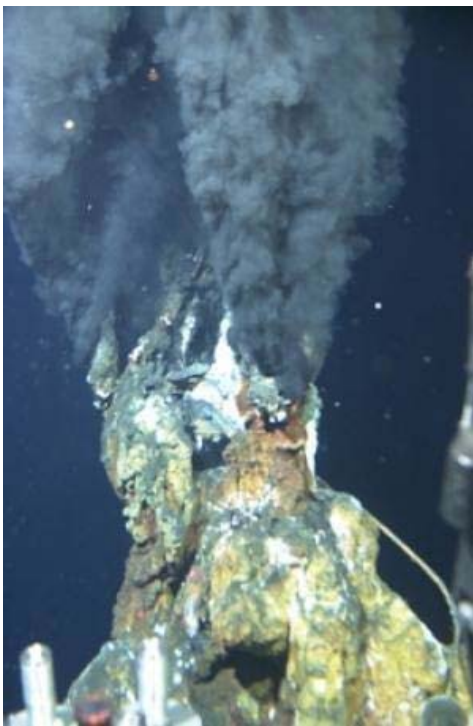




# Bismarck Mining Corporation (Vanuatu) Limited (Part of Neptune Minerals Group)



Harvey Cook - Director

Tim McConachy – Director

Sophie Egden – Manager Regional Affairs

# Introduction

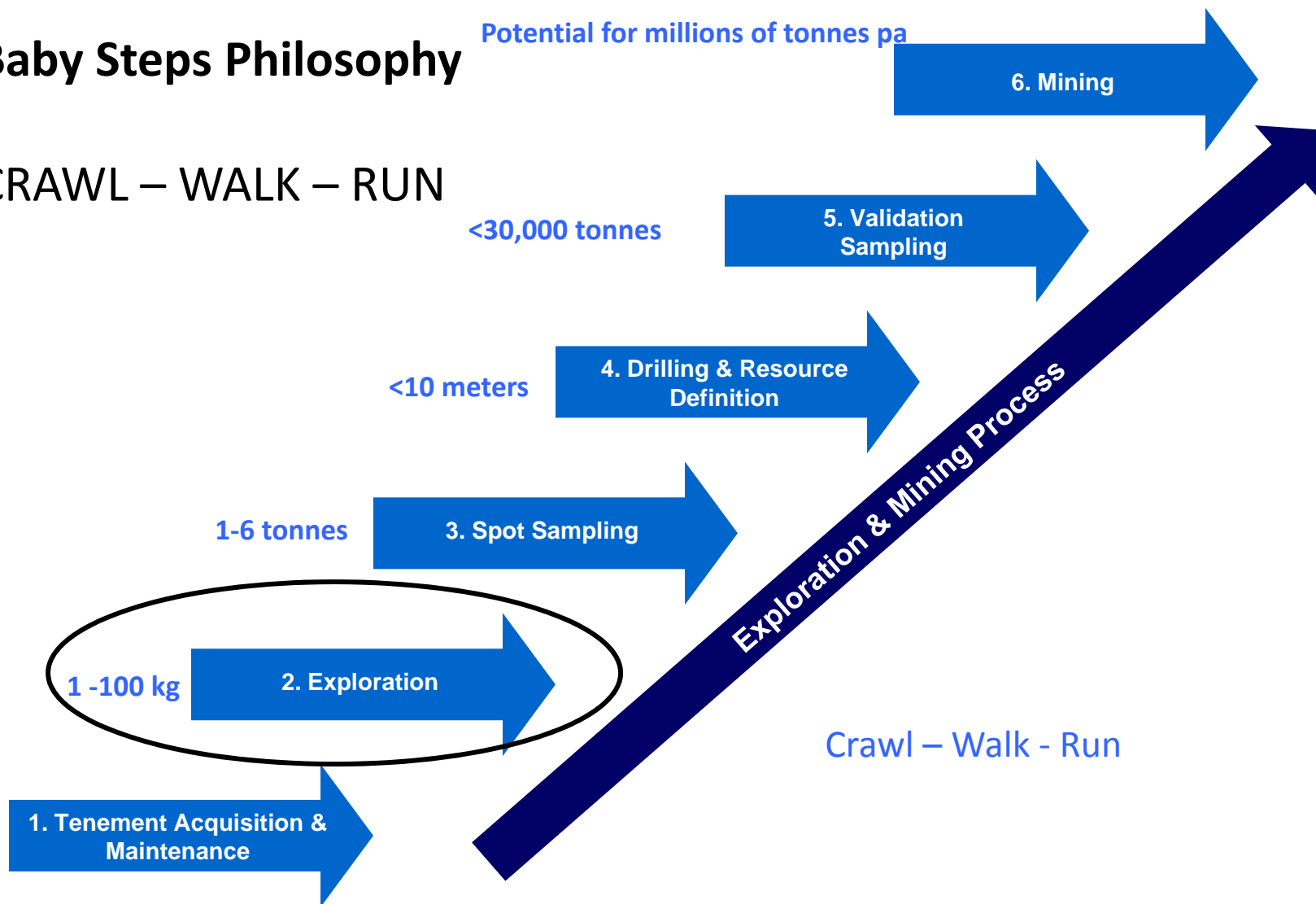
- Who we are:
- Seafloor minerals explorer
- Granted exploration licences and applications in W Pacific
- Part of Bluewater Metals/Neptune Minerals Group of Companies
- Project Office in Sydney
- Financial Office in Melbourne
- Head Office in Tampa, USA

# Scope of Talk

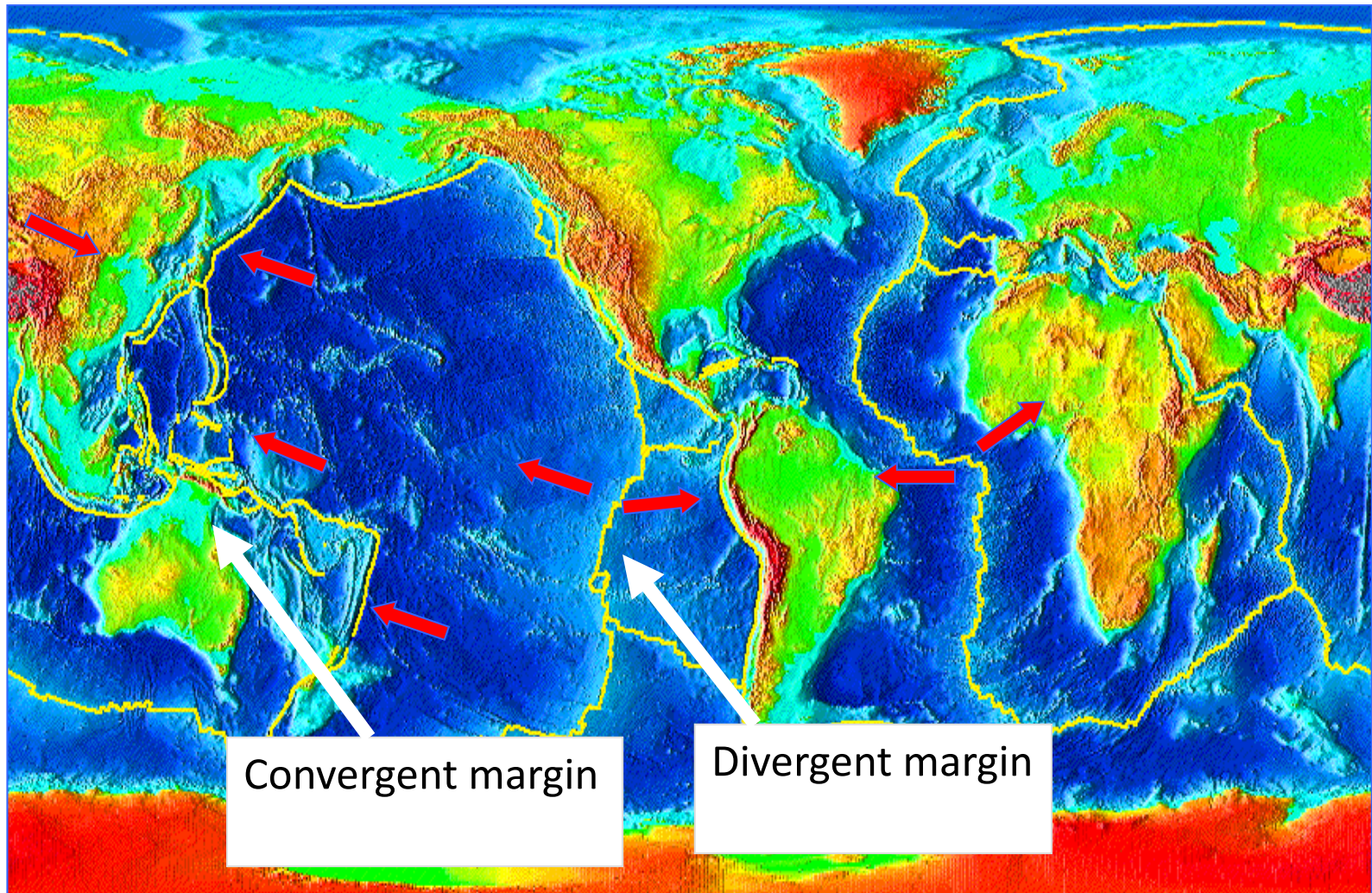
<b>Scope of current work</b>	Exploration not mining
<b>Our approach</b>	<b>Baby Steps.</b>  We are careful and respectful.
<b>Environment</b>	We are knowledgeable and will do the right thing
<b>Local benefits</b>	This will be a good thing for All Islanders
<b>The need for sub-sea mining</b>	The world needs new sources of minerals
<b>Our credentials</b>	We are responsible & trustworthy

# Baby Steps Philosophy

CRAWL – WALK – RUN



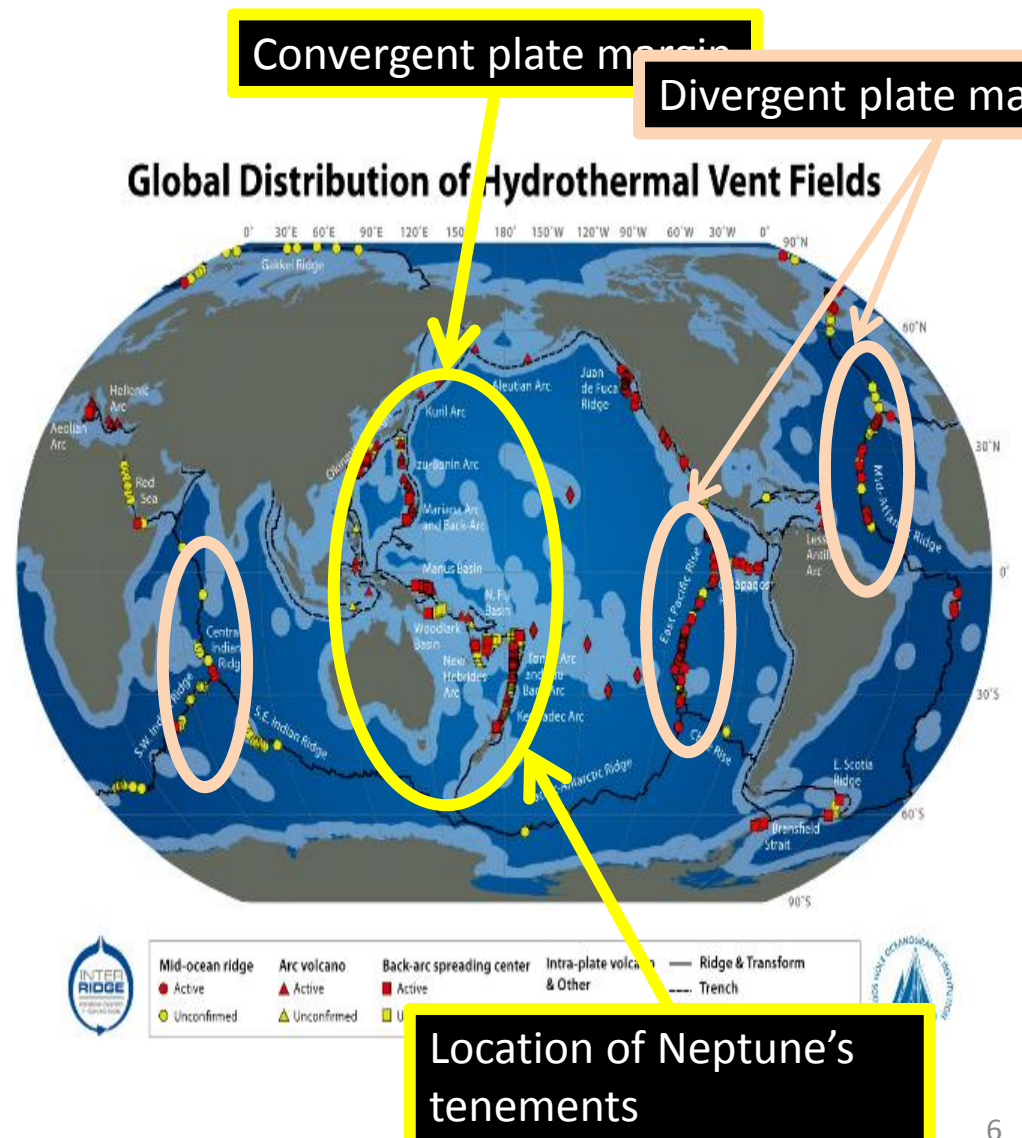
# 72% world's surface is ocean





# Prospectivity of Seafloor

- Seafloor massive sulfide (SMS) deposits form on ocean floor,
- High concentrations of copper, zinc, gold, silver and other trace metals.
- Modern-day equivalents of ancient land based volcanogenic massive sulfide (VMS) deposits, major source of world's base and precious metals.
- Since 1979, ~150 SMS found discovered at divergent and convergent plate boundaries
- ~1,000 SMS deposits across the world's oceans<sup>1</sup>
- Convergent plate margins, including 22,000 km of volcanic arcs and 7,000 km of back arcs, 40% of world's SMS deposits



<sup>1</sup>Baker, E. T., German, C. R., 2004. On the Global Distribution of Hydrothermal Vent Fields. Mid-Ocean Ridges: Hydrothermal Interactions Between Lithosphere and Oceans, Geophysical Monograph Series 148, pp 245-266.

# SEAWATER

- Cold
- Alkaline
- Oxidizing
- Sulfate rich
- Metal poor

P L U M E

$\text{CH}_4$ ,  $\text{H}_2\text{S}$

## PRECIPITATION due to

- $\Delta$  Temperature
- $\Delta$  pH
- Saturation

Sulfides

Lavas

Water - Rock  
Reaction

## HYDROTHERMAL FLUID

- Hot
- Acid
- Reducing
- Sulfide rich
- Metal rich

Fractured  
Lower Crust

High -  
Temperature  
Reaction

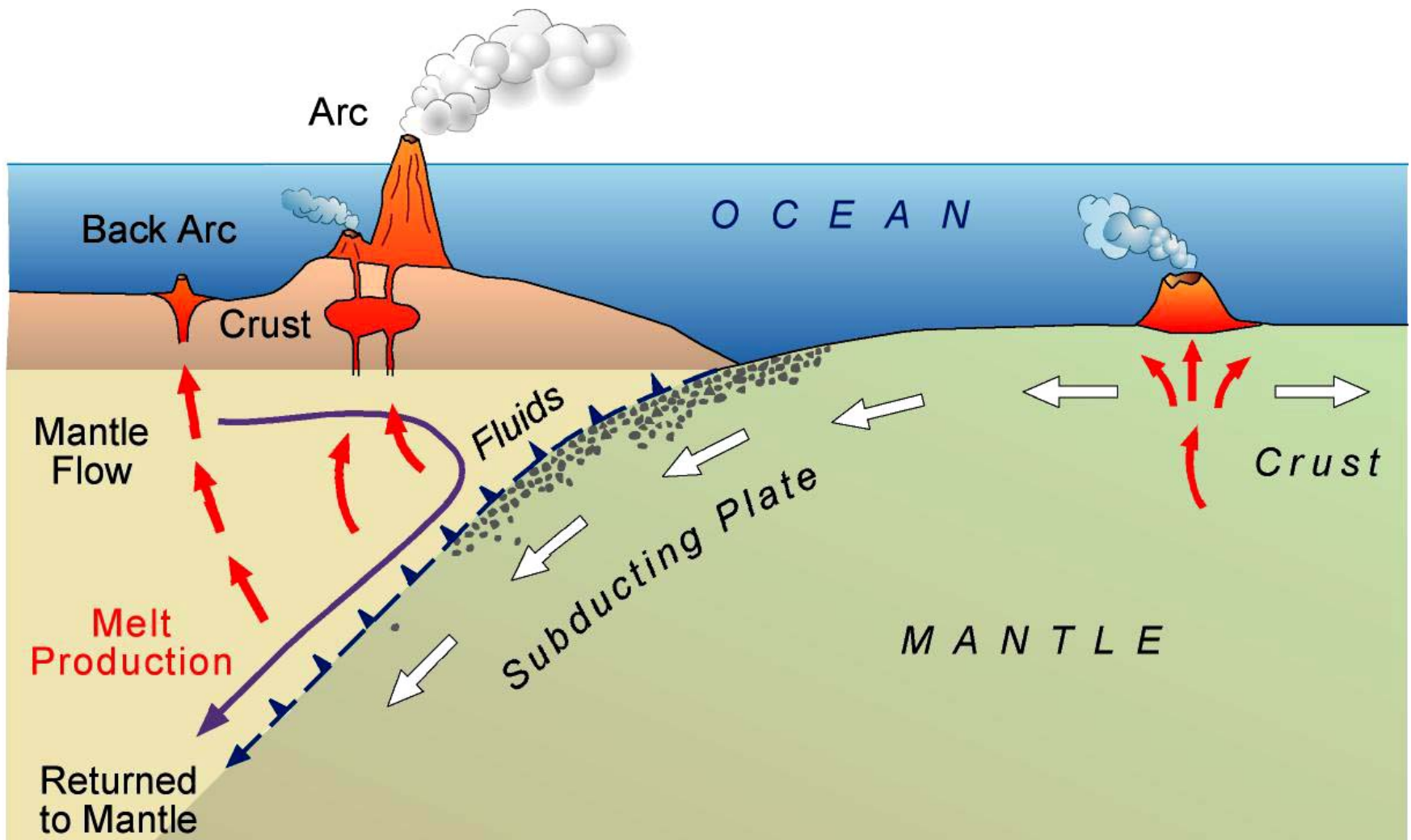
MAGMA

confidential

# Exploration Tenent

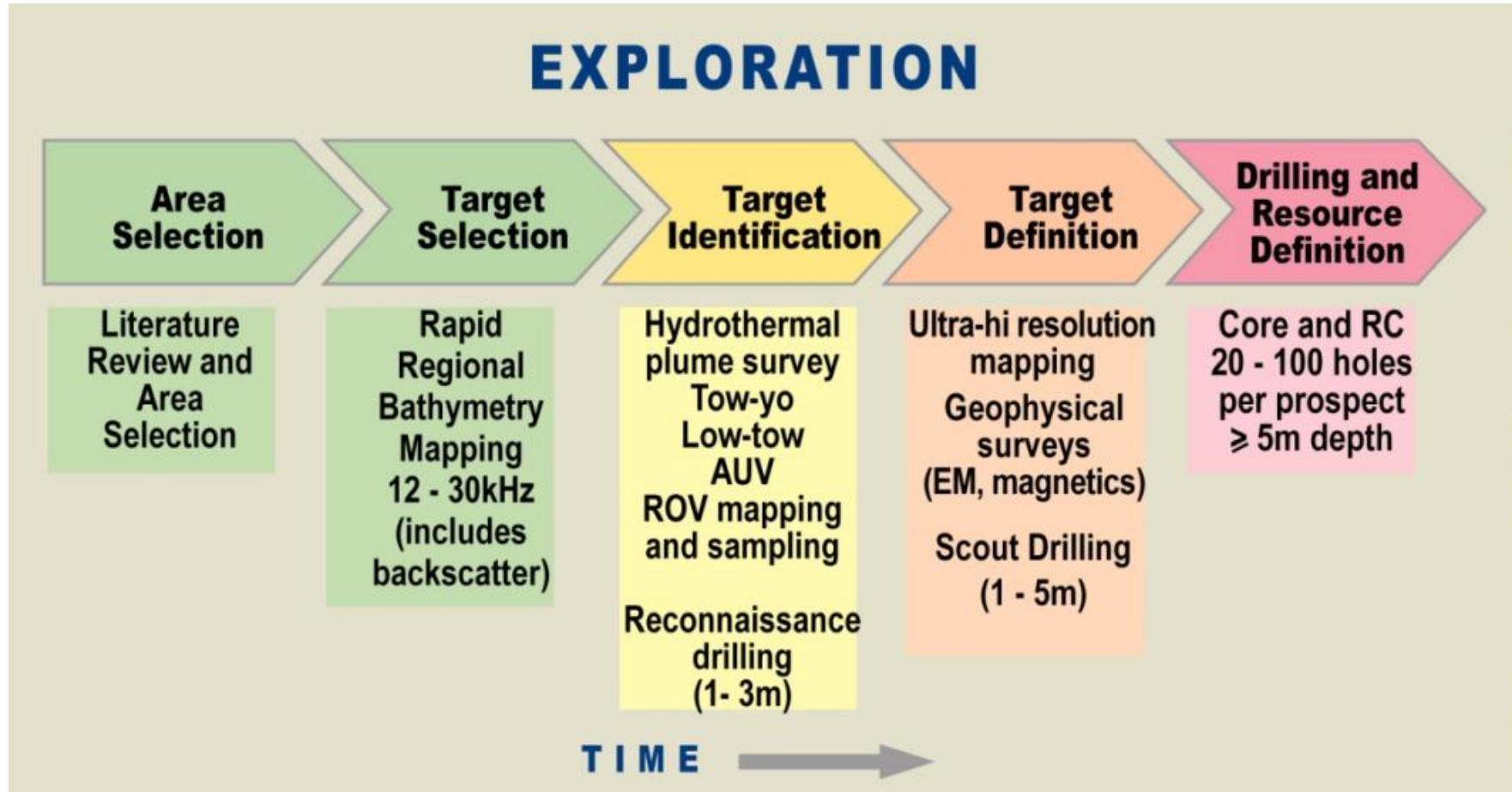
CONVERGENT

DIVERGENT





# Our Exploration Strategy



# Exploration

- MV Dorado Discovery
- Multibeam 40Khz mapping
- Hydrothermal plume survey
- Follow up mapping and sampling with Remotely Operated Vehicle (ROV)
- Spot sampling
- Drilling
- Validation Sampling
- Environmental studies start Day 1, integral to all work
- Government officials invited to be active participants in all campaigns; have access to all areas



MV Dorado Discovery



**Remotely  
Operated Vehicle**

# MV Dorado Discovery

## Swiss Army Knife for seafloor exploration







IMO  
8715156

DORADO

ODYSSEY







# MASSIVE SULFIDE SAMPLES

Harvey Cook

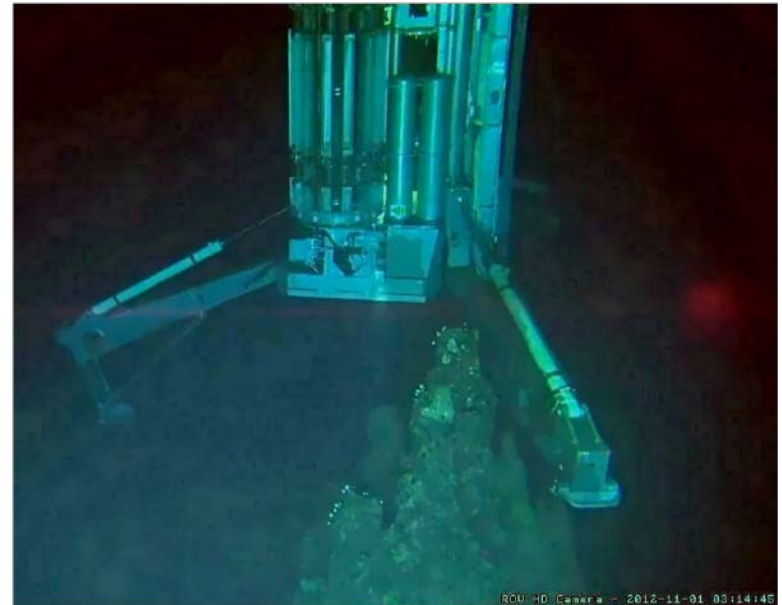
Tim McConachy

Chimney Samples



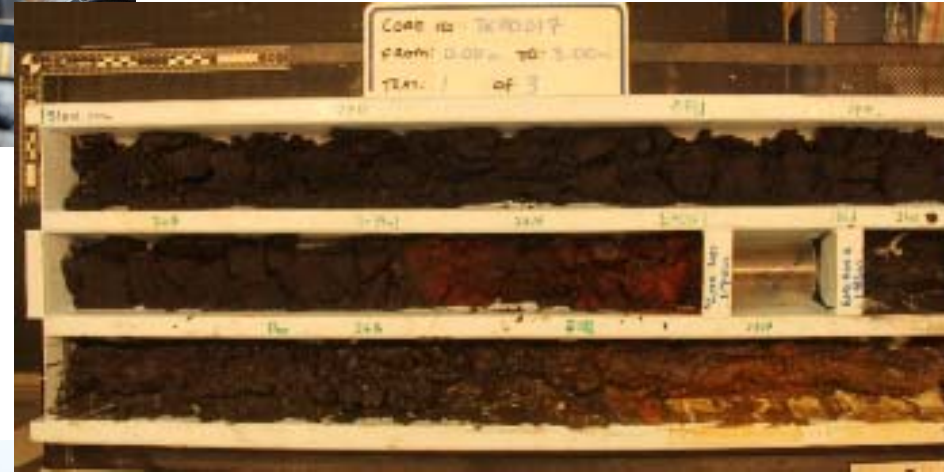
# Drilling Campaign

- Determine extent of mineralization.
- Various options evaluated before selecting the PROD 3 seafloor drill provided and operated by Benthic Geotech.
- Main reasons for the choice were:
  - Proven track record
  - Multiple drilling options
  - Productivity
  - Core retrieval methodologies
- Capability to perform onboard processing of samples and to gather hand held XRF measurements were implemented.
- Multiple operations planned for to optimize vessel use; drilling, environmental and survey programs planned and executed.





# Drill core



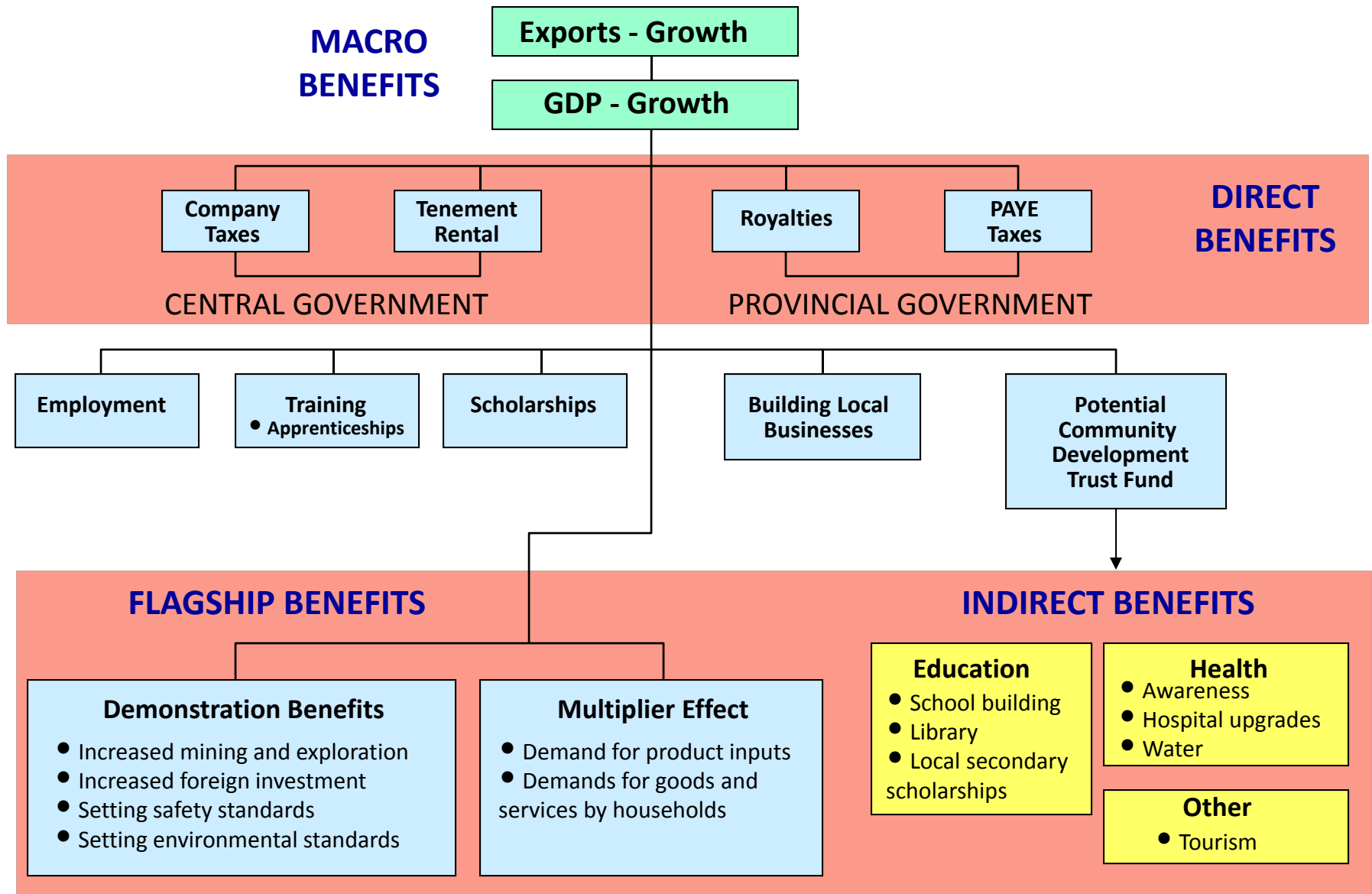
# Drill recovery

# Social Licence (most important)





# Seafloor Exploration and Mining – The Benefits



Topic	Major message	Our Belief
Scope of current work	Exploration not Mining	No sub-sea mining activities at all at this stage. Focusing on exploration activities only under a licence issued by the National Government's Ministry of Mines. Mining project, if it goes ahead, will not take place for several years from now.
Our approach	Baby Steps. We are careful and respectful	We are here to do no harm. We are taking baby steps every step of the way so that we can assess and review the outcomes of our work. We will only proceed to the next step if it is safe to do so.
Environment	We are knowledgeable and will do the right thing	Protecting the environment, as well as the health, safety and welfare of all Islanders, is a primary concern for us.



Topic	Major message	Our Belief
<b>Local benefits</b>	<b>This should be a good thing for all Islanders</b>	A sub-sea mining project, if it goes ahead, would benefit all Islanders. Benefits will come through taxes paid to the National Government for the betterment of the local community; sharing of knowledge and data and jobs for local people in service industries which would support the project.
<b>The need for sub-sea mining</b>	<b>The world needs new sources of minerals</b>	Our world needs to develop new sources of minerals because land based deposits are getting harder to find and more costly to build. Declining grades, rising volumes. Minerals are used in all sorts of ways in our homes, roads and buildings. SMS production is a low impact, small carbon foot print
<b>Our credentials</b>	<b>We are responsible &amp; trustworthy</b>	We are an active contributor to SOPAC. All our work is carried out in accordance with SOPAC, ISA guidelines. Have history of collegial cooperation with government and stakeholders