

RepRisk Special Report

Deep Sea Extractive Activities: Seabed Mining and Deep Sea Drilling

Foreword from the CEO

I am pleased to announce the release of our Deep Sea Extractive Activities Report, which focuses on the challenges facing Seabed Mining and Deep Sea Drilling.

The scientific community is slowly recognizing that the deep-sea marine environment harbors complex and diverse ecosystems that can potentially benefit mankind. Pharmaceutical companies also believe that the deep-sea may provide resources for the discovery of new medicines derived from natural products.

Exploration of the deep-sea marine environment is in its infancy, and many discoveries undoubtedly remain to be made. Commercial overfishing and pollution have already harmed the world's oceans, and the interest to exploit mineral and oil deposits in deep-sea locations has raised concerns that these fragile marine ecosystems will be irrevocably damaged before scientists have had time to explore their full potential.

Scientists and civil society organizations are urging companies to consider the cumulative impacts of their extraction in their risk management strategies, and are calling for an international consensus on the protection of the marine environment.

We hope that this report sheds some light on the scale of the challenges facing companies that want to explore the commercial potential of deep-sea environments and will increase awareness of the ESG risks involved in such activities.

Philipp Aeby
CEO, RepRisk AG

About RepRisk

RepRisk is a leading business intelligence provider specializing in dynamic environmental, social and governance (ESG) risk analytics and metrics.

On a daily basis, RepRisk systematically screens big data from a broad range of open intelligence sources in 15 languages in order to identify, filter, analyze and quantify ESG risks (such as environmental degradation, human rights abuses and corruption) related to companies, projects, sectors and countries. This external perspective provides valuable insight on whether a company's policies, processes and commitments are consistently translating into performance.

Since 2006, RepRisk has built and continues to grow the most comprehensive ESG risk database that serves as a due diligence tool and early warning system in risk management, compliance, investment management, corporate benchmarking and supplier risk. The database currently includes risk profiles for over 53,000 public and private companies and 13,000 projects as well as for every sector and country in the world.

Headquartered in Zurich, Switzerland, RepRisk serves clients worldwide including global banks, insurance companies, investment managers, and corporates, helping them to manage and mitigate ESG and reputational risks in day-to-day business.

RepRisk provides the transparency needed to enable better, more informed decisions. For more information, please visit www.reprisk.com.

Introduction

Oceans and seas cover over 70 percent of the earth's surface. Approximately 55 percent of these waters harbor deep ocean basins that contain mineral resources such as gold, silver, copper, nickel, cobalt, zinc, lead, and barium. These areas, known as the "deep-sea," can reach depths of over 1,000 meters.

Until the middle of the twentieth century, scientists believed that life was almost impossible in this eternally dark and extremely cold environment. However, probes in the 1970s revealed hydrothermal vents that provide nutrients and energy for an abundance of life. In recent years, over 500 previously unknown species have been discovered in deep-sea areas, some of which are of major interest to medical science.

Extracting minerals from shallow depths of up to 100 meters has already been practiced for over a century, and underwater oil wells in salt-water environments have been in operation since the early 1900s. However, "frontier" technologies are now allowing scientific exploration at greater depths, and as the planet's terrestrial resources diminish, there will almost certainly

be increased interest in developing extractive activities in deep-sea areas.

Scientists have warned, however, that deep-sea extraction represents significant environmental challenges, and conservationists claim that such industrial operations could negatively affect fragile deep-sea ecosystems.

Multiple NGOs have expressed concerns that seafloor disturbance could release toxic particles and expose undiscovered species to heavy metals and acids. The claim is that these could accumulate in the tissues of marine organisms or even cause contaminants to enter the food chain eaten by local communities.

Environmentalists are also concerned about the effect of light on species that are accustomed to a perpetually dark, deep-sea habitat. There are also fears that some marine species, which rely on sound for communication and navigation, will be impacted by noise that can allegedly travel hundreds of kilometers in an underwater environment.

Experts also warn that ocean currents could spread contamination from min-

ing waste, or an oil leak, far beyond the actual sites, and that such incidents could even lead to international disputes.

The 1982 UN Convention on the Law of the Sea established the International Seabed Authority (ISA), which became fully operational as an autonomous international organization in 1996. The ISA, which counted 167 member countries and states as of January 2015, organizes and controls activities on the seabed and ocean floor that lie beyond the limits of national jurisdictions.

The number of companies seeking licenses to explore deep-sea environments is increasing rapidly. There are concerns from various stakeholders that the ISA has signed multiple contracts since the beginning of 2015 with member states and companies, authorizing them to carry out exploration activities in areas including the Central Indian Ocean, the Magellan Mountains in the Pacific Ocean, the Clarion-Clipperton Zone of the Pacific Ocean and the mid-Atlantic Ridge in the Atlantic Ocean.

Ocean mines have an economic advantage over land mines, as they do not require expensive installations such as shafts and tunnels. There is also no need to build a comprehensive supporting infrastructure, as the mining ship can be taken to another site once the ore is exhausted. Transportation costs are also comparatively low as the ore is shipped by sea.

Environmentalists have raised concerns, however, that mining waste released back into the sea could contain heavy metals and other pollutants. Greenpeace has warned that deep-sea mining activities could even reduce fish populations that support the world's fisheries, already at risk due to widespread commercial overfishing, and the coastal communities that depend on them.

RepRisk first identified criticism of deep-sea mining projects at the beginning of 2007, when the government of Papua New Guinea was criticized for granting a 20-year mining license to Nautilus, a company partly owned by Anglo American, to develop the Solwara 1 Project.

The Solwara 1 Project, being developed by the company's subsidiary, Nautilus Minerals Nuigini Ltd, is a concession that extends over an area of 158,000 square meters. Nautilus allegedly plans to use a 1,600-meter long suction pipe to scrape 80,000 tons of copper and 150,000 ounces of gold from the ocean floor each year. The Russian company Metalloinvest, previously known as Gazmetall, apparently has a stake in the project.

NGOs including Greenpeace, the Deep Sea Mining Campaign, and Friends of the Earth, raised concerns about the impact of this new mining procedure on

the seabed, and Mining Watch warned that the Government of Papua New Guinea was not capable of monitoring this completely new mining technique.

Indigenous coastal communities also claimed that the project would pollute the seawater, cause other environmental damage, and would have a negative impact on their livelihoods and food sources, which are dependent on fishing. The European Union was accused of disenfranchising local communities by supporting the new mining method through its funding of the Secretariat of the Pacific Community, a regional, intergovernmental organization that aims to develop the professional capabilities of Pacific Island people.

In November 2012, a report released by the Deep Sea Mining Campaign claimed that Solwara's Environmental Impact Study was seriously flawed, as it failed to correctly identify the risks associated with the project and had underestimated the impacts on local communities. Development of the project was suspended in early 2013 due to a dispute between Nautilus and the government of Papua New Guinea over their partnership agreement.

Companies most associated with seabed mining
Nautilus Minerals Inc
Chatham Rock Phosphate Ltd
Trans-Tasman Resources Limited
Lockheed Martin Corp
Anglo American PLC

Scientists, university professors, church leaders and members of local communities have expressed fierce opposition to the Solwara 1 Project. Stop Experimental Seabed Mining in the Pacific, an NGO, claimed that the dangers to the ecological system could not be predicted, as seabed mining was a completely new industrial activity. In November 2013, the government of Papua New Guinea was sued by a coalition of NGOs for granting the license to Nautilus and failing to listen to warnings about the project.

In April 2015, however, Nautilus announced that the project would continue and that it hoped to begin production in early 2018.

Nautilus has also applied for deep-water licenses in other areas, including Tonga, Fiji, New Zealand, and the Solomon Islands. In February 2013, a member of Portugal's PCP party criticized the company for its plans to secure a seabed mining license for an area near the Azores islands, in the North Atlantic Ocean off the west coast of continental Portugal, and warned that the company's excavation techniques could severely impact deep-sea habitats.

At the end of 2013, the Bismarck Ramu Group, an NGO in Papua New Guinea, warned that several planned and exist-

Most criticized seabed mining projects
Solwara 1 Project
Chatham Rise Project
Sandpaper Marine Rock Phosphate Project

ing seabed mining projects by Nautilus Minerals could have devastating social and environmental impacts. The group claimed that Nautilus was planning a new project that would exceed the scope of the Solwara 1 Project.

Another proposed seabed mining project, to be developed by Namibian Marina Phosphate, a joint venture between UCL Resources Limited, Mawarid Mining, and Havana Investments has also been criticized. The companies propose to mine phosphate from the seafloor of the South Atlantic Ocean in an area located 120 kilometers from Walvis Bay on the Namibian Continental Shelf. Coastal residents and environmentalists have expressed concerns that the USD multibillion joint venture, known as the Sandpaper Marine Rock Phosphate Project, would disturb the ocean floor and natural marine ecology and would cause acid pockets that could negatively impact marine life. The project is currently on hold as the Namibian Fishing Ministry has imposed a moratorium on marine phosphate mining until the impacts on the ocean environment can be assessed.

Also in Namibia, De Beers has received permission to recover diamonds from the seafloor.

In June 2014, the New Zealand Environmental Protection Authority (EPA) rejected an application by Trans-Tasman Resources to mine iron ore in a 66-square kilometer area located off the coast of Taranaki. The company hoped to extract about USD 446 million worth of iron each year, but the EPA withheld their consent on the grounds that the

project could damage the environment and the fishing industry.

Almost a year later, in February 2015, the EPA also rejected plans by Chatham Rock Phosphate to mine for phosphate off New Zealand’s Canterbury coast. The project, known as Chatham Rise, had been opposed by the Hokotehi Mori Trust, due to concerns about the potential impact on the marine environment and fears that it would jeopardize the country’s commercial fishing industry. The annual catch of hoki fish from the Chatham Rise is valued at USD 730 million, and represents about 30 percent of the national hoki catch.

In May 2015, the Center for Biological Diversity filed a lawsuit against the US government in a US federal court, targeting the National Oceanic and Atmospheric Administration over its renewal of permits for deep-sea mining in the Clarion-Clipperton Fracture Zone between Mexico and Hawaii by OMCO Seabed Exploration, a subsidiary of Lockheed Martin. The NGO claims

that large-scale deep-sea mining in the area will destroy underwater ecosystems and damage the habitats of sea turtles, whales, and sharks. In addition, Greenpeace has expressed concern that the International Seabed Authority (ISA) has already issued 12 contracts for deep sea mining exploration in the Clarion Clipperton Zone.

NGOs engaging against seabed mining
Greenpeace International
Center for Biological Diversity
Kiwis Against Seabed Mining
MiningWatch Canada (MWC)
ACT NOW!

Countries most associated with seabed mining
Papua New Guinea
New Zealand
Namibia
United States of America
Azores Islands (Portugal)

RepRisk users can learn more about Seabed Mining on the [Topic Tag Profile Page](#) (must be logged into the RepRisk ESG Platform to access).

Part 2 Deep Sea Drilling

Drilling for oil and natural gas in water depths of over 1,000 meters presents multiple challenges. Drilling equipment is subjected to extremely cold temperatures and thousands of pounds of pressure, and the oil platforms can be exposed to hurricanes and cyclones. However, oil companies are seeking to explore reserves at even greater depths and environmentalists are concerned about the potential risks.

The Deepwater Horizon explosion on April 20, 2010 focused the world's attention on the risks associated with deep sea drilling. The explosion left 11 people dead and spilled approximately 4.9 million barrels of oil from the Macondo Well into the Gulf of Mexico. The National Oceanic and Atmospheric Administration and Defenders of Wildlife have estimated that the disaster caused the deaths of about 800,000 birds in the Gulf of Mexico's coastal and offshore waters.

BP, who operated the Deepwater Horizon platform, is facing a fine of around USD 13 billion, an amount that comes on top of more than USD 42 billion that the company has paid out or set aside for cleanup and compensation costs. Transocean, the owner of the Deepwater Horizon oil rig agreed to pay USD 400 million in criminal fines and USD 1 billion in civil fines after pleading guilty to violating the Clean Water Act. However, other US state governments and cities, including Texas, Harris County and the City of Houston have also filed lawsuits against all the companies involved in the project, claiming that the spill has caused considerable economic losses and costs related to environmental damage. Companies facing such lawsuits include BP Exploration Production, BP American Production, Transocean, Transocean Offshore Deepwater Drilling, Transocean

Deepwater, Transocean Holdings, Triton Asset Leasing, Halliburton Energy Services, and Sperry Drilling.

BP was also accused of giving misleading information about the amount of leaked oil and of exposing workers and thousands of others to a carcinogenic cleaning agent. In March 2015, the NGO Bellona claimed that critics of the ongoing impacts of the spill were facing retaliation and death threats. The NGO reported that some people had disappeared or that their houses had been burned, while people who had contracted oil-related health issues were being spied on.

However, despite the risks exposed by the Deepwater Horizon disaster, BP and other oil and gas companies have continued to develop projects in deep-sea environments.

On April 1, 2015, an explosion and fire on Pemex's oil platform in the Bay of Campeche on the north shore of Mexico killed at least four people, injured 16 others and forced the evacuation of 300 people.

In March 2015, Petrobras and Brazil's National Agency of Petroleum were criticized for extracting oil and gas from Brazil's Whales Park Pre-Salt Project in Campos Basin in the Brazilian state of Espirito Santo. Fishermen claim that the extraction, which is allegedly being carried out at depths of 7,000 meters, is destroying their livelihoods as the industrial activity is disorientating migratory fish and turtles, and harming corals and the seafloor.

Petrobras was also in the news in February 2015, when an explosion occurred on the Cidade de São Mateus oil platform in Brazil, resulting in the deaths of nine people and injuring a further twenty-six.

The Wilderness Society in Australia also criticized BP, Santos and Chevron in February 2015 for their plans to conduct deep sea drilling activities in the Great Australian Bight, which would allegedly put at risk one of the world's greatest whale sanctuaries.

In October 2014, activists from Greenpeace International and Greenpeace

Companies most associated with deep sea drilling
BP PLC
Transocean Ltd
Halliburton Company
Chevron Corp
Royal Dutch Shell

Most criticized deep sea drilling projects
Deepwater Horizon (Macondo Well)
Frade Oil Platform
Leiv Eiriksson Oil Rig
Beaufort Sea Drilling Program; Browse Basin Gas Field; Canary Islands Deepwater Drilling Project; Montara Oil and Gas Field (all equally criticized)

Italy staged a 36-hour protest on an oil platform operated by Eni Mediterranea Idrocarburi, a subsidiary of Eni SpA, in the Straits of Sicily. The NGO claimed that offshore oil drilling could cause significant damages to the environment and deprive fishermen of their source of income.

Throughout 2014, various well-known personalities gave their support to a campaign against Cairn Energy's planned oil drilling off the coast of Ibiza, a popular Spanish tourist island and a UNESCO World Heritage Site. The drilling is planned at a depth of 1,200 meters but fishermen, local island governments, and the NGOs, Greenpeace, Alliance Mar Blava and the Natural Resources Defense Council, warned that oil exploration could impact the island's tourism and fishing industries and threaten the Balearic ecosystem, which is home to dolphins, whales and a type of sea-grass only found in Europe. Approximately 125,000 people in Spain have voiced opposition to the proposed exploration, and over 210,000 people from German-speaking countries have signed a protest, launched by Ocean Care, calling for an end to the project. The Swiss and Austrian Travel Federations have also voiced criticism.

Repsol is also facing strong opposition to its plans to explore for oil offshore from the Canary Islands. The Spanish UNESCO Committee warned that the activities could disturb marine mammals, contaminate the seabed with sludge and heavy metal residues, and seriously affect the local population's access to water, as most water consumed on the island is desalinated seawater.

The WWF also raised concerns in Canada in July 2014 about the risks of drilling

for oil in the Beaufort Sea and claimed that a major incident would trap oil in the sea ice, making it virtually impossible to clean up. Imperial Oil and Chevron have plans to drill for oil in this area before the end of the decade, but are facing strong opposition from the Inuit community who fear possible damage to marine species and wildlife, which is their main source of food.

Environmentalists also raised concerns in May 2014, when Russian companies Rosneft and Zarubezhneft signed an agreement with Cuba to explore offshore oil deposits located at depths of more than 1,500 meters between the shores of Cuba and Florida. The former US Senator, Bob Graham, warned that Russia did not have experience in deep sea drilling and that Cuba would not have sufficient capabilities to respond to a spill. Oceanographers claimed that in the case of an accident, the oil slick would reach the beaches, reefs and marine sanctuaries of Florida in just over a week.

Statoil has been strongly criticized for its deep-sea activities off the coast of Northland in New Zealand. In Au-

gust 2014, Greenpeace claimed that the seismic tests being carried out by Statoil caused levels of sound that would be fatal to humans and that this noise could be heard thousands of kilometers from the test sites. Dr. Lindy Weilgart, a world expert on the impact of sound on whales and dolphins, warned that seismic surveys are strongly linked to the deaths of marine mammals. The coastal community also expressed concern about the environmental effects of deep sea drilling and the threats it posed to shellfish and the sea fishing industry.

Also in New Zealand, Shell has faced criticism for its plans to drill for oil at depths of at least 1,300 meters off the coast of Otago. The NGO, Oil Free Otago, claimed that the project would affect the tourism industry, marine environments, and the climate.

Anadarko has also faced opposition for its plans to drill for oil off the coast of New Zealand. Environmentalists have raised fears that an oil spill could threaten the marine ecosystem and have warned of the possible impacts on the only existing mainland breeding colony of the Royal Albatross.

NGOs that engage against deep sea drilling
Greenpeace International
Natural Resources Defense Council (NRDC)
Friends of the Earth International
Oceana
Bellona Foundation

Countries most associated with deep sea drilling
United States of America
Brazil
New Zealand
Australia
United Kingdom

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METHODOLOGY

RepRisk Special Reports are compiled using information from the RepRisk database, which monitors environmental, social and governance (ESG) risks for companies, projects, sectors and countries. The RepRisk database currently contains risk incidents on over 53,000 public and private companies, as well as over 13,000 projects. RepRisk analysts monitor the issues related to ESG risk across a broad shareholder and other stakeholder audience of NGOs, academics, media, politicians, regulators and communities. Once the risk incident has been identified with advanced search algorithms and analyzed for its novelty, relevance and severity, risk analysts enter an original summary into the database and link it to the companies and projects in question. No article is entered twice unless it has been escalated to a more influential source, contains a significant development, or has not appeared for the past 6 weeks.

All data is collected and processed through a strictly rule-based methodology. This helps to ensure the balanced and objective rating and weighting of the risk incident, and thus the company’s quantitative measure of risk exposure, the RepRisk Index (RRI). The RRI measures the risk to a company’s reputation, not its actual reputation.

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