



# Environmental Factsheet

APRIL 2014

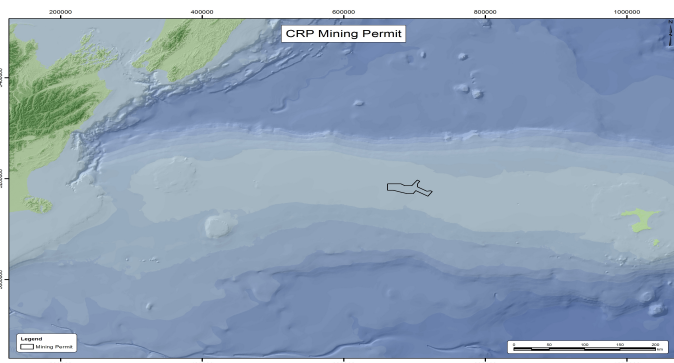
## OVERVIEW

Chatham Rock Phosphate has been granted a Mining Permit to extract New Zealand's only major rock phosphate resource from the Chatham Rise. Obtaining this Mining Permit is the first of a two-part process, which also involves an application for an environmental Marine Consent.

The Marine Consent process takes six months and formally gets underway in a few weeks once the Environmental Protection Authority accepts our application. The process includes the opportunity for any person or organisation to make a submission to the EPA, and it will also involve formal hearings.

The extraction process involves bringing up the top 30 cm of sediment from the seabed onto a surface vessel, mechanically separating the nodules and returning the rest to the seabed via a long pipe. Sediment will be released from the pipe near the seafloor. A mining "cycle" is 8-12 days. Within each cycle we'll be operating about a third of the time on the rise and the rest of the time the vessel will be either in transit or in port.

The permit area, shown below in dark grey, is about 450 km from NZ. The total area to be mined each year is about 30 km<sup>2</sup> and over 15 years will amount to 450 km<sup>2</sup> or approximately 0.5 % of the rise.

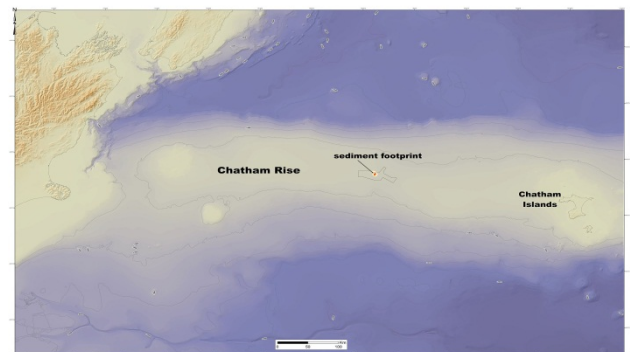


We've now spent more than \$25 million, much on

scientific studies on potential environmental impacts from our proposed operations. Our research has looked at all of the potential impacts of our operations (especially re-depositing the sediment) on the water and the sea floor ecology.

Key scientific reports have been peer reviewed. Information will be scrutinised by those with an interest in the project and assessed by the expert panel who'll decide on our Marine Consent. With that expectation we can confidently say:

1. There are no long-term impacts predicted from our operations on spawning, juvenile or young fish
2. Significant seabed sediment effects are predicted to be within a few kilometres of the mining areas
3. While we *will* destroy organisms in our mining area, those affected are found elsewhere over a wide area.



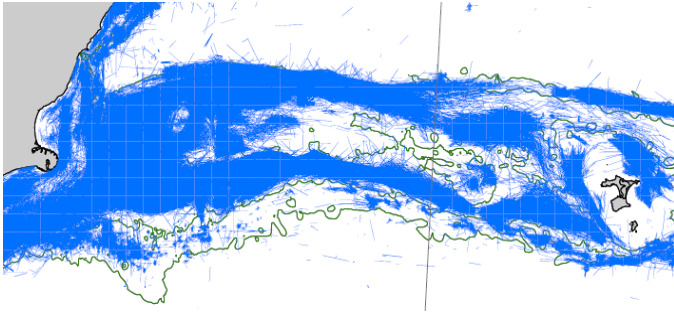
In summary our studies have found:

1. There is a low environmental risk of impacts on commercial fisheries
2. Sediment deposits as thick as 5 cm (which would affect seabed creatures) are predicted to remain within the 2 km by 5 km mining blocks.
3. Sediment of 1 mm thickness (about half the depth of one line of print) are predicted to extend no further than 8 km along the seabed.
4. Silt and clay in concentrations so diluted they're not visible (1 mg per litre) could drift up to 15 km in the water. Scientists say that won't affect organisms.
5. Suspended sediment is predicted to remain within 50 m of the seabed.

## ENVIRONMENTAL QUESTIONS AND ANSWERS

### 1. What about effects on fishing?

The permit area is not a fish trawling area. Spawning of hoki predominantly occurs around the NZ coast, 450 km away. Juvenile hoki live over the entire 188,000 km<sup>2</sup> of the rise.



*The blue area above shows the cumulative trawl footprint from 1989-90 to 2009-10.*

### 2. How do our impacts compare with those of fishing?

Trawling covers 50,000 km<sup>2</sup> of seafloor each year – 1,600 times our footprint. That includes 3,000 km<sup>2</sup> of new seafloor annually – 100 times our expected annual mining area. Trawling has affected 385,000 km<sup>2</sup> (9.3 % of the EEZ) since 1989.

Trawling involves scraping weighted nets across very large areas of seabed and repeatedly damaging the same areas. We'll affect a very confined area where there is no trawling and will do it only once so the area will be able to recover over time.

### 3. What about impacts on the Chatham Islands?

Our research found it is very unlikely there will be any environmental impact on the Chatham Islands from our planned activities.

After questions were raised we researched potential impacts on both eels and lobster and found there were no issues with either.

### 4. Why has there been no environmental consents regime in the EEZ until now?

Until 2013, the few activities undertaken within the EEZ were managed, from an environmental point of view, under piecemeal existing industry-specific

legislation. Seabed mining is a new development, along with deep-water marine farming and aspects of the offshore oil and gas industry.

The Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act establishes an environmental management regime for New Zealand's EEZ and continental shelf. The Environmental Protection Authority is the decision-maker under the Act and monitors and enforces compliance.

### 5. What are the main environmental benefits of this project to New Zealand?

1. The rock phosphate can be applied directly onto pasture, making it as effective as superphosphate.
2. It reduces water pollution from run-off when used as a direct application fertiliser. Run off is reduced because it releases slowly, requiring less frequent applications than conventional fertiliser, further reducing its carbon footprint.
3. The rock is highly reactive, heightening its effectiveness as a fertiliser and has strong liming qualities.
4. It has the lowest concentration of cadmium of any known phosphate rock.
5. Because the resource is close to NZ it will result in reduced transport costs – therefore a lower carbon footprint.
6. It is an organic New Zealand-origin product.

In addition it is worth remembering the main economic benefits:

1. It is a cheaper source of phosphate and involves reduced foreign exchange risk
2. It will assist New Zealand's balance of payments by reducing imports and being exported.
3. The New Zealand Institute of Economic Research has estimated New Zealand will be \$900 million richer as a result of our activities.

### 6. How big an area will the mining involve?

Our permit covers 820 km<sup>2</sup> and we envisage our operations will affect about half that area over the life of the mine. That means less than a quarter of 1% of the Chatham Rise sea floor will be disturbed and even then only intermittently.

CRP has applied for a prospecting permit over additional areas to both the west and east of our

mining permit. One of the key purposes of these permits is to provide us with flexibility of where to mine.

## 7. Why is low cadmium a plus?

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Imported rock phosphate often has relatively high levels of cadmium. There are potential health problems with cadmium because it is a heavy metal. The main concerns of raised levels of cadmium are that chronic exposure can lead to kidney damage, bone disease and may be a risk factor in breast cancer.

The Ministry for Primary Industries has introduced a cadmium control programme following research shows cadmium levels have gradually increased over decades. The strategy recommends farmers and growers work closely with their fertiliser representatives to determine the most cost effective, efficient and appropriate fertiliser application and land management options as one way of minimising cadmium build up.

The build-up of cadmium levels in sheep made New Zealand authorities some years ago ban the export of some offal from animals older than 2½ years. Testing showed up to 28 percent of sheep kidneys and 20 percent of cattle kidneys sampled between 1989 and 1991 exceeded the maximum residue levels allowed in New Zealand meat of 1 mg per kg. Health guidelines for soil contamination at the time had a maximum level of 3mg/kg of soil.

The natural average level of cadmium in NZ soils is 0.16mg/kg, but when farmland is taken into account, the average is more than double that, 0.35mg/kg, and soils on farms which have had a lot of superphosphate, such as dairy farms, can have as much as 2.52mg/kg. Dairying areas with high fertiliser use tend to have the highest average contamination, including Taranaki (0.66mg/kg), Waikato (0.60mg/kg) and Bay of Plenty (0.52mg/kg).

## 8. Does the public need to be consulted about CRP's proposals?

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We are trying to keep all interested parties and the wider public informed about our progress and are consulting with a range of interest groups including relevant government agencies, industry, marine, conservation, iwi, imi and other groups. We make

regular market and news announcements and publish a lot of information on our website.

Under the EEZ Act anyone with an interest has the opportunity to make submissions and to be heard during the marine consent process.

## 9. What are the likely impacts on the environment?

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The work we are doing with our technical partner Royal Boskalis, Dutch ocean researcher Deltares, NIWA, Golder Associates and our environmental advisers is focused on ways we can ensure there is minimal environmental impact.

Our research predicts any seabed sediment effects will be confined to a few kilometres of our mining area, which is about 250 km from the Chatham Islands and 450 km from New Zealand.

We will destroy organisms in our mining area, but they are widely distributed and we are working with marine biologists to identify mining exclusion areas in our permit area to preserve representative communities.

The Deep Water Fishing Group is concerned about possible impacts of our activities on commercial fishing. The key environmental impact, apart from disturbing areas of seabed, will be the sediment plume from the return of the fine material to the sea floor. The modelling of the impacts on the seabed and in the water column predicts there is a low environmental risk of adverse impacts on commercial fish.

Sediment of sufficient thickness to harm organisms on the sea floor (5 cm or more) is predicted to be restricted to the mining area itself and immediately alongside. Sediment more than 1 mm thick (about half the thickness of one line of print) is predicted to extend no further than 8 km from the mining area.

Silt and clay concentrations so diluted they are not visible (1 mg per litre) could drift up to 15 km in the water. The immediate mining area is the only location concentrations higher than 100 mg per litre are predicted to last for more than a day.

Scientists say these low levels of suspended sediment won't affect organisms. The models predict the sediment won't rise more than 50 m above the

seabed – well below the most biologically productive part of the water column.

We also believe it is appropriate to balance any environmental impact from our activities against the environmental benefits of sourcing a lower carbon footprint, low run-off, low-cadmium fertiliser.

### **10. What does CRP currently know about the environment in the Mining Permit area?**

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We undertook more than 50 days of research on the Chatham Rise over the 2011-12 summer and gathered a huge amount of data and samples, which have since been evaluated.

We now know quite a lot from our data. NIWA, Deltares and other experts have prepared studies ranging from what exists on the seabed, current knowledge around the marine currents and weather patterns, to complex modelling of plume behaviour in various conditions and looking at specific potential impacts.

The area is within a benthic-protection area, closed to bottom fish trawling. The deeper water areas - adjacent to but some distance from the extraction area - are important fishing grounds, and associated feeding and breeding areas.

The proposed extraction area is about 100 nautical miles from two ecologically significant seamount areas. The wider Chatham Rise is home to areas of corals, on the hard substrate.

### **11. Shouldn't an independent body do an environmental impact assessment before any mining starts?**

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The granting of an environmental marine consent will involve a six-month structured process managed by the Environmental Protection Authority. The EPA appoints an independent expert panel to consider our application and hear evidence, including submissions from interested parties.

CRP will submit a comprehensive Environmental Impact Assessment involving around 30 expert reports covering all possible areas of interest and these will be publicly available to enable people to learn about what we are proposing and to make submissions if they wish.

CRP has spent many millions of dollars on scientific research to assess the potential impacts of our project. These environmental data will be released to support public research on the Chatham Rise ecosystems.

### **12. Is the Marine Consent process different to the resource consent application processes under the Resource Management Act?**

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Yes. While it has many similarities to the Resource Management Act provisions, it has some differences. The RMA enables the development of district and regional plans, which provides for different resource management approaches throughout New Zealand.

In contrast the EEZ Act establishes an approach that is the same throughout the EEZ. Also, all applications are lodged with and processed by the Environmental Protection Authority and appeals can only be made on points of law.