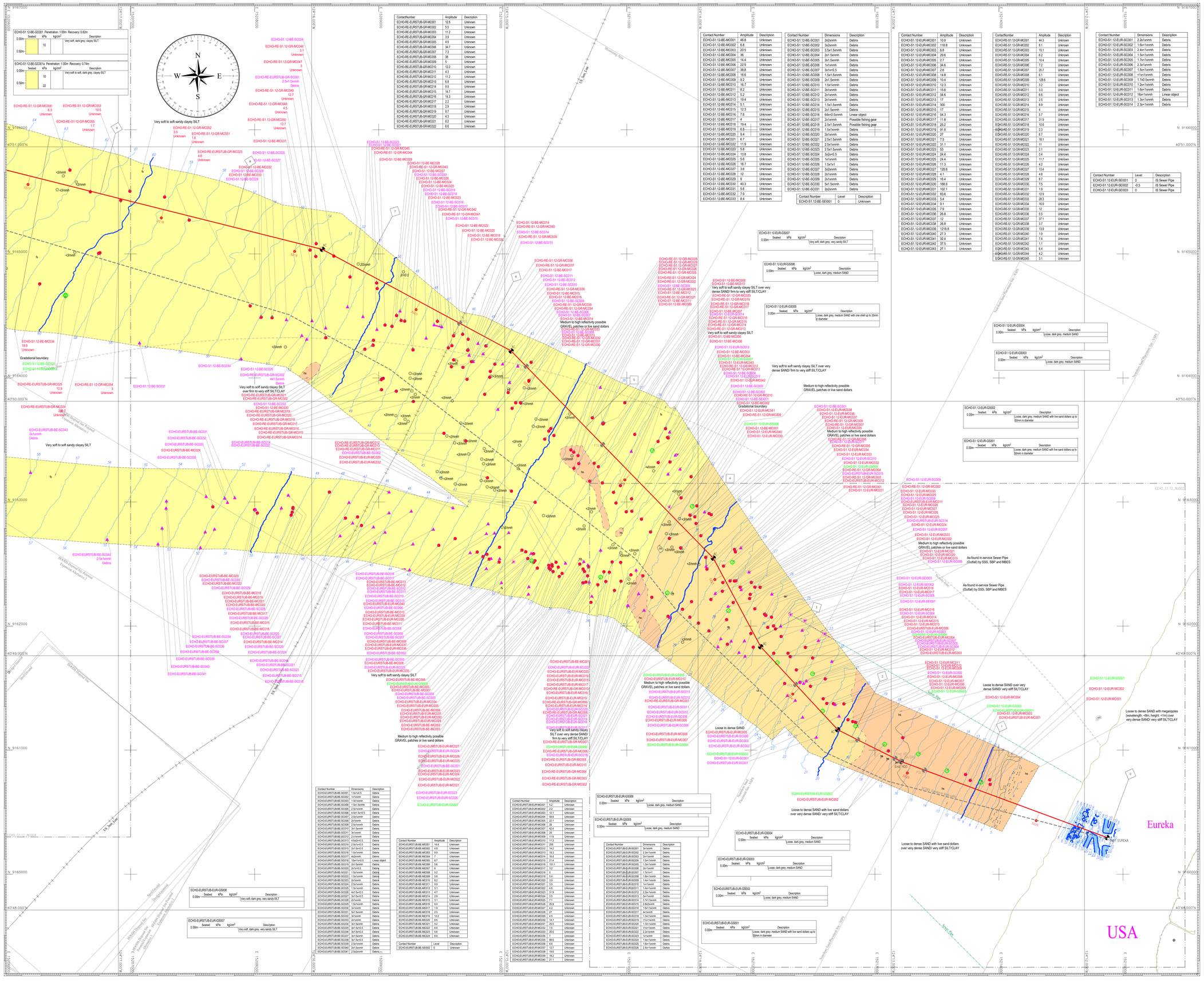


CARTOGRAPHIC SYMBOLS

- Post survey route with kilometre post and reverse kilometre post
- Adjacent route
- Beach manhole / Alter course / Branching Unit
- Point on line / Cable crossing / Pipeline crossing
- Coastline (from Admiralty charts)
- Chart matchline
- Telecommunications cable position, In-service/Out of service/Planned (as-found in magenta)
- Pipeline position, In-service/Out of service/Planned (as-found in magenta)
- Power cable position, In-service/Out of service/Planned (as-found in magenta)
- Maritime boundaries
- Restricted zones and special areas
- Concession block
- Submerged wreck / Exposed wreck / Obstruction / Well / Platform / Explosives dumping ground and symbol or line feature in grey, plotted from desk top study (as-found in magenta). (For general symbols and abbreviations refer to British Admiralty Chart)

BATHYMETRY

- Bathymetric contours in metres. Contour interval may be reduced to aid in clarity.
- Downslope gradient in degrees (°) as measured over the shortest significant distance
- Approximate limit of swath bathymetry coverage (shown only in areas of flat seabed)

SEABED FEATURES

- CORAL
- Gas seepage area with predominant sediment classification
- Boulder field with predominant sediment classification
- Fine sediment (predominantly CLAY/SILT)
- Coarse sediment (SAND and GRAVEL)
- Very coarse sediment (COBBLES and BOULDERS)
- Subcropping ROCK with predominant sediment classification (sediment thickness < target burial depth)
- ROCK outcrop (with veneer of sediments)
- HARDGROUND (very dense/very stiff/consolidated sediments; sediment thickness < target burial depth)
- Isolated sonar contact with reference number (length x width x height in metres where measurable; nmh = no measurable height)
- Linear sonar contact, dashed where partially buried
- Pipeline contact determined by seismic profiling system with reference number and description (level at the top of pipeline is stated in metres, +/- equivalent to above or below ambient seabed)
- Unidentified magnetic anomaly with reference number and amplitude (in nano-Tesla)
- Cable/Pipeline position, as determined by magnetometer, with reference number and amplitude (in nano-Tesla)
- Located wreck with reference no. (length x width x height in metres where measurable)
- Gravity core (GC); Grab sample (GS) location with reference number
- MiniCPT (CP) location with reference number
- Small ROCK outcrop with height in metres if discernible
- Seabed depression or pockmark with diameter (d) and depth (D) in metres, where discernible
- Sediment or feature boundary
- Inferred sediment or feature boundary
- General orientation of sandwave crest (Hachures on lee side where observable, with wavelength and height in metres)
- Approximate limit of side scan sonar coverage
- Orientation of megaripple crest (Hachures on lee side where observable, with wavelength and height in metres)
- Seabed scar (trawl or anchor)
- Isopach contours shown at 1m interval with labels every 1m
- Isopach of megaripples (with interval and height in metres)
- Beach probe (BP); Beach sample (BS) location with reference number
- Orientation of sediment ribbon
- Orientation of current lineation
- Diver probe (DP); Diver sample (DS) location with reference number
- Fault with depth below seafloor (Hachures on footwall)

CHART COMMENT

Cable and Pipelines

Unknown buried cable @ 40°48.289'N, 124°11.910'W (KP0.05) (landfall area)

Two (2) in-service sewer pipes are mapped on both sides of the proposed route in the southeastern portion of the chart. Segment EURSTUB runs sub-parallel to the route in the chart.

Hazards and Obstructions

Subcropping HARDGROUND of very dense SAND/ very stiff SILT/CLAY areas are present in the south-eastern portion and locally near center portion of the chart.

Megaripples are mapped at the start of the geophysical survey corridor.

Occasional pockmarks are observed in the central portion of the chart.

Two hundred twenty two (222) unknown magnetic contacts, one hundred sixteen (116) sonar contacts (including three linear objects, two possible fishing gears), and five (5) seismic contact are identified within the survey corridor. Three (3) of seismic contacts are related to as-found IS Sewer Pipe.

The route traverses the "Nearshore Sand Placement Site - NSPS" area in the southeastern portion of the chart.

The route enters "monitoring area" in the central portion of the chart.

The route exits the US 3nm line in the middle of the chart.

Segment EURSTUB runs sub-parallel to the route in the chart.

A wreck and three (3) foul-ground are charted in the southeastern part of the chart.

Several hazardous areas of soil ground, dredged material, and HOODS disposal sites are mapped at the southwest portion of the chart.

The route exits the security zone in the northwestern portion of the chart.

The route lies within the United States- Territorial Sea.

GENERAL NOTES

	INSHORE	SHALLOW AND DEEP WATER	SHALLOW AND DEEP WATER
Survey vessel		MV IAB	RV Bold Explorer	RV Geo Resolution
Surface positioning system	C-Nav 2050 DGPS System, Qinsy Navigation System	Kongsberg Seapath 380 System, Veripos DGPS System	Octopus F185+ GPS, Veripos LDG DGPS
Underwater positioning system	--	Kongsberg HiPAP 502 USBL	Kongsberg HiPAP 501P USBL
Bathymetry	R2Sonics 2024 MBES	Kongsberg EM124 MBES, Kongsberg EM2040C MBES, Kongsberg Simrad EA400 SBES	Reson Seabat 7150-F MBES, Kongsberg Simrad EA400 SBES
Morphology and stratigraphy	Edgetech 4200 SSS, C-Boom Low Voltage Boomer System	Edgetech 2000 DSS, GeoAcoustics 4x4, GeoAcoustics GeoPulse	EdgeTech TVD 2000, EdgeTech DSS-2000, EdgeTech 4200, GeoAcoustics 4x4 Array Pinger
Magnetometer survey	Geometrics 882 Magnetometer	Geometrics 882 Magnetometer	Geometrics 882 Magnetometer
Target burial depth:	1.5m up to 1500WD		
Descriptive terms and definitions:	The criteria used for interpretations and descriptions are presented in survey reports		

GEODETIC PARAMETERS

Ellipsoidal parameters	Projection parameters	
Ellipsoid : WGS84	Projection : Mercator	Scale factor : 1
Semi-major axis (a) (m) : 6378137.000	Longitude of origin : 180°W	False easting : 10 000 000
Inverse flattening (1/f) : 298.257223563	Standard parallel : 33°N	False northing : 5 000 000

VERTICAL DATUM

In landfall and inshore survey charts:

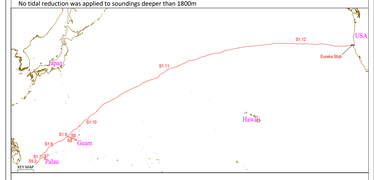
Bathymetry data has been reduced to Lowest Astronomical Tide (LAT) - using tidal predictions from the National Oceanographic and Atmospheric Agency (NOAA) - 9418767 Humboldt Bay, North Spit CA

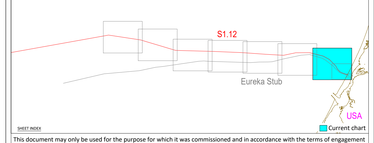
In shallow water survey charts:

Bathymetry data has been reduced to Lowest Astronomical Tide (LAT) - using tidal predictions from the Admiralty Tide Tables North Pacific Ocean Volume 6, 2020 - 9268 Trinidad Head and 9270 North Spit (2020). National Oceanographic and Atmospheric Agency (NOAA) - 9418767 Humboldt Bay, North Spit CA (2021 Re-Route)

In deep water survey charts:

No tidal reduction was applied to soundings deeper than 1800m





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Survey date: June - July 2020, Aug - Sep 2021

Scale : NATURAL SCALE 1 : 10,000 at 33°N

(At mid-latitude of chart) TRUE SCALE 1 : 9026.34

0.0 0.2 0.4 0.6 0.8 1.0 km

Contractor : NEC Corporation

Surveyor : EGS Survey Group

Project name: ECHO Submarine Cable System Marine Route Survey

Document title: Segment 1.12(Eureka to BU11) NORTH UP CHART Chart No. 003 of 050 (KP 0.00 - KP 9.70)

Rev	Date	Prepared by	Checked by	Approved by
1	Oct 2021	Jacky Leung	Anh Luong	Chris Welsh
0.1	Sep 2021	Bruce Shiu	Claire Lam	Chris Welsh
0	Mar 2021	Lung L. Elmo W.	W. L. Lam	Chris Welsh

Provisional

Route based upon: ECHO_S1.12(Eureka to BU11)_RPL_Issue-5.0(PL01)_22Sep2021

File name: ECHO_S1.12_NU003