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Report

NI 43-101 Technical Report

TOML Clarion Clipperton Zone Project, Pacific Ocean

Effective Date of Technical Report: March 30, 2016
Prepared for Nautilus Minerals Inc.

Qualified Persons:
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AMC Project 315039
Nautilus Document Number CCZ-TOM-DEV-RPT-2200-002

Despatch Date: 4 July 2016

ITEM 1. Executive summary

A large deposit of polymetallic nodules is located in the Clarion Clipperton Zone (CCZ) of the northern central Pacific Ocean. Despite the nodules being located at great depths (4 000 to 6 000 m), they were explored with considerable success between the mid-1960s to the present day using a variety of increasingly sophisticated deep-sea technologies. In early 2012, Tonga Offshore Mining Limited (TOML), a 100% owned subsidiary of Nautilus Minerals Inc. acquired an Exploration Area of 74 713 km^2 of the CCZ. In line with the requirements of the relevant oversight body (International Seabed Authority or ISA) TOML is sponsored by the government of the Kingdom of Tonga. The contract for exploration of polymetallic nodules was approved in July 2011, and then formalised on 11 January 2012. The Exploration area consists of six separate areas (termed Areas A to F) scattered across the CCZ (Figure 1.1).

TOML has commissioned AMC Consultants Pty Ltd (AMC) to prepare a Technical Report in accordance with the Canadian National Instrument 43-101 reporting standards (NI43-101) and Form 43-101F1. The Report presents the results of exploration and related studies carried out between 2013 and 2016 and an updated Mineral Resource estimate. The Mineral Resource statement was prepared in accordance with the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines"

Exploration and development efforts in the CCZ started in the 1960s by state sponsored groups from Russia, France, Japan, Eastern Europe, China, Korea and Germany. Several commercial consortia also explored between the 1960s and the 1980s and in some instances their descendants are still involved to the present day. No commercial mining operations have yet been established in the CCZ. However, a variety of collectors, pick-up systems, and metallurgical processing flow sheets were tested, and several integrated "demonstration scale" systems operated in the CCZ for several months in the late 1970s. Processing test-work has encompassed a variety of hydrometallurgical and pyrometallurgical flow sheets, usually with good results.

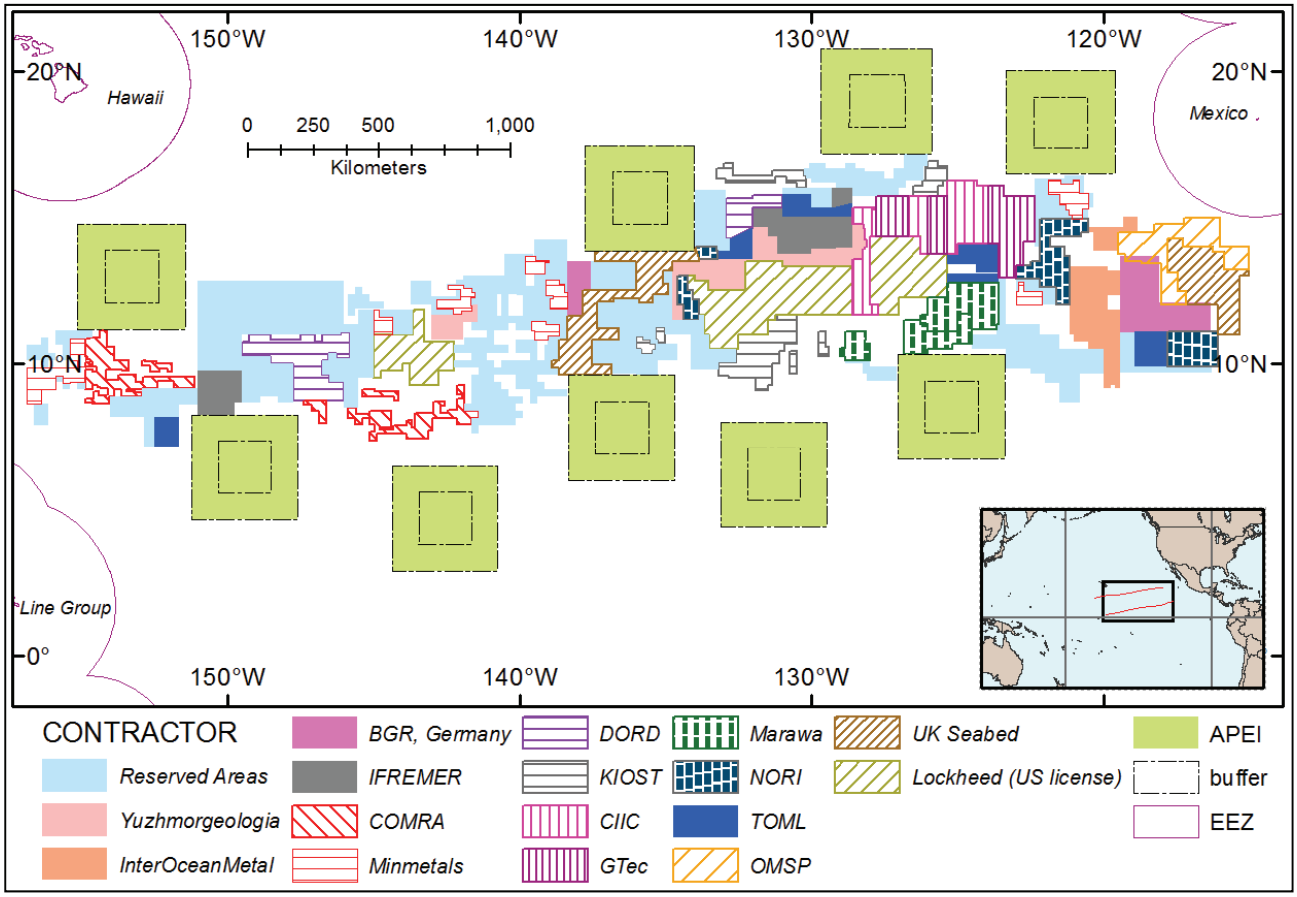
The climate is largely warm, and equatorial surface currents vary by season but are not generally very strong. Wave heights and frequencies are relatively moderate (for the open ocean). Storms are significant for part of the year as a major tropical cyclone belt covers the southern side of the CCZ, approximately one cyclone traverses any given area each year. The deposit is distal from major sea routes used by commercial transport vessels, and is marginal to tuna fisheries. No communication cables cross the region.

The worldwide occurrence of polymetallic nodules has been known since the late 1800s. They form by the precipitation of metals either directly from ocean waters or via decomposing microorganisms and/or their waste matter in the benthic sediments. The specific conditions of the CCZ (water depth, latitude and seafloor sediment type) are believed to be the key controls on the formation of the CCZ nodule deposit , which is believed to be the largest and highest Ni-Cu-Co grade deposit of this type in the world. Nodules are typically 4 to 6 cm and up to 10 cm in diameter.

Unlike most land deposits, seafloor nodule deposits are characterized in terms of abundance, measured in units of wet kg/m^2. This is because both the primary exploration method (surface sampling) and likely recovery method (surface collectors or rakes) are unlikely to work at any significant depth below the seafloor (i.e. 0 to 30 cm). Abundances are typically reported as wet weights due to the practicalities of handling the nodule samples, the wet density of studied nodules is around 2 t/m^3 irrespective of the nodule size. Studies show nodules to contain around 29% free water and 16% water of crystallisation (incorporated into the complex manganese and iron oxy-hydroxide minerals of formation).

In 2012, Golder Associates Pty Ltd estimated an Inferred Mineral Resource for the entire TOML tenement Area. Part of this data was collected by previous explorers including pioneer contractors representing Japan, Russia and France. This data were obtained directly from the ISA and were not supplied with quality assurance or quality control data. However, verification was possible by cross comparison between all of the six pioneer contractors (also Korea, Germany and the IOM group) who have so far supplied the ISA with data across what is effectively a single large deposit.

Figure 1.1 Location of the Clarion Clipperton Zone



Map compiled from contract announcements at www.isa.org.jm; APEI is an Area of Particular Environmental Interest. EEZ is Exclusive Economic Zone. See Item 6 for explanation of Contractor names and acronyms.

Data collected by TOML in 2013 and 2015 supports the historical data but also is of sufficient quantity and quality to allow estimation of an Indicated Mineral Resource for five sub areas within TOML Areas B, C, D and F called B1, C1, D1, D2 and F1. More detailed data collected by TOML has also allowed estimation of a Measured Mineral Resource for a single sub area within TOML Area B. Chain of custody, sample security, Quality Assurance and Quality Control were documented in detail for the TOML data.

The key data sets behind the Inferred Mineral Resource estimate for TOML Areas A through E are surface samples obtained by free fall grab samplers, although a few results from box-corers were also included. Free fall grab samplers are the standard sampling method as they are the most productive tool available. They are believed to underestimate the actual abundance, as smaller nodules may escape some grabs during ascent and larger nodules around the edge of the sampler may be knocked or fall out during the sampling process. This may introduce some conservatism to the Inferred Mineral Resource estimates.

The key data behind the Inferred Mineral Resource estimate for TOML Area F and the Indicated and Measured Mineral Resources are box-corers and measured photographs. Box-corers take longer to collect than free fall grab samplers but they are believed to have less bias. Photos cover a much greater area than either free fall grabs or box-cores. The weight of individual nodules can be accurately estimated from the length of their long or major axis; a relationship first discovered in the 1970s. Using the box-core samples as calibration devices, TOML was able to measure the size of nodules on several hundred photographs in Areas B and C. Abundance is shown to be related both to nodule coverage in photos and to acoustic response (backscatter) from regional survey. This data thus provides very detailed indications of nodule abundance and continuity.

Many of the records of the sampling procedures used by the pioneer contractors were not available to the Qualified Persons, but it is likely that all of the pioneer contractors followed similar procedures to that used by TOML. Nodule abundance (wet kg/m^2) was derived by dividing the weight of recovered nodules by the

surface area covered by the open jaws of the sampler or corer (typically 0.25 to 0.75 m^2). A split of the nodules was dried, crushed and ground to enable grade determination via standard analytical methods (typically atomic absorption spectrometry, X-ray fluorescence or inductively coupled plasma methods), either on the vessel or back on shore. Specific nodule chemical standards were used for instrument calibration. TOML also present the results of field, submitted and laboratory duplicates of nodule samples.

Analysis of the data reveals that, as a consequence of their origin, nodule grades vary only slightly across the CCZ, with spatial continuity of the Abundance, Mn, Ni, Co and Cu grades often ranging from the order of several kilometres up to several tens of kilometres. Nodule abundance is sometimes less continuous than grade, as it is also subject to local changes in net sedimentation (a consequence of seafloor slope, slumping, erosion and local currents).

The TOML Exploration Area has been split into two domains: areas with polymetallic nodules; and areas predominately without polymetallic nodules. The multibeam bathymetry and the backscatter data was used to interpret the parts of TOML Area B through F with no polymetallic nodules.

Estimation of tonnage and grade for the TOML Exploration Area within the CCZ was undertaken using only sample data within the TOML Exploration Area. Six block models were constructed using the programs Gstat 1.1-3 and R 3.2.5, one for each TOML Exploration Area (A through to F), in three passes. The first pass used a parent block dimension of 1.75 km by 1.75 km and filled the areas defined as Measured Mineral Resource. The second pass for Indicated Mineral Resource used a parent block size of 3.5 km by 3.5 km while the third pass for Inferred used a parent block size of 7.0 km by 7.0 km.

The modelling methodology used for estimating the Mineral Resource was determined through careful consideration of the scale of deposit, mechanism of nodule formation, geological controls and nature of the sampling method. The approach involved estimating nodule abundance and grades into a two-dimensional block model with abundance used for calculating tonnage. Abundance and grades were estimated using Ordinary Kriging (OK) with comparison (not reported) estimates using Inverse Distance Weighting (IDW) and nearest neighbour (NN). The modelling methodology is similar to the method applied by the ISA (2010) for its global estimate (not NI 43-101 compliant) which was produced by a multi-disciplinary effort that involved recognised subject matter experts.

The Mineral Resource estimate, with an effective date of 30 March 2016, is presented in Table 1.1. The Mineral Resource estimate at an abundance cut-off of 6 wet kg/m^2 is the selected base case scenario considering a non-selective bulk mining operation. Changes to the Mineral Resource with changes in abundance cut-off are shown in Figure 1.2.

Table 1.1 2016 Mineral Resource Estimate for the TOML Exploration Area

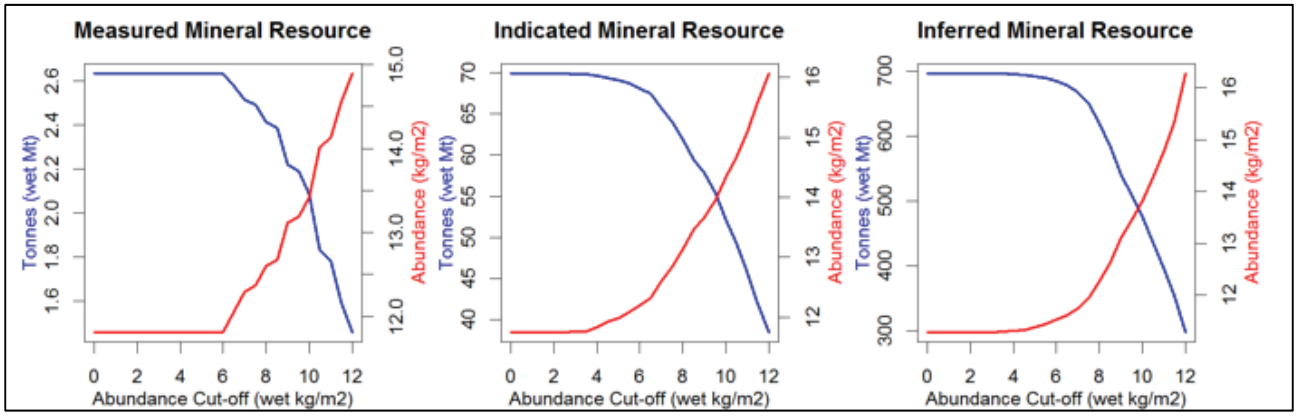
Mineral Resource Classification	Abundance (wet kg/m^2)	Mn (%)	Ni (%)	Cu (%)	Co (%)	Polymetallic Nodules ($x10^6$ wet t)*
Measured	11.81	27.57	1.33	1.05	0.23	2.6
Indicated	12.19	30.32	1.35	1.18	0.21	68.1
Inferred	11.52	29.05	1.29	1.14	0.20	685.3

*Abundance cut-off of 6 wet kg/m^2 used.

Variations in Totals are due to rounding of individual values

Mn, Ni, Cu and Co assays on samples dried at 105°C

Figure 1.2 Nodule Abundance – Tonnage Curves



The available information regarding mining and processing of the manganese nodules has been assessed and there are reasonable prospects for economic extraction.

TOML has not yet released any detailed recovery planning or equipment design for the nodule project, but a large and growing body of work, by a variety of organisations over the past 30 plus years, indicates that recovery of the nodules is possible.

TOML has not released any mineral processing or metallurgical test-work on the seafloor nodules from the TOML licences. However, considerable historical work has been done at both laboratory scale and pilot plant scale that indicates that processing of the nodules is technically feasible.

Recommended future work on the TOML Exploration Area will focus on:

- Detailed studies to develop key modifying factors to a point where a Mineral Reserve may potentially be estimated;
- Environmental work to support an EIS for trial mining;
- Concept study work on engineering and commercial aspects leading to trial mining;
- Trial mining.

TOML Exploration Areas A to F have sufficient samples of adequate quality to define a Mineral Resource for Mn, Ni, Cu and Co. Other metals of potential value (e.g. Mo, rare earth elements) have not been estimated, but could provide significant upside. The estimate of abundance and hence tonnage for the Inferred Mineral Resource for the TOML Exploration Areas A to F may be underestimated due to reliance on free fall grab samples in places.

Contents

Tables

Figures

List of Acronyms and Terms

AAS	– Atomic Absorption Spectroscopy
AP	- Abyssal Plain
AH	- Abyssal Hills
APEI	- Areas of Particular Environmental Interest
Abundance	– See definition in section 7.3.3
AFERNOD	– Association Française pour l'Étude et la Recherche des Nodules
ALS	- ALS Group or ALS Laboratories
AMC	- AMC Consultants
AMR	– Arbeitsgemeinschaft Meerestechnisch Gewinnbare Rohstoffe
ANOSIM	- Analysis of Similarity
ASMOD	- Adaptive Spline Modelling of Observation Data
AUV	- Autonomous Underwater Vehicle
BC	– Box Corer
BIE	- Benthic Impact Experiment
BGR	– German Consortium
BL	- bottom left
BR	- bottom right
BRT	- Boosted Regression Trees
C	- centre
CAPEX	– Capital Expenditure
CATAMI	- Collaborative & Annotation Tools for Analysis of Marine Imagery & Video
CCD	– Calcite Compensation Depth
CCZ	– Clarion Clipperton Zone
CEA	- Commissariat à l'Energie Atomique
CIIC	- Cook Islands Investment Corporation
CIM	– Canadian Institute of Mining, Metallurgy and Petroleum
CGL -	- Reference material CGL131 (nodule geochemical standard)
CLB	- Continuous Line Bucket Group
CMECS	- Coastal and Marine Ecological Classification Standard
COC	- Chain of custody
COMRA	– China Ocean Mineral Resources Research and Development Association (Chinese Consortium)
COR	- Committee of Representatives
CSMF	- conservation significant marine fauna
CV	- Coefficient of variation
DAS	- acid pressure digestion system
DEME	- Dredging, Environmental & Marine Engineering or DEME Group
DNA	- deoxyribonucleic acid
DOMA	- Deep Ocean Minerals Association
DOMCO	– Deep Ocean Mining Co.
DOMES	- Deep Ocean Mining Environmental Study
DORD	– Deep Ocean Resources Development Company (Japanese Consortium)
DSSRS	- Deep Sea Sediment Re-suspension System
EC	- European Commission
eDNA	- environmental DNA
EEZ	- Exclusive Economic Zone
EIS	- Environmental Impact Statement
EMP	- Environmental Management Plan
ENSO	- El Niño–Southern Oscillation
Enterprise	– See definition in section 4.1.3
EPR	– East Pacific Rise
EUNIS	- European Nature Information System
FFG	– Free fall Grab samplers
FGDC	- US Federal Geographic Data Committee
FIGNR	– Federal Institute for Geosciences and Natural Resources (German Consortium)
FPSO	- Floating Production Storage and Offloading

GEBCO	– General Bathymetric Chart of the Oceans (www.gebco.net)
GEMONOD	- Groupement pour la mise au point des MOyens nécéssaires à l'exploitation des NODules
GH	- Graben horst
GPO	- Government Printing Office
GSR	- Global Sea Mineral Resources
Gstat	- program for modelling geo-statistical data in one, two or three dimensions
G-TEC	- G-TEC Sea Mineral Resources
GU	- Gently undulating
HEBBLE	- High-Energy Benthic Boundary Layer Experiment
HPAL	– High temperature and high pressure sulfuric acid leach process
ICP-AES	- Inductively couple plasma atomic emission spectrometry
ICP-MS	- Inductively couple plasma mass spectrometry
ICP-OES	- Inductively couple plasma optical emission spectrometry
IDOE	– International Decade of Ocean Exploration
IDW	– Inverse Distance Weighting estimation method
Ifremer	– Institut Français de Recherché pour l'Exploitation de la Mer (French Research Institute for Exploitation of the Sea)
IHC	- Royal IHC or IHC Merwede
INCO	– International Nickel Corporation
IOM	– Interoceanmetal Joint Organization (Bulgaria, Cuba, Czech Republic, Poland, Russian Federation and Slovakia Consortium)
ISA	– International Seabed Authority
ITLOS	– International Tribunal for the Law of the Sea
JAG	- US Navy Judge Advocates General's Corps
JET	- Japan Deep Sea Impact Experiment
JORC	– Joint Ore Reserves Committee
JPI Oceans	- Joint Programming Initiative Healthy and Productive Seas and Oceans
KADOM	– Korean Association of Deep-Ocean Mineral Development
KCON	– Kennecott Consortium
KEI	- Kennecott Exploration Inc
KIGAM	- Korea Institute of Geology, Mining and Materials
KIOST	- Korean Institute of Ocean Science and Technology
KMPC	- Korea Mining Promotion Corporation
KORDI	– Korean Ocean Research and Development Institute (now known as KIOST; Korean Institute of Ocean Science and Technology)
KRISO	- Korea Research Institute of Ships & Ocean Engineering
L	- left
LAE	- Long Axis Estimation
LMS	– Lockheed Martin Systems
LOI	- Loss on ignition
LTC	– Legal and Technical Commission of the ISA
MAK	- YMG MAK-1 sidescan sonar
MAPR	- Miniature (mini) autonomous plume recorder
MBES	- MultiBeam Echo Sounding
MFES	- Multi-Frequency Exploration System
MIR	- YMG Towed sonar & photo platform
MITI	- Japanese Ministry of International Trade and Industry
NI 43-101	– Canadian National Instrument 43-101
NIOT	– National Institute of Ocean Technology
NOAA	– National Oceanic and Atmospheric Administration
NOAA NWS	- US National Oceanic and Atmospheric Administration, National Weather Service
NOD-P-1	- NOD-P-1 is a geochemical reference standard
NORI	– Nauru Ocean Resources Inc
NORIA	- NOdules RIches et Abondants
NORMED	- Chantiers du Nord et de la Méditerranée
NN	– Nearest Neighbour estimation method
OK	– Ordinary Kriging estimation method
OMA	– Ocean Mining Associates

OMCO	– Ocean Minerals Co. (US Consortium)
OMI	– Ocean Mining Incorporated
OMS	- Ocean Mineral Singapore Pte Ltd
OPEX	– Operating Expenditure
ORP	- Oxygen Reduction Potential
PMA	- Priority mining areas
PREPCOM	- Preparatory Commission
PTFE	- polytetrafluoroethylene
QAQC	– Quality Assurance and Quality Control
QP	– Qualified Person
QQ	- Quantile-quantile
%RSD	- % relative standard deviation
R	- right
R-type	– Rough type nodules
REE	- Rare Earth Elements
ROV	– Remotely Operated Vehicle
ROTV	– Remotely Operated Towed Vehicle
RSR	- Reciprocating States Regime
SA-SSS	– Synthetic aperture side scan sonar
SIO	– Scripps Institution of Oceanography
SIS	- Sequential indicator simulation
SOEST	- School of Ocean and Earth Science and Technology, University of Hawaii
SOSI	- Sound Ocean Systems Inc
S-R-type	– Smooth-rough type nodules
SSS	– Sidescan sonar
S-type	– Smooth type nodules
TL	top left
TM	- Total metals
TOML	– Tonga Offshore Mining Limited
TPA (tpa)	- Tonnes Per Annum
TR	- top right
TSS	- Total suspended sediment
UGI	- YMG underwater geotechnical instrument
UH	- Undulating hills
UK	- United Kingdom
UKSR	- UK Seabed Resources
UN	- United Nations
UNCLOS	– United Nations Convention on the Law of the Sea 1982
UNOETO	- United Nations Oceans Economics and Technology Office
USBL	- Ultra Short BaseLine
USGS	- United States Geological Service
US/USA	- United States/United States of America
USNEL	- United States Naval Electronic Laboratory
USSR	- Union of Soviet Socialist Republics
UTM	– Universal Transverse Mercator Cartesian coordinate system
V/H	– vertical on horizontal (vertical exaggeration in a profile or section)
WA	- US state of Washington
WGS	- World Geodetic System
WOR	- World Ocean Review 2010
XRF	- X-ray fluorescence
YMG	– State Enterprise Yuzhmorgeologiya (Russian Federation Consortium)

Elements

Al – Aluminium
As – Arsenic
Ba – Barium
Ca – Calcium
Ce – Cerium
Ce Cerium
Cl – Chlorine
Co – Cobalt
Cu – Copper
Dy Dysprosium
Er Erbium
Eu Europium
F – Fluorine
Fe – Iron
Gd Gadolinium
Ho Holmium
La – Lanthanum
La Lanthanum
Lu Lutetium
Mg – Magnesium
Mn – Manganese
Mo – Molybdenum
Nd – Niobium
Nd Neodymium
Ni – Nickel
Pb – Lead
PGM – Platinum Group Minerals
Pm Promethium
Pr Praseodymium
Pt – Platinum
REE – Rare Earth Elements
S – Sulphur
Sc Scandium
Si – Silicon
Sm Samarium
Sr – Strontium
Tb Terbium
Te – Tellurium
Ti – Titanium
Tm Thulium
Y Yttrium
Yb Ytterbium
Zn – Zinc
Zr – Zirconium

Direction – Azimuth Abbreviations

N – North
E – East
S – South
W – West
NNE – North North East
NE – North East
ENE – East North East
ESE – East South East
SE – South East

SSE – South South East
SSW – South South West
SW – South West
WSW – West South West
WNW – West North West
NW – North West
NNW – North North West

Symbols and Units

° – degree
°C – degrees centigrade
(aq) – aqueous
µm – micrometre
cm – centimetre
g/t – grams per tonne
Gt - Giga (billion) tonnes
kg – kilogram
kg/m^2 – kilograms per square kilometre (surface abundance)
km^2 – square kilometres
kn - knot
kWh/t – kilowatt hour per tonne
m – metre
M - mole
Mt - million tonnes
Mwt - million wet tonnes
m/s – metres per second
m^3 – cubic metre
mbsl – metres below sea level
mm – millimetre
Mwt – million tonnes (wet)
nm – nautical mile
ppb – parts per billion
ppm – parts per million
s – second(s) – soluble
t/m^3 – tonnes per cubic metre

Distribution list

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ITEM 2. Introduction

A large deposit of polymetallic nodules is located in the Clarion Clipperton Zone (CCZ) of the northern central Pacific Ocean. Despite the nodules being located at great depths (4,000 to 6,000 m), they were explored with considerable success between the mid-1960s to the present day using a variety of increasingly sophisticated deep-sea technologies. In early 2012, Tonga Offshore Mining Limited (TOML), a 100% owned subsidiary of Nautilus Minerals Inc. acquired an Exploration Area of 74 713 km^2 of the CCZ. In line with the requirements of the relevant oversight body (International Seabed Authority or ISA) TOML is sponsored by the government of the Kingdom of Tonga. The contract for exploration of polymetallic nodules was approved in July 2011, and then formalised on 11 January 2012.

TOML has commissioned AMC Consultants Pty Ltd (AMC) to prepare a Technical Report in accordance with the Canadian National Instrument 43-101 reporting standards (NI43-101) and Form 43-101F1. The Report presents the results of exploration and related studies carried out between 2013 and 2016 and an updated Mineral Resource estimate. The Mineral Resource statement was prepared in accordance with the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines".

2.1 Data sources

2.1.1 International Seabed Authority data

The historical sample data used as the basis for the Mineral Resource estimate in this report were obtained by Golder Associates directly from the ISA for use in an earlier Technical Report (Golder Associates 2013). The data was also obtained separately by TOML.

Under the principles of the Law of the Sea (Item 4), developed nation contractors explore then relinquish or return 50% of their initial Exploration Area to the ISA (see also section 4.1.3). As part of this process the ISA requires each pioneer contractor to provide all sample data to a robust centrally managed database within the ISA. The ISA then analyse these data to verify that the two areas are of equal economic value. The analysis and acceptance, or otherwise, of the data by the ISA indicates a degree of verification and validation of these data.

The ISA also supplied TOML with other data in numerous reports (referenced accordingly in the text) and the Mining Code administered by the ISA. These reports as well as structure and authorities of the ISA are publicly available from the ISA website (http://www.isa.org.jm).

The authors of this report neither supervised nor were involved with the preparation, compilation and management of data supplied by the ISA. The ISA compiled these data from multiple and independent Contractors and other sources. These data can be relied upon for the following reasons:

- The ISA has an imperative to manage these data properly and fairly in order to maintain credibility and minimize disputes amongst its many stakeholders (the nations of the world) and to date AMC is unaware of any such disputes being raised in the context of data quality and management;
- The ISA operates independently of any particular government or commercial stakeholder;
- These data have been used as part of a CCZ wide study and mineral inventory estimation exercise (ISA, 2010), which involved experts not employed by the ISA, or TOML, and these data were deemed to be of suitable reliability by the ISA for this exercise.

2.1.2 TOML exploration data

In addition to the above ISA data TOML has recently collected additional data including:

- 64,432 km^2 of Multibeam sonar bathymetry and backscatter response and interpretation thereof collected during a cruise in 2013 on the R/V Mt Mitchell, as presented in Item 9;
- 13 nodule bulk samples and analysis thereof collected on the above 2013 cruise, as presented in Items 7, 9 and 12;
- 113 quantitative estimates of nodule abundance from box-core sampling collected during a cruise in 2015 on the R/V Yuzhmorgeologiya, as presented in Items 7, 8, 9, 11, 12 and 14;
- 161 quantitative estimates of nodule abundance from 587 line km or 20,857 frames of sea bed photography collected on the above 2015 cruise, as presented in Items 9, 11, 12 and 14, as well as logging of megafauna from the photos and 192 hours of continuous video;

- 4 nodule bulk samples and analysis thereof collected on the above 2015 cruise, as presented in Items 7, 9 and 12;
- 280 line km of sidescan and sub-bottom profile sonar survey and interpretation thereof collected on the above 2015 cruise, as presented in Items 7 and 9;
- 334 profiles of water chemistry and sea column characterization data and analysis thereof collected on the above 2015 cruise, as presented in Item 9;
- Biological taxonomy (in progress) of 3195 samples collected on the above 2015 cruise, as presented in Items 9 and 20.

2.2 Report Distribution

This report is intended to be used by TOML and Nautilus subject to the terms and conditions of its contract with AMC. That contract permits TOML and Nautilus to publicly file this report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to provincial securities legislation. Except for the purposes legislated under provincial securities laws, any other use of this report by any third party is at that party's sole risk.

2.3 Purpose of the Technical Report

To present TOML's current state of knowledge of the geology, mineral resource estimates, and related information for its Exploration Area covering parts of the polymetallic seafloor nodule deposit in the CCZ.

2.4 Personal Inspection of the Property

Mr John Parianos visited the CCZ from 4 September to 7 October 2013 on board the R/V Mt Mitchell and from 4 August to 10 October 2015 on board the R/V Yuzhmorgeologiya. He has spent a total of approximately three months within the CCZ surveying and sampling the TOML Exploration Areas (Item 9).

ITEM 3. Reliance on Other Experts

This Technical Report is based on information supplied to AMC by TOML. The work completed by AMC that is the subject of this NI43-101 Technical Report was carried out primarily by the following persons:

Ian Lipton, Fellow of the Australian Institute of Mining and Metallurgy, a full-time employee of AMC, is a Principal Geologist and the Qualified Person with overall responsibility for the Technical Report.

Matthew Nimmo, Member of the Australian Institute of Geoscientists, is a Consultant Geologist and the Qualified Person with overall responsibility for the Mineral Resource including Items 11, 12 and 14.

John Parianos, Member of the Australian Institute of Geoscientists and employee of Nautilus Minerals, is Chief Geologist and the Qualified Person responsible for Items 4, 6, 7, 8, 9 and 19 of this report.

Outside of referenced public documents, this Technical Report includes statements on the property tenure, location and ownership and accessibility as presented in Items 4 and 5 and elsewhere in this report. These were provided by John Parianos, Chief Scientist of TOML. AMC has not undertaken an independent review of the tenure held by TOML and relies on the expertise and experience in international tenure provided by TOML in this regard.

Information supporting historical exploration in the CCZ (Item 11, Item 12 and Item 14) was collated with the assistance of Dr Charles Morgan, Limnologist of Moana Hohonu Consulting LLC. Dr Morgan has over 30 years experience in ocean science including research into the CCZ.

Information supporting Item 13 Mineral Processing and Metallurgical Testing was provided and reviewed by Mr David White, Consulting Metallurgist. Mr White has over 30 years experience in metallurgical processing of bulk oxide type ores.

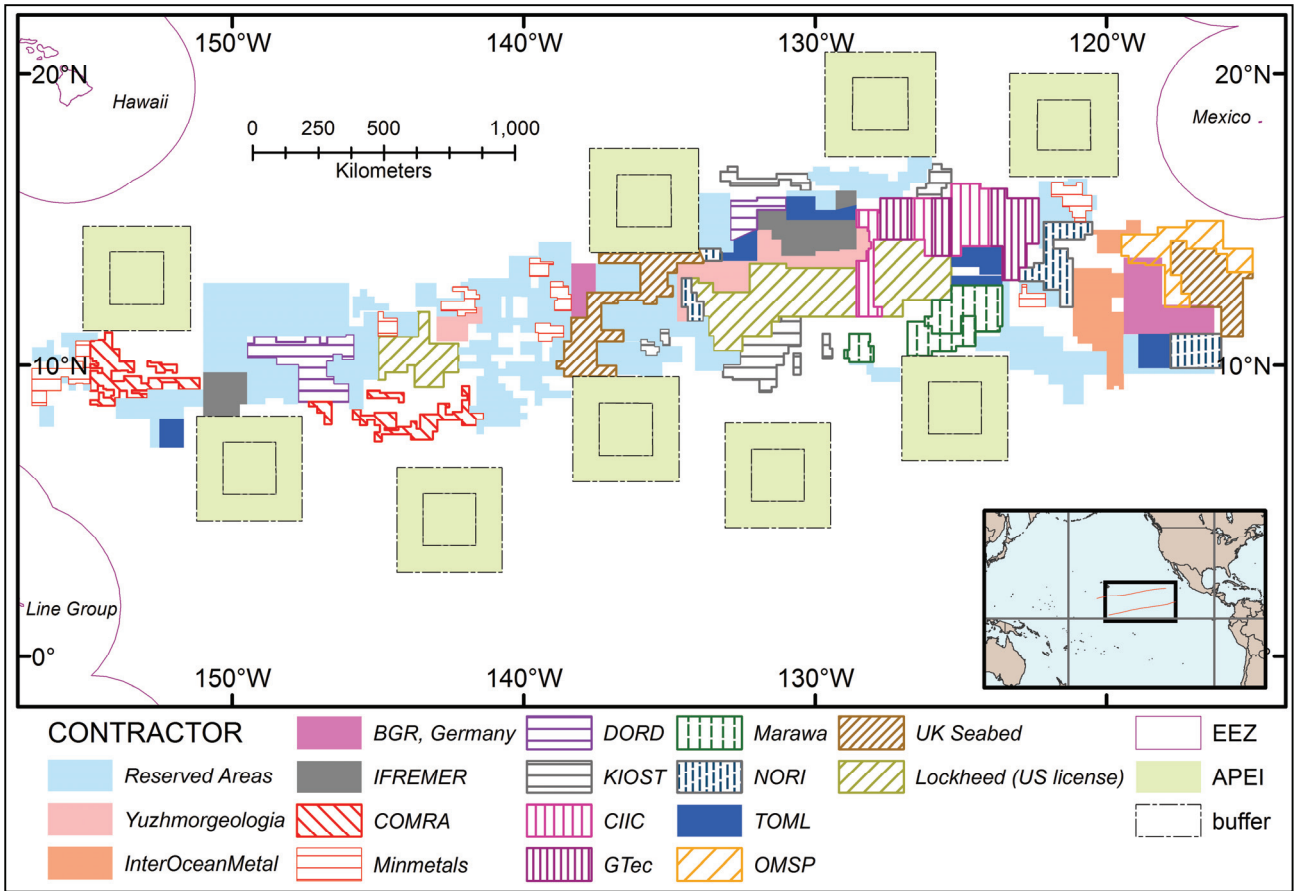
Information supporting Item 16 Mining Methods was provided by Mr Frank Brockett, Principal Engineer at Sound Ocean Systems Inc. Mr Brockett has over 30 years experience in deep-ocean engineering including collector development in the CCZ. AMC has reviewed the information on mining for the purpose of assessing the potential prospects of economic extraction of the nodules from the TOML Exploration Area. The assessment is conceptual in nature and is not supported by a preliminary economic assessment (PEA).

Information supporting Item 9 Exploration was provided and reviewed by Dr Adrian Flynn, Marine Biologist of Fathom Pacific. Dr Flynn has over 15 years experience in the marine environment and deep-sea biology.

ITEM 4. Property Description and Location

The TOML exploration rights are located within the Clarion Clipperton Zone (CCZ) located in the Pacific Ocean Figure 4.1). The western end of the CCZ is approximately 500 km ENE of Kiribati and approximately 1,000 km south of the Hawaiian island group. The CCZ extends over 4,500 km ENE, in an approximate 750 km broad trend with the eastern limits located approximately 2,000 km west of southern Mexico.

Figure 4.1 Location and Contractors in the Clarion Clipperton Zone



Map compiled from contract announcements at www.isa.org.jm; Refer Item 23 for details on the other contractors

4.1 Tenement and Permitting

Tonga Offshore Mining Ltd (TOML), a 100% owned subsidiary of Nautilus Minerals Inc., was sponsored by the Government of the Kingdom of Tonga in its application for approval of a “plan of work for exploration for polymetallic nodules” by the International Seabed Authority (ISA) under the terms of the United Nations Convention on the Law of the Sea 1982 (UNCLOS) and the Mining Code of the ISA (specifically the Regulations for Prospecting and Exploration of Polymetallic Nodules).

The ISA approved the plan of work in July 2011 and this led to signing of a “contract for exploration for polymetallic nodules” by the ISA and TOML on 11 January 2012, that formalised an “Exploration Area” (tenement or licence; Figure 4.1, Table 4.1), a term of 15 years for the contract, and a programme of activities for the first 5-year period. The contract also formalised the rights of TOML around security of tenure leading to a “contract for exploitation”. The contract does not cover minerals other than polymetallic nodules but in this context the ISA is obligated to ensure that no other entity operates in a manner that might unreasonably interfere with TOML.

Table 4.1 TOML Exploration Area in the CCZ

Exploration Area	Reserved Block	Area (km^2)
Area A	Block 2	10 281
Area B	Block 15	9 966
Area C	Block 16	15 763
Area D	Block 20	15 881
Area E	Block 21	7 002
Area F	Block 25	15 820
Total		74 713

4.1.1 United Nations Convention of the Law of the Sea

UNCLOS (also known as the Law of Sea) was drafted in 1982 replacing earlier United Nations led conventions on the sea as well as the "freedom of the seas concept". As of 15 May 2011 it had been signed by 162 parties (mostly independent states and the European Union; ISA, 2012c). The law is overviewed by The Division for Ocean Affairs and the Law of the Sea within the United Nations. It deals with navigational rights, territorial sea limits, economic jurisdiction, legal status of resources on the seabed beyond the limits of national jurisdiction, passage of ships through narrow straits, conservation and management of living marine resources, protection of the marine environment, and marine research. Major issues, amendments and disputes are dealt with by the International Tribunal for the Law of the Sea (ITLOS).

The most notable "non-signatory" to the Law of the Sea is the United States of America (USA) which maintains its own deep-seabed exploration and mining regulations. The USA has signed the Law of the Sea but not ratified it (Item 6).

Part XI of UNCLOS, and its subsequent Implementation Agreement of 1994, deals with mining of minerals from the seafloor outside of nationally regulated areas. The agreements provide a framework for countries and companies (with country sponsorship) to obtain legal title to areas of the seafloor from the ISA for the purpose of exploration and eventually exploitation of resources.

4.1.2 International Seabed Authority

The ISA is an autonomous international organization established under UNCLOS and the 1994 Implementation Agreement. The ISA is the organization through which parties to the Law of the Sea shall, in accordance with the regime for the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction established in Part XI, organise and control activities beyond the limits of national jurisdiction, particularly with a view to administering its resources.

The ISA, which has its headquarters in Kingston, Jamaica, came into existence on 16 November 1994, upon the entry into force of the 1982 Convention. The ISA became operational as an autonomous international organization in June 1996. Legal recourse with the Law of the Sea by association the ISA is handled by the International Tribunal for the Law of the Sea in Hamburg (http://www.itlos.org). More information on the history of UNCLOS, the Implementation Agreement and the ISA can be found in Item 6.

Within the ISA is a function called the Central Data Repository (Kodagali, 2009). This function collects and stores data on marine deposits of all types within international waters. Much of the data is publically available, but other data is kept confidentially. This includes data supplied to the ISA by Pioneer Contractors under the 1994 implementation agreement and their respective exploration contracts.

4.1.3 Tenement Areas and the Enterprise

A key principle of the Law of the Sea is that "*the seabed and ocean floor and the subsoil thereof beyond the limits of national jurisdiction, as well as its resources, are the common heritage of mankind, the exploration and exploitation of which shall be carried out for the benefit of mankind as a whole*".

With this intent the ISA has issued regulations on Prospecting and Exploration for Polymetallic Nodules (adopted 13 July 2000 and amended 25th July 2013; ISA, 2013a; ISA, 2013b), Prospecting and Exploration

for Polymetallic Sulfides (adopted 7 May 2010), and Regulations for Prospecting and Exploration of Cobalt-Rich Crusts (adopted 27 July 2012).

Contracts of exploration for polymetallic nodules are granted for 15 years, and provide the Contractor with exclusive title and security of tenure in moving to a contract of exploitation. Regulations regarding the exploitation of polymetallic nodules have not yet been finalised, but it is noted that a first draft is due for review in July 2016, and these regulations will need to be consistent with the Law of the Sea.

Pioneer Contracts or Contractors sponsored by developed nations explore an initial area and "return" half of equal value to the ISA for inclusion into the Reserved Areas. So far all developed nation Contractors have been descended from major explorers in the region that predate the formation of the ISA. The Pioneer Contractors are a group of seven explorers (some from developed nations and some from developing nations; France, South Korea, India, China, Russia, IOM consortium, Japan) who were granted special terms from the ISA in the 1990's (Item 6). Specifically the Pioneer Contractors started with an initial area of about 300,000 km^2 on filing application for an exploration contract with the ISA, and returned 50% of equal value to the ISA. The Pioneer Contractors reduced their remaining 150,000 km^2 to 75,000 km^2 over about ten years during the course of their exploration. Other groups sponsored by developed nations (e.g. by Germany, United Kingdom) started with about 150,000 km^2 on entering into an exploration contract immediately returning about 75,000 km^2 to the ISA.

Contractors sponsored by developing nations (including TOML which is sponsored by the Kingdom of Tonga) can apply for up to 75,000 km^2 of area within the Reserved Areas under an exploration contract. The Reserved Areas thus exist to allow developing nations (or their sponsored companies) to apply for ground and to benefit also from the deep-sea resource inventory. The ISA may also elect to manage the ground through its own mining organisation termed the Enterprise, which at the time of publication of this report, has not been set up.

As detailed in Item 23, to date 15 contractors have been granted contracts for exploration for polymetallic nodules within the CCZ.

4.2 TOML Obligations

The contract for exploration for polymetallic nodules contains conditions covering such areas as obligations of the sponsoring state, environmental obligations, marine scientific research, fees, and work programmes.

4.2.1 Work Programme

A five year programme of activities is part of the contract for exploration for polymetallic nodules between the ISA and TOML:

- Year 1 involved compilation and review of historical work – completed in 2013;
- Years 2 and 3 involve cruises to evaluate the mineral resources to a higher standard and address the key modifying factors of environment, mining and other engineering, metallurgy and economics to complete a prefeasibility study – completed in 2015;
- Years 4 and 5 involve a feasibility study.

TOML also has commitments to provide bursaries and scholarships and capacity building and training to Tongan nationals, nationals from other developing nations and ISA personnel, and is in compliance with these commitments.

4.2.2 Royalties and Taxes

Royalties and taxes payable on any future production from the property will only be finalised once the ISA has developed an 'exploitation code'. This was formally proposed as a project by the Secretary General of the ISA and endorsed at the 17th Annual Session of the ISA. Any code will need to honour the key principles of UNCLOS.

TOML has agreed to a royalty with the Tongan government of US$1.25 per dry ton of nodules for the first 3 million dry tons of nodules mined in any one year and US$0.75 per dry ton for all dry tons mined thereafter in that same year.

ITEM 5. Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility Climate and Infrastructure

Access to the CCZ is essentially only achieved by ocean going vessels.

Climate in the region of the CCZ is generally benign for seaborne mining production with warm equatorial, conditions moving northwards into lower temperate zones. An environmental review for the OMA consortia (NOAA, 1984) indicates that:

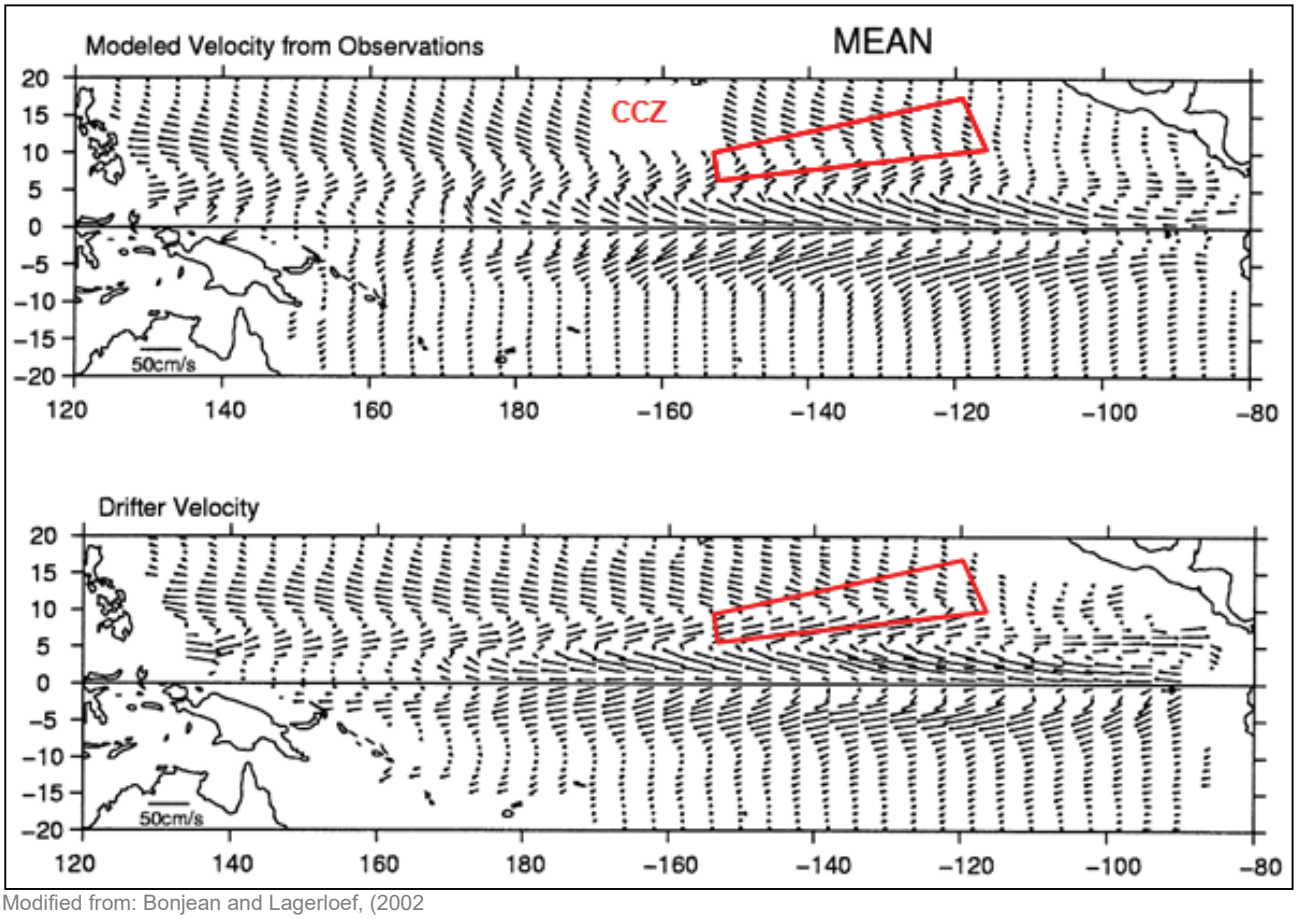
- Prevailing winds are easterly all year round
- Predominant swell direction is from the east to northeast due to trade-wind influences, wave height and period probability are shown in (Table 5.1)
- Cyclones in any particular location are uncommon but they do occur within the vast area of the CCZ, within a season that is generally from May to October with peak frequency from July to September (Table 5.2).

Experience from the TOML cruises in 2013 and 2015 is consistent with the metocean statistics for the region (Table 5.1).

Prevailing currents change seasonally and with El Nino-La Nina events but generally are gentle (Figure 5.1).

Consultation with other users of the ocean is ongoing and future usage conflict seems very unlikely. The International Maritime Organisation (IMO) is an observer in the ISA Assembly (ISA, 2015a). The CCZ is outside major shipping lanes as shown in Figure 5.2, and submarine cables laid to date are well away from the TOML areas (ISA, 2015b).

Figure 5.1 Mean diagnostic surface current velocity relative to the 30 m depth surface layer and drifter velocity (15 m sub-surface) for the central Pacific



Modified from: Bonjean and Lagerloef, (2002

Table 5.1 Wave height probabilities around the CCZ

Per 100000 waves source: Global Wave Statistics (Area 45) compiled by Metocean for TOML

Sig Hgt (m)	569	12956	83278	208476	269867	216911	123904	55020	20289	6521	1894	1000000
> 14							1	1	2	2	1	
13 to 14							1	1	1	1	1	6
12 to 13						1	2	2	2	2	1	11
11 to 12						1	3	4	4	3	2	18
10 to 11					1	3	6	8	7	5	3	32
9 to 10					2	7	13	15	13	8	5	63
8 to 9				1	7	21	36	39	30	18	9	162
7 to 8				6	35	94	140	137	97	54	25	590
6 to 7			3	44	220	503	659	571	363	182	76	2622
5 to 6			29	342	1405	2721	3060	2307	1290	576	216	11947
4 to 5		6	270	2482	8126	12851	12036	7684	3690	1432	473	49050
3 to 4		77	2248	14994	36987	45414	33875	17593	7002	2289	646	161125
2 to 3	5	811	14312	62200	105325	92690	51355	20410	6381	1675	387	355549
1 to 2	89	5696	47330	109935	109092	60473	22327	6190	1399	273	48	362852
0 to 1	475	6365	19086	18471	8166	2131	391	57	7	1		55148
	< 4	4 ~ 5	5 ~ 6	6 ~ 7	7 ~ 8	8 ~ 9	9 ~ 10	10 ~ 11	11 ~ 12	12 ~ 13	> 13	
	Zero Crossing Period (s)											

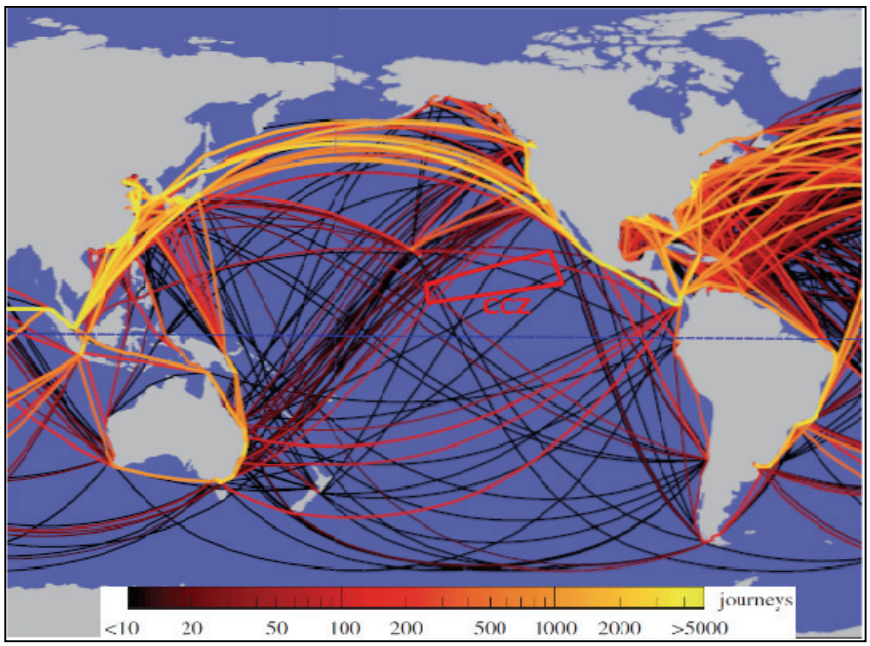
Source: Metocean, (2012) internal report to TOML

Table 5.2 Frequency and wind speeds of tropical storms in the TOML Areas

Area	Earliest storm record[1]	Number of years of records	Number of tropical storms[2]	Avg. years between storms	Avg wind speed (kn)	Max. wind speed (kn)	Number of Hurricanes[3]
A	No storms recorded thus far						
B	1966	48	32	1.50	46	120	7
C	1957	57	67	0.85	51	125	18
D	1957	57	67	0.85	44	120	16
E	1957	57	42	1.36	44	120	8
F	1972	42	28	1.50	43	105	2

[1]Records available through 2013; [2]Sustained winds greater than 33 kn; [3]Sustained winds greater than 64 kn. Source: NOAA NWS (2015)

Figure 5.2 Ship movements through the Pacific coloured on journeys per annum



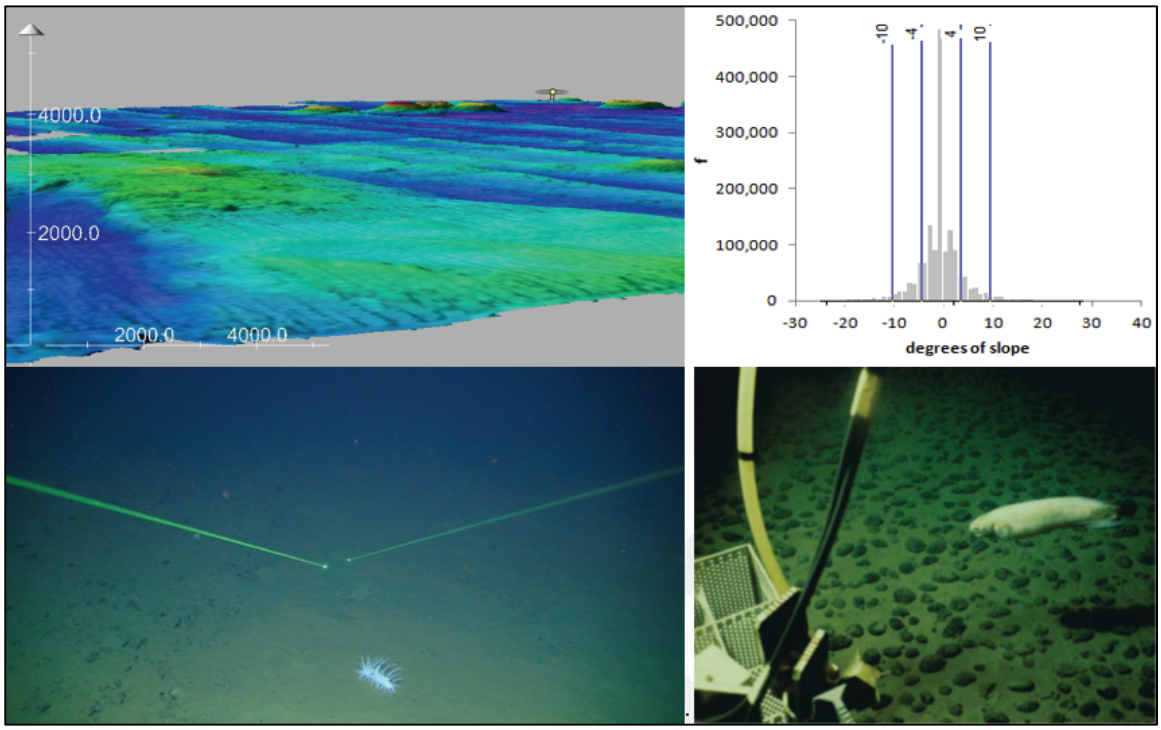
Modified from: Kaluza et al., (2010)

5.2 Seabed Conditions and Physiography

The seabed within the TOML areas is generally (~80%) very flat with slopes under 4° and generally closer to 2° (Figure 5.3). Most of the area is covered with soft sediment on which the mineralised nodules rest.

Interaction with the seabed during exploration is thus relatively straightforward once ship heave is allowed for. Sampling and collecting devices need to allow for the softness and cohesiveness of the sediment, but they can be skimmed several metres above or dragged along the seabed without the need for sophisticated active control systems and only occasionally do seabed obstacles need to be considered.

Figure 5.3 Example bathymetry, slopes, and photos from the CCZ



Sources: TL: northeast view of multibeam bathymetry collected by TOML across TOML Area B; TR: histogram of slope from mutlibeam bathymetry collected by TOML across TOML Area B BL seabed and Oneirophanta sp (http://abyssline.info/): BR: nodules and fish Ophidiidae Barathrites sp. (Tilot, 2006)

Seabed currents are typically low (order of 5 cm/s) although there is evidence for occasional higher velocities, (Item 7.2.5). Pressures are high (~44,000 kPa) and temperatures are typically near 1.5°C.

The substantial water depth (4200-4900 m) is important in terms of cable capacity and catenary, especially regarding drag of towed equipment and power transmission losses.