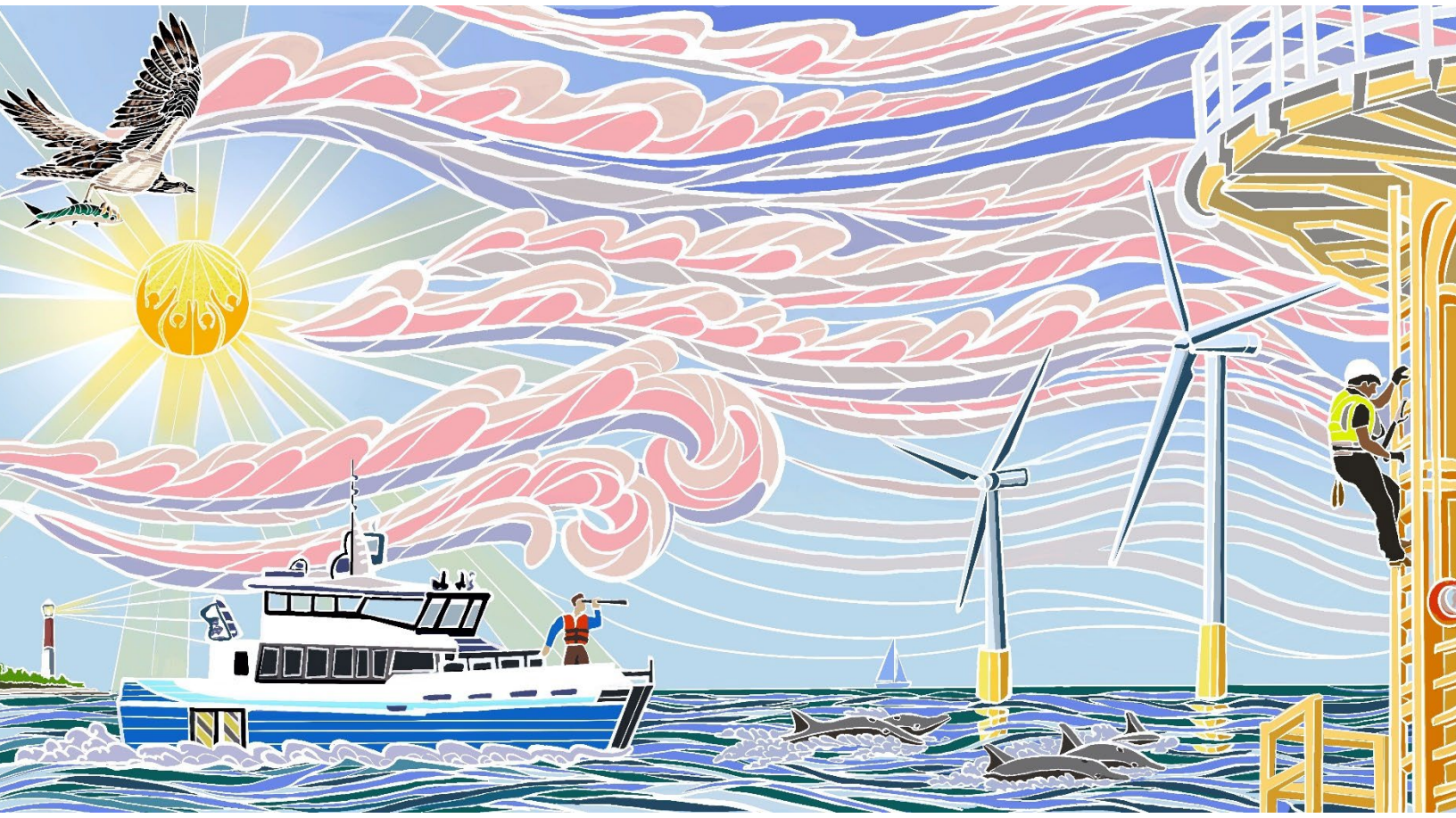

Appendix II-J1

Essential Fish Habitat (EFH) Technical Report

March 2024

Note: Atlantic Shores has updated the Project Design Envelope to include the following landfall sites: Monmouth Landfall Site, Asbury Landfall Site, Kingsley Landfall Site, Lemon Creek Landfall Site, Wolfe's Pond Landfall Site, and Fort Hamilton Landfall Site. The information included in this report demonstrates the completeness of Atlantic Shores' multi-year development efforts and should be considered representative for the Project. For additional information regarding the layout of the Project, please refer to COP Volume I Project Information, Sections 1.0 Introduction and 4.7 Landfall Sites, as well as Figure 1.1-2 Project Overview.

Essential Fish Habitat Technical Report

Atlantic Shores Offshore Wind North

Prepared for:

Atlantic Shores Offshore Wind, LLC
1 Dock 72 Way
7th Floor
Brooklyn, NY 11205
www.atlanticshoreswind.com

Prepared by:

Environmental Design & Research,
Landscape Architecture, Engineering & Environmental Services, D.P.C.
217 Montgomery Street, Suite 1000
Syracuse, New York 13202
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F: 315.471.1061
www.edrdpc.com

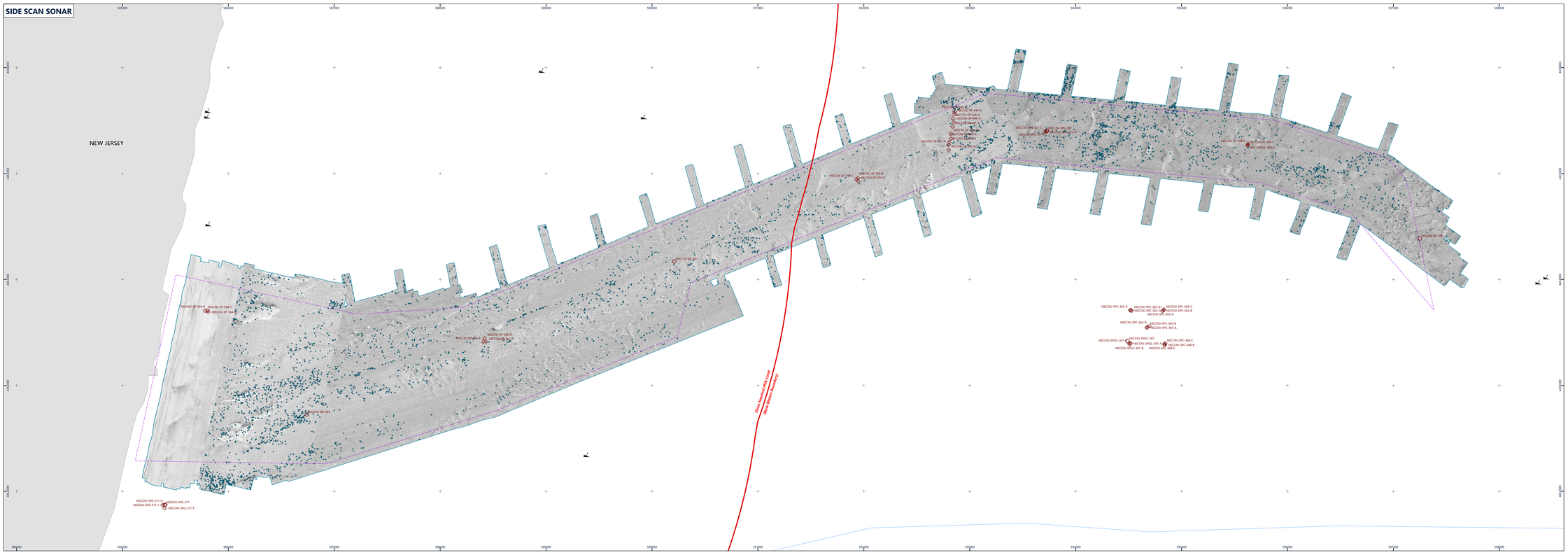
March 2024

Attachment 3

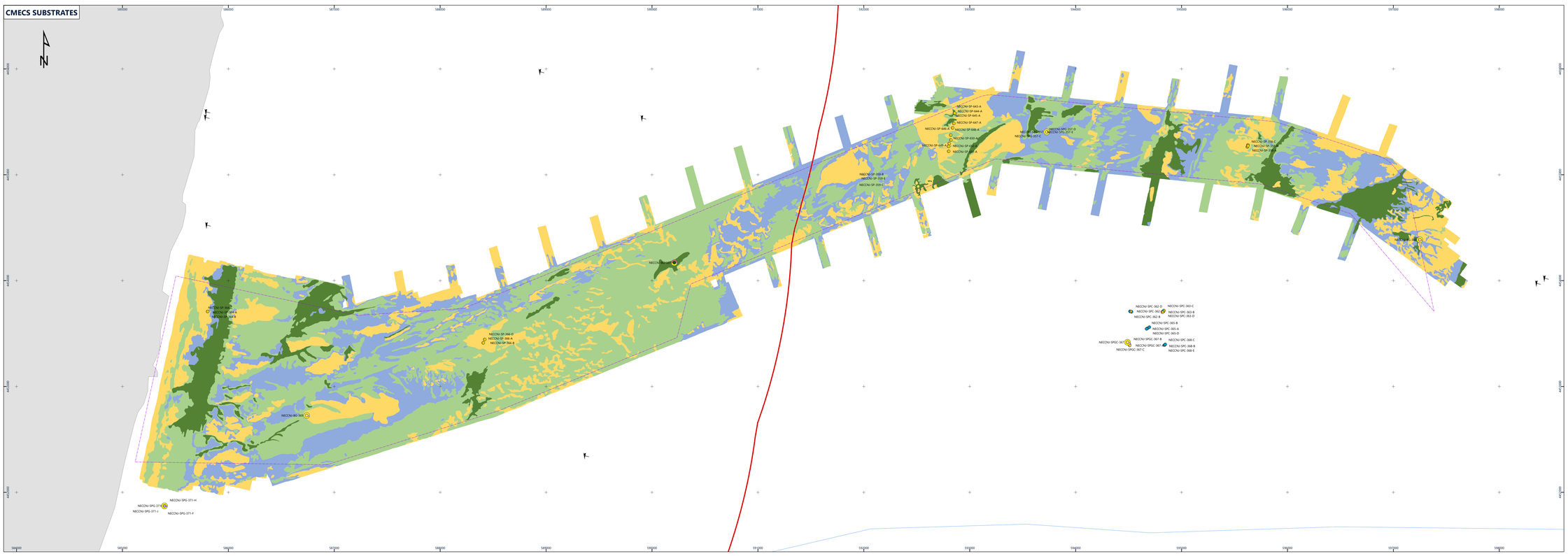
Benthic Habitat Maps – 1:10,000 Scale

Northern Export Cable Corridor – New Jersey

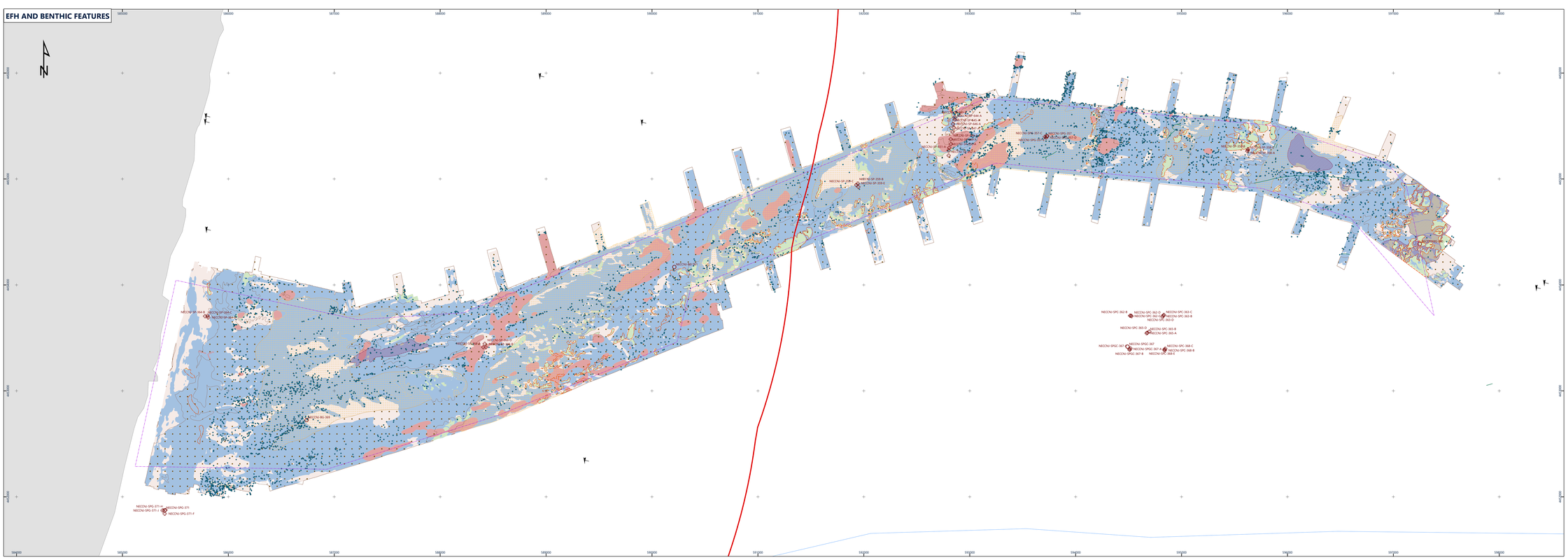
SIDE SCAN SONAR



CMECS SUBSTRATES



EFH AND BENTHIC FEATURES

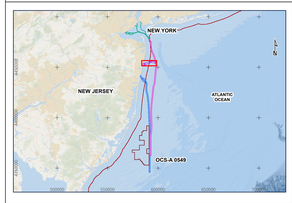


ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 4
OFFSHORE NEW JERSEY
NORTHERN EXPORT CABLE CORRIDOR
NEW JERSEY LANDFALL APPROACH ALIGNMENT SHEET
BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES

2023 Chart No. E1

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
- Northern Export Cable Corridor Trunk
- Lease Area OCS-A 0549
- Monmouth Export Cable Corridor
- Northern Export Cable Corridor New York Landfall Approaches
- Northern Export Cable Corridor New Jersey Landfall Approach
- Cables (Active)
- Cables (Inactive)
- Shipwrecks (AWOIS and ENC)

DATA EXTENTS

- Northern Export Cable Corridor New Jersey Landfall Approach Extent
- Northern Export Cable Corridor New Jersey Landfall Approach SSS Data Extent

BENTHIC SAMPLING LOCATIONS

This chart symbolizes benthic samples taken from a survey conducted in 2022 by Fugro.

- NECCNI-BG-361 — Benthic Sample - Grab
- NECCNI-SPG-645A — Benthic Sample - SPI-PV

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)
CMECS Substrate Group and Substrate Subgroup

- Gravel Mixes,Sandy Gravel
- Gravelly,Pebble, Granule
- Gravels,Pebble, Granule
- Gravelly,Gravelly Sand
- Sand,Very Coarse, Coarse Sand
- Sand,Fine, Very Fine Sand
- Sand,Medium Sand
- Mud, N/A

GRAB SAMPLE LOCATIONS
Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

- Gravel-Gravel Mixes
- Gravelly
- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

Wentworth Grain Size Composition
(Center symbol represents CMECS substrate classification)

- Gravel (%)
- Sand (%)
- Mud (%)

CMECS SUBSTRATES

- Gravel-Gravel Mixes
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- Gravelly Sand
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SIDE SCAN SONAR
REFLECTIVITY
HIGH
LOW

NMFS ESSENTIAL FISH HABITAT (EFH)

Composite benthic features layers indicate that more than one benthic feature is present in the same geographic area

BENTHIC FEATURES

- Seafloor Scarps
- Seabed Scars
- Dredged Area - Trench
- Dredged Area - Borrow
- Eroded_Thinned_Drape
- Surficial Interbedded Deposits
- Localized Relief Features
- Sand Waves
- Megaripples
- Ripples

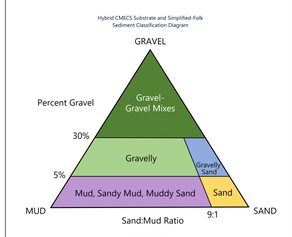
BOULDER / DEBRIS

- Individual Boulder/Debris

ESSENTIAL FISH HABITAT CLASSIFICATION

- Soft
- Heterogeneous Complex
- Complex
- Large Grained Complex

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



DRAFT

NOTES

1) The coordinate grid is in NAD1983 UTM Zone 18N, meters.

2) Fugro collected (non-continuously) geophysical and geotechnical data in the Northern ECC New Jersey Landfall Approach survey area from 18 April 2022 to 6 July 2022 and benthic data from 27 May 2022 to 16 July 2022 on board the R/V Enterprise. Nearshore geophysical data was acquired by S.T. Hudson Engineers, Inc. from 4 June 2022 to 7 June 2022 onboard the M/V Bella Marie.

3) Reported lease block information is based on Fugro's GIS database. Cable locations were provided by Atlantic Shores on January 5th, 2021.

4) Obstructions and shipwrecks were obtained from the Automated Wrecks and Obstructions Information System (AWOIS) and Electronic Navigational Charts (ENC), NOAA (2021).

5) Maritime Boundaries are provided by NOAA Nautical Charts (2019); Federal/State Boundaries are provided by BOEM Digital Offshore Cadastre (DOC), Admin83, Submerged Lands Act (SLA) Boundary.

6) EFH habitat delineations and characterization of benthic features charted here are in reference to MHF3' letter to BOEM dated March 29, 2021 regarding "Updated Recommendations for Mapping Fish Habitat".

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8) Biotic classification (NMFS Modified CMECS) of grab samples (Terraworld, 2019 and Fugro, 2020, 2022), GrabCam video (Fugro, 2020, 2022), and towed video transects (RPS, 2021) are reported in the COP Volume II - Affected Environment. SPI-PV biotic classification is reported in 2022 COP MSIR Volume 3.

9) The hard edges are due to survey boundary limitations and seasonal changes in sediment, sediments transport, and movement of morphological features.

10) Seabed scars caused by fishing activities is seasonal and annually changing, and may not be present in all interpreted datasets due to time of year that the data were collected.

11) Permanent obstructions and buoys inhibited the collection of data at certain locations within the survey area.

12) SSS mosaic bin size is 0.25 m, 800 kHz frequency.

EQUIPMENT

Vessel(s)
Fugro Enterprise, S.T. Hudson Bella Marie

Navigation System GPS Primary
(Fugro Enterprise) Fugro StarPack Global Navigation Satellite System
(S.T Hudson Bella Marie) Applanix POSMV 320 WaveMaster II w/ RTK

Multibeam System
(Fugro Enterprise) Kongsberg EM2040 MBES
(S.T Hudson Bella Marie) NorbitWingHead (7th

Side Scan Sonar
(Fugro Enterprise) EdgeTech 4205 SSS (300/600) kHz frequencies
(S.T Hudson Bella Marie) EdgeTech 4205 SSS (600/900) kHz frequencies

USBL System
(Fugro Enterprise) Kongsberg HiPAP 502 USBL system,
(S.T Hudson Bella Marie) SonarVerse MiniRanger2 USBL

SPI-PV (Fugro, 2022)
Seabed imagery collected from Ocean Imaging System (OIS) with Nikon D7100 24-megapixel high resolution digital camera for sediment profile imagery (SPI) and an OIS Model DSC 24000 24-megapixel underwater camera for plan view (PV) imagery

GrabCam (Fugro, 2022)
Ted Young-Modified Van Veen Grab dual 0.04 m2 bucket sampler
equipped with Fugro's real-time GrabCam video system

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GEODETIC PARAMETERS

GEODETIC DATUM	North American Datum 1983
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000 m
Inverse Flattening	298.257222101
PROJECTION	UNIVERSAL TRANSVERSE MERCATOR / Zone 18N (*EPSG 26918*)
Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,000 mE
False Northing	0 mN
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

Scale 1 : 10,000 at 63" x 67" page size

0 100 200 300 400 500 600 700 800 900 1,000 Meters

0 600 1,200 1,800 2,400 3,000 3,600 Feet

Issue No:	Date:	Description	Drawn:	Checked:	Approved:
01	1/24/2023	DRAFT - For Review	RG	DD	DD

Project No:	Chart Name:	Chart No:
02.22030006	22030009_NECCNJ_01	E1

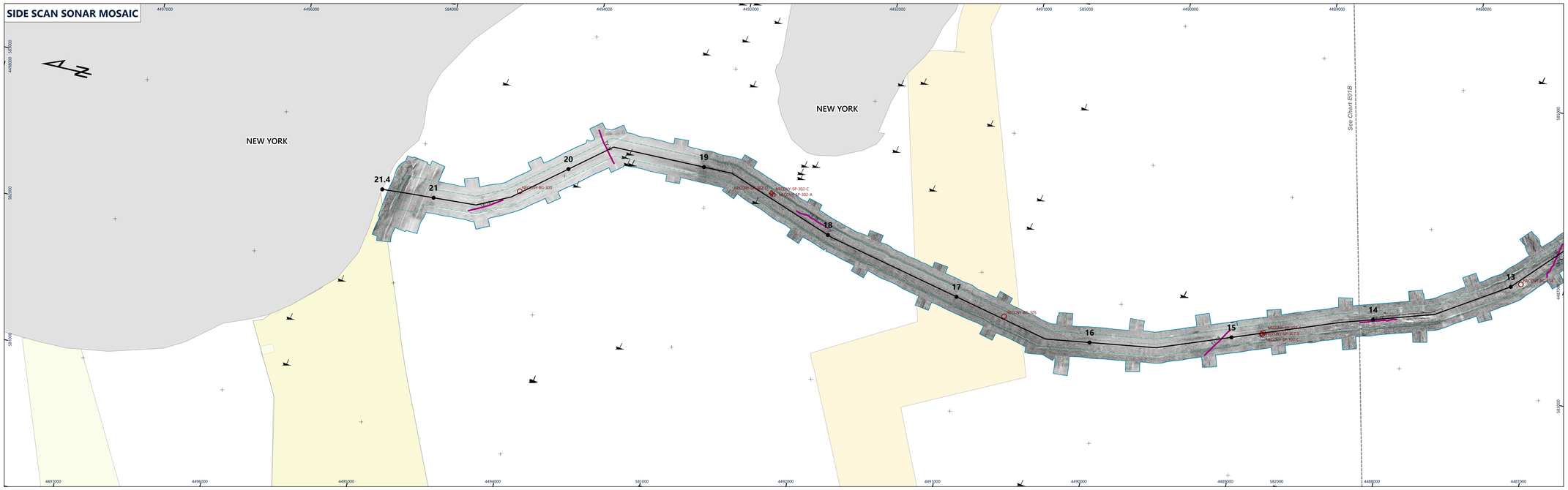
Attachment 3

Benthic Habitat Maps – 1:10,000 Scale

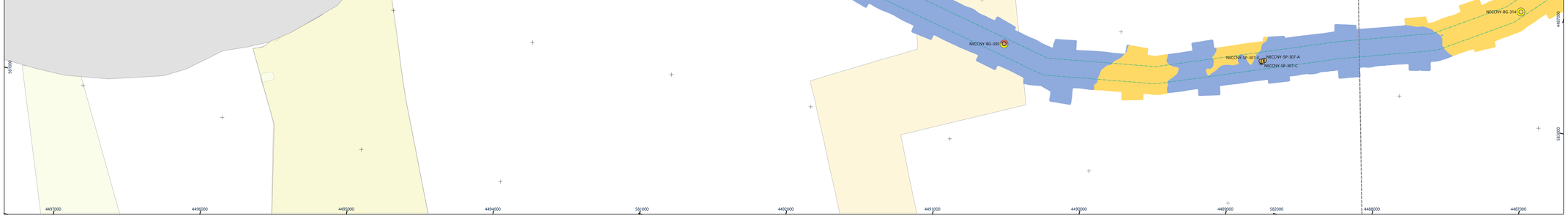
Northern Export Cable Corridor – New York

Note: Atlantic Shores has updated the Project Design Envelope to include the following landfall sites: Monmouth Landfall Site, Asbury Landfall Site, Kingsley Landfall Site, Lemon Creek Landfall Site, Wolfe's Pond Landfall Site, and Fort Hamilton Landfall Site. The information included in this report demonstrates the completeness of Atlantic Shores' multi-year development efforts and should be considered representative for the Project. For additional information regarding the layout of the Project, please refer to COP Volume I Project Information, Sections 1.0 Introduction and 4.7 Landfall Sites, as well as Figure 1.1-2 Project Overview.

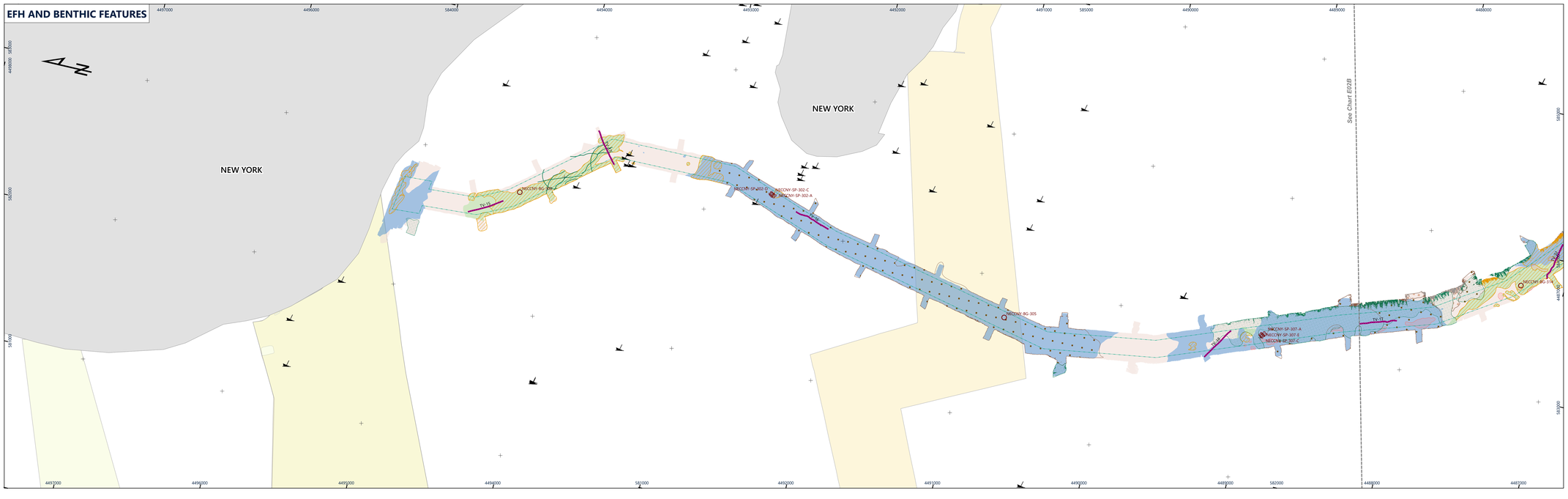
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



EFH AND BENTHIC FEATURES



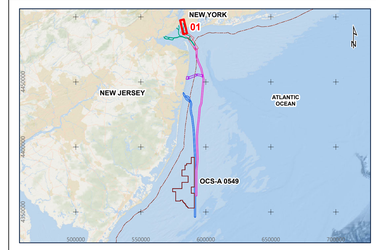
ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 3
OFFSHORE NEW YORK

NORTHERN EXPORT CABLE CORRIDOR
NEW YORK LANDFALL APPROACH ALIGNMENT SHEET - BELT PARKWAY
BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES,
AND EFH BENTHIC FEATURES

2023 Chart No. E01A

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

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- 10 Export Cable Corridor and Indicative Centerline Stationing at 1-km intervals are labeled
- Submarine Cables (NOAA)
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DATA EXTENTS

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- Northern Export Cable Corridor New York Landfall Approach SSS Data Extent

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This chart symbolizes benthic samples taken from several surveys conducted in 2022 by various contractors.

- Towed Video Transects (RPS, 2022)
- Benthic Sample - Grab (Fugro, 2022)
- Benthic Sample - SPI-PV (Fugro, 2022)

CMECS SUBSTRATES

- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

GRAB SAMPLE LOCATIONS (Fugro, 2022)

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ESSENTIAL FISH HABITAT CLASSIFICATION

- Complex
- Heterogeneous Complex
- Soft

Wentworth Grain Size Composition (Center symbol represents CMECS substrate classification)

- Gravel (%)
- Sand (%)
- Mud (%)

BENTHIC FEATURES

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- Dredged Area - Borrow
- Irregular Seafloor Areas
- Localized Relief Features
- Megaripples
- Ripples

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

CMECS Substrate Group and Substrate Subgroup

- Shell Hash (CMECS Subclass)

SIDE SCAN SONAR
REFLECTIVITY

HIGH
LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram

NOTES

1) The coordinate grid is in NAD1983 UTM Zone 18N, meters.
2) S.T. Hudson Engineers, Inc. collected (non-continuously) geophysical data in the Northern ECC New York Landfall Approaches survey area from 25 April 2022 to 24 June 2022 on board the M/V *Bella Marie* and benthic data from 27 May 2022 to 16 July 2022 on board the R/V Yeti.
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12) SSS mosaic bin size is 0.25 m, 600 kHz frequency.

EQUIPMENT

Vessel(s):
S.T. Hudson *Yeti*, and *Bella Marie*

Navigation System GPS Primary:
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Multibeam System:
Norbit Winghead 077i

Side Scan Sonar:
EdgeTech 4205 SSS (600/900) kHz frequencies

USBL System:
Sonardyne MiniRanger2 USBL

SPI-PV (Fugro, 2022)
Dual camera system from Ocean Imaging System (OIS) with Nikon D7100 24-megapixel high resolution digital camera for sediment profile imagery (SPI) and an OIS Model DSC 24000 24-megapixel underwater camera for plan view (PV) imagery

GrabCam (Fugro, 2022)
Ted Young-Modified Van Veen Grab dual 0.04 m^2 bucket sampler equipped with Fugro's real-time GrabCam video system.

Towed Video (2022)
Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

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GEODETIC PARAMETERS

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Horizontal and vertical units are in meters

Scale 1 : 10,000 at Arch 42" x 52" page size

0 100 200 300 400 500 600 700 800 900 1,000 Meters

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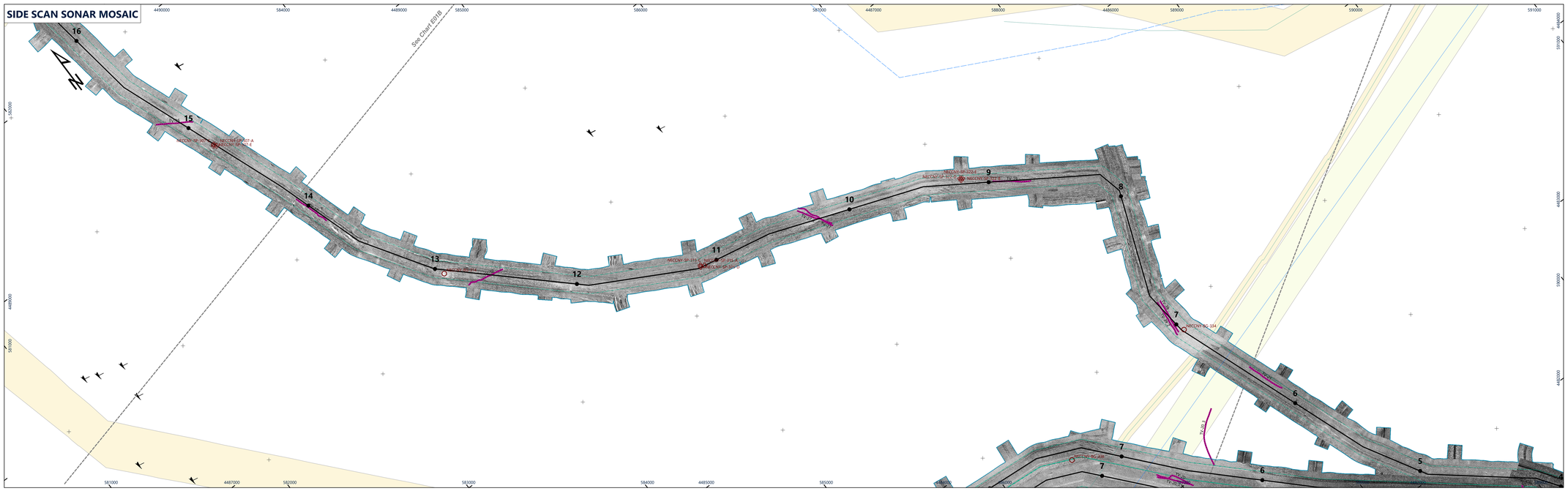
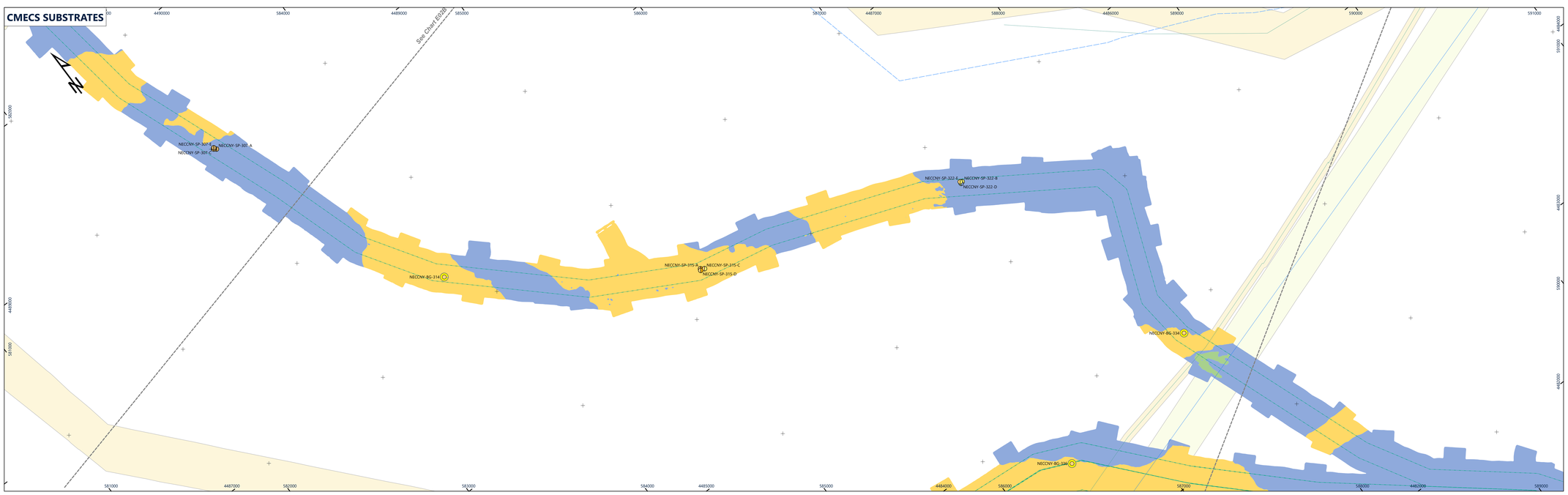
Issue No:	Date:	Description:	Drawn:	Checked:	Approved:
01	1/18/2023	DRAFT - For Review	RG	DK	DD
02	3/2/2023	FINAL - Issued For Approval	SC, KR	DK	DD

Project No:	Chart Name:	Chart No:
02.22030006	22030006_NECC_BELT_PARKWAY_E1A	01 of 06

SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



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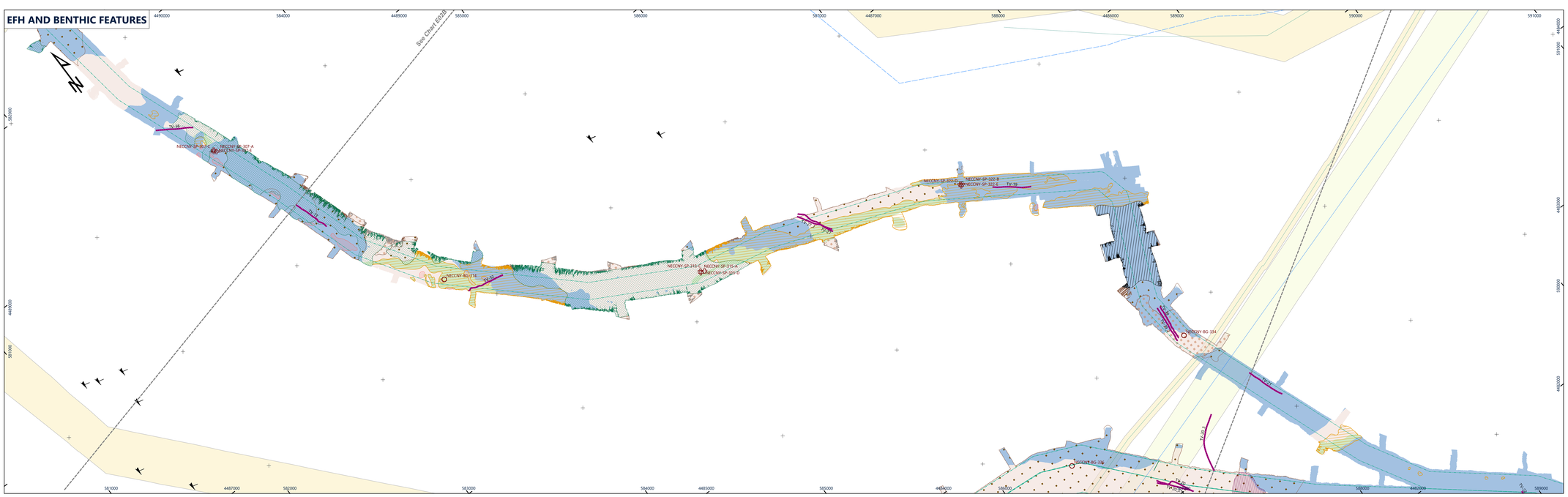

ATLANTIC SHORES offshore wind

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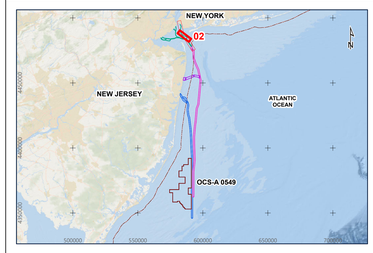
2023 Chart No. E01B

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



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- Benthic Sample - Grab (Fugro, 2022)
- Benthic Sample - SPI-PV (Fugro, 2022)

CMECS SUBSTRATES

- Gravelly
- Gravelly Sand
- Sand

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Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

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- Ripples

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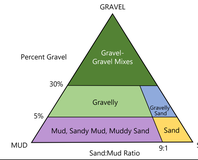
- Sand/Very Coarse/Coarse Sand
- Sand/Fine/Very Fine Sand; Sand/Medium Sand

SIDE SCAN SONAR REFLECTIVITY

HIGH — LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



NOTES

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EQUIPMENT

Vessel(s):
S.T. Hudson *Yeti*, and *Bella Marie*

Navigation System:
GPS Primary:
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Multibeam System:
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Towed Video (2022)
Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

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GEODETIC PARAMETERS

GEODETIC DATUM	North American Datum 1983
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000 m
Inverse Flattening	298.257222101
PROJECTION	UNIVERSAL TRANSVERSE MERCATOR / Zone 18N *(EPSG 26918)*
Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,000 mE
False Northing	0 mN
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

Scale 1 : 10,000 at Arch 42" x 52" page size

0 100 200 300 400 500 600 700 800 900 1,000 Meters
0 600 1,200 1,800 2,400 3,000 3,600 Feet

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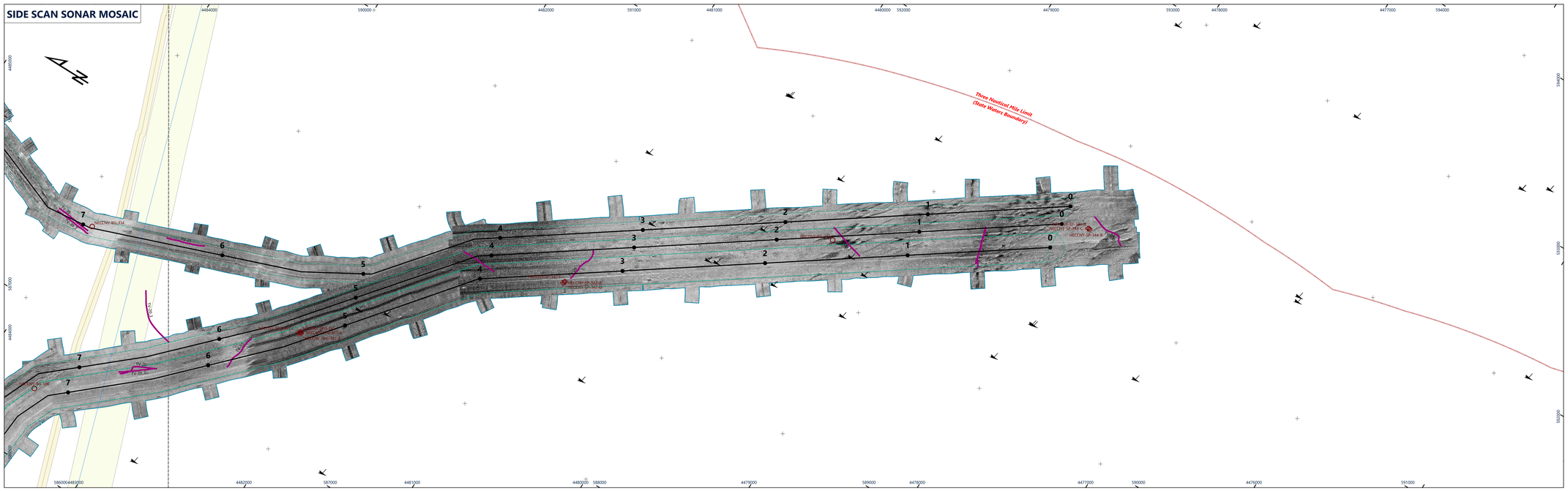
Project No:	Chart Name:	Chart No:
02.22030006	22030006_NECC_BELT_PARKWAY_E1B	01 of 06

SIDE SCAN SONAR MOSAIC



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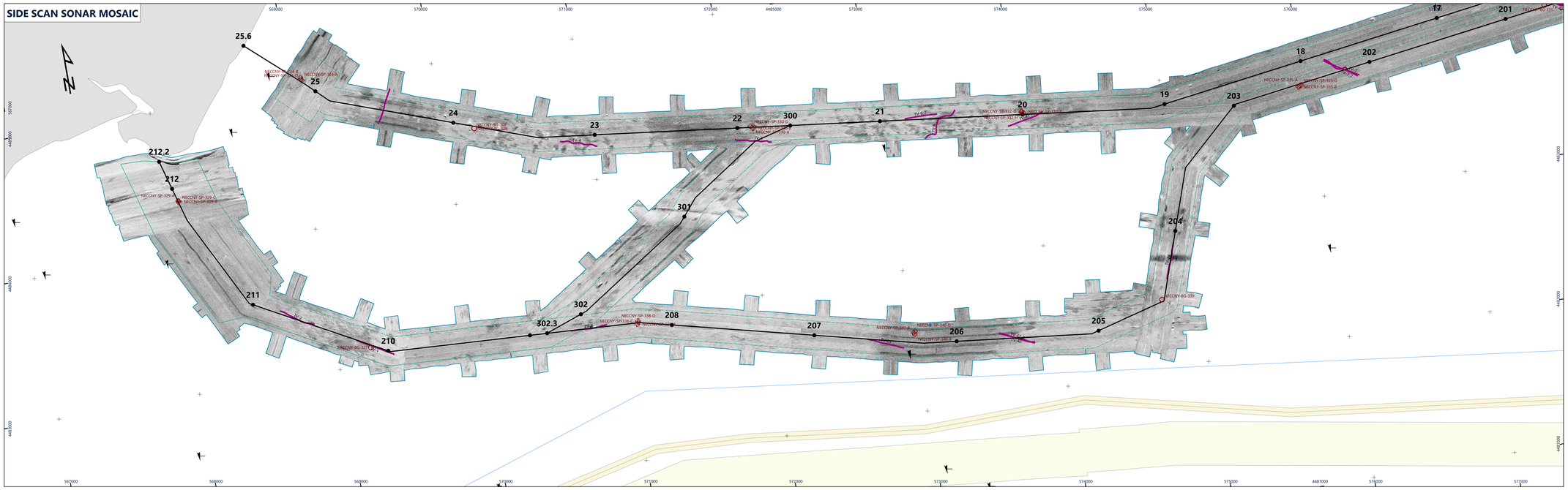

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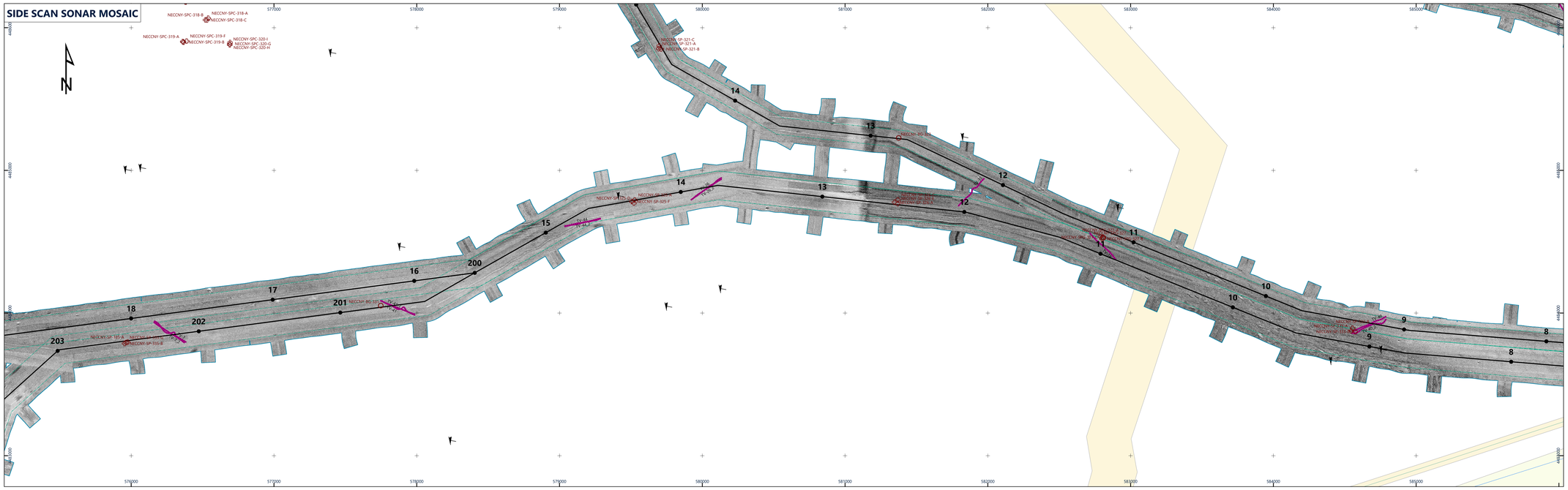

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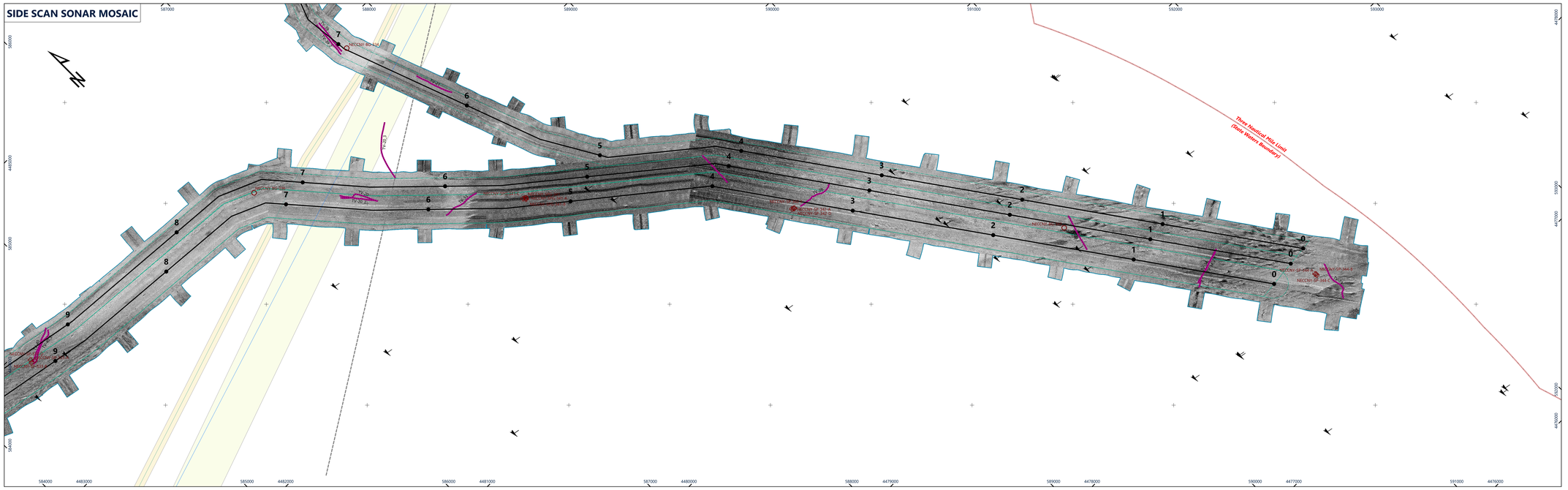
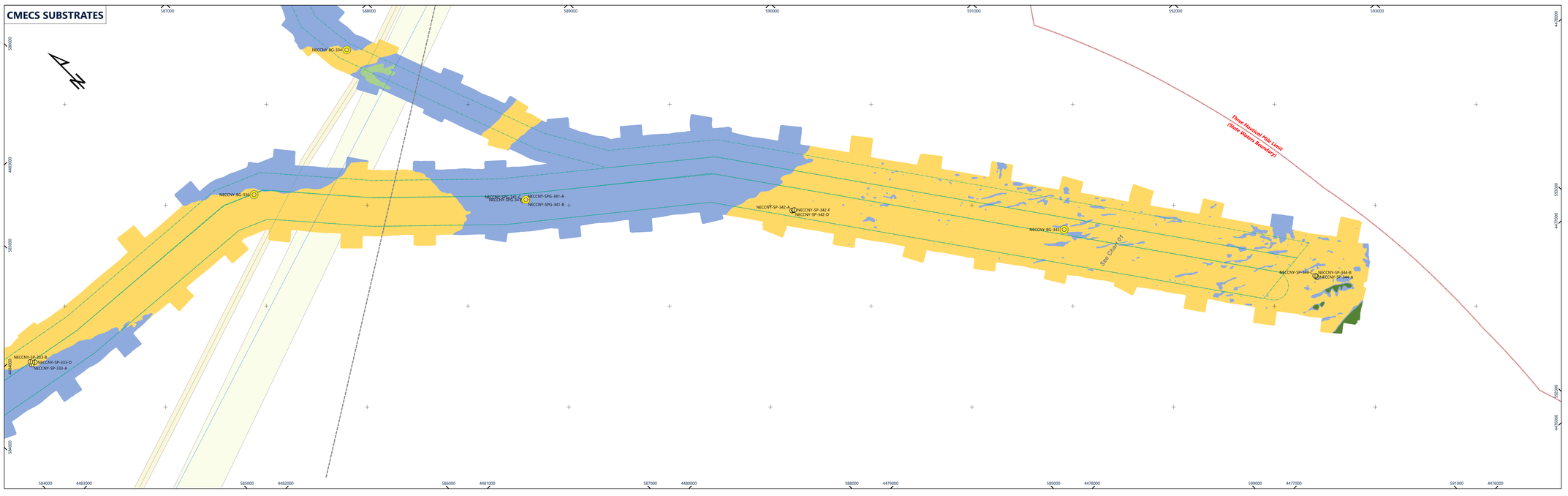
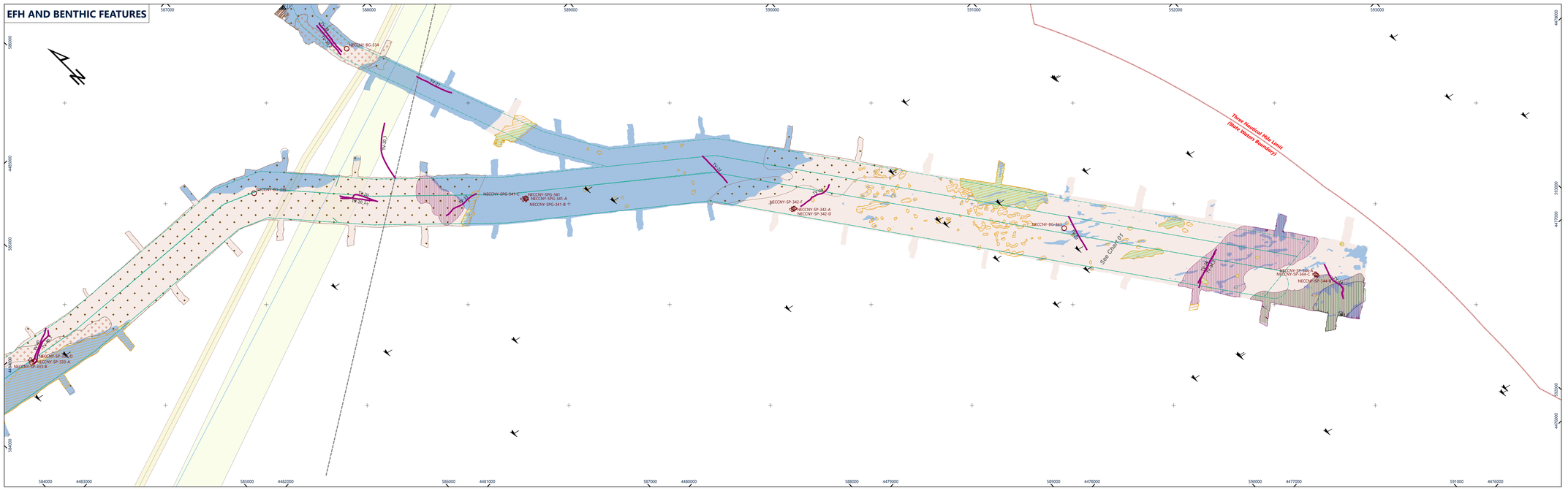


CMECS SUBSTRATES



EFH AND BENTHIC FEATURES



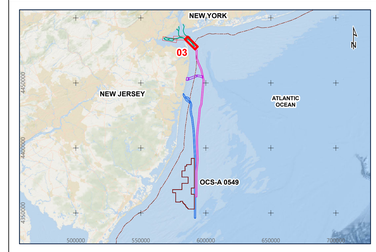
ATLANTIC SHORES
offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 3
OFFSHORE NEW YORK

NORTHERN EXPORT CABLE CORRIDOR
NEW YORK LANDFALL APPROACH ALIGNMENT SHEET - LEMON CREEK
BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES

2023 Chart No. E03C

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
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- Gravel-Gravel Mixes
- Gravelly
- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

GRAB SAMPLE LOCATIONS (Fugro, 2022)

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

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Wentworth Grain Size Composition (Center symbol represents CMECS substrate classification)

- Gravel (%)
- Sand (%)
- Mud (%)

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

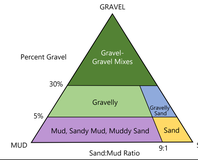
CMECS Substrate Group and Substrate Subgroup

- Sand/Very Coarse/Coarse Sand
- Sand/Fine/Very Fine Sand; Sand/Medium Sand

SIDE SCAN SONAR REFLECTIVITY

HIGH
LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



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False Northing	0 mN
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

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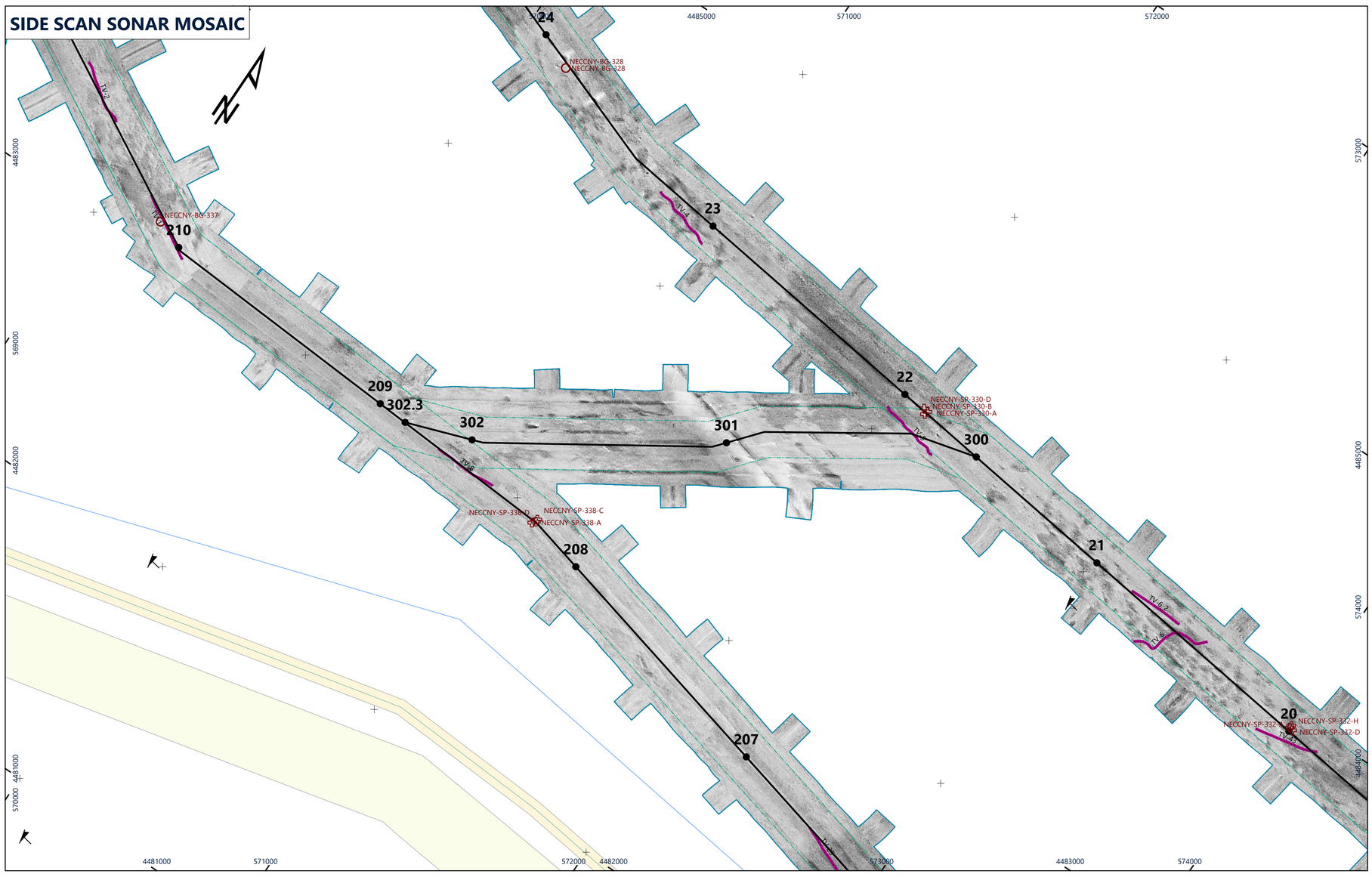
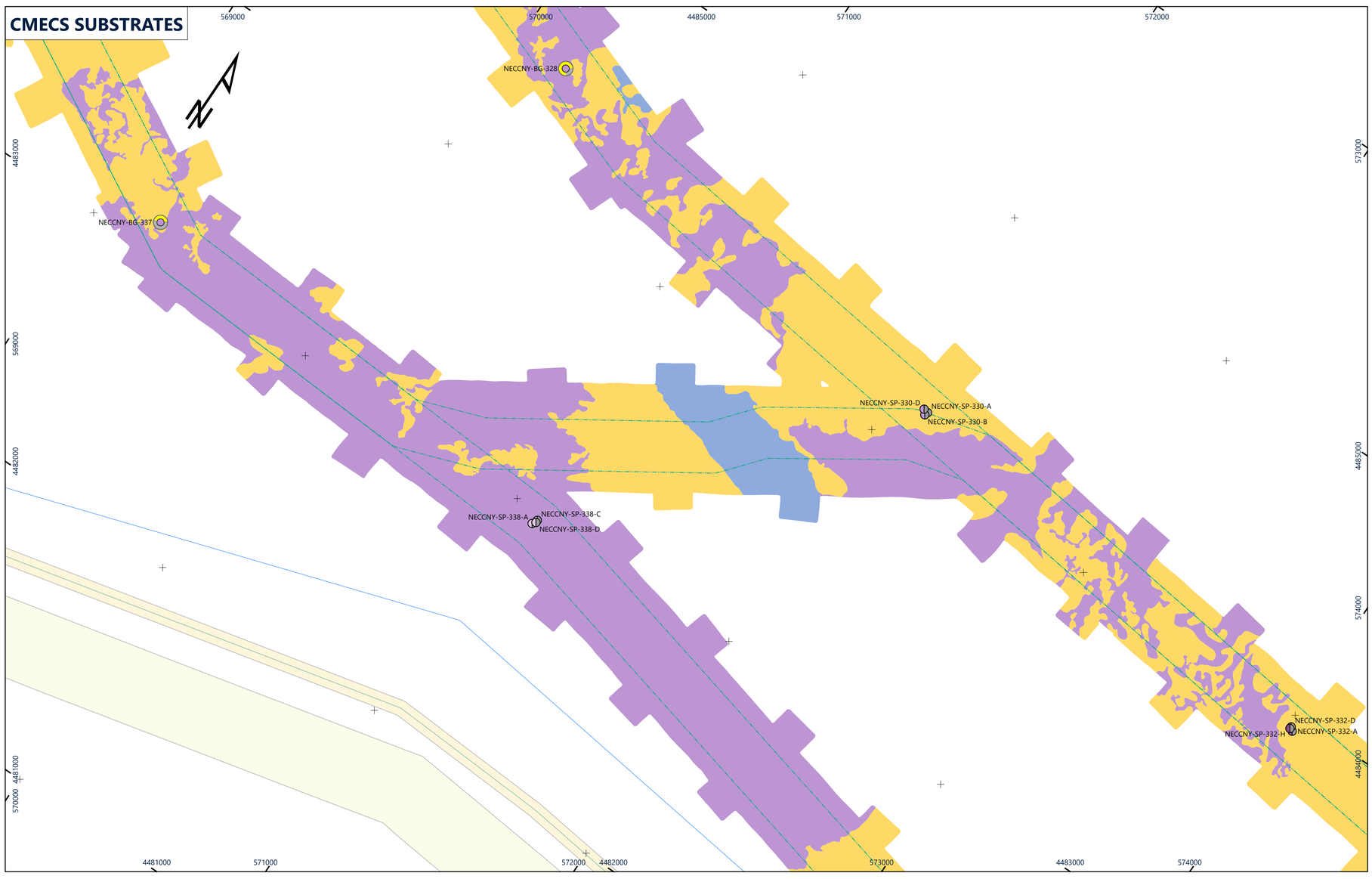
01	1/18/2023	DRAFT - For Review	RG	DK	DD
02	3/2/2023	FINAL - Issued For Approval	SC, KR	DK	DD

Project No:	Chart Name:	Chart No:
02.22030006	22030006_NECC_LC_E3C	03 of 06

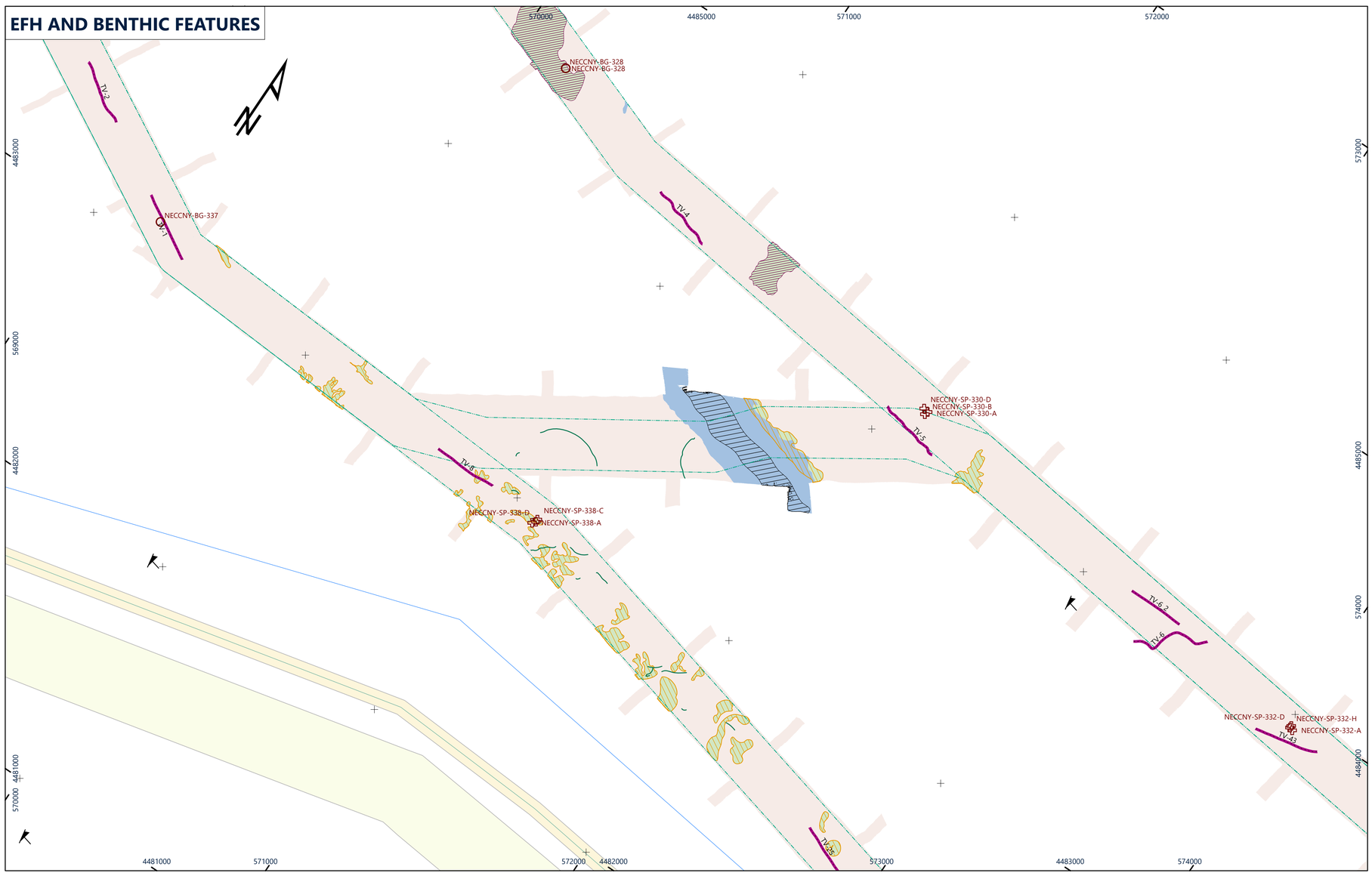
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



EFH AND BENTHIC FEATURES



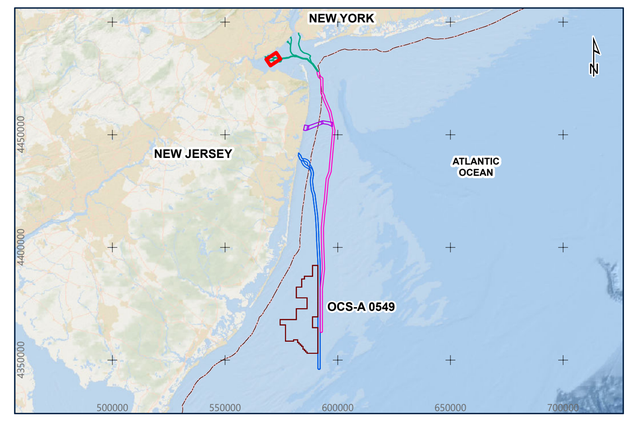
ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 3
OFFSHORE NEW YORK

NORTHERN EXPORT CABLE CORRIDOR
NEW YORK LANDFALL APPROACH ALIGNMENT SHEET - LEMON CREEK ALT
BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES,
AND EFH BENTHIC FEATURES

2023 Chart No. E02

FUGRO USA MARINE, INC.
6100 Hilcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
- Northern Export Cable Corridor Trunk
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- Monmouth Export Cable Corridor
- Northern Export Cable Corridor New York Landfall Approaches
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- Cables (Active)
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- Submarine Cables (NOAA)
- Pipeline Areas
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- 10 — Export Cable Corridor and Indicative Centerline Stationing at 1-km intervals are labeled

DATA EXTENTS

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CMECS SUBSTRATES

- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

GRAB SAMPLE LOCATIONS (Fugro, 2022)

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

- Gravel-Gravel Mixes
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Wentworth Grain Size Composition
(Center symbol represents CMECS substrate classification)

- Gravel (%)
- Sand (%)
- Mud (%)

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

CMECS Substrate Group and Substrate Subgroup

- Shell Hash (CMECS Subclass)
- Muddy Sand/NA
- Sandy Mud/NA
- Mud/NA

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Composite benthic features layers indicate that more than one benthic feature is present in the same geographic area

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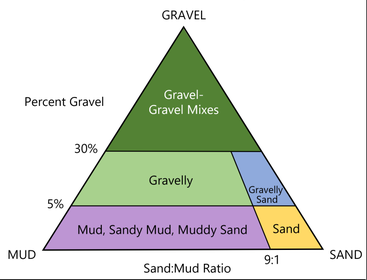
SIDE SCAN SONAR

REFLECTIVITY

HIGH

LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



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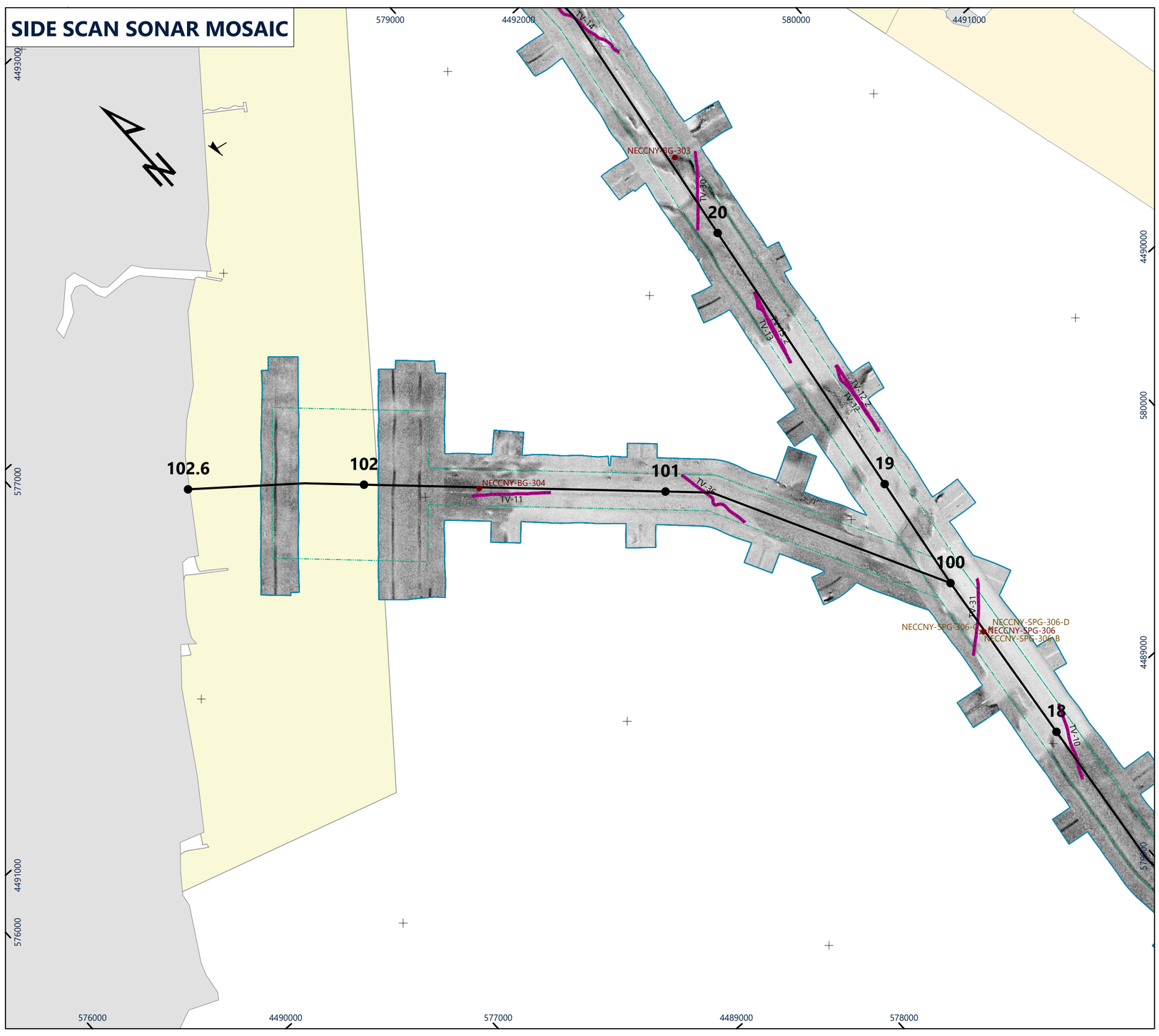
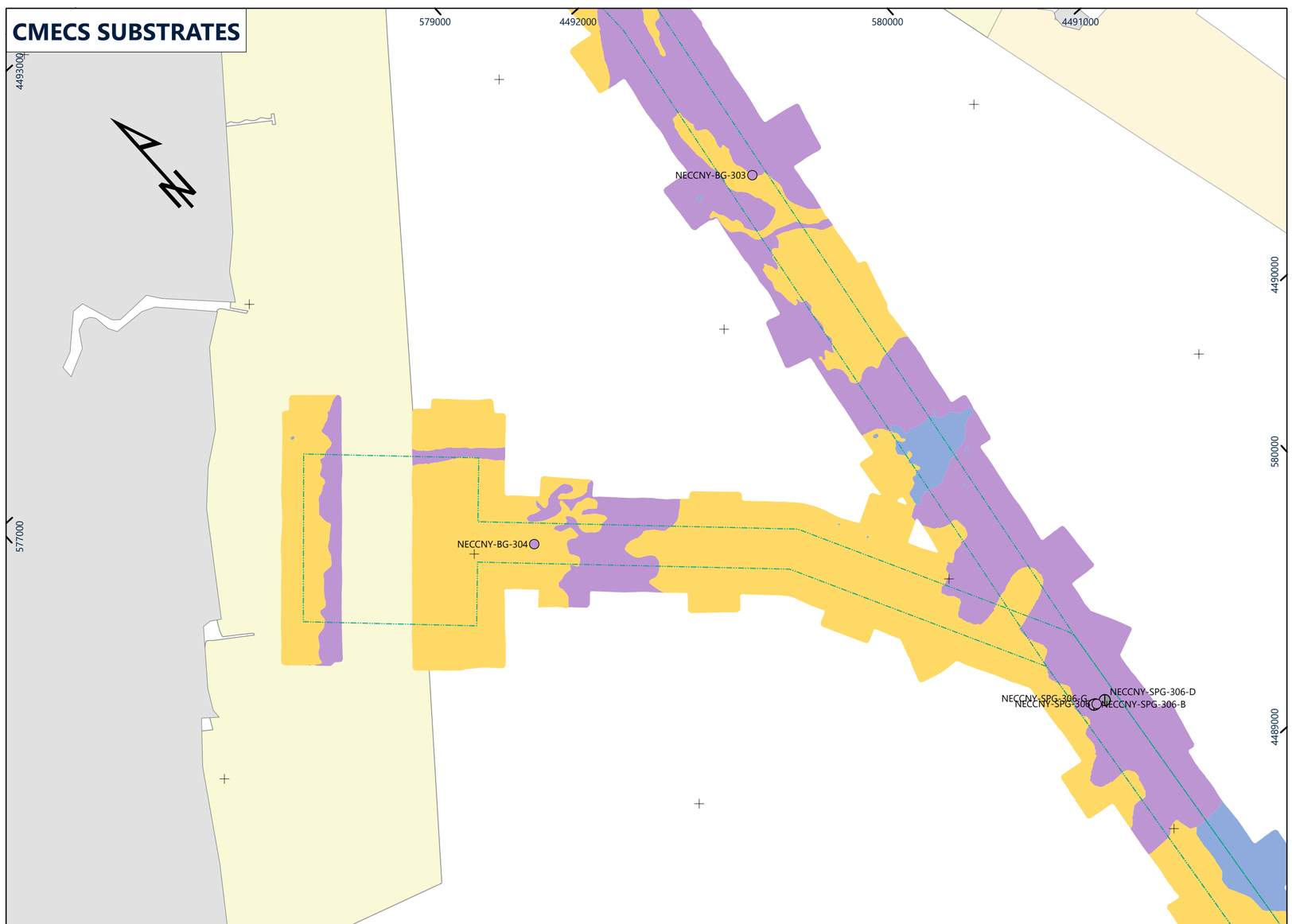
02.22030006	22030006_NECC_LCA_E2	02 of 06

SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



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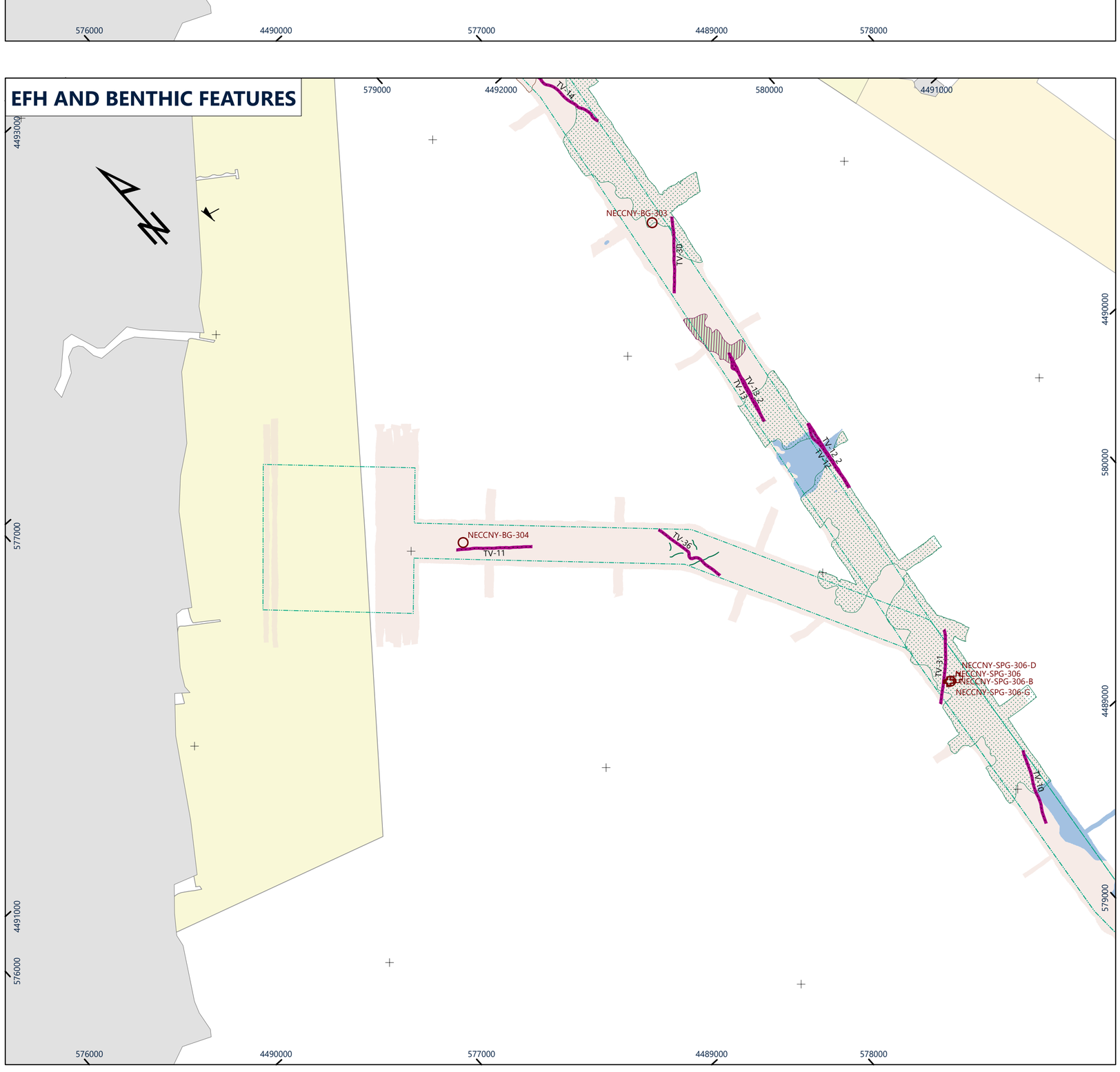

ATLANTIC SHORES offshore wind

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INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 3
OFFSHORE NEW YORK

NORTHERN EXPORT CABLE CORRIDOR
NEW YORK LANDFALL APPROACH ALIGNMENT SHEET - MIDLAND
BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES,
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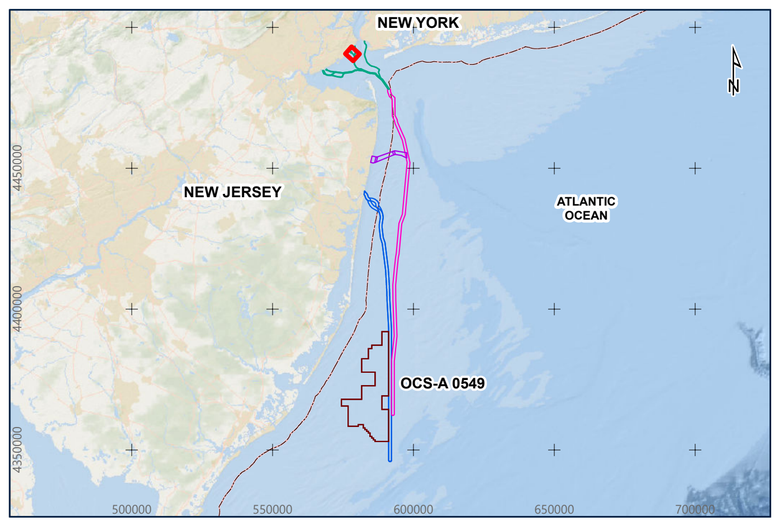
2023 Chart No. E04

FUGRO USA MARINE, INC.
6100 Hilcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



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Wentworth Grain Size Composition
(Center symbol represents CMECS substrate classification)

- Gravel (%)
- Sand (%)
- Mud (%)

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

CMECS Substrate Group and Substrate Subgroup

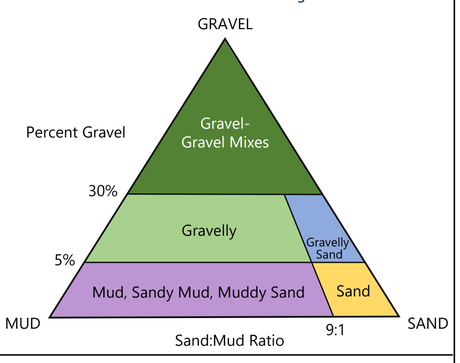
- Sandy Mud/NA

SIDE SCAN SONAR
REFLECTIVITY

HIGH

LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



NOTES

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12) SSS mosaic bin size is 0.25 m, 600 kHz frequency.

EQUIPMENT

Vessel(s):
S.T. Hudson *Yeti, and Bella Marie*

Navigation System GPS Primary:
Applanix POSMV 320 WaveMaster II w/ RTK

Multibeam System:
Norbit Winghead i77h

Side Scan Sonar:
EdgeTech 4205 SSS (600/900) kHz frequencies

USBL System:
Sonardyne MiniRanger2 USBL

SPI-PV (Fugro, 2022)
Dual camera system from Ocean Imaging System (OIS) with Nikon D7100 24-megapixel high resolution digital camera for sediment profile imagery (SPI) and an OIS Model DSC 24000 24-megapixel underwater camera for plan view (PV) imagery

GrabCam (Fugro, 2022)
Ted Young-Modified Van Veen Grab dual 0.04 m^2 bucket sampler equipped with Fugro's real-time GrabCam video system

Towed Video (2022)
Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

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GEODETIC PARAMETERS

GEODETIC DATUM	North American Datum 1983
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000 m
Inverse Flattening	298.257222101
PROJECTION	UNIVERSAL TRANSVERSE MERCATOR / Zone 18N *(EPSG 26918)*
Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,000 mE
False Northing	0 mN
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

Scale 1 : 10,000 at 42" x 24" page size

0 100 200 300 400 500 600 700 800 900 1,000 Meters

0 600 1,200 1,800 2,400 3,000 3,600 Feet

Issue No:	Date:	Description:	Drawn:	Checked:	Approved:
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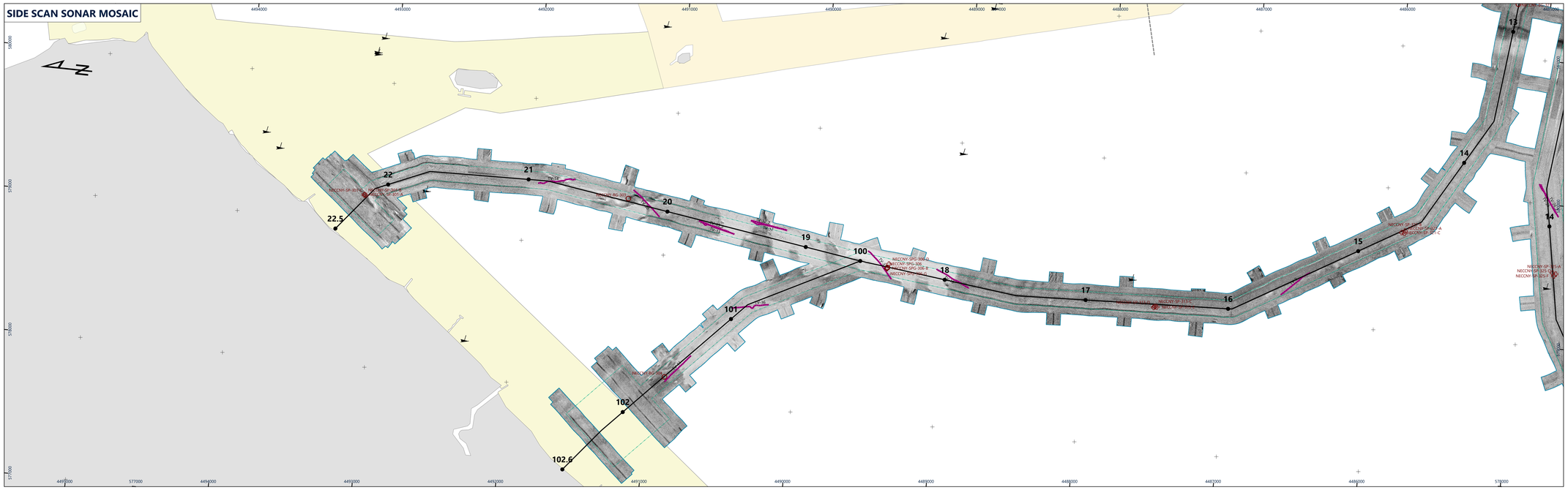
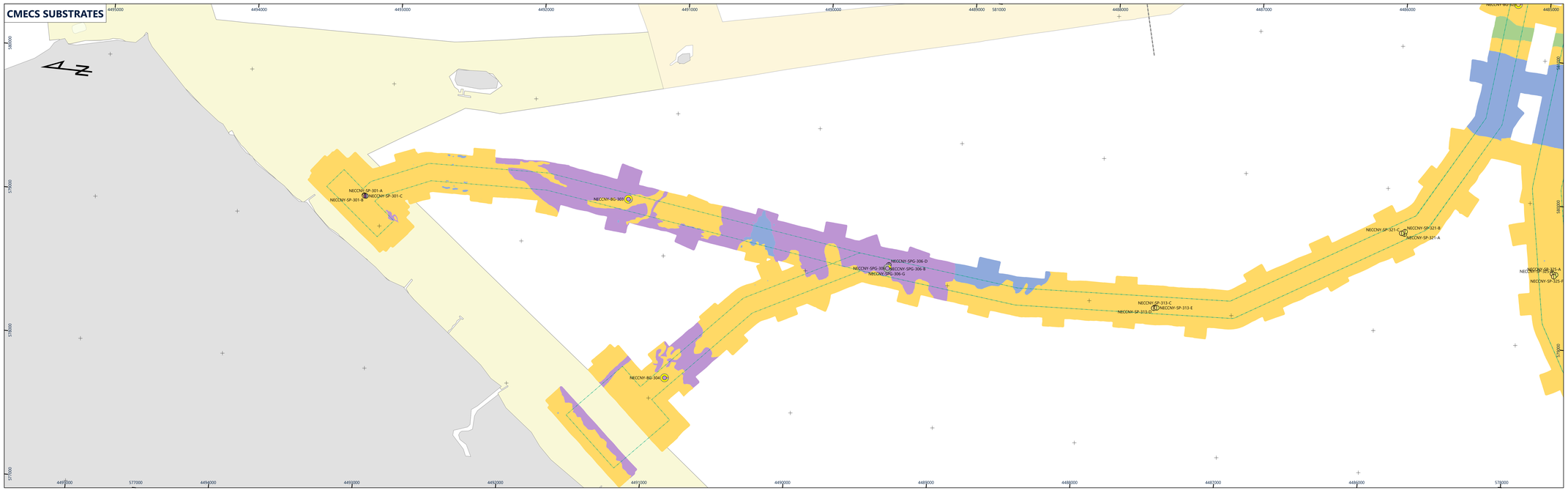
02	3/2/2023	FINAL - Issued For Approval	SC, KR	DK	DD

Project No:	Chart Name:	Chart No:
02.22030006	22030006_NECC_M_E4	04 of 06

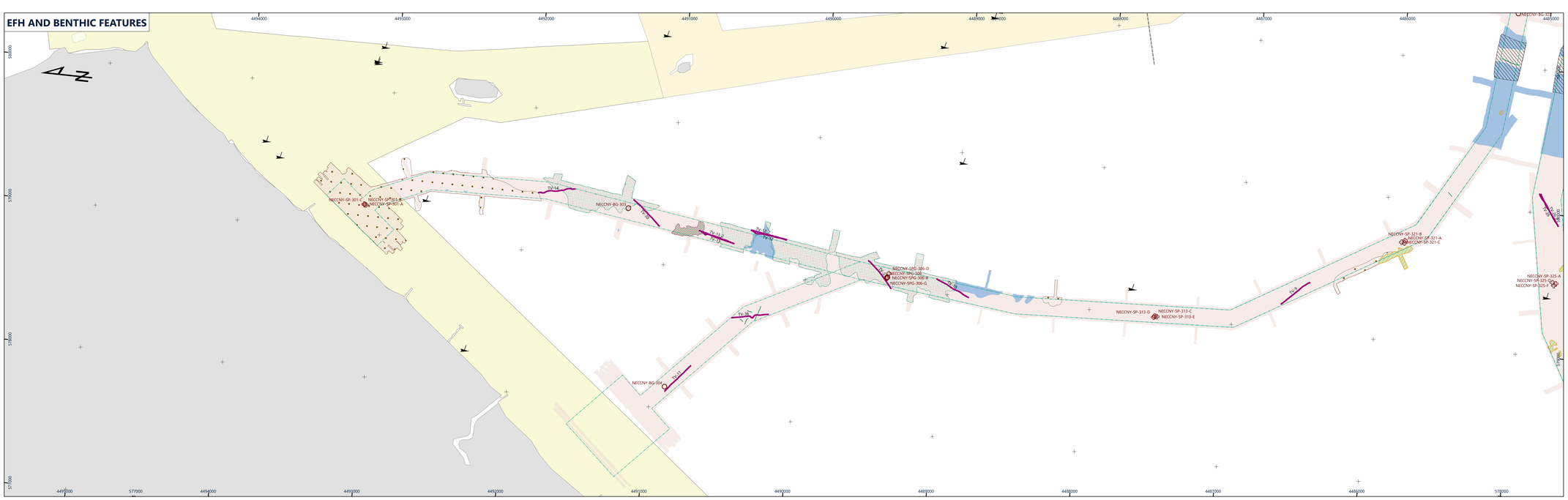
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



EFH AND BENTHIC FEATURES



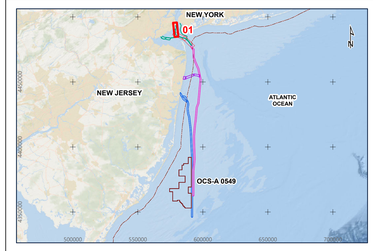
ATLANTIC SHORES
offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 3
OFFSHORE NEW YORK

NORTHERN EXPORT CABLE CORRIDOR
NEW YORK LANDFALL APPROACH ALIGNMENT SHEET - SOUTH BEACH
BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES

2023 Chart No. E05A

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
- Northern Export Cable Corridor Trunk
- Lease Area OCS-A 0549
- Monmouth Export Cable Corridor
- Northern Export Cable Corridor New York Landfall Approaches
- Northern Export Cable Corridor New Jersey Landfall Approach
- Cables (Active)
- Cables (Inactive)
- Shipwrecks (AWOIS and ENC)
- 10 Export Cable Corridor and Indicative Centerline Stationing at 1-km intervals are labeled
- Submarine Cables (NOAA)
- Pipeline Areas
- Submarine Cable Areas

DATA EXTENTS

- Northern Export Cable Corridor New York Landfall Approach Extent
- Northern Export Cable Corridor New York Landfall Approach SSS Data Extent

BENTHIC SAMPLING LOCATIONS

This chart symbolizes benthic samples taken from several surveys conducted in 2022 by various contractors.

- Towed Video Transects (RPS, 2022)
- Benthic Sample - Grab (Fugro, 2022)
- Benthic Sample - SPI-PV (Fugro, 2022)

CMECS SUBSTRATES

- Gravelly
- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

GRAB SAMPLE LOCATIONS (Fugro, 2022)

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

- Gravel-Gravel Mixes
- Gravelly Mud, Gravelly Muddy Sand
- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

NMFS ESSENTIAL FISH HABITAT (EFH)

Composite benthic features layers indicate that more than one benthic feature is present in the same geographic area

ESSENTIAL FISH HABITAT CLASSIFICATION

- Complex
- Heterogeneous Complex
- Soft

Wentworth Grain Size Composition (Center symbol represents CMECS substrate classification)

- Gravel (%)
- Sand (%)
- Mud (%)

BENTHIC FEATURES

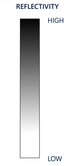
- Seabed Scars
- Dredged Area - Trench
- Dredged Area - Borrow
- Irregular Seafloor Areas
- Surficial Interbedded Deposits
- Ripples

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

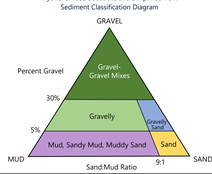
CMECS Substrate Group and Substrate Subgroup

- Sand/Fine/Very Fine Sand; Sand/Medium Sand
- Muddy Sand/NA
- Sandy Mud/NA

SIDE SCAN SONAR
REFLECTIVITY



Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



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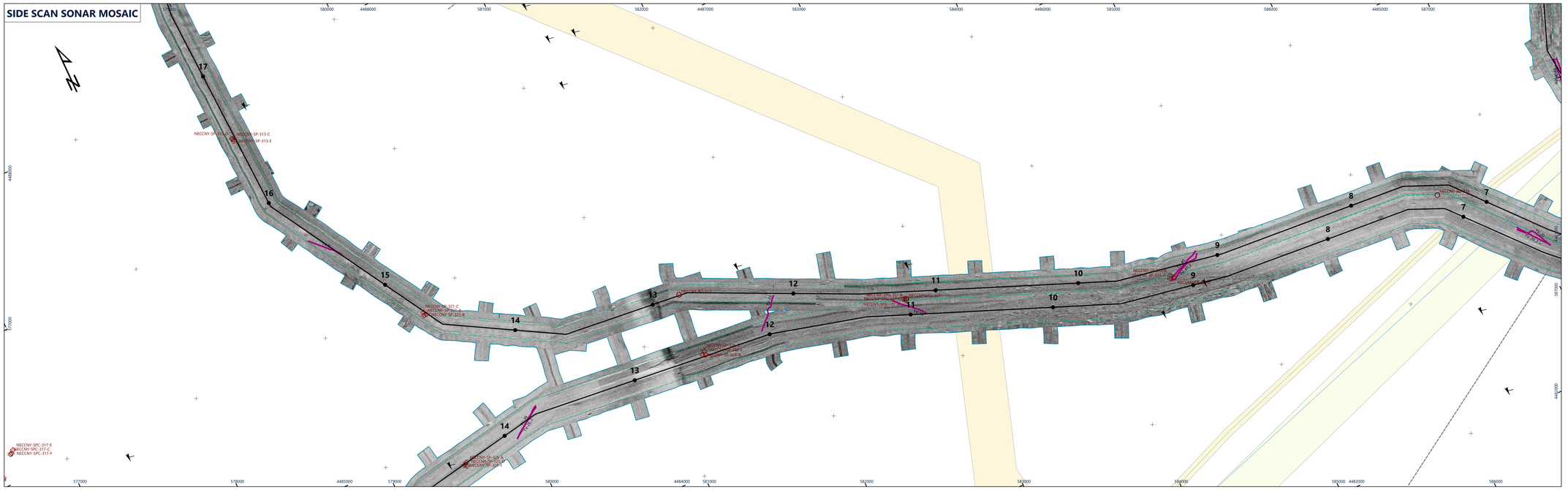
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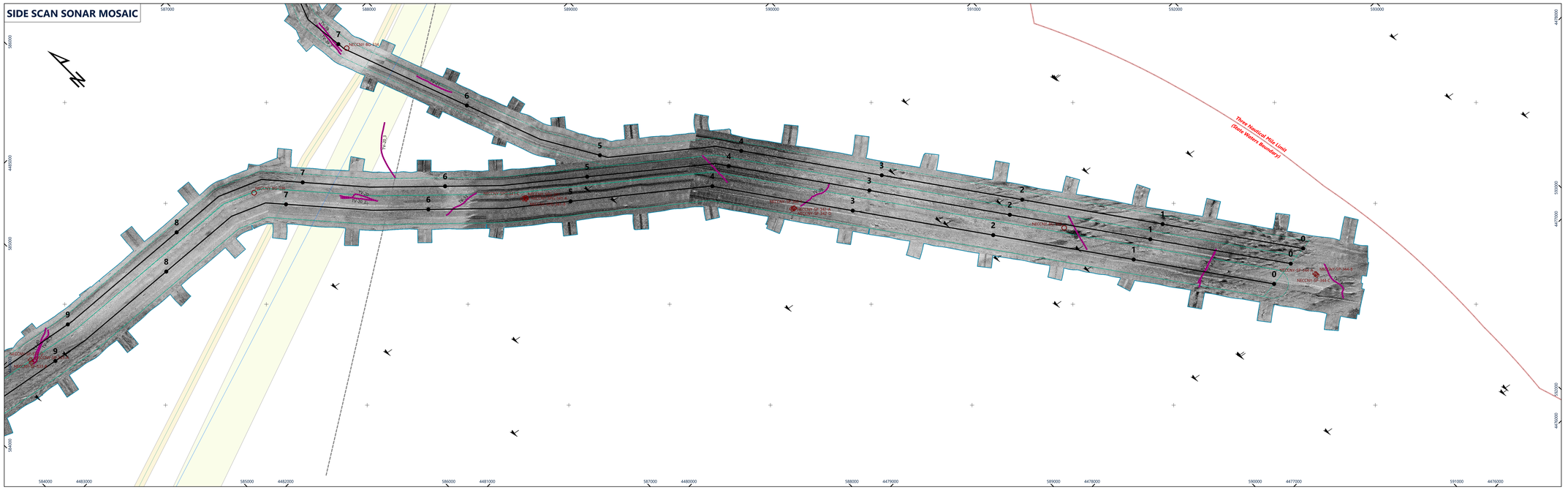
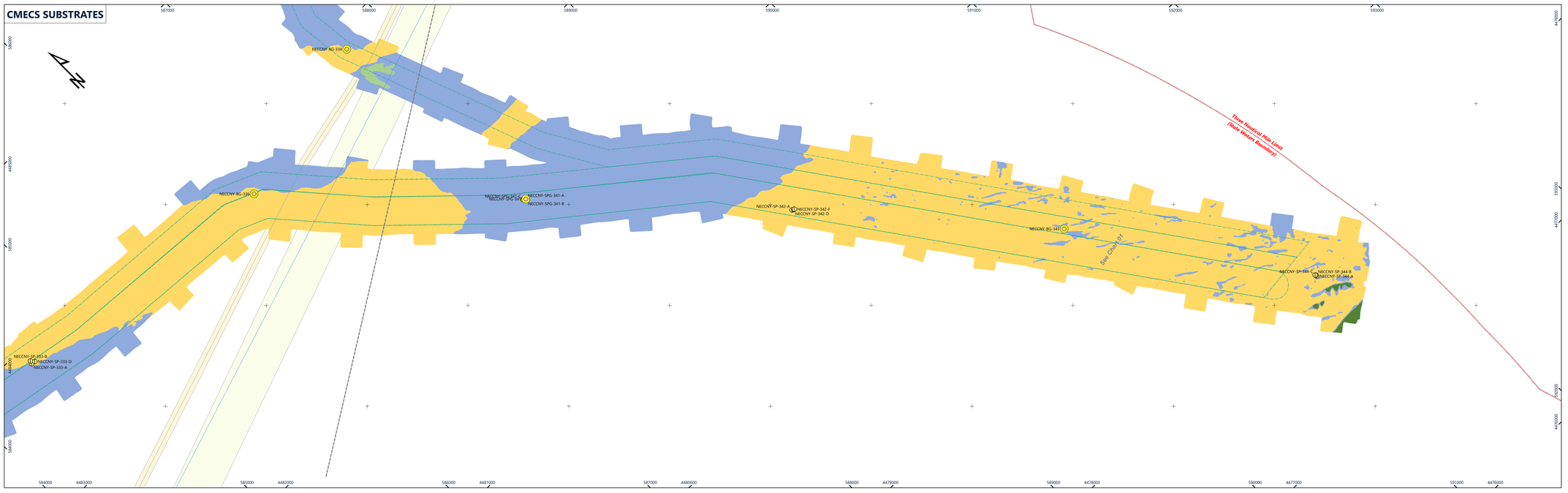
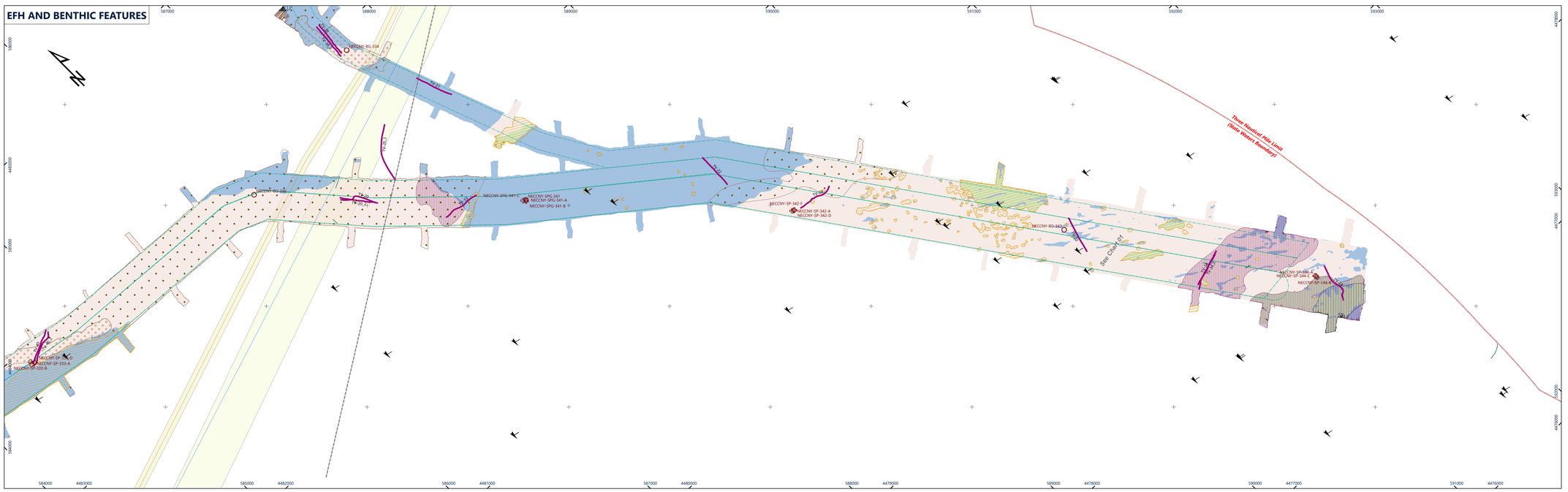
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



EFH AND BENTHIC FEATURES



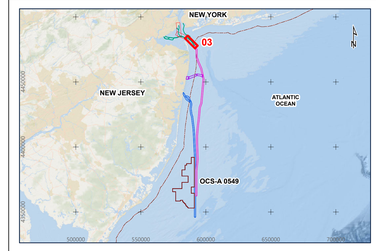
ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 3
OFFSHORE NEW YORK

NORTHERN EXPORT CABLE CORRIDOR
NEW YORK LANDFALL APPROACH ALIGNMENT SHEET - SOUTH BEACH
BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES,
AND EFH BENTHIC FEATURES

2023 Chart No. E05C

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
- Northern Export Cable Corridor Trunk
- Lease Area OCS-A 0549
- Monmouth Export Cable Corridor
- Northern Export Cable Corridor New York Landfall Approaches
- Northern Export Cable Corridor New Jersey Landfall Approach
- Cables (Active)
- Cables (Inactive)
- Shipwrecks (AWOIS and ENC)
- 10 Export Cable Corridor and Indicative Centerline Stationing at 1-km intervals are labeled
- Submarine Cables (NOAA)
- Pipeline Areas
- Submarine Cable Areas

DATA EXTENTS

- Northern Export Cable Corridor New York Landfall Approach Extent
- Northern Export Cable Corridor New York Landfall Approach SSS Data Extent

BENTHIC SAMPLING LOCATIONS

This chart symbolizes benthic samples taken from several surveys conducted in 2022 by various contractors.

- Towed Video Transects (RPS, 2022)
- Benthic Sample - Grab (Fugro, 2022)
- Benthic Sample - SPI-PV (Fugro, 2022)

CMECS SUBSTRATES

- Gravel-Gravel Mixes
- Gravelly
- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

GRAB SAMPLE LOCATIONS (Fugro, 2022)

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

NMFS ESSENTIAL FISH HABITAT (EFH)

Composite benthic features layers indicate that more than one benthic feature is present in the same geographic area

ESSENTIAL FISH HABITAT CLASSIFICATION

- Complex
- Heterogeneous Complex
- Soft

- Gravel-Gravel Mixes
- Gravelly Mud, Gravelly Muddy Sand
- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

Wentworth Grain Size Composition (Center symbol represents CMECS substrate classification)

- Gravel (%)
- Sand (%)
- Mud (%)

BENTHIC FEATURES

- Seabed Scars
- Dredged Area - Trench
- Surficial Interbedded Deposits
- Megaripples
- Ripples

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

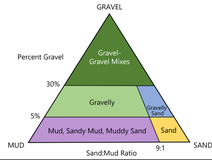
CMECS Substrate Group and Substrate Subgroup

- Sand/Very Coarse/Coarse Sand
- Sand/Fine/Very Fine Sand; Sand/Medium Sand

SIDE SCAN SONAR
REFLECTIVITY

HIGH
LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



NOTES

1) The coordinate grid is in NAD1983 UTM Zone 18N, meters.
2) S.T. Hudson Engineers, Inc. collected (non-continuously) geophysical data in the Northern ECC New York Landfall Approaches survey area from 25 April 2022 to 24 June 2022 on board the M/V *Bella Marie* and benthic data from 27 May 2022 to 16 July 2022 on board the R/V Yeti.
3) Reported lease block information is based on Fugro's GIS database. Cable locations were provided by Atlantic Shores on January 5th, 2021.
4) Obstructions and shipwrecks were obtained from the Automated Wrecks and Obstructions Information System (AWOIS) and Electronic Navigational Charts (ENC), NOAA (2021).
5) Maritime Boundaries are provided by NOAA Nautical Charts (2019). Federal/State Boundaries are provided by BOEM Digital Offshore Cadastre (DOC), Atlantic83, Submerged Lands Act (SLA) Boundary.
6) EFH habitat delineations and characterization of benthic features charted here are in reference to NMFS' letter to BOEM dated March 29, 2021 regarding "Updated Recommendations for Mapping Fish Habitat".
7) Neither vegetated habitats nor submerged aquatic vegetation (SAV) has been charted in the survey area.
8) Biotic classification (NMFS Modified CMECS) of grab samples (Terrasond, 2019 and Fugro, 2020, 2022), GrabCam video (Fugro, 2020, 2022), and towed video transects (RPS, 2021) are reported in the COP Volume II - Affected Environment. SPI-PV biotic classification is reported in 2022 COP MSIR Volume 3.
9) The hard-edges are due to survey boundary limitations and seasonal changes in sediment, sediments transport. and movement of morphological features.
10) Seabed scars caused by fishing activities is seasonal and annually changing, and may not be present in all interpreted datasets due to time of year that the data were collected.
11) Permanent obstructions and buoys inhibited the collection of data at certain locations within the survey area.
12) SSS mosaic bin size is 0.25 m, 600 kHz frequency.

EQUIPMENT

Vessel(s):
S.T. Hudson *Yeti*, and *Bella Marie*

Navigation System GPS Primary:
Applanix POSMV 320 WaveMaster II w/ RTK

Multibeam System:
Norbit Winghead i77h

Side Scan Sonar:
EdgeTech 4205 SSS (600/900) kHz frequencies

USBL System:
Sonardyne MiniRanger2 USBL

SPI-PV (Fugro, 2022)
Dual camera system from Ocean Imaging System (OIS) with Nikon D7100 24-megapixel high resolution digital camera for sediment profile imagery (SPI) and an OIS Model DSC 24000 24-megapixel underwater camera for plan view (PV) imagery

GrabCam (Fugro, 2022)
Ted Young-Modified Van Veen Grab dual 0.04 m^2 bucket sampler equipped with Fugro's real-time GrabCam video system

Towed Video (2022)
Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

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GEODETIC PARAMETERS

GEODETIC DATUM	North American Datum 1983
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000 m
Inverse Flattening	298.257222101
PROJECTION	UNIVERSAL TRANSVERSE MERCATOR / Zone 18N *(EPSG 26918)*
Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,000 mE
False Northing	0 mN
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

Scale 1 : 10,000 at 42" x 52" page size

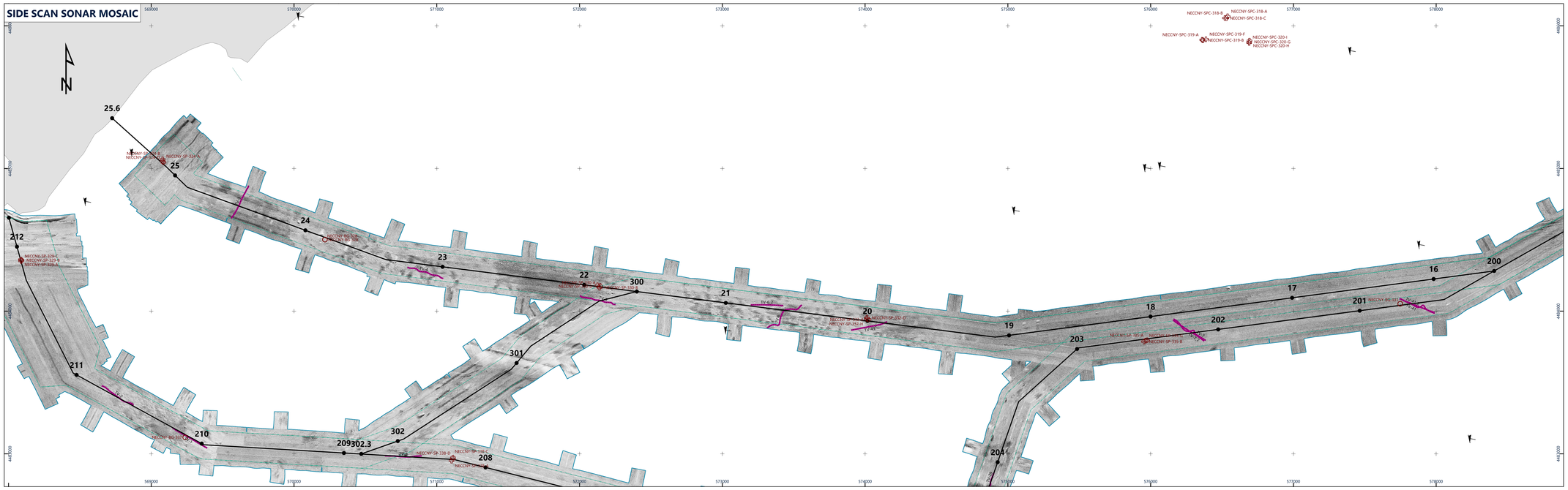
0 100 200 300 400 500 600 700 800 900 1,000 Meters

0 600 1,200 1,800 2,400 3,000 3,600 Feet

Issue No:	Date:	Description:	Drawn:	Checked:	Approved:
01	1/18/2023	DRAFT - For Review	RG	DK	DD
02	3/2/2023	FINAL - Issued For Approval	SC, KR	DK	DD

Project No:	Chart Name:	Chart No:
02.22030006	22030006_NECC_SB_ESC	05 of 06

SIDE SCAN SONAR MOSAIC



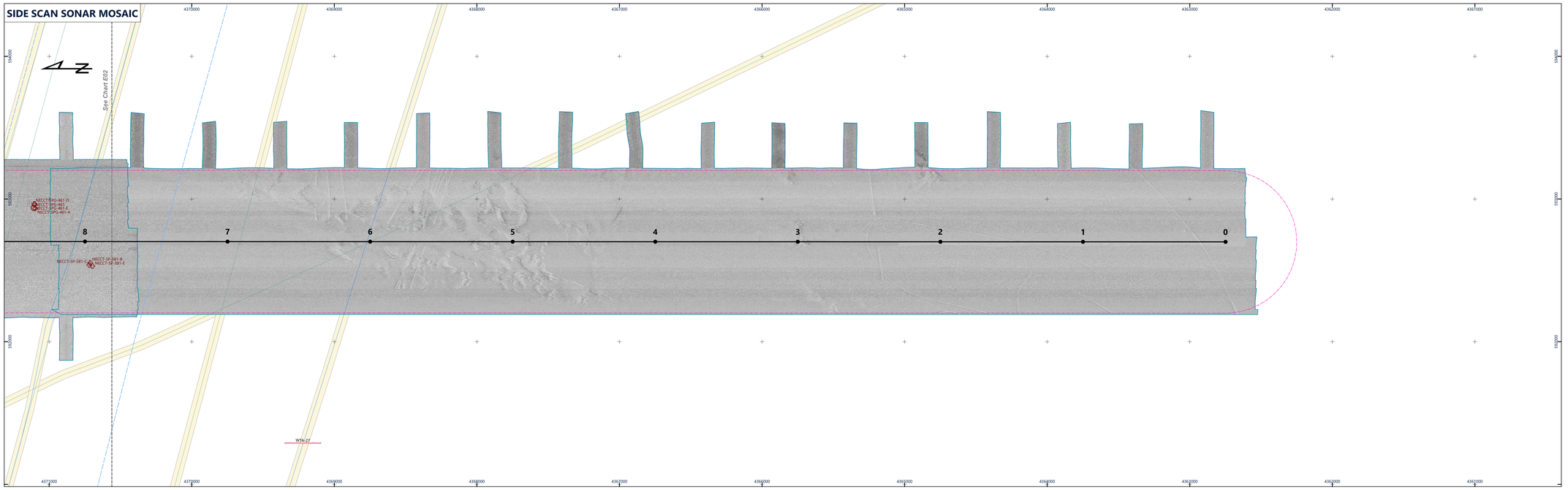
Attachment 3

Benthic Habitat Maps – 1:10,000 Scale

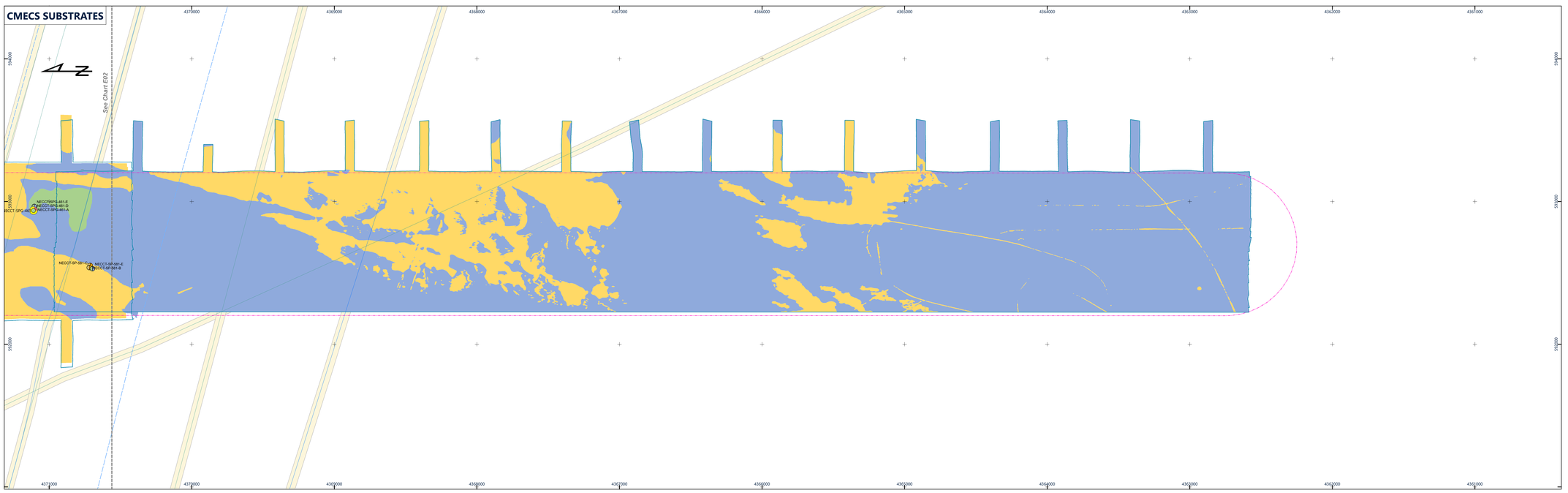
Northern Export Cable Corridor

Note: Atlantic Shores has updated the Project Design Envelope to include the following landfall sites: Monmouth Landfall Site, Asbury Landfall Site, Kingsley Landfall Site, Lemon Creek Landfall Site, Wolfe's Pond Landfall Site, and Fort Hamilton Landfall Site. The information included in this report demonstrates the complteness of Atlantic Shores' multi-year development efforts and should be considered representative for the Project. For Additional Information regarding the layout of the Project, please refer to COP VOlume I Project Information, Section 1.0 Introduction and 4.7 Landfall Sites, as well as Figure 1.1-2 Project Overview.

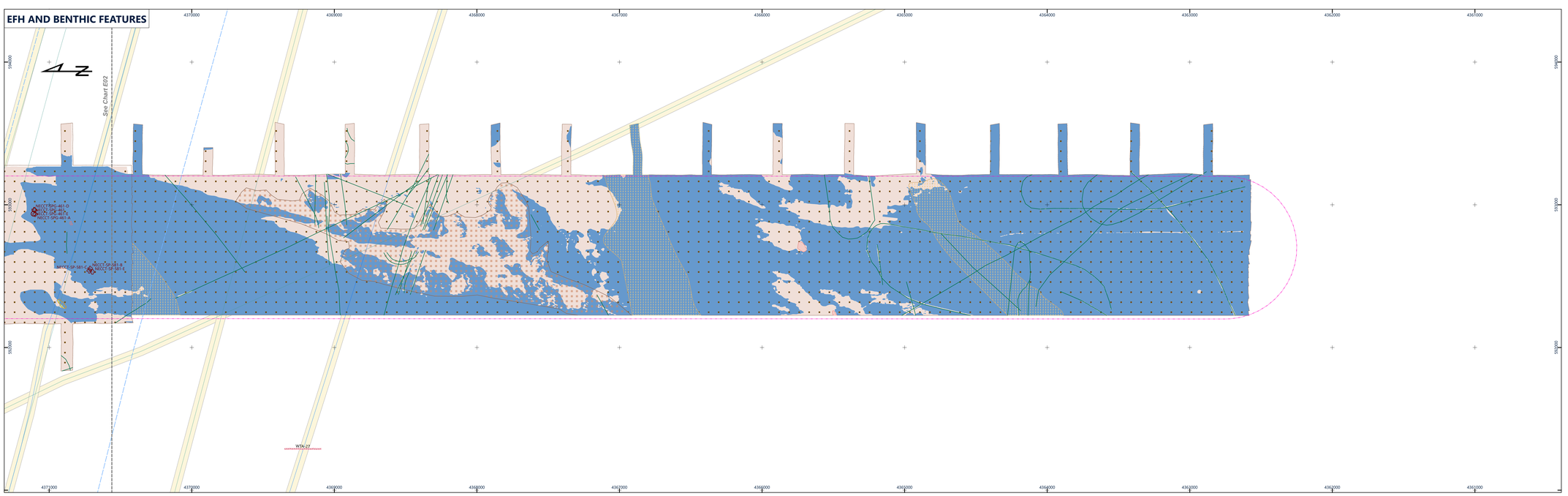
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



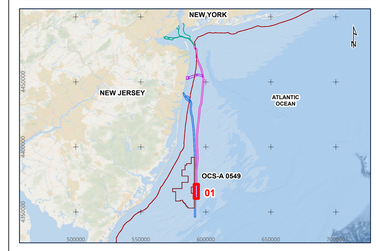
EFH AND BENTHIC FEATURES



ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 2
OFFSHORE NEW JERSEY
NORTHERN EXPORT CABLE CORRIDOR
ALIGNMENT SHEET - BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES
2023 Chart No. E01

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
- Northern Export Cable Corridor Trunk
- Lease Area OCS-A 0549
- Monmouth Export Cable Corridor
- Northern Export Cable Corridor New York Landfall Approaches
- Northern Export Cable Corridor New Jersey Landfall Approach
- Cables (Active)
- Cables (Inactive)
- Submarine Cables (NOAA)
- Pipeline Areas
- Submarine Cable Areas
- 10 — Export Cable Corridor and Indicative Centerline Stationing at 1-km intervals are labeled

DATA EXTENTS

- Northern Export Cable Corridor Trunk Landfall Approach Extent
- Northern Export Cable Corridor Trunk Landfall Approach SSS Data Extent

BENTHIC SAMPLING LOCATIONS

This chart symbolizes benthic samples taken from several surveys conducted in 2022 by various contractors.

- Towed Video Transects (RPS, 2021)
- Benthic Sample - Grab (Fugro, 2022)
- Benthic Sample - SPI-PV (Fugro, 2022)

CMECS SUBSTRATES

- Gravel-Gravel Mixes
- Gravelly
- Gravelly Sand
- Sand

NMFS ESSENTIAL FISH HABITAT (EFH)

Composite benthic features layers indicate that more than one benthic feature is present in the same geographic area

ESSENTIAL FISH HABITAT CLASSIFICATION

- Complex
- Heterogeneous Complex
- Soft

BENTHIC FEATURES

- Seafloor Scarps
- Seabed Scars
- Irregular Seafloor Areas
- Localized Relief Features
- Ripples

GRAB SAMPLE LOCATIONS (Fugro, 2022)

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

- Gravel-Gravel Mixes
- Gravelly Mud, Gravelly Muddy Sand
- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

Wentworth Grain Size Composition (Center symbol represents CMECS substrate classification)

- Gravel (%)
- Sand (%)
- Mud (%)

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

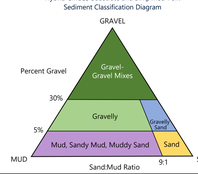
CMECS Substrate Group and Substrate Subgroup

- Gravelly/Gravelly Sand
- Sand/Very Coarse/Coarse Sand

SIDE SCAN SONAR REFLECTIVITY

HIGH — LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



NOTES

1) The coordinate grid is in NAD1983 UTM Zone 18N, meters.
2) Fugro collected (non-continuously) geophysical and geotechnical data in the Northern ECC Trunk survey area from 14 October 2021 to 13 September 2022 and benthic data from 27 May 2022 to 16 July 2022. Geophysical and geotechnical data were acquired in the South Monmouth Ext. Reroute previously in 2021 (Fugro, 2021d).
3) Reported lease block information is based on Fugro's GIS database. Cable locations were provided by Atlantic Shores on January 5th, 2021.
4) Obstructions and shipwrecks were obtained from the Automated Wrecks and Obstructions Information System (AWOIS) and Electronic Navigational Charts (ENC), NOAA (2021).
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11) Seabed scars caused by fishing activities is seasonal and annually changing, and may not be present in all interpreted datasets due to time of year that the data were collected.
12) SSS mosaic bin size is 0.25 m, 600 kHz frequency.
13) The proposed Northern ECC Trunk is intended to accommodate one or more export cables. The precise cable route(s) have not yet been defined. Therefore, an indicative cable corridor centerline was developed and implemented for the Cable Burial Risk Assessment study and shown here for cross correlation. Please see report text for additional details.

EQUIPMENT

Vessel(s): Fugro Enterprise	SPI-PV (Fugro, 2022): Dual camera system from Ocean Imaging System (OIS) with Nikon D7100 24-megapixel high resolution digital camera for sediment profile imagery (SPI) and an OIS Model DSC 24000 24-megapixel underwater camera for plan view (PV) imagery
Navigation System GPS Primary: (Fugro Enterprise) Fugro StarPack Global Navigation Satellite System	
Side Scan Sonar: EdgeTech 4205 SSS (300/600 kHz frequencies)	GrabCam (Fugro, 2022): Ted Young-Modified Van Veen Grab dual 0.04 m2 bucket sampler equipped with Fugro's real-time GrabCam video system
USBL System: (Fugro Enterprise) Kongsberg HiPAP 502 USBL system	Towed Video (2022): Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

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Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,000 mE
False Northing	0 mN
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

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0 100 200 300 400 500 600 700 800 900 1,000 Meters
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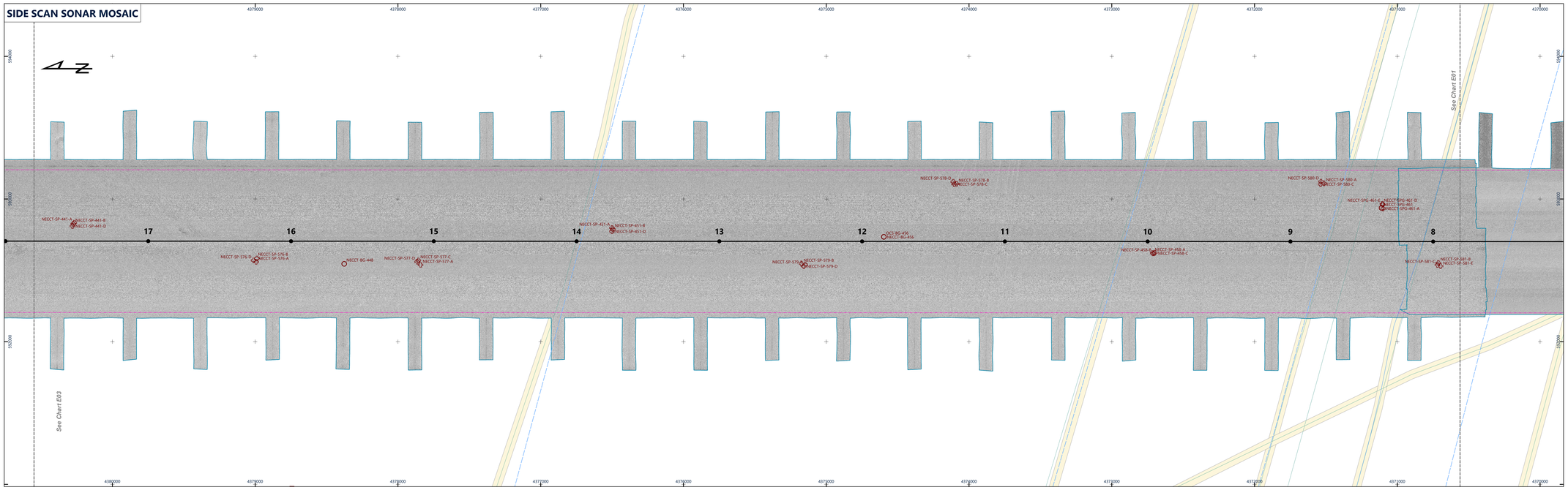
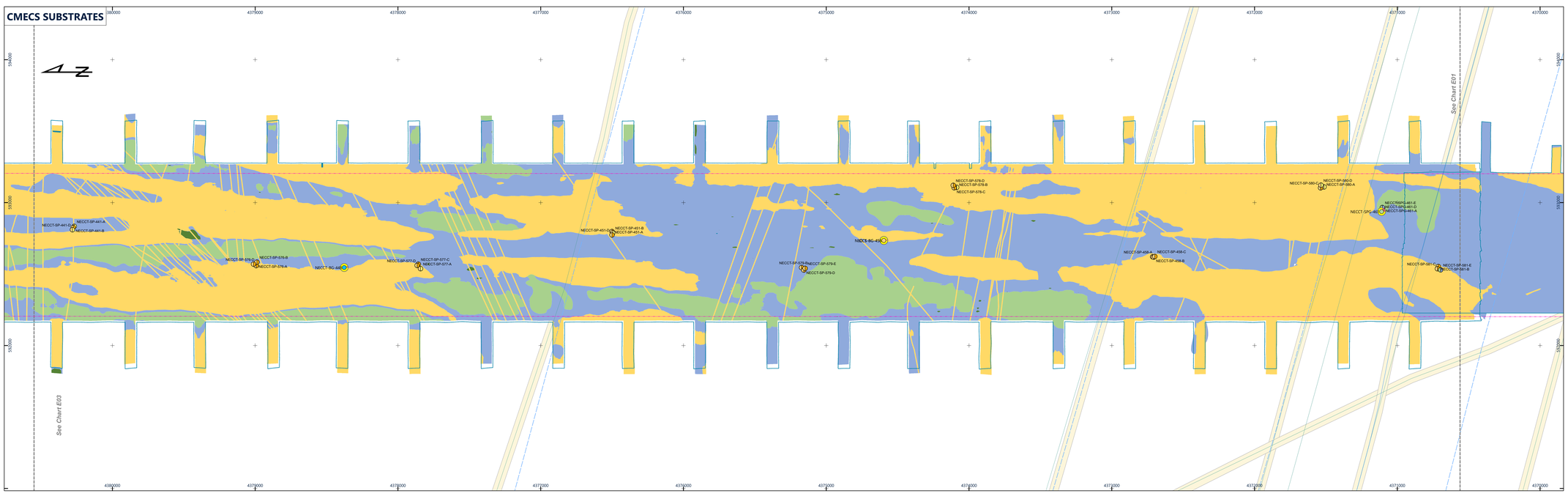
01	1/18/2023	DRAFT - For Review	RG	DK	DD
02	3/1/2023	REVISED - Issued For Approval	SC, KR	DK	DD

Project No:	Chart Name:	Chart No:
02.21030011	21030011_NECCT_01	01 of 12

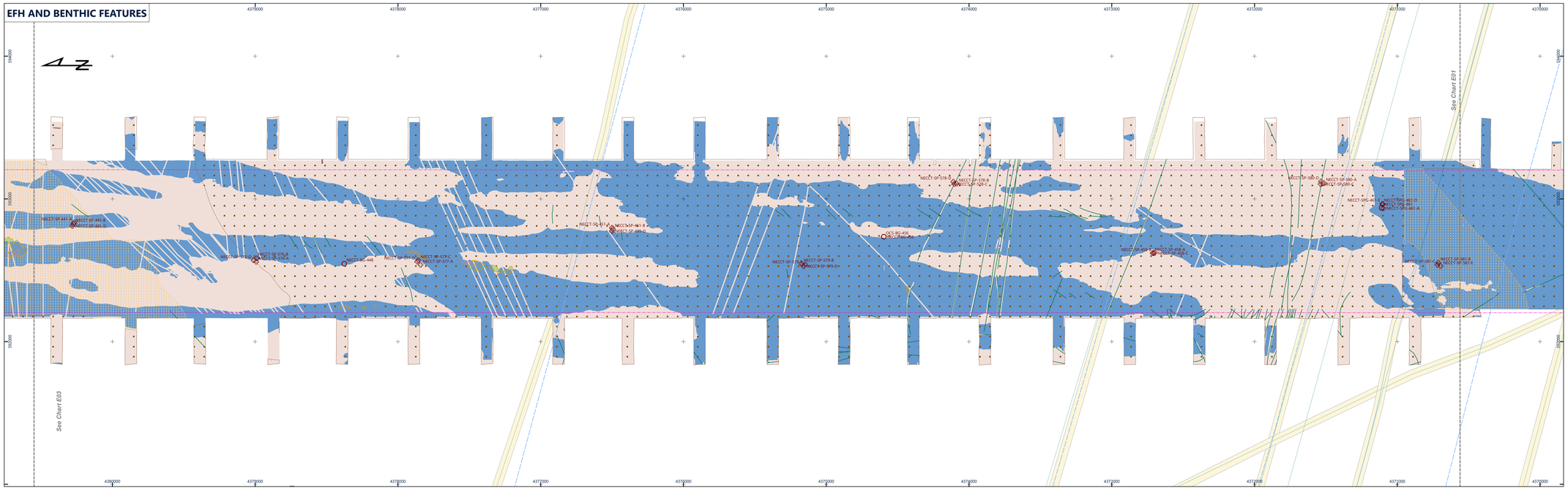
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



EFH AND BENTHIC FEATURES



ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 2
OFFSHORE NEW JERSEY
NORTHERN EXPORT CABLE CORRIDOR
ALIGNMENT SHEET - BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES
2023 Chart No. E02

FUGRO USA MARINE, INC.
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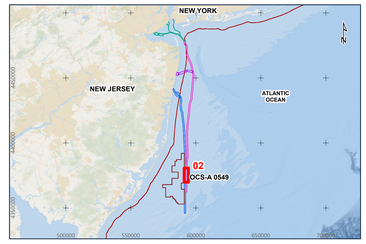
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
- Northern Export Cable Corridor Trunk
- Lease Area OCS-A 0549
- Monmouth Export Cable Corridor
- Northern Export Cable Corridor New York Landfall Approaches
- Northern Export Cable Corridor New Jersey Landfall Approach
- Cables (Active)
- Cables (Inactive)
- 10 — Export Cable Corridor and Indicative Centerline Stationing at 1-km intervals are labeled

DATA EXTENTS

- Northern Export Cable Corridor New York Landfall Approach Extent
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BENTHIC SAMPLING LOCATIONS

This chart symbolizes benthic samples taken from several surveys conducted in 2022 by various contractors.

- Benthic Sample - Grab (Fugro, 2022)
- Benthic Sample - SPI-PV (Fugro, 2022)

CMECS SUBSTRATES

- Gravel-Gravel Mixes
- Gravelly
- Gravelly Sand
- Sand

NMFS ESSENTIAL FISH HABITAT (EFH)

Composite benthic features layers indicate that more than one benthic feature is present in the same geographic area

ESSENTIAL FISH HABITAT CLASSIFICATION

- Complex
- Heterogeneous Complex
- Soft

BENTHIC FEATURES

- Seabed Scars
- Irregular Seafloor Areas
- Localized Relief Features
- Sand Waves
- Ripples

GRAB SAMPLE LOCATIONS (Fugro, 2022)

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

- Gravel-Gravel Mixes
- Gravelly Mud, Gravelly Muddy Sand
- Gravelly Sand
- Sand
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Wentworth Grain Size Composition (Center symbol represents CMECS substrate classification)

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- Sand (%)
- Mud (%)

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

CMECS Substrate Group and Substrate Subgroup

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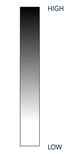
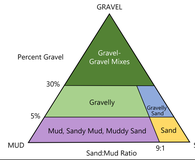
SIDE SCAN SONAR
REFLECTIVITY



Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



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EQUIPMENT

Vessel(s): Fugro Enterprise	SPI-PV (Fugro, 2022) Dual camera system from Ocean Imaging System (OIS) with Nikon D7100 24-megapixel high resolution digital camera for sediment profile imagery (SPI) and an OIS Model DSC 24000 24-megapixel underwater camera for plan view (PV) imagery
Navigation System GPS Primary: (Fugro Enterprise) Fugro StarPack Global Navigation Satellite System	
Side Scan Sonar: EdgeTech 4205 SSS (300/600 kHz frequencies)	GrabCam (Fugro, 2022) Ted Young-Modified Van Veen Grab,dual 0.04 m2 bucket sampler equipped with Fugro's real-time GrabCam video system
USBL System (Fugro Enterprise) Kongsberg HiPAP 502 USBL system	Towed Video (2022) Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

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GEODETIC PARAMETERS

GEODETIC DATUM	North American Datum 1983
ELLIPSOID	GRS 1980
Semi-Major Axis	6,378,137.000 m
Inverse Flattening	298.257222101
PROJECTION	UNIVERSAL TRANSVERSE MERCATOR / Zone 18N *(EPSG 26918)*
Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,000 mE
False Northing	0 mN
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

Scale 1 : 10,000 at Arch 42" x 52" page size

0 100 200 300 400 500 600 700 800 900 1,000 Meters

0 600 1,200 1,800 2,400 3,000 3,600 Feet

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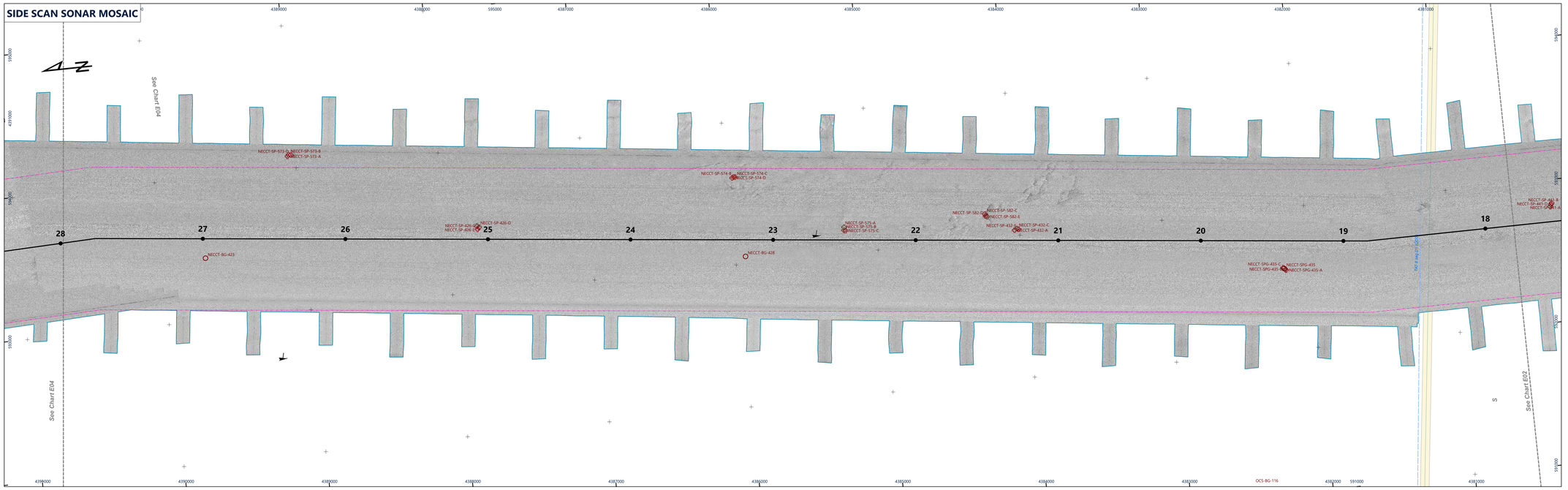
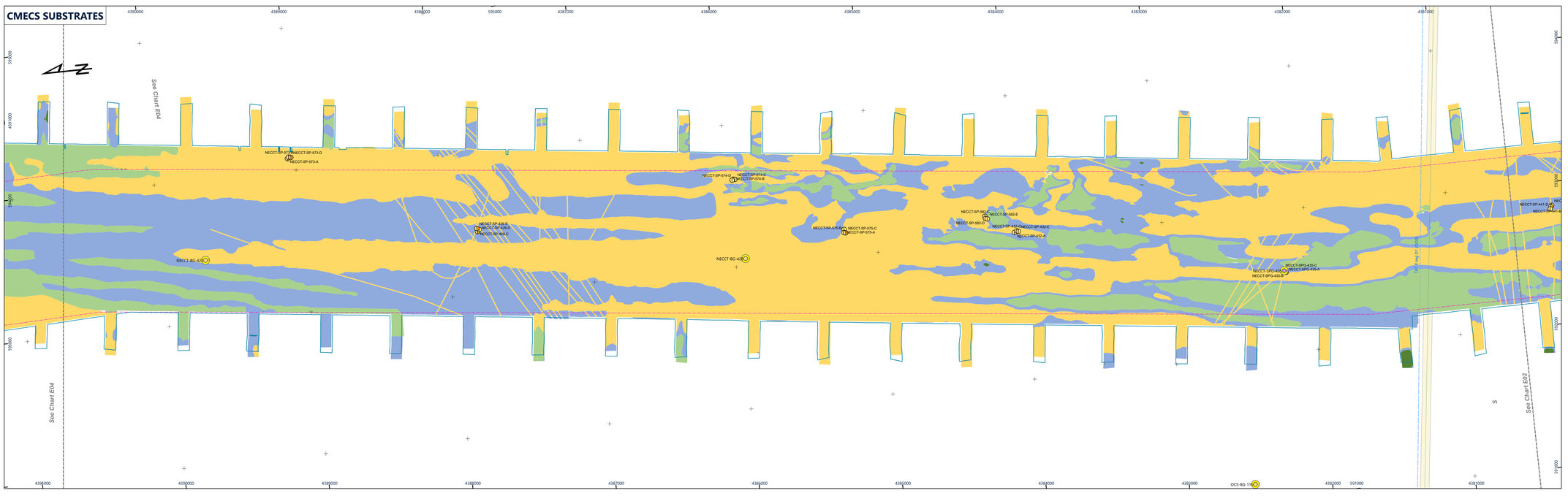
02	3/1/2023	REVISED - Issued For Approval	SC, KR	DK	DD

Project No:	Chart Name:	Chart No:
02.21030011	21030011_NECCT_02	02 of 12

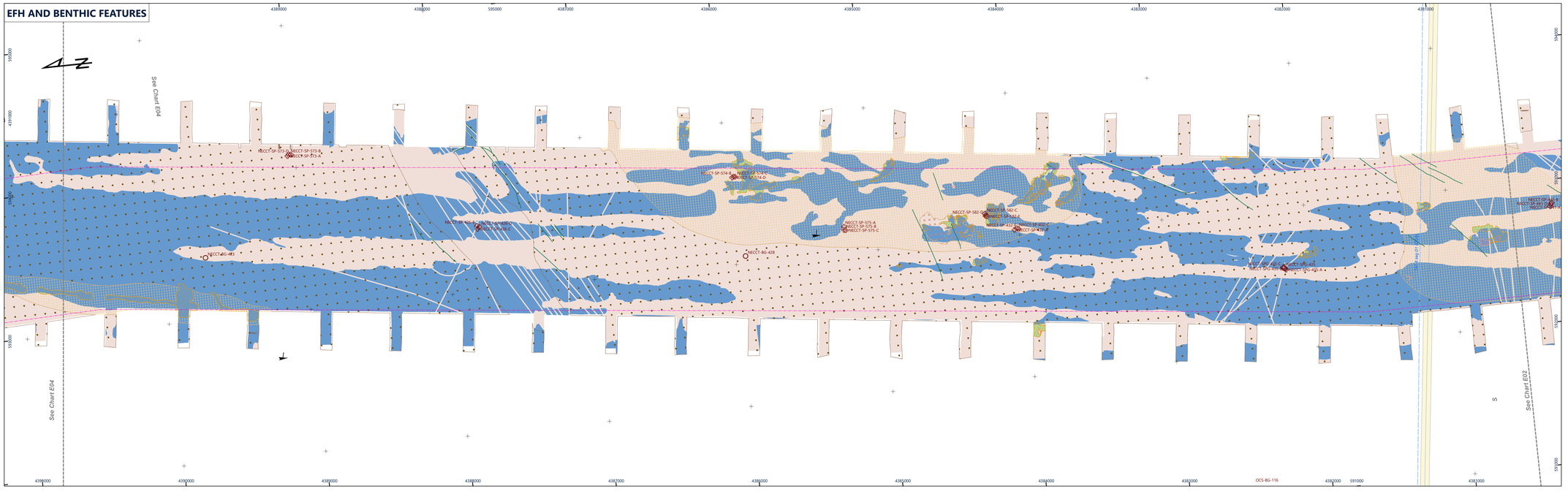
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



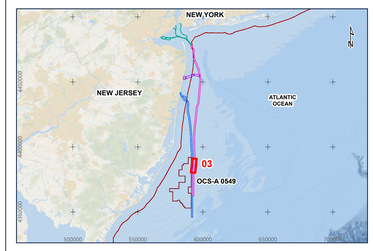
EFH AND BENTHIC FEATURES



ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 2
OFFSHORE NEW JERSEY
NORTHERN EXPORT CABLE CORRIDOR
ALIGNMENT SHEET - BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES
2023 Chart No. E03

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
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- Monmouth Export Cable Corridor
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- Pipeline Areas
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DATA EXTENTS

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BENTHIC FEATURES

- Seabed Scars
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- Sand Waves
- Megaripples
- Ripples

BOULDERS / DEBRIS

CMECS SUBSTRATES

- Gravel-Gravel Mixes
- Gravelly
- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

GRAB SAMPLE LOCATIONS (Fugro, 2022)

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CMECS Substrate Group and Substrate Subgroup

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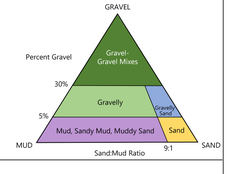
SIDE SCAN SONAR REFLECTIVITY

HIGH … LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



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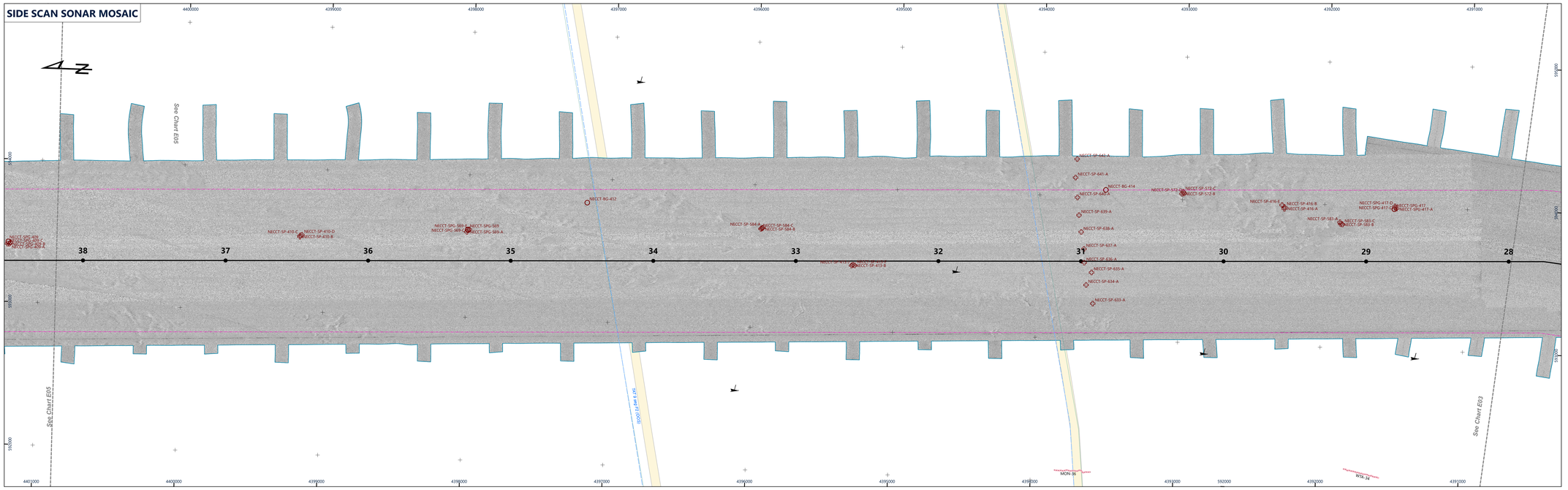
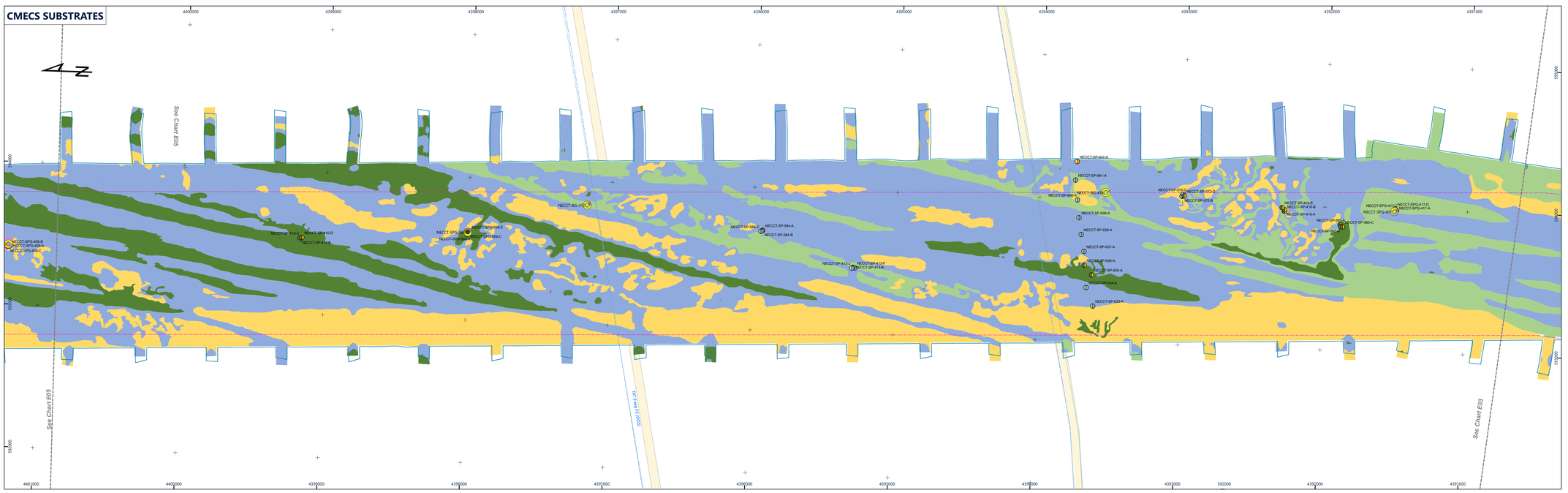
02	3/1/2023	REVISED - Issued For Approval	SC, KR	DK	DD

Project No:	Chart Name:	Chart No:
02.21030011	21030011_NECCT_03	03 of 12

SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



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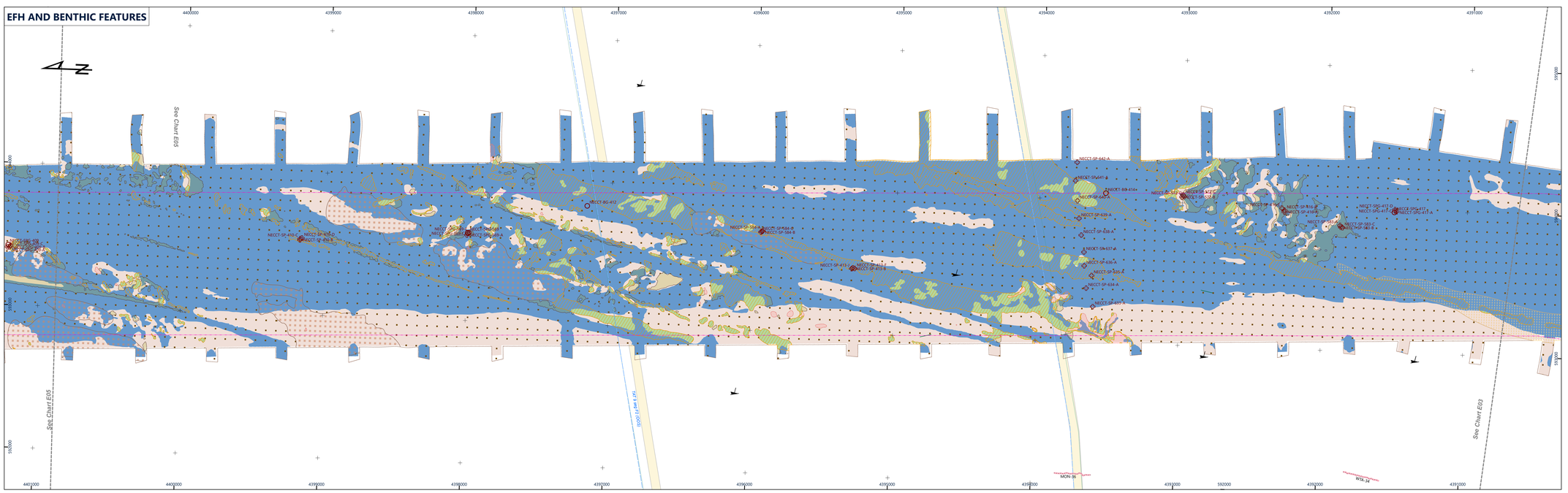

ATLANTIC SHORES offshore wind

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INTEGRATED GEOPHYSICAL & GEOTECHNICAL
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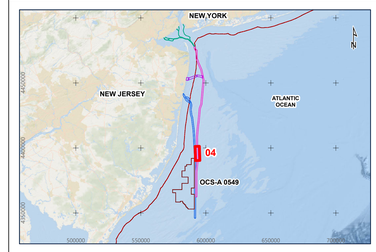
2023 Chart No. E04

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



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HIGH — LOW

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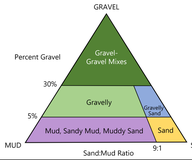

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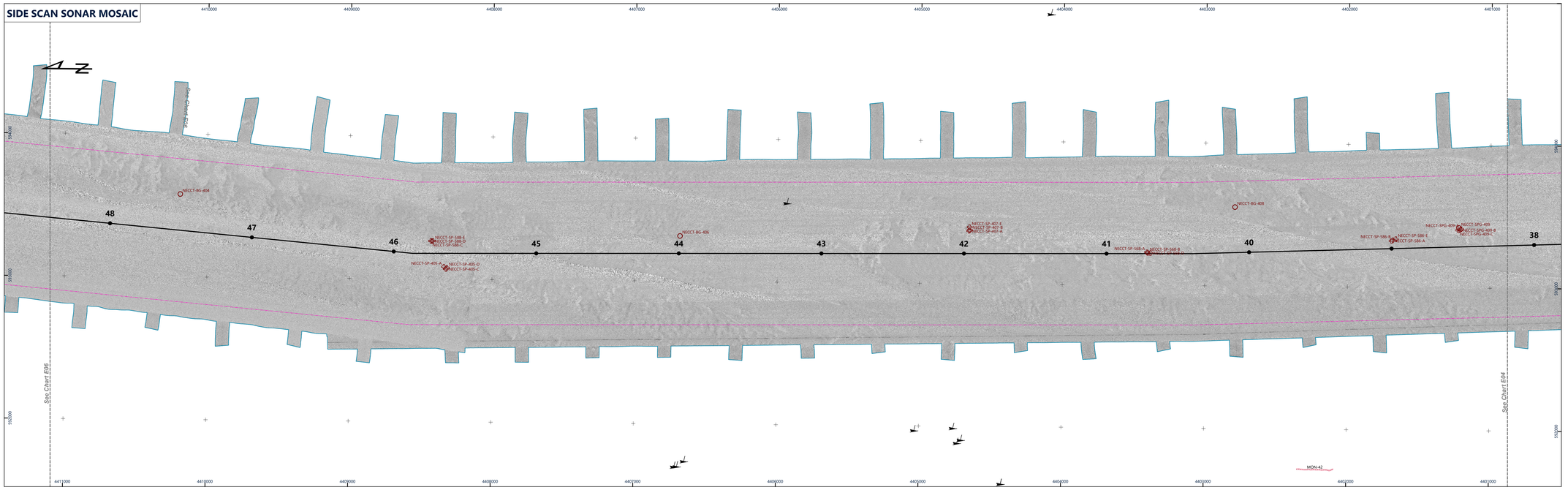
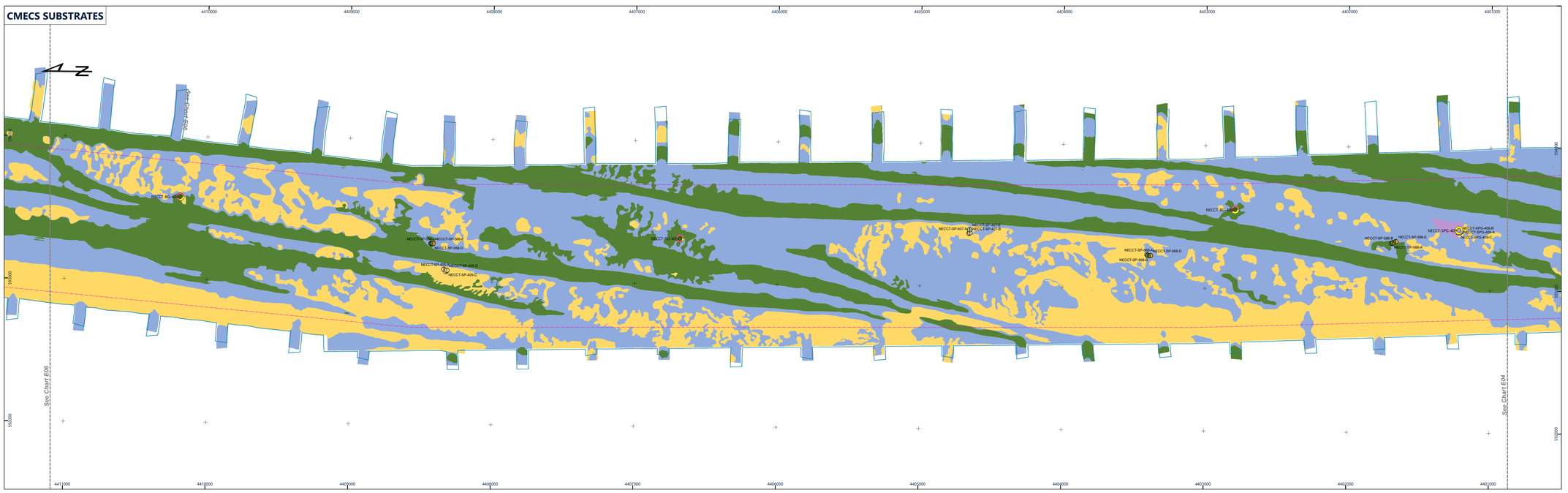
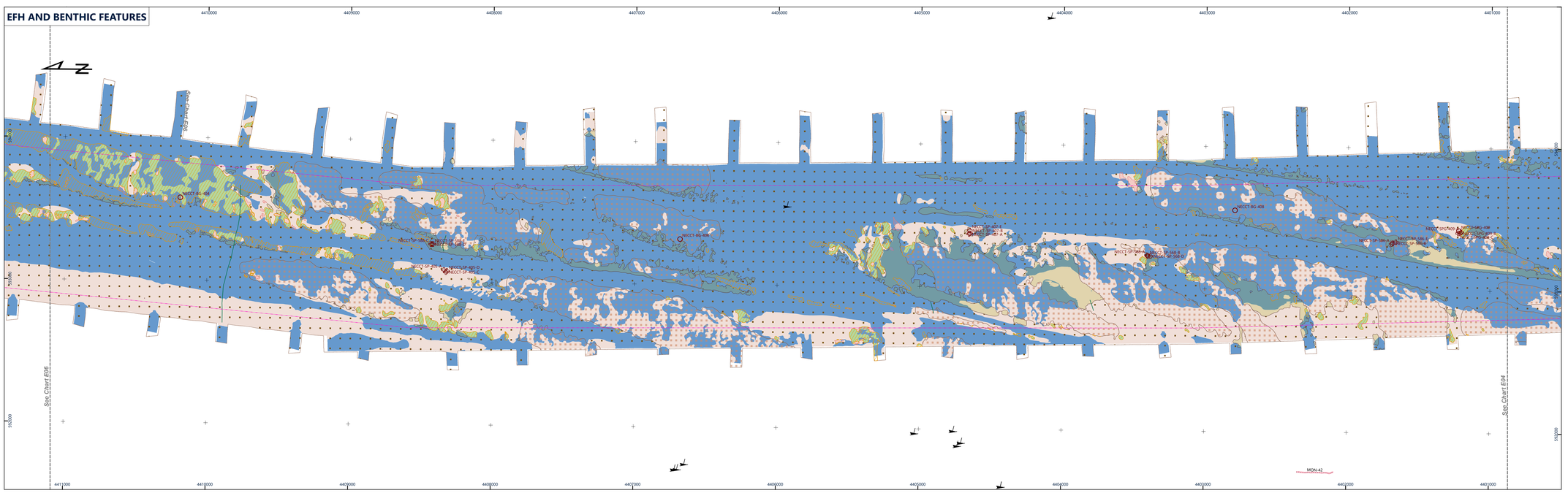
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



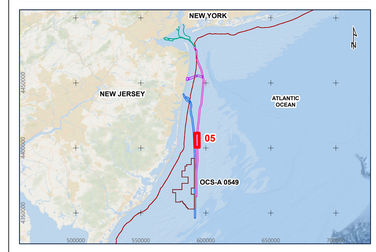
EFH AND BENTHIC FEATURES



ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 2
OFFSHORE NEW JERSEY
NORTHERN EXPORT CABLE CORRIDOR
ALIGNMENT SHEET - BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES
2023 Chart No. E05

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
- Northern Export Cable Corridor Trunk
- Lease Area OCS-A 0549
- Monmouth Export Cable Corridor
- Northern Export Cable Corridor New York Landfall Approaches
- Northern Export Cable Corridor New Jersey Landfall Approach

10 — Export Cable Corridor and Indicative Centerline Stationing at 1-km intervals are labeled

DATA EXTENTS

- Northern Export Cable Corridor New York Landfall Approach Extent
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BENTHIC SAMPLING LOCATIONS

This chart symbolizes benthic samples taken from several surveys conducted in 2022 by various contractors.

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- Gravel-Gravel Mixes
- Gravelly Sand
- Sand
- Mud, Sandy Mud, Muddy Sand

NMFS ESSENTIAL FISH HABITAT (EFH)

Composite benthic features layers indicate that more than one benthic feature is present in the same geographic area

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BENTHIC FEATURES

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- Irregular Seafloor Areas
- Localized Relief Features
- Megaripples
- Ripples

GRAB SAMPLE LOCATIONS (Fugro, 2022)

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

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Wentworth Grain Size Composition (Center symbol represents CMECS substrate classification)

- Gravel (%)
- Sand (%)
- Mud (%)

SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

CMECS Substrate Group and Substrate Subgroup

- Gravels/Pebble/Granule
- Gravel Mixes/Sandy Gravel
- Gravelly/Gravelly Sand
- Sand/Very Coarse/Coarse Sand
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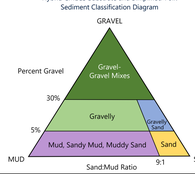
SIDE SCAN SONAR REFLECTIVITY

HIGH — LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



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EQUIPMENT

Vessel(s):
Fugro Enterprise

Navigation System GPS Primary:
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Side Scan Sonar:
EdgeTech 4205 SSS (300/600 kHz frequencies)

USBL System:
(Fugro Enterprise) Kongsberg HiPAP 502 USBL system

SPI-PV (Fugro, 2022):
Dual camera system from Ocean Imaging System (OIS) with Nikon D7100 24-megapixel high resolution digital camera for sediment profile imagery (SPI) and an OIS Model DSC 24000 24-megapixel underwater camera for plan view (PV) imagery

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Ted Young-Modified Van Veen Grab dual 0.04 m2 bucket sampler equipped with Fugro's real-time GrabCam video system

Towed Video (2022):
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Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

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02	3/1/2023	REVISED - Issued For Approval	SC, KR	DK	DD

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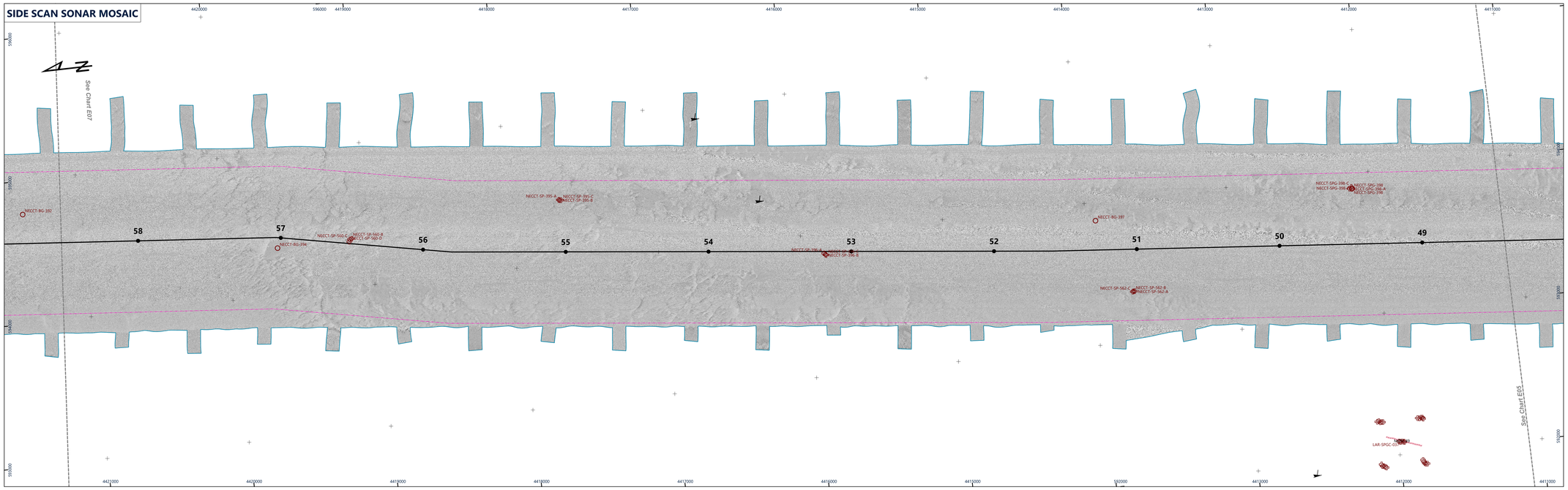
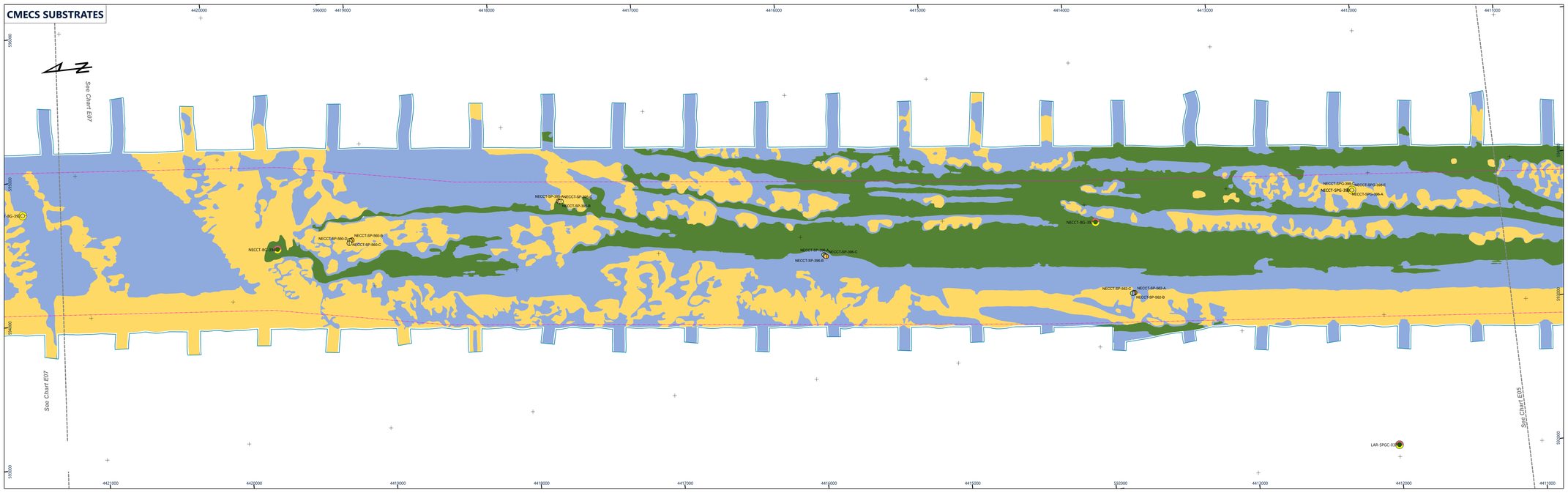
02.21030011	21030011_NECCT_05	05 of 12

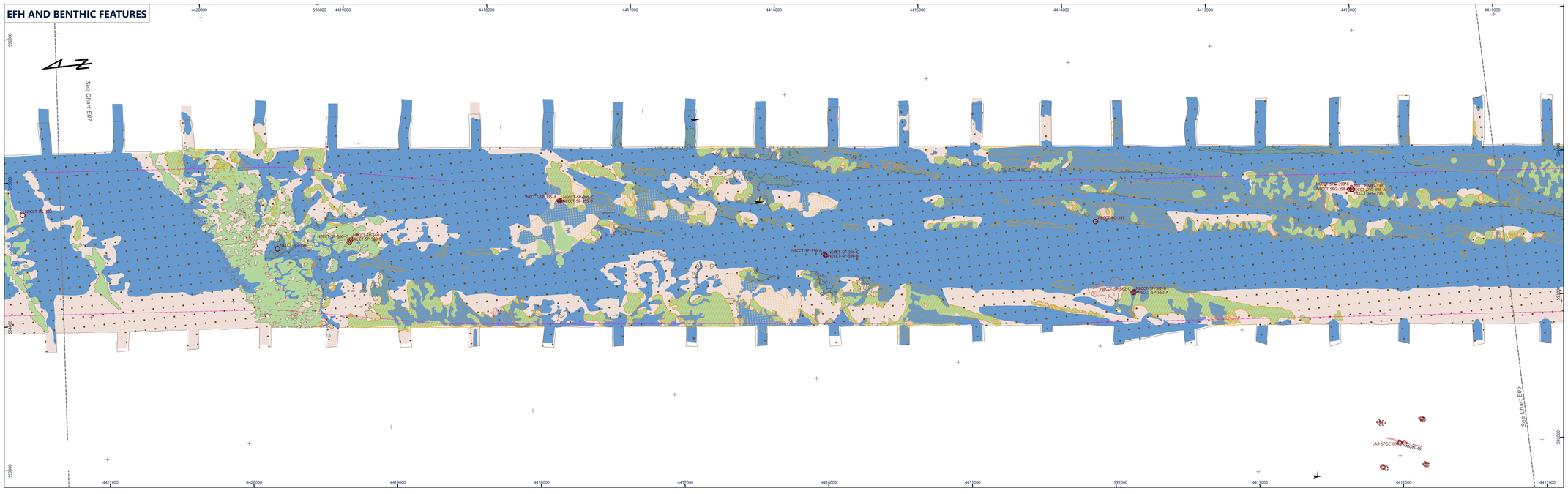
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



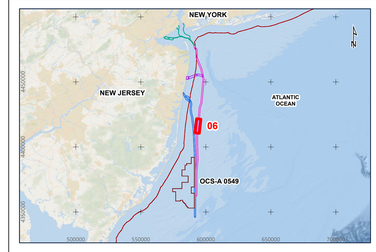
EFH AND BENTHIC FEATURES



ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 2
OFFSHORE NEW JERSEY
NORTHERN EXPORT CABLE CORRIDOR
ALIGNMENT SHEET - BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES
2023 Chart No. E06

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
- Northern Export Cable Corridor Trunk
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- Northern Export Cable Corridor New York Landfall Approaches
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- 10 — Export Cable Corridor and Indicative Centerline Stationing at 1-km intervals are labeled

DATA EXTENTS

- Northern Export Cable Corridor New York Landfall Approach Extent
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BENTHIC SAMPLING LOCATIONS

This chart symbolizes benthic samples taken from several surveys conducted in 2022 by various contractors.

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CMECS SUBSTRATES

- Gravel-Gravel Mixes
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BENTHIC FEATURES

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GRAB SAMPLE LOCATIONS (Fugro, 2022)

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HIGH — LOW

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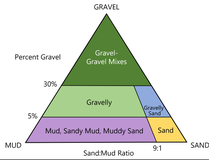

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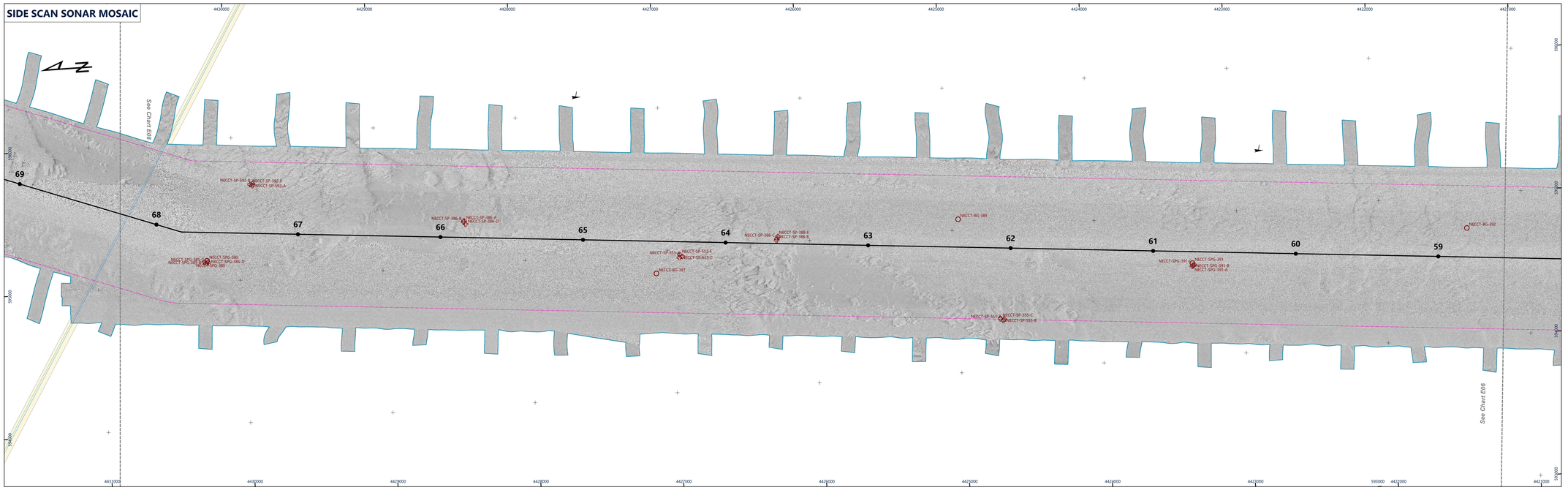
02.21030011	21030011_NECCT_06	06 of 12

SIDE SCAN SONAR MOSAIC



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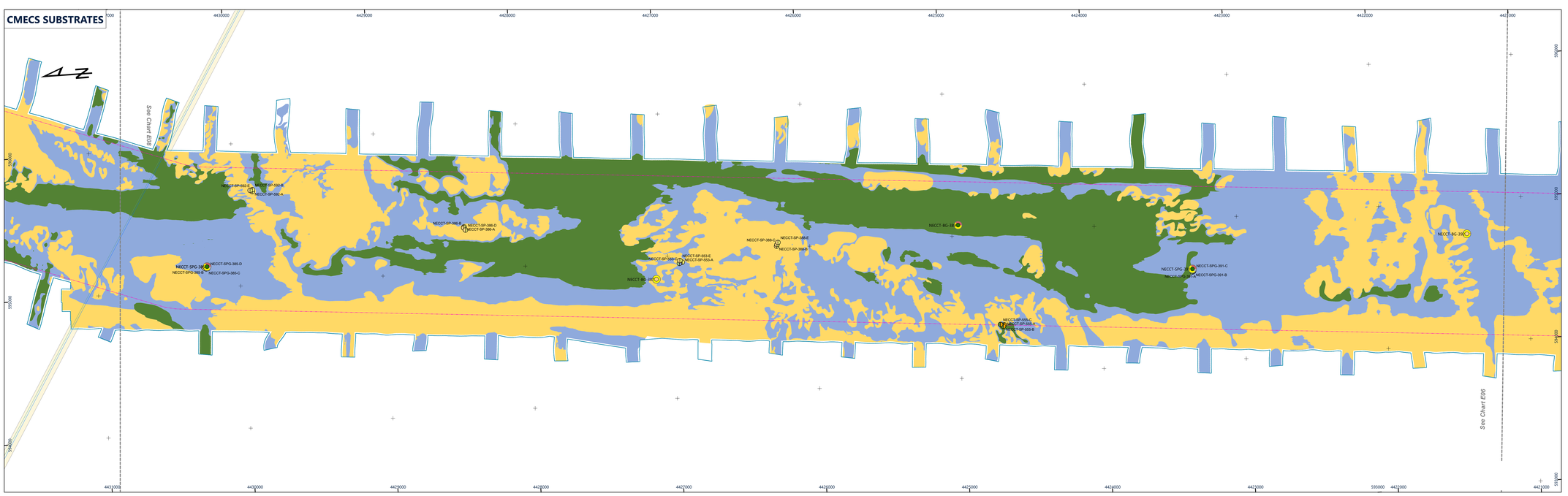

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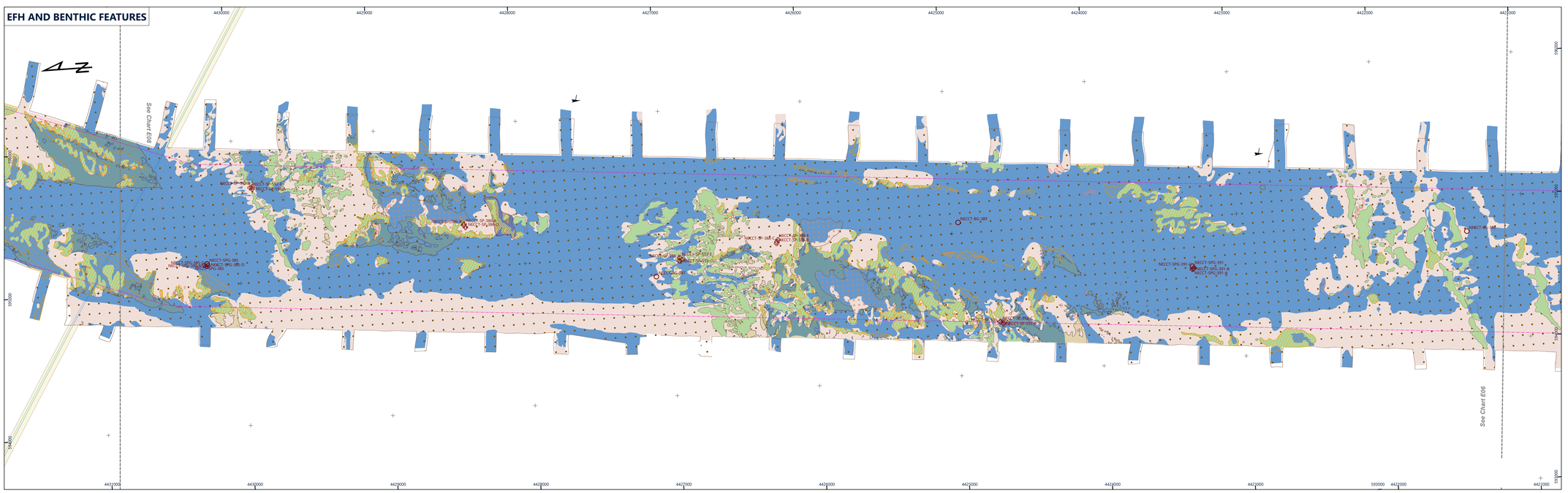

ATLANTIC SHORES offshore wind

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INTEGRATED GEOPHYSICAL & GEOTECHNICAL
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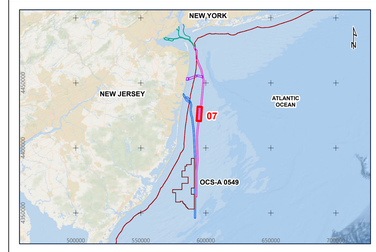
ALIGNMENT SHEET - BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES
2023 Chart No. E07

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



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- Pipeline Areas
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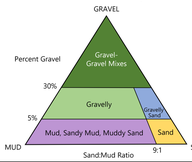

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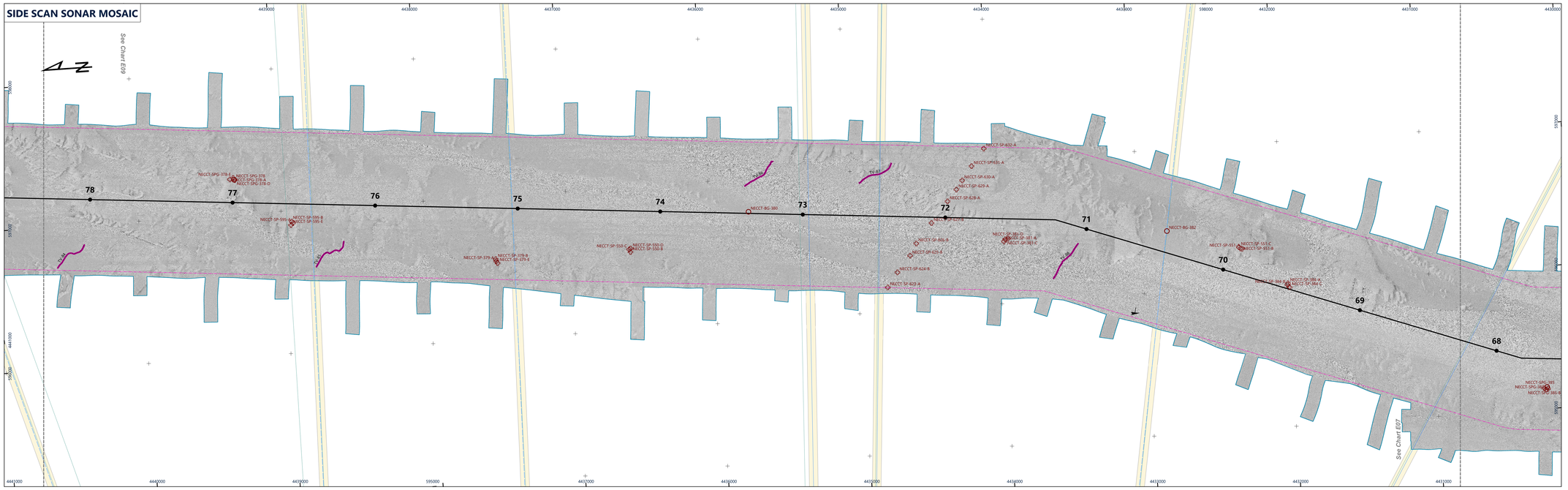
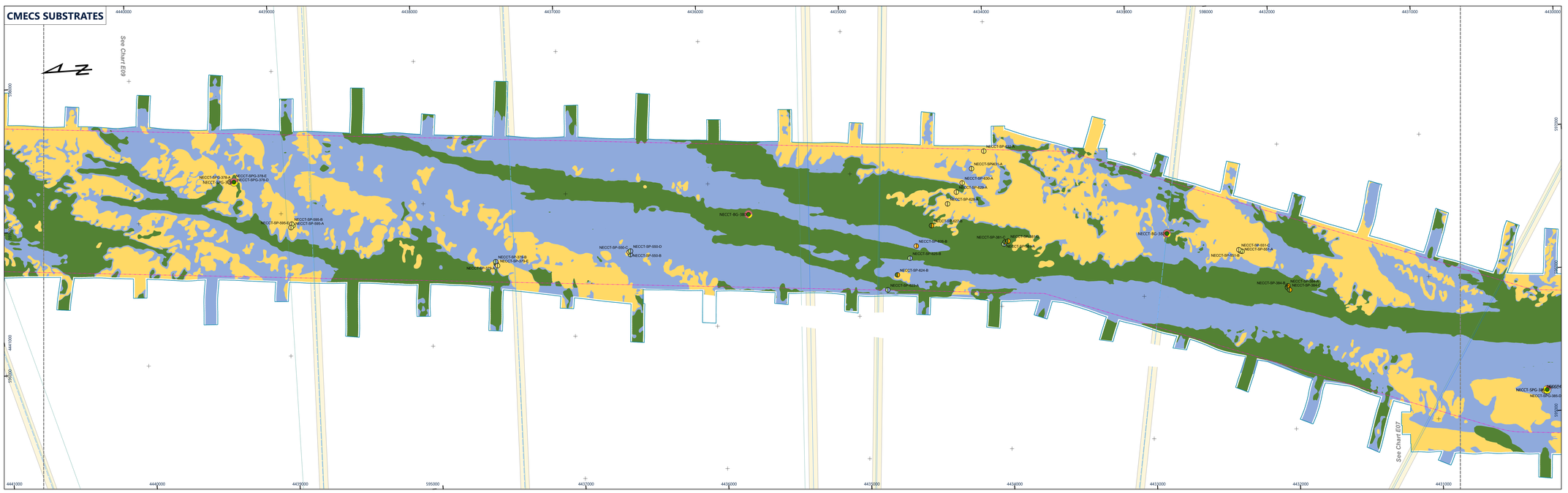
02.21030011	21030011_NECCT_07	07 of 12

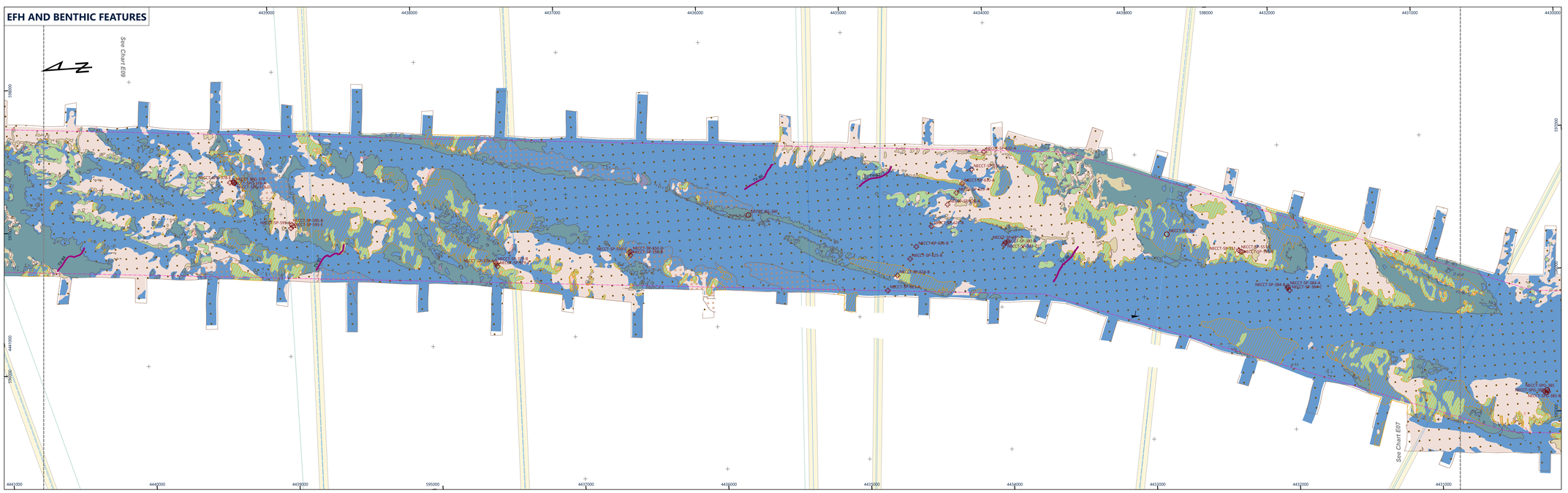
SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



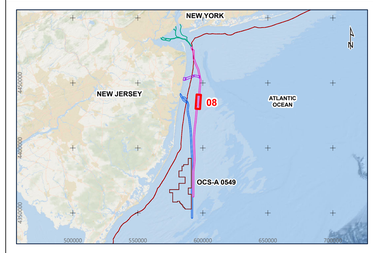
EFH AND BENTHIC FEATURES



ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 2
OFFSHORE NEW JERSEY
NORTHERN EXPORT CABLE CORRIDOR
ALIGNMENT SHEET - BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES
2023 Chart No. E08

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
- Northern Export Cable Corridor Trunk
- Lease Area OCS-A 0549
- Monmouth Export Cable Corridor
- Northern Export Cable Corridor New York Landfall Approaches
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- 10 Export Cable Corridor and Indicative Centerline Stationing at 1-km intervals are labeled
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DATA EXTENTS

- Northern Export Cable Corridor New York Landfall Approach Extent
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This chart symbolizes benthic samples taken from several surveys conducted in 2022 by various contractors.

- Towed Video Transects (RPS, 2022)
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- Benthic Sample - SPI-PV (Fugro, 2022)

CMECS SUBSTRATES

- Gravel-Gravel Mixes
- Gravelly Sand
- Sand

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Composite benthic features layers indicate that more than one benthic feature is present in the same geographic area

ESSENTIAL FISH HABITAT CLASSIFICATION

- Complex
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- Soft

BENTHIC FEATURES

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GRAB SAMPLE LOCATIONS (Fugro, 2022)

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification (Fugro, 2022)

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- Gravelly Sand
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Wentworth Grain Size Composition (Center symbol represents CMECS substrate classification)

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SPI-PV SAMPLE LOCATIONS (Fugro, 2022)

CMECS Substrate Group and Substrate Subgroup

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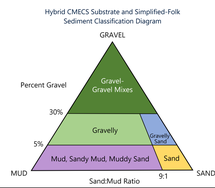
SIDE SCAN SONAR REFLECTIVITY

HIGH
LOW

Hybrid CMECS Substrate and Simplified-Folk Sediment Classification Diagram



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EQUIPMENT

Vessel(s): Fugro Enterprise	SPI-PV (Fugro, 2022): Dual camera system from Ocean Imaging System (OIS) with Nikon D7100 24-megapixel high resolution digital camera for sediment profile imagery (SPI) and an OIS Model DSC 24000 24-megapixel underwater camera for plan view (PV) imagery
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USBL System: (Fugro Enterprise) Kongsberg HiPAP 502 USBL system	Towed Video (2022): Camera sled equipped with altimeter, GoPro Hero 9, and 4K camera

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GEODETIC PARAMETERS

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False Northing	0 mN
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

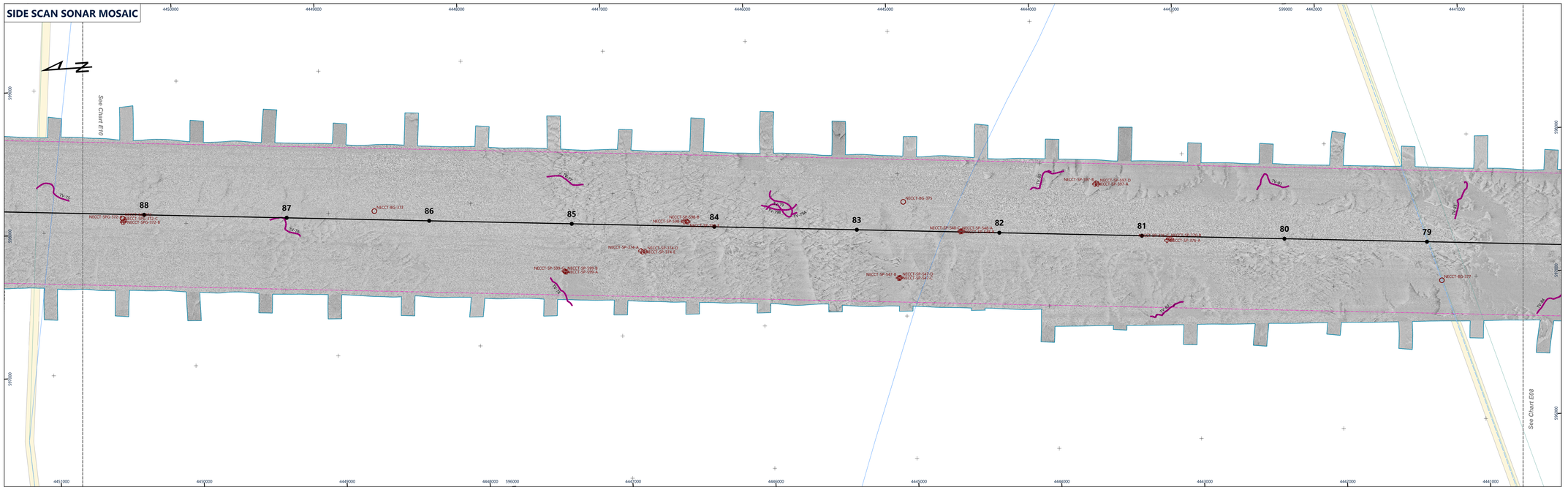
Scale 1 : 10,000 at Arch 42" x 52" page size

0 100 200 300 400 500 600 700 800 900 1,000 Meters
0 600 1,200 1,800 2,400 3,000 3,600 Feet

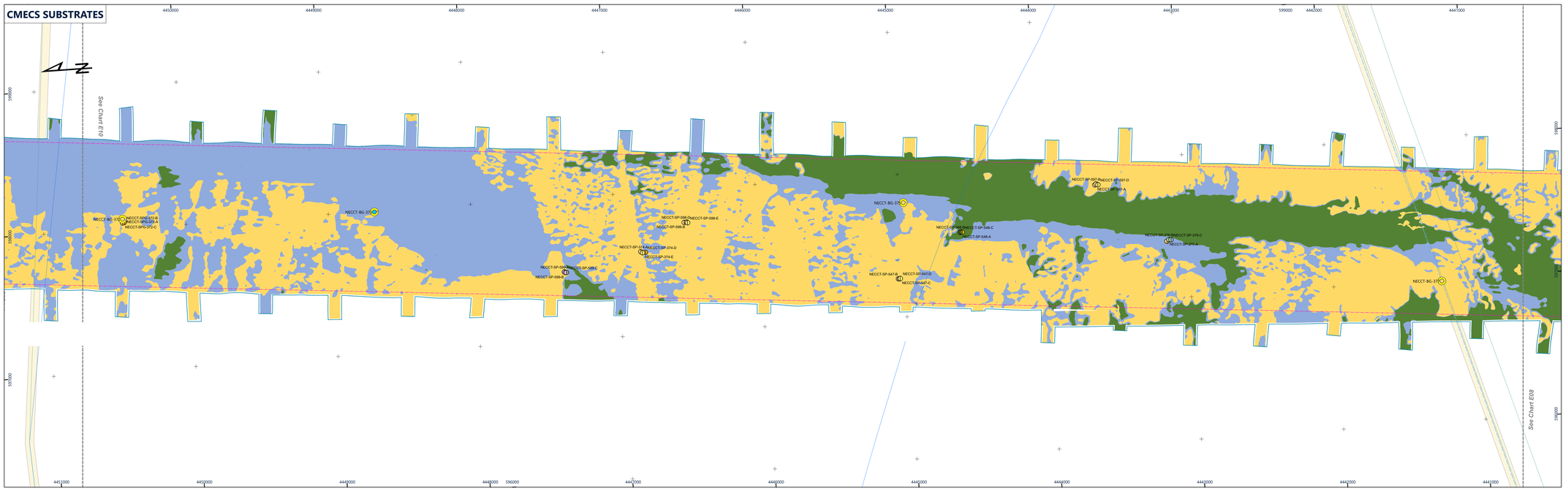
Issue No:	Date:	Description:	Drawn:	Checked:	Approved:
01	1/18/2023	DRAFT - For Review	RG	DK	DD
02	3/1/2023	REVISED - Issued For Approval	SC, KR	DK	DD

Project No:	Chart Name:	Chart No:
02.21030011	21030011_NECCT_08	08 of 12

SIDE SCAN SONAR MOSAIC



CMECS SUBSTRATES



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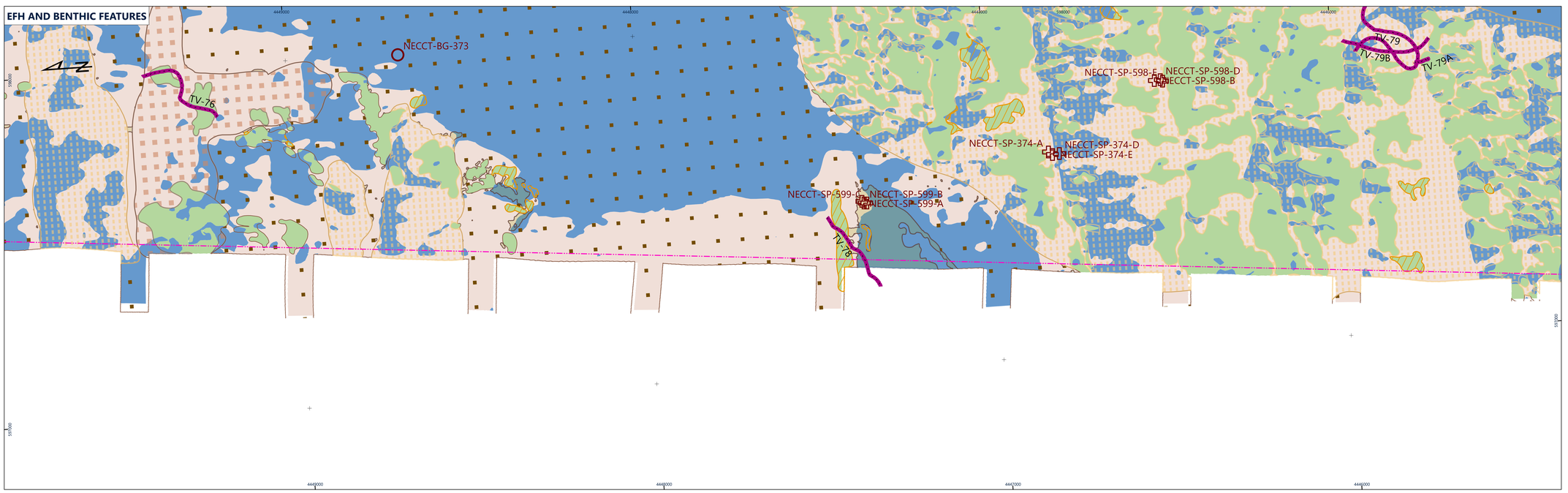
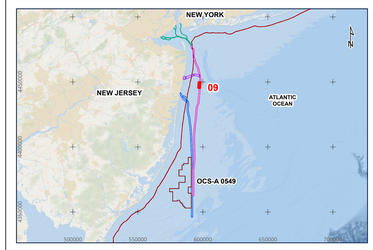


ATLANTIC SHORES offshore wind

ATLANTIC SHORES OFFSHORE WIND, LLC (ATLANTIC SHORES)
INTEGRATED GEOPHYSICAL & GEOTECHNICAL
MARINE SITE INVESTIGATION REPORT: VOLUME 2
OFFSHORE NEW JERSEY
NORTHERN EXPORT CABLE CORRIDOR
ALIGNMENT SHEET - BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES
2023 Chart No. E09

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



LEGEND

- Three Nautical Mile Limit (State Waters Boundary)
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- Northern Export Cable Corridor New York Landfall Approaches
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HIGH … LOW

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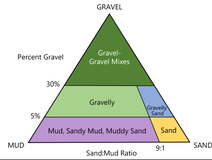

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02.21030011	21030011_NECCT_09	09 of 12

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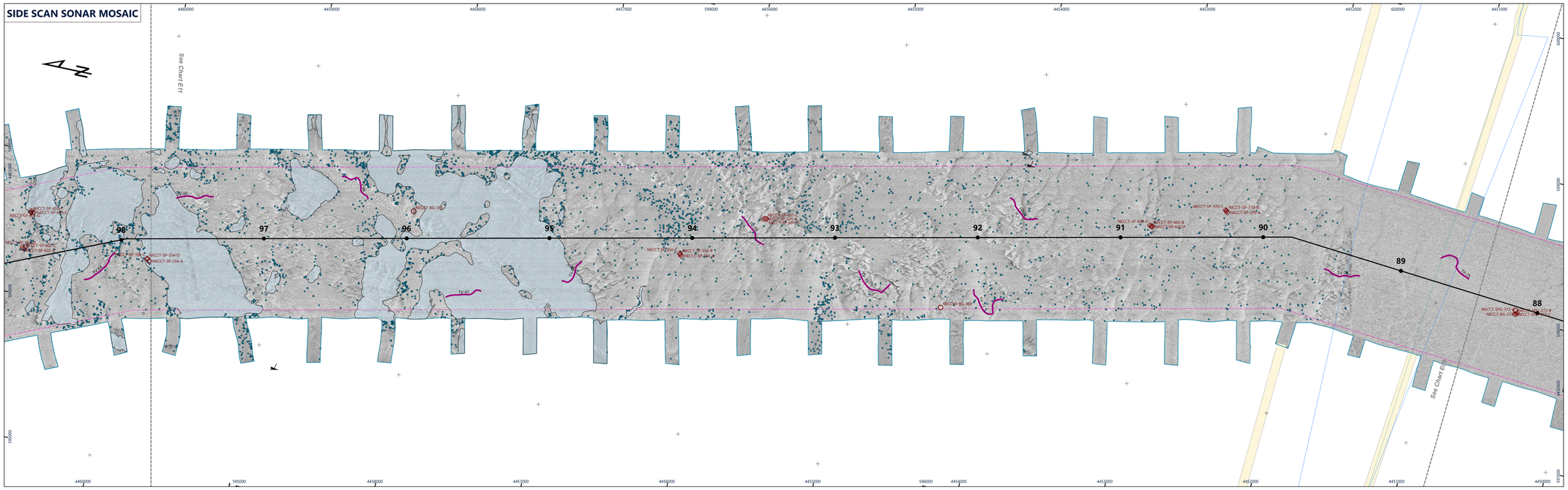

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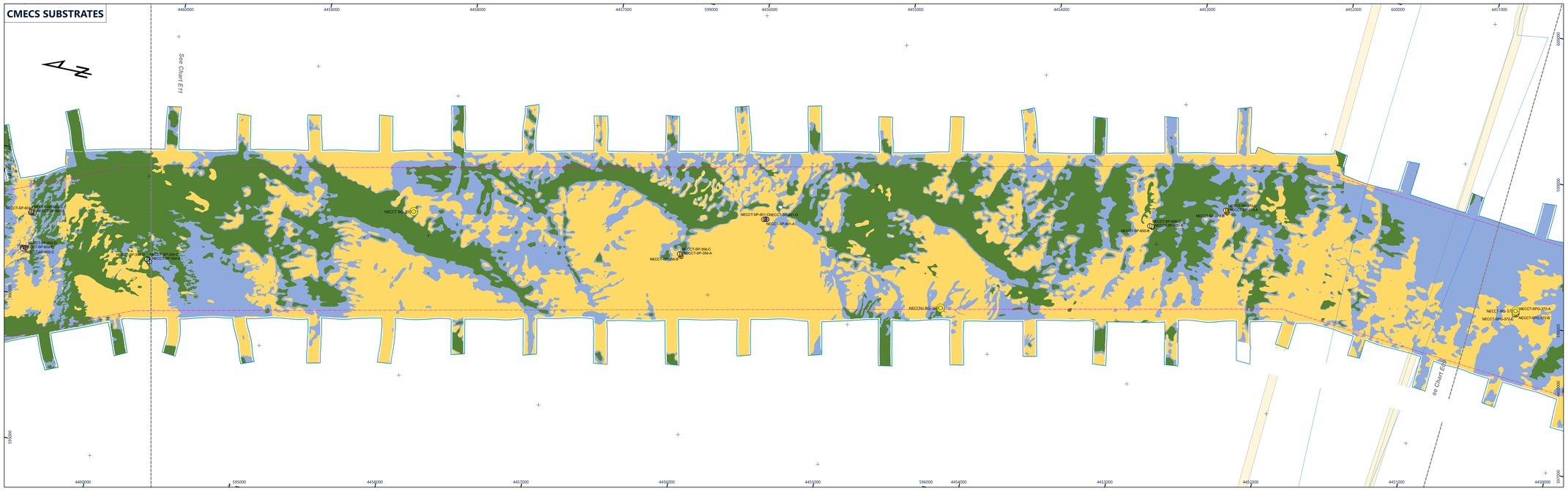

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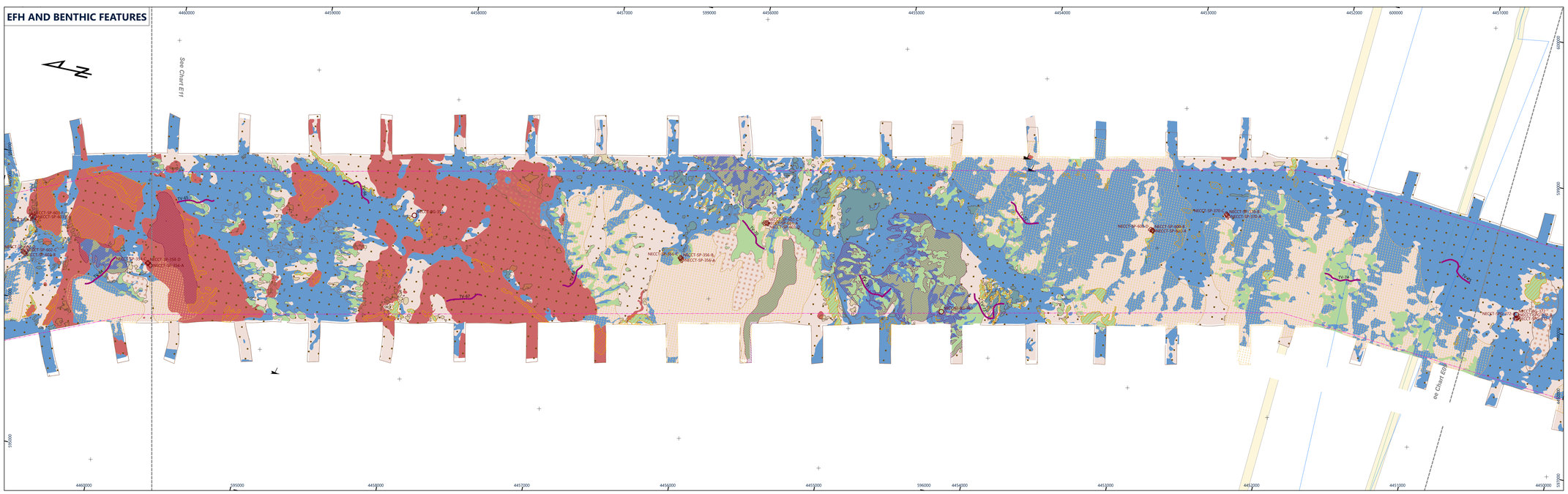

ATLANTIC SHORES offshore wind

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INTEGRATED GEOPHYSICAL & GEOTECHNICAL
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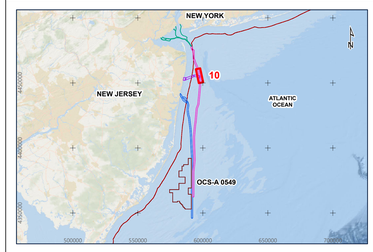
NORTHERN EXPORT CABLE CORRIDOR
ALIGNMENT SHEET - BENTHIC SURVEY LOCATIONS, CMECS SUBSTRATES, AND EFH BENTHIC FEATURES
2023 Chart No. E10

FUGRO USA MARINE, INC.
6100 Hillcroft Avenue
Houston, Texas 77081
Tel: +1 713 772 3700 Fax: +1 713 778 6816



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BOULDERS / DEBRIS

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- Boulder/Debris Field

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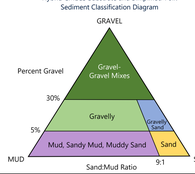

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Inverse Flattening	298.257222101
PROJECTION	UNIVERSAL TRANSVERSE MERCATOR / Zone 18N *(EPSG 26918)*
Central Meridian (CM)	75°00'00" W
Latitude of Origin	00°00'00" N
False Easting	500,000 mE
False Northing	0 mN
Scale Factor at CM	0.9996
VERTICAL DATUM	MEAN LOWER LOW WATER (MLLW)

Horizontal and vertical units are in meters

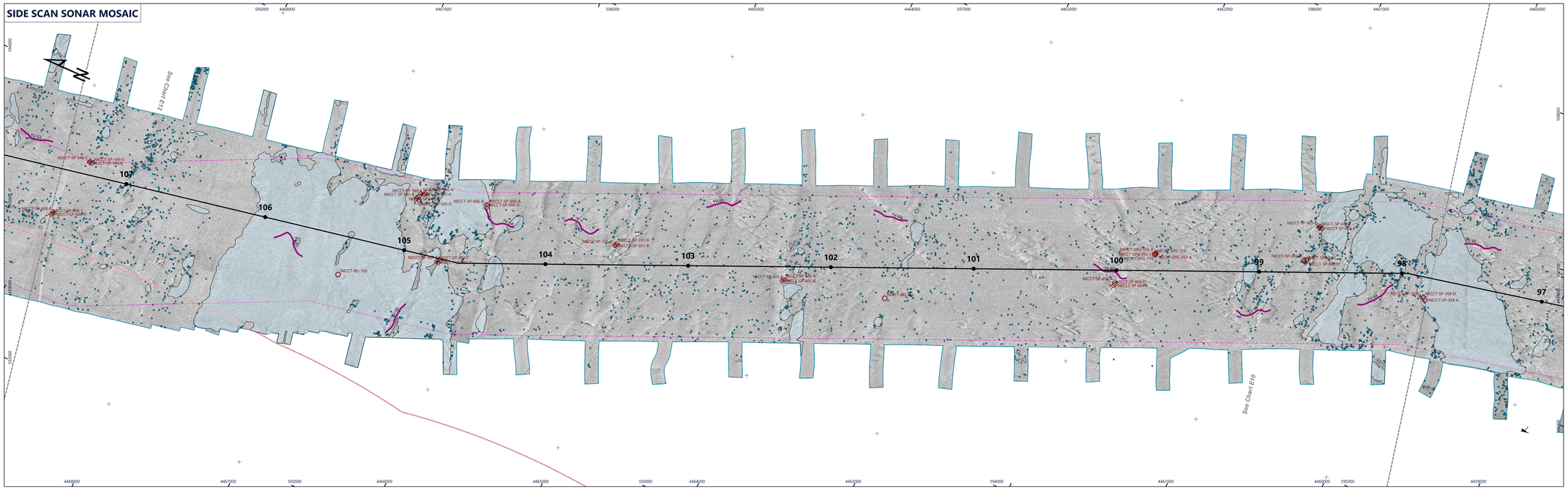
Scale 1 : 10,000 at Arch 42" x 52" page size

0 100 200 300 400 500 600 700 800 900 1,000 Meters
0 600 1,200 1,800 2,400 3,000 3,600 Feet

Issue No:	Date:	Description:	Drawn:	Checked:	Approved:
01	1/18/2023	DRAFT - For Review	RG	DK	DD
02	3/1/2023	REVISED - Issued For Approval	SC, KR	DK	DD

Project No:	Chart Name:	Chart No:
02.21030011	21030011_NECCT_10	10 of 12

SIDE SCAN SONAR MOSAIC



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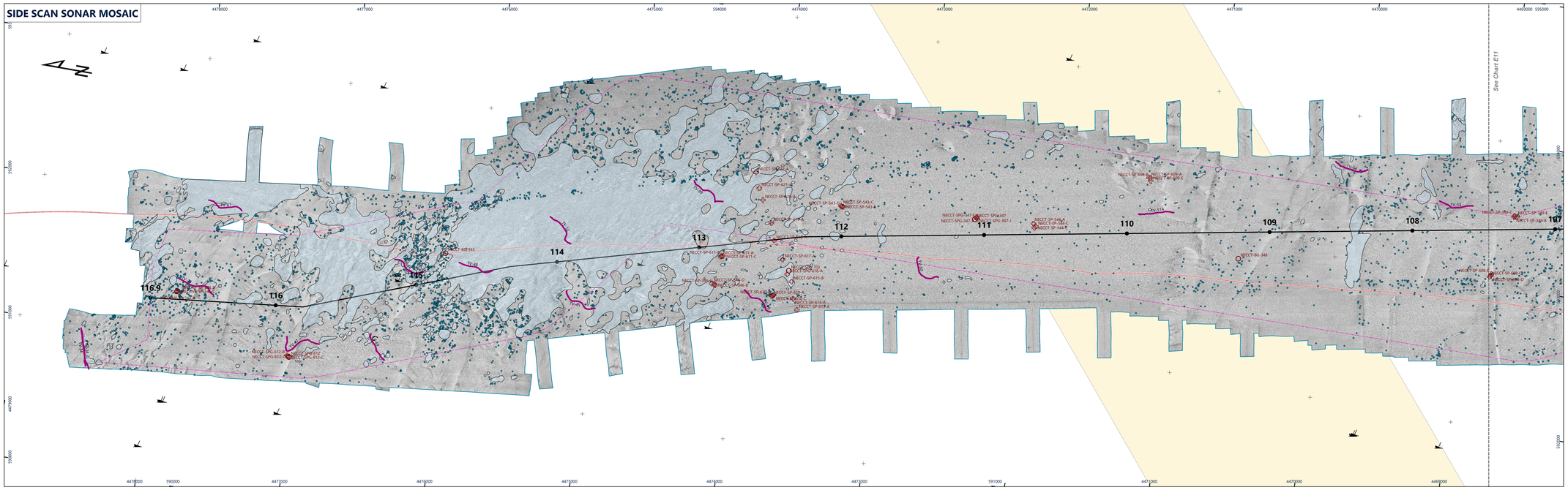
See Chart E11
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