	8	**Date:**	20/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	IJmuiden; 52°28'N, 04°35'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	0	/	20
Sound bite training	1	/	6
Cross Departmental Tours	1	/	1
Permit to Work	3	/	14
Vessel Drills	0	/	1
Toolbox Talk (TBT)	4	/	19
Safety Meetings	0	/	0
Audits / Inspections	2	/	2
Inductions	0	/	1
Hazard Observation Cards	7	/	13
Near Miss	0	/	0
Daily HOD Meetings	1	/	6
TRA Review	2	/	17
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Sound bite training
Cross departmental tour
2x Inspections - Health & hygiene and Safety inspections.
7x HOCs

- HOC_23.176 - Unsafe Act - Different cutting boards must be kept apart – 20230420
- HOC_23.177 - Unsafe Condition - Waste segregation not adhered to – 20230420
- HOC_23.178 - Unsafe Condition - Oven requires a deep clean – 20230420
- HOC_23.179 - Unsafe Condition - Waste bin in the galley must have a lid – 20230420
- HOC_23.180 - Unsafe Condition - Mouldy foodstuff removed from the cold store – 20230420
- HOC_23.181 - Unsafe Condition - Toilet in the hospital must be cleaned again – 20230420
- HOC_23.182 - Suggestion - Doors and walls should be cleaned better - 20230420

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	Weather - Mob	Alongside IJmuiden, waiting on weather.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	94:40	49.31%
Equipment Cal	0:00	/	22:00	11.46%
Transit to/from Site	0:00	/	8:50	4.60%
Weather - Mob	24:00	/	66:30	34.64%
Total	24:00	/	192:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	E	E	E	
Wind Speed	Beaufort	5	4	4	4	
Sig Wave Height	m	-	-	-	-	

Weather Forecast

Ridge over the North Sea declines N today whilst a trough lies ENE over S North Sea, driving bands of rain WNW from the near continent into S England. Rain drifts N overnight, reaching C North Sea tomorrow AM. After, complex low forms over S North Sea, although uncertainty surrounds its exact location. The low remains relatively stationary over the North Sea on Sunday, driving various bands of rain & showery troughs.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	221.50	0.00	0.80	220.70	9.60	m^3
Water	89.00	0.00	6.00	83.00	41.00	m^3
Lube oil	730.00	0.00	0.00	730.00	70.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will depart for the verification site at Nederwiek Zuid and continue with streamer balancing.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer Fugro Pioneer Party Chief	21/04/2023

Client Representative

Terry Wiseman RVO Client Representative	21/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	9	**Date:**	21/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	IJmuiden; 52°28'N, 04°35'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	3	/	23
Sound bite training	0	/	6
Cross Departmental Tours	0	/	1
Permit to Work	2	/	16
Vessel Drills	0	/	1
Toolbox Talk (TBT)	5	/	24
Safety Meetings	0	/	0
Audits / Inspections	0	/	2
Inductions	0	/	1
Hazard Observation Cards	0	/	13
Near Miss	0	/	0
Daily HOD Meetings	1	/	9
TRA Review	3	/	20
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	15:25	15:25	Weather - Mob	Alongside IJmuiden, waiting on weather.
15:25	22:40	07:15	Weather - Mob	Transit to site during inclement weather.
22:40	24:00	01:20	Weather - Mob	Waiting on weather at NW-Z.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	94:40	43.83%
Equipment Cal	0:00	/	22:00	10.19%
Transit to/from Site	0:00	/	8:50	4.09%
Weather - Mob	24:00	/	90:30	41.90%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Total	24:00	/	216:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	E	E	ENE	N	
Wind Speed	Beaufort	4	4	4	3	
Sig Wave Height	m	-	-	1.3	1.3	

Weather Forecast

A complex low lies broadly over the UK and North Sea, with one centre drifting NNW off NE England this morning and associated troughs affecting the North Sea. The complex low moves NE over Norway tomorrow as another shallow low moves ENE from England to the Netherlands, continuing over Denmark on Monday morning. Meanwhile on Monday, a N'ly flow develops over the North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	220.70	0.00	0.80	219.90	10.40	m^3
Water	83.00	0.00	5.00	78.00	46.00	m^3
Lube oil	730.00	0.00	0.00	730.00	70.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will standby, waiting for the weather to improve on site before commencing streamer balancing.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer Fugro Pioneer Party Chief	22/04/2023

Client Representative

Terry Wiseman RVO Client Representative	22/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	10	**Date:**	22/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Nederwiek Zuid; 52°28'N, 04°35'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	1	/	24
Sound bite training	0	/	6
Cross Departmental Tours	0	/	1
Permit to Work	1	/	17
Vessel Drills	0	/	1
Toolbox Talk (TBT)	7	/	31
Safety Meetings	0	/	0
Audits / Inspections	0	/	2
Inductions	0	/	1
Hazard Observation Cards	7	/	20
Near Miss	0	/	0
Daily HOD Meetings	1	/	10
TRA Review	1	/	21
Stop, Look, Assess, Manage	0	/	0

HSE Comments

7x HOCs
- HOC_23.183 - Suggestion - Lifting wires stowed properly – 20230421
- HOC_23.184 - Unsafe Condition - Open cable trays on the deck is a trip hazard – 20230421
- HOC_23.185 - Suggestion - Suggest to stow SOPEP equipment after use – 20230421
- HOC_23.186 - Suggestion - Twistlocks should be secured in the locked position – 20230421
- HOC_23.187 - Unsafe Act - Witnessed two members near the stern rails without wearing PPE – 20230421
- HOC_23.188 - Suggestion - Do not forget to move your T card when going off and returning to the ship - 20230421
- HOC_23.189 - Unsafe Act - Two members about to enter HV container without PPE – 20230421

Summary of Activities

Begin	End	Duration	Type	Description
00:00	09:40	09:40	Weather - Mob	Waiting on weather before continuing with equipment verification.
09:40	12:40	03:00	Equipment Cal	Toolboxes followed by deployment of the equipment. - Soft start procedure.
12:40	24:00	11:20	Equipment Cal	Continuing streamer balancing and tethering.

DOME

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	94:40	39.44%
Equipment Cal	14:20	/	36:20	15.14%
Transit to/from Site	0:00	/	8:50	3.68%
Weather - Mob	9:40	/	100:10	41.74%
Total	24:00	/	240:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	SE	S	S	S	
Wind Speed	Beaufort	5	4	3	4	
Sig Wave Height	m	-	-	1.3	1.3	

Weather Forecast

A complex low lies broadly over the UK and North Sea driving showery troughs around its perimeter. The main low centre lies over the N North Sea through today, driving a trough NE over the S of the sea, with another shallow low forming on it at times. The low centres drift E tomorrow, forming a complex low over S Norway/Skagerrak. Meanwhile tomorrow, showery troughs move SSE over the North Sea within a N'ly flow.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	219.90	0.00	2.70	217.20	13.10	m^3
Water	78.00	0.00	5.00	73.00	51.00	m^3
Lube oil	730.00	0.00	0.00	730.00	70.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will endeavour to complete the streamer balancing and continue to site.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer Fugro Pioneer Party Chief	23/04/2023

Client Representative

Terry Wiseman RVO Client Representative	23/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	11	**Date:**	23/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Nederwiek Zuid; 52°28'N, 04°35'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	6	/	30
Sound bite training	1	/	7
Cross Departmental Tours	0	/	1
Permit to Work	0	/	17
Vessel Drills	1	/	2
Toolbox Talk (TBT)	0	/	31
Safety Meetings	1	/	1
Audits / Inspections	0	/	2
Inductions	0	/	1
Hazard Observation Cards	0	/	20
Near Miss	0	/	0
Daily HOD Meetings	1	/	11
TRA Review	0	/	21
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Sound bite Training
Vessel drill - Medevac
General safety meeting

Summary of Activities

Begin	End	Duration	Type	Description
00:00	06:40	06:40	Equipment Cal	Equipment calibrations and verification.
06:40	11:05	04:25	Ops - Equipment Dep/Rec	Recover equipment - preparing to steam to the worksite.
11:05	13:00	01:55	Transit between locations	Transit to the worksite from the verification site.
13:00	16:00	03:00	Weather - Mob	Waiting on conditions to improve before deployment.
16:00	19:00	03:00	General Mob	Deployment of the 3DUHRS system.
19:00	22:00	03:00	General Mob	New weather forecast changed significantly, deployment aborted and the equipment is being recovered.
22:00	24:00	02:00	Transit to/from Site	Transit to IJmuiden to standby on weather.

DOME

Time Summary

Activity	Today	/	To Date	Progress
General Mob	6:00	/	100:40	38.13%
Equipment Cal	6:40	/	43:00	16.29%
Transit to/from Site	2:00	/	10:50	4.10%
Weather - Mob	3:00	/	103:10	39.08%
Ops - Equipment Dep/Rec	4:25	/	4:25	1.67%
Transit between locations	1:55	/	1:55	0.73%
Total	24:00	/	264:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	SSE	S	S	NE	
Wind Speed	Beaufort	4	5	3	3	
Sig Wave Height	m	0.8	1.2	1.0	0.8	

Weather Forecast

A low off W Denmark drives a frontal trough E over the German Bight and showery troughs S over the North Sea. The low drifts NE over the Skagerrak this evening as the frontal trough clears E. Meanwhile, a N'ly flow develops over the North Sea with showery troughs within it. The flow becomes NW'ly tomorrow as the low moves over S Sweden and a ridge builds SE over the UK. A high then forms off East Anglia on Wednesday.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	217.20	0.00	1.70	215.50	14.80	m^3
Water	73.00	0.00	3.00	70.00	54.00	m^3
Lube oil	730.00	0.00	70.00	660.00	140.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will come alongside in IJmuiden and stand by on weather.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer **Fugro Pioneer Party Chief**	**24/04/2023**

Client Representative

Terry Wiseman **RVO Client Representative**	**24/04/2023**

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	12	**Date:**	24/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+01:00
Location:	Alongside IJmuiden; 52°50'N,03°44'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	1
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	0	/	30
Sound bite training	0	/	7
Cross Departmental Tours	0	/	1
Permit to Work	0	/	17
Vessel Drills	0	/	2
Toolbox Talk (TBT)	4	/	35
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	0	/	1
Hazard Observation Cards	0	/	20
Near Miss	0	/	0
Daily HOD Meetings	1	/	12
TRA Review	3	/	24
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	07:00	07:00	Transit to/from Site	Transit to IJmuiden to wait on weather
07:00	24:00	17:00	Weather - Mob	Alongside IJmuiden, waiting on weather.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	100:40	34.95%
Equipment Cal	0:00	/	43:00	14.93%
Transit to/from Site	7:00	/	17:50	6.19%
Weather - Mob	17:00	/	120:10	41.72%
Ops - Equipment Dep/Rec	0:00	/	4:25	1.53%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Transit between locations	0:00	/	1:55	0.67%
Total	24:00	/	288:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NW	WNW	WNW	W	
Wind Speed	Beaufort	6	6	6	5	
Sig Wave Height	m	1.3	-	-	-	

Weather Forecast

A ridge extending SE over the UK, interacts with a low over Scandinavia to generate a NW'ly flow over the North Sea. A col develops over the UK and W North Sea tomorrow morning. A weak frontal trough then moves E over Central England into the S North Sea overnight into Thursday. The NW'ly flow is maintained over the NE North Sea throughout.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	215.50	0.00	1.70	213.80	16.50	m^3
Water	70.00	0.00	6.00	64.00	60.00	m^3
Lube oil	660.00	0.00	0.00	660.00	140.00	L

Other Comments

Planned work for the next 24 hours

Pioneer will be alongside IJmuiden, waiting on weather.

Client Representative Comments

Party Chief Comments

Fugro Representative

Jaco de Beer Fugro Pioneer Party Chief	25/04/2023

Client Representative

Terry Wiseman RVO Client Representative	25/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	13	**Date:**	25/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside IJmuiden; 52°50'N,03°44'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	1	/	2
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	1	/	31
Sound bite training	2	/	9
Cross Departmental Tours	0	/	1
Permit to Work	2	/	19
Vessel Drills	0	/	2
Toolbox Talk (TBT)	5	/	40
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	2	/	3
Hazard Observation Cards	3	/	23
Near Miss	0	/	0
Daily HOD Meetings	0	/	12
TRA Review	2	/	26
Stop, Look, Assess, Manage	0	/	0

HSE Comments

Internal project KoM
Safety inductions x 3
PTW: Working at height x 2
Sound bite training: Start of rotation HSE remainders – Pioneer good practices
Sound Bite Training: Survey equipment familiarisation

- HOC_23.190 - Positive observation - During on-signing safety tour noted levers to twist locks in situ on the back deck all had preventers in place
- HOC_23.191 - Positive observation - All safety control measures were implemented when working at height in cherry-picker
- HOC_23.192 - Suggestion - During back deck walk around was suggested to skirmish and remove small debris items from deck

Summary of Activities

Begin	End	Duration	Type	Description
00:00	08:00	08:00	Weather - Mob	Alongside IJmuiden, waiting on weather.
08:00	20:00	12:00	Port Call	Crew change & handovers - Received fresh water bunkers.
20:00	24:00	04:00	Weather - Mob	Alongside IJmuiden, waiting on weather.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	100:40	32.26%
Equipment Cal	0:00	/	43:00	13.78%
Transit to/from Site	0:00	/	17:50	5.72%
Port Call	12:00	/	12:00	3.85%
Weather - Mob	12:00	/	132:10	42.36%
Ops - Equipment Dep/Rec	0:00	/	4:25	1.42%
Transit between locations	0:00	/	1:55	0.61%
Total	24:00	/	312:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	10	10	12
Client representative	1	0	0	1
Marine crew	14	1	2	13
Total	27	11	12	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NW	WNW	NW	NW	Alongside IJmuiden: 00:00 to 24:00
Wind Speed	Beaufort	5	4	4	4	Alongside IJmuiden: 00:00 to 24:00
Sig Wave Height	m	-	-	-	-	Alongside IJmuiden: 00:00 to 24:00

Weather Forecast

A ridge extending SE over the UK, interacts with a low over Scandinavia to generate a NW'ly flow over the North Sea. A col develops over the UK and W North Sea tomorrow morning. A weak frontal trough then moves E over Central England into the S North Sea overnight into Thursday. The NW'ly flow is maintained over the NE North Sea throughout.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	213.80	0.00	0.80	213.00	17.30	m^3
Water	64.00	55.00	6.00	113.00	66.00	m^3
Lube oil	660.00	0.00	0.00	660.00	140.00	L

Other Comments

Planned work for the next 24 hours

08:00 Sail to IJ56 - Phase 4 area: Scout area for fishing gear; Deploy full 3D spread including tethering to verify offsets and to conduct 3D final data assessment

Client Representative Comments

Party Chief Comments

Fugro Representative		Client Representative	
			
Paul Miller Fugro Pioneer Party Chief	25/04/2023	Terry Wiseman RVO Client Representative	25/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	14	**Date:**	26/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside IJmuiden; Transit to IJ56 - Phase 4 area. Midnight Position: 52°50'N,03°44'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	5	/	36
Sound bite training	1	/	10
Cross Departmental Tours	0	/	1
Permit to Work	1	/	20
Vessel Drills	3	/	5
Toolbox Talk (TBT)	3	/	43
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	0	/	3
Hazard Observation Cards	3	/	26
Near Miss	0	/	0
Daily HOD Meetings	1	/	13
TRA Review	2	/	28
Stop, Look, Assess, Manage	1	/	1

HSE Comments

Vessel drills: Abandon ship, Fire & ISPS drills
Sound bite training: Correct management of UHR containers & CSP's
Stop The Job / SLAM & LMRA Topics: Shackle without colour code markings for use with fall arrestor. Shackle was replaced.

- HOC_23.193 - Positive observation - Chief Officer delivered a very detailed briefs for Abandon ship, Fire & ISPS drills whilst also checking reaction times for donning lifejackets
- HOC_23.194 - Positive observation - Full check on Safety helmets found all helmets were in-date for use
- HOC_23.195 - Positive observation - Very detailed toolbox talk to support the first deployment of the 3DUHR spread for the rotation

Summary of Activities

Begin	End	Duration	Type	Description
00:00	07:50	07:50	Weather - Mob	Alongside IJmuiden, waiting on weather.
07:50	15:00	07:10	Transit to/from Site	Transit to IJ56 Phase 4 survey area
15:00	15:45	00:45	General Mob	Toolbox talks followed by deployment of moonpool & outriggers, plus CTD casts
15:45	19:30	03:45	Weather - Mob	Scouting survey area for fishing gear during weather standby - Toolbox talk for deployment of 3DUHR equipment and tethers

DOME

Summary of Activities

Begin	End	Duration	Type	Description
19:30	24:00	04:30	Equipment Cal	Commenced first deployment of 3DUHR spread with full tethering assembly - checking and adjusting offsets as required. Continue overnight.

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:45	/	101:25	30.18%
Equipment Cal	4:30	/	47:30	14.14%
Transit to/from Site	7:10	/	25:00	7.44%
Port Call	0:00	/	12:00	3.57%
Weather - Mob	11:35	/	143:45	42.78%
Ops - Equipment Dep/Rec	0:00	/	4:25	1.31%
Transit between locations	0:00	/	1:55	0.57%
Total	24:00	/	336:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NW	NW	NW	S	Alongside IJmuiden: 00:00 to 08:00
Wind Speed	Beaufort	3	3	2	2	Alongside IJmuiden: 00:00 to 08:00
Sig Wave Height	m	-	1.7	1.5	1.1	Alongside IJmuiden: 00:00 to 08:00

Weather Forecast

A series of showery troughs move SE over the N/Central North Sea. Meanwhile a weak high is centred over the SW North Sea. This high moves SE into central Europe tonight, extending a ridge NW over the S/Central North Sea. Tomorrow, the ridge declines E towards Denmark as a complex low near Scotland drives a frontal trough over the North Sea overnight into Friday.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	213.00	0.00	1.40	211.60	18.70	m^3
Water	113.00	0.00	5.00	108.00	71.00	m^3
Lube oil	660.00	0.00	0.00	660.00	140.00	L

Other Comments

Planned work for the next 24 hours

- Complete deployment with full tethering arrangement. Confirm in-sea offsets - recover, adjust & deploy as necessary

DOME

Planned work for the next 24 hours

- Final Data Assessment
- Commence acquisition IJ56 Phase 4 – initial line separation at 12m

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller Fugro Pioneer Party Chief	26/04/2023

Client Representative

Terry Wiseman RVO Client Representative	26/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	15	**Date:**	27/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53°04.2'N, 003°36.9'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	2	/	38
Sound bite training	0	/	10
Cross Departmental Tours	0	/	1
Permit to Work	0	/	20
Vessel Drills	0	/	5
Toolbox Talk (TBT)	2	/	45
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	0	/	3
Hazard Observation Cards	3	/	29
Near Miss	0	/	0
Daily HOD Meetings	1	/	14
TRA Review	0	/	28
Stop, Look, Assess, Manage	1	/	2

HSE Comments

Stop The Job / SLAM & LMRA Topics: Stopped preparations for test lines due to risk of entanglement from towed sensors - adjusted in-sea setup

- HOC_23.196 - Unsafe condition - A shackle without colour markings for use with fall arrestor was observed
- HOC_23.197 - Positive observation - Despite long exposure hours on the back deck by night-shift during the initial deployment all activities were conducted safely
- HOC_23.198 - Positive observation - Good call by Online team for stopping preparations for acquiring test lines due to risk of entanglement from towed sensors

Summary of Activities

Begin	End	Duration	Type	Description
00:00	09:00	09:00	Equipment Cal	Continued with first deployment of 3DUHR spread with full tethering assembly - checking and adjusting offsets as required.
09:00	11:00	02:00	Equipment Cal	Test lines (without triggering MLSS's) checking In-sea offsets with all equipment & tethering deployed
11:00	11:47	00:47	Equipment Cal	ADD deployed
11:47	13:06	01:19	Equipment Cal	ADD activated for 5 mins, followed by soft start. Followed by warm-up for each MLSS
13:06	13:30	00:24	Equipment Cal	Adjustment to In-sea setup: 2 x MLSS adjusted by 1.7m.

Summary of Activities

Begin	End	Duration	Type	Description
13:30	15:51	02:21	Equipment Cal	System checks to in-sea setup
15:51	23:00	07:09	Equipment Cal	3DUHR test lines for offsets and data quality at speeds: 4.0kts, 3.5kts & 3.2kts STW
23:00	24:00	01:00	Weather - Mob	Unplanned significant deterioration in weather conditions - preparations for a full recovery of 3D spread

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	101:25	28.17%
Equipment Cal	23:00	/	70:30	19.58%
Transit to/from Site	0:00	/	25:00	6.94%
Port Call	0:00	/	12:00	3.33%
Weather - Mob	1:00	/	144:45	40.21%
Ops - Equipment Dep/Rec	0:00	/	4:25	1.23%
Transit between locations	0:00	/	1:55	0.53%
Total	24:00	/	360:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	S	S	SE	SE	
Wind Speed	Beaufort	3	2	3	6	
Sig Wave Height	m	1.2	1.1	0.8	1.8	

Weather Forecast

A ridge extending NW over the S North Sea declines this evening as a low over Ireland drives a frontal trough NE over the UK and into the North Sea overnight. The low then moves E/ESE over the S North Sea tomorrow, clearing overnight. Meanwhile, a new low forms over the N Isles tomorrow, clearing E into Norway overnight. Through Saturday AM a high near Iceland extends a ridge SE across the North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	211.60	0.00	2.00	209.60	20.70	m³
Water	108.00	0.00	5.00	103.00	76.00	m³
Lube oil	660.00	0.00	0.00	660.00	140.00	L

Other Comments

Planned work for the next 24 hours

Recover full 3D spread due to poor weather. Whilst equipment is on deck:

- Minor adjustments to in-sea setup (Tethering & tow points)
- Check RTK pods to both MLSS's
- Charge batteries to RTK pods

Deploy 3D setup once conditions improve

- IJ56 – Phase 4 area:
- Test lines to confirm offsets and data quality.

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

27/04/2023

Client Representative

Terry Wiseman
RVO Client Representative

27/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	16	**Date:**	28/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53°04.2'N, 003°36.9'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	4	/	42
Sound bite training	0	/	10
Cross Departmental Tours	0	/	1
Permit to Work	0	/	20
Vessel Drills	0	/	5
Toolbox Talk (TBT)	2	/	47
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	0	/	3
Hazard Observation Cards	4	/	33
Near Miss	0	/	0
Daily HOD Meetings	1	/	15
TRA Review	0	/	28
Stop, Look, Assess, Manage	0	/	2

HSE Comments

- HOC_23.199 - Suggestion - Rationalise contents to FWD Store
- HOC_23.200 - Suggestion - Removeable bars to new stern railing system must be in place when not in use for survey operations
- HOC_23.201 - Positive observation - Good use of safety signage by AB's and Bosun when implementing deep cleaning & maintenance
- HOC_23.202 - Positive observation - Excellent work by night-shift for the safe recovery of full 3D spread in very marginal

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:45	00:45	Weather - Mob	Extended shift handovers to discuss feedback from test lines
00:45	01:15	00:30	Weather - Mob	Toolbox talk: Recovery of full 3DUHR spread
01:15	05:45	04:30	Weather - Mob	Recovery of full 3DUHR spread
05:45	15:45	10:00	Weather - Mob	Weather standby in survey area - Minor adjustments to in-sea setup (Tethering & tow points) - Check RTK pods to both MLSS's - Charge batteries to RTK pods - Toolbox talks: Deployment of 3DUHR spread & CTD cast

DOME

Summary of Activities

Begin	End	Duration	Type	Description
15:45	16:00	00:15	Equipment Cal	CTD cast
16:00	20:57	04:57	Equipment Cal	Deployed 4 x streamers only for noise tests. Deployed current meter
20:57	22:00	01:03	Equipment Cal	2 x test lines for noise tests of 4 x streamers
22:00	24:00	02:00	Equipment Cal	Deployment of 2 x MLSS's & full tethering. Continue overnight

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	101:25	26.41%
Equipment Cal	8:15	/	78:45	20.51%
Transit to/from Site	0:00	/	25:00	6.51%
Port Call	0:00	/	12:00	3.13%
Weather - Mob	15:45	/	160:30	41.80%
Ops - Equipment Dep/Rec	0:00	/	4:25	1.15%
Transit between locations	0:00	/	1:55	0.50%
Total	24:00	/	384:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	0.00	N°	0.00%
Survey Lines N-S	LS	590.40	0.00	0.00	km	0.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	E	E	NE	N	
Wind Speed	Beaufort	6	5	3	3	
Sig Wave Height	m	1.9	1.5	1.0	1.1	

Weather Forecast

This evening two low centres clear away E, one into Norway, and one into N Germany respectively. Pressure then builds over the North Sea into tomorrow, with a high centre becoming anchored over the Central North Sea tomorrow evening. The high clears away E over Denmark on Sunday, as a fragmenting frontal trough moves NE across Scotland into the NW North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	209.60	0.00	1.70	207.90	22.40	m³
Water	103.00	0.00	5.00	98.00	81.00	m³
Lube oil	660.00	0.00	0.00	660.00	140.00	L

Other Comments

Planned work for the next 24 hours

Conduct Noise test with full equipment spread. Batches of 2 x test lines (reciprocal) at various speeds to confirm offsets & data quality

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

28/04/2023

Client Representative

Terry Wiseman
RVO Client Representative

28/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	17	**Date:**	29/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53°03.3'N, 003°37.0'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	4	/	46
Sound bite training	0	/	10
Cross Departmental Tours	1	/	2
Permit to Work	2	/	22
Vessel Drills	0	/	5
Toolbox Talk (TBT)	3	/	50
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	0	/	3
Hazard Observation Cards	9	/	42
Near Miss	0	/	0
Daily HOD Meetings	1	/	16
TRA Review	2	/	30
Stop, Look, Assess, Manage	0	/	2

HSE Comments

Cross department safety tour

- HOC_23.203 - Unsafe condition - Unnecessary extension of back deck work by Day-shift. Equipment was in a safe position to hand-over to Night-shift
- HOC_23.204 - Suggestion - Suggest mounting a large Clock on the back deck to improve time-keeping
- HOC_23.205 - Suggestion - Safety Harness to be stowed correctly
- HOC_23.206 - Suggestion - Label new stowage area for personnel PPE
- HOC_23.207 - Suggestion - During safety tour noted some food items will expire at end of May. Ensure these items are used first
- HOC_23.208 - Suggestion - Daily temperature checks to Bridge fridge has not been recorded in recent days - implement daily checks
- HOC_23.209 - Positive observation - Big improvement seen in Bottle Store in regards to condensation
- HOC_23.210 - Suggestion - Better degreasing required in deep areas to the Galley
- HOC_23.211 - Suggestion - Fix Bin lids which do not lock in closed position

Summary of Activities

Begin	End	Duration	Type	Description
00:00	02:54	02:54	Equipment Cal	Deployment of 2 x MLSS's & full tethering.
02:54	03:56	01:02	Equipment Cal	2 x test lines for noise tests of full 3DUHR spread
03:56	05:30	01:34	General Mob	Recovered 2 x MLSS's to investigate intermittent positioning problem from both MLSS's

DOME

Summary of Activities

Begin	End	Duration	Type	Description
05:30	10:20	04:50	General Mob	Maintenance to RTK pods & WiFi antennas to both MLSS's
10:20	11:50	01:30	General Mob	Toolbox talk followed by deployment of 2 x MLSS + tethers
11:50	13:00	01:10	Equipment Cal	Deployed and activated ADD for 5 mins. Followed by soft start
13:00	14:17	01:17	Equipment Cal	Setting in-sea 3DUHR systems to work
14:17	17:57	03:40	Equipment Cal	Test lines in reciprocal line directions (N / S) to verify offsets and data quality @ 4.0kts, 3.5kts & 3.2 kts. - Toolbox talk followed by CTD cast
17:57	18:22	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA001P1 Hdg: 001°.
18:22	18:42	00:20	Line Turn	Line turn
18:42	19:00	00:18	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA064P1 Hdg: 181°.
19:00	19:25	00:25	Line Turn	Line turn
19:25	19:53	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA002P1 Hdg: 001°.
19:53	20:15	00:22	Line Turn	Line turn
20:15	20:35	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA065P1 Hdg: 181°.
20:35	20:59	00:24	Line Turn	Line turn
20:59	21:24	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA003P1 Hdg: 001°.
21:24	21:45	00:21	Line Turn	line turn
21:45	22:06	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA066P1 Hdg: 181°.
22:06	22:29	00:23	Line Turn	Line turn
22:29	22:50	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA004P1 Hdg: 001°.
22:50	23:17	00:27	Line Turn	Line turn
23:17	23:41	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA067P1 Hdg: 181°.
23:41	24:00	00:19	Line Turn	Line turn

Time Summary

Activity	Today	/	To Date	Progress
General Mob	7:54	/	109:19	26.79%
Equipment Cal	10:03	/	88:48	21.76%
Transit to/from Site	0:00	/	25:00	6.13%
Port Call	0:00	/	12:00	2.94%
Weather - Mob	0:00	/	160:30	39.34%
Ops - Equipment Dep/Rec	0:00	/	4:25	1.08%
Transit between locations	0:00	/	1:55	0.47%
Data Acquisition	3:02	/	3:02	0.74%
Line Turn	3:01	/	3:01	0.74%
Total	24:00	/	408:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	1.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	18.80	18.80	km	3.18%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1

DOME

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	N	NW	SSW	NE	
Wind Speed	Beaufort	3	3	2	2	
Sig Wave Height	m	1.1	1.0	0.5	0.5	

Weather Forecast

A high centre lies over the North Sea this afternoon/evening, as a weak showery trough moves ESE into SW Norway. The high clears E over N Germany tomorrow, as a low moves E across the Northern Isles, driving a fragmenting frontal trough ENE across the Central/North Sea. The low clears E across SW Norway on Monday, as the remnants of any troughs over the North Sea fill.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	207.90	0.00	1.40	206.50	23.80	m^3
Water	98.00	0.00	4.00	94.00	85.00	m^3
Lube oil	660.00	0.00	0.00	660.00	140.00	L

Other Comments

Planned work for the next 24 hours

Continue with 3DUHR and MBES acquisition within Phase-4 area

Client Representative Comments

Party Chief Comments

Mobilisation for 3DUHR & MBES is deemed complete

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief
29/04/2023

Client Representative

Terry Wiseman
RVO Client Representative
29/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	18	**Date:**	30/04/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53°05.0'N, 003°33.8'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	4	/	50
Sound bite training	0	/	10
Cross Departmental Tours	0	/	2
Permit to Work	0	/	22
Vessel Drills	1	/	6
Toolbox Talk (TBT)	2	/	52
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	0	/	3
Hazard Observation Cards	4	/	46
Near Miss	0	/	0
Daily HOD Meetings	1	/	17
TRA Review	0	/	30
Stop, Look, Assess, Manage	0	/	2

HSE Comments

MOB drill

- HOC_23.212 - Positive observation - Good initiative post deployment of 3D equipment with a skirmish of the back deck area
- HOC_23.213 - Positive observation - Excellent initiative of introducing a control measure of a barrier for anyone wishing to proceed aloft
- HOC_23.214 - Unsafe condition - Day bags are trip hazards in Online Room
- HOC_23.215 - Unsafe condition - Rogue rope end found on deck

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:01	00:01	Line Turn	Line turn
00:01	00:21	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA005P1 Hdg: 001°.
00:21	00:42	00:21	Line Turn	Line turn
00:42	01:10	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA068P1 Hdg: 181°.
01:10	01:34	00:24	Line Turn	Line turn
01:34	01:54	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA006P1 Hdg: 001°.

DOME

Summary of Activities

Begin	End	Duration	Type	Description
01:54	02:23	00:29	Line Turn	Line turn
02:23	02:49	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA069P1 Hdg: 181°.
02:49	03:17	00:28	Line Turn	Line turn
03:17	03:37	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA007P1 Hdg: 001°.
03:37	04:06	00:29	Line Turn	Line turn - Toolbox talk followed by CTD cast
04:06	04:29	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA070P1 Hdg: 181°.
04:29	04:58	00:29	Line Turn	Line turn
04:58	05:21	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA008P1 Hdg: 001°.
05:21	05:43	00:22	Line Turn	Line turn
05:43	06:03	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA071P1 Hdg: 181°.
06:03	06:25	00:22	Line Turn	Line turn
06:25	06:51	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA009P1 Hdg: 001°.
06:51	07:13	00:22	Line Turn	Line turn
07:13	07:32	00:19	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA072P1 Hdg: 181°.
07:32	07:54	00:22	Line Turn	Line turn
07:54	08:18	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA010P1 Hdg: 001°.
08:18	08:38	00:20	Line Turn	Line turn
08:38	08:57	00:19	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA073P1 Hdg: 181°.
08:57	09:18	00:21	Line Turn	Line turn
09:18	09:43	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA011P1 Hdg: 001°.
09:43	10:03	00:20	Line Turn	Line turn
10:03	10:22	00:19	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA074P1 Hdg: 181°.
10:22	10:43	00:21	Line Turn	Line turn
10:43	11:06	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA012P1 Hdg: 001°.
11:06	11:26	00:20	Line Turn	Line turn
11:26	11:47	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA075P1 Hdg: 181°.
11:47	12:30	00:43	Line Turn	Line turn
12:30	12:52	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA013P1 Hdg: 001°.
12:52	13:18	00:26	Line Turn	Line turn
13:18	13:45	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA076P1 Hdg: 181°.
13:45	14:08	00:23	Line Turn	Line turn
14:08	14:30	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA014P1 Hdg: 001°.
14:30	14:52	00:22	Line Turn	Line turn
14:52	15:20	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA077P1 Hdg: 181°.
15:20	15:41	00:21	Line Turn	Line turn
15:41	16:03	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA015P1 Hdg: 001°.
16:03	16:31	00:28	Line Turn	Line turn - Toolbox talk followed by CTD cast
16:31	16:55	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA078P1 Hdg: 181°.
16:55	17:15	00:20	Line Turn	Line turn
17:15	17:38	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA016P1 Hdg: 001°.
17:38	17:59	00:21	Line Turn	Line turn
17:59	18:22	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA079P1 Hdg: 181°.
18:22	18:44	00:22	Line Turn	Line turn
18:44	19:08	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA017P1 Hdg: 001°.
19:08	19:29	00:21	Line Turn	Line turn
19:29	19:50	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA080P1 Hdg: 181°.
19:50	20:13	00:23	Line Turn	Line turn

Summary of Activities

Begin	End	Duration	Type	Description
20:13	20:41	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA018P1 Hdg: 001°.
20:41	21:04	00:23	Line Turn	Line turn
21:04	21:26	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA081P1 Hdg: 181°.
21:26	21:48	00:22	Line Turn	Line turn
21:48	22:12	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA019P1 Hdg: 001°.
22:12	22:34	00:22	Line Turn	Line turn
22:34	22:56	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA082P1 Hdg: 181°.
22:56	23:17	00:21	Line Turn	Line turn
23:17	23:41	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA020P1 Hdg: 001°.
23:41	24:00	00:19	Line Turn	Line turn

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	109:19	25.30%
Equipment Cal	0:00	/	88:48	20.56%
Transit to/from Site	0:00	/	25:00	5.79%
Port Call	0:00	/	12:00	2.78%
Weather - Mob	0:00	/	160:30	37.15%
Ops - Equipment Dep/Rec	0:00	/	4:25	1.02%
Transit between locations	0:00	/	1:55	0.44%
Data Acquisition	11:52	/	14:54	3.45%
Line Turn	12:08	/	15:09	3.51%
Total	24:00	/	432:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	73.00	91.80	km	15.55%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	SE	SE	E	
Wind Speed	Beaufort	2	3	3	3	
Sig Wave Height	m	0.4	0.8	0.8	1.0	

Weather Forecast

A high centred over N Germany clears E this evening as a low moves E across the Northern Isles. This drives a fragmented frontal trough E across the Central/N North Sea, with a deeper frontal trough moving E across the Northern Isles. The low clears E across SW Norway tomorrow, as the remnants of any troughs fill over the North Sea. On Tuesday a high centre forms along the E coast of the UK.

DOME

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	206.50	0.00	1.80	204.70	25.60	m³
Water	94.00	0.00	4.00	90.00	89.00	m³
Lube oil	660.00	0.00	0.00	660.00	140.00	L

Other Comments

Planned work for the next 24 hours

Continue with 3DUHR and MBES acquisition within Phase-4 area

Client Representative Comments

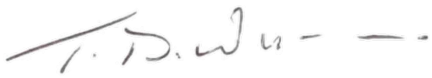
Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

30/04/2023

Client Representative



Terry Wiseman
RVO Client Representative

30/04/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	19	**Date:**	01/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53°03.8'N, 003°38.0'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	4	/	54
Sound bite training	1	/	11
Cross Departmental Tours	0	/	2
Permit to Work	2	/	24
Vessel Drills	0	/	6
Toolbox Talk (TBT)	2	/	54
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	0	/	3
Hazard Observation Cards	4	/	50
Near Miss	0	/	0
Daily HOD Meetings	1	/	18
TRA Review	2	/	32
Stop, Look, Assess, Manage	0	/	2

HSE Comments

Sound bite training: Configuring RTK pods

- HOC_23.216 - Suggestion - Personnel to talk more quietly in Online Room
- HOC_23.217 - Suggestion - Garbage bins label should be replaced
- HOC_23.218 - Suggestion - Replace immersion suit with smaller size
- HOC_23.219 - Suggestion - Correct etiquette for WCs

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:02	00:02	Line Turn	Line turn
00:02	00:25	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA083P1 Hdg: 181°.
00:25	00:45	00:20	Line Turn	Line turn
00:45	01:09	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA021P1 Hdg: 001°.
01:09	01:31	00:22	Line Turn	Line turn
01:31	01:55	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA084P1 Hdg: 181°.

Summary of Activities

Begin	End	Duration	Type	Description
01:55	02:14	00:19	Line Turn	Line turn
02:14	02:37	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA022P1 Hdg: 001°.
02:37	03:01	00:24	Line Turn	Line turn
03:01	03:24	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA085P1 Hdg: 181°.
03:24	03:44	00:20	Line Turn	Line turn - Toolbox talk followed by CTD cast
03:44	04:06	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA023P1 Hdg: 001°.
04:06	04:31	00:25	Line Turn	Line turn
04:31	04:59	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA086P1 Hdg: 181°.
04:59	05:19	00:20	Line Turn	Line turn
05:19	05:44	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA024P1 Hdg: 001°.
05:44	06:06	00:22	Line Turn	Line turn
06:06	06:31	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA087P1 Hdg: 181°.
06:31	06:52	00:21	Line Turn	Line turn
06:52	07:18	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA025P1 Hdg: 001°.
07:18	07:38	00:20	Line Turn	Line turn
07:38	08:00	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA088P1 Hdg: 181°.
08:00	08:24	00:24	Line Turn	Line turn
08:24	08:55	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA026P1 Hdg: 001°.
08:55	09:16	00:21	Line Turn	Line turn
09:16	09:38	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA089P1 Hdg: 181°.
09:38	09:58	00:20	Line Turn	Line turn
09:58	10:26	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA027P1 Hdg: 001°.
10:26	10:46	00:20	Line Turn	Line turn
10:46	11:09	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA090P1 Hdg: 181°.
11:09	11:30	00:21	Line Turn	Line turn
11:30	11:54	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA028P1 Hdg: 001°.
11:54	12:16	00:22	Line Turn	Line turn
12:16	12:39	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA091P1 Hdg: 181°.
12:39	13:02	00:23	Line Turn	Line turn
13:02	13:26	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA029P1 Hdg: 001°.
13:26	13:48	00:22	Line Turn	Line turn
13:48	14:12	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA092P1 Hdg: 181°.
14:12	14:34	00:22	Line Turn	Line turn
14:34	14:37	00:03	Downtime - Survey	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA030P1 Hdg: 001°. Line aborted due to positioning of 2 x MLSS's
14:37	15:09	00:32	Downtime - Survey	Line turn
15:09	15:31	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA030P2 Hdg: 001°
15:31	15:55	00:24	Line Turn	Line turn
15:55	16:24	00:29	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA093P1 Hdg: 181°. - Toolbox talk followed by CTD cast
16:24	16:46	00:22	Line Turn	Line turn
16:46	17:09	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA031P1 Hdg: 001°
17:09	17:29	00:20	Line Turn	Line turn
17:29	17:56	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA094P1 Hdg: 181°.
17:56	18:19	00:23	Line Turn	Line turn
18:19	18:44	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA032P1 Hdg: 001°
18:44	19:05	00:21	Line Turn	Line turn
19:05	19:27	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA095P1 Hdg: 181°.

Summary of Activities

Begin	End	Duration	Type	Description
19:27	19:50	00:23	Line Turn	Line turn
19:50	20:17	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA033P1 Hdg: 001°
20:17	20:38	00:21	Line Turn	Line turn
20:38	20:58	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA096P1 Hdg: 181°.
20:58	21:22	00:24	Line Turn	Line turn
21:22	21:50	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA034P1 Hdg: 001°
21:50	22:11	00:21	Line Turn	Line turn
22:11	22:32	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA097P1 Hdg: 181°.
22:32	22:55	00:23	Line Turn	Line turn
22:55	23:21	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA035P1 Hdg: 001°
23:21	23:43	00:22	Line Turn	Line turn
23:43	24:00	00:17	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA098P1 Hdg: 181°. Continued overnight

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	109:19	23.97%
Equipment Cal	0:00	/	88:48	19.47%
Transit to/from Site	0:00	/	25:00	5.48%
Port Call	0:00	/	12:00	2.63%
Weather - Mob	0:00	/	160:30	35.20%
Ops - Equipment Dep/Rec	0:00	/	4:25	0.97%
Transit between locations	0:00	/	1:55	0.42%
Data Acquisition	12:31	/	27:25	6.01%
Line Turn	10:54	/	26:03	5.71%
Downtime - Survey	0:35	/	0:35	0.13%
Total	24:00	/	456:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	72.85	164.65	km	27.89%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	SE	W	SE	NE	
Wind Speed	Beaufort	3	3	3	3	
Sig Wave Height	m	0.8	0.8	0.8	0.9	

Weather Forecast

A low clears E across S Sweden, as the remnants of any troughs fill over the North Sea. A ridge builds SSE over the UK tomorrow with a high centre forming over the W North Sea. The high loses its identity on Wednesday as the ridge drifts E to extend SSE over the North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	204.70	0.00	1.80	202.90	27.40	m³
Water	90.00	0.00	4.00	86.00	93.00	m³
Lube oil	660.00	0.00	70.00	590.00	210.00	L

Other Comments

Planned work for the next 24 hours

Continue with 3DUHR and MBES acquisition within Phase-4 area / Weather standby in survey area

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

01/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

01/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	20	**Date:**	02/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53°03.7'N, 003°38.7'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	5	/	59
Sound bite training	1	/	12
Cross Departmental Tours	0	/	2
Permit to Work	0	/	24
Vessel Drills	0	/	6
Toolbox Talk (TBT)	0	/	54
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	0	/	3
Hazard Observation Cards	3	/	53
Near Miss	0	/	0
Daily HOD Meetings	1	/	19
TRA Review	0	/	32
Stop, Look, Assess, Manage	0	/	2

HSE Comments

- Sound bite training: Configuring RTK pods
- HOC_23.220 - Positive observation - Good communication at Daily Morning meeting which allows effective planning of deep cleaning internally within vessel
- HOC_23.221 - Unsafe act - Person descending stairwell without holding hand-rail
- HOC_23.222 - Positive observation - Good judgement by Online Team for terminating 3DUHR ops in deteriorating Wx

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:06	00:06	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA098P1 Hdg: 181°
00:06	00:28	00:22	Line Turn	Line turn
00:28	00:53	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA036P1 Hdg: 001°
00:53	01:30	00:37	W/S at Sea	Deterioration in weather. Toolbox talks for recovery of 3DUHR spread & Moonpool & CTD cast
01:30	05:40	04:10	W/S at Sea	Recovered 3DUHR spread & moonpool. CTD cast
05:40	19:00	13:20	W/S at Sea	Weather standby in survey area - Continued with Offline routines

DOME

Summary of Activities

Begin	End	Duration	Type	Description
				- Finalising the draft mob report - Maintenance to 2 x MLSS's: replaced 2 x RTK pods - Maintenance to survey current meter
19:00	19:35	00:35	W/S at Sea	Toolbox talks for deployment of 3DUHR spread & moonpool. (Sig WH 1.4m)
19:35	20:00	00:25	W/S at Sea	Deployed moonpool & CTD cast (Sig WH 1.5m)
20:00	24:00	04:00	W/S at Sea	Deployed 4 x streamers. Waiting for weather conditions to improve in order to deploy 2 x MLSS's and tethering. Continued overnight. (Sig WH 1.3m)

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	109:19	22.77%
Equipment Cal	0:00	/	88:48	18.50%
Transit to/from Site	0:00	/	25:00	5.21%
Port Call	0:00	/	12:00	2.50%
W/S at Sea	23:07	/	23:07	4.82%
Weather - Mob	0:00	/	160:30	33.44%
Ops - Equipment Dep/Rec	0:00	/	4:25	0.92%
Transit between locations	0:00	/	1:55	0.40%
Data Acquisition	0:31	/	27:56	5.82%
Line Turn	0:22	/	26:25	5.50%
Downtime - Survey	0:00	/	0:35	0.12%
Total	24:00	/	480:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	2.35	167.00	km	28.29%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	N	NNW	NW	NNE	
Wind Speed	Beaufort	5	5	4	4	
Sig Wave Height	m	2.0	1.8	1.4	1.3	

Weather Forecast

A ridge builds SSE over the UK, with a high centre forming over the W North Sea. The high becomes entered over the central North Sea tomorrow, as the ridge drifts E to extend SSE towards Germany. The ridge then declines into Thursday as an Atlantic low drives a frontal trough N over England.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	202.90	0.00	1.80	201.10	29.20	m³
Water	86.00	0.00	4.00	82.00	97.00	m³
Lube oil	590.00	0.00	0.00	590.00	210.00	L

Other Comments

Planned work for the next 24 hours

Resume 3DUHR and MBES acquisition within Phase-4 area

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

02/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

02/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	21	**Date:**	03/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53°10.3'N, 003°39.5'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	0
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	5	/	64
Sound bite training	0	/	12
Cross Departmental Tours	0	/	2
Permit to Work	0	/	24
Vessel Drills	0	/	6
Toolbox Talk (TBT)	0	/	54
Safety Meetings	0	/	1
Audits / Inspections	0	/	2
Inductions	0	/	3
Hazard Observation Cards	1	/	54
Near Miss	0	/	0
Daily HOD Meetings	1	/	20
TRA Review	0	/	32
Stop, Look, Assess, Manage	0	/	2

HSE Comments

- HOC_23.223 - Positive observation - Good communication and coordination to avoid free-floating fishing gear during a line turn

Summary of Activities

Begin	End	Duration	Type	Description
00:00	02:00	02:00	Ops - Equipment Dep/Rec	Deployed MLSS's & tethering
02:00	02:47	00:47	Ops - Equipment Dep/Rec	Deployed & operated ADD. Soft start. Setting in-sea systems to work.
02:47	02:52	00:05	Downtime - Survey	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA099P1 Hdg: 181°. Line aborted due to freeze to recording system
02:52	03:28	00:36	Downtime - Survey	Line turn
03:28	04:00	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA099P2 Hdg: 181°.
04:00	04:21	00:21	Line Turn	Line turn
04:21	04:41	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA037P1 Hdg: 001°
04:41	05:05	00:24	Line Turn	Line turn

DOME

Summary of Activities

Begin	End	Duration	Type	Description
05:05	05:36	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA100P1 Hdg: 181°.
05:36	06:02	00:26	In Fills/ Re run	Line turn
06:02	06:26	00:24	In Fills/ Re run	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA037J1 Hdg: 001°. Re-run for wash-outs in seismic data
06:26	07:00	00:34	Line Turn	Line turn
07:00	07:24	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA038P1 Hdg: 181°
07:24	08:34	01:10	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality - Toolbox talk followed by CTD cast
08:34	08:56	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA039P1 Hdg: 181°
08:56	09:53	00:57	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality
09:53	10:13	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA040P1 Hdg: 181°
10:13	11:15	01:02	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality
11:15	11:37	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA041P1 Hdg: 181°
11:37	12:40	01:03	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality
12:40	13:04	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA042P1 Hdg: 181°
13:04	14:06	01:02	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality
14:06	14:34	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA043P1 Hdg: 181°
14:34	15:31	00:57	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality
15:31	16:02	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA044P1 Hdg: 181°
16:02	17:03	01:01	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality
17:03	17:04	00:01	Downtime - Survey	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA045P1 Hdg: 181°. Line aborted due to recording system crashing
17:04	17:39	00:35	Downtime - Survey	Line turn
17:39	18:08	00:29	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA045P2 Hdg: 181°
18:08	19:07	00:59	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality
19:07	19:32	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA046P1 Hdg: 181°
19:32	20:00	00:28	Data Acquisition	Toolbox talk followed by CTD cast
20:00	20:15	00:15	W/S at Sea	Deterioration in weather. Toolbox talks: Recovery of 3DUHR spread & moonpool
20:15	24:00	03:45	W/S at Sea	Recovering 3DUHR spread & moonpool. Continued overnight

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:50	/	0:50	0.17%
General Mob	0:00	/	109:19	21.69%
Equipment Cal	0:00	/	88:48	17.62%
Transit to/from Site	0:00	/	25:00	4.96%
Port Call	0:00	/	12:00	2.38%
W/S at Sea	4:00	/	27:07	5.38%
Weather - Mob	0:00	/	160:30	31.85%
Ops - Equipment Dep/Rec	2:47	/	7:12	1.43%
Transit between locations	0:00	/	1:55	0.38%
Data Acquisition	5:36	/	33:32	6.65%
Line Turn	1:19	/	27:44	5.50%
Ops - Extended Line Turn	8:11	/	8:11	1.62%
Downtime - Survey	1:17	/	1:52	0.37%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Total	24:00	/	504:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	28.20	195.20	km	33.06%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	Onboard
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	NE	
Wind Speed	Beaufort	3	3	3	3	
Sig Wave Height	m	1.2	1.1	1.3	1.4	

Weather Forecast

A ridge extending SSE over the North Sea declines N, as an Atlantic low drives a frontal trough N over England. The frontal trough moves NNE over the North Sea on Friday with showery troughs following astern.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	201.10	0.00	1.80	199.30	31.00	m³
Water	82.00	0.00	4.00	78.00	101.00	m³
Lube oil	590.00	0.00	0.00	590.00	210.00	L

Other Comments

Planned work for the next 24 hours

Weather standby in survey area / resume 3DUHR and MBES acquisition within Phase-4 area.

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller Fugro Pioneer Party Chief	03/05/2023

Client Representative

Terry Wiseman RVO Client Representative	03/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	22	**Date:**	04/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 04.8'N, 003°37.2'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	32
Daily HOD Meetings	1	/	21
Near Miss	0	/	0
Hazard Observation Cards	1	/	55
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	1
Toolbox Talk (TBT)	2	/	56
Vessel Drills	0	/	6
Permit to Work	0	/	24
Cross Departmental Tours	0	/	2
Sound bite training	0	/	12
Toolbox TBT (led by others)	2	/	66
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

- HOC_23.224 - Positive observation - Good use of LMRA's & SLAM technique when resolving an entanglement

Summary of Activities

Begin	End	Duration	Type	Description
00:00	01:00	01:00	W/S at Sea	Shift handover & toolbox talk: Recovery of 3DUHR spread
01:00	05:00	04:00	W/S at Sea	Recovery of 3DUHR spread
05:00	24:00	19:00	W/S at Sea	Weather standby in survey area

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	0:50	0.16%
General Mob	0:00	/	109:19	20.70%
Equipment Cal	0:00	/	88:48	16.82%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Transit to/from Site	0:00	/	25:00	4.73%
Port Call	0:00	/	12:00	2.27%
W/S at Sea	24:00	/	51:07	9.68%
Weather - Mob	0:00	/	160:30	30.40%
Ops - Equipment Dep/Rec	0:00	/	7:12	1.36%
Transit between locations	0:00	/	1:55	0.36%
Data Acquisition	0:00	/	33:32	6.35%
Line Turn	0:00	/	27:44	5.25%
Ops - Extended Line Turn	0:00	/	8:11	1.55%
Downtime - Survey	0:00	/	1:52	0.35%
Total	24:00	/	528:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	195.20	km	33.06%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	NE	
Wind Speed	Beaufort	5	6	7	7	
Sig Wave Height	m	1.6	1.8	1.7	1.6	

Weather Forecast

A series of frontal/showery troughs move NNE across the North Sea throughout. A compact shallow low develops on one of these troughs E of Scotland tomorrow afternoon/evening.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	199.30	0.00	1.80	197.50	32.80	m^3
Water	78.00	0.00	4.00	74.00	105.00	m^3
Lube oil	590.00	0.00	0.00	590.00	210.00	L

Other Comments

Planned work for the next 24 hours

Weather standby in survey area / resume 3DUHR and MBES acquisition within Phase-4 area.

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller Fugro Pioneer Party Chief	04/05/2023

Client Representative

Terry Wiseman RVO Client Representative	04/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	23	**Date:**	05/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 05.3'N, 003°37.4'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	32
Daily HOD Meetings	1	/	22
Near Miss	0	/	0
Hazard Observation Cards	1	/	56
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	1	/	2
Toolbox Talk (TBT)	1	/	57
Vessel Drills	0	/	6
Permit to Work	0	/	24
Cross Departmental Tours	0	/	2
Sound bite training	0	/	12
Toolbox TBT (led by others)	4	/	70
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

HODS Monthly Safety Meeting
- HOC_23.225 - Positive observation - Very pertinent safety alerts discussed during HODS monthly safety meeting

Summary of Activities

Begin	End	Duration	Type	Description
00:00	06:20	06:20	W/S at Sea	Weather standby in survey area
06:20	06:40	00:20	Ops - Equipment Dep/Rec	Toolbox talks: Deployment of moonpool & 3DUHR spread. CTD cast
06:40	11:00	04:20	Ops - Equipment Dep/Rec	Deployed moonpool & 3DUHR spread. CTD cast
11:00	12:08	01:08	Ops - Equipment Dep/Rec	Deployed ADD. Operated ADD followed by soft start with Innomar
12:08	13:44	01:36	Data Acquisition	Test lines to confirm data quality in 1.0m / 1.1m seas
13:44	14:06	00:22	Downtime - Survey	Phase 4: 3DUHR Re-run: IJ3IA024J1 Hdg: 181°. Re-run for poor seismic data. Data rejected WH 1.2m
14:06	22:42	08:36	Downtime - Survey	Periodically acquiring test lines until data became acceptable whilst race-tracking in the survey area. Sig Wave HT ranging from 1.2m to 1.0 m

DOME

Summary of Activities

Begin	End	Duration	Type	Description
				- Toolbox talk followed by CTD cast
22:42	23:03	00:21	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA037J2 Hdg: 181°.
23:03	24:00	00:57	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:21	/	1:11	0.21%
General Mob	0:00	/	109:19	19.80%
Equipment Cal	0:00	/	88:48	16.09%
Transit to/from Site	0:00	/	25:00	4.53%
Port Call	0:00	/	12:00	2.17%
W/S at Sea	6:20	/	57:27	10.41%
Weather - Mob	0:00	/	160:30	29.08%
Ops - Equipment Dep/Rec	5:48	/	13:00	2.36%
Transit between locations	0:00	/	1:55	0.35%
Data Acquisition	1:36	/	35:08	6.36%
Line Turn	0:00	/	27:44	5.02%
Ops - Extended Line Turn	0:57	/	9:08	1.65%
Downtime - Survey	8:58	/	10:50	1.96%
Total	24:00	/	552:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	195.20	km	33.06%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	SW	SSW	S	
Wind Speed	Beaufort	4	4	3	3	
Sig Wave Height	m	1.3	1.2	1.2	1.0	

Weather Forecast

High pressure persists over Scandinavia over the next few days, as low pressure in the Atlantic drives various showery/frontal troughs NE across the UK/North Sea. The troughs tend to fill as they approach the NE North Sea where higher pressure is most dominant.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	197.50	0.00	1.40	196.10	34.20	m³
Water	74.00	0.00	4.00	70.00	109.00	m³
Lube oil	590.00	0.00	0.00	590.00	210.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area.

Client Representative Comments

Party Chief Comments

Unable to acquire acceptable seismic data when sig wave height/swell ranged from 1.2m to 1.0m due to wash-outs & noise in seismic data. Hence recorded as Survey Downtime.

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

05/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

05/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	24	**Date:**	06/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 05.5'N, 003°37.6'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	32
Daily HOD Meetings	1	/	23
Near Miss	0	/	0
Hazard Observation Cards	5	/	61
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	2	/	59
Vessel Drills	0	/	6
Permit to Work	0	/	24
Cross Departmental Tours	1	/	3
Sound bite training	0	/	12
Toolbox TBT (led by others)	2	/	72
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Cross department safety tour
- HOC_23.226 - Unsafe condition - COSHH locker not locked during safety tour
- HOC_23.227 - Suggestion - Remove dirt from drainage to Wet Store
- HOC_23.228 - Suggestion - Paint peeling on deck in vicinity of work bench
- HOC_23.229 - Suggestion - Retractable air-line does not retract
- HOC_23.230 - Suggestion - Continue with plan to replace temporary covers to the DCC's

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:05	00:05	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
00:05	00:27	00:22	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA043J1 Hdg: 181°.
00:27	01:32	01:05	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction

DOME

Summary of Activities

Begin	End	Duration	Type	Description
01:32	01:54	00:22	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA044J1 Hdg: 181°.
01:54	02:56	01:02	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
02:56	03:23	00:27	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA024J2 Hdg: 181°.
03:23	04:28	01:05	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
04:28	05:03	00:35	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA037J3 Hdg: 181°.
05:03	06:55	01:52	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality - Toolbox talk followed by CTD cast
06:55	07:16	00:21	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA037J4 Hdg: 001°.
07:16	08:26	01:10	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
08:26	08:53	00:27	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA045J1 Hdg: 001°.
08:53	09:53	01:00	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
09:53	10:25	00:32	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA046J1 Hdg: 001°.
10:25	11:28	01:03	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
11:28	12:00	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA047P1 Hdg: 001°
12:00	12:24	00:24	In Fills/ Re run	Line turn
12:24	12:45	00:21	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA084J1 Hdg: 181°.
12:45	13:15	00:30	Line Turn	Line turn
13:15	13:45	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA048P1 Hdg: 001°
13:45	14:08	00:23	In Fills/ Re run	Line turn
14:08	14:30	00:22	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA085J1 Hdg: 181°.
14:30	14:56	00:26	Line Turn	Line turn
14:56	15:21	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA049P1 Hdg: 001°
15:21	15:50	00:29	In Fills/ Re run	Line turn
15:50	16:20	00:30	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA019J1 Hdg: 181°.
16:20	17:19	00:59	Line Turn	Line turn
17:19	17:38	00:19	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA050P1 Hdg: 001°
17:38	18:13	00:35	In Fills/ Re run	Line turn
18:13	18:47	00:34	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA044J2 Hdg: 181°.
18:47	19:17	00:30	Line Turn	Line turn
19:17	19:38	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA051P1 Hdg: 001°
19:38	20:07	00:29	Line Turn	Line turn - Toolbox talk followed by CTD cast
20:07	20:36	00:29	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA101P1 Hdg: 181°
20:36	21:39	01:03	Line Turn	Line turn
21:39	22:07	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA052P1 Hdg: 001°
22:07	22:31	00:24	Line Turn	Line turn
22:31	22:51	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA102P1 Hdg: 181°
22:51	23:21	00:30	Line Turn	Line turn
23:21	23:52	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA053P1 Hdg: 001°
23:52	24:00	00:08	Line Turn	Line turn

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	6:44	/	7:55	1.37%
General Mob	0:00	/	109:19	18.98%
Equipment Cal	0:00	/	88:48	15.42%
Transit to/from Site	0:00	/	25:00	4.34%
Port Call	0:00	/	12:00	2.08%
W/S at Sea	0:00	/	57:27	9.97%
Weather - Mob	0:00	/	160:30	27.86%
Ops - Equipment Dep/Rec	0:00	/	13:00	2.26%
Transit between locations	0:00	/	1:55	0.33%
Data Acquisition	3:55	/	39:03	6.78%
Line Turn	4:59	/	32:43	5.68%
Ops - Extended Line Turn	8:22	/	17:30	3.04%
Downtime - Survey	0:00	/	10:50	1.88%
Total	24:00	/	576:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	21.20	216.40	km	36.65%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	S	SW	SE	SE	
Wind Speed	Beaufort	3	3	3	4	
Sig Wave Height	m	0.9	0.8	0.7	0.8	

Weather Forecast

A set of fragmenting frontal troughs move NE over the Dover Straits and North Sea this evening and tonight, fragmenting further over the N North Sea tomorrow night. A col forms over the S North Sea tomorrow night, as the frontal trough lingers in the N North Sea, before an Atlantic low pushes a new frontal trough E across the UK and into the North Sea by Monday afternoon.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	196.10	0.00	1.80	194.30	36.00	m³
Water	70.00	1.00	4.00	67.00	113.00	m³
Lube oil	590.00	0.00	0.00	590.00	210.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area.

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

06/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

06/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	25	**Date:**	07/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 03.1'N, 003°38.1'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	32
Daily HOD Meetings	1	/	24
Near Miss	0	/	0
Hazard Observation Cards	1	/	62
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	2	/	61
Vessel Drills	0	/	6
Permit to Work	0	/	24
Cross Departmental Tours	0	/	3
Sound bite training	0	/	12
Toolbox TBT (led by others)	2	/	74
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

- HOC_23.231 - Positive observation - Good initiative to host BBQ in good weather

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:14	00:14	Line Turn	Line turn
00:14	00:34	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA103P1 Hdg: 181°
00:34	01:03	00:29	Line Turn	Line turn
01:03	01:31	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA054P1 Hdg: 001°
01:31	01:50	00:19	Line Turn	Line turn
01:50	02:10	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA104P1 Hdg: 181°
02:10	02:36	00:26	Line Turn	Line turn
02:36	03:02	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA055P1 Hdg: 001°
03:02	03:26	00:24	Line Turn	Line turn

DOME

Summary of Activities

Begin	End	Duration	Type	Description
03:26	03:52	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA105P1 Hdg: 181°
03:52	04:15	00:23	Line Turn	Line turn
04:15	04:36	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA056P1 Hdg: 001°
04:36	05:02	00:26	Line Turn	Line turn
05:02	05:33	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA106P1 Hdg: 181°
05:33	05:55	00:22	Line Turn	Line turn
05:55	06:15	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA057P1 Hdg: 001°
06:15	06:44	00:29	Line Turn	Line turn
06:44	07:20	00:36	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA107P1 Hdg: 181°
07:20	07:58	00:38	Line Turn	Line turn - Toolbox talk followed by CTD cast
07:58	08:20	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA058P1 Hdg: 001°
08:20	09:22	01:02	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
09:22	09:51	00:29	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA059P1 Hdg: 001°
09:51	11:08	01:17	Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
11:08	11:42	00:34	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA060P1 Hdg: 001°
11:42	12:07	00:25	In Fills/ Re run	Line turn
12:07	12:26	00:19	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA106J1 Hdg: 181°.
12:26	13:00	00:34	Line Turn	Line turn
13:00	13:33	00:33	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA061P1 Hdg: 001°
13:33	13:58	00:25	In Fills/ Re run	Line turn
13:58	14:20	00:22	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA107J1 Hdg: 181°.
14:20	14:48	00:28	Line Turn	Line turn
14:48	15:15	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA062P1 Hdg: 001°
15:15	15:43	00:28	Line Turn	Line turn
15:43	16:10	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA108P1 Hdg: 181°
16:10	16:37	00:27	Line Turn	Line turn
16:37	17:00	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA063P1 Hdg: 001°
17:00	17:35	00:35	Line Turn	Line turn
17:35	18:10	00:35	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA251P1 Hdg: 181°
18:10	18:38	00:28	Line Turn	Line turn
18:38	18:57	00:19	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA215P1 Hdg: 001°
18:57	19:33	00:36	Line Turn	Line turn - Toolbox talk followed by CTD cast
19:33	20:06	00:33	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA250P1 Hdg: 181°
20:06	20:36	00:30	Line Turn	Line turn
20:36	20:58	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA109P1 Hdg: 001°
20:58	21:24	00:26	Line Turn	Line turn
21:24	21:49	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA144P1 Hdg: 181°
21:49	22:18	00:29	Line Turn	Line turn
22:18	22:48	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA110P1 Hdg: 001°
22:48	23:14	00:26	Line Turn	Line turn
23:14	23:34	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA145P1 Hdg: 181°
23:34	24:00	00:26	Line Turn	Line turn

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	1:31	/	9:26	1.57%
General Mob	0:00	/	109:19	18.22%
Equipment Cal	0:00	/	88:48	14.80%
Transit to/from Site	0:00	/	25:00	4.17%
Port Call	0:00	/	12:00	2.00%
W/S at Sea	0:00	/	57:27	9.57%
Weather - Mob	0:00	/	160:30	26.75%
Ops - Equipment Dep/Rec	0:00	/	13:00	2.17%
Transit between locations	0:00	/	1:55	0.32%
Data Acquisition	10:07	/	49:10	8.19%
Line Turn	11:20	/	44:03	7.34%
Ops - Extended Line Turn	1:02	/	18:32	3.09%
Downtime - Survey	0:00	/	10:50	1.81%
Total	24:00	/	600:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	54.10	270.50	km	45.82%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	SE	SE	SW	W	
Wind Speed	Beaufort	3	3	2	2	
Sig Wave Height	m	0.8	0.9	0.7	0.6	

Weather Forecast

A fragmenting frontal trough slowly drifts NE across the North Sea this evening. A brief col forms over the S North Sea tonight, as the trough moves N across the N North Sea. Another frontal trough then moves E across the UK tomorrow morning, continuing slowly E across the North Sea through tomorrow and into Tuesday, with a low forming over the N North Sea, and showery troughs following astern.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	194.30	0.00	1.70	192.60	37.70	m³
Water	67.00	5.00	5.00	67.00	118.00	m³
Lube oil	590.00	0.00	70.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area.

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

07/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

07/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	26	**Date:**	08/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 00.2'N, 003°37.6'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	1	/	33
Daily HOD Meetings	1	/	25
Near Miss	0	/	0
Hazard Observation Cards	0	/	62
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	2	/	63
Vessel Drills	0	/	6
Permit to Work	1	/	25
Cross Departmental Tours	0	/	3
Sound bite training	0	/	12
Toolbox TBT (led by others)	3	/	77
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Nil

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:06	00:06	Line Turn	Line turn
00:06	00:32	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA111P1 Hdg: 001°
00:32	00:56	00:24	Line Turn	Line turn
00:56	01:16	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA180P1 Hdg: 181°
01:16	01:41	00:25	Line Turn	Line turn
01:41	02:13	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA112P1 Hdg: 001°
02:13	02:34	00:21	Line Turn	Line turn
02:34	02:56	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA181P1 Hdg: 181°
02:56	03:20	00:24	Line Turn	Line turn

DOME

Summary of Activities

Begin	End	Duration	Type	Description
03:20	03:47	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA113P1 Hdg: 001°
03:47	04:14	00:27	In Fills/ Re run	Line turn
04:14	04:41	00:27	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA181J1 Hdg: 181°.
04:41	05:04	00:23	Line Turn	Line turn
05:04	05:25	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA114P1 Hdg: 001°
05:25	05:57	00:32	Line Turn	Line turn
05:57	06:33	00:36	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA182P1 Hdg: 181°
06:33	06:53	00:20	Line Turn	Line turn
06:53	07:13	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA115P1 Hdg: 001°
07:13	07:38	00:25	Line Turn	Line turn
07:38	08:11	00:33	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA183P1 Hdg: 181°
08:11	08:35	00:24	Line Turn	Line turn - Toolbox talk followed by CTD cast
08:35	08:57	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA116P1 Hdg: 001°
08:57	09:19	00:22	Line Turn	Line turn
09:19	09:45	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA184P1 Hdg: 181°
09:45	10:08	00:23	Line Turn	Line turn
10:08	10:35	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA117P1 Hdg: 001°
10:35	10:56	00:21	Line Turn	Line turn
10:56	11:18	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA185P1 Hdg: 181°
11:18	11:43	00:25	Line Turn	Line turn
11:43	12:14	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA118P1 Hdg: 001°
12:14	12:38	00:24	Line Turn	Line turn
12:38	12:59	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA186P1 Hdg: 181°
12:59	13:23	00:24	Line Turn	Line turn
13:23	13:53	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA119P1 Hdg: 001°
13:53	14:16	00:23	Line Turn	Line turn
14:16	14:37	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA187P1 Hdg: 181°
14:37	15:04	00:27	Line Turn	Line turn
15:04	15:35	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA120P1 Hdg: 001°
15:35	16:03	00:28	Line Turn	Line turn
16:03	16:27	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA188P1 Hdg: 181°
16:27	16:50	00:23	Line Turn	Line turn
16:50	17:11	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA121P1 Hdg: 001°
17:11	17:37	00:26	Line Turn	Line turn
17:37	18:10	00:33	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA189P1 Hdg: 181°
18:10	18:31	00:21	Line Turn	Line turn
18:31	18:52	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA122P1 Hdg: 001°
18:52	19:23	00:31	Line Turn	Line turn - Toolbox talk followed by CTD cast
19:23	19:58	00:35	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA190P1 Hdg: 181°
19:58	20:30	00:32	Ops - Equipment Dep/Rec	Toolbox talk: Recovery of 3DUHR spread to replace ALL RTK batteries
20:30	21:00	00:30	Ops - Equipment Dep/Rec	Preparations for recovery of 3DUHR equipment
21:00	24:00	03:00	Ops - Equipment Dep/Rec	Recovered 3DUHR spread.

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:54	/	10:20	1.66%
General Mob	0:00	/	109:19	17.52%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Equipment Cal	0:00	/	88:48	14.23%
Transit to/from Site	0:00	/	25:00	4.01%
Port Call	0:00	/	12:00	1.92%
W/S at Sea	0:00	/	57:27	9.21%
Weather - Mob	0:00	/	160:30	25.72%
Ops - Equipment Dep/Rec	4:02	/	17:02	2.73%
Transit between locations	0:00	/	1:55	0.31%
Data Acquisition	10:02	/	59:12	9.49%
Line Turn	9:02	/	53:05	8.51%
Ops - Extended Line Turn	0:00	/	18:32	2.97%
Downtime - Survey	0:00	/	10:50	1.74%
Total	24:00	/	624:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	54.10	324.60	km	54.98%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	W	SSW	SW	SW	
Wind Speed	Beaufort	2	3	4	4	
Sig Wave Height	m	0.4	0.5	0.9	1.0	

Weather Forecast

A deep frontal trough moves NE-E across the North Sea this evening/tonight. Tomorrow afternoon a shallow low forms on the trough over the Central North Sea, with associated showery troughs moving E across the SW North Sea. Through Wednesday the shallow low clears N towards the Northern Isles as the original frontal trough stalls over the E North Sea as further showery troughs are driven E across the UK.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	192.60	0.00	1.70	190.90	39.40	m³
Water	67.00	4.00	4.00	67.00	122.00	m³
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area.

DOME

Client Representative Comments

Party Chief Comments

Fugro Representative		Client Representative	
			
Paul Miller Fugro Pioneer Party Chief	08/05/2023	Terry Wiseman RVO Client Representative	08/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	27	**Date:**	09/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 04.8'N, 003°39.1'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	33
Daily HOD Meetings	1	/	26
Near Miss	0	/	0
Hazard Observation Cards	2	/	64
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	3	/	66
Vessel Drills	0	/	6
Permit to Work	0	/	25
Cross Departmental Tours	0	/	3
Sound bite training	0	/	12
Toolbox TBT (led by others)	4	/	81
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

- HOC_23.232 - Unsafe act - Filter of washing machine was clogged with foreign objects
- HOC_23.233 - Positive observation - Great team-work by both shifts for the recovery, full replacement of RTK batteries and deployment of 3DUHR spread

Summary of Activities

Begin	End	Duration	Type	Description
00:00	03:00	03:00	Ops - Equipment Dep/Rec	Replaced ALL RTK batteries with spares
03:00	03:15	00:15	Ops - Equipment Dep/Rec	Toolbox talks: Deployment of 3DUHR spread & CTD cast
03:15	06:55	03:40	Ops - Equipment Dep/Rec	Deployed 3DUHR spread. CTD cast
06:55	07:45	00:50	Ops - Equipment Dep/Rec	Setting seismic systems to work
07:45	08:30	00:45	Ops - Equipment Dep/Rec	Deployed and operated ADD for 5 mins. Followed by soft start.
08:30	09:40	01:10	Ops - Equipment Dep/Rec	Test lines to confirm data quality
09:40	10:03	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA123P1 Hdg: 001°
10:03	10:26	00:23	Line Turn	Line turn

DOME

Summary of Activities

Begin	End	Duration	Type	Description
10:26	10:50	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA191P1 Hdg: 181°
10:50	11:13	00:23	Line Turn	Line turn
11:13	11:41	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA124P1 Hdg: 001°
11:41	12:04	00:23	Line Turn	Line turn
12:04	12:25	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA192P1 Hdg: 181°
12:25	12:50	00:25	Line Turn	Line turn
12:50	13:23	00:33	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA125P1 Hdg: 001°
13:23	13:45	00:22	Line Turn	Line turn
13:45	14:06	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA193P1 Hdg: 181°
14:06	14:31	00:25	Line Turn	Line turn
14:31	15:02	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA126P1 Hdg: 001°
15:02	15:26	00:24	Line Turn	Line turn
15:26	15:49	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA194P1 Hdg: 181°
15:49	16:12	00:23	Line Turn	Line turn
16:12	16:40	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA127P1 Hdg: 001°
16:40	17:04	00:24	Line Turn	Line turn
17:04	17:31	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA195P1 Hdg: 181°
17:31	17:56	00:25	Line Turn	Line turn
17:56	18:18	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA128P1 Hdg: 001°
18:18	18:46	00:28	Line Turn	Line turn
18:46	19:21	00:35	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA196P1 Hdg: 181°
19:21	19:44	00:23	Line Turn	Line turn - Toolbox talk followed by CTD cast
19:44	20:05	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA129P1 Hdg: 001°
20:05	20:36	00:31	Line Turn	Line turn
20:36	21:08	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA197P1 Hdg: 181°
21:08	21:32	00:24	Line Turn	Line turn
21:32	21:53	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA130P1 Hdg: 001°
21:53	22:17	00:24	Line Turn	Line turn
22:17	22:43	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA198P1 Hdg: 181°
22:43	23:08	00:25	Line Turn	Line turn
23:08	23:36	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA131P1 Hdg: 001°
23:36	23:59	00:23	Line Turn	Line turn
23:59	24:00	00:01	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA199P1 Hdg: 181°. Continued overnight

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	10:20	1.59%
General Mob	0:00	/	109:19	16.87%
Equipment Cal	0:00	/	88:48	13.70%
Transit to/from Site	0:00	/	25:00	3.86%
Port Call	0:00	/	12:00	1.85%
W/S at Sea	0:00	/	57:27	8.87%
Weather - Mob	0:00	/	160:30	24.77%
Ops - Equipment Dep/Rec	9:40	/	26:42	4.12%
Transit between locations	0:00	/	1:55	0.30%
Data Acquisition	7:25	/	66:37	10.28%
Line Turn	6:55	/	60:00	9.26%
Ops - Extended Line Turn	0:00	/	18:32	2.86%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Downtime - Survey	0:00	/	10:50	1.67%
Total	24:00	/	648:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	40.00	364.60	km	61.75%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	SE	SE	SW	W	
Wind Speed	Beaufort	4	4	3	3	
Sig Wave Height	m	1.0	0.8	0.6	0.4	

Weather Forecast

A frontal trough stalls over the E North Sea this evening, with a shallow low developing over the C North Sea astern. The front slowly fills tomorrow, meanwhile the shallow low and associated showery troughs move across the SW North Sea. This low merges with a low over the UK on Thursday, with various showery troughs moving N across the North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	190.90	0.00	1.70	189.20	41.10	m^3
Water	67.00	4.00	4.00	67.00	126.00	m^3
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area.

Client Representative Comments

Party Chief Comments

Fugro Representative		Client Representative	
			
Paul Miller **Fugro Pioneer Party Chief**	**09/05/2023**	**Terry Wiseman** **RVO Client Representative**	**09/05/2023**

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	28	**Date:**	10/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 04.1'N, 003°39.2'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	1	/	34
Daily HOD Meetings	1	/	27
Near Miss	0	/	0
Hazard Observation Cards	1	/	65
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	3	/	69
Vessel Drills	0	/	6
Permit to Work	1	/	26
Cross Departmental Tours	0	/	3
Sound bite training	0	/	12
Toolbox TBT (led by others)	2	/	83
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

- HOC_23.234 - Suggestion - Personnel reminded of good house-keeping practices that includes cleaning-up drink spillages on deck

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:21	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA199P1 Hdg: 181°
00:21	00:44	00:23	Line Turn	Line turn
00:44	01:14	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA132P1 Hdg: 001°
01:14	01:38	00:24	Line Turn	Line turn
01:38	01:57	00:19	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA200P1 Hdg: 181°
01:57	02:26	00:29	Line Turn	Line turn
02:26	02:54	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA133P1 Hdg: 001°
02:54	03:22	00:28	Line Turn	Line turn
03:22	03:41	00:19	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA201P1 Hdg: 181°

Summary of Activities

Begin	End	Duration	Type	Description
03:41	04:08	00:27	Line Turn	Line turn
04:08	04:32	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA134P1 Hdg: 001°
04:32	05:15	00:43	Line Turn	Line turn
05:15	05:40	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA202P1 Hdg: 181°
05:40	06:02	00:22	Line Turn	Line turn
06:02	06:24	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA135P1 Hdg: 001°
06:24	06:49	00:25	Line Turn	Line turn
06:49	07:19	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA203P1 Hdg: 181°
07:19	07:42	00:23	Line Turn	Line turn
07:42	08:02	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA136P1 Hdg: 001°
08:02	08:32	00:30	Line Turn	Line turn - Toolbox talk followed by CTD cast
08:32	09:03	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA204P1 Hdg: 181°
09:03	09:28	00:25	Line Turn	Line turn
09:28	09:48	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA137P1 Hdg: 001°
09:48	10:14	00:26	In Fills/ Re run	Line turn
10:14	10:40	00:26	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA189J1 Hdg: 181°.
10:40	11:04	00:24	Line Turn	Line turn
11:04	11:30	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA138P1 Hdg: 001°
11:30	11:53	00:23	In Fills/ Re run	Line turn
11:53	12:15	00:22	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA189J1 Hdg: 181°.
12:15	12:43	00:28	Line Turn	Line turn
12:43	13:16	00:33	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA139P1 Hdg: 001°
13:16	13:37	00:21	In Fills/ Re run	Line turn
13:37	13:57	00:20	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA189J2 Hdg: 181°.
13:57	14:26	00:29	Line Turn	Line turn
14:26	14:59	00:33	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA140P1 Hdg: 001°
14:59	15:22	00:23	Line Turn	Line turn
15:22	15:43	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA205P1 Hdg: 181°
15:43	16:09	00:26	Line Turn	Line turn
16:09	16:40	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA141P1 Hdg: 001°
16:40	17:04	00:24	Line Turn	Line turn
17:04	17:28	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA206P1 Hdg: 181°
17:28	17:51	00:23	Line Turn	Line turn
17:51	18:14	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA142P1 Hdg: 001°
18:14	18:39	00:25	Line Turn	Line turn
18:39	19:06	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA207P1 Hdg: 181°
19:06	19:26	00:20	Line Turn	Line turn
19:26	19:47	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA143P1 Hdg: 001°
19:47	20:16	00:29	Line Turn	Line turn - Toolbox talk followed by CTD cast
20:16	20:49	00:33	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA208P1 Hdg: 181°
20:49	21:14	00:25	Line Turn	Line turn
21:14	21:34	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA146P1 Hdg: 001°
21:34	22:00	00:26	In Fills/ Re run	Line turn
22:00	22:32	00:32	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA207J1 Hdg: 181°.
22:32	22:57	00:25	Line Turn	Line turn
22:57	23:22	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA147P1 Hdg: 001°
23:22	23:46	00:24	Line Turn	Line turn

Summary of Activities

Begin	End	Duration	Type	Description
23:46	24:00	00:14	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA209P1 Hdg: 181°. Continued overnight

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	3:16	/	13:36	2.02%
General Mob	0:00	/	109:19	16.27%
Equipment Cal	0:00	/	88:48	13.21%
Transit to/from Site	0:00	/	25:00	3.72%
Port Call	0:00	/	12:00	1.79%
W/S at Sea	0:00	/	57:27	8.55%
Weather - Mob	0:00	/	160:30	23.88%
Ops - Equipment Dep/Rec	0:00	/	26:42	3.97%
Transit between locations	0:00	/	1:55	0.29%
Data Acquisition	10:20	/	76:57	11.45%
Line Turn	10:24	/	70:24	10.48%
Ops - Extended Line Turn	0:00	/	18:32	2.76%
Downtime - Survey	0:00	/	10:50	1.61%
Total	24:00	/	672:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	57.90	422.50	km	71.56%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	WSW	SW	SW	SE	
Wind Speed	Beaufort	3	3	3	2	
Sig Wave Height	m	0.4	0.3	0.5	0.3	

Weather Forecast

A shallow low moves SE over Scotland, driving showery troughs E across the S North Sea tonight. The low combines with a low over central Europe tomorrow, with minor showery troughs continuing to affect the S North Sea. The low then drives a fragmented trough W across the S North Sea into Friday, clearing WSW through the day. Meanwhile, an area of high pressure develops over the N North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	189.20	0.00	1.70	187.50	42.80	m³
Water	67.00	5.00	5.00	67.00	131.00	m³

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area.

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

10/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

10/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	29	**Date:**	11/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 03.1'N, 003°39.4'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	34
Daily HOD Meetings	1	/	28
Near Miss	0	/	0
Hazard Observation Cards	1	/	66
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	2	/	71
Vessel Drills	1	/	7
Permit to Work	0	/	26
Cross Departmental Tours	0	/	3
Sound bite training	0	/	12
Toolbox TBT (led by others)	2	/	85
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

ERP drill
- HOC_23.235 - Suggestion - Advised Project Management the telephone number for the Dutch Coastguard will be replaced in coming weeks

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:10	00:10	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA209P1 Hdg: 181°
00:10	00:34	00:24	Line Turn	Line turn
00:34	01:03	00:29	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA148P1 Hdg: 001°
01:03	01:28	00:25	Line Turn	Line turn
01:28	01:48	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA210P1 Hdg: 181°
01:48	02:15	00:27	Line Turn	Line turn
02:15	02:47	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA149P1 Hdg: 001°
02:47	03:13	00:26	Line Turn	Line turn

Summary of Activities

Begin	End	Duration	Type	Description
03:13	03:33	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA211P1 Hdg: 181°
03:33	03:58	00:25	Line Turn	Line turn
03:58	04:28	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA150P1 Hdg: 001°
04:28	04:50	00:22	Line Turn	Line turn
04:50	05:13	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA212P1 Hdg: 181°
05:13	05:37	00:24	Line Turn	Line turn
05:37	06:02	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA151P1 Hdg: 001°
06:02	06:24	00:22	Line Turn	Line turn
06:24	06:50	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA213P1 Hdg: 181°
06:50	07:11	00:21	Line Turn	Line turn
07:11	07:33	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA152P1 Hdg: 001°
07:33	07:57	00:24	Line Turn	Line turn
07:57	08:27	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA214P1 Hdg: 181°
08:27	08:56	00:29	Line Turn	Line turn - Toolbox talk followed CTD cast
08:56	09:16	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA153P1 Hdg: 001°
09:16	09:41	00:25	Line Turn	Line turn
09:41	10:12	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA216P1 Hdg: 181°
10:12	10:34	00:22	Line Turn	Line turn
10:34	10:55	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA154P1 Hdg: 001°
10:55	11:20	00:25	Line Turn	Line turn
11:20	11:45	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA217P1 Hdg: 181°
11:45	12:06	00:21	Line Turn	Line turn
12:06	12:31	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA155P1 Hdg: 001°
12:31	12:53	00:22	Line Turn	Line turn
12:53	13:15	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA218P1 Hdg: 181°
13:15	13:39	00:24	Line Turn	Line turn
13:39	14:10	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA156P1 Hdg: 001°
14:10	14:34	00:24	Line Turn	Line turn
14:34	14:54	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA219P1 Hdg: 181°
14:54	15:21	00:27	Line Turn	Line turn
15:21	15:53	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA157P1 Hdg: 001°
15:53	16:18	00:25	Line Turn	Line turn
16:18	16:39	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA220P1 Hdg: 181°
16:39	17:02	00:23	Line Turn	Line turn
17:02	17:30	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA158P1 Hdg: 001°
17:30	17:53	00:23	Line Turn	Line turn
17:53	18:16	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA221P1 Hdg: 181°
18:16	19:24	01:08	Line Turn	Line turn
19:24	19:46	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA159P1 Hdg: 001°
19:46	20:14	00:28	Line Turn	Line turn - Toolbox talk followed CTD cast
20:14	20:46	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA222P1 Hdg: 181°
20:46	21:34	00:48	Line Turn	Line turn
21:34	21:54	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA160P1 Hdg: 001°
21:54	22:20	00:26	Line Turn	Line turn
22:20	22:52	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA223P1 Hdg: 181°
22:52	23:18	00:26	Line Turn	Line turn
23:18	23:41	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA161P1 Hdg: 001°

Summary of Activities

Begin	End	Duration	Type	Description
23:41	24:00	00:19	Line Turn	Line turn. Continued overnight

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	13:36	1.95%
General Mob	0:00	/	109:19	15.71%
Equipment Cal	0:00	/	88:48	12.76%
Transit to/from Site	0:00	/	25:00	3.59%
Port Call	0:00	/	12:00	1.72%
W/S at Sea	0:00	/	57:27	8.25%
Weather - Mob	0:00	/	160:30	23.06%
Ops - Equipment Dep/Rec	0:00	/	26:42	3.84%
Transit between locations	0:00	/	1:55	0.28%
Data Acquisition	11:35	/	88:32	12.72%
Line Turn	12:25	/	82:49	11.90%
Ops - Extended Line Turn	0:00	/	18:32	2.66%
Downtime - Survey	0:00	/	10:50	1.56%
Total	24:00	/	696:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	64.40	486.90	km	82.47%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	E	E	NE	NE	
Wind Speed	Beaufort	3	3	3	5	
Sig Wave Height	m	0.3	0.3	0.5	0.8	

Weather Forecast

Shallow low drifts south over the Irish Sea today, driving showery troughs about its centre which invigorate over land this PM. The low fills and loosing its identity overnight as it merges with a low over NW Europe. Overnight a frontal trough moves W over the SNS, clearing by the PM. Meanwhile, tonight, a high develops over NNS orientated NE-SW, stretching over NW UK. Tomorrow the high extends further S over North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	187.50	0.00	1.70	185.80	44.50	m³
Water	67.00	4.00	4.00	67.00	135.00	m³

DOME

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area / weather standby in survey area

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

11/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

11/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	30	**Date:**	12/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 02.8'N, 003°36.6'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	34
Daily HOD Meetings	1	/	29
Near Miss	0	/	0
Hazard Observation Cards	1	/	67
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	2	/	73
Vessel Drills	1	/	8
Permit to Work	0	/	26
Cross Departmental Tours	0	/	3
Sound bite training	1	/	13
Toolbox TBT (led by others)	3	/	88
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Sound bite training: MBES User interface overview
Drills: Rescue from Enclosed Spaces

- HOC_23.236 - Positive observation - Excellent communication between back deck & Bridge during the recovery of the 3D equipment

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:05	00:05	Line Turn	Line turn
00:05	00:30	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA224P1 Hdg: 181°
00:30	00:54	00:24	Line Turn	Line turn
00:54	01:17	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA162P1 Hdg: 001°
01:17	01:38	00:21	Line Turn	Line turn
01:38	02:01	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA225P1 Hdg: 181°
02:01	02:30	00:29	W/S at Sea	Preparations for recovery of 3D spread due to deterioration in weather

Summary of Activities

Begin	End	Duration	Type	Description
02:30	03:00	00:30	W/S at Sea	Toolbox talks for recovery of 3DUHR spread & moonpool. CTD cast
03:00	06:40	03:40	W/S at Sea	Recovery of 3D UHR spread & moonpool. CTD cast
06:40	24:00	17:20	W/S at Sea	Weather standby in survey area

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	13:36	1.89%
General Mob	0:00	/	109:19	15.18%
Equipment Cal	0:00	/	88:48	12.33%
Transit to/from Site	0:00	/	25:00	3.47%
Port Call	0:00	/	12:00	1.67%
W/S at Sea	21:59	/	79:26	11.03%
Weather - Mob	0:00	/	160:30	22.29%
Ops - Equipment Dep/Rec	0:00	/	26:42	3.71%
Transit between locations	0:00	/	1:55	0.27%
Data Acquisition	1:11	/	89:43	12.46%
Line Turn	0:50	/	83:39	11.62%
Ops - Extended Line Turn	0:00	/	18:32	2.57%
Downtime - Survey	0:00	/	10:50	1.50%
Total	24:00	/	720:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	7.00	493.90	km	83.66%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	N	NE	NE	N	
Wind Speed	Beaufort	7	7	6	6	
Sig Wave Height	m	1.5	1.7	1.6	1.5	

Weather Forecast

Showery trough over the low countries fill tonight. Meanwhile this evening, a high centre develops over N Scotland, slipping SE to lie over the CNS tomorrow. Throughout, the high maintains a ridge over the NNS & CNS. The high then decays tomorrow night, as a col forms temporarily over the North Sea on Sunday morning. After, a frontal trough is driven SE, then ESE over the North Sea through Sunday PM.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit

DOME

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	185.80	0.00	1.70	184.10	46.20	m³
Water	67.00	4.00	4.00	67.00	139.00	m³
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

Weather standby in survey area. Subject to weather - resume 3DUHR and MBES acquisition within Phase-4 area

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

12/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

12/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	31	**Date:**	13/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 04.2'N, 003°37.6'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	34
Daily HOD Meetings	1	/	30
Near Miss	0	/	0
Hazard Observation Cards	3	/	70
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	2	/	75
Vessel Drills	0	/	8
Permit to Work	0	/	26
Cross Departmental Tours	1	/	4
Sound bite training	0	/	13
Toolbox TBT (led by others)	2	/	90
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Cross department safety tour
- HOC_23.238 - Suggestion - Update daily temperature checks to fridge in Hospital
- HOC_23.239 - Suggestion - Update monthly check to fire extinguisher in Sonar Room
- HOC_23.240 - Suggestion - Route cable into cable tray on Bridge deck

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	W/S at Sea	Weather standby in survey area

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	13:36	1.83%
General Mob	0:00	/	109:19	14.69%
Equipment Cal	0:00	/	88:48	11.94%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Transit to/from Site	0:00	/	25:00	3.36%
Port Call	0:00	/	12:00	1.61%
W/S at Sea	24:00	/	103:26	13.90%
Weather - Mob	0:00	/	160:30	21.57%
Ops - Equipment Dep/Rec	0:00	/	26:42	3.59%
Transit between locations	0:00	/	1:55	0.26%
Data Acquisition	0:00	/	89:43	12.06%
Line Turn	0:00	/	83:39	11.24%
Ops - Extended Line Turn	0:00	/	18:32	2.49%
Downtime - Survey	0:00	/	10:50	1.46%
Total	24:00	/	744:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	493.90	km	83.66%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	N	NE	NE	NNE	
Wind Speed	Beaufort	7	7	6	5	
Sig Wave Height	m	1.6	1.7	1.6	1.5	

Weather Forecast

A high over the central North Sea decays tonight, and a col briefly forms early tomorrow morning. Meanwhile, a weak trough extends N over the S North Sea. Tomorrow afternoon, a frontal trough is driven ESE over the W North Sea, and the trough extends further NNW over the German Bight. By Monday morning, the frontal trough fragments over the central North Sea, as a ridge builds NE to Shetland.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	184.10	0.00	1.30	182.80	47.50	m³
Water	67.00	2.00	4.00	65.00	143.00	m³
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

Weather standby in survey area. Subject to weather - resume 3DUHR and MBES acquisition within Phase-4 area

Client Representative Comments

DOME

Party Chief Comments

Fugro Representative

Paul Miller Fugro Pioneer Party Chief	13/05/2023

Client Representative

Terry Wiseman RVO Client Representative	13/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	32	**Date:**	14/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Midnight Position: 53° 04.2'N, 003°37.6'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	34
Daily HOD Meetings	1	/	31
Near Miss	0	/	0
Hazard Observation Cards	0	/	70
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	2	/	77
Vessel Drills	0	/	8
Permit to Work	0	/	26
Cross Departmental Tours	0	/	4
Sound bite training	0	/	13
Toolbox TBT (led by others)	4	/	94
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Nil

Summary of Activities

Begin	End	Duration	Type	Description
00:00	04:20	04:20	W/S at Sea	Weather standby in survey area - Toolbox talk followed deployment of Moonpool
04:20	04:40	00:20	Ops - Equipment Dep/Rec	Toolbox talks: CTD cast. Deployment of 3D UHR spread
04:40	09:15	04:35	Ops - Equipment Dep/Rec	CTD cast. Deployment of 3D UHR spread
09:15	09:45	00:30	Ops - Equipment Dep/Rec	Setting in-sea systems to work
09:45	10:37	00:52	Ops - Equipment Dep/Rec	Deployed and operated ADD. Soft start.
10:37	12:34	01:57	Ops - Equipment Dep/Rec	Test lines to confirm data quality in improving weather conditions
12:34	12:56	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA249P1 Hdg: 001°
12:56	14:09	01:13	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data

DOME

Summary of Activities

Begin	End	Duration	Type	Description
				quality. - Test line acquired during line turn to verify data quality in opposite direction
14:09	14:31	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA248P1 Hdg: 001°
14:31	15:31	01:00	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
15:31	15:56	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA247P1 Hdg: 001°
15:56	17:04	01:08	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction - Toolbox talk followed by CTD Cast
17:04	17:35	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA246P1 Hdg: 001°
17:35	18:42	01:07	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
18:42	19:18	00:36	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA245P1 Hdg: 001°
19:18	20:20	01:02	Ops - Extended Line Turn	Extended line turn due to acquiring data in one direction only due to conditions impacting data quality. - Test line acquired during line turn to verify data quality in opposite direction
20:20	20:52	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA244P1 Hdg: 001°
20:52	21:22	00:30	In Fills/ Re run	Line turn
21:22	21:45	00:23	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA162J1 Hdg: 181°
21:45	22:09	00:24	In Fills/ Re run	Line turn
22:09	22:35	00:26	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA225J1 Hdg: 001°
22:35	23:01	00:26	Line Turn	Line turn
23:01	23:31	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA163P1 Hdg: 180°
23:31	23:57	00:26	Line Turn	Line turn
23:57	24:00	00:03	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA226P1 Hdg: 001°. Continued overnight

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	1:43	/	15:19	1.99%
General Mob	0:00	/	109:19	14.23%
Equipment Cal	0:00	/	88:48	11.56%
Transit to/from Site	0:00	/	25:00	3.26%
Port Call	0:00	/	12:00	1.56%
W/S at Sea	4:20	/	107:46	14.03%
Weather - Mob	0:00	/	160:30	20.90%
Ops - Equipment Dep/Rec	8:14	/	34:56	4.55%
Transit between locations	0:00	/	1:55	0.25%
Data Acquisition	3:21	/	93:04	12.12%
Line Turn	0:52	/	84:31	11.00%
Ops - Extended Line Turn	5:30	/	24:02	3.13%
Downtime - Survey	0:00	/	10:50	1.41%
Total	24:00	/	768:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	16.40	510.30	km	86.43%
Surveying Additional line KM	DR	0.00	0.00	0.00	km	0.00%

DOME

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
(MBES/2DUHRS)						
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NNE	NE	NW	N	
Wind Speed	Beaufort	4	3	4	3	
Sig Wave Height	m	1.3	1.1	0.8	0.7	

Weather Forecast

A frontal trough is driven ESE over the W North Sea this evening, meanwhile a trough deepens NNW over the German Bight. Through tomorrow, the frontal trough fragments over the central North Sea, and a ridge builds ENE across the UK and North Sea by tomorrow evening. The ridge remains dominant into Tuesday.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	182.80	0.00	1.50	181.30	49.00	m^3
Water	65.00	0.00	5.00	60.00	148.00	m^3
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area. Weather standby. Transit to IJmuiden

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

14/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

14/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	33	**Date:**	15/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 - Phase 4 area. Transit to IJmuiden. Midnight Position: 52° 27.8'N, 004°35.2'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	3	/	37
Daily HOD Meetings	1	/	32
Near Miss	0	/	0
Hazard Observation Cards	2	/	72
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	6	/	83
Vessel Drills	0	/	8
Permit to Work	0	/	26
Cross Departmental Tours	0	/	4
Sound bite training	0	/	13
Toolbox TBT (led by others)	4	/	98
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

- HOC_23.241 - Suggestion - New stainless steel plit pins should replace existing split pins for items with long term exposure to Wx
- HOC_23.242 - Positive observation - Good use of cordons on public quayside for lift operations

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:18	00:18	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA226P1 Hdg: 001°
00:18	00:49	00:31	Line Turn	Line turn
00:49	01:21	00:32	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA164P1 Hdg: 181°
01:21	01:44	00:23	Line Turn	Line turn
01:44	02:05	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA227P1 Hdg: 001°
02:05	02:33	00:28	Line Turn	Line turn
02:33	03:04	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA165P1 Hdg: 181°
03:04	03:28	00:24	Line Turn	Line turn

DOME

Summary of Activities

Begin	End	Duration	Type	Description
03:28	03:52	00:24	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA228P1 Hdg: 001°
03:52	04:15	00:23	Line Turn	Line turn
04:15	04:40	00:25	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA166P1 Hdg: 181°
04:40	05:05	00:25	In Fills/ Re run	Line turn
05:05	05:31	00:26	In Fills/ Re run	Phase 4: 3DUHR Re-run: IJ3IA246J1 Hdg: 001°
05:31	05:56	00:25	Line Turn	Line turn
05:56	06:18	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA167P1 Hdg: 181°
06:18	06:45	00:27	W/S at Sea	Toolbox talks: CTD cast. Recovery of 3D spread & moonpool
06:45	09:50	03:05	W/S at Sea	CTD cast. Recovered 3D spread & moonpool
09:50	15:10	05:20	W/S at Sea	Transit to Ijmuiden to shelter from weather
15:10	24:00	08:50	W/S at Sea	Alongside IJmuiden on weather standby - Preparations for maintenance to stern A-frame - Embarked fresh provisions

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:51	/	16:10	2.04%
General Mob	0:00	/	109:19	13.80%
Equipment Cal	0:00	/	88:48	11.21%
Transit to/from Site	0:00	/	25:00	3.16%
Port Call	0:00	/	12:00	1.52%
W/S at Sea	17:42	/	125:28	15.84%
Weather - Mob	0:00	/	160:30	20.27%
Ops - Equipment Dep/Rec	0:00	/	34:56	4.41%
Transit between locations	0:00	/	1:55	0.24%
Data Acquisition	2:53	/	95:57	12.11%
Line Turn	2:34	/	87:05	11.00%
Ops - Extended Line Turn	0:00	/	24:02	3.03%
Downtime - Survey	0:00	/	10:50	1.37%
Total	24:00	/	792:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	16.50	526.80	km	89.23%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	N	N	NW	NW	15:10 to 24:00 Alongside IJmuiden

DOME

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Speed	Beaufort	3	3	4	6	15:10 to 24:00 Alongside IJmuiden
Sig Wave Height	m	0.5	0.8	-	-	15:10 to 24:00 Alongside IJmuiden

Weather Forecast

A frontal trough fills over the E North Sea as a high in the N Atlantic builds a ridge ENE-NE across the UK and the North Sea. The ridge drifts S over the Low Countries tomorrow as a showery trough moves SSE over the UK. The trough fills tomorrow night as the ridge re-builds NE from the high now centred over the Celtic Sea. A separate high centre develops on the ridge over the S North Sea Wednesday evening.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	181.30	0.00	1.80	179.50	50.80	m^3
Water	60.00	0.00	4.00	56.00	152.00	m^3
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

Weather standby alongside IJmuiden
- Maintenance to Stern A-frame

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief
15/05/2023

Client Representative

Terry Wiseman
RVO Client Representative
15/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	34	**Date:**	16/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside IJmuiden. Midnight Position: 52° 27.8'N, 004°35.2'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	6	/	43
Daily HOD Meetings	1	/	33
Near Miss	0	/	0
Hazard Observation Cards	0	/	72
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	6	/	89
Vessel Drills	0	/	8
Permit to Work	4	/	30
Cross Departmental Tours	0	/	4
Sound bite training	0	/	13
Toolbox TBT (led by others)	2	/	100
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

- HOC_23.243 - Positive observation - Good coordination of back deck operations by Chief Officer & CH Engineer ensured safe work activities by external contractors

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	W/S in Port	Alongside IJmuiden on weather standby - Maintenance to stern A-frame - Equipment maintenance routines - Continued with Offline routines - Dispatched RVO 3D data drop to Norway

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	16:10	1.98%
General Mob	0:00	/	109:19	13.40%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Equipment Cal	0:00	/	88:48	10.88%
Transit to/from Site	0:00	/	25:00	3.06%
Port Call	0:00	/	12:00	1.47%
W/S in Port	24:00	/	24:00	2.94%
W/S at Sea	0:00	/	125:28	15.38%
Weather - Mob	0:00	/	160:30	19.67%
Ops - Equipment Dep/Rec	0:00	/	34:56	4.28%
Transit between locations	0:00	/	1:55	0.23%
Data Acquisition	0:00	/	95:57	11.76%
Line Turn	0:00	/	87:05	10.67%
Ops - Extended Line Turn	0:00	/	24:02	2.95%
Downtime - Survey	0:00	/	10:50	1.33%
Total	24:00	/	816:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	526.80	km	89.23%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NW	NW	NW	NW	00:00 to 24:00 Alongside IJmuiden
Wind Speed	Beaufort	4	3	3	3	00:00 to 24:00 Alongside IJmuiden
Sig Wave Height	m	-	-	-	-	00:00 to 24:00 Alongside IJmuiden

Weather Forecast

A showery trough moves SSE over the UK and SE over the German Bight. The troughs fill tonight as a ridge builds NE from the high over the Celtic Sea. A separate high develops on the ridge over the SW North Sea tomorrow evening. Overnight into Thursday the high/ridge declines into NW Europe as a fragmenting trough moves SE into the N North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	179.50	0.00	1.50	178.00	52.30	m³
Water	56.00	0.00	5.00	51.00	157.00	m³
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

Planned work for the next 24 hours

Weather standby alongside IJmuiden. Continue with maintenance to stern A-frame

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller Fugro Pioneer Party Chief	16/05/2023

Client Representative

Terry Wiseman RVO Client Representative	16/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	35	**Date:**	17/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside IJmuiden. Midnight Position: 52° 27.8'N, 004°35.2'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	4	/	47
Daily HOD Meetings	1	/	34
Near Miss	0	/	0
Hazard Observation Cards	0	/	72
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	6	/	95
Vessel Drills	0	/	8
Permit to Work	2	/	32
Cross Departmental Tours	0	/	4
Sound bite training	0	/	13
Toolbox TBT (led by others)	1	/	101
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Nil

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	W/S in Port	Alongside IJmuiden on weather standby - Maintenance to stern A-frame - Equipment maintenance routines - Continued with Offline routines - Embarked fresh water - Embarked luboil - Service to marine gyro - 1 x on-signer - 2nd Chief Officer

Time Summary

Activity	Today	/	To Date	Progress

DOME

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	16:10	1.92%
General Mob	0:00	/	109:19	13.01%
Equipment Cal	0:00	/	88:48	10.57%
Transit to/from Site	0:00	/	25:00	2.98%
Port Call	0:00	/	12:00	1.43%
W/S in Port	24:00	/	48:00	5.71%
W/S at Sea	0:00	/	125:28	14.94%
Weather - Mob	0:00	/	160:30	19.11%
Ops - Equipment Dep/Rec	0:00	/	34:56	4.16%
Transit between locations	0:00	/	1:55	0.23%
Data Acquisition	0:00	/	95:57	11.42%
Line Turn	0:00	/	87:05	10.37%
Ops - Extended Line Turn	0:00	/	24:02	2.86%
Downtime - Survey	0:00	/	10:50	1.29%
Total	24:00	/	840:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	526.80	km	89.23%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	1	0	14
Total	26	1	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NW	NW	NW	SE	00:00 to 24:00 Alongside IJmuiden
Wind Speed	Beaufort	4	3	3	2	00:00 to 24:00 Alongside IJmuiden
Sig Wave Height	m	-	-	-	-	00:00 to 24:00 Alongside IJmuiden

Weather Forecast

A high develops on a ridge over the SW North Sea this evening. The high/ridge declines into NW Europe tonight as a fragmenting frontal trough moves ESE into the N North Sea, filling through tomorrow. Another frontal trough follows over the N North Sea early Friday, filling later in the day as an elongated high forms from S Sweden to NE England.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	178.00	0.00	0.80	177.20	53.10	m³
Water	51.00	65.00	4.00	112.00	161.00	m³
Lube oil	520.00	0.00	0.00	520.00	280.00	L

Other Comments

Planned work for the next 24 hours

Weather standby alongside IJmuiden. Marine magnetic compass calibration. Transit to survey area to resume operations on IJ56 Phase 4 area

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

17/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

17/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	36	**Date:**	18/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside IJmuiden. Transit to IJ56 - Phase 4 area. Midnight Position: 53° 05.3'N, 003°40.3'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	2	/	49
Daily HOD Meetings	1	/	35
Near Miss	0	/	0
Hazard Observation Cards	2	/	74
Inductions	0	/	3
Audits / Inspections	0	/	2
Safety Meetings	0	/	2
Toolbox Talk (TBT)	6	/	101
Vessel Drills	0	/	8
Permit to Work	0	/	32
Cross Departmental Tours	0	/	4
Sound bite training	0	/	13
Toolbox TBT (led by others)	4	/	105
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

- HOC_23.244 - Positive observation - Safety tour of back deck and survey compartments prior to sailing found all areas were secured for sea
- HOC_23.245 - Positive observation - Good Q & A during toolbox for deployment of 3D spread

Summary of Activities

Begin	End	Duration	Type	Description
00:00	08:20	08:20	W/S in Port	Alongside IJmuiden on weather standby
08:20	09:30	01:10	W/S at Sea	Marine magnetic compass calibration within harbour of IJmuiden
09:30	10:05	00:35	W/S in Port	Alongside IJmuiden to disembark magnetic compass contractor
10:05	15:10	05:05	W/S at Sea	Transit to survey area - Toolbox talks: CTD cast. Deployment of 3DUHR Spread & moonpool
15:10	21:00	05:50	Ops - Equipment Dep/Rec	CTD cast. Deployed moonpool, outriggers & 3D spread
21:00	21:50	00:50	Ops - Equipment Dep/Rec	ADD deployed and operated. Soft start
21:50	24:00	02:10	Ops - Equipment Dep/Rec	Setting systems to work & test lines

DOME

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	16:10	1.87%
General Mob	0:00	/	109:19	12.65%
Equipment Cal	0:00	/	88:48	10.28%
Transit to/from Site	0:00	/	25:00	2.89%
Port Call	0:00	/	12:00	1.39%
W/S in Port	8:55	/	56:55	6.59%
W/S at Sea	6:15	/	131:43	15.24%
Weather - Mob	0:00	/	160:30	18.58%
Ops - Equipment Dep/Rec	8:50	/	43:46	5.07%
Transit between locations	0:00	/	1:55	0.22%
Data Acquisition	0:00	/	95:57	11.11%
Line Turn	0:00	/	87:05	10.08%
Ops - Extended Line Turn	0:00	/	24:02	2.78%
Downtime - Survey	0:00	/	10:50	1.25%
Total	24:00	/	864:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	526.80	km	89.23%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	SE	SE	SE	NE	00:00 to 08:20 Alongside IJmuiden
Wind Speed	Beaufort	2	3	2	3	00:00 to 08:20 Alongside IJmuiden
Sig Wave Height	m	-	1.0	1.0	0.9	00:00 to 08:20 Alongside IJmuiden

Weather Forecast

High pressure sits over the German Bight while a series of fragmenting frontal troughs move E into NNS. The troughs fill by tomorrow night as the high drifts E over the Baltic, extending a ridge WSW over the CNS into Saturday. Meanwhile on Saturday, a deepening low over the Med combines with the ridge to provide a fresh NE'ly flow over the far S North Sea. Additionally, a frontal trough tracks E across the NNS.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	177.20	0.00	1.30	175.90	54.40	m³
Water	112.00	0.00	4.00	108.00	165.00	m³
Lube oil	520.00	1,040.00	0.00	1,560.00	280.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area.

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

18/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

18/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	37	**Date:**	19/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Phase 4 area. Midnight Position: 53° 04.1'N, 003°39.4'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	49
Daily HOD Meetings	1	/	36
Near Miss	0	/	0
Hazard Observation Cards	6	/	80
Inductions	0	/	3
Audits / Inspections	2	/	4
Safety Meetings	0	/	2
Toolbox Talk (TBT)	2	/	103
Vessel Drills	1	/	9
Permit to Work	0	/	32
Cross Departmental Tours	1	/	5
Sound bite training	0	/	13
Toolbox TBT (led by others)	2	/	107
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	0
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Monthly Safety inspection
Monthly Health & Hygiene inspection
Monthly routine random alcohol tests
Rescue at height drill
Cross department safety tour

- HOC_23.246 - Suggestion - Place rubber tape around the connection to the Wave Rider sensor
- HOC_23.247 - Suggestion - Replace rusty lashing straps for outriggers
- HOC_23.248 - Suggestion - Remove unused GeoTech Block when next in port
- HOC_23.249 - Unsafe condition - Dumbbell not secured
- HOC_23.250 - Suggestion - Suggest clean under gratings prior to embarking food provisions
- HOC_23.251 - Suggestion - Food should be stored in plastic boxes and not in cartons or paper boxes

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:47	00:47	Ops - Equipment Dep/Rec	Test lines
00:47	01:09	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA243P1 Hdg: 181°

DOME

Summary of Activities

Begin	End	Duration	Type	Description
01:09	01:34	00:25	Line Turn	Line turn
01:34	01:56	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA179P1 Hdg: 001°
01:56	02:28	00:32	Line Turn	Line turn
02:28	02:55	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA242P1 Hdg: 181°
02:55	03:20	00:25	Line Turn	Line turn
03:20	03:40	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA178P1 Hdg: 001°
03:40	04:05	00:25	Line Turn	Line turn
04:05	04:35	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA241P1 Hdg: 181°
04:35	04:58	00:23	Line Turn	Line turn - Toolbox talk followed by CTD cast
04:58	05:19	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA177P1 Hdg: 001°
05:19	05:46	00:27	Line Turn	Line turn
05:46	06:16	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA240P1 Hdg: 181°
06:16	06:39	00:23	Line Turn	Line turn
06:39	07:02	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA176P1 Hdg: 001°
07:02	07:25	00:23	Line Turn	Line turn
07:25	07:48	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA239P1 Hdg: 181°
07:48	08:12	00:24	Line Turn	Line turn
08:12	08:40	00:28	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA175P1 Hdg: 001°
08:40	09:05	00:25	Line Turn	Line turn
09:05	09:25	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA238P1 Hdg: 181°
09:25	09:51	00:26	Line Turn	Line turn
09:51	10:22	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA174P1 Hdg: 001°
10:22	10:45	00:23	Line Turn	Line turn
10:45	11:05	00:20	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA237P1 Hdg: 181°
11:05	11:35	00:30	Line Turn	Line turn
11:35	12:05	00:30	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA173P1 Hdg: 001°
12:05	12:30	00:25	Line Turn	Line turn
12:30	12:51	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA236P1 Hdg: 181°
12:51	13:20	00:29	Line Turn	Line turn
13:20	13:46	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA172P1 Hdg: 001°
13:46	14:11	00:25	Line Turn	Line turn
14:11	14:37	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA235P1 Hdg: 181°
14:37	15:04	00:27	Line Turn	Line turn
15:04	15:25	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA171P1 Hdg: 001°
15:25	15:49	00:24	Line Turn	Line turn
15:49	16:20	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA234P1 Hdg: 181°
16:20	16:45	00:25	Line Turn	Line turn
16:45	17:06	00:21	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA170P1 Hdg: 001°
17:06	17:36	00:30	Line Turn	Line turn - Toolbox talk followed by CTD cast
17:36	18:09	00:33	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA233P1 Hdg: 181°
18:09	18:34	00:25	Line Turn	Line turn
18:34	18:57	00:23	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA169P1 Hdg: 001°
18:57	19:19	00:22	Line Turn	Line turn
19:19	19:45	00:26	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA232P1 Hdg: 181°
19:45	20:11	00:26	Line Turn	Line turn
20:11	20:38	00:27	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA168P1 Hdg: 001°
20:38	21:28	00:50	Line Turn	Line turn

Summary of Activities

Begin	End	Duration	Type	Description
21:28	21:50	00:22	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA231P1 Hdg: 181°
21:50	22:36	00:46	Line Turn	Line turn
22:36	23:07	00:31	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA229P1 Hdg: 001°
23:07	23:42	00:35	Line Turn	Line turn
23:42	24:00	00:18	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA230P1 Hdg: 181°. Continued overnight

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	16:10	1.82%
General Mob	0:00	/	109:19	12.31%
Equipment Cal	0:00	/	88:48	10.00%
Transit to/from Site	0:00	/	25:00	2.82%
Port Call	0:00	/	12:00	1.35%
W/S in Port	0:00	/	56:55	6.41%
W/S at Sea	0:00	/	131:43	14.83%
Weather - Mob	0:00	/	160:30	18.07%
Ops - Equipment Dep/Rec	0:47	/	44:33	5.02%
Transit between locations	0:00	/	1:55	0.22%
Data Acquisition	11:13	/	107:10	12.07%
Line Turn	12:00	/	99:05	11.16%
Ops - Extended Line Turn	0:00	/	24:02	2.71%
Downtime - Survey	0:00	/	10:50	1.22%
Total	24:00	/	888:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	63.10	589.90	km	99.92%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	ESE	E	NE	NE	
Wind Speed	Beaufort	3	3	4	4	
Sig Wave Height	m	1.0	0.6	0.6	0.9	

Weather Forecast

High pressure over Norway extends a ridge SW across the Central/N North Sea. Meanwhile, low pressure over Europe deepens a shallow trough NW across the S North Sea. The trough/ridge persist through tomorrow. On Sunday the ridge drifts N to lie SW towards Scotland as a showery trough moves NW into the German Bight.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	175.90	0.00	2.50	173.40	56.90	m³
Water	108.00	0.00	4.00	104.00	169.00	m³
Lube oil	1,560.00	0.00	0.00	1,560.00	280.00	L

Other Comments

Planned work for the next 24 hours

3DUHR and MBES acquisition within Phase-4 area / Weather standby - all subject to weather conditions

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

19/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

19/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	38	**Date:**	20/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Phase 4 area. Midnight Position: 53° 03.1'N, 003°39.9'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	49
Daily HOD Meetings	1	/	37
Near Miss	0	/	0
Hazard Observation Cards	1	/	81
Inductions	0	/	3
Audits / Inspections	0	/	4
Safety Meetings	0	/	2
Toolbox Talk (TBT)	3	/	106
Vessel Drills	0	/	9
Permit to Work	0	/	32
Cross Departmental Tours	0	/	5
Sound bite training	0	/	13
Toolbox TBT (led by others)	3	/	110
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	1	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Environmental Incident: Small hydraulic leak to stern A-frame.
HOC_23.252 - Positive observation - Great work by night-shift by implementing a LMRA during recovery of 3D spread to avoid permanent entanglement

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:01	00:01	Data Acquisition	Phase 4: 3DUHR & MBES Maiden Line: IJ3IA230P1 Hdg: 181°.
00:01	07:40	07:39	W/S at Sea	Test lines in both directions to indicate whether conditions are suitable for acquisition
07:40	08:00	00:20	W/S at Sea	Toolbox talks: Recovery of 3D spread & moonpool
08:00	11:10	03:10	W/S at Sea	Recovered 3D spread & moonpool
11:10	24:00	12:50	W/S at Sea	Weather standby in the survey area

Time Summary

Activity	Today	/	To Date	Progress

DOME

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	16:10	1.77%
General Mob	0:00	/	109:19	11.99%
Equipment Cal	0:00	/	88:48	9.74%
Transit to/from Site	0:00	/	25:00	2.74%
Port Call	0:00	/	12:00	1.32%
W/S in Port	0:00	/	56:55	6.24%
W/S at Sea	23:59	/	155:42	17.07%
Weather - Mob	0:00	/	160:30	17.60%
Ops - Equipment Dep/Rec	0:00	/	44:33	4.88%
Transit between locations	0:00	/	1:55	0.21%
Data Acquisition	0:01	/	107:11	11.75%
Line Turn	0:00	/	99:05	10.86%
Ops - Extended Line Turn	0:00	/	24:02	2.64%
Downtime - Survey	0:00	/	10:50	1.19%
Total	24:00	/	912:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.50	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	NE	
Wind Speed	Beaufort	3	4	5	5	
Sig Wave Height	m	1.2	1.4	1.5	1.5	

Weather Forecast

A ridge extends SW from Norway across the Central North Sea, as a frontal trough lies Norwegian Sea to Aberdeen and a weak trough lies NW across the S North Sea. The frontal trough drifts E and fills tomorrow, with the ridge decaying as a col develops over the N North Sea, with a showery trough moving NW into the German Bight. This persists on Sunday, as a ridge broadens NE across the N North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	173.40	0.00	1.70	171.70	58.60	m³
Water	104.00	0.00	5.00	99.00	174.00	m³
Lube oil	1,560.00	0.00	35.00	1,525.00	315.00	L

Other Comments

Planned work for the next 24 hours

Weather standby in Survey area whilst reviewing subsequent weather forecasts

Client Representative Comments

Party Chief Comments

Environmental Incident: Small hydraulic leak to stern A-frame. During weather standby, at 22:15 it was noted a small hydraulic leak to stern A-frame. The On-shift team immediately applied SOPEP absorbent pads followed by Chief Engineer replacing connection to small hydraulic hose. Quantity of leak 0.3 litres which was fully contained on-board. Stern A-frame was deemed fully operational at 23:15.

Approximately 2 x days of 3DUHR infill remaining.

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

20/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

20/05/2023

DOME

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	39	**Date:**	21/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Phase 4 area. Transit to Ijmuiden. Midnight Position: 52° 27.8'N, 004°35.2'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	2	/	51
Daily HOD Meetings	1	/	38
Near Miss	0	/	0
Hazard Observation Cards	2	/	83
Inductions	0	/	3
Audits / Inspections	0	/	4
Safety Meetings	1	/	3
Toolbox Talk (TBT)	4	/	110
Vessel Drills	1	/	10
Permit to Work	0	/	32
Cross Departmental Tours	0	/	5
Sound bite training	0	/	13
Toolbox TBT (led by others)	0	/	110
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Cyber security drill
Monthly whole vessel safety meeting

- HOC_23.253 - Positive observation - Small oil leak was spotted by Survey Team coming from T-frame which was followed by correct immediate reaction
- HOC_23.254 - Positive observation - Another exemplary presentation delivered by Chief Officer for the Safety Meeting

Summary of Activities

Begin	End	Duration	Type	Description
00:00	10:15	10:15	W/S at Sea	Weather standby in the survey area
10:15	16:55	06:40	W/S at Sea	Transit to IJmuiden
16:55	24:00	07:05	W/S in Port	Weather standby alongside IJmuiden

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	16:10	1.73%

DOME

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	109:19	11.68%
Equipment Cal	0:00	/	88:48	9.49%
Transit to/from Site	0:00	/	25:00	2.67%
Port Call	0:00	/	12:00	1.28%
W/S in Port	7:05	/	64:00	6.84%
W/S at Sea	16:55	/	172:37	18.44%
Weather - Mob	0:00	/	160:30	17.15%
Ops - Equipment Dep/Rec	0:00	/	44:33	4.76%
Transit between locations	0:00	/	1:55	0.20%
Data Acquisition	0:00	/	107:11	11.45%
Line Turn	0:00	/	99:05	10.59%
Ops - Extended Line Turn	0:00	/	24:02	2.57%
Downtime - Survey	0:00	/	10:50	1.16%
Total	24:00	/	936:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	NE	16:55 to 24:00 Alongside IJmuiden
Wind Speed	Beaufort	3	4	5	3	16:55 to 24:00 Alongside IJmuiden
Sig Wave Height	m	1.3	1.3	-	-	16:55 to 24:00 Alongside IJmuiden

Weather Forecast

A slack pressure gradient lies over the N North Sea, as a shallow trough lies NW over the S North Sea. Tonight/tomorrow a deep showery trough moves NW across the German Bight, as a ridge extends NE across Scotland towards the N North Sea. Tomorrow night/Tuesday the showery trough clears E over Denmark, as the ridge slips S and becomes oriented NE across the entire North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	171.70	0.00	1.50	170.20	60.10	m³
Water	99.00	0.00	4.00	95.00	178.00	m³
Lube oil	1,525.00	0.00	0.00	1,525.00	315.00	L

Other Comments

Planned work for the next 24 hours

Weather standby alongside IJmuiden preparing for crew change

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller
Fugro Pioneer Party Chief

21/05/2023

Client Representative

Terry Wiseman
RVO Client Representative

21/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	40	**Date:**	22/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside Ijmuiden. Midnight Position: 52° 27.8'N, 004°35.2'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	2	/	53
Daily HOD Meetings	1	/	39
Near Miss	0	/	0
Hazard Observation Cards	0	/	83
Inductions	0	/	3
Audits / Inspections	0	/	4
Safety Meetings	0	/	3
Toolbox Talk (TBT)	4	/	114
Vessel Drills	0	/	10
Permit to Work	2	/	34
Cross Departmental Tours	0	/	5
Sound bite training	0	/	13
Toolbox TBT (led by others)	2	/	112
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	2
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Nil

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	W/S in Port	Weather standby alongside IJmuiden - Preparations for crew change & handovers

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	16:10	1.68%
General Mob	0:00	/	109:19	11.39%
Equipment Cal	0:00	/	88:48	9.25%
Transit to/from Site	0:00	/	25:00	2.60%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Port Call	0:00	/	12:00	1.25%
W/S in Port	24:00	/	88:00	9.17%
W/S at Sea	0:00	/	172:37	17.98%
Weather - Mob	0:00	/	160:30	16.72%
Ops - Equipment Dep/Rec	0:00	/	44:33	4.64%
Transit between locations	0:00	/	1:55	0.20%
Data Acquisition	0:00	/	107:11	11.16%
Line Turn	0:00	/	99:05	10.32%
Ops - Extended Line Turn	0:00	/	24:02	2.50%
Downtime - Survey	0:00	/	10:50	1.13%
Total	24:00	/	960:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	14	0	0	14
Total	27	0	0	27

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	NE	00:00 to 24:00 Alongside IJmuiden
Wind Speed	Beaufort	3	3	3	3	00:00 to 24:00 Alongside IJmuiden
Sig Wave Height	m	-	-	-	-	00:00 to 24:00 Alongside IJmuiden

Weather Forecast

A ridge builds NE over the N North Sea, while a low over Germany drives a showery trough across the German Bight, clearing into Denmark/Scandinavia tonight. Tomorrow, the ridge broadens across the Central/S North Sea while a shallow low moves S over Denmark, the filling over Germany on Wednesday.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	170.20	0.00	1.20	169.00	61.30	m³
Water	95.00	0.00	5.00	90.00	183.00	m³
Lube oil	1,525.00	0.00	9.00	1,516.00	324.00	L

Other Comments

Planned work for the next 24 hours

Weather standby alongside IJmuiden. Crew change, handovers & replenishment of stores. ETD is subject to reviewing the latest weather forecasts.

Client Representative Comments

Party Chief Comments

Fugro Representative

Paul Miller Fugro Pioneer Party Chief	22/05/2023

Client Representative

Terry Wiseman RVO Client Representative	22/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	41	**Date:**	23/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside Ijmuiden. Midnight Position: 52° 27.8'N, 004°35.2'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	53
Daily HOD Meetings	0	/	39
Near Miss	0	/	0
Hazard Observation Cards	0	/	83
Inductions	1	/	4
Audits / Inspections	0	/	4
Safety Meetings	0	/	3
Toolbox Talk (TBT)	9	/	123
Vessel Drills	0	/	10
Permit to Work	2	/	36
Cross Departmental Tours	0	/	5
Sound bite training	0	/	13
Toolbox TBT (led by others)	0	/	112
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	1	/	3
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Internal vessel kick-off meeting.

Summary of Activities

Begin	End	Duration	Type	Description
00:00	08:00	08:00	W/S in Port	Weather standby alongside IJmuiden - Preparations for crew change & handovers
08:00	20:00	12:00	Port Call	Alongside IJmuiden. Crew change, handovers & replenishment of stores
20:00	21:00	01:00	W/S in Port	Weather standby alongside IJmuiden
21:00	24:00	03:00	Transit to/from Site	Transit to IJ56 Phase 4 survey area.

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	16:10	1.64%

DOME

Time Summary

Activity	Today	/	To Date	Progress
General Mob	0:00	/	109:19	11.11%
Equipment Cal	0:00	/	88:48	9.02%
Transit to/from Site	3:00	/	28:00	2.85%
Port Call	12:00	/	24:00	2.44%
W/S in Port	9:00	/	97:00	9.86%
W/S at Sea	0:00	/	172:37	17.54%
Weather - Mob	0:00	/	160:30	16.31%
Ops - Equipment Dep/Rec	0:00	/	44:33	4.53%
Transit between locations	0:00	/	1:55	0.19%
Data Acquisition	0:00	/	107:11	10.89%
Line Turn	0:00	/	99:05	10.07%
Ops - Extended Line Turn	0:00	/	24:02	2.44%
Downtime - Survey	0:00	/	10:50	1.10%
Total	24:00	/	984:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	10	10	12
Client representative	1	0	0	1
Marine crew	14	4	5	13
Total	27	14	15	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NW	NW	NNE	4	00:00 to 21:00 Alongside IJmuiden
Wind Speed	Beaufort	5	4	4	3	00:00 to 21:00 Alongside IJmuiden
Sig Wave Height	m	-	-	-	1.5	00:00 to 21:00 Alongside IJmuiden

Weather Forecast

A high in the North Atlantic, SW of Ireland, extends a ridge ENE-NE across the North Sea throughout.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	169.00	0.00	0.80	168.20	62.10	m³
Water	90.00	30.00	6.00	114.00	189.00	m³
Lube oil	1,516.00	0.00	0.00	1,516.00	324.00	L

Other Comments

Planned work for the next 24 hours

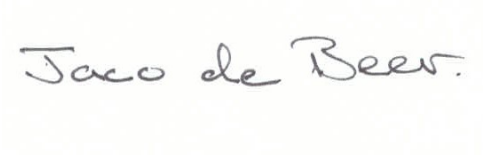
Weather permitting, Pioneer will continue to survey infills and reruns in the IJ56 survey area.

DOME

Client Representative Comments

Party Chief Comments

Fugro Representative



Jaco de Beer Fugro Pioneer Party Chief	24/05/2023

Client Representative

Terry Wiseman RVO Client Representative	24/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	42	**Date:**	24/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	In transit to IJ56. Midnight Position: 52°32.183'N, 04°09.578'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	53
Daily HOD Meetings	1	/	40
Near Miss	0	/	0
Hazard Observation Cards	0	/	83
Inductions	2	/	6
Audits / Inspections	0	/	4
Safety Meetings	0	/	3
Toolbox Talk (TBT)	2	/	125
Vessel Drills	3	/	13
Permit to Work	0	/	36
Cross Departmental Tours	0	/	5
Sound bite training	0	/	13
Toolbox TBT (led by others)	4	/	116
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Vessel drills: ISPS, abandon ship, firefighting.

Summary of Activities

Begin	End	Duration	Type	Description
00:00	08:00	08:00	Transit to/from Site	Transit IJ56 Phase 4 survey site.
08:00	09:00	01:00	W/S at Sea	Waiting on weather at site.
09:00	12:40	03:40	Ops - Equipment Dep/Rec	Toolbox talks followed by deployment of the survey equipment.
12:40	13:15	00:35	Ops - Equipment Dep/Rec	Soft start procedure while turning to line.
13:15	13:22	00:07	In Fills/ Re run	Turning to line.
13:22	13:26	00:04	In Fills/ Re run	Survey infill IJ3IA145J1. Hdg: 181°
13:26	14:29	01:03	In Fills/ Re run	Survey infill IJ3IA144J1; Hdg: 001°
14:29	15:17	00:48	In Fills/ Re run	Survey infill IJ3IA245J1; Hdg: 181°
15:17	16:16	00:59	In Fills/ Re run	Survey infill IJ3IA161J1; Hdg: 001°

DOME

Summary of Activities

Begin	End	Duration	Type	Description
16:16	17:05	00:49	In Fills/ Re run	Survey infill IJ3IA237J1; Hdg: 181°
17:05	17:53	00:48	In Fills/ Re run	Survey infill IJ3IA159J1; Hdg: 001°
17:53	18:49	00:56	In Fills/ Re run	Survey infill IJ3IA236J1; Hdg: 181°
18:49	19:39	00:50	In Fills/ Re run	Survey infill IJ3IA158J1; Hdg: 001°
19:39	20:53	01:14	In Fills/ Re run	Survey infill IJ3IA225J2; Hdg: 181°
20:53	21:55	01:02	In Fills/ Re run	Survey infill IJ3IA222J1; Hdg: 001°
21:55	23:01	01:06	In Fills/ Re run	Survey infill IJ3IA212J1; Hdg: 181°
23:01	24:00	00:59	In Fills/ Re run	Survey infill IJ3IA206J1; Hdg: 001°

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	10:45	/	26:55	2.67%
General Mob	0:00	/	109:19	10.84%
Equipment Cal	0:00	/	88:48	8.81%
Transit to/from Site	8:00	/	36:00	3.57%
Port Call	0:00	/	24:00	2.38%
W/S in Port	0:00	/	97:00	9.62%
W/S at Sea	1:00	/	173:37	17.22%
Weather - Mob	0:00	/	160:30	15.92%
Ops - Equipment Dep/Rec	4:15	/	48:48	4.84%
Transit between locations	0:00	/	1:55	0.19%
Data Acquisition	0:00	/	107:11	10.63%
Line Turn	0:00	/	99:05	9.83%
Ops - Extended Line Turn	0:00	/	24:02	2.38%
Downtime - Survey	0:00	/	10:50	1.07%
Total	24:00	/	1008:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	WNW	NW	NW	N	
Wind Speed	Beaufort	3	2	3	4	
Sig Wave Height	m	1.5	1.2	1	0.9	

Weather Forecast

A high in the North Atlantic, SW of Ireland, extends a ridge ENE-NE across the North Sea throughout.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	168.20	0.00	1.80	166.40	63.90	m³
Water	114.00	0.00	6.00	108.00	195.00	m³
Lube oil	1,516.00	0.00	0.00	1,516.00	324.00	L

Other Comments

Planned work for the next 24 hours

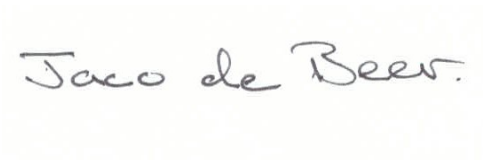
Pioneer will continue to shoot infill at site as long as the weather permits.

Client Representative Comments

Party Chief Comments

Present Infill status:
- 191km infill identified
- 91 km accepted

Fugro Representative



Jaco de Beer
Fugro Pioneer Party Chief
25/05/2023

Client Representative

Terry Wiseman
RVO Client Representative
25/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	43	**Date:**	25/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 Phase 4. Midnight Position: 53°04.859'N'N,03°39.193'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	53
Daily HOD Meetings	1	/	41
Near Miss	0	/	0
Hazard Observation Cards	0	/	83
Inductions	0	/	6
Audits / Inspections	0	/	4
Safety Meetings	0	/	3
Toolbox Talk (TBT)	2	/	127
Vessel Drills	0	/	13
Permit to Work	0	/	36
Cross Departmental Tours	0	/	5
Sound bite training	0	/	13
Toolbox TBT (led by others)	2	/	118
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:50	00:50	In Fills/ Re run	Survey infill IJ3IA221J1; Hdg: 181°
00:50	01:52	01:02	In Fills/ Re run	Survey infill IJ3IA204J1; Hdg: 001°
01:52	02:37	00:45	In Fills/ Re run	Survey infill IJ3IA196J1; Hdg: 181°
02:37	03:11	00:34	Downtime - Survey	PSPU failure - going around while rebooting the system.
03:11	04:07	00:56	In Fills/ Re run	Survey infill IJ3IA198J1; Hdg: 001°
04:07	04:50	00:43	In Fills/ Re run	Survey infill IJ3IA229J1; Hdg: 181°
04:50	05:36	00:46	In Fills/ Re run	Survey infill IJ3IA179J1; Hdg: 001°
05:36	06:22	00:46	In Fills/ Re run	Survey infill IJ3IA140J1; Hdg: 181°
06:22	07:12	00:50	In Fills/ Re run	Survey infill IJ3IA168J1; Hdg: 001°

Summary of Activities

Begin	End	Duration	Type	Description
07:12	08:05	00:53	In Fills/ Re run	Survey infill IJ3IA090J1; Hdg: 181°
08:05	08:54	00:49	In Fills/ Re run	Survey infill IJ3IA006J1; Hdg: 001°
08:54	09:46	00:52	In Fills/ Re run	Survey infill IJ3IA050J1; Hdg: 181°
09:46	10:27	00:41	In Fills/ Re run	Survey infill IJ3IA122J1; Hdg: 001°
10:27	11:06	00:39	In Fills/ Re run	Survey infill IJ3IA151J1; Hdg: 181°
11:06	14:20	03:14	Downtime - Survey	Tailbuoy 3 Positioning failure, recovering the streamer to investigate.
14:20	14:45	00:25	In Fills/ Re run	Tailbuoy 3 Positioning repaired and the streamers redeployed. - Turning to line
14:45	19:00	04:15	W/S at Sea	Acquiring test data in both directions to determine whether conditions are suitable for operations.
19:00	21:40	02:40	W/S at Sea	Toolbox talks followed by recovery of the survey equipment.
21:40	24:00	02:20	W/S at Sea	Weather standby at site.

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	10:57	/	37:52	3.67%
General Mob	0:00	/	109:19	10.59%
Equipment Cal	0:00	/	88:48	8.60%
Transit to/from Site	0:00	/	36:00	3.49%
Port Call	0:00	/	24:00	2.33%
W/S in Port	0:00	/	97:00	9.40%
W/S at Sea	9:15	/	182:52	17.72%
Weather - Mob	0:00	/	160:30	15.55%
Ops - Equipment Dep/Rec	0:00	/	48:48	4.73%
Transit between locations	0:00	/	1:55	0.19%
Data Acquisition	0:00	/	107:11	10.39%
Line Turn	0:00	/	99:05	9.60%
Ops - Extended Line Turn	0:00	/	24:02	2.33%
Downtime - Survey	3:48	/	14:38	1.42%
Total	24:00	/	1032:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	NE	
Wind Speed	Beaufort	3	5	5	5	

DOME

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Sig Wave Height	m	0.9	1.1	1.3	2.1	

Weather Forecast

High pressure is centred across the Central North Sea, slipping SE towards the S North Sea tomorrow as a weak frontal trough moves E across the Northern Isles. Overnight into Sunday the high becomes absorbed by a stronger high W of Ireland. This high extends a ridge E across the North Sea Sunday morning.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	166.40	0.00	1.60	164.80	65.50	m^3
Water	108.00	0.00	5.00	103.00	200.00	m^3
Lube oil	1,516.00	0.00	0.00	1,516.00	324.00	L

Other Comments

Planned work for the next 24 hours

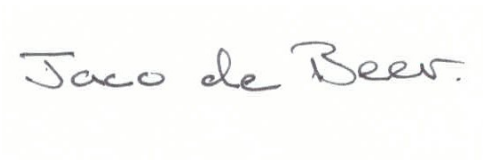
Pioneer will standby on weather at site and deploy just prior to conditions turning favourable to continue acquisition.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total Infill identified: 224km
- Infill surveyed: 111km
- Infill pending: 113km

Fugro Representative



Jaco de Beer
Fugro Pioneer Party Chief
26/05/2023

Client Representative

Terry Wiseman
RVO Client Representative
26/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	44	**Date:**	26/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 Phase 4. Midnight Position: 53°04.090'N,03°38.619'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	53
Daily HOD Meetings	1	/	42
Near Miss	0	/	0
Hazard Observation Cards	0	/	83
Inductions	0	/	6
Audits / Inspections	0	/	4
Safety Meetings	0	/	3
Toolbox Talk (TBT)	4	/	131
Vessel Drills	0	/	13
Permit to Work	0	/	36
Cross Departmental Tours	0	/	5
Sound bite training	0	/	13
Toolbox TBT (led by others)	3	/	121
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	09:40	09:40	W/S at Sea	Standby on site, waiting on weather.
09:40	14:40	05:00	W/S at Sea	Toolbox talks followed by deployment of all seismic equipment.
14:40	15:10	00:30	W/S at Sea	ADD streamed, soft start procedures while turning to line.
15:10	16:03	00:53	In Fills/ Re run	Survey infill IJ3IA236J2; Hdg 001°
16:03	16:57	00:54	In Fills/ Re run	Survey infill IJ3IA206J2; Hdg 181°
16:57	18:08	01:11	In Fills/ Re run	Survey infill IJ3IA006J2; Hdg 001°
18:08	19:13	01:05	In Fills/ Re run	Survey infill IJ3IA010J2; Hdg 181°
19:13	20:16	01:03	In Fills/ Re run	Survey infill IJ3IA014J1; Hdg 001°
20:16	21:31	01:15	In Fills/ Re run	Survey infill IJ3IA022J1; Hdg 181°

Summary of Activities

Begin	End	Duration	Type	Description
21:31	22:29	00:58	In Fills/ Re run	Survey infill IJ3IA025J1; Hdg 001°
22:29	24:00	01:31	In Fills/ Re run	Survey infill IJ3IA017J1; Hdg 181°

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	8:50	/	46:42	4.42%
General Mob	0:00	/	109:19	10.35%
Equipment Cal	0:00	/	88:48	8.41%
Transit to/from Site	0:00	/	36:00	3.41%
Port Call	0:00	/	24:00	2.27%
W/S in Port	0:00	/	97:00	9.19%
W/S at Sea	15:10	/	198:02	18.75%
Weather - Mob	0:00	/	160:30	15.20%
Ops - Equipment Dep/Rec	0:00	/	48:48	4.62%
Transit between locations	0:00	/	1:55	0.18%
Data Acquisition	0:00	/	107:11	10.15%
Line Turn	0:00	/	99:05	9.38%
Ops - Extended Line Turn	0:00	/	24:02	2.28%
Downtime - Survey	0:00	/	14:38	1.39%
Total	24:00	/	1056:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	ENE	
Wind Speed	Beaufort	6	4	4	5	
Sig Wave Height	m	1.5	1.5	1.1	1.6	

Weather Forecast

High pressure centred across the Central North Sea, slips SE towards the S North Sea as a frontal trough moves ESE across the Northern Isles. Overnight into tomorrow the high becomes absorbed by a stronger high W of Ireland. This high extends a ridge E-ESE across the North Sea tomorrow. Overnight into Monday the high becomes centred W of Scotland, extending the ridge SE across the North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	164.80	0.00	1.30	163.50	66.80	m³
Water	103.00	0.00	4.00	99.00	204.00	m³
Lube oil	1,516.00	0.00	0.00	1,516.00	324.00	L

Other Comments

Planned work for the next 24 hours

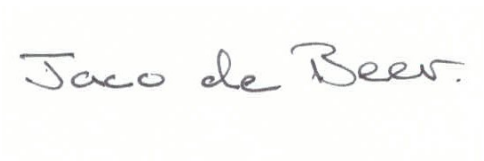
Pioneer will continue to survey infill in IJ56 Phase 4 area as long as the weather permits.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total Infill identified: 224km
- Infill Surveyed: 144km
- Infill pending: 80km

Fugro Representative



Jaco de Beer
Fugro Pioneer Party Chief
27/05/2023

Client Representative

Terry Wiseman
RVO Client Representative
27/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	45	**Date:**	27/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 Phase 4. Midnight Position: 53°03.490'N,03°37.137'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	53
Daily HOD Meetings	1	/	43
Near Miss	0	/	0
Hazard Observation Cards	0	/	83
Inductions	0	/	6
Audits / Inspections	0	/	4
Safety Meetings	0	/	3
Toolbox Talk (TBT)	2	/	133
Vessel Drills	0	/	13
Permit to Work	0	/	36
Cross Departmental Tours	0	/	5
Sound bite training	0	/	13
Toolbox TBT (led by others)	2	/	123
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	01:00	01:00	In Fills/ Re run	Survey infill IJ3IA041J1; Hdg: 001°
01:00	02:03	01:03	In Fills/ Re run	Survey infill IJ3IA044J3; Hdg: 181°
02:03	03:20	01:17	In Fills/ Re run	Survey infill IJ3IA037J5; Hdg: 001°
03:20	04:08	00:48	In Fills/ Re run	Survey infill IJ3IA050J2; Hdg: 181°
04:08	05:33	01:25	In Fills/ Re run	Survey infill IJ3IA056J1; Hdg: 001°
05:33	06:26	00:53	In Fills/ Re run	Survey infill IJ3IA057J1; Hdg: 181°
06:26	07:35	01:09	In Fills/ Re run	Survey infill IJ3IA062J1; Hdg: 001°
07:35	08:40	01:05	In Fills/ Re run	Survey infill IJ3IA064J1; Hdg: 181°
08:40	09:48	01:08	In Fills/ Re run	Survey infill IJ3IA060J1; Hdg: 001°

Summary of Activities

Begin	End	Duration	Type	Description
09:48	11:07	01:19	In Fills/ Re run	Survey infill IJ3IA068J1; Hdg: 181°
11:07	12:05	00:58	In Fills/ Re run	Survey infill IJ3IA074J1; Hdg: 001°
12:05	13:19	01:14	In Fills/ Re run	Survey infill IJ3IA086J1; Hdg: 181°
13:19	16:15	02:56	Downtime - Survey	Communications to head buoy no. 3 lost: - Toolboxes followed by recovery of the head buoy. - Replaced the battery. - Redeployed the head buoy
16:15	18:07	01:52	In Fills/ Re run	Turning to line.
18:07	18:45	00:38	In Fills/ Re run	Survey infill IJ3IA090J2; Hdg: 001°
18:45	19:39	00:54	In Fills/ Re run	Survey infill IJ3IA161J2; Hdg: 181°
19:39	20:37	00:58	In Fills/ Re run	Survey infill IJ3IA236J3; Hdg: 001°
20:37	21:45	01:08	In Fills/ Re run	Survey infill IJ3IA241J1; Hdg: 181°
21:45	22:41	00:56	In Fills/ Re run	Survey infill IJ3IA198J2; Hdg: 001°
22:41	24:00	01:19	In Fills/ Re run	Survey infill IJ3IA231J1; Hdg: 181°

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	21:04	/	67:46	6.27%
General Mob	0:00	/	109:19	10.12%
Equipment Cal	0:00	/	88:48	8.22%
Transit to/from Site	0:00	/	36:00	3.33%
Port Call	0:00	/	24:00	2.22%
W/S in Port	0:00	/	97:00	8.98%
W/S at Sea	0:00	/	198:02	18.34%
Weather - Mob	0:00	/	160:30	14.86%
Ops - Equipment Dep/Rec	0:00	/	48:48	4.52%
Transit between locations	0:00	/	1:55	0.18%
Data Acquisition	0:00	/	107:11	9.92%
Line Turn	0:00	/	99:05	9.17%
Ops - Extended Line Turn	0:00	/	24:02	2.23%
Downtime - Survey	2:56	/	17:34	1.63%
Total	24:00	/	1080:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	E	NE	NE	NE	
Wind Speed	Beaufort	2	2	3	4	
Sig Wave Height	m	0.9	1.6	1.6	0.9	

Weather Forecast

High pressure centred across the Central North Sea, slips SE towards the S North Sea as a frontal trough moves ESE across the Northern Isles. Overnight into tomorrow the high becomes absorbed by a stronger high W of Ireland. This high extends a ridge E-ESE across the North Sea tomorrow. Overnight into Monday the high becomes centred W of Scotland, extending the ridge SE across the North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	163.50	0.00	1.50	162.00	68.30	m^3
Water	99.00	0.00	5.00	94.00	209.00	m^3
Lube oil	1,516.00	0.00	0.00	1,516.00	324.00	L

Other Comments

Planned work for the next 24 hours

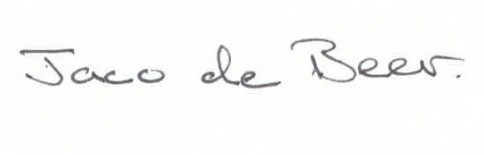
Pioneer will continue the survey as long as the weather allows.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total Infill identified: 226km
- Infill Surveyed: 186km
- Infill pending: 40km

Fugro Representative



Jaco de Beer
Fugro Pioneer Party Chief
28/05/2023

Client Representative

Terry Wiseman
RVO Client Representative
28/05/2023

DOME

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	46	**Date:**	28/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	IJ56 Phase 4. Midnight Position: 53°03.794'N,03°39.424'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	0	/	53
Daily HOD Meetings	1	/	44
Near Miss	0	/	0
Hazard Observation Cards	0	/	83
Inductions	0	/	6
Audits / Inspections	2	/	6
Safety Meetings	0	/	3
Toolbox Talk (TBT)	3	/	136
Vessel Drills	0	/	13
Permit to Work	0	/	36
Cross Departmental Tours	1	/	6
Sound bite training	0	/	13
Toolbox TBT (led by others)	3	/	126
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

Cross departmental tour
Safety and hygiene inspection,

Summary of Activities

Begin	End	Duration	Type	Description
00:00	01:07	01:07	In Fills/ Re run	Survey infill IJ3IA159J2; Hdg: 001°
01:07	02:11	01:04	In Fills/ Re run	Survey infill IJ3IA122J2; Hdg: 181°
02:11	03:19	01:08	In Fills/ Re run	Survey infill IJ3IA151J2; Hdg: 001°
03:19	04:13	00:54	In Fills/ Re run	Survey infill IJ3IA120J1; Hdg: 181°
04:13	05:17	01:04	In Fills/ Re run	Survey infill IJ3IA168J3; Hdg: 001°
05:17	06:06	00:49	In Fills/ Re run	Survey infill IJ3IA114J2; Hdg: 181°
06:06	07:17	01:11	In Fills/ Re run	Survey infill IJ3IA167J2; Hdg: 001°
07:17	08:14	00:57	In Fills/ Re run	Survey infill IJ3IA098J1; Hdg: 181°

DOME

Summary of Activities

Begin	End	Duration	Type	Description
08:14	09:12	00:58	In Fills/ Re run	Survey infill IJ3IA168J2; Hdg: 001°
09:12	10:18	01:06	In Fills/ Re run	Survey infill IJ3IA108J1; Hdg: 181°
10:18	11:15	00:57	In Fills/ Re run	Survey infill IJ3IA169J1; Hdg: 001°
11:15	12:28	01:13	In Fills/ Re run	Survey infill IJ3IA113J1; Hdg: 181°
12:28	13:24	00:56	In Fills/ Re run	Survey infill IJ3IA135J1; Hdg: 001°
13:24	14:33	01:09	In Fills/ Re run	Survey infill IJ3IA127J1; Hdg: 181°
14:33	15:41	01:08	In Fills/ Re run	Survey infill IJ3IA130J1; Hdg: 001°
15:41	16:29	00:48	In Fills/ Re run	Survey infill IJ3IA171J1; Hdg: 181°
16:29	19:00	02:31	W/S at Sea	Toolboxes followed by recovery of all survey equipment.
19:00	24:00	05:00	W/S at Sea	Transit to IJmuiden during inclement weather.

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	16:29	/	84:15	7.63%
General Mob	0:00	/	109:19	9.90%
Equipment Cal	0:00	/	88:48	8.04%
Transit to/from Site	0:00	/	36:00	3.26%
Port Call	0:00	/	24:00	2.17%
W/S in Port	0:00	/	97:00	8.79%
W/S at Sea	7:31	/	205:33	18.62%
Weather - Mob	0:00	/	160:30	14.54%
Ops - Equipment Dep/Rec	0:00	/	48:48	4.42%
Transit between locations	0:00	/	1:55	0.17%
Data Acquisition	0:00	/	107:11	9.71%
Line Turn	0:00	/	99:05	8.97%
Ops - Extended Line Turn	0:00	/	24:02	2.18%
Downtime - Survey	0:00	/	17:34	1.59%
Total	24:00	/	1104:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	0	12
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	0	26

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NNE	NE	
Wind Speed	Beaufort	3	3	6	6	

DOME

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Sig Wave Height	m	0.6	1.0	2.0	2.8	

Weather Forecast

A high W of Scotland extends a ridge E-SE across the North Sea throughout. The ridge weakens briefly tonight as a shallow low moves S across Denmark.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	162.00	0.00	1.50	160.50	69.80	m³
Water	94.00	0.00	5.00	89.00	214.00	m³
Lube oil	1,516.00	0.00	46.00	1,470.00	370.00	L

Other Comments

Planned work for the next 24 hours

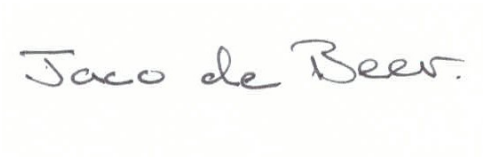
Pioneer will wait on weather alongside IJmuiden.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total infill identified: 226km
- Infill surveyed: 210km
- Infill pending: 16km

Fugro Representative



Jaco de Beer
Fugro Pioneer Party Chief
29/05/2023

Client Representative

Terry Wiseman
RVO Client Representative
29/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	47	**Date:**	29/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Transit to IJmuiden. Midnight Position: 53°03.794'N,03°39.424'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	3	/	56
Daily HOD Meetings	1	/	45
Near Miss	0	/	0
Hazard Observation Cards	3	/	86
Inductions	0	/	6
Audits / Inspections	0	/	6
Safety Meetings	0	/	3
Toolbox Talk (TBT)	5	/	141
Vessel Drills	0	/	13
Permit to Work	1	/	37
Cross Departmental Tours	0	/	6
Sound bite training	0	/	13
Toolbox TBT (led by others)	0	/	126
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

3x HOCs
- HOC_23.255 - Suggestion - Ventilate mast store to combat moisture – 20230528
- HOC_23.256 - Suggestion - Removed rubbish found in the ECR – 20230528
- HOC_23.257 - Suggestion - Add local numbers to chemicals - 20230528

Summary of Activities

Begin	End	Duration	Type	Description
00:00	09:00	09:00	W/S at Sea	Transit to IJmuiden during inclement weather.
09:00	24:00	15:00	W/S in Port	Alongside IJmuiden, waiting on weather.

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	84:15	7.47%
General Mob	0:00	/	109:19	9.69%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Equipment Cal	0:00	/	88:48	7.87%
Transit to/from Site	0:00	/	36:00	3.19%
Port Call	0:00	/	24:00	2.13%
W/S in Port	15:00	/	112:00	9.93%
W/S at Sea	9:00	/	214:33	19.02%
Weather - Mob	0:00	/	160:30	14.23%
Ops - Equipment Dep/Rec	0:00	/	48:48	4.33%
Transit between locations	0:00	/	1:55	0.17%
Data Acquisition	0:00	/	107:11	9.50%
Line Turn	0:00	/	99:05	8.78%
Ops - Extended Line Turn	0:00	/	24:02	2.13%
Downtime - Survey	0:00	/	17:34	1.56%
Total	24:00	/	1128:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	12	0	2	10
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	26	0	2	24

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	NE	
Wind Speed	Beaufort	6	5	5	5	
Sig Wave Height	m	2.3	-	-	-	

Weather Forecast

This morning a shallow low tracks S across Denmark extending a weak front over the German Bight. The low fills and loses its identity through the afternoon. Meanwhile a high W of Scotland extends a ridge E-SE across the North Sea throughout. Under the flank of the high, the German Bight and SNS will continue to experience brisk NE'ly winds.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	160.50	0.00	1.10	159.40	70.90	m³
Water	89.00	0.00	5.00	84.00	219.00	m³
Lube oil	1,470.00	0.00	0.00	1,470.00	370.00	L

Other Comments

Planned work for the next 24 hours

Planned work for the next 24 hours

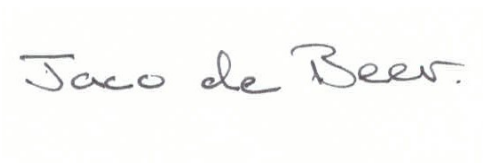
Pioneer will wait on weather alongside IJmuiden.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total infill identified: 226km
- Infill surveyed: 210km
- Infill pending: 16km

Fugro Representative



Jaco de Beer Fugro Pioneer Party Chief	30/05/2023

Client Representative

Terry Wiseman RVO Client Representative	30/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	48	**Date:**	30/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside IJmuiden. Midnight Position: 53°03.794'N,03°39.424'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	1	/	57
Daily HOD Meetings	1	/	46
Near Miss	0	/	0
Hazard Observation Cards	0	/	86
Inductions	0	/	6
Audits / Inspections	0	/	6
Safety Meetings	0	/	3
Toolbox Talk (TBT)	5	/	146
Vessel Drills	2	/	15
Permit to Work	1	/	38
Cross Departmental Tours	0	/	6
Sound bite training	0	/	13
Toolbox TBT (led by others)	0	/	126
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

2x Vessel drills
- Casevac simulation
- Launching of the MOB boat.

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	W/S at Sea	Alongside IJmuiden, waiting on weather.

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	84:15	7.31%
General Mob	0:00	/	109:19	9.49%
Equipment Cal	0:00	/	88:48	7.71%

DOME

Time Summary

Activity	Today	/	To Date	Progress
Transit to/from Site	0:00	/	36:00	3.13%
Port Call	0:00	/	24:00	2.08%
W/S in Port	0:00	/	112:00	9.72%
W/S at Sea	24:00	/	238:33	20.71%
Weather - Mob	0:00	/	160:30	13.93%
Ops - Equipment Dep/Rec	0:00	/	48:48	4.24%
Transit between locations	0:00	/	1:55	0.17%
Data Acquisition	0:00	/	107:11	9.30%
Line Turn	0:00	/	99:05	8.60%
Ops - Extended Line Turn	0:00	/	24:02	2.09%
Downtime - Survey	0:00	/	17:34	1.52%
Total	24:00	/	1152:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	10	0	0	10
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	24	0	0	24

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	N	N	N	N	
Wind Speed	Beaufort	4	4	4	4	
Sig Wave Height	m	-	-	-	-	

Weather Forecast

A high W of Scotland extends a ridge ESE across the North Sea. The ridge becomes orientated SE from tomorrow afternoon as a low moves S across Sweden & the Kattegat. The low continues SSW across Denmark/the Kattegat on Thursday, deepening a trough WNW across the German Bight.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	159.40	0.00	0.70	158.70	71.60	m³
Water	84.00	0.00	4.00	80.00	223.00	m³
Lube oil	1,470.00	0.00	0.00	1,470.00	370.00	L

Other Comments

Planned work for the next 24 hours

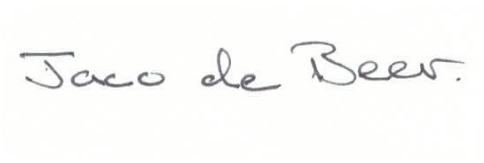
Pioneer will be standing by, waiting on weather.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total infill identified: 226km
- Infill surveyed: 210km
- Infill pending: 16km

Fugro Representative



Jaco de Beer Fugro Pioneer Party Chief	31/05/2023

Client Representative

Terry Wiseman RVO Client Representative	31/05/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	49	**Date:**	31/05/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside IJmuiden. Midnight Position: 53°03.794'N,03°39.424'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Stop, Look, Assess, Manage	0	/	2
TRA Review	1	/	58
Daily HOD Meetings	1	/	47
Near Miss	0	/	0
Hazard Observation Cards	0	/	86
Inductions	0	/	6
Audits / Inspections	0	/	6
Safety Meetings	0	/	3
Toolbox Talk (TBT)	5	/	151
Vessel Drills	0	/	15
Permit to Work	1	/	39
Cross Departmental Tours	0	/	6
Sound bite training	0	/	13
Toolbox TBT (led by others)	0	/	126
Two-Part HIRA	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Health and Safety Incident	0	/	0
Environmental Incident	0	/	1
Security Incident	0	/	0
Quality Related Incident	0	/	0

HSE Comments

1x Permit to work - working at height.

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	W/S at Sea	Alongside IJmuiden, waiting on weather.

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	0:00	/	84:15	7.16%
General Mob	0:00	/	109:19	9.30%
Equipment Cal	0:00	/	88:48	7.55%
Transit to/from Site	0:00	/	36:00	3.06%
Port Call	0:00	/	24:00	2.04%

DOME

Time Summary

Activity	Today	/	To Date	Progress
W/S in Port	0:00	/	112:00	9.52%
W/S at Sea	24:00	/	262:33	22.33%
Weather - Mob	0:00	/	160:30	13.65%
Ops - Equipment Dep/Rec	0:00	/	48:48	4.15%
Transit between locations	0:00	/	1:55	0.16%
Data Acquisition	0:00	/	107:11	9.11%
Line Turn	0:00	/	99:05	8.43%
Ops - Extended Line Turn	0:00	/	24:02	2.04%
Downtime - Survey	0:00	/	17:34	1.49%
Total	24:00	/	1176:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	10	0	0	10
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	24	0	0	24

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	N	N	N	N	
Wind Speed	Beaufort	4	4	4	4	
Sig Wave Height	m	-	-	-	-	

Weather Forecast

High pressure off western Scotland maintains a ridge ESE across the British Isles and North Sea throughout but weakens for a time today as a filling low sinks south across Denmark and the Kattegat. The low fills through tomorrow as it clears into Central Europe and the ridge re-strengthens ESE over the North Sea astern.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	158.70	0.00	0.70	158.00	72.30	m³
Water	80.00	0.00	4.00	76.00	227.00	m³
Lube oil	1,470.00	0.00	0.00	1,470.00	370.00	L

Other Comments

Planned work for the next 24 hours

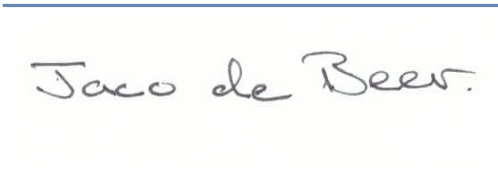
Pioneer will be alongside IJmuiden, waiting on weather.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total infill identified: 226km
- Infill surveyed: 210km
- Infill pending: 16km

Fugro Representative



Jaco de Beer Fugro Pioneer Party Chief	01/06/2023

Client Representative

Terry Wiseman RVO Client Representative	01/06/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	50	**Date:**	01/06/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside IJmuiden. Midnight Position: 53°03.794'N,03°39.424'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	1
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	1	/	127
Sound bite training	0	/	13
Cross Departmental Tours	0	/	6
Permit to Work	2	/	40
Vessel Drills	0	/	15
Toolbox Talk (TBT)	6	/	152
Safety Meetings	0	/	3
Audits / Inspections	0	/	6
Inductions	0	/	6
Hazard Observation Cards	0	/	86
Near Miss	0	/	0
Daily HOD Meetings	1	/	48
TRA Review	4	/	62
Stop, Look, Assess, Manage	0	/	2

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	24:00	24:00	W/S at Sea	Alongside IJmuiden, waiting on weather.

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	00:00	/	84:15	7.02%
General Mob	00:00	/	109:19	9.11%
Equipment Cal	00:00	/	88:48	7.40%
Transit to/from Site	00:00	/	36:00	3.00%
Port Call	00:00	/	24:00	2.00%
W/S in Port	00:00	/	112:00	9.33%

DOME

Time Summary

Activity	Today	/	To Date	Progress
W/S at Sea	24:00	/	286:33	23.88%
Weather - Mob	00:00	/	160:30	13.38%
Ops - Equipment Dep/Rec	00:00	/	48:48	4.07%
Transit between locations	00:00	/	01:55	0.16%
Data Acquisition	00:00	/	107:11	8.93%
Line Turn	00:00	/	99:05	8.26%
Ops - Extended Line Turn	00:00	/	24:02	2.00%
Downtime - Survey	00:00	/	17:34	1.46%
Total	24:00	/	1200:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	10	0	0	10
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	24	0	0	24

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NNE	NW	N	N	
Wind Speed	Beaufort	4	4	5	5	
Sig Wave Height	m	-	-	-	-	

Weather Forecast

High pressure S of Iceland maintains a ridge ESE across the British Isles and North Sea, while a weak frontal trough sinks S across the North Sea this morning. The ridge strengthens ESE over the North Sea this afternoon, although a trough deepens SW out of Sweden towards the German Bight tomorrow morning, deepening further overnight and into Sunday.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	158.00	0.00	0.80	157.20	73.10	m³
Water	76.00	40.00	5.00	111.00	232.00	m³
Lube oil	1,470.00	0.00	30.00	1,440.00	400.00	L

Other Comments

Planned work for the next 24 hours

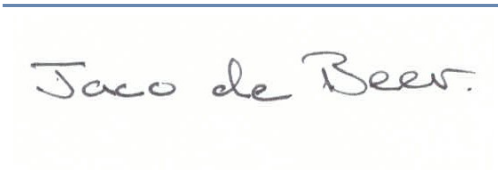
Pioneer will steam to site to start operations when the weather allows.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total infill identified: 226km
- Infill surveyed: 210km
- Infill pending: 16km

Fugro Representative



Jaco de Beer Fugro Pioneer Party Chief	02/06/2023

Client Representative

Terry Wiseman RVO Client Representative	02/06/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	51	**Date:**	02/06/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Alongside IJmuiden. Midnight Position: 53°03.794'N,03°39.424'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	1
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	0	/	127
Sound bite training	0	/	13
Cross Departmental Tours	0	/	6
Permit to Work	0	/	40
Vessel Drills	0	/	15
Toolbox Talk (TBT)	5	/	157
Safety Meetings	0	/	3
Audits / Inspections	0	/	6
Inductions	0	/	6
Hazard Observation Cards	0	/	86
Near Miss	0	/	0
Daily HOD Meetings	1	/	49
TRA Review	3	/	65
Stop, Look, Assess, Manage	0	/	2

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	15:00	15:00	W/S at Sea	Alongside IJmuiden, waiting on weather.
15:00	24:00	09:00	W/S at Sea	Transit to site IJ56 Phase 4 during inclement weather.

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	00:00	/	84:15	6.88%
General Mob	00:00	/	109:19	8.93%
Equipment Cal	00:00	/	88:48	7.25%
Transit to/from Site	00:00	/	36:00	2.94%
Port Call	00:00	/	24:00	1.96%

DOME

Time Summary

Activity	Today	/	To Date	Progress
W/S in Port	00:00	/	112:00	9.15%
W/S at Sea	24:00	/	310:33	25.37%
Weather - Mob	00:00	/	160:30	13.11%
Ops - Equipment Dep/Rec	00:00	/	48:48	3.99%
Transit between locations	00:00	/	01:55	0.16%
Data Acquisition	00:00	/	107:11	8.76%
Line Turn	00:00	/	99:05	8.10%
Ops - Extended Line Turn	00:00	/	24:02	1.96%
Downtime - Survey	00:00	/	17:34	1.44%
Total	24:00	/	1224:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	10	0	0	10
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	24	0	0	24

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	N	NE	N	NNE	
Wind Speed	Beaufort	4	4	6	4	
Sig Wave Height	m	-	-	2.5	2.5	

Weather Forecast

High pressure S of Iceland maintains a ridge ESE across the British Isles and North Sea, while a weak frontal trough sinks S across the North Sea this morning. The ridge strengthens ESE over the North Sea this afternoon, although a trough deepens SW out of Sweden towards the German Bight tomorrow morning, deepening further overnight and into Sunday.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	157.20	0.00	1.60	155.60	74.70	m³
Water	111.00	0.00	4.00	107.00	236.00	m³
Lube oil	1,440.00	0.00	0.00	1,440.00	400.00	L

Other Comments

Planned work for the next 24 hours

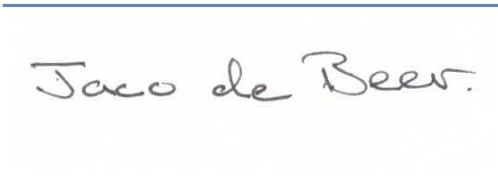
Pioneer will continue to survey the pending infill at site.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total infill identified: 226km
- Infill surveyed: 210km
- Infill pending: 16km

Fugro Representative



Jaco de Beer Fugro Pioneer Party Chief	03/06/2023

Client Representative

Terry Wiseman RVO Client Representative	03/06/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	52	**Date:**	03/06/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	Transit to site IJ56 Phase 4. Midnight Position: 53°03.794'N,03°39.424'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	1
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	2	/	129
Sound bite training	0	/	13
Cross Departmental Tours	0	/	6
Permit to Work	0	/	40
Vessel Drills	0	/	15
Toolbox Talk (TBT)	2	/	159
Safety Meetings	0	/	3
Audits / Inspections	0	/	6
Inductions	0	/	6
Hazard Observation Cards	1	/	87
Near Miss	0	/	0
Daily HOD Meetings	1	/	50
TRA Review	0	/	65
Stop, Look, Assess, Manage	0	/	2

HSE Comments

1x HOC
- HOC_23.258 - Suggestion - Many thanks for installation of the noise baffles - 20230603

Summary of Activities

Begin	End	Duration	Type	Description
00:00	07:10	07:10	W/S at Sea	Standby at site, waiting on the weather to improve.
07:10	11:00	03:50	Ops - Equipment Dep/Rec	Toolboxes followed by deployment of the seismic equipment.
11:00	12:05	01:05	In Fills/ Re run	Turning to line. - ADD deployed, soft start procedure.
12:05	12:12	00:07	In Fills/ Re run	Survey infill line IJ3IA129J1; Hdg: 001°
12:12	12:48	00:36	In Fills/ Re run	Survey infill line IJ3IA044J4; Hdg: 181°
12:48	12:57	00:09	In Fills/ Re run	Survey infill line IJ3IA040J1; Hdg: 181°
12:57	13:44	00:47	In Fills/ Re run	Survey infill line IJ3IA040J2; Hdg: 181°

DOME

Summary of Activities

Begin	End	Duration	Type	Description
13:44	14:38	00:54	In Fills/ Re run	Survey infill line IJ3IA009J1; Hdg: 001°
14:38	15:48	01:10	In Fills/ Re run	Survey infill line IJ3IA060J2; Hdg: 181°
15:48	16:34	00:46	In Fills/ Re run	Survey infill line IJ3IA184J1; Hdg: 001°
16:34	18:39	02:05	In Fills/ Re run	Survey infill line IJ3IA229J2; Hdg: 181°
18:39	19:44	01:05	In Fills/ Re run	Survey infill line IJ3IA198J2; Hdg: 181°
19:44	20:38	00:54	In Fills/ Re run	Survey infill line IJ3IA230J3; Hdg: 001°
20:38	22:20	01:42	In Fills/ Re run	Survey infill line IJ3IA206J3; Hdg: 001°
22:20	23:19	00:59	In Fills/ Re run	Survey infill line IJ3IA179J2; Hdg: 181°
23:19	24:00	00:41	In Fills/ Re run	Survey infill line IJ3IA241J2; Hdg: 001°

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	13:00	/	97:15	7.79%
General Mob	00:00	/	109:19	8.76%
Equipment Cal	00:00	/	88:48	7.12%
Transit to/from Site	00:00	/	36:00	2.88%
Port Call	00:00	/	24:00	1.92%
W/S in Port	00:00	/	112:00	8.97%
W/S at Sea	07:10	/	317:43	25.46%
Weather - Mob	00:00	/	160:30	12.86%
Ops - Equipment Dep/Rec	03:50	/	52:38	4.22%
Transit between locations	00:00	/	01:55	0.15%
Data Acquisition	00:00	/	107:11	8.59%
Line Turn	00:00	/	99:05	7.94%
Ops - Extended Line Turn	00:00	/	24:02	1.93%
Downtime - Survey	00:00	/	17:34	1.41%
Total	24:00	/	1248:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	10	0	0	10
Client representative	1	0	0	1
Marine crew	13	0	0	13
Total	24	0	0	24

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	NNE	
Wind Speed	Beaufort	5	3	4	4	
Sig Wave Height	m	2.0	1.3	1.0	1.4	

Weather Forecast

A high W of Scotland extends a ridge ESE-SE across the North Sea, while a shallow low over S Norway/Skagerrak deepens a trough WSW/SW across the German Bight/ E North Sea. This set up generally persists over the next 48 hours.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	155.60	0.00	1.50	154.10	76.20	m³
Water	107.00	0.00	4.00	103.00	240.00	m³
Lube oil	1,440.00	0.00	0.00	1,440.00	400.00	L

Other Comments

Planned work for the next 24 hours

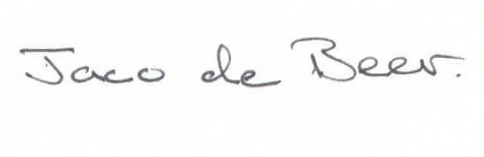
Pioneer will endeavour to complete all infills and thereby the project.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total infill identified: 262km
- Infill surveyed: 245km
- Infill pending: 17km

Fugro Representative



Jaco de Beer
Fugro Pioneer Party Chief
04/06/2023

Client Representative

Terry Wiseman
RVO Client Representative
04/06/2023

DAILY PROGRESS REPORT

PIO/RVO NL IJmuiden Ver Wind Farm
Zone 3D Phase 4 2023(Sites V and VI)
Geophysical Investigations

Fugro Pioneer

Project No.:	221924	**Report No.:**	53	**Date:**	04/06/2023
Client:	Ministerie van Economische Zaken en Klimaat			**Timezone:**	UTC+02:00
Location:	At site IJ56 Phase 4. Midnight Position: 53°03.329'N,03°39.550'E				

Quality, Health, Safety and Environment

Safety Information	Today	/	To Date
Quality Related Incident	0	/	0
Security Incident	0	/	0
Environmental Incident	0	/	1
Health and Safety Incident	0	/	0
Vessel Led Kick of Meeting (KOM)	0	/	3
Two-Part HIRA	0	/	0
Toolbox TBT (led by others)	3	/	132
Sound bite training	0	/	13
Cross Departmental Tours	0	/	6
Permit to Work	1	/	41
Vessel Drills	0	/	15
Toolbox Talk (TBT)	0	/	159
Safety Meetings	0	/	3
Audits / Inspections	0	/	6
Inductions	0	/	6
Hazard Observation Cards	0	/	87
Near Miss	0	/	0
Daily HOD Meetings	1	/	51
TRA Review	1	/	66
Stop, Look, Assess, Manage	0	/	2

HSE Comments

Summary of Activities

Begin	End	Duration	Type	Description
00:00	00:42	00:42	In Fills/ Re run	Survey infill line IJ3IA241J2; Hdg: 001°
00:42	01:31	00:49	In Fills/ Re run	Survey infill line IJ3IA177J1; Hdg: 181°
01:31	02:06	00:35	In Fills/ Re run	Survey infill line IJ3IA231J2; Hdg: 001°
02:06	03:20	01:14	In Fills/ Re run	Survey infill line IJ3IA174J1; Hdg: 181°
03:20	04:10	00:50	In Fills/ Re run	Survey infill line IJ3IA231J3; Hdg: 001°
04:10	05:26	01:16	In Fills/ Re run	Survey infill line IJ3IA184J1; Hdg: 181°
05:26	06:15	00:49	In Fills/ Re run	Survey infill line IJ3IA140J2; Hdg: 001°
06:15	07:30	01:15	In Fills/ Re run	Survey infill line IJ3IA206J4; Hdg: 181°
07:30	08:03	00:33	In Fills/ Re run	Survey infill line IJ3IA129J2; Hdg: 001°

Summary of Activities

Begin	End	Duration	Type	Description
08:03	09:12	01:09	In Fills/ Re run	Survey infill line IJ3IA171J2; Hdg: 181°
09:12	10:51	01:39	In Fills/ Re run	Survey infill line IJ3IA204J2; Hdg: 181°
10:51	12:06	01:15	In Fills/ Re run	Survey infill line IJ3IA052J1; Hdg: 001°
12:06	12:48	00:42	In Fills/ Re run	Survey infill line IJ3IA039J1; Hdg: 001°
12:48	13:54	01:06	In Fills/ Re run	Survey infill line IJ3IA023J1; Hdg: 181°
13:54	14:49	00:55	In Fills/ Re run	Survey infill line IJ3IA055J1; Hdg: 001°
14:49	15:57	01:08	In Fills/ Re run	Survey infill line IJ3IA042J1; Hdg: 181°
15:57	16:31	00:34	In Fills/ Re run	Survey infill line IJ3IA031J1; Hdg: 001°
16:31	17:18	00:47	In Fills/ Re run	Survey infill line IJ3IA021J1; Hdg: 181°
17:18	18:06	00:48	In Fills/ Re run	Survey infill line IJ3IA157J1; Hdg: 001°
18:06	19:27	01:21	In Fills/ Re run	Survey infill line IJ3IA198J4; Hdg: 181°
19:27	20:01	00:34	In Fills/ Re run	Survey infill line IJ3IA239J1; Hdg: 001°
20:01	20:18	00:17	In Fills/ Re run	Survey infill line IJ3IA241J3; Hdg: 001°
20:18	21:14	00:56	In Fills/ Re run	Survey infill line IJ3IA157J2; Hdg: 181°
21:14	22:32	01:18	In Fills/ Re run	Survey infill line IJ3IA243J1; Hdg: 001°
22:32	24:00	01:28	In Fills/ Re run	Survey infill line IJ3IA179J4; Hdg: 181°

Time Summary

Activity	Today	/	To Date	Progress
In Fills/ Re run	24:00	/	121:15	9.53%
General Mob	00:00	/	109:19	8.59%
Equipment Cal	00:00	/	88:48	6.98%
Transit to/from Site	00:00	/	36:00	2.83%
Port Call	00:00	/	24:00	1.89%
W/S in Port	00:00	/	112:00	8.81%
W/S at Sea	00:00	/	317:43	24.98%
Weather - Mob	00:00	/	160:30	12.62%
Ops - Equipment Dep/Rec	00:00	/	52:38	4.14%
Transit between locations	00:00	/	01:55	0.15%
Data Acquisition	00:00	/	107:11	8.43%
Line Turn	00:00	/	99:05	7.79%
Ops - Extended Line Turn	00:00	/	24:02	1.89%
Downtime - Survey	00:00	/	17:34	1.38%
Total	24:00	/	1272:00	

Production Summary

Product	DR/ LS	Estimated	Produced	To Date	Unit	Progress
Mobilisation Vessel 1	LS	1.00	0.00	1.00	N°	100.00%
Survey Lines N-S	LS	590.40	0.00	590.40	km	100.00%
Surveying Additional line KM (MBES/2DUHRS)	DR	0.00	0.00	0.00	km	0.00%
Extra port call upon Client request	LS	0.00	0.00	0.00	N°	0.00%

Personnel Status

	Yesterday	Arrived	Departed	On Project
Project crew	10	0	0	10
Client representative	1	0	0	1
Marine crew	13	0	0	13

Personnel Status

	Yesterday	Arrived	Departed	On Project
Total	24	0	0	24

Weather and Sea State Status

Weather and Sea State	Unit	06:00	12:00	18:00	24:00	Comments
Wind Direction	Coords	NE	NE	NE	NNE	
Wind Speed	Beaufort	5	3	4	4	
Sig Wave Height	m	2.0	1.3	1.0	1.4	

Weather Forecast

A high W of Scotland extends a ridge ESE-SE across the North Sea. Meanwhile, a shallow low over S Norway/Skagerrak deepens a trough WSW/SW across the German Bight and the E North Sea.

Liquids Status

Item	Amount at start	Added today	Used Today	Amount at End	Used to Date	Unit
Fuel	154.10	0.00	1.60	152.50	77.80	m^3
Water	103.00	0.00	5.00	98.00	245.00	m^3
Lube oil	1,440.00	0.00	0.00	1,440.00	400.00	L

Other Comments

Planned work for the next 24 hours

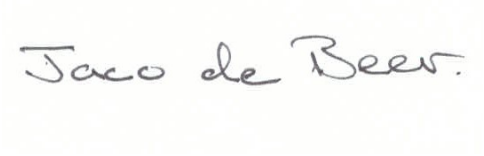
Pioneer will complete the survey, recover the seismic equipment and steam to IJmuiden to demobilise the project.

Client Representative Comments

Party Chief Comments

Infill Status:
- Total infill identified: 270km
- Infill surveyed: 267km
- Infill pending: 3km

Fugro Representative



Jaco de Beer
Fugro Pioneer Party Chief
04/06/2023

Client Representative

Terry Wiseman
RVO Client Representative
04/06/2023

Appendix D

Fugro Pioneer Vessel Specifications

FUGRO
M.V. FUGRO PIONEER

M.V. Fugro Pioneer has been built to the highest standards demanded of a modern internationally operating multi-purpose survey vessel.

The diesel electric propulsion, specially designed hull, resilient engine mounts and rudder propellers maximize station keeping and navigational control while ensuring acoustically quiet running at survey speeds.

Designed with consideration for safety and environment, Fugro Pioneer is a compact flexible platform supporting a wide range of offshore services with a typical operational profile of geophysical, geotechnical survey operations up to 1000m WD.

It's limited 3m draft adds to its capabilities to operate in shallow water nearshore. The vessel can easily be configured to support light ROV and environmental operations. The 53 metre-long vessel is prepared for dynamic positioning and equipped with state-of-the-art survey equipment.

State of the Art Kongsberg Dual Head Dual Ping Multibeam in retractable moonpool system.

Limited draft makes it specifically suitable for survey nearshore.

M.V. FUGRO PIONEER

Technical specifications

General info

Name	Fugro Pioneer
Classification society	DNVGL
Flag state / Port	Bahamas Maritime Authority / Nassau
Build(er)	September 2014 – Damen Shipyards Galati
IMO / Cal sign	9701645 / C6BH3
Official Number	7000674

Dimensions

LOA.	53.7m
Beam	12.5m
Draught (summer) max.	3.1m + 0.26m blister
Tonnage	1322T
Deck area aft	250m^2
Deck strength	5T / m^2
Deck load	81,6T

Accommodation

Cabins	30+4 Bunks / 10x Single cabins, 10x Double cabins
Crew (Typical)	11x Marine Crew, 20x Survey Crew
Recreational	1x Dayroom, 1x Gym
Work Offices	2x Survey, 1x Meeting room

Machinery

Propulsion	2x Azimuth thrusters (electric)
Bow thrusters	1x Tunnel thrusters (electric)
Cruising speed	10 kn
Survey speed	Variable as required
Maximum speed	11.2 kn

Electrical power

Diesel generator sets	4x 372kW
UPS supply survey	1x 30VA, 220vac

Capacities

Fuel capacity	305 m^3
Fuel consumption (FOC t/day)	Survey 3t / Stationary (DP) 4.2t / Transit 6t
Potable water capacity	115 m^3
Water making	6 m^3/d

Control and navigation

DP System	Imtech DP-0
Radar	Hagenuk Bridgemaster FT CAT1/2 S-band and X-band
Electronic chart	Imtech ECDIS (Single)
DGPS	1x Koden KGPGZO / 2x Fugro Starpack
Magnetic compass	Sperry Jupiter

Deck Machinery

Deck crane aft	Palfinger PK65002 MD
Storage crane forward	Palfinger PK15000 MC
Hydraulics Ring Main system	300bar / 200ltr.
A-frame aft (geophysical)	2x 3/6T SWL
A-frame side (geotechnical)	1x 9T SWL
CTD winch/davit	1x 300 kg / 1000m (environmental sampling)
Tugger winch aft deck	4x 3T SWL
Moonpool	Rectangular 1630x883mm (free space)

Communications

GMDSS	Motorola - 3x VHF Handheld
Vsat	2x Seatel 5009 Ku-band
Iridium	Iridium Openport (Fall back)
UHF / VHF Radios (Operational coms)	Motorola - 2x VHF Handheld / 3x UHF Mobile / 9x UHF Portable
CCTV Camera system	Orlaco
TVRO	Intellian t40W

Safety

MOB boat	RIB
Life rafts	6 x 20 persons
Survival suits & Life jackets	44 pcs
Lifeline Pulley System	Yes
Personal Locator Beacons (PLB)	SeaMarshall

Survey equipment

DGPS Positioning	Fugro Starfix Starpacks
Navigation package	Fugro Starfix Suite
Acoustic positioning	Kongsberg HiPap 501 incl Cymbal
Motion Reference Unit	Hydrins + Octans
Echosounder	Simrad EA400
Draft monitoring	2x Rosemount Pressure Sensors
Multibeam Echosounder	Kongsberg Maritime EM 2040 (Dual head/ Dual ping)
Side Scan Sonar	Edgetech 4200 (100/600)
Sub Bottom Profiler	Hullmount Array/ Fugro Glog, Boomer, Sparker
Magnetometer	Geometrics G-882
Geophysical tow winch	2x EMCE (3.5Te/ 4000m/ Rochester)
Geotechnical hoisting winch	1x EMCE (9Te/ 1500m/ 19mm)
Seismic Compressor	Wärtsilä Water Systems Ltd Hamworthy 185E MK2
2D-Seismic gear	as required
Geotechnical sampling	as required
Environmental sampling	as required

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2264 SG, Leidschendam
The Netherlands
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Appendix E

Hazard Observation Cards

Table E.1: Hazard Observation Card Register

HOC Number	HOC Type	HOC Date	HOC Summary

Appendix F

QC Logs

Appendix G

Milestone Completion

Acceptance Certificate

Appendix H

Seismic Processing Report

3D UUHR Multi-channel Seismic Processing Report – Phase 4

Geophysical Survey at the IJmuiden Ver Wind Farm Sites V and VI (IJ56) | Dutch Sector, The Netherlands

F192961_REP_015 | 02 | 7 July 2023
Final

Rijksdienst voor Ondernemend Nederland

Netherlands Enterprise Agency

Document Control

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Client Information

Client	Rijksdienst voor Ondernemend Nederland
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Client Document No.	N/A

Revision History

Issue	Date	Status	Comments on Content	Prepared By	Checked By	Approved By
V1	15 June 2023	Draft Issued		PB	PC	
V2	07 July 2023	Final		PC	PB	

Project Team

Initials	Name	Role
AD	Alexia Darbo	Client Deliverables Coordinator
PB	Patrick Burn	Operations Supervisor - Seismic Processing Marine Site Characterisation
PC	Patrick Chilton	Seismic Processing Project Manager

Contents

Figures

Tables

Abbreviations

2D UUHR	Two-Dimensional Ultra Ultra High Resolution
3D UUHR	Three-Dimensional Ultra Ultra High Resolution
CDP	Common Depth-point
CMP	Common Mid-Point
LNA	Linear Noise Attenuation
LAT	Lowest Astronomical Tide
NMO	Normal Move Out
PoSTM	Post-Stack Time Migration
QC	Quality Control
SRME	Surface Related Multiple Elimination
SWNA	Surface Wave Noise Attenuation
TVF	Time Variant Filter
TFDN	Time Frequency De-Noise
UTM	Universal Transverse Mercator
TWT	Two-way time
BSB	Below seabed

1. Introduction

Rijksdienst voor Ondernemend Nederland (RVO) contracted Fugro to perform a geophysical investigation of the IJmuiden Ver Wind Farm Sites V and VI (IJ56). IJ56 is located within the IJmuiden Ver Wind Farm Zone (IJVWFZ). The site is in the Dutch Sector of the North Sea, approximately 80 km off the west coast of the Netherlands. Site characterisation of IJmuiden sites V and VI is required to prepare for offshore wind development. The aim of the geophysical soil investigation is to contribute to the bathymetrical, morphological, and geological understanding of IJ56.

The location of the IJmuiden Ver WFZ site is shown in Figure 1.1

This report details seismic processing steps carried out on the Phase 4 3D UUHR dataset.

Figure 1.1: IJmuiden Ver Wind Farm Sites V and VI (IJ56)

1.1 Scope of Work

The 3D UUHR data is required for the high potential area for the location of offshore wind turbines at the perimeter of the installable areas. The 3D UUHR data should enable the detection, interpretation and mapping of all significant subsurface horizons including formation interfaces, buried channel features and other relevant indicators of geohazards in high detail.

Work package 3 (3DUHRS) commenced early 2022 but was suspended in September 2023 after acquisition of 1245 line km. 255 3D UHRS line km are still required. Work package 3 – Phase 4 commenced April 2023 and should finalize the geophysical stage of the project.

The objective of this project is to complete the Phase 4 3D UHRS section of the work package by completing a series of north-south survey lines over a series of tunnel valleys in the north, as presented by the red box in Figure 1.2. The migrated data should provide useful information to a target depth of ~60 m below seabed. The data are to be processed on a 1 x 1 m bin grid and final stacked volumes are to be produced in SEG-Y (rev 1) format.

Fugro received raw data from the vessel and processing began in June 2023, using inhouse processing software Uniseis.

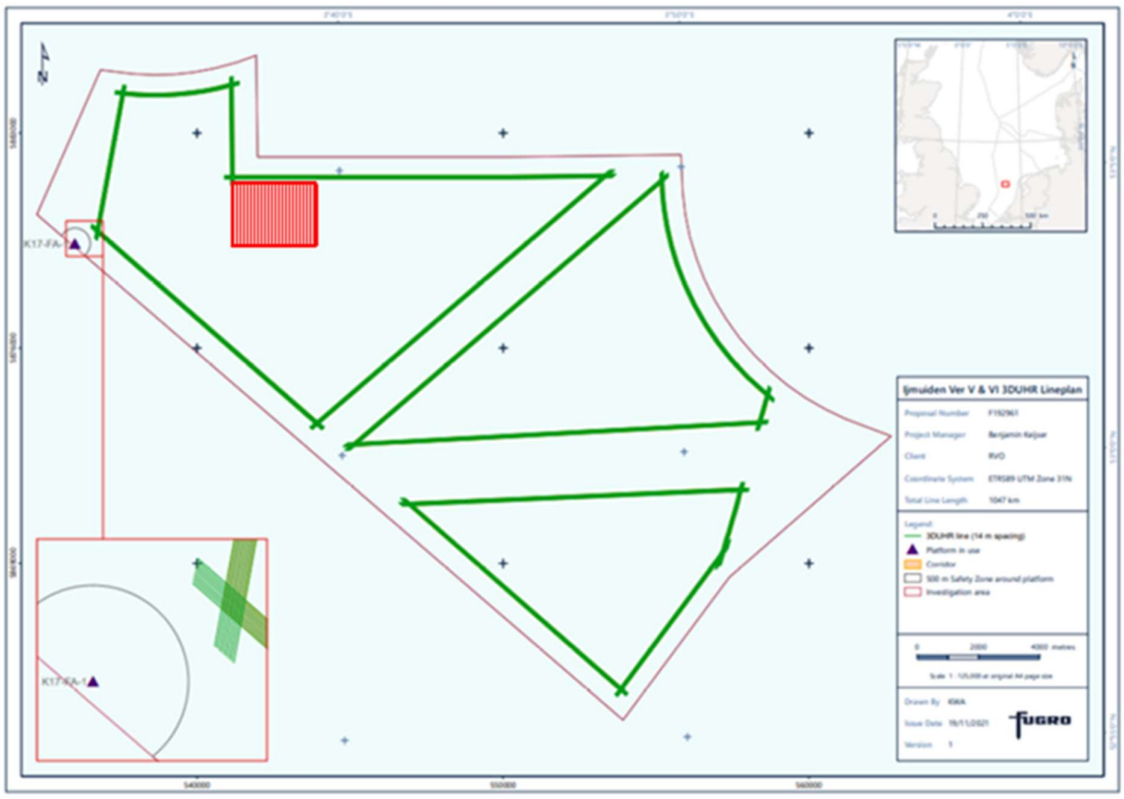

Figure 1.3: 3D UUHR seismic line plan. Fourteen 3D sections (shown in green) are approximately 110 m wide. The red square represents the Phase 4 acquisition.

1.2 Acquisition Configuration

A 2 source 4 streamer 3D UUHR system was deployed (see Table 1.1 & Figure 1.4), comprising 4 hybrid-group streamers. Two Multi-Level Stacked Sparker (MLSS) sources were deployed centrally, approximately 10 m inline from each streamer (channel 1). RTK pods were mounted on 4 head buoys and 4 tail buoys. RTK positioning was also present on each source.

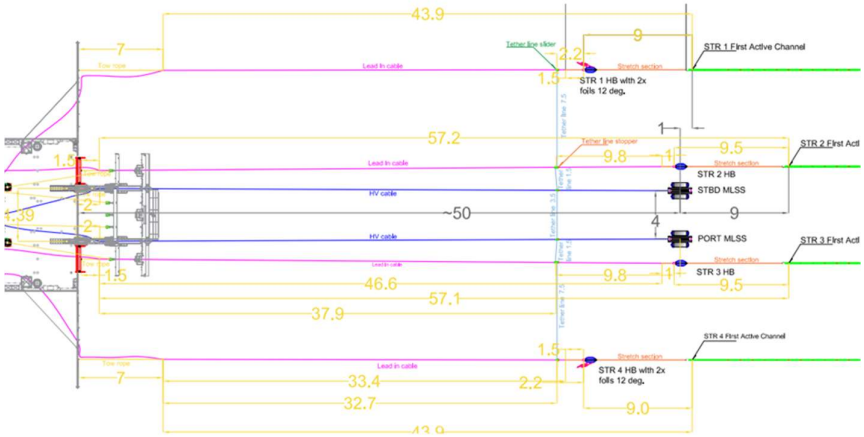

Figure 1.4: 3D configuration schematic

Table 1.1: 3D UUHR acquisition parameters

Streamer	
Active length	4 x 48 m
Number seismic groups	4 x 32 [total 128]
Group spacing	1 m [Chan. 1 – 16], 2m [17 – 32]
Group length	Single hydrophone
Streamer spacing	8 m
Streamer depth	1.4 m
Sources	2 x MLSS 900J
Source spacing	4 m
Shot point interval	0.5 m [flip-flop]
Source depth	0.72m, 0.90 m and 1.12 m [3 x tip arrays]
Streamer type	GeoEel LH-16
Recording system	CNT-2
Sample interval	0.125 ms
Record length	154.875 ms
Format	SEG-D 8058 rev 1

2. 3D UUHR Processing Flow

2.1 3D UUHR Processing Summary

The agreed processing flow was applied to all the lines as follows:

- Read and reformat SEG-D to internal format
- Assign cable number based on channel range
- Low-cut filter [20Hz / 18 dB/Oct]
- Spherical divergence [T^2]
- Source & receiver navigation merge and assign 2D & 3D geometry
- Pick zero offset seabed – assign hyperbolic seabed time per channel
- Shot domain swell noise attenuation
- Channel domain swell noise attenuation
- Channel regularisation [interpolate down to 1 m group interval]
- Linear noise attenuation
- Designature [source deghost & debubble]
- 2D SRME
- Diffracted multiple attenuation
- Receiver deghosting
- Tidal static correction
- 3D statics
- Velocity analysis [500 m picking grid]
- 3D Fourier interpolation and regularisation
- Re-grid to processing grid [1 x 1 m]
- Sort to 3D CMP domain
- NMO using picked velocity
- Outer trace final mute
- Stack using 1/N trace normalisation [24-fold]
- Post stack Kirchhoff time migration [80 m half-aperture]
- Footprint removal [kxky filter]
- Zero phase conversion using data derived wavelet [positive seabed]
- Time variant gain [100 dB/s]
- Source and receiver datum correction
- Cosmetic seabed mute
- Output to SEG-Y [trimmed to exclude low fold edges]

2.2 Reformatting and Navigation Merge

For each sequence, raw field data in SEG-D format were reformatted to Uniseis internal processing format; this process includes decoding relevant trace headers stored in the SEG-D General and External header (e.g., shotpoint number, navigation time and source number). The GeoEel recording system has no start of data delay, so the trace data kept the original acquired 154.875 ms record length at a sample rate of 0.125 ms. A de-bias low-cut filter of 20 Hz / 18 dB/Octave was applied to the data removing low frequency noise and instrument DC

bias prior to processing. A spherical divergence correction (time squared) was applied to the data to aid in QC and further processing.

A QC of the data was conducted on the vessel so that any missing shots, bad channels, and noisy records that may have an adverse effect on data quality could be identified.

Upon receipt of a P1/90, source and receiver positions were merged with the seismic data providing CMP positions and direct offsets. 2D and 3D geometry were assigned giving each trace a CMP number and 3D inline and crossline numbers, as per the bin grid.

Raw, navigation-merged, SEG-Y shot gathers were output onboard without spherical divergence applied nor a low-cut filter.

Finally, near trace gathers were used to interactively pick a zero offset water bottom time for use in later processing.

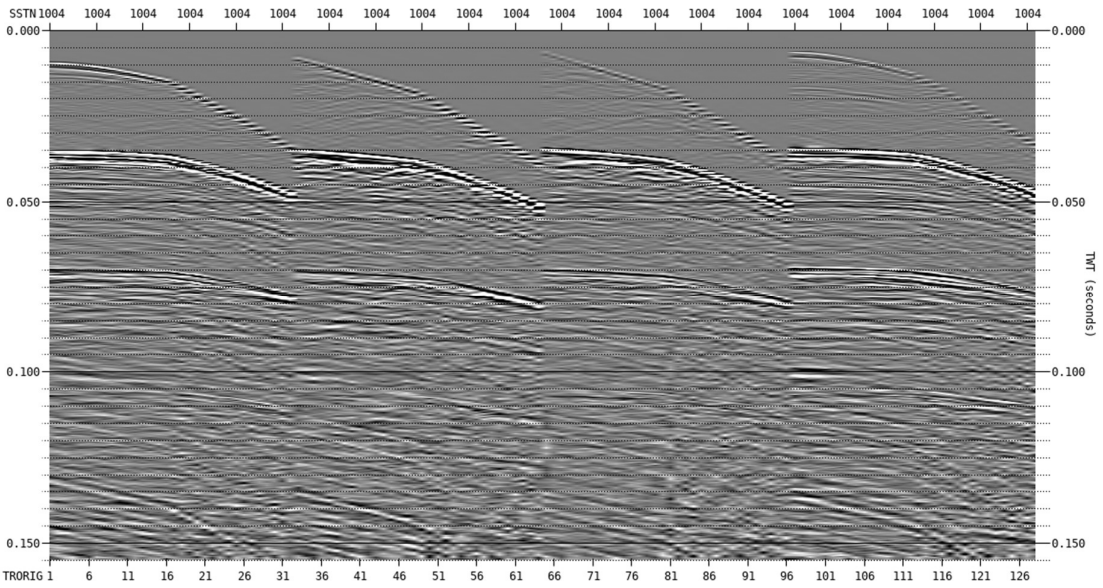

Figure 2.1: Raw shot gathers showing streamers 1 to 4, left to right

2.3 Swell Noise Attenuation

Swell noise was effectively attenuated using Uniseis SWELL, SWNA and TFDN tools. These tools were firstly applied to the data in the shot domain, followed by a further pass in the channel domain.

TFDN (time-frequency de-noise) and SWELL algorithms make use of the fact that, unlike an impulsive source such as a shot, the amplitude of swell noise will not decay with time since it is being continuously generated during recording. The processes decompose trace data into signal and noise components, down weighting, or attenuating noise to leave a clean trace.

In the shot domain, TFDN was applied up to 200 Hz, using a 25 ms sliding window and a spatial analysis window of 11 traces. SWELL was applied up to 75 Hz. Dip attenuation (SWNA) was then applied to attenuate any non-physical dips up to 100Hz below 1000 m/s apparent velocity.

The same processes were applied again in the channel domain, except the spatial window for TFDN was increased to include 101 traces and frequency up to 250 Hz were targeted. Higher values than 250 Hz was tested, but these did not show any improvement in swell noise attenuation, as it is predominantly a lot lower frequency than this.

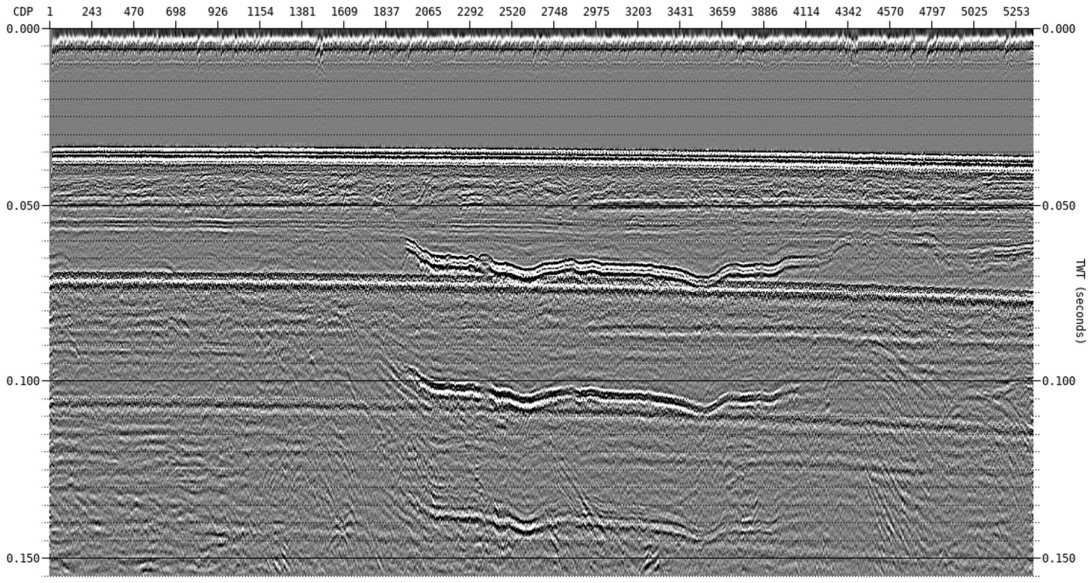

Figure 2.2: Source 2, streamer 1. Brute 2D stack

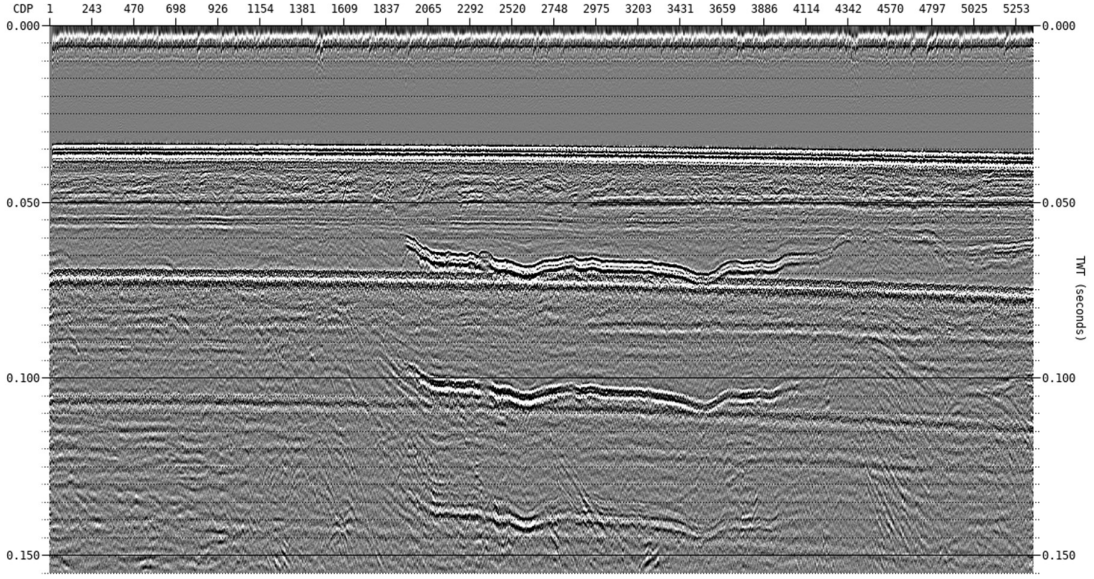

Figure 2.3: Source 2, streamer 1. Common channel denoise 2D stack

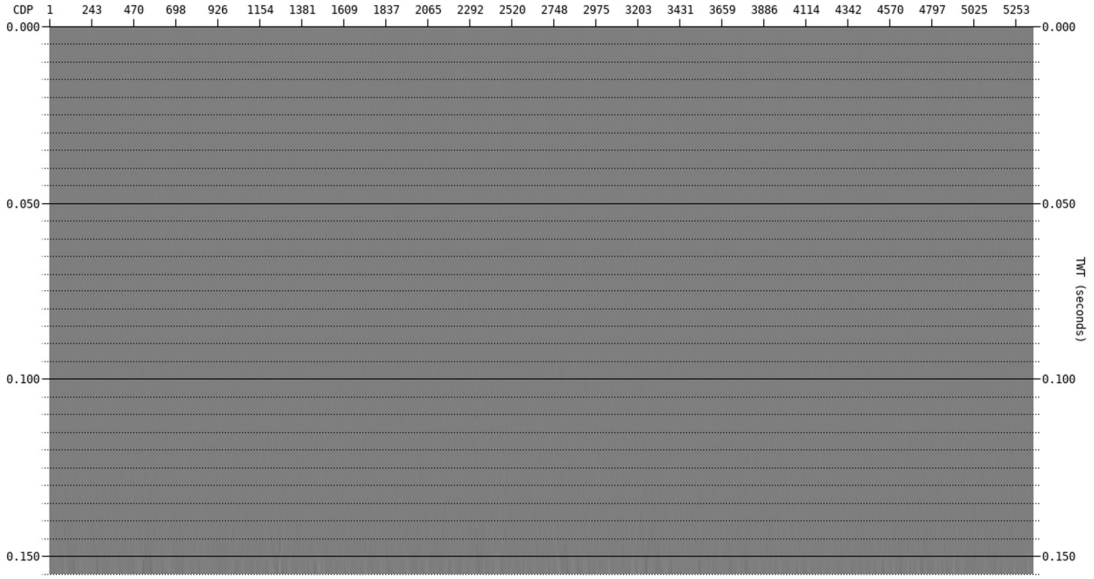

Figure 2.4: Difference stack showing attenuated noise

2.4 Channel Interpolation and Linear Noise Attenuation

Channels 17-32 have a 2 m native group interval. Shot gathers were regularised to 1 m group interval using an FX based interpolation tool with a wrap-around NMO. This regularises the CMP fold and aids transform based processes such as Tau-P.

Low amplitude, linear noise was observed on most lines in this survey. Linear noise filtering was applied in the Tau-P domain to effectively attenuate this noise. Data in the Tau-P domain with dip less than -20 ms and greater than +40 ms at maximum offset were muted from the

full Tau-P transform. Values of ±65 ms transform range began to show hints of primary removal, and ±25 ms was less effective at linear noise attenuation.

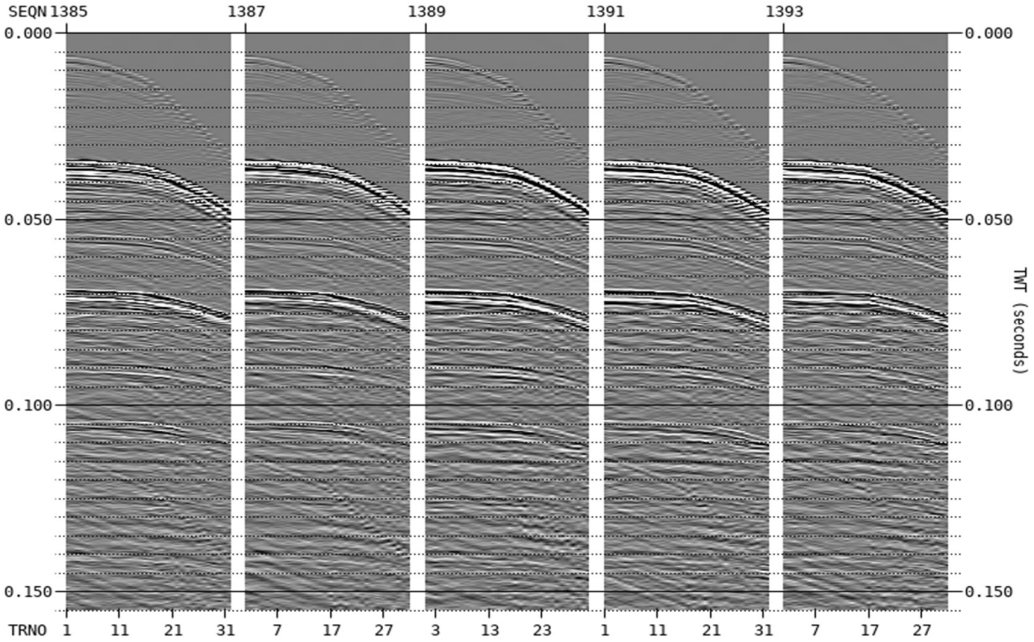

Figure 2.5: Source 1, streamer 1. Pre-interpolation shot gathers

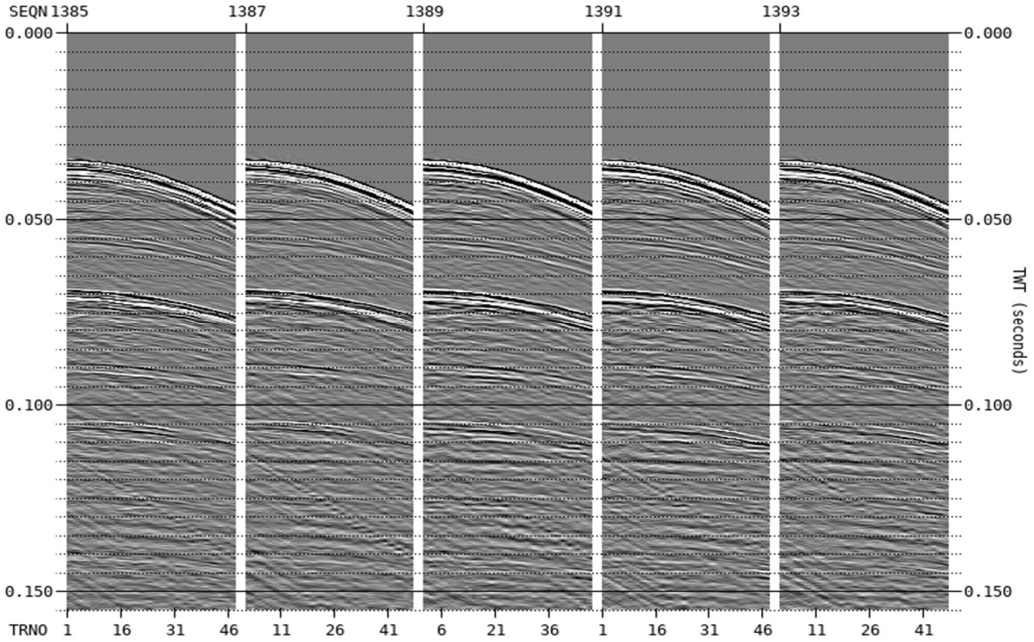

Figure 2.6: Source 1, streamer 1. Post-interpolation

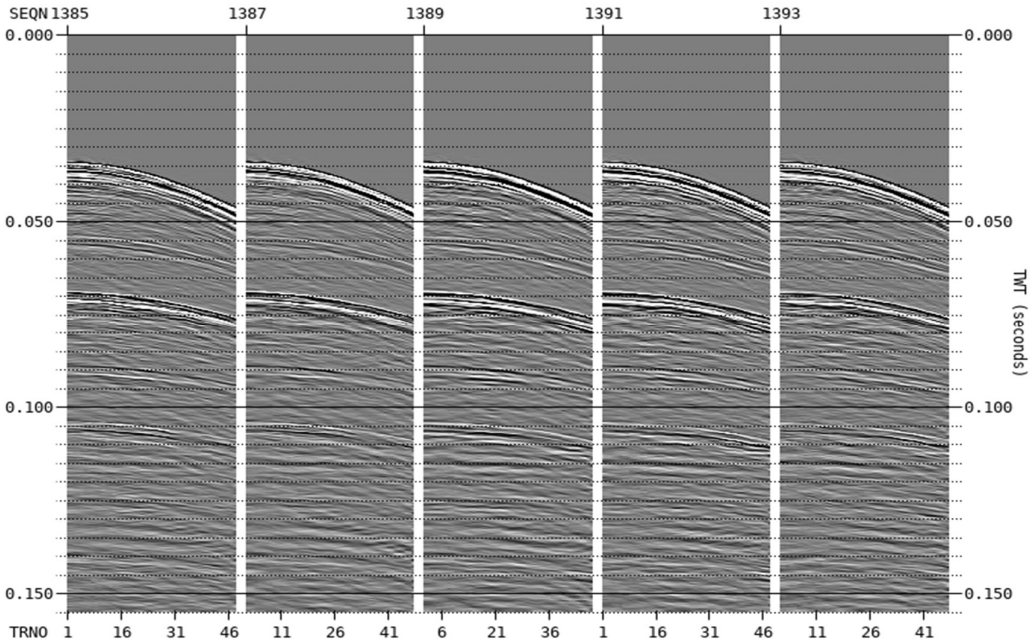

Figure 2.7: Source 1, streamer 1. Post linear noise attenuation

2.5 Source Deghosting and Debubble

The high acoustic impedance contrast between the water column and the sea surface causes the latter to act as a near perfect reflector of acoustic energy. Consequently, some of the acoustic energy from a seismic source reflects at this interface before being recorded at the receivers and this is referred to as (source/receiver) ghost, thereby limiting the wavefield spectral band.

To attenuate source, receiver, and combined source / receiver ghosts, the Uniseis DEGHOST module was applied. DEGHOST attempts to separate the primary energy from the ghost wavefield. The primary upcoming wavefield should be more representative of subsurface reflectivity required for interpretation & well-log matching. Reflections should become shorter, less complex wavelets and be more representative of their characteristic reflectivity in magnitude and polarity. The consequence of this is that we improve the resolution and achieve a broader spectrum. Various tests showed the standard reflection coefficient of -1 for the source and receiver deghosting worked well to attenuate the ghost. A 0 m wave height was used to remove the frequency dependent scattering and instead an iterative search window of 80 – 10% for the source ghost (0.2 m seed depth) was applied.

The bubble energy was collapsed in common channel using a deconvolution averaged over each subsurface line. The deconvolution operator was 15 ms (total length) with a 1 ms gap.

At this step, only source ghost and bubble energy were attenuated. Receiver ghost energy is often more complex, and attenuation was tested at this stage, but ringing was observed around the multiple. This is a common phenomenon with UUHR deghosting due to high sensitivity to receiver depth as well as the variation in reflection angles of the primary and

multiple a different sea surface ghost reflection point will be encountered. Therefore, demultiple was applied first followed by receiver deghosting.

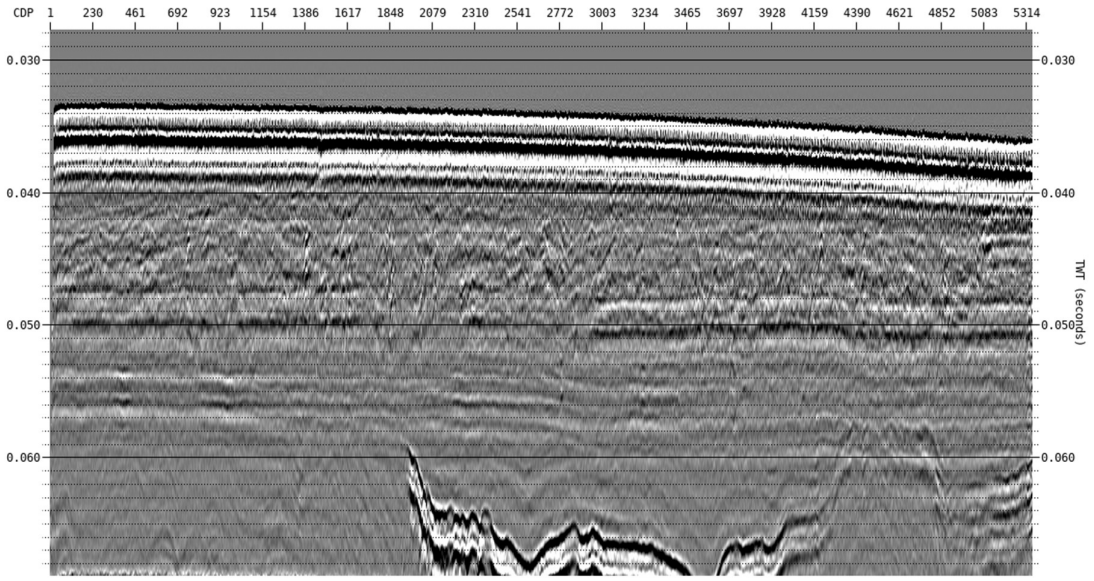

Figure 2.8: Source 1, streamer1. Pre-designature 2D stack (zoom 25 – 70 ms TWT)

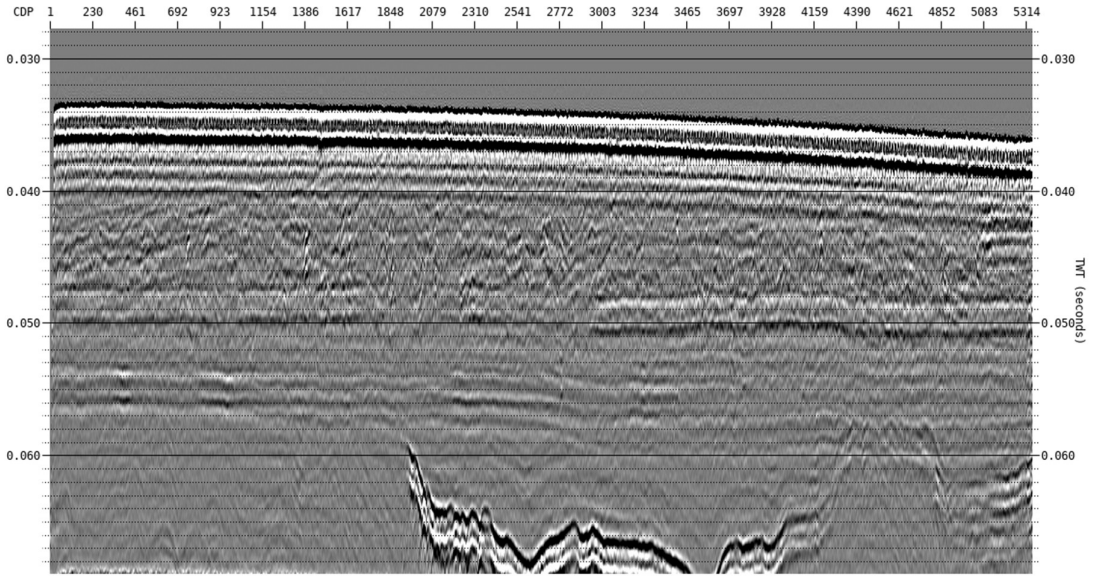

Figure 2.9: Source 1, streamer 1. Post source Deghost and Debubble

2.6 Surface Related Multiple Elimination (2D SRME)

SRME uses the geometry of shot recording to estimate possible multiples that can be generated by the surface. One order of surface related multiples is predicted using auto-convolutions of input data. A test of 2D vs 3D SRME was conducted on the previous blocks

processed and it was seen that 2D was giving an improved result, on the Phase 4 processing it was decided to mirror the processing on previous blocks in the area for consistence.

The predicted multiple model is then adaptively subtracted from the input shots. This is done during two passes of adaptive matching, the first pass in the common offset domain, and the second pass on shot gathers. Seabed times were picked automatically prior to running this process to aid with the model adaption. SRME was found to be effective at attenuating much of the low frequency, higher amplitude multiple energy whilst preserving all primary events.

However, residual diffracted (high frequency) multiple remained and is tackled in the next step.

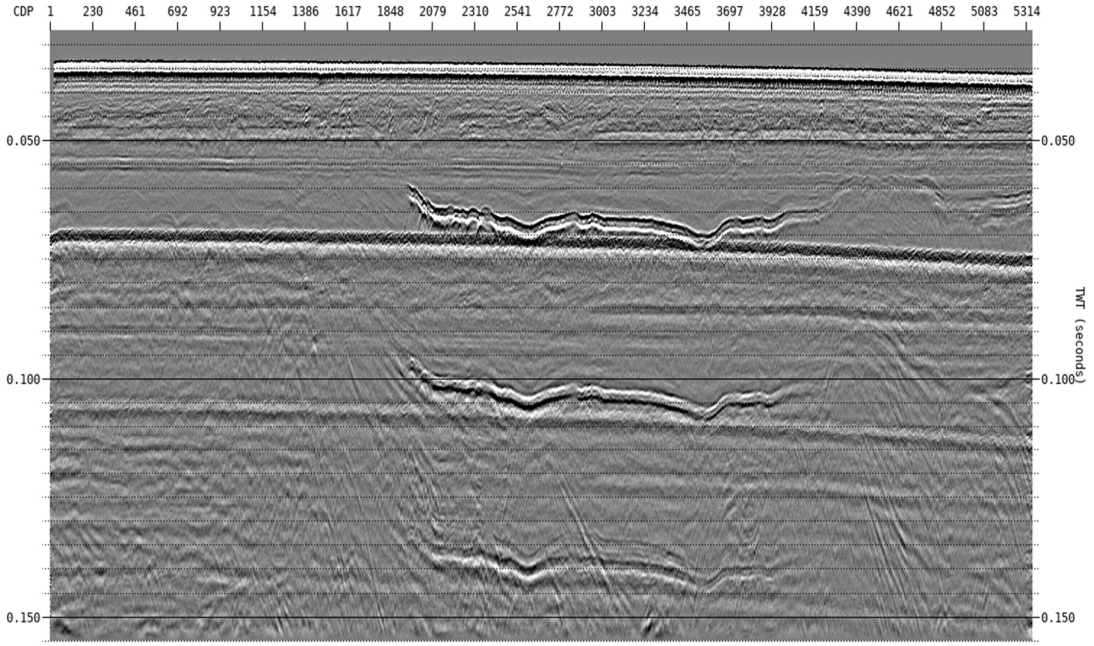

Figure 2.10: Source 1, streamer 1. Pre-2D SRME 2D stack

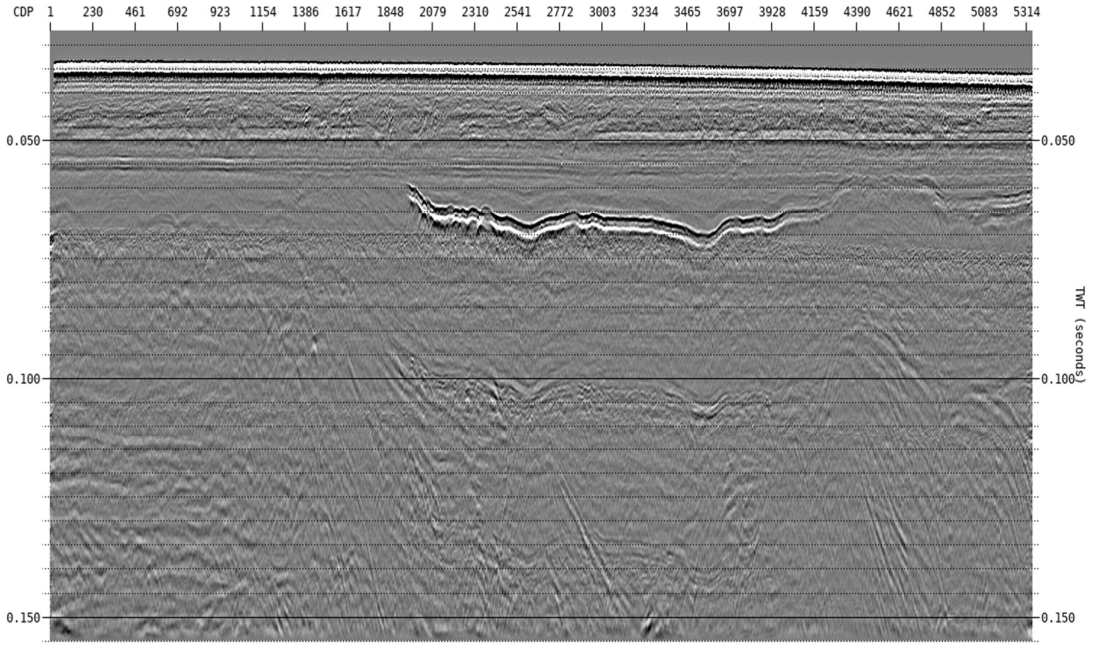

Figure 2.11: Source 1, streamer 1. 2D SRME stack. Note the residual diffracted multiple on the first bounce

2.7 Diffracted Demultiple

There was significant diffracted multiple energy within the data, mainly associated with the water bottom. Diffracted multiple energy was attenuated with a combination of Uniseis tools WAVDN (Wavelet denoise) and MEMUL (Moveout Equation Multiple Elimination).

The first step was the application of WAVDN, which uses a variation on the Discrete Wavelet transform to attenuate coherent noise. WAVDN was useful at attenuating high frequency noise generated by the multiple, and thus cleaned the data prior to the application of MEMUL.

MEMUL uses moveout equations to generate a multiple model. The model is derived by extrapolating observed shot records through an additional round trip to the sea floor, equaling the multiple period. The water bottom time was picked from the nearest channel on each gun streamer combination. MEMUL adaptive matching in the channel domain was computed over 551 adjacent traces, with a filter length of 6 ms and a window length of 6 ms. The model generated by MEMUL was then adaptively subtracted from the input data, using a multi-channel matching filter that incorporated summed auto and cross correlations and a wiener filter to achieve a safe and effective multiple removal. The filter had a filter length of 0.75 ms and a window length of 100 ms

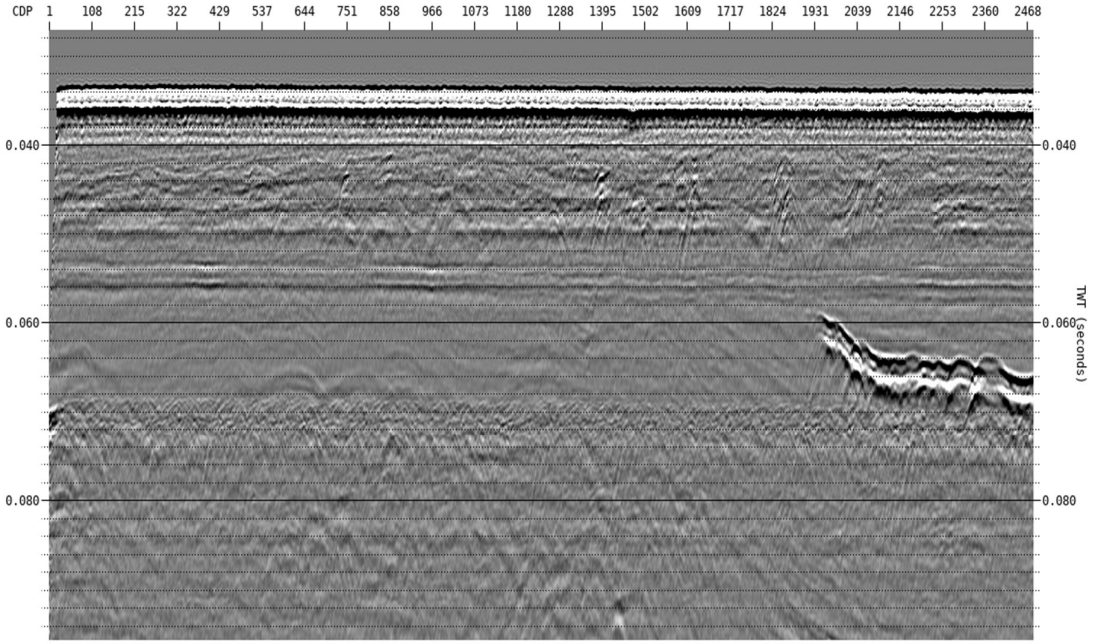

Figure 2.12: Source 1, streamer1. Pre-demultiple 2D stack (zoom window 35 – 100 ms TWT)

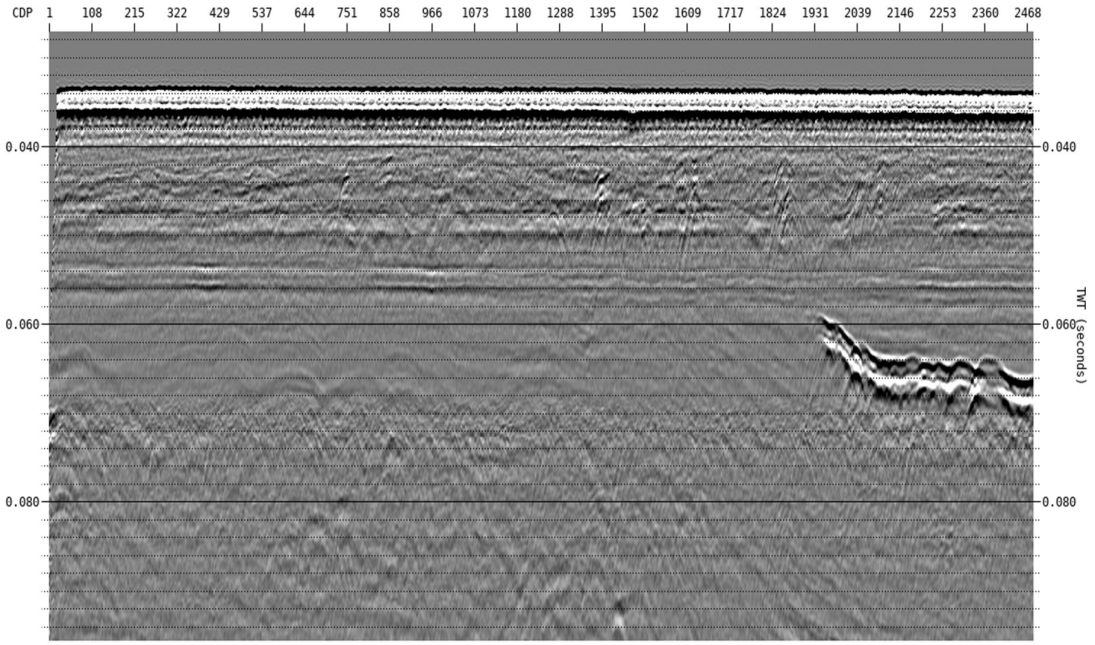

Figure 2.13: Source 1, streamer 1. Post demultiple (including diffracted multiple attenuation)

2.8 Receiver Deghosting

Like Section 2.5, the Uniseis module DEGHOST was used to attenuate receiver ghost energy on a trace-by-trace basis. DEGHOST iteratively inverts for apparent receiver depth on every channel and populates a trace header to be used in the final step which is the application of deghosting based on that depth. This refinement is crucial to reduce ringing and is the reason 2D inversion methods are not currently used

Again a wave height allowance of 0 m was used to disable the frequency dependent scattering and an iterative (40 – 10 %) search window for the receiver ghost (1.4 m seed depth) was applied.

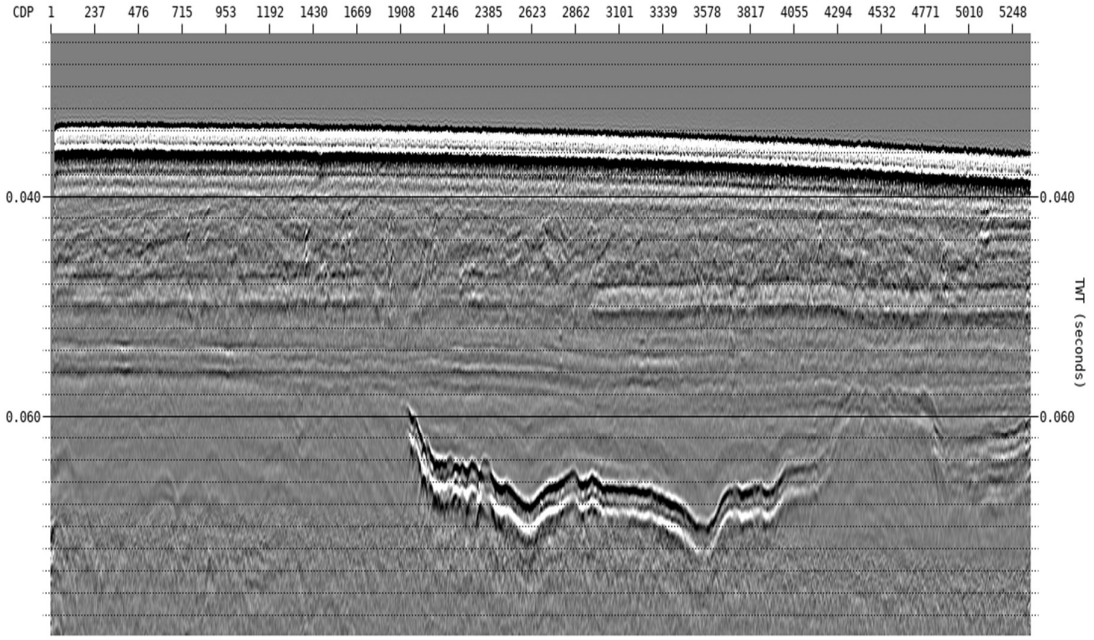

Figure 2.14: Source 1, streamer 1. Pre-deghost 2D stack (zoom window 35 – 80 ms TWT)

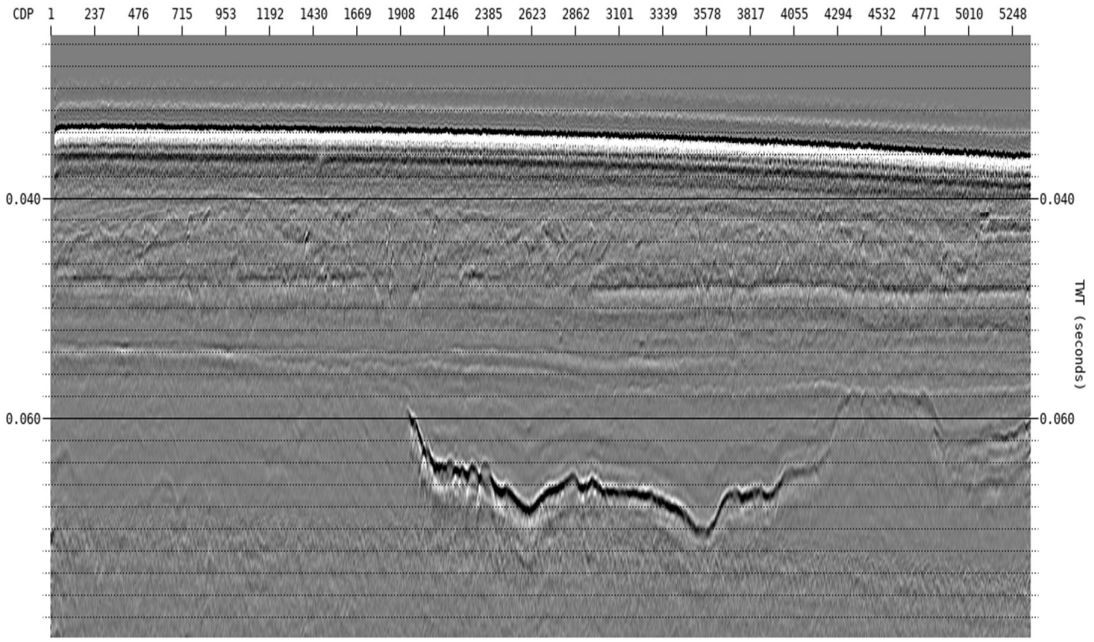

Figure 2.15: Source 1, streamer 1. Receiver Deghosted stack

2.9 3D Source Statics

In the marine environment, deployed equipment elevation changes and depth variations, relate to tow speed, current and wave action. This means that the depth and elevation of sensors below the water surface is not necessarily constant, as we would prefer, and these variations induce timing errors which compromise imaging quality.

Uniseis tool NEPTUNE attempts to resolve observed residual statics into their separate components and allow correction of those known to be caused by different physical characteristics of the seismic experiment. The simplest to consider is the source static component. All traces recorded when a particular shot fires are influenced by the position of the shot in space and time at the instant that it fires, and for the duration that is recorded. So, the shot station number (or X position along the line) relates the spatial position, and the instantaneous elevation, and depth of the source below the water level datum, governs the time component. Variations from the average tow depth and elevation are computed as static (timing) errors.

The source depth and elevation variation are perceived and measured as a source static, common to all traces within a particular shot. NEPTUNE averages their profiles over the whole line to minimize the corrections it computes.

Short period (receiver) residual statics would normally be refined after application of NEPTUNE source statics, using the CDP trim statics module PASTA before final stack. But not before velocity analysis as this may distort the estimate of NMO

2.10 Velocity analysis

A high-resolution velocity analysis using 2nd order NMO correction was conducted using the interactive velocity analysis software PEGASUS. The analysis was performed on sub-surface line at 500 m intervals; with each location being compared to and constrained by neighboring locations. The example images below show the displays generated by PEGASUS for the purposes of velocity analysis. This image shows; multi velocity stacks, dynamic gather, semblance, real time stack (Figure 2.16).

The RMS velocity field is converted to interval velocity via the DIX equation and interpolated to match every bin location on the final stack volumes.

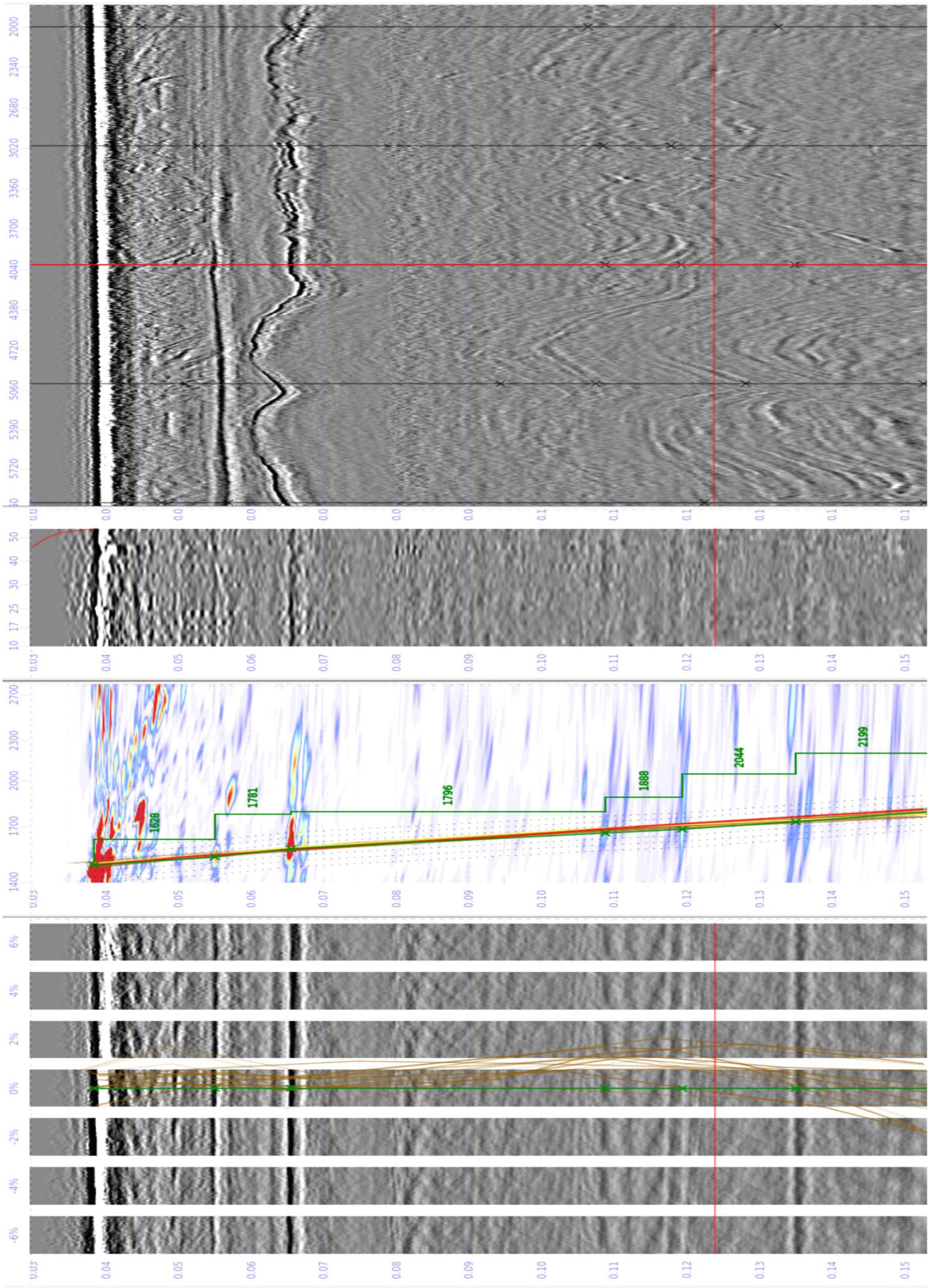

Figure 2.16: Example velocity location in PEGASUS software. Multi-velocity stacks, dynamic gathers, semblance, and real-time stack (left to right)

2.11 Tides

Observed tides are calculated from GNSS elevation measurements. The source of the elevation data is typically from a GNSS antenna and referenced to the WGS84 ellipsoid. This data shall first be reduced to the waterline, using offsets and motion data. Secondly, the waterline elevations relative to the WGS84 ellipsoid have to be reduced to the required vertical datum, e.g. MSL, LAT, etc. Observed tides were applied to the data removing the tidal effect between adjacent sail lines.

2.12 3D Trim statics

Like Section 2.9, on the source statics, and to compensate for timing variations, residual statics are recomputed in a 3D domain, using PASTA (trim statics) then applied to NMO corrected 3D CDPs. This is achieved in a similar manner, by cross correlating traces in adjacent 3D CDPs with a pilot trace which is a weighted trace mix of the cube

2.13 3D Interpolation and Regularisation

Data were split into offset volumes based on channel number (as the offset was relatively regular across all streamers). Data were also binned onto a final migration grid of 1 x 1 m (from the native 2 x 0.5 m). Offset volumes, with NMO applied, were then regularised (interpolating traces to bin centre) and empty bins were populated using nearby good traces.

The Uniseis tool FRECON was used on each of the 24 offset volumes. The module works in 3D, selectively transforming data using an anti-leakage Fourier transform. This allows the module to effectively interpolate dipping reflectors while transform method inherently prioritises signal over noise.

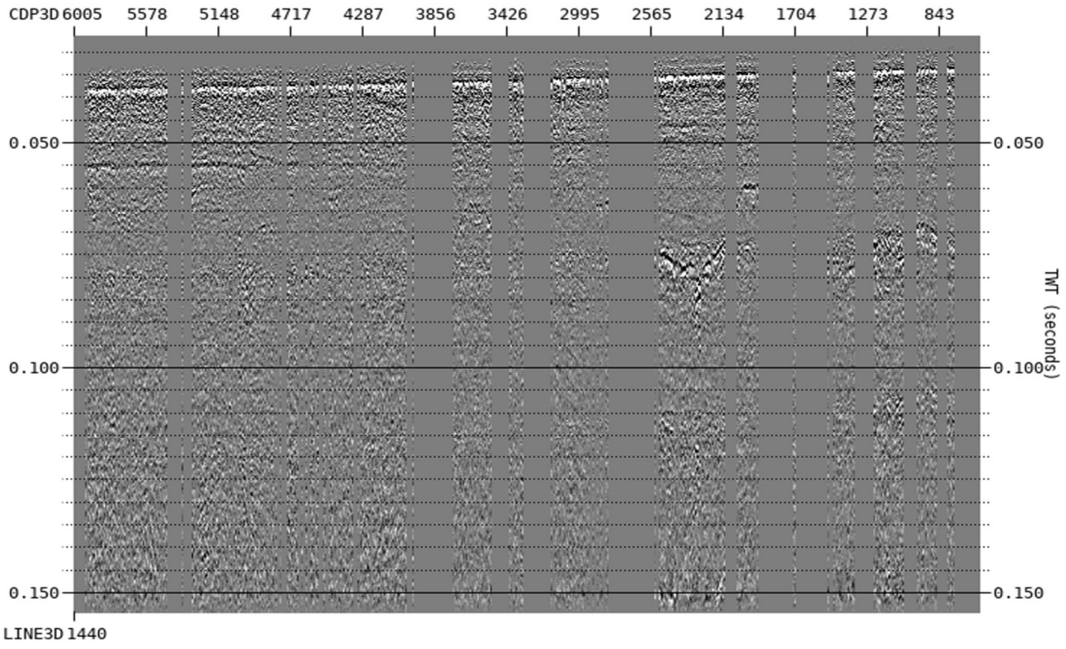

Figure 2.17: Phase 4. Offset volume 2 before interpolation and regularisation

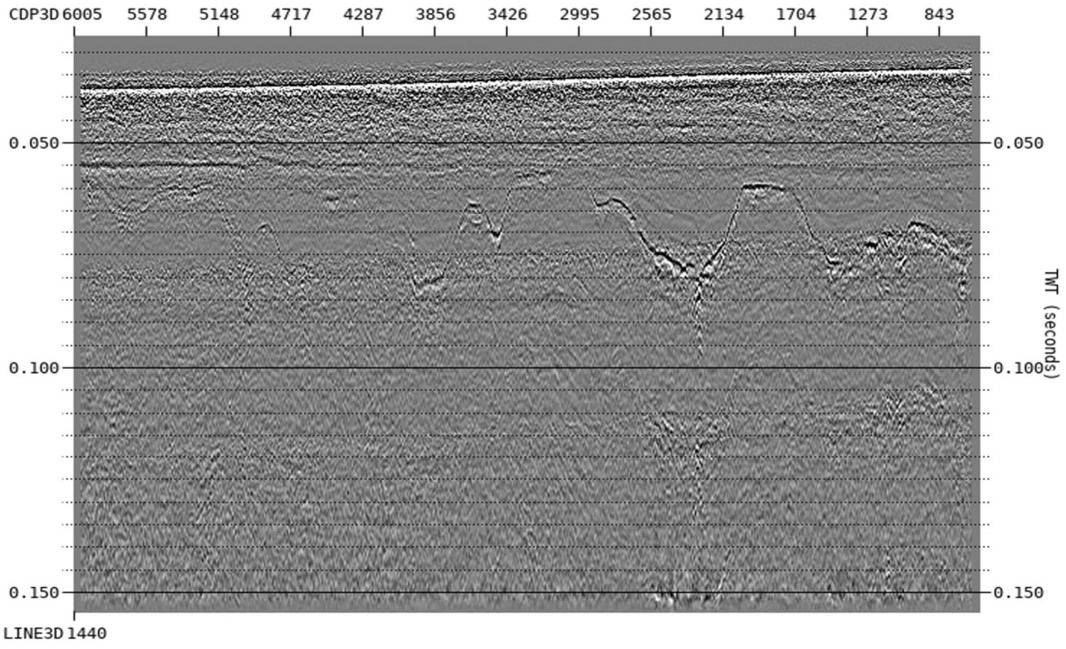

Figure 2.18: Phase 4. Offset volume 2 after FRECON

2.14 Final Mute and Stack

The data were then ready to be stacked. An outer trace mute was applied to remove NMO stretch on far offsets. A more open mute would introduce stretch in the shallow regions, a consequence of the shallow water conditions. Trace normalization of 1/N was used when stacking. See below for an example of the gathers with the final mute overlaid.

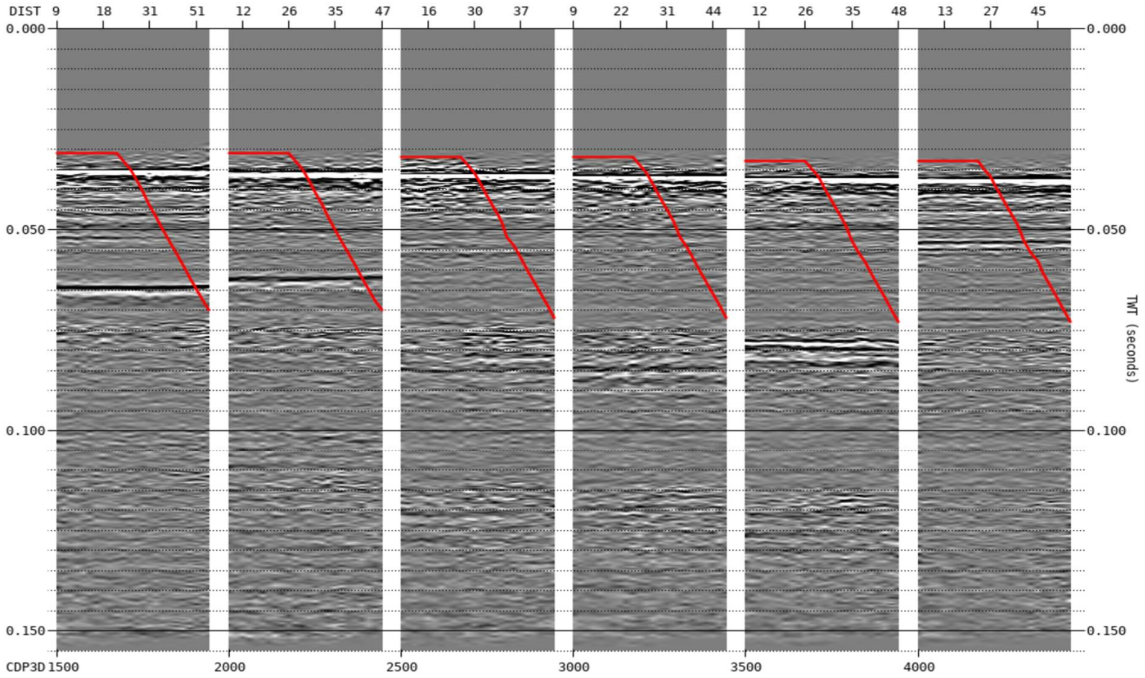

Figure 2.19: Mute overlaid (red) on 3D CDP gathers

Table 2.1: 3D UUHR final mute parameters. Mute times are interpolated between the seabed time range

Seabed time (ms)	Mute time (ms)	Offset [m]
10	8	9
	8	22
	12	26
	25	41
	45	55
100	98	9
	98	22
	102	26
	125	41
	145	55

2.15 Pre-migration Post Stack Residual Statics

Prior to the migration the bathymetry survey from the area was used to resolve any long wavelength residual statics present on the stack to reduce migration swing and improve the imaging, this was applicable due to the minimal seafloor topography in the area. The static is the difference between a water bottom pick on the seismic data and bathymetry converted to time. The residual static was heavily smoothed in X and Y direction to ensure only a long wavelength static was extracted and limited in the time shifts applied to the data.

2.16 Post Stack Kirchhoff Migration (PoSTM)

3D Post-Stack Kirchhoff Time Migration was performed using the picked velocities. A migration aperture of radius 80 m was used with a 60% stretch mute to minimise dipping artefacts. Anti-aliasing was applied by pre-filtering the data within the migration scan depending upon the local migration operator dip. Anti-aliasing protection prevents any undesirable data being included.

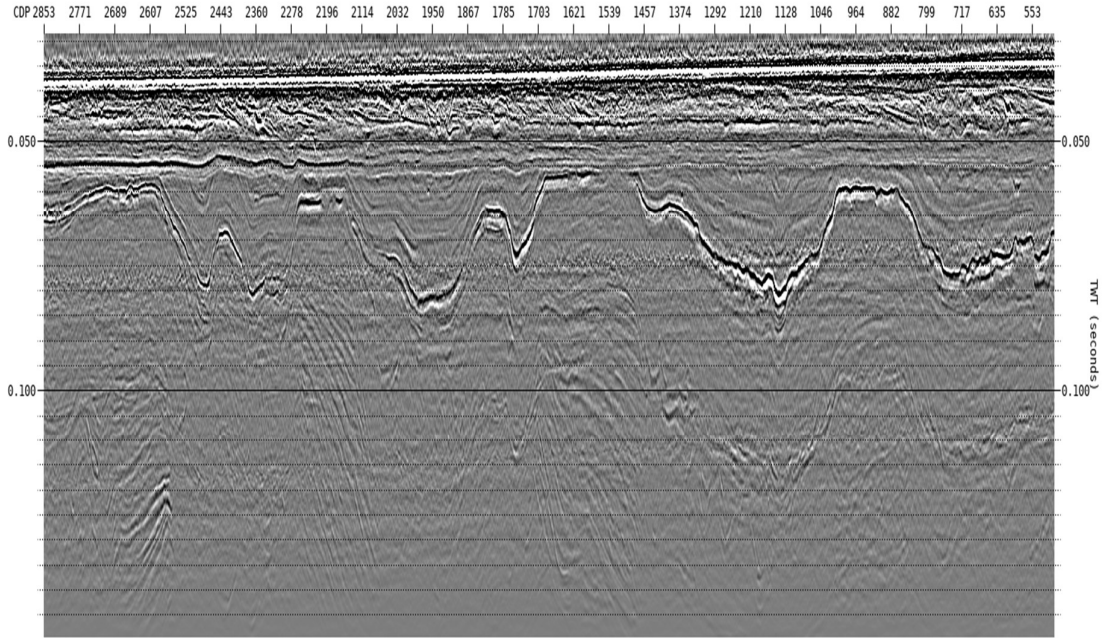

Figure 2.20: 3D inline 1440. 3D migrated IL stack

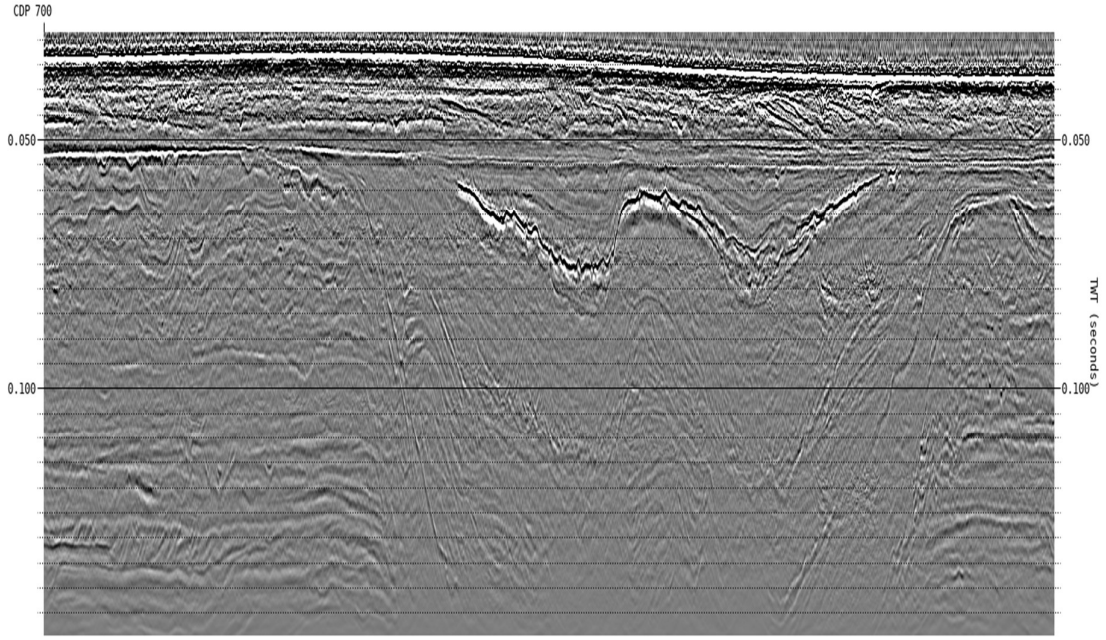

Figure 2.21: 3D xline 700. 3D migrated XL stack

2.17 Acquisition Footprint Filtering

Spatially periodic noise can be viewed on timeslices as regular amplitude modulations or striping. In marine seismic data this is usually related to the streamer/gun configuration where it is commonly known as an acquisition footprint. Stripes in the spatial domain appear as discrete spots of energy in the Kx-Ky domain. Filtering was performed on one transformed time-slice at a time with an example of a timeslice below.

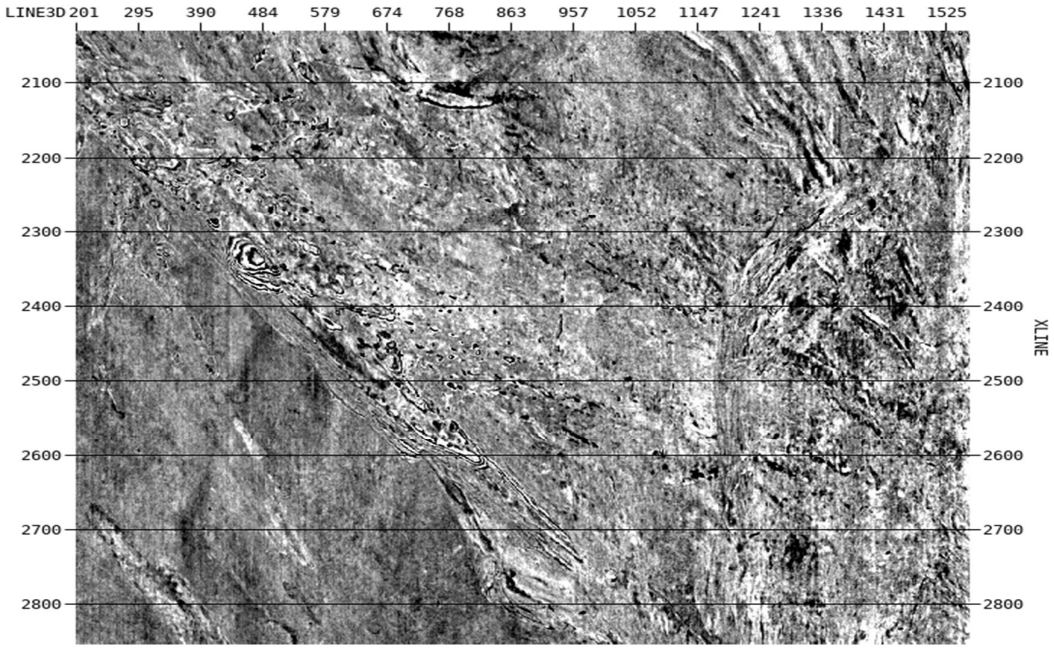

Figure 2.22: Pre-KxKy timeslices (timeslice at 43 ms TWT)

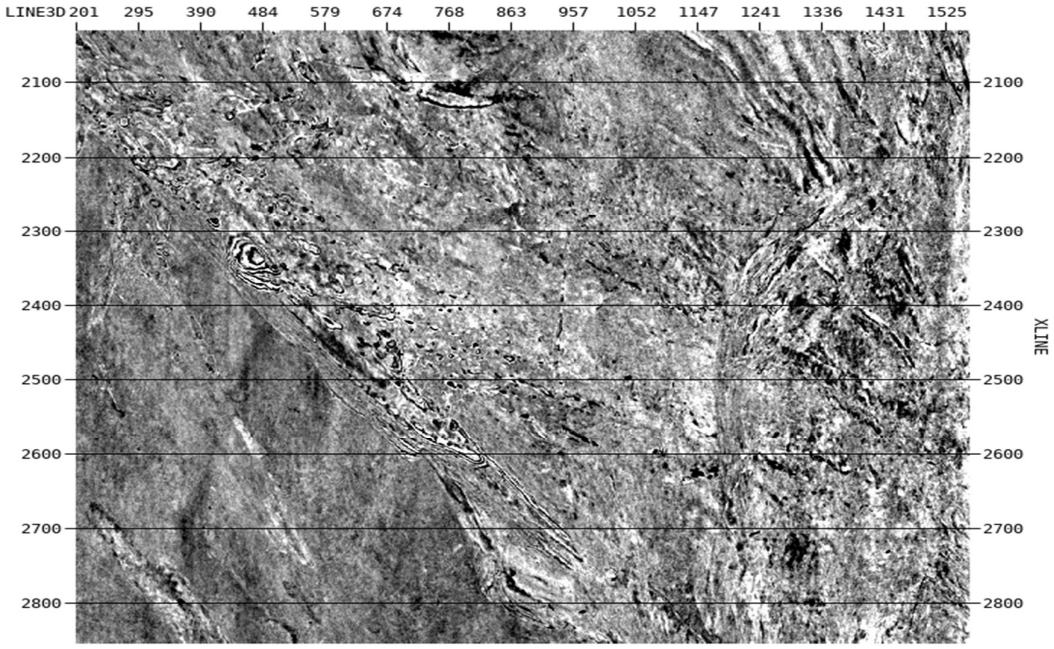

Figure 2.23: KxKy timeslices (footprint attenuation)

2.18 Zero Phase

A zero-phase filter was designed using an extracted wavelet. This was created by flattening the seabed and stacking all the data. The onset of the super stacked wavelet was then shifted to 0 ms and the zero-phase filter calculated. See below for an example of the zero-phase filter applied to the stack.

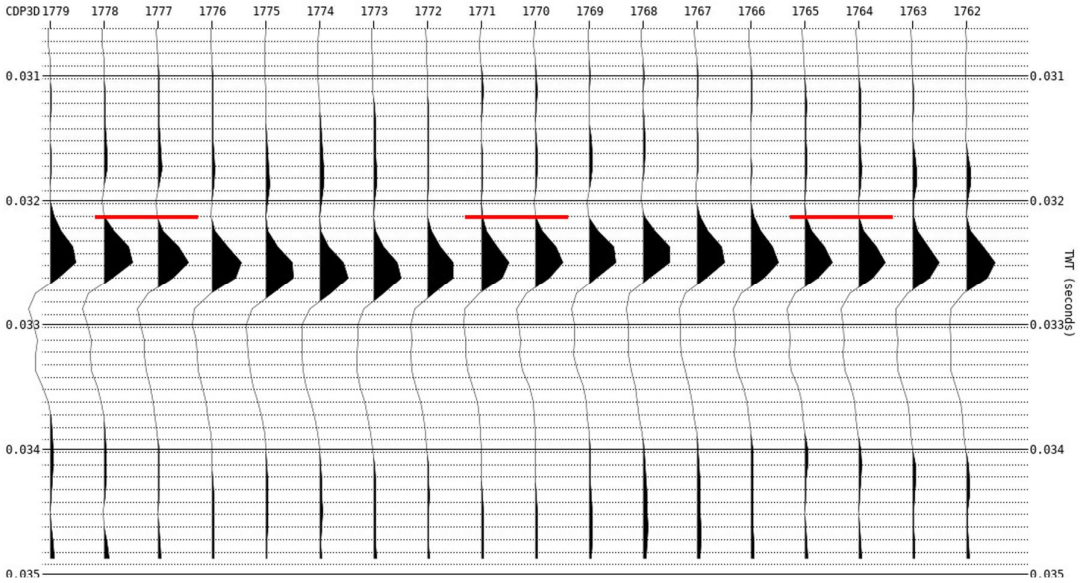

Figure 2.24: Example seabed wavelet before zero-phase

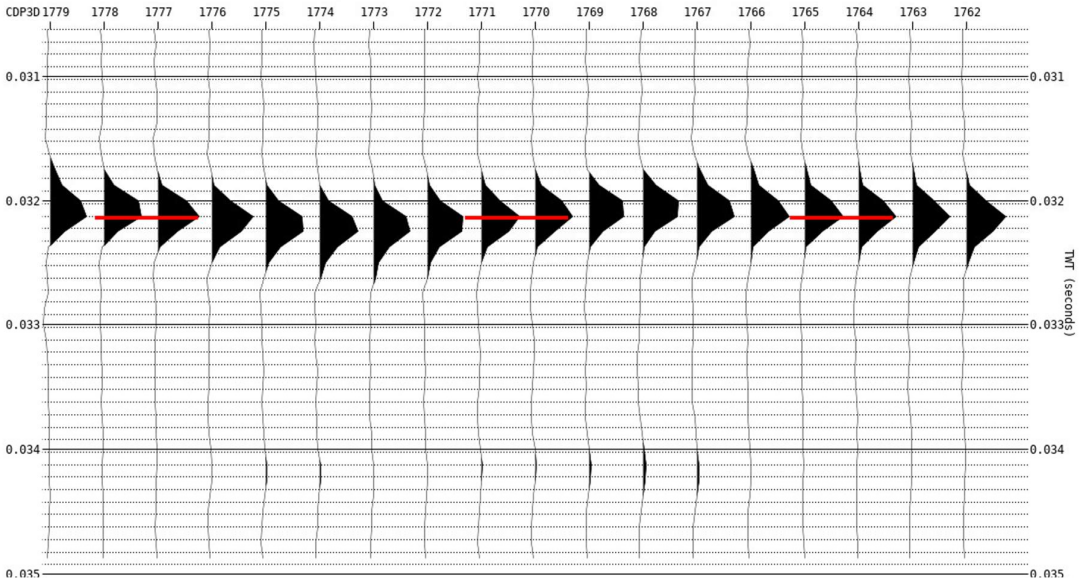

Figure 2.25: Example wavelet after zero-phase

2.19 Post Stack Processing

A gain (100 dB per second) was applied to the data to balance the amplitude of the final volume.

Source and receiver depth static corrections (total +1.6 ms, nominal source depth = 1 m, nominal cable depth = 1.4 m) were also applied, reducing the data to sea surface datum.

Lastly a cosmetic seabed mute was applied to remove noise above the seabed.

Amplitude-only Q (Q = 100) was applied for one set of deliverables.

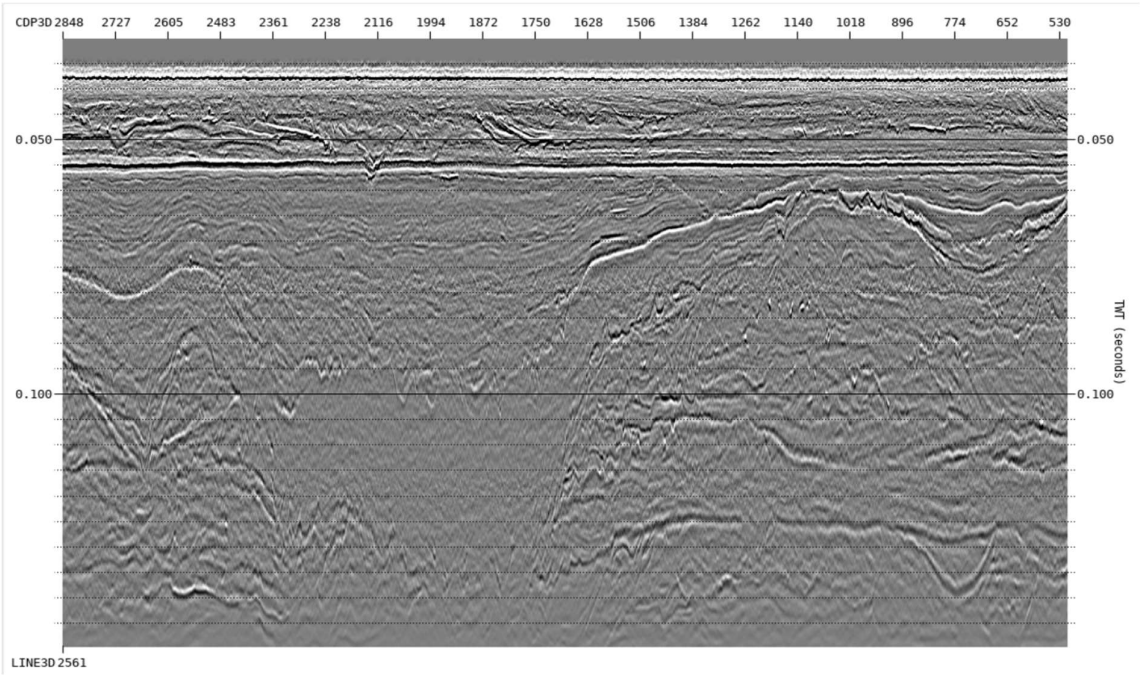

Figure 2.26: Inline 2561. Final image (including amplitude-only Q)

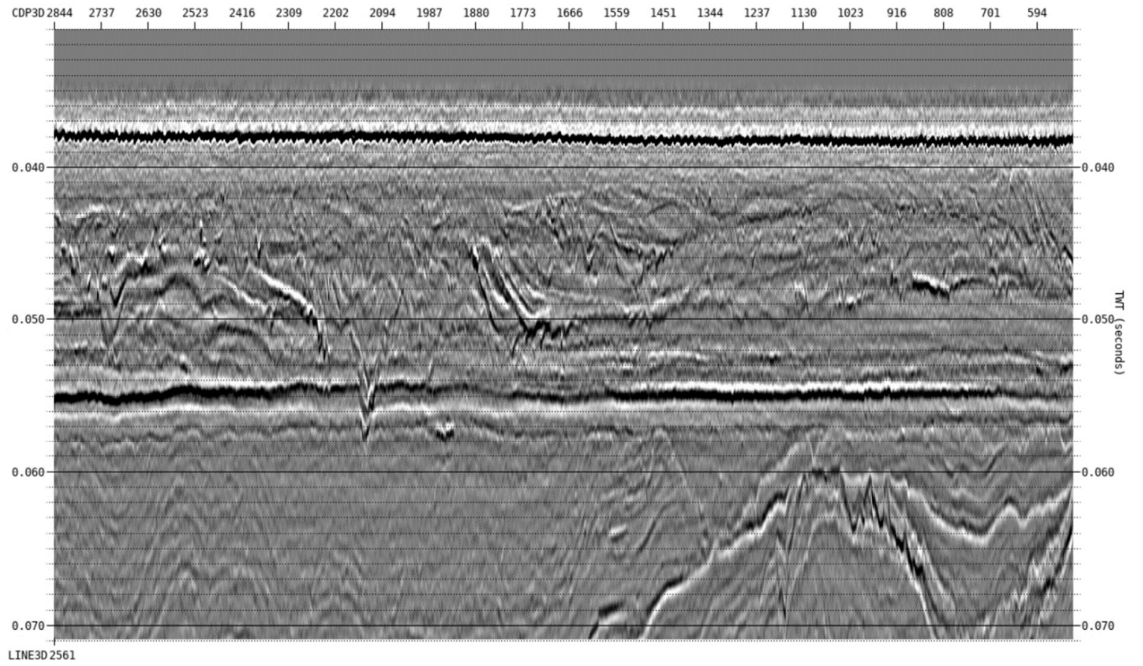

Figure 2.27: Inline 2561. Final image (zoom window 30 – 70 ms TWT)

2.20 Output to SEG-Y

The final Phase 4 3D volume was output in SEG-Y format (revision 1). The files were electronically transferred to the client via MediaShuttle. An example of the approved EBCDIC header is displayed below.

```
C01 CLIENT: RVO                          RECORDED BY: FUGRO
C02 SECTION: PHASE4                      PROJECT: PHASE4
C03 AREA: IJ56                           SITE SURVEY: WINDFARM UUHR
C04 RECORDING PARAMETERS ==========================================================
C05 VESSEL: FUGRO_PIONEER                          ACQ. DATE: APR-JUN 2023
C06 FORMAT: SEGY (REV 1)
C07 REC LENGTH: 155.875 MS               SAMPLE RATE: 0.125 MS
C08 FILTERS LOW CUT: N/A                 HIGH CUT: N/A
C09 SOURCE: 2*SPARKER                              SOURCE DEPTH: 0.5 M
C10 LEVEL: 900J                          SP INTERVAL: 0.5 M
C11 CABLE TYPE: 4*GEOEEL                 CABLE DEPTH: 1.4 M
C12 NUM CHANNELS: 128                              GRP INTERVAL: 1|2 M
C13 NAVIGATION PRIMARY: STARFIX NG
C14 PROCESSING BY: FUGRO
C15 PROCESSING SYSTEM: UNISEIS
C16 PROCESSING SEQUENCE ===================================================
C17 1)TRANSCRIPTION TO 155.875 MS AT 0.125 MS NO. CHANNELS: 32
C18 2)MERGE SRC/REC NAV 3)APPLY GEOMETRY 4)EDIT BAD TRACES
C19 5)SHOT / CHANNEL DENOISE 6)LNA 7)DESIGNATURE/DEBUBBLE
C20 8)SRC DEGHOSTING 9) DIFFRACTED MULTIPLE ATTN.10)2D SRME 11)REC DEGHOSTING
C21 12)PRELIM STATICS 13)TIDAL STATIC 14)VELOCITY PICKS (500M)
C22 15)REGRID 1M X 1M 16)NMO 17)TRIM STATICS 18)3D FOURIER REG
C23 19)SORT TO 3D CMPS 20)MUTE 21)STACK 22)FINAL STATICS
C24 23)POST STACK MIGRATION 24)FULL FOLD MASK 25)KXKY (FOOTPRING ATTENUATION)
C25 26)ZERO PHASE 27)DB GAIN 28)SRC|REC STATIC 29)OUTPUT SEGY (REV1)
C26 TRACE HEADER BYTE INFORMATION (HEADER (STARTBYTE-ENDBYTE) ==============
C27 IL   (189-192); XL   (193-196)
C28 CDPX (181-184); CDPY (185-188)
C29 PROCESSING GRID INFORMATION (IL, XL, X, Y) ================================
C30 1.000000 M INLINE SPACING INC. 1 || 1.000000 M XLINE SPACING INC. 1
C31 201,502,541294.00,5881475.62
C32 201,2853,541294.00,5879124.62
C33 3201,502,544294.00,5881475.62
C34 3201,2853,544294.00,5879124.62
C35 DATA INFORMATION ======================================================
C36 SECTION NUMBER   : PHASE 4           DATA: MIGRATED TIME CUBE
C37 ILINE RANGE      : 201-3201          DATE: JUN-2023
C38 XLINE RANGE      : 502-2853
C39 POLARITY ==============================================================
C40 INCREASE IN ACOUSTIC IMPEDANCE = POSITIVE NUMBER
```

Figure 2.28: Example EBCDIC header – error found on line C09 source depth incorrect and C21 the processing order is TIDAL STATICS followed by PRELIM STATICS not vice versa.

2.21 Processing comment

This section will comment on the vertical resolution (the ability to resolve two closely spaced interfaces) it was calculated using the Rayleigh Criterion: $\Delta h = \lambda/4$ [Δh = vertical resolution (m), λ = wavelength (m), 1600 m/s velocity was assumed] (assumptions of this method include a monochromatic seismic signal and a single velocity wavefield). Figures 2.29-32 illustrate analysis windows on the final seismic data and corresponding amplitude spectra. The windows represent depths 0-20 m bsb, 20-40 m bsb, and 40-60 m bsb. The client specification was vertical resolution of 0-40 m bsb ≤ 0.5 m, and 40-60 m ≤ 1.5 m. When signal strength (amplitude) reaches -3 dB (0 dB representing peak), the amplitude is roughly half the peak value; bandwidth within the range 0 dB to -3 dB is typically considered strong signal strength. The dominant frequency (based on peak amplitude) and the dominant bandwidth (signal amplitude down to -3 dB) were estimated from spectra shown in Figures 2.30-32 and were used to evaluate vertical resolution.

- Within the depth range 0-20 m bsb (referring to Figure 2.30), a dominant frequency of 375 Hz corresponds to a vertical resolution of 1.07 m. Additionally, the spectrum shows a relatively broad bandwidth to 687.5 Hz estimating a vertical resolution of 0.58 m. A dominant bandwidth of 190-1400 Hz predicts a resolution range of 0.29-2.11 m.
- Within the depth range 20-40 m bsb (referring to Figure 2.31), a dominant frequency of 437.5 Hz corresponds to a vertical resolution of 0.91 m. A dominant bandwidth of 250-750 Hz predicts a resolution range of 0.53-1.60 m.
- Within the depth range 40-60 m bsb (referring to Figure 2.32), a dominant frequency of 437.5 Hz corresponds to a vertical resolution of 0.91 m. A dominant bandwidth of 250-725 Hz predicts a resolution range of 0.55-1.60 m.

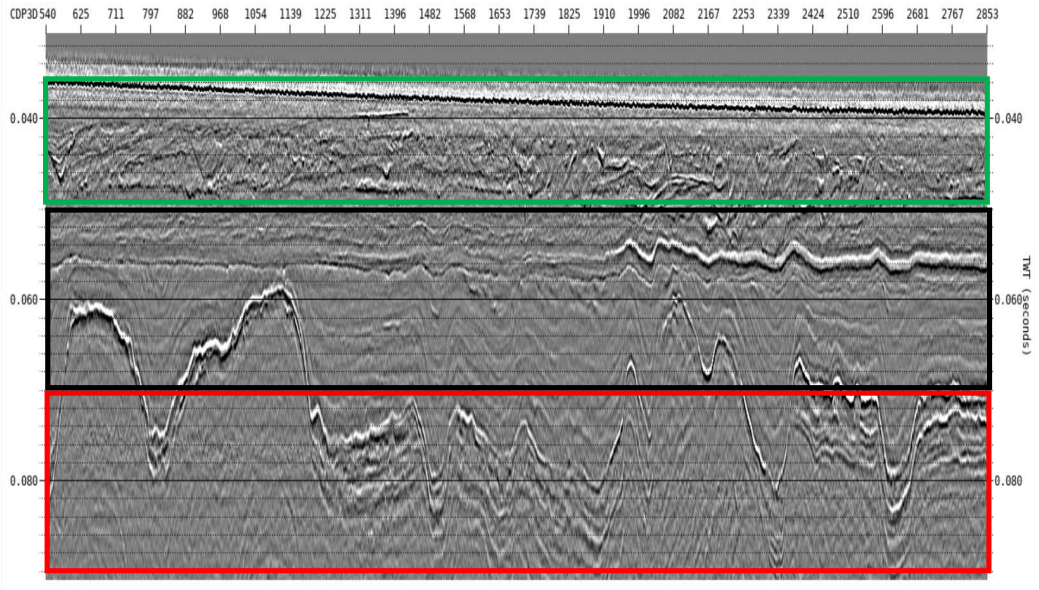

Figure 2.29 Phase 4 inline 1600 - boxes represent analysis windows for the below.

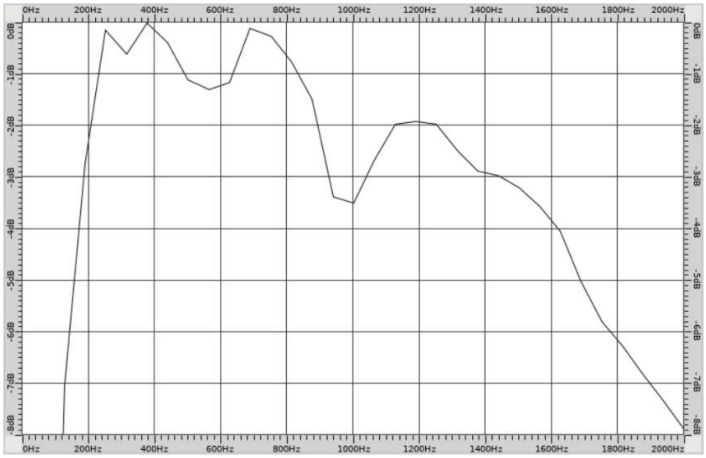

Figure 2.30 Amplitude spectra over 0-20 m bsb. Dominant frequency is 375 Hz, and the dominant bandwidth is approximately 190-1400 Hz

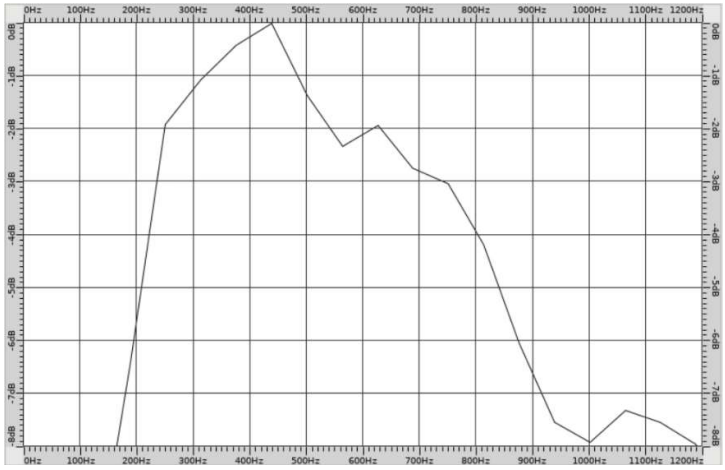

Figure 2.31 Amplitude spectra over 20-40 m bsb. Dominant frequency is 437.5 Hz, and the dominant bandwidth is approximately 250-750 Hz

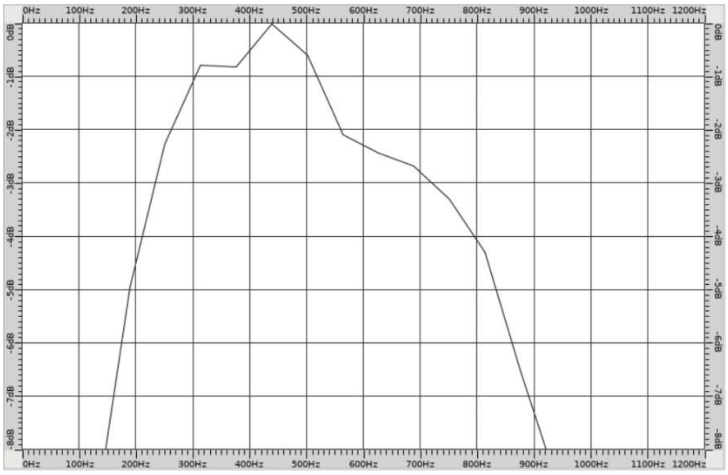

Figure 2.32 Amplitude spectra over 40-60 m bsb. Dominant frequency is 437.5 Hz, and the dominant bandwidth is approximately 250-725 Hz

Appendix A

Line Listings

A.1 3D UUHR Line Listing

The following is a line listing of processed lines, sorted in order of acquisition. The first three characters of the line name (IJ3) are the prefix. The following two characters depict the section number (e.g., IJ302… is a line in section 2). The remaining characters are the line name followed by a letter depicting the line status (P1 is primary line, P2 is part two of a primary line, R is a reshoot, and J is infill).

Table A.1: 3D UUHR line listing

Line name	First shot	Last shot
IJ3IA001P1	1002	6303
IJ3IA064P1	1001	6307
IJ3IA002P1	1004	6305
IJ3IA065P1	1005	6306
IJ3IA003P1	1003	6305
IJ3IA066P1	1001	6304
IJ3IA004P1	1002	6303
IJ3IA067P1	1102	6305
IJ3IA005P1	1002	6307
IJ3IA068P1	1035	6306
IJ3IA006P1	1004	6307
IJ3IA069P1	1003	6305
IJ3IA007P1	1002	6303
IJ3IA070P1	1004	6304
IJ3IA008P1	1003	6305
IJ3IA071P1	1004	6304
IJ3IA009P1	1002	6304
IJ3IA072P1	1003	6303
IJ3IA010P1	1002	6304
IJ3IA073P1	1001	6306
IJ3IA011P1	1002	6305
IJ3IA074P1	1004	6306
IJ3IA012P1	1003	6303
IJ3IA075P1	1002	6305
IJ3IA013P1	1003	6305
IJ3IA076P1	1004	6305
IJ3IA014P1	1004	6303
IJ3IA077P1	1004	6306
IJ3IA015P1	1004	6304
IJ3IA078P1	1003	6305
IJ3IA016P1	1005	6306
IJ3IA079P1	1004	6305
IJ3IA017P1	1003	6305
IJ3IA080P1	1004	6306
IJ3IA018P1	1001	6306
IJ3IA081P1	1002	6304

Line name	First shot	Last shot
IJ3IA082P1	1003	6305
IJ3IA020P1	1002	6304
IJ3IA083P1	1003	6303
IJ3IA021P1	1002	6303
IJ3IA022P1	1004	6305
IJ3IA023P1	1002	6303
IJ3IA086P1	1003	6304
IJ3IA087P1	1003	6304
IJ3IA025P1	1003	6304
IJ3IA088P1	1002	6306
IJ3IA026P1	1004	6305
IJ3IA089P1	1001	6305
IJ3IA027P1	1004	6306
IJ3IA090P1	1003	6304
IJ3IA028P1	1002	6305
IJ3IA091P1	1002	6303
IJ3IA029P1	1004	6306
IJ3IA092P1	1002	6305
IJ3IA030P2	1001	6306
IJ3IA093P1	1003	6304
IJ3IA031P1	1002	6305
IJ3IA094P1	1003	6304
IJ3IA032P1	1003	6303
IJ3IA095P1	1002	6306
IJ3IA033P1	1002	6304
IJ3IA096P1	1005	6305
IJ3IA034P1	1003	6304
IJ3IA097P1	1003	6305
IJ3IA035P1	1003	6304
IJ3IA098P1	1004	6304
IJ3IA036P1	1004	6303
IJ3IA099P2	1004	6306
IJ3IA100P1	1003	6304
IJ3IA038P1	1004	6306
IJ3IA039P1	1004	6303
IJ3IA040P1	1004	6304
IJ3IA041P1	1004	6303
IJ3IA042P1	1002	6303
IJ3IA043J1	1004	6303
IJ3IA024J3	1002	6303
IJ3IA037J4	1003	6304
IJ3IA045J1	1004	6304
IJ3IA046J1	1002	6304
IJ3IA047P1	1003	6305

Line name	First shot	Last shot
IJ3IA084J1	1005	6305
IJ3IA048P1	1003	6306
IJ3IA085J1	1003	6306
IJ3IA049P1	1004	6305
IJ3IA019J1	1001	6305
IJ3IA050P1	1003	6307
IJ3IA044J2	1002	6305
IJ3IA051P1	1004	6304
IJ3IA101P1	1003	6306
IJ3IA052P1	1003	6304
IJ3IA102P1	1003	6303
IJ3IA053P1	1004	6304
IJ3IA103P1	1005	6303
IJ3IA054P1	1003	6304
IJ3IA104P1	1003	6306
IJ3IA055P1	1002	6303
IJ3IA105P1	1004	6304
IJ3IA056P1	1003	6304
IJ3IA057P1	1002	6304
IJ3IA058P1	1004	6307
IJ3IA059P1	1004	6304
IJ3IA106J1	1004	6308
IJ3IA061P1	1002	6304
IJ3IA107J1	1004	6303
IJ3IA062P1	1002	6303
IJ3IA108P1	1004	6303
IJ3IA063P1	1003	6302
IJ3IA251P1	1004	6305
IJ3IA215P1	1003	6303
IJ3IA250P1	1004	6305
IJ3IA109P1	1004	5307
IJ3IA109P1	5308	6306
IJ3IA144P1	1003	6303
IJ3IA110P1	1004	6304
IJ3IA145P1	1004	6306
IJ3IA111P1	1003	6306
IJ3IA180P1	1003	6304
IJ3IA112P1	1003	6305
IJ3IA113P1	1003	6306
IJ3IA181J1	1003	6305
IJ3IA114P1	1003	6307
IJ3IA182P1	1003	6305
IJ3IA115P1	1003	6306
IJ3IA183P1	1003	6305

Line name	First shot	Last shot
IJ3IA116P1	1003	6306
IJ3IA184P1	1004	6303
IJ3IA117P1	1003	6305
IJ3IA185P1	1001	6306
IJ3IA118P1	1003	6306
IJ3IA186P1	1005	6307
IJ3IA119P1	1002	6304
IJ3IA187P1	1004	6305
IJ3IA120P1	1002	6304
IJ3IA188P1	1002	6307
IJ3IA121P1	1003	6306
IJ3IA122P1	1005	6305
IJ3IA123P1	1004	6306
IJ3IA191P1	1004	6306
IJ3IA124P1	1004	6305
IJ3IA192P1	1002	6304
IJ3IA125P1	1002	6305
IJ3IA193P1	1002	6305
IJ3IA126P1	1003	6304
IJ3IA194P1	1002	6304
IJ3IA127P1	1004	6305
IJ3IA195P1	1004	6305
IJ3IA128P1	1004	6306
IJ3IA196P1	1004	6305
IJ3IA129P1	1003	6307
IJ3IA197P1	1003	6306
IJ3IA130P1	1002	6306
IJ3IA198P1	1004	6304
IJ3IA131P1	1002	6304
IJ3IA199P1	1002	6307
IJ3IA132P1	1003	6306
IJ3IA200P1	1005	6306
IJ3IA133P1	1004	6306
IJ3IA201P1	1004	6305
IJ3IA134P1	1004	6304
IJ3IA202P1	1002	6303
IJ3IA135P1	1004	6304
IJ3IA203P1	1002	6305
IJ3IA136P1	1003	6304
IJ3IA204P1	1001	6304
IJ3IA137P1	1004	6304
IJ3IA189J1	1002	4179
IJ3IA138P1	1004	6303
IJ3IA190J1	1002	6305

Line name	First shot	Last shot
IJ3IA139P1	1002	6303
IJ3IA189J2	1003	6306
IJ3IA140P1	1002	6306
IJ3IA205P1	1005	6306
IJ3IA141P1	1042	6303
IJ3IA206P1	1004	6306
IJ3IA142P1	1002	6306
IJ3IA143P1	1004	6307
IJ3IA208P1	1001	6304
IJ3IA146P1	1004	6304
IJ3IA207J1	1003	6304
IJ3IA147P1	1002	6304
IJ3IA209P1	1001	6304
IJ3IA148P1	1002	6305
IJ3IA210P1	1004	6305
IJ3IA149P1	1003	6305
IJ3IA211P1	1005	6306
IJ3IA150P1	1003	6305
IJ3IA212P1	1004	6303
IJ3IA151P1	1002	6305
IJ3IA213P1	1003	6304
IJ3IA152P1	1002	6304
IJ3IA214P1	1004	6305
IJ3IA153P1	1003	6304
IJ3IA216P1	1003	6305
IJ3IA154P1	1002	6305
IJ3IA217P1	1003	6304
IJ3IA155P1	1002	6306
IJ3IA218P1	1003	6305
IJ3IA156P1	1002	6306
IJ3IA219P1	1004	6304
IJ3IA157P1	1003	6304
IJ3IA220P1	1002	6307
IJ3IA158P1	1004	6304
IJ3IA221P1	1003	6305
IJ3IA159P1	1003	6304
IJ3IA222P1	1004	6303
IJ3IA160P1	1005	6307
IJ3IA223P1	1003	6306
IJ3IA161P1	1002	6307
IJ3IA224P1	1003	6303
IJ3IA249P1	1004	6307
IJ3IA248P1	1004	6306
IJ3IA247P1	1004	6304

Line name	First shot	Last shot
IJ3IA245P1	1003	6304
IJ3IA244P1	1004	6306
IJ3IA162J1	1002	6305
IJ3IA225J1	1004	6305
IJ3IA163P1	1005	6305
IJ3IA226P1	1004	6303
IJ3IA164P1	1002	6304
IJ3IA227P1	1001	6304
IJ3IA165P1	1002	6305
IJ3IA228P1	1003	6305
IJ3IA166P1	1004	6305
IJ3IA246J1	1003	6303
IJ3IA167P1	1003	6303
IJ3IA243P1	1004	6307
IJ3IA242P1	1004	6305
IJ3IA178P1	1004	6303
IJ3IA177P1	1004	6306
IJ3IA240P1	1004	6306
IJ3IA176P1	1001	6304
IJ3IA239P1	1004	6303
IJ3IA175P1	1005	6306
IJ3IA238P1	1002	6304
IJ3IA174P1	1003	6304
IJ3IA237P1	1004	6305
IJ3IA173P1	1003	6305
IJ3IA236P1	1002	6306
IJ3IA172P1	1002	6305
IJ3IA235P1	1002	6303
IJ3IA171P1	1004	6305
IJ3IA234P1	1002	6306
IJ3IA170P1	1003	6303
IJ3IA233P1	1003	6304
IJ3IA169P1	1004	6303
IJ3IA232P1	1004	6304
IJ3IA145J1	1004	2099
IJ3IA144J1	1026	2100
IJ3IA245J1	1002	6304
IJ3IA237J1	1004	6303
IJ3IA158J1	1003	6304
IJ3IA225J2	1004	6304
IJ3IA222J1	1004	6305
IJ3IA212J1	1032	6304
IJ3IA221J1	1004	6303
IJ3IA196J1	1003	6305

Line name	First shot	Last shot
IJ3IA206J2	1002	6303
IJ3IA006J2	1002	6301
IJ3IA010J1	1011	6303
IJ3IA014J1	1009	6305
IJ3IA022J1	1003	6304
IJ3IA025J1	1001	6304
IJ3IA017J1	1022	6305
IJ3IA041J1	1002	6305
IJ3IA044J3	1002	6306
IJ3IA037J5	1002	6305
IJ3IA050J2	1002	6304
IJ3IA056J1	1003	6305
IJ3IA057J1	1004	6303
IJ3IA062J1	1003	6304
IJ3IA064J1	1003	6306
IJ3IA060J1	1004	6305
IJ3IA068J1	1004	6304
IJ3IA074J1	1002	6307
IJ3IA086J1	1002	6305
IJ3IA090J2	1004	6304
IJ3IA161J2	1008	6304
IJ3IA236J3	1004	6305
IJ3IA241J1	1002	6304
IJ3IA198J2	1037	6304
IJ3IA231J1	1002	6304
IJ3IA159J2	1003	6304
IJ3IA122J2	1002	6306
IJ3IA151J2	1002	6306
IJ3IA120J1	1005	6306
IJ3IA168J3	1003	6305
IJ3IA114J1	1004	6304
IJ3IA167J1	1001	6306
IJ3IA098J1	1002	6306
IJ3IA168J2	1001	6304
IJ3IA108J1	1003	6304
IJ3IA169J1	1003	6304
IJ3IA113J1	1003	6306
IJ3IA135J1	1004	6306
IJ3IA127J1	1028	6304
IJ3IA130J1	1029	6305
IJ3IA044J4	1005	1722
IJ3IA040J2	1003	2143
IJ3IA009J1	1003	4661
IJ3IA060J2	1003	6305

Line name	First shot	Last shot
IJ3IA229J2	1002	6305
IJ3IA230J1	1004	6304
IJ3IA179J2	1001	6303
IJ3IA241J2	1003	6306
IJ3IA177J1	1003	6303
IJ3IA174J1	1002	6306
IJ3IA231J3	1002	6306
IJ3IA184J2	1003	6305
IJ3IA140J2	1003	6305
IJ3IA206J4	1003	6305
IJ3IA129J2	1003	1970
IJ3IA171J2	1006	6303
IJ3IA204J2	1002	6304
IJ3IA052J1	1001	1919
IJ3IA039J1	1003	1874
IJ3IA023J1	1003	6305
IJ3IA055J1	1002	6305
IJ3IA042J1	1003	6305
IJ3IA031J1	1004	1843
IJ3IA021J1	1001	1622
IJ3IA198J4	1001	6304
IJ3IA239J1	1002	2538
IJ3IA241J3	1003	1737
IJ3IA157J2	1004	6304
IJ3IA179J4	1002	6305
IJ3IA231J4	1002	1925

Appendix B

Deliverables

B.1 3D UUHR Deliverables

- SEG-Y: raw navmerged shot gathers, TWT
- SEG-Y: shot gathers after receiver deghosting, TWT
- ASCII: statics files
- SEG-Y: unmigrated stack volume, TWT
- SEG-Y: final migrated stack volume, TWT
- SEG-Y: final migrated stack (with Q) volume, TWT
- SEG-Y: interval velocity volume, TWT
- ASCII: RMS stacking velocities (ESSOV2XY)
- Final seismic processing report (.doc, .pdf)

B.2 ESSOV2 file descriptor

ESSOV2XY format descriptor [column width index numbers]

Column 1 [0-1] - Format (e.g., V2)

Column 2 [4-6] - Country Code

Column 3 [7-10] - Inline number

Column 4 [11-15] - Crossline number

Column 5 [25-30] - Date (YYMMDD)

Column 6 [31-35] - Two-way time (ms)

Column 7 [53-56] - RMS velocity (m/s)

Column 8 [57-64] - Northing (m)

Column 9 [65-71] - Easting (m)

B.3 Delivery Status

- All stack deliverables uploaded to RVO MediaShuttle site
- SEG-Y navmerged shot gathers, SEG-Y shot gathers after receiver deghosting and statics file on USB.

This investigation was carried out by Fugro, commissioned by RVO, an agency of the Ministry of Economic Affairs and Climate Policy.

The information in this document is valid at the time of publishing (see month/year). Updates will be published on the website https://offshorewind.rvo.nl/ at the relevant sitemap, General Information, submap Revision Log and Q & A. In the Revision Log is indicated which versions are the latest and what the changes are in relation to previous versions. The documents can be found at the relevant sites, indicated in the List of all reports and deliverables.

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