



Chatham

Rock
Phosphate Ltd

Phosphates, rare earths and more

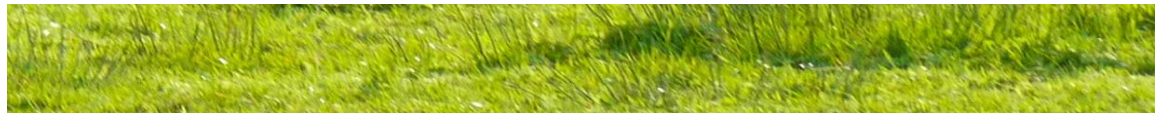
December 2018

Chatham | Rock
Phosphate Ltd
TSX.V: NZP

www.rockphosphate.co.nz

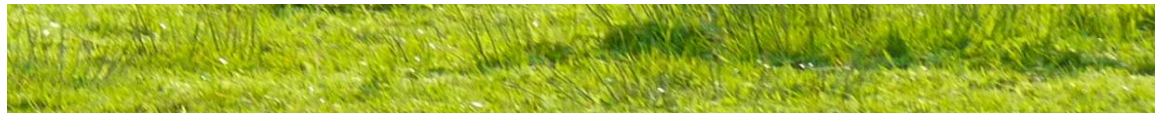
Overview

- **Breaking news – Many rare earths and other valuable minerals are contained in our rock phosphates**
- **Role of Pacific Rare Earths, independent research Underway**
- **Investment highlights**
- **History and forward strategy**
- **Objectives**
- **Significance of direct application rock**
- **What Chatham has achieved already**
- **Excellent circumstances favour the grant of the environmental permit**
- **Funding programme – the investment opportunity**



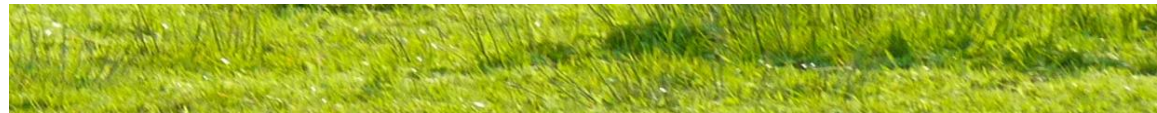
Discovery of Rare Earths and other valuable minerals

- ✓ It's been known for a decade that the seafloor muds in our permit area include rare earths and other valuable minerals or elements
- ✓ These include cerium, lanthanum, neodymium, praseodymium, yttrium, cobalt, rubidium, cesium, germanium, gallium, strontium, thallium and tungsten.
- ✓ However, the proposed mining method for the phosphate nodules is not suitable to also recover these finer substances and hence their potential value as a by-product has been discounted
- ✓ In a very recent development we established that the phosphate nodules (which will be recovered using our existing engineering designs) also contain rare earths and other valuable minerals.
- ✓ These include 15 of the 17 recognised rare earths, as well as varying concentrations of other valuable minerals including nickel, cobalt, chromium, vanadium, zirconium, elemental fluorine and strontium



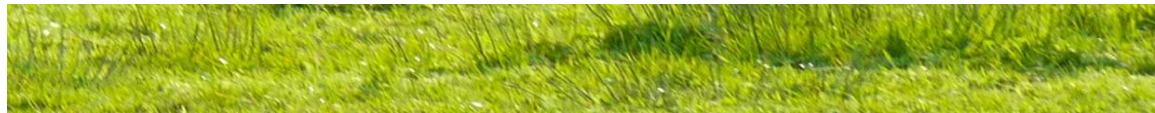
Establishment of Pacific Rare Earths

- CRP recently announced that it has recently formed a 100% owned subsidiary Pacific Rare Earths Limited. (PRE)
- This company has been formed to project-manage a work programme aimed at quantifying the extent, value and recoverability of rare earths and other potentially strategic or valuable minerals contained in the rock phosphate nodules on the Chatham Rise.
- In addition, the company will be investigating the existence and recovery potential of rare earths and other valuable minerals in seafloor muds on the Rise.
- If the latter research is successful PRE will undertake feasibility studies to evaluate the likely project economics of eventually establishing a secondary marine mining operation focusing just on the rare earths



Further Independent Research

- The information CRP already holds about REEs and other valuable minerals in its permit areas was generated by independent organisations, with some of this work undertaken up to a decade ago.
- The current knowledge confirms that REEs occur over a wide area, and estimates of the average grades and therefore the size of the potential deposits have been made at a conceptual level. The current conceptual information, when assessed against current price data, confirms potential significant value.
- As a result of the extremely favourable preliminary research, CRP has contracted a substantial overseas company to analyse the composition of the rock nodules and the seafloor muds in order to further develop better understanding of the extraction and recovery potential of the minerals.



Uses of Rare Earths

Chatham rock phosphate contains 15 of the 17 rare earths, The uses and applications of these rare earths are listed in the table below.

Rare Earth	Application
Neodymium	Powerful magnets used in loudspeakers, computer hard drives, wind turbines, electric vehicles, used in lasers
Lanthanum	Camera and telescope lenses, carbon lighting applications, studio lighting and cinema projection Used in the process of refining crude oil. Used in specialty glasses and optics, electrodes and for hydrogen storage.
Cerium	Catalytic converters in cars Makes an excellent oxidizer, used in oil cracking during petroleum refining and is used for yellow color in ceramics and glass.
Praseodymium	Used to create strong metals used in aircraft engines Used to make a special type of glass used in visors to protect welders and glassmakers Used in magnets, lasers and as green color in ceramics and glass.
Gadolinium	Used in X-ray and MRI scanning systems, and also in television screens Used in magnets, specialty optics, and computer memory.

Yttrium	Televisions, computer screens and other devices that have visual displays Used in superconductors and exotic light sources.
Terbium	Used as green in ceramics and paints, and in lasers and fluorescent lamps.
Europium	Europium is used in making control rods in nuclear reactors Makes colored phosphors, lasers, and mercury-vapor lamps.
Samarium:	Used in magnets, lasers and for neutron capture.
Dysprosium:	Used in magnets and lasers.
Holmium:	Used in lasers.
Erbium	Used in steel alloyed with vanadium, as well as in lasers.
Thulium	Used in portable x-ray equipment.
Ytterbium	Used in infrared lasers. Also, works as a great chemical reducer.
Lutetium	Used in specialty glass and radiology equipment.



Company History and Forward Strategy

- Formed 2004. Now listed on the TSX.V, NZAX and Frankfurt Stock Exchange
- Mineral asset - inferred JORC code 23.4Mt phosphate resource offshore NZ
- Granted 20 year mining permit Dec 2013, applying for environmental permit
- Core business - sourcing and marketing reactive rock phosphate in NZ and international markets
- Plan to dredge deposit using contractor Royal Boskalis; targeted start 2023
- Chatham actively seeking to acquire other phosphate sources to reduce portfolio risk
- Evaluation of contained rare earths and development if commercially feasible



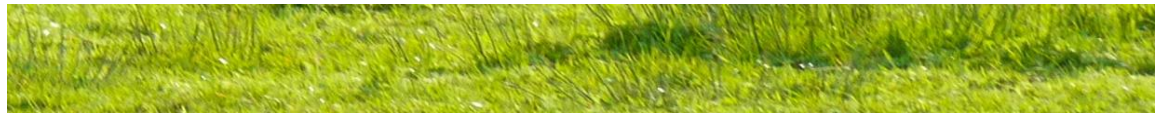
Objectives

Chatham aims to be premier supplier of low cadmium, direct application phosphate to NZ and global agricultural sector

We're passionate about the benefit of direct application fertiliser to sustainable farming given its improved soil profile and water quality outcomes

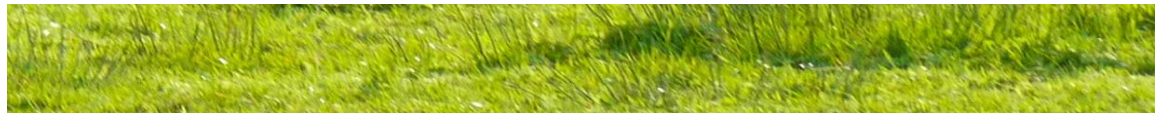
Our objectives are evolving and are now:

- **Achieve consent of the Chatham Rise project and develop the asset**
- **Diversify our product mix from other reactive rock phosphate sources**
- **Develop an added value distribution strategy (retail packs)**
- **Establish the viability and implement the recovery of rare earths as a by-product**



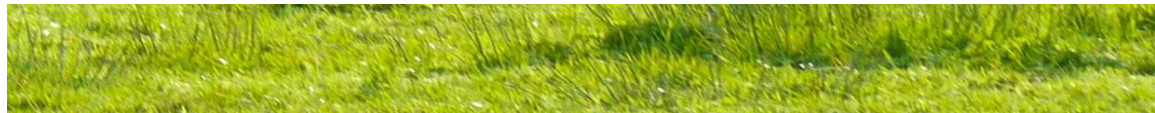
Why Chatham is an attractive investment

- ✓ **Low market capitalisation (only \$C 4 million with 20.9 m shares out, fully diluted 25.2m)**
- ✓ **Management is the largest shareholder group with 12.2%**
- ✓ **No development capital required**
 - **project will be contract-mined per tonne using a modified dredge**
- ✓ **Project independently valued at \$US200m to \$US300m (\$C250m - \$C375m)**
- ✓ **Strategic location**
 - **mining costs almost equal cost of shipping from other side of the world. World price has to collapse to near zero before Chatham can't compete**
- ✓ **Annual forecast earnings before tax - \$C 90 million**
 - **project highly profitable given no incoming freight costs and low mining costs**

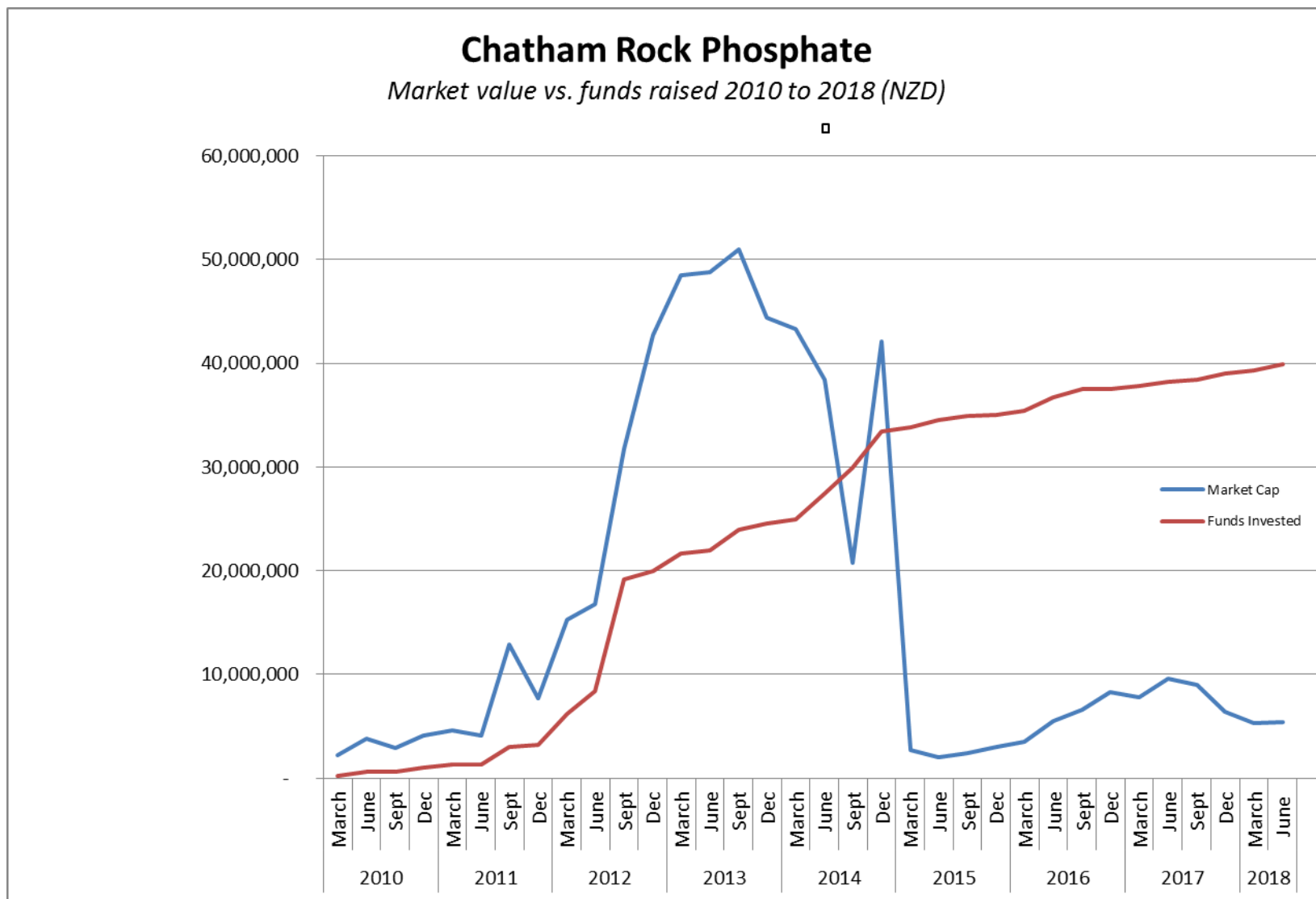


Attractive investment (more)

- ✓ Will pay \$C 26.7 million in annual taxes and royalties, plus millions in port charges. **Hence will have central and local government support**
- ✓ Will create many high-value knowledge-based jobs in the port, on the mining ship, undertaking environmental monitoring and broader scientific research, in the agriculture and hospitality sectors and on the Chatham Islands. **Hence broad-based community support and social licence**
- ✓ Security of fertiliser supply for NZ agriculture – **Hence farmer support**
- ✓ Environmental benefits – much lower run off impact on lakes and rivers, much lower cadmium and much lower carbon footprint. **Hence likely to have support from environmental and local water catchment authorities**
- ✓ Current main phosphate source in NZ is from a disputed territory in North Africa subject to UN sanctions. **Ethical supply option**

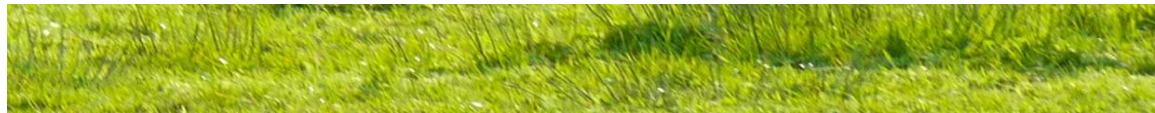


Chatham – Market Value compared with funds raised



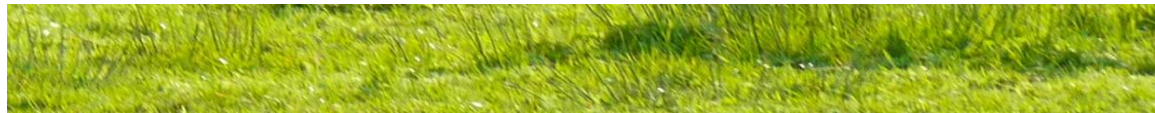
Investment Highlights

- Chatham holds a 20 year mining permit over a phosphate deposit with an in situ value of over \$US 3.5 billion (=~ 3 million ounces of gold)
- The deposit will be contract mined by a dredging company so there is no development capital required
- Chatham phosphate rock is low in heavy metals such as cadmium and ultra-environmentally friendly being an authentic reactive phosphate rock.
- As such (although this is not assumed in our forecasts) the rock will, over time, trade at a premium due to environmental and food safety pressure
- Annual forecast pre-tax earnings are > 20 X the current market cap
- Chatham is seeking to raise \$C5 million in Q4, 2018

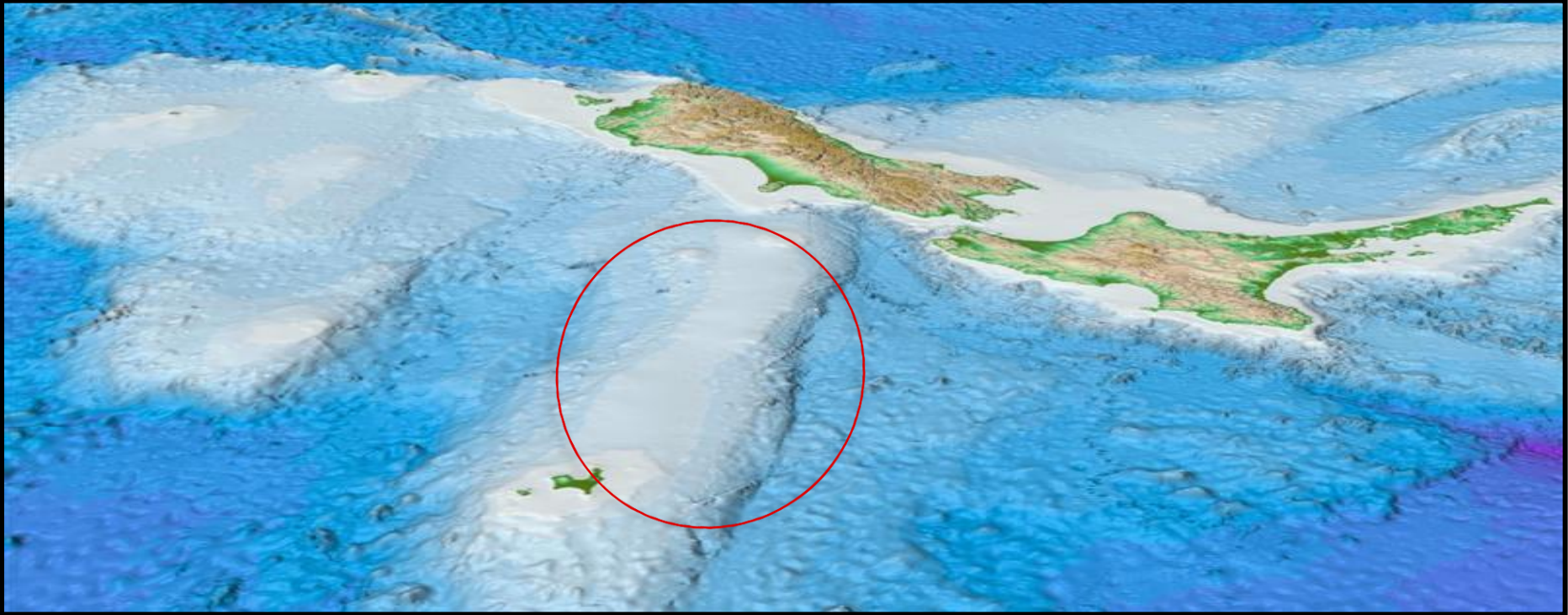


What's so special about direct application rock phosphate?

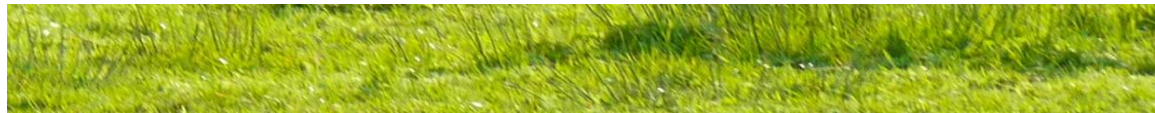
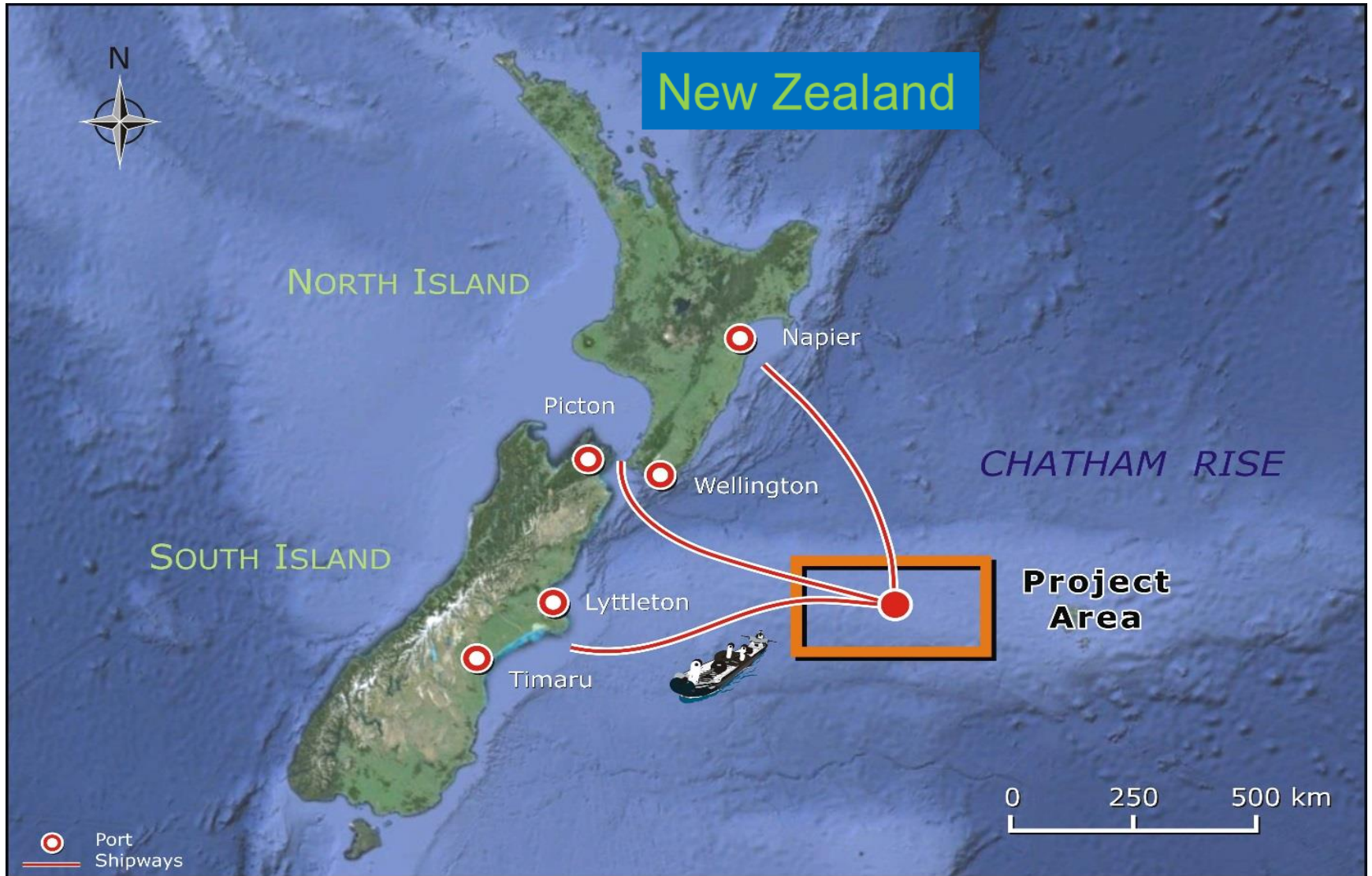
- 1 Unique resource with special characteristics**
- 2 Direct application rock phosphate is significantly more environmentally friendly – reducing waterways run off by 80% and improving soil health**
- 3 Loss of phosphate nutrient into waterways is also wasting a finite resource**
- 4 It can sell at a significant premium, despite lower production costs, because it is both “organic” and is almost (85% according to recent greenhouse tests) as effective a fertiliser as triple superphosphate (TSP)**



Chatham Rise Rock Phosphate – location



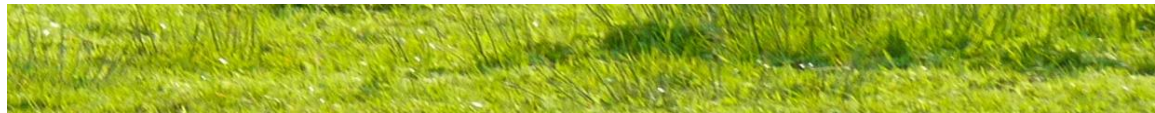
Regional Port Access



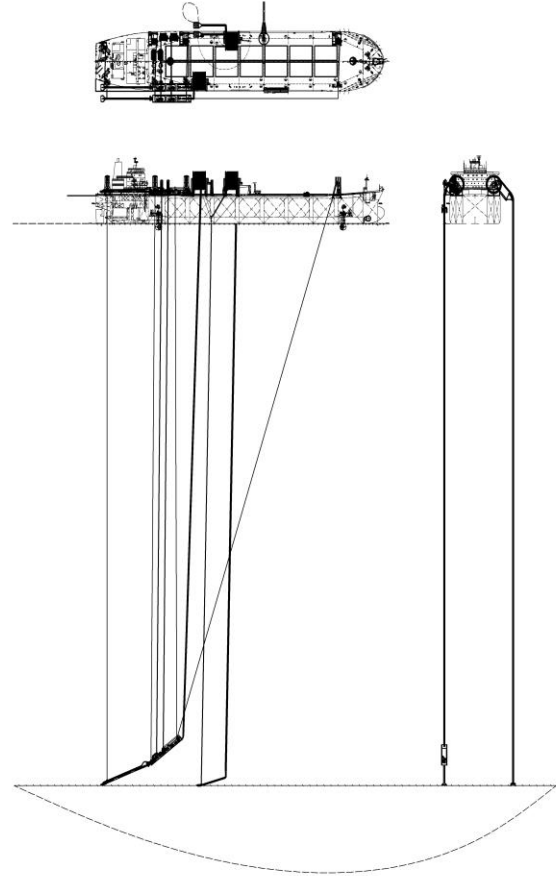
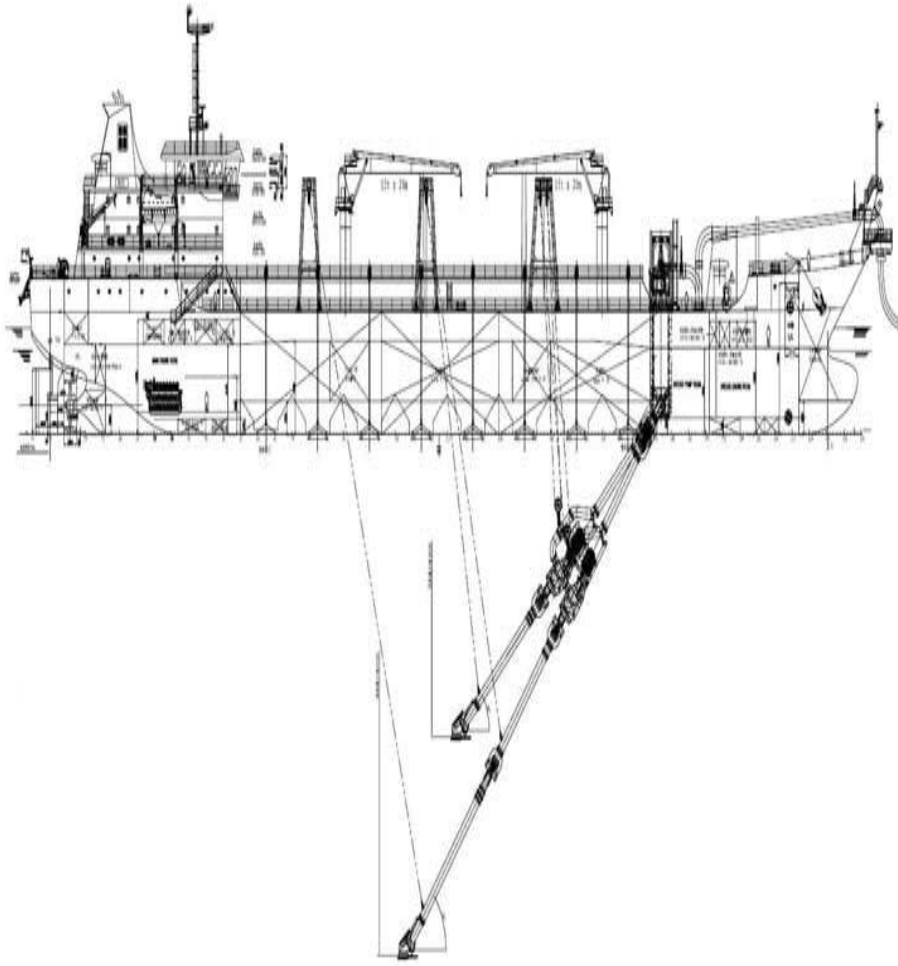
Boskalis Dredging Vessel



235m Conventional Trailing Suction Hopper Dredge



Project Conceptual Designs



Milestones already achieved

- ✓ **Increasingly valuable and strategically located mineral deposit**
- ✓ **Well-defined and well-studied deposit with knowledge gained by spending \$US66m since 1966**
- ✓ **A 20 year mining permit**
- ✓ **Feasibility studies by our technical partner Boskalis that will contract mine for us**
- ✓ **A market for our product and a strong competitive position – location, product characteristics, security of supply**
- ✓ **A great management team**
- ✓ **Supportive cornerstone shareholders**



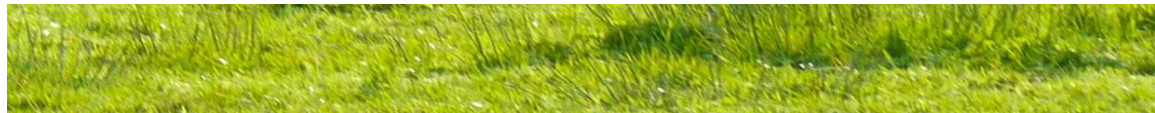
Marine Consent Application - next steps

1. **Appoint project leader (completed)**
2. **Raise finance to complete application and EPA hearing process (over time, \$C 5.3m including field studies)**
3. **Plan resubmission process:**
 - ◆ **Consult stakeholders**
 - ◆ **Gather further data including field studies**
 - ◆ **Reformat information from previous application**
 - ◆ **Complete application and related management plans**
4. **Re-submit time frame: 15 months after raising funds**



Why we believe we will be granted the marine consent next time

- We will fill the information gaps and communicate the science more clearly
- We have learned a lot from observing the TTR hearing and from reading the judgement and the appeal (particularly the dissenting views)
- We will demonstrate wide support from key stakeholders (farming, key government agencies, local authorities, water catchment boards, other Govt agencies)
- Will seek to deal better with concerns of iwi and fishing industry
- The EPA will continue to improve its processes
- Changes to the EEZ Act have created a more level playing field
- We are no longer the pioneer (either in NZ or overseas)



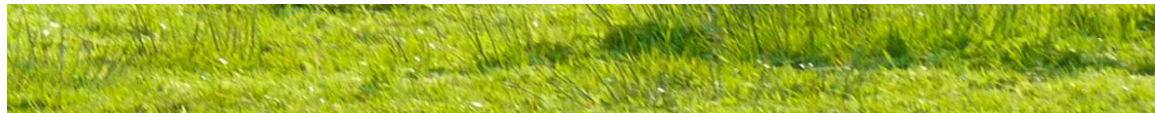
Use of Funds - 5 year budget

Chatham Rock Phosphate 5 Year Budget (\$CA,000)					
	12 month periods				
	2018	2019	2020	2021	2022
Opening Cash	\$161	\$232	\$128	\$226	\$474
Preparation of Consent re-application	\$792	\$1,848	\$0		
Hearing Costs		\$1,760	\$880		
Pastoral field studies			\$220		
Mining and exploration permit work programme		\$440	\$414	\$1,100	\$880
Corporate Costs	\$852	\$852	\$852	\$852	\$852
Existing options exercised	\$528	\$396			
Funds to be raised	\$1,187	\$4,400	\$2,464	\$2,200	\$1,540
Year end cash position	\$232	\$128	\$226	\$474	\$282
Cumulative funds raised	\$1,715	\$6,511	\$8,975	\$11,175	\$12,715



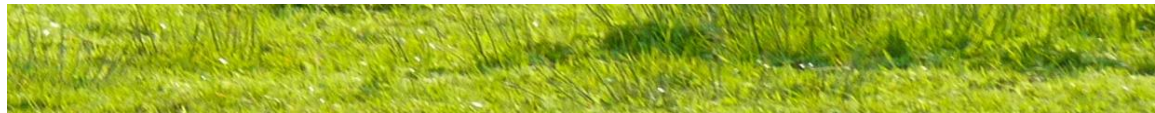
Phosphate rock market facts (\$US)

- Current World Bank reported price of P2O5 ex Morocco is \$92 (does not reflect actual contract prices which are confidential)
- Freight to NZ/Asia \$30 to \$70, assume \$50, so landed cost in our region is \$142
- If sold to make superphosphate , estimated value of CRP rock is presently ~ \$110 adjusted for its 22% P2O5 grade and a low cadmium premium
- If sold as reactive phosphate rock (RPR), retail value in NZ is \$241.
- If sold internationally as RPR the estimated price will be similar.
- If sold in NZ as a substitute for triple super phosphate the market price should be \$371 (being 85% of the TSP price in NZ)
- If sold internationally as a substitute for TSP the market price should be \$322 (being 85% of the international price)
- Phosphate 1kg packs retail at up to \$10, = \$10,000/t, we assume that we will recover \$1 per pack after sales taxes, retail and wholesale margins



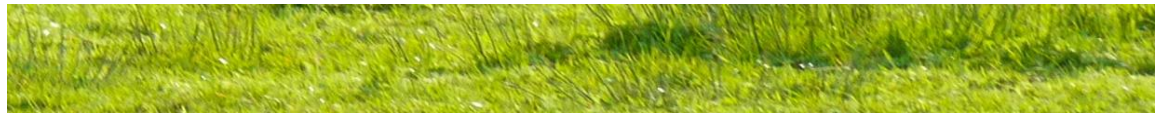
Phosphate rock market facts (2)

- The weighted average selling price is \$164 (see following table)
- Then discounted 20% to gain market share, \$132
- BUT: The demand for RPR will continue to grow in parallel with the demand for organic products. CRP rock is also ultra-low in cadmium (< 3 mg/Kg P₂O₅)
- The EU will set a 60mg/Kg P₂O₅ Cd limit in 2019, reducing to 20 mg/Kg in 2030
- This will eliminate all rock sourced from Egypt, Israel, Boucraa & Youssoufia (Morocco), Senegal, Togo, Tunisia, Nauru & Christmas Island
- Analysts consider that this will result in increasing price premiums over time
- Chatham won't be in production until 2023

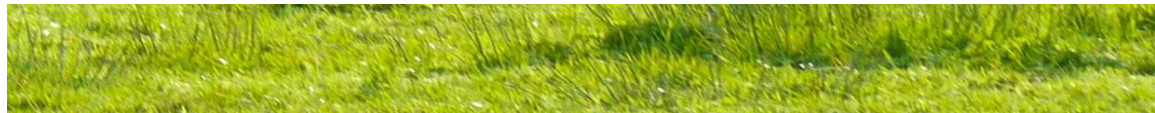
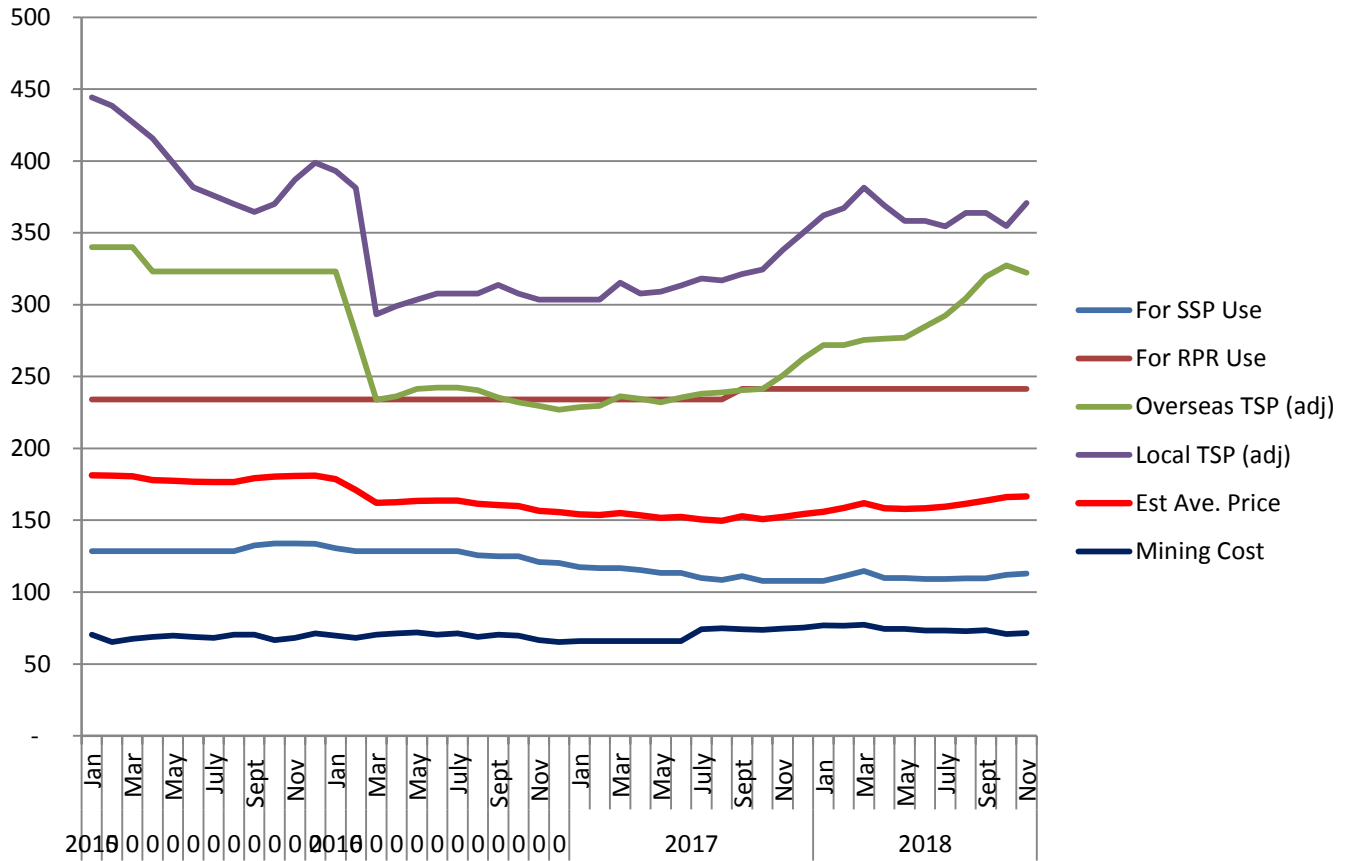


Sales Forecasts (\$US)

Sales Forecast			
Product Use	Tonnes	Price	Revenue
Rock sold in NZ for SSP manufacture	200,000	113	22,600,000
Rock sold O/seas for SSP manufacture	810,000	113	91,530,000
Rock sold in 1kg packs retail & online	40,000	1,000	40,000,000
Rock for TSP use NZ (85%)	50,000	371	18,550,000
Rock for TSP use overseas (85%)	200,000	322	64,400,000
Rock sold as "organic" RPR NZ	100,000	241	24,100,000
Rock sold as "organic" RPR overseas	100,000	241	24,100,000
	1,500,000		285,280,000
Average revenue per tonne			190.19
Average revenue per tonne after freight cost on exports			164.29
Average revenue per tonne after 20% discount			132.42
Total domestic sales in NZ	390,000		-
Total overseas sales	1,110,000		



Historic Phosphate Rock Prices



Environmental + ethical + financial + economic benefits = Good for NZ

(for more detail see <http://www.rockphosphate.co.nz/projectinfographic/>)

- Low run off to rivers and lakes
- Very low cadmium
- Much reduced carbon footprint
- Improved soil health

Benefits for Environment

Taxes, jobs and knowledge

- \$NZ42m a year in tax and royalties
- High value knowledge based jobs
- NZ leadership in marine technology potentially worth billions
- Marine environment knowledge identifies conservation priorities

- NZ can have own supply without depending on other countries
- NZ wouldn't export environmental footprint to countries where mining phosphate involves social and environmental distress

Ethical, secure supply

Strongly profitable

- Annual earnings of \$120m before royalties and tax
- Capital repaid in less than a year