

**BEFORE THE ENVIRONMENTAL PROTECTION AUTHORITY
AT WELLINGTON**

IN THE MATTER of the Exclusive Economic Zone and
Continental Shelf (Environmental Effects)
Act 2012

AND

IN THE MATTER of a decision-making committee
appointed to hear a marine consent
application by Trans Tasman Resources to
undertake iron ore extraction and
processing operations offshore in the
South Taranaki Bight

**EXPERT SUPPLEMENTARY EVIDENCE OF PHILIP HUNTER MITCHELL ON
BEHALF OF TRANS TASMAN RESOURCES LIMITED IN RESPONSE TO
QUESTIONS FROM THE DECISION MAKING COMMITTEE**

2 MAY 2017



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INTRODUCTION

1. My name is Philip Hunter Mitchell.
2. I have previously prepared the following on behalf of Trans-Tasman Resources Limited ("TTRL") for these proceedings:
 - (a) Expert Evidence dated 19 December 2016 ("First Statement");
 - (b) Rebuttal Evidence dated 10 February 2017;
 - (c) TTRL Proposed Marine Consent Conditions – Version 3 dated 15 March 2017 ("Version 3 Conditions"); and
 - (d) Memorandum titled 'Response to Minute 41, Appendix 1, Questions 1, 2 and 7' dated 27 April 2017 ("Response Memo").
3. My qualifications and experience as a planning expert are set out in paragraphs 6 - 10 of my First Statement.
4. I repeat the confirmation given at paragraph 11 of my First Statement that I have read the Code of Conduct for Expert Witnesses and agree to comply with it.
5. The purpose of this additional statement is to provide a high level overview of the latest version of the proposed marine consent conditions ("the Revised Conditions") which have been provided to the Decision Making Committee ("DMC") following the completion of the "worse-case scenario" modelling requested by the DMC. The Revised Conditions are attached to this statement as Appendix 1 and supersede all versions previously provided.
6. I wish to stress that while the Revised Conditions may appear significantly different from the previous versions, there has been little change to their substance. In that regard, the core elements of the conditions, which have been developed in order to ensure that the actual and potential adverse effects of the proposal are avoided, remedied or mitigated, have been retained throughout. In that regard, conditions originally subject to consultation with DOC, TRC and other parties have not changed in any material way, but in some areas have been developed further in response to queries and guidance from the DMC.
7. The key aspects of the Revised Conditions that I wish to highlight are:
 - (a) Approach taken to define "discharge limits";

- (b) Inclusion of a "benthic recovery standard" within the mining area;
- (c) Inclusion of an "ecological standard" to be applied to the environment beyond the mining area; and
- (d) Structure of the Revised Conditions.

I discuss these further below.

APPROACH TO "DISCHARGE LIMITS"

- 8. The set of conditions provided as Attachment 1 to the Impact Assessment contained receiving environment Suspended Sediment Concentrations ("SSC") limits for seven (7) specific sites located outside of the proposed mining area. These SSC limits were proposed on the basis that they would enable suspended sediment levels resulting from the discharges to be assessed on an on-going basis to ensure that adverse effects would not arise. These same SSC limits were also included in the version of conditions attached to my First Statement of evidence.
- 9. As part of the Version 3 Conditions provided following the planning conferencing and the release of the Environmental Protection Agency's ("EPA") Conditions Report, the receiving environment limits were replaced with "end-of-pipe" discharge limits.
- 10. Following the provision of these Version 3 Conditions, and in response to questioning of me by Dr Thompson (where I confirmed I had no objection to the reinstatement of the SSC limits if the DMC considered that desirable) I have now included conditions that specify both "end-of-pipe" discharge limits and receiving environment SSC limits. These have now been provided for as Condition 5 (end-of-pipe limits), and Condition 6 (receiving environment SSC limits) in the Revised Conditions, as follows:

5. The following limits shall apply:

- a. The rate of extraction of sediment from the seabed, averaged over any monthly period, shall not exceed 8,000 tonnes per hour ("t/hr"); and*
- b. The rate of discharge of de-ored sediment onto the seabed, averaged over any monthly period, shall not exceed 7,190 t/hr; and*
- c. The rate of discharge of de-ored sediment having a size of <38 microns ("µm") shall not exceed:*

- i. 130 cubic metres per hour ("m3/hr"), averaged over any 48 hour period; and
 - ii. 83 m3/hr, averaged over any seven (7) day period; and
 - iii. 66 m3/hr, averaged over any three (3) month period.
- d. Averaged over any one (1) week period, the extraction of sediment having a size of <math><8\mu\text{m}</math>, shall not exceed 1.8% of the total sediment extracted.

For the purpose of (c) of this condition, the average value shall be derived from the analysis of one daily composite sample.

For the purpose of (d) of this condition, the average value shall be derived from the analysis of a minimum of 20 representative samples of the excavated seabed material.

The Consent Holder shall record Particle Size Distribution, and the rate and volume of the discharge continuously.

The information collected in accordance with this condition shall be reported on as part of the Quarterly Operational Report required by Condition 98.

6. The activities authorised by these consents shall not result in:
- a. An exceedence of a Suspended Sediment Concentration Limit ("SSC Limit") specified in Schedule 2; or
 - b. An exceedence of any modified numerical values of an SSC Limit determined in accordance with Condition 46 (in which case a. above will no longer apply); or
 - c. As determined by the EPA following advice from the TRG, any significant change of the 25th, 50th, 80th and 95th percentile Suspended Sediment Concentrations ("SSC") at any of the seven monitoring sites identified in Schedule 2 when compared to the baseline SSC at those sites as determined by the validated OPSM (Condition 48) following the completion of PCEMP (Condition 43), but taking into account any wider environmental changes not related to mining activities.

11. I note that Condition 6(c) has also been reinstated and provides for the "exposure over time" SSC scenario that was included in the Version 3 Conditions as Condition 20b. The rationale for reinstating this condition has been outlined in my response to Question 7 in the Response Memo.
12. Additionally, I note that the receiving environment SSC limits (Condition 6) only provide for a single compliance limit at each location, being the 95th percentile limit of background SSC levels. The 80th percentile SSC limits (previously the Response Limit) have not been reinstated as they were never compliance limits and, in any event, have been superseded by the "discharge limits" in Condition 6 and the "end-of-pipe" limits in Condition 5, all of which must be complied with.

INCLUSION OF A "BENTHIC RECOVERY STANDARD"

13. The specialist evidence provided by TTRL concluded that applying a "benthic recovery standard" to the area mined was not necessary and it would be extremely difficult to draft a clear, enforceable condition.
14. However, to try and address the questions raised by the DMC, TTRL's advisors have since given the matter considerable thought and developed a condition (Condition 9) that, while complex, I consider to be both precise and enforceable.
15. Proposed Condition 9 states:
 9. *No later than five (5) years following the completion of all iron sand extraction within two (2) km of the location where extraction has first occurred, the Consent Holder shall be required to demonstrate that recovery of the macroinfauna benthic community at that location has occurred, provided that, as determined by the EPA following advice from the TRG, the annual monitoring results for that area (Condition 49) indicate that that such recovery is on track to be achieved.*

For the purpose of this condition, "recovery of the benthic environment" will have occurred when the macroinfauna communities at a specified location are within 15% of the average pre-mining total abundance, biomass and species richness, but taking into account any wider environmental changes not related to mining activities.
16. This condition requires TTRL to demonstrate that the post-mining benthic environment within 2km of where the mining activity first commenced has recovered following the completion of all mining within that 2km distance, and that annual monitoring during that five (5) year period indicates that recovery is on track to be achieved.

17. As the recovery standard condition applies for a five (5) year period, I have made a consequential change to the Post-Extraction Benthic Recovery Monitoring (Condition 52) so that it occurs for the same duration, being five (5) years.

INCLUSION OF AN "ECOLOGICAL STANDARD"

18. Again, in response to questioning by the DMC, TTRL's specialists have given this matter further consideration and developed a new condition (Condition 8) which requires TTRL to monitor six (6) specific sites beyond the mined area and demonstrate that the ecology at these sites is not significantly affected by the proposal. These sites are the same ones that are identified in Schedule 2 of the Revised Conditions, except that the site "Source A to Whanganui 1km" has been excluded.
19. Proposed Condition 8 states:
8. *The activities authorised by these consents shall not, as determined by the EPA following advice from the TRG, result in an ecologically significant change in the species diversity and abundance at the following monitoring sites when compared against the pre-commencement monitoring data as determined in accordance with Condition 43, but taking into account any wider environmental changes not related to mining activities:*
 - a. *Rolling Grounds (WGS 1984 - 39 57 22.58780 S, 174 22 29.90885 E)*
 - b. *Graham Bank (WGS 1984 - 39 53 16.22020 S 174 24 40.68384 E)*
 - c. *Source A to Whanganui 20 km (WGS 1984 - 39 53 14.34932 S 174 27 08.62846 E)*
 - d. *South Traps (WGS 1984 - 39 51 53.21010 S 174 32 48.75387 E)*
 - e. *North Traps (WGS 1984 - 39 51 02.22374 S 174 31 10.63364 E)*
 - f. *Tuteremoana (WGS 1984 - 39 55 00.03802 S 174 47 41.29085 E)*
20. Compliance with the condition is to be assessed by comparing the pre-commencement monitoring data collected under the Pre-Commencement Monitoring Plan (Condition 43) with data collected following the commencement of the mining activities as required by the Environmental Monitoring and Management Plan (Condition 49).

STRUCTURE OF THE REVISED CONDITIONS

21. The most obvious change made is that the conditions have been restructured and reordered. I have removed the boxing of the separate conditions and used a more straight-forward numbering approach. I consider the Revised Conditions now follow a more logical sequence.
22. I have also made numerous minor amendments to the wording of the conditions to improve understanding and the consistency of the language used. I have not identified each of these changes specifically.
23. By way of summary, the Revised Conditions have been grouped into the following sub-sections each of which has its own heading within the consent document for ease of reference:
 - (a) **General Conditions (Conditions 1 – 3)**
 - (b) **Discharge Limits (Conditions 4 - 5)**
 - (c) **Environmental Limits (Conditions 6 – 19)** – sediment, benthic ecology, benthic recovery, seabirds, marine mammals, underwater noise, and archaeological remains.
 - (d) **Operational Controls (Conditions 20 – 42)** - vessel and operational management, effects on existing interests, spill prevention, "soft-starts", mooring of the Integrated Mining Vessel, other discharges from operational vessels, and biosecurity management.
 - (e) **Pre-Commencement Monitoring (Conditions 43 – 46)** - the Pre-Commencement Environmental Monitoring Plan.
 - (f) **Operational Sediment Plume Model (Conditions 47 – 48)**
 - (g) **Environmental Monitoring Requirements (Conditions 49 – 55)** – the Environmental Management and Monitoring Plan, the Post-Extraction Benthic Recovery Monitoring and Laboratory Accreditation.
 - (h) **Technical Review Group (Conditions 56 – 60)**
 - (i) **Management Plans (Conditions 61 – 66)** - comprising the:
 - i. Seabirds Effects Mitigation and Management Plan;

- ii. Marine Mammal Management Plan;
 - iii. Spill Contingency Management Plan;
 - iv. Collision (Loss of Position) Contingency Management Plan;
 - v. Simultaneous Operations Plan; and
 - vi. Bio-security Management Plan.
- (j) **Relationship with Tangata Whenua (Conditions 67 – 75)**
 - (k) **Community Relationships (Conditions 76 – 80)**
 - (l) **Fishing Industry Relationship (Condition 81)**
 - (m) **Operational Documentation (Conditions 82 – 84)** - Operational Assessment Report, training of personnel, and complaints register.
 - (n) **Marine Safety Matters (Conditions 85 – 97)**
 - (o) **Reporting Requirement (Conditions 98 – 100)** - Quarterly Operational Report, and Annual Report.
 - (p) **Review Condition (Condition 101);** and
 - (q) **Risk Management (Conditions 102 – 103).**

SUMMARY

- 24. In summary, I consider that the Revised Conditions are structured logically and provide a comprehensive framework for monitoring and managing the effects of the proposal and, if consents are granted, will ensure that any adverse effects of the activities authorised by the consents will be appropriately controlled and managed.
- 25. For completeness, I consider that the Revised Conditions are consistent with the provisions of sections 63 and 87F of the EEZ Act regarding the requirements of conditions of marine consents and marine discharge consents, respectively.



Philip Hunter Mitchell

2 May 2017

APPENDIX 1 – REVISED PROPOSED CONSENT CONDITIONS – 2 MAY 2017

PROPOSED MARINE AND MARINE DISCHARGE CONSENT CONDITIONS

GLOSSARY

ANZECC 2000	Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000
PCEMP	Pre-commencement Environmental Monitoring Plan
Crawler	Seabed Sediment Extraction Device
DOC	Department of Conservation
EEZ Act	Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012
EMMP	Environmental Monitoring and Management Plan
EPA	Environmental Protection Authority
HNZ	Heritage New Zealand Pouhere Taonga
IMO Guidelines	International Marine Organisation 2011 'Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species'
IMO	International Maritime Organisation
IMV	Integrated Mining Vessel
ISQG-High	Interim Sediment Quality Guideline-High
MNZ	Maritime New Zealand
Kupe Operator	Operator of the Kupe Petroleum Mining License #38146
OSPM	Operational Sediment Plume Model
SSC Limit	Suspended Sediment Concentration Limit
TRG	Technical Review Group

GENERAL CONDITIONS

1. Pursuant to s73(1)(a) of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (“EEZ Act”):
 - a. The marine consents for s20 activities; and
 - b. The marine discharge consents for s20B and s20C activities;

will expire 35 years after the date on which they commence.
2. These consents shall lapse ten (10) years after the date of their commencement unless the consents are given effect to prior to that date.
3. Subject to compliance with these consent conditions, the activities authorised by these consents shall be undertaken in general accordance with the application and supporting documents submitted as part of the application lodged on 22 August 2016 and in addition to the requirements of the Maritime Transport Act and Marine Protection Rules. Where information contained in the application documents is contrary to the conditions of these consents the conditions will prevail.

DISCHARGE LIMITS

4. The Consent Holder shall not remove more than 12.5 million tonnes of seabed material during any three (3) month period, and 50 million tonnes of seabed material during any twelve (12) month period for the term of these consents.

The Consent Holder shall continuously record the amount of seabed material removed and report on this as part of the Quarterly Operational Report required by Condition 98.

5. The following limits shall apply:

- a. The rate of extraction of sediment from the seabed, averaged over any monthly period, shall not exceed 8,000 tonnes per hour (“t/hr”); and
- b. The rate of discharge of de-ored sediment onto the seabed, averaged over any monthly period, shall not exceed 7,190 t/hr; and
- c. The rate of discharge of de-ored sediment having a size of <38 microns (“µm”) shall not exceed:
 - i. 130 cubic metres per hour (“m³/hr”), averaged over any 48 hour period; and
 - ii. 83 m³/hr, averaged over any seven (7) day period; and
 - iii. 66 m³/hr, averaged over any three (3) month period.
- d. Averaged over any one (1) week period, the extraction of sediment having a size of <8µm, shall not exceed 1.8% of the total sediment extracted.

For the purpose of (c) of this condition, the average value shall be derived from the analysis of one daily composite sample.

For the purpose of (d) of this condition, the average value shall be derived from the analysis of a minimum of 20 representative samples of the excavated seabed material.

The Consent Holder shall record Particle Size Distribution, and the rate and volume of the discharge continuously.

The information collected in accordance with this condition shall be reported on as part of the Quarterly Operational Report required by Condition 98.

ENVIRONMENTAL LIMITS

Sediments

6. The activities authorised by these consents shall not result in:
 - a. An exceedence of a Suspended Sediment Concentration Limit (“SSC Limit”) specified in Schedule 2; or
 - b. An exceedence of any modified numerical values of an SSC Limit determined in accordance with Condition 46 (in which case a. above will no longer apply);or
 - c. As determined by the EPA following advice from the TRG, any significant change of the 25th, 50th, 80th and 95th percentile Suspended Sediment Concentrations (“SSC”) at any of the seven monitoring sites identified in Schedule 2 when compared to the baseline SSC at those sites as determined by the validated OPSM (Condition 48) following the completion of PCEMP (Condition 43), but taking into account any wider environmental changes not related to mining activities.
7. The activities authorised by these consents shall not result in an exceedence of any Interim Sediment Quality Guideline-High (“ISQG-High”) value in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (“ANZECC 2000”), or any subsequent versions thereof, at any of the seven monitoring sites identified in Schedule 2.

For the purpose of these consents, any reference herein to either ISQG-High is deemed to be a reference to the ISQG-High values for metals, metalloids, organometallic and organic compounds provided in the ANZECC 2000, or any subsequent versions thereof.

Benthic Ecology

8. The activities authorised by these consents shall not, as determined by the EPA following advice from the TRG, result in an ecologically significant change in the species diversity and abundance at the

following monitoring sites when compared against the pre-commencement monitoring data as determined in accordance with Condition 43, but taking into account any wider environmental changes not related to mining activities:

- a. Rolling Grounds (WGS 1984 - 39 57 22.58780 S, 174 22 29.90885 E)
- b. Graham Bank (WGS 1984 - 39 53 16.22020 S 174 24 40.68384 E)
- c. Source A to Whanganui 20 km (WGS 1984 - 39 53 14.34932 S 174 27 08.62846 E)
- d. South Traps (WGS 1984 - 39 51 53.21010 S 174 32 48.75387 E)
- e. North Traps (WGS 1984 - 39 51 02.22374 S 174 31 10.63364 E)
- f. Tuteremoana (WGS 1984 - 39 55 00.03802 S 174 47 41.29085 E)

Benthic Recovery

9. No later than five (5) years following the completion of all iron sand extraction within two (2) km of the location where extraction has first occurred, the Consent Holder shall be required to demonstrate that recovery of the macroinfauna benthic community at that location has occurred, provided that, as determined by the EPA following advice from the TRG, the annual monitoring results for that area (Condition 49) indicate that that such recovery is on track to be achieved.

For the purpose of this condition, “recovery of the benthic environment” will have occurred when the macroinfauna communities at a specified location are within 15% of the average pre-mining total abundance, biomass and species richness, but taking into account any wider environmental changes not related to mining activities.

Seabirds

10. At all times during the term of these consents, the Consent Holder shall comply with the following:
 - a. There shall be no adverse effects at a population level of seabirds of the species classified under the New Zealand Threat Classification System as “Nationally Endangered”, “Nationally Critical” or “Nationally Vulnerable” or classified “Endangered” or “Vulnerable” in the International Union for the Conservation of Nature “Red List”; and
 - b. Adverse effects on seabirds, including but not limited to effects arising from:
 - i. Lighting;
 - ii. Spills; and
 - iii. The effect of sediment in the water column on diving birds that forgo visually,
 shall be avoided to the greatest extent practicable; and
 - c. Adverse effects on seabirds from vessel lighting including the Integrated Mining Vessel (“IMV”), Floating Storage and Offloading Vessel and other support vessels shall be mitigated, and where possible, avoided.

Marine Mammals

11. Notwithstanding the requirements of Conditions 12, 32, 62 and 83, with respect to marine mammals (excluding seals), the Consent Holder shall ensure that:
 - a. There are no adverse effects at a population level on:
 - i. Blue whales; or
 - ii. Marine mammal species classified under the New Zealand Threat Classification System as “Nationally Endangered”, “Nationally Critical” or “Nationally Vulnerable”; or

- iii. Marine mammal species classified as “Endangered” or “Vulnerable” in the International Union for the Conservation of Nature “Red List”;
- b. Adverse effects on marine mammals, including but not limited to effects arising from:
 - i. Noise;
 - ii. Collision and entanglement;
 - iii. Spills; and
 - iv. Sediment in the water column,

are avoided to the greatest extent practicable.
- c. At all times during the exercise of these consents, at least one (1) designated and trained marine mammal observer is on-board each of the operational vessels, but not including bulk carriers. While the vessel is in motion, the observer shall be in a position where a clear field of vision is provided over the forward section of the vessel and beyond the bow;
- d. A video camera is placed in a prominent position on all operational vessels where a clear field of vision is provided over the forward section of the vessel, beyond the bow and to the sides of the bow, and is recording at all times while the vessel is in motion. Further to the camera, a monitoring screen shall be installed on the bridge of each vessel and the video feed from each of the cameras will be made available on the Consent Holder’s website or such other website as may be established from time to time (Condition 76). The purpose of the cameras is to record passage of the vessels and any contact with marine mammals while in motion;
- e. All employees and contractors undertaking airborne, seagoing and watch-keeping duties are informed of their obligations under the Marine Mammals Protection Act 1978 and Marine Mammals Protection Regulations 1992 or any subsequent Regulations;
- f. All employees and contractors record any sightings of whales or dolphins including the date, time and, where possible, GPS position of the vessel;
- g. Any sightings of Maui’s or Hector’s Dolphins are immediately reported to the Department of Conservation (“DOC”);
- h. Masters of all vessels are instructed to reduce speed to a safe minimum within 500 m of any large cetaceans and feeding aggregations of blue whales, and take all necessary steps to avoid contact with the animals by detouring around and, where practicable, maintaining a distance of at least 500 m from the animal/s;
- i. Helicopters servicing the operation (subject to compliance with Safety and Civil Aviation Authority requirements) maintain a minimum altitude of 600 m (2,000 feet) except when landing and taking off;
- j. Any marine mammal strikes, entanglements, injuries or deaths are reported to DOC and the EPA as soon as practicable following any such event;
- k. If a strike, entanglement, injury or death involves Maui’s or Hector’s Dolphin, the carcass is recovered, DOC and the EPA are notified immediately of that recovery and the carcass is returned to shore as soon as possible for collection by DOC subject to the Consent Holder’s obligations under the Marine Mammals Protection Act 1978 or any subsequent Regulations;
- l. Records are kept of all sightings of marine mammals (except seals). All records shall be contained in an Observation Log and be made available to EPA and / or DOC staff upon request and Annual Report required by Condition 99; and
- m. Any other relevant operational response in relation to marine mammals that has been approved by the EPA is undertaken.

For the purpose of these consents, any observer engaged by the Consent Holder shall first be approved by the EPA in accordance with s67(3) of the EEZ Act.

Advice note: For the purpose of this condition, the term 'in motion' refers to any period when the Consent Holder's operational vessels are moving under the power of their own engines, but does not apply to movement of the IMV at those times when it is anchored to the seabed.

Advice note: For the purpose of this condition, the term 'large cetaceans' refers to any of the following marine mammal species:

- o All members of the Mysticeti group (i.e. Baleen whales); and / or*
- o All members of the Physeteriodea group (i.e. Sperm whales); and / or*
- o All members of the Ziphiodea group (i.e. Beaked whales); and / or*
- o All members of the Globicephala group (i.e. Pilot whales); and / or*
- o All members of the Orcinus group (i.e. Killer whales).*

Underwater Noise

12. At all times during the operation of marine vessels and / or project equipment, the Consent Holder shall comply with the following requirements in relation to underwater noise:
- a. The combined noise from the IMV and the Seabed Sediment Extraction Device ("Crawler") operating under representative full production conditions shall be measured at a nominal depth of ten (10) m below the sea surface and at 300 m, 500 m, 750 m and 1,000 m from the port or starboard side of the IMV;
 - b. The overall combined noise level at 500 m shall not exceed 130 dB re 1µPa RMS linear in any of the following frequency ranges: low frequency 10-100 Hz, mid-frequency 100-10,000 Hz, and high frequency >10,000 Hz;
 - c. The overall combined noise level at a nominal depth of ten (10) m below the sea surface and 500 m from the IMV, across all frequencies shall not exceed a sound pressure level of 135 dB re 1µPa RMS linear;
 - d. Measurements shall be undertaken in calm sea conditions (e.g. Beaufort sea state less than 3 (beginning of white-capping)), with no precipitation and no external noise sources (e.g. passing ships);
 - e. The monitoring equipment shall be calibrated before and after measurements; and
 - f. The combined noise shall be monitored:
 - i. Within one (1) month of commencement of iron sand extraction activities and if less than 80% of full production condition, a further measurement will be made within one (1) month of iron sand extraction activities reaching 90% of full production conditions;
 - ii. An additional two times in the first twelve (12) months of the commencement of 90% of full production. Each measurement being separated by a period of at least six (6) months;
 - iii. Annually for the following four (4) years;
 - iv. Every five (5) years thereafter; and
 - v. At any time reasonably requested by the EPA.

Should the operation of the IMV and Crawler be altered in any way which may change the magnitude or character of the underwater noise production, the noise shall be monitored within one (1) month of the change to demonstrate compliance with Condition 12 (b) has been maintained.

Advice note: For the purpose of this condition, the reference to "full production conditions" equates to an operational extraction of 8,000 tonnes per hour.

13. Within twenty (20) working days of any noise monitoring undertaken in accordance with Condition 12, the Consent Holder shall provide a detailed report on the monitoring and results to the EPA. As a minimum, this report shall include:
- a. Details of the equipment used and calibration methods used;
 - b. A description of the measurement conditions and location; and
 - c. A summary of the noise levels measured, including broadband and one third octave band frequency data and compliance of the operation with respect to the noise standards specified in Condition 12.
14. Notwithstanding Conditions 4 - 13 above, the Consent Holder shall ensure that the activities authorised by these consents do not result in any adverse effects that were not anticipated at the time of the granting of these consents.

Archaeological Remains (Shipwrecks)

15. If any of the following:

- a. Steel;
- b. Brass;
- c. Other metals in solid state;
- d. Manufactured or worked timbers; or
- e. Other material not naturally found in the iron sand extraction area,

are discovered during iron sand extraction activities that are of potential historical or cultural importance, the Consent Holder shall immediately stop iron sand extraction activities within the discovery area.

16. The Consent Holder shall record all discoveries made under Condition 15 and as a minimum record:
- a. GPS location and depth of the find;
 - b. Photos of the find; and
 - c. A detailed description of the find.

This record shall be provided to an appropriately qualified and experienced archaeologist for interpretation and identification, and provided to the EPA and Heritage New Zealand Pouhere Taonga (“HNZ”) upon completion.

17. Further to the requirements of Condition 16, the Consent Holder shall notify the EPA of any discoveries made in accordance with Condition 15.

Additionally, the Consent Holder shall consult with HNZ and iwi representatives to confirm the origin and any other relevant information to the discovery including, as a minimum:

- a. What it is that has been discovered; and
- b. What the age of the discovery is.

18. If the discoveries under Condition 15 are found to be a legally protected archaeological site (origins pre-dating 1900), the Consent Holder shall obtain the relevant Archaeological Authority from HNZ prior to any iron sand extraction activities recommencing within the discovery area.

19. The Consent Holder shall not recommence iron sand extraction activities in the discovery area until HNZ has confirmed the discovery does not qualify as a legally protected archaeological site (pre-1900 shipwreck) as described under the Heritage New Zealand Pouhere Taonga Act 2014 or the relevant Archaeological Authority has been obtained in accordance with Condition 18.

The Consent Holder shall inform the EPA of the outcome of any engagement with HNZ as soon as practicable following the completion of any engagement process.

OPERATIONAL CONTROLS

Vessel and Operational Management

20. The Consent Holder shall ensure that when extracting seabed material using the Crawler, the cut depths shall not be deeper than eleven (11) m below the pre-mined seabed level and that only one (1) Crawler is in use, or in place, on the seabed at any time.

The Consent Holder shall continuously record the cut depth of the Crawler and report on this as part of the Quarterly Operational Report required by Condition 98.

21. The IMV shall be anchored to the seabed at all times when the Crawler is operating.

Upon each resetting of any anchor, the Consent Holder shall undertake a ‘proof-load test’ for the anchor and keep a record of each test. In addition to recording the proof-loading tests, each test should be witnessed by the relevant Class society or Marine Warranty Surveyor. The record of all tests undertaken shall be made available to the EPA upon request following a review by a suitably qualified expert.

In situations where the mooring or thruster assistance of the IMV is in a degraded capability situation and is deemed unsafe by the Captain of the IMV, all Floating Storage and Off-loading transshipment operations will be ceased immediately and the IMV will be removed to a safe location until the capability situation is, in the opinion of the Captain of the IMV, deemed operationally safe.

Advice note: In this condition, "safe location" is defined as "safe for the Consent Holder's personnel and assets, the Kupe assets, and shipping".

22. The discharge of all de-ored sediment from the IMV, shall take place by means of a dedicated pipe which discharges at a nominal distance of four (4) m above the seabed.

The height and GPS position of any mounds created on the seabed during the deposition of de-ored sediments shall be recorded and reported on in the Quarterly Operational Report required by Condition 98. Re-deposition mound heights shall be recorded with an accuracy for both height and location of +/- one (1) m.

Advice note: For the purpose of this condition, the ‘seabed’ refers to the area immediately below the point of discharge, whether that be the natural seabed or the base of the mining pit.

23. The direct deposition of de-ored sediment onto the seabed shall not occur within 300 m of the seaward boundary of the Coastal Marine Area.

24. All pits remaining at the end of each mining lane shall be no deeper than ten (10) m maximum depth and five (5) m average depth below the pre-mined seabed level.

The average and maximum depth and GPS position of any unfilled pits remaining after completion of a mining lane shall be recorded and reported in the Quarterly Operational Report required by Condition 98.

Advice note: For the purpose of these consents, the term ‘pit’ refers to the pit that remains following the extraction of seabed materials by the Crawler.

25. The Consent Holder shall ensure that:

- a. Pits created by the removal of seabed material, other than those at the end of each mining lane, are backfilled using de-ored sediments; and
- b. Other than at the commencement of each mining lane, all de-ored sediment is backfilled into the mining lanes.

Effects on Existing Interests

26. At all times during the term of these consents, the Consent Holder shall, to the greatest extent practicable, mitigate and where possible avoid, any adverse effects on the environment or on existing interests (including infrastructure and operations of licences) as a result of mooring failure or loss of position.

27. At all times during the term of these consents, the Consent Holder shall:

- a. Mitigate, and where possible avoid, adverse biosecurity effects resulting from activities being undertaken by the IMV, Floating Storage and Offloading Vessel and other support vessels; and
- b. Ensure that there are effective procedures in place to manage biosecurity risk from overseas and domestic vessels.

28. The Consent Holder shall manage all activities associated with the iron sand extraction operations, including the project vessels and their operation, to ensure that the activities authorised by this consent do not result in any adverse effects on the Operator of the Kupe Petroleum Mining License #38146 (“the Kupe Operator”) Kupe assets and Infrastructure.

Spill Prevention

29. At all times during the term of these consents, the Consent Holder shall undertake all necessary measures to ensure that there are no discharges or spills of oils or fuels from any of the operational vessels into any environment.

30. Notwithstanding Condition 29, in the event that there is a discharge or spill of oil or fuels, the Consent Holder shall implement all necessary operational responses, including the measures set out in the Spill Contingency Management Plan (Condition 63), to ensure that any adverse effects associated with such event/s are remedied or mitigated.

As soon as practicable following any spill or discharge of oil or fuels, the Consent Holder shall notify the EPA of any such event. Notification shall include a description of the event, its location and the Consent Holder’s response.

“Soft Starts”

31. The Consent Holder shall ensure that any start-up, whether related to commencement or re-commencement after a break, of the iron sand extraction activities shall be completed as a “soft start” whereby equipment shall be gradually increased in power over a minimum of twenty (20) minutes. For clarity, a “soft start” includes noise from the IMV, Crawler and any associated plant.

Soft starts may only commence in daylight hours and during good sighting conditions (visibility to at least 500 m).

32. Prior to each start-up, the Consent Holder shall use suitably trained marine mammal observer(s), in accordance with Condition 83, to conduct pre-start observations over a 500 m radius (mitigation zone) surrounding the IMV for at least thirty (30) minutes to ensure no whales or dolphins are present within the mitigation zone.

If any whales or dolphins are observed in the mitigation zone during pre-start observations, then the soft start shall be delayed until the mammals are seen to leave the mitigation zone or have not been detected within the mitigation zone for a further thirty (30) minutes from the last sighting.

A record of pre-start observations shall be kept and made available to the EPA on request and included in the Quarterly Operational Report required by Condition 98 and the Annual Report required by Condition 99.

Any observer engaged by the Consent Holder shall first be approved by the EPA in accordance with s67(3) of the EEZ Act.

Mooring of the Integrated Mining Vessel

33. All mooring lines and associated anchors for the IMV shall be located within the area bounded by the co-ordinates set out below and within the boundary shown in Schedule 4:

Longitude	Latitude
174 02 25.991 E	39 50 31.772 S
174 02 50.521 E	39 50 36.773 S
174 03 01.220 E	39 50 44.081 S
174 03 37.595 E	39 51 19.249 S
174 06 08.626 E	39 51 11.999 S
174 06 34.844 E	39 51 10.325 S
174 07 03.608 E	39 51 26.161 S
174 07 29.690 E	39 51 19.249 S
174 07 34.410 E	39 51 10.688 S
174 07 48.173 E	39 51 00.184 S
174 09 17.294 E	39 50 08.963 S
174 01 54.984 E	39 50 44.354 S
174 01 38.867 E	39 51 00.295 S
174 01 29.982 E	39 51 19.120 S
174 01 27.257 E	39 52 37.056 S
174 01 38.838 E	39 53 00.222 S
174 02 21.106 E	39 53 34.505 S
174 02 21.106 E	39 53 34.505 S
174 03 20.239 E	39 54 15.826 S
174 03 24.102 E	39 54 18.205 S
174 04 08.746 E	39 54 42.628 S
174 04 27.660 E	39 54 48.330 S
174 05 33.180 E	39 54 54.950 S
174 07 17.836 E	39 55 01.477 S
174 07 43.140 E	39 54 56.884 S
174 09 26.539 E	39 54 08.428 S
174 12 40.756 E	39 52 22.433 S
174 12 45.767 E	39 52 19.229 S
174 13 29.914 E	39 51 45.857 S
174 10 22.771 E	39 49 12.680 S

34. If any equipment or machinery greater than one (1) m x one (1) m in size is lost overboard from any project or operational vessel, the Consent Holder shall collect it from the seafloor as soon as practicable.

Where it is not practicable to recover the item, the Consent Holder shall provide a description of the item (including dimensions) and record the location and depth that the item was lost overboard. This information shall be provided to the EPA, the Coastguard and the Harbour Master (if within the twelve (12) nautical mile limit) and placed on the Consent Holder's website (Condition 76) within twenty four (24) hours of the item going overboard.

35. Notwithstanding the requirements of Condition 34 the Consent Holder shall ensure that any equipment or structures involved with the extraction operations are removed from the seabed, no later than one (1) month following the cessation of the iron sand extraction activities authorised by these consents.

Other Discharges from Operational Vessels

36. The Consent Holder shall not dispose of, or discharge, any chemicals or harmful substances at sea.

All hazardous and/or oily waste shall be stored on board each project vessel for transport in suitable containers or packaging to an authorised shore side reception facility.

For the purpose of this condition, 'harmful substances' do not include any 'mining discharges' from the iron sand extraction activities as defined by s4 of the EEZ Act or any biodegradable hydraulic fluid / oils from the Crawler.

37. All fuel used in the operational vessels shall have a sulphur content no greater than 3.5% (w/w) by weight.

A record of all fuel used in, and the sulphur content of, any of the project vessels shall be kept and provided as part of the Annual Report required under Condition 99 and shall be made available to the EPA upon request.

Biosecurity Management

38. All operational vessels carrying ballast water that travel to and from overseas ports, including bulk carriers, shall be required to have a shipboard ballast water treatment system as part of their charter agreements with the Consent Holder. The ballast water treatment system shall be in the Ministry for Primary Industry List of Approved Ballast Water Treatment Systems, or be an equivalent system approved by the International Maritime Organization.

Any vessel that does not comply with the above requirements shall not be used for any part of the iron sand extraction activities authorised by these consents, unless the vessel's Master can demonstrate that the vessel complies with additional ballast water management options listed in the Ministry for Primary Industries' Import Health Standard: Ballast Water from All Countries, 16 December 2015, or any replacement rule or standard, including the Maritime New Zealand ("MNZ") Marine Protection Rules (Part 300: Ballast Water Management).

39. The Consent Holder shall ensure that:

- a. All overseas vessels that are to be permanently located in the vicinity of the project area, including but not limited to the IMV and Crawler; and
- b. All vessels servicing the iron sand extraction operation that regularly travel to and from overseas ports, including bulk carriers,

meet the 'Clean Hull' for 'long-stay vessels' requirement specified in the Ministry for Primary Industries Craft Risk Management Standard: Biofouling on Vessels Arriving to New Zealand, 15 May 2014 ("the CRMS"), or any subsequent version thereof. For vessels permanently located in the vicinity of the project area, special measures to minimise biofouling risk shall be considered as part of a Biosecurity Management Plan ("BMP") developed under Condition 66.

Any vessel that does not comply with the above requirements shall not be used for any part of the iron sand extraction activities authorised by these consents.

40. Within twenty (20) working days of each anniversary of the commencement of these consents, the Consent Holder shall provide a copy of the 'Biofouling Record Book' (Condition 66 (b)(iv)) to a nominated representative of the Aquaculture Industry, as appointed by Aquaculture New Zealand, and to the EPA.
41. Vessels associated with operations authorised by these consents shall only enter and anchor in Admiralty Bay for the purpose of seeking shelter in adverse weather or vessel safety requirements, and under no circumstances shall any operational or maintenance activities, including the discharge of ballast water, be undertaken at this location unless:
 - a. An emergency situation arises and, in the opinion of the vessel's Master, there is no realistic alternative; and
 - b. MNZ, the Marlborough District Council, Aquaculture New Zealand and a nominated representative of Ngati Koata are notified as soon as practicable following the occurrence of any such emergency event.
42. Prior to any vessels associated with operations authorised by these consents entering and anchoring in Admiralty Bay in accordance with Condition 41, the Consent Holder shall notify Ngati Koata as soon as reasonably practicable and, to the extent practicable:
 - a. Provide the opportunity for a nominated representative from Ngati Koata to have input in the anchoring location within the bay; and
 - b. Provide the opportunity for a nominated Ngati Koata iwi observer to monitor the presence of marine mammals.

PRE-COMMENCEMENT MONITORING

Pre-commencement Environmental Monitoring Plan

43. Prior to the commencement of any iron sand extraction activities, the Consent Holder shall ensure that a minimum of two (2) years of environmental monitoring has been undertaken and shall, as a minimum, include monitoring of:
 - Suspended sediment concentrations;
 - Sediment quality;
 - Subtidal and intertidal biology;
 - Optical water quality;
 - Physio-chemical parameters;
 - Heavy metals;
 - Seafood resources;
 - Marine mammals;
 - Underwater noise;
 - Seabirds;
 - Commercial fishing;
 - Beach profiles; and
 - Recreational fishing.

The Consent Holder shall prepare, and undertake pre-commencement environmental monitoring, in accordance with the procedures and methods, at the locations (including representative points around the Kupe Well Head Platform and along the pipeline and umbilical route), and for the duration and frequency detailed in the approved Pre-commencement Environmental Monitoring Plan ("PCEMP") the purpose of which is to:

- a. Establish a set of environmental data that identifies natural background levels while taking into account spatial and temporal variation;
- b. Confirm the current understanding of the seasonality and natural variability of environmental parameters that will be monitored during iron sand extraction activities;
- c. Provide data to validate the background data used in the Operational Sediment Plume Model (Condition 47), which predicts the sediment transportation processes in the South Taranaki Bight; and
- d. Provide data to verify that the ‘SSC Limit’ values in Schedule 2 are appropriate following the validation of the Operational Sediment Plume Model (Condition 47);
- e. Ensure compliance with all regulatory requirements and guidelines.

The PCEMP shall also include:

- a) The roles and responsibilities of parties who are to undertake the pre-commencement environmental monitoring;
- b) Objectives for the pre-commencement environmental monitoring associated with these consents;
- c) All parameters being monitored, including sampling design, methodology, frequency, duration and monitoring locations;
- d) Details of data analysis and processing for all parameters being monitored; and
- e) Report methods for all parameters being monitored.

The PCEMP shall be prepared by a suitably qualified and experienced person(s) in general accordance with the draft PCEMP dated YYYYYY. The PCEMP shall then be independently peer reviewed and then reviewed by the Technical Review Group (“TRG”) (Condition 56) to confirm that the intended monitoring meets the purposes of the PCEMP as set out in this condition.

The PCEMP together with comments and recommendations of the TRG including, where necessary, an explanation as to why a TRG recommendation has not been accepted, shall be submitted to the EPA for approval in a technical certification capacity that the PCEMP meets the requirements of this condition.

If within thirty (30) working days the EPA has not approved the PCEMP, or advised the Consent Holder that it has not yet been approved, the PCEMP will be deemed to have been so approved.

The pre-commencement monitoring required by these consents shall be undertaken in accordance with the approved PCEMP.

44. The Consent Holder may amend the PCEMP at any time, but any changes will only come into effect once they have been approved by the EPA, acting in a technical certification capacity that such amendment is consistent with purposes of, and follows the preparation and review processes of, Condition 43, and that the monitoring locations, duration and frequency of monitoring are representative and relevant to each of the environmental components being monitored.

If within twenty (20) working days the EPA has not approved the amended PCEMP, or advised the Consent Holder that it has not yet been approved, the amended PCEMP will be deemed to have been so approved.

Where approval for an amended plan is not received, the Consent Holder shall continue to use the plan which was in place prior to the lodgement of the amended plan.

Advice note: Minor amendments that take into account unforeseen circumstances, or that address circumstances that require immediate action on site do not need to be submitted in advance of the work

being undertaken, provided the effects of such amendments are no greater than those provided for under the consents. The Consent Holder should submit any such amendments as soon as practicable.

45. For the purpose of all monitoring in accordance with the conditions of these consents, the Consent Holder shall undertake monitoring at all required times except:
- a. During a mechanical or technical breakdown or malfunction of monitoring equipment; or
 - b. Where monitoring equipment has been damaged or is being replaced; or
 - c. Due to unforeseen circumstances.

If any of the above situations occur the Consent Holder shall immediately, but no later than twenty-four (24) hours following, notify the EPA of any such occurrence identifying:

- a) What monitoring was affected and for how long; and
 - b) When the monitoring will recommence.
46. Prior to the commencement of the iron sand extraction activities and following completion of the pre-commencement environmental monitoring required under Condition 43, the Consent Holder shall determine updated numerical values of the SSC Limits in Schedule 2 of these consents utilising the methodology specified in Schedule 3 to the satisfaction of the EPA. The review of the numerical values must be undertaken by suitably qualified and experienced person(s) and submitted to the TRG for review and comment prior to being submitted to the EPA.

In the event that the numerical values of the SSC Limits as a result of monitoring are different from the numerical values of the SSC Limits in Schedule 2 of these consents, then the updated numerical values shall supersede the numerical values of the SSC Limits in Schedule 2 for the purpose of these consents

Any change to the numerical values in accordance with this condition shall not require a change of consent conditions but are to be identified in the Environmental Monitoring and Management Plan (“EMMP”) required under Condition 50.

OPERATIONAL SEDIMENT PLUME MODEL

47. At all times during the term of these consents, the Consent Holder shall maintain an Operational Sediment Plume Model (“OSPM”), in order to ensure that activities authorised by these consents comply with the conditions of these consents and to provide an effective mechanism to assist in:
- a. Predicting background and extraction derived Suspended Sediment Concentrations to inform the management of the iron sand extraction activities;
 - b. Distinguishing operationally derived contributions to Suspended Sediment Concentrations from background processes; and
 - c. Forecasting, as accurately as possible, sediment plume dynamics including but not limited to:
 - Intensity; and
 - Geographic spread.

The OSPM shall be run in real time forecast mode using up to date Met Ocean three (3), five (5), seven (7) or ten (10) day forecasts to inform the day to day mine operations and ensure that compliance with the SSC Limits specified in Condition 6 is maintained.

The OSPM shall be developed and maintained by a suitably qualified and experienced person(s).

The OSPM is to be updated and independently peer reviewed by a suitably qualified and experienced person at the following intervals:

- a) Once at the conclusion of the PCEMP period prior to any iron sand extraction activities;
- b) During iron sand extraction activities immediately following each calibration and validation exercise at the frequencies defined in Condition 48.

The scope of the OSPM independent review shall include the model, its calibration, validation, availability and applicability of data and the use of the OSPM in management of the iron sand extraction activities. The predictive fine sediment identification methods and sampling density (Condition 82) shall be included within the review scope.

An OSPM report shall be prepared that summarises the establishment, calibration, validation, operation and updating of the OSPM. The OSPM report, including that updated OSPM, shall, together with the independent peer review, be provided to the TRG for review prior to lodgement with the EPA.

The OSPM report, including the updated OSPM, the comments and recommendations of the peer reviewer and the TRG, and explanations as to why any recommendation has not been accepted; shall be provided to the EPA for approval in a technical certification capacity, that the updated OSPM satisfies the requirements of this Condition 47.

The Consent Holder shall at all times operate an EPA approved OSPM. If approval of an updated OSPM is not received, the Consent Holder shall continue to use the OSPM that was in use prior to lodgement of the updated OSPM.

48. The Consent Holder shall calibrate and validate the OPSM at least:

- a. Every six (6) months during the PCEMP and for the first three (3) years of iron sand extraction activities; and
- b. Every twenty-four (24) months thereafter,

utilising the sediment data from the PCEMP (Condition 43), the Operational Assessment Report (Condition 82) and the on-going monitoring information collected in accordance with Conditions 49.

The calibration and validation exercise shall review the modelled and measured sediment plume properties. The Consent Holder shall review whether the benthic ecology and SSC monitoring sites are appropriately located to detect any adverse effect of SSC and report the outcome of that review to the TRG under Condition 56b. Any change to the location of benthic ecology monitoring sites shall be by way of an amendment to the EMMP in accordance with Condition 51.

ENVIRONMENTAL MONITORING REQUIREMENTS

49. Following the completion of the pre-commencement monitoring provided for in Condition 43 and the review of the SSC Limits under Condition 46, the Consent Holder shall, as a minimum, undertake monitoring of:

- Suspended Sediment Concentrations, as measured from grab samples and as calculated from continuous turbidity measurements;
- Sediment quality;
- Subtidal and intertidal biology;
- Optical water quality;
- Physio-chemical parameters;
- Heavy metals;
- Seafood resources;
- Marine mammals;
- Underwater noise;

- Beach profiles; and
- Recreational fishing.

The Consent Holder shall prepare, and undertake environmental monitoring in accordance with the procedures and methods, at the locations, and for the duration and frequency detailed in the approved EMMP required by Condition 50.

Environmental Management and Monitoring Plan

50. The Consent Holder shall ensure that monitoring required by Condition 49 is appropriate to ensure that the activities authorised by these consents do not result in any adverse effects that were not anticipated at the time of the granting of these consents.

The EMMP shall, as a minimum:

- a. Identify the sampling design and methodology for each of the parameters being monitored, including the frequency, duration and monitoring locations;
- b. Describe how the results of the pre-commencement environmental monitoring programme provided for in the PCEMP has been incorporated into the EMMP (Condition 43);
- c. Outline the process for the on-going validation of the OSPM including the calibration and validation of the plume component of the model (Condition 47);
- d. Identify the limits contained in the ISQG-High values (Condition 7);
- e. Specify procedures for comparing the monitoring data against the background data that assist in determining if any activities authorised by the consents have resulted in adverse effects that were not anticipated at the time of the granting;
- f. Identify the TRG membership, and their evaluation process in accordance with Conditions 56 - 60;
- g. Identify the operational responses to be undertaken if unanticipated adverse effects are identified;
- h. Detail data analysis and processing for all parameters being monitored; and
- i. Define the reporting methods and schedule for all parameters being monitored.

The EMMP shall be prepared by a suitably qualified and experienced person(s) in general accordance with the draft EMMP dated YYYYYY. The EMMP shall then be independently peer reviewed and then reviewed by the TRG (Condition 56) to confirm that the intended monitoring meets the purposes of the EMMP as set out in this condition.

The EMMP together with comments and recommendations of the TRG including, where necessary, an explanation as to why a TRG recommendation has not been accepted, shall be submitted to the EPA for approval in a technical certification capacity that the PCEMP meets the requirements of this condition.

The environmental monitoring required by these consents shall be undertaken in accordance with the approved EMMP and shall commence no later than one (1) month prior to the commencement of the iron sand extraction activities authorised by these consents.

If within twenty (20) working days the EPA has not approved the EMMP, or advised the Consent Holder that it has not yet been approved, it will be deemed to have been so approved.

51. The Consent Holder may amend the EMMP at any time, but any changes will only come into effect once they have been approved by the EPA, acting in a technical certification capacity that:

- a. Such changes are consistent with the requirements of Conditions 49 and 50; and
- b. The processes set out in Condition 50 have been followed; and
- c. The monitoring locations, and the duration and frequency of monitoring, continue to be representative and relevant to each of the environmental components being monitored; and / or
- d. The change in monitoring location or timing of monitoring is necessary to reflect operational changes, or changes in methodology, due to advances in technology or scientific understanding.

If within twenty (20) working days the EPA has not approved the amended EMMP, or advised the Consent Holder that it has not yet been approved, the amended EMMP will be deemed to have been so approved.

Where approval for an amended plan is not received, the Consent Holder shall continue to use the plan which was in place prior to the lodgement of the amended plan.

Advice note: Minor amendments that take into account unforeseen circumstances on site, or that address circumstances that require immediate action do not need to be submitted in advance of the work being undertaken, provided any effects of such amendments are no greater than those provided for under these consents. The Consent Holder should submit any such amendments as soon as practicable.

Post-Extraction Benthic Recovery Monitoring

- 52. Following the completion of the iron sand extraction activities authorised by these consents, the Consent Holder shall undertake five (5) years of post-extraction monitoring of the biological environment, including heavy metal concentrations, within the consent area and its surrounds, the purpose of which is to demonstrate that recovery of the benthic environment, as defined in Condition 9, has been achieved.

At least three (3) months prior to the completion of the iron sand extraction activities, the Consent Holder shall provide to the EPA for approval in a technical certification capacity, a Post-extraction Monitoring Plan which shall, as a minimum, include:

- a. The roles and responsibilities of parties who are to undertake each aspect of the environmental monitoring;
- b. Objectives for the post-extraction monitoring associated with these consents;
- c. A description of the TRG, their role and their evaluation process in accordance with Conditions 56 - 60;
- d. Identification of the sampling design and methodology for each of the parameters being monitored, including the frequency, duration and monitoring locations;
- e. Procedures for comparing the monitoring data against the background data that will assist in determining if the biological environment within the extraction area is recovering following the completion of the extraction activities;
- f. Details of data analysis and processing for all parameters being monitored; and
- g. Reporting methods for all parameters being monitored.

If within twenty (20) working days the EPA has not approved the Post-extraction Monitoring Plan, or advised the Consent Holder that it has not yet been approved, it will be deemed to have been so approved.

53. Within twenty (20) working days of each anniversary of the commencement of the post-extraction monitoring programme, the Consent Holder shall, following consultation with the TRG, prepare and lodge with the EPA, an Annual Post-extraction Monitoring Report that includes as a minimum:
- a. The monitoring undertaken in the previous twelve (12) month period;
 - b. The monitoring to be undertaken in the next twelve (12) month period;
 - c. Data collected from the monitoring undertaken;
 - d. Any remediation undertaken and the results of any such remediation;
 - e. A summary of any commentary or recommendations from the TRG and, where necessary, an explanation as to why any TRG recommendation has not been accepted; and
 - f. A summary report of the findings of the monitoring undertaken with conclusions drawn as to the recovery and overall biological health of the extraction area.
54. Within sixty (60) working days of the completion of the post-extraction monitoring programme, the Consent Holder shall, following consultation with the TRG, prepare and lodge with the EPA, a Final Post-extraction Monitoring Report that includes as a minimum:
- a. A summary of all of the monitoring undertaken in the previous forty-eight (48) month period;
 - b. A summary report of the findings of the monitoring undertaken with conclusions drawn as to the recovery and overall biological health of the iron sand extraction area; and
 - c. Identification of any commentary or recommendations from the TRG and, where necessary, an explanation as to why any TRG recommendation has not been accepted.

Laboratory Accreditation

55. All laboratory based analyses undertaken in conjunction with the requirements of these consents shall be performed by an IANZ accredited laboratory or, where applicable, any other accredited laboratory.

TECHNICAL REVIEW GROUP

56. At least six (6) months prior to the commencement of the PCEMP required by Condition 43, the Consent Holder shall provide for the formation of a TRG, the role of which is to provide technical advice to the Consent Holder, including but not limited to the following:
- a. Prior to their lodgement with the EPA, review and advise on the appropriateness of the monitoring provided for in the PCEMP and EEMP (Conditions 43 and 50), and any review of the PCEMP and EEMP (Conditions 44 and 51);
 - b. Compare the monitoring data against the pre-commencement data in order to assist in determining if any activities authorised by these consents have resulted in adverse effects on the marine environment that were not anticipated at the time of the granting;
 - c. Consider and make recommendations on the need for any new parameter to be monitored in accordance with Conditions 49 and 50;
 - d. Community knowledge and “matauranga maori” issues when reviewing the monitoring data;
 - e. The environmental management component of the iron sand extraction activities by an annual data review whereby each year’s monitoring results will be tabulated, reviewed, and compared against the previous monitoring data collected; and

- f. Make recommendations to the Consent Holder that a review of the consent conditions be undertaken for the purpose of avoiding, remedying or mitigating adverse effects on the environment which may arise from the exercise of these consents and which it is appropriate to deal with at a later stage.

The Consent Holder shall invite the following parties to nominate one suitably qualified and experienced representative to be involved in the TRG:

- The Consent Holder;
- Taranaki Regional Council;
- Fisheries Inshore New Zealand;
- The Kaitiakitanga Reference Group (Condition 68);
- Te Tai Hauauru Regional Fishing Forum;
- DOC; and
- The Kupe Operator.

Each representative shall have specialist expertise in one or more of the key environmental, ecosystem, matauranga maori (Maori traditional knowledge) and engineering components being monitored.

In the event that a Kaitiakitanga Reference Group, as specified in Condition 68, is not formed the Consent Holder is not required to extend an invitation to any alternative party.

In the event that Fisheries Inshore New Zealand do not accept the invitation to nominate a representative, the Consent Holder shall invite Sanford Limited to do so.

At any time during the term of these consents, any party who appoints a representative to the TRG may change that representative on the basis that any new representative also has the relevant qualifications and experience.

At any time during the term of these consents, including if any party is not able, for whatever reason, to provide a representative to the TRG, the TRG may recommend to the Consent Holder that other suitably qualified and experienced specialists be seconded, or technical studies be commissioned for the proper exercise of the TRG functions. The decision on whether to act on such a recommendation will rest with the Consent Holder after consultation with the EPA.

57. The Consent Holder shall maintain the TRG for the duration of these consents, and beyond as necessary, to provide for the review and commentary on any post-extraction monitoring undertaken in accordance with these consents.

58. The Consent Holder shall convene meetings of the TRG:

- a. Annually, following the completion of each year of monitoring, during the pre-commencement environmental monitoring period;
- b. Then, for the first five (5) years following the commencement of the iron sand extraction activities, on a quarterly basis (during the months of January, April, July and October of each year) with one meeting to occur following completion of each annual monitoring period;
- c. Then annually, following completion of each annual monitoring period, for the duration of these consents;
- d. Then annually, following the completion of each annual post-extraction monitoring period; and
- e. At any other time requested by the Consent Holder.

For the purpose of this condition, the 'annual monitoring period' is the twelve (12) month period commencing in the month in which the pre-commencement environmental monitoring or the operational environmental monitoring commenced. Further, the 'annual post-extraction monitoring period' is the twelve (12) month period commencing in the month following the month that the iron sand extraction activities ceased.

59. The Consent Holder shall fund the administration of each meeting of the TRG and shall meet all actual and reasonable costs incurred by any other specialists seconded to the TRG, as provided for in Condition 56.
60. Minutes of each of the TRG meetings, including the identification of any disagreements between the TRG members and any recommendations provided by the TRG to the Consent Holder, shall be taken and forwarded to its members, the Consent Holder, the Kaitiakitanga Reference Group, and the EPA, and provided on the Consent Holder’s website (Condition 76), within ten (10) working days of any meeting being held.

MANAGEMENT PLANS

Seabird Effects Mitigation and Management Plan

61. The consent holder shall prepare, and implement, a Seabird Effects Mitigation and Management Plan (“SEMMP”) that has been prepared following consultation with DOC, which shall, as a minimum, set out:
 - a. How compliance with Condition 10 will be achieved;
 - b. Set out indicators of adverse effects due to mortality or injury of seabirds of the species classified under the New Zealand Conservation Status as “Nationally Endangered”, “Nationally Critical” or “Nationally Vulnerable” or classified “Endangered” or “Vulnerable” in the International Union for the Conservation of Nature “Red List”;
 - c. Identify responses / actions to be undertaken by the Consent Holder if the indicators in (b) are reached; and
 - d. Outline any monitoring requirements for bird strike due to vessel lighting and, where necessary, provide for procedures to alter vessel lighting and vessel operations to reduce the incidence of bird strike.

The SEMMP shall be prepared by a suitably qualified and experienced person(s) in general accordance with the draft SEMMP dated YYYYYY, and submitted to the EPA for approval in a technical certification capacity that the requirements of this condition have been met.

Any amendments to the SEMMP shall be submitted to the EPA for approval in a technical certification, and shall only be implemented following confirmation from the EPA that the amended SEMMP meets the requirements of this condition. Where approval for an amended plan is not received, the Consent Holder shall continue to use the plan which was in place prior to the lodgement of the amended plan.

The activities authorised by these consents shall be undertaken in accordance with the latest approved SEMMP.

A copy of the approved SEMMP, or any subsequent amendment, shall be held on-board each of the Consent Holder’s project vessels and at the Consent Holder’s head office.

Marine Mammal Management Plan

62. The Consent Holder shall prepare, and implement, a Marine Mammal Management Plan (“MMMP”) that has been prepared and implemented following consultation with DOC, which shall, as a minimum, set out:
 - a. How compliance with Condition 11 will be achieved; and
 - b. Procedures and protocols to minimise the risk of whale and dolphin entanglement; and
 - c. A training framework relating to marine mammal operational responses; and

- d. Integrate any obligations under the Marine Mammals Protection Act 1978 and Marine Mammals Protection Regulations 1992, or any superseding legislation.

The MMMP shall be prepared by a suitably qualified and experienced person(s) in general accordance with the draft MMMP dated YYYY, and submitted to the EPA for approval in a technical certification capacity that the requirements of this condition have been met.

Any amendments to the MMMP shall be submitted to the EPA for approval in a technical certification capacity, and shall only be implemented following confirmation from the EPA that the amended MMMP meets the requirements of this condition. Where approval for an amended plan is not received, the Consent Holder shall continue to use the plan which was in place prior to the lodgement of the amended plan.

The activities authorised by these consents shall be undertaken in accordance with the EPA approved MMMP and a copy of the approved MMMP, or any subsequent amendment, shall be held on-board each of the Consent Holder’s project vessels and at the Consent Holder’s head office.

Spill Contingency Management Plan

- 63. The Consent Holder shall, following consultation with MNZ, prepare and implement, a Spill Contingency Management Plan (“SCMP”) which shall, as a minimum set out:
 - a. How compliance with Condition 30 will be achieved; and
 - b. Outline the protocols, methods and responses to be implemented after any unplanned discharge or spill to the environment; and
 - c. Identify the measures to be taken to avoid, remedy or mitigate, to the greatest extent practicable, any adverse environmental effects resulting from the discharge or spill.

The SCMP shall be prepared by a suitably qualified and experienced person(s) and submitted to the EPA for approval in a technical certification capacity that the requirements of this condition have been met.

Any amendments to the SCMP shall be submitted to the EPA for approval in a technical certification capacity, and shall only be implemented following confirmation from the EPA that the amended SCMP meets the requirements of this condition. Where approval for an amended plan is not received, the Consent Holder shall continue to use the plan which was in place prior to the lodgement of the amended plan.

The activities authorised by these consents shall be undertaken in accordance with the EPA approved SCMP and a copy of the approved SCMP, or any subsequent amendments, shall be held on-board each of the Consent Holder’s project vessels and at the Consent Holder’s head office.

Collision (Loss of Position) Contingency Management Plan

- 64. The Consent Holder shall develop a Collision (Loss of Position) Contingency Management Plan (“CCMP”) following consultation with MNZ and the Kupe Operator.

The purpose of the CCMP is to demonstrate how the objectives set out below will be achieved and to outline the specific operating procedures to be implemented during the iron sand extraction operations. The CCMP shall, as a minimum, identify the following:

- a. How compliance with Conditions 26 and 28 will be achieved;
- b. The processes, methods, procedures and responses to be implemented after any unplanned / emergency event that potentially results in mooring failure or loss of position;

- c. The measures which will be taken to avoid, remedy or mitigate any adverse environmental effects or effects on existing interests such as the infrastructure and operations of the licensee of Petroleum Mining License #38146;
- d. How the IMV will be operated to 'sit out' severe environmental conditions such that the risk of collision between the Consent Holder's assets and the Kupe assets is as low as reasonably practicable;
- e. The emergency procedures to be implemented in the event of a mooring failure / loss of station-keeping by the IMV;
- f. The protective measures / procedures proposed should any aspect of the thruster system, and its associated systems, be rendered out of service by accident or planned maintenance, such that they are immediately available in the event of a mooring leg failure;
- g. The procedure for ensuring that, when the IMV is operating in any position where a station keeping failure may result in a potential collision of the IMV or its dragged mooring system with the Kupe assets, the thruster system be fully operational and active to enable immediate control of the IMV in the event of an incident. This shall include having such power generation capacity on line at these times;
- h. The procedures for the recovery and setting of the IMV anchors such that the required anchor holding capacity is achieved including an operability assessment assessing the likelihood that an anchor handling operation cannot be completed due to a fast rising storm;
- i. The measures to address the reduced station keeping integrity of the mooring whilst recovering, running and re-setting anchors;
- j. The planned inspection regime for the safety critical TAM systems including the discard criteria for the mooring wires;
- k. The detailed emergency response procedure (including communication requirements and notification periods) addressing incidents such as mooring leg failure, loss of heading control, thruster drive off, and disablement of thruster system. The response must address the risk of collision between the Consent Holder's assets and the Kupe assets to ensure the risk is 'As Low As Reasonably Practicable';
- l. The procedure for recovering and resetting of the mooring line and anchor buffer zone with regard to the requirements for the Anchor Handling Tug to recover and set anchors; and
- m. The joint operating procedures for the trans-shipment of ore between the IMV and the Floating Storage and Off-loading Vessel.

All operational procedures must be developed to reflect the safe operating requirements outlined in the final version of the CCMP with clear descriptions on when each procedure is applicable (i.e. normal operations, or under emergency trigger conditions).

The CCMP shall be prepared by a suitably qualified and experienced person(s) and submitted to the EPA for approval in a technical certification capacity that the requirements of this condition have been met.

Prior to being finalised, the CCMP shall be independently reviewed by a suitably qualified and internationally recognised person or body. The review shall confirm that the CCMP is fit for purpose and demonstrates how the objectives above will be achieved, including sufficient detail as to the operating procedures required to achieve them. The recommendations of the review shall be incorporated into the final version of the CCMP.

The CCMP may be amended at any time during the term of these consents following consultation with MNZ and the Kupe Operator. At the Kupe Operator's request, proposed amendments to the CCMP shall be subject to a further independent peer review. The Consent Holder shall consult with MNZ on the

recommendations of that review prior to them being incorporated into the final amendments to the CCMP.

The most up to date copy of the CCMP is to be held on all operational vessels and at the Consent Holder's head office and shall be provided to the EPA and the Kupe Operator upon request.

Advice note: The reviewer shall be mutually agreed between the Consent Holder and the Kupe Operator. In the event that the Consent Holder and the Kupe Operator cannot reach agreement, each party shall recommend one suitably qualified independent reviewer to the Chief Executive of the EPA who will decide on the reviewer to be appointed from the two recommendations. The costs of the review will be met by the Consent Holder.

Simultaneous Operations Plan

65. The Consent Holder shall prepare a Simultaneous Operations Plan ("SIMOPP") in accordance with the requirements of IMCA M 203 Guidance on Simultaneous Operations (SIMOPS) following consultation with the Kupe Operator.

The purpose of the SIMOPP is to:

- a. Define the procedures to be followed when two or more vessels are operating in the same general area and in close proximity to each other;
- b. Outline the consultation framework under which the Kupe Operator may provide input into the Consent Holder's design and execution of the mining operations;
- c. Identify how the Consent Holder will operate within the guidelines as specified in IMCA M 203, Guidelines on Simultaneous Operations; and
- d. Identify how the operations of both the Consent Holder and the Kupe Operator within the area of Petroleum Mining Licence #38146 will be conducted for the duration of the iron sand extraction operations.

The SIMOPP shall, as a minimum, set out:

- a) How mining operations will be managed in the event that a 'Jack-up Drill Rig' is being moved into position or temporarily moored adjacent to the Kupe platform prior to spudding in or jacking down of a rig;
- b) How the Consent Holder shall confer with the Kupe Operator regarding the sequence of blocks of areas to be mined to ensure that any proposed pipeline corridor or location for a 'Jack-up Drill Rig' has time to consolidate, based on the geotechnical data relevant to that block.
- c) How the Consent Holder shall confer with the Kupe Operator with regards to the planning of maintenance activities undertaken by the Kupe Operator on the Kupe assets.

Prior to being finalised, the SIMOPP shall be independently reviewed by a suitably qualified and internationally recognised person or body. The review shall confirm that the SIMOPP is fit for purpose, and identifies how the Consent Holder will operate within the guidelines as specified in IMCA M 203, Guidelines on Simultaneous Operations. The recommendations of that review shall be incorporated into the SIMOPP.

The SIMOPP must be finalised and provided to the EPA and the Kupe Operator at least three months prior to the commencement of any iron sand extraction activities authorised by these consents.

The SIMOPP may be amended at any time during the term of these consents following consultation with the Kupe Operator. At the Kupe Operator's request, proposed amendments to the SIMOPP shall be subject to a further independent peer review.

The Consent Holder shall ensure that the EPA has a copy of the most update version of the SIMOPP at all times, and shall provide a copy to the Kupe Operator upon request.

Advice note: The reviewer shall be mutually agreed between the Consent Holder and the Kupe Operator. In the event that the Consent Holder and the Kupe Operator cannot reach agreement, each party shall recommend one a suitably qualified independent reviewer to the Chief Executive of the EPA who will decide on the reviewer to be appointed from the two recommendations.

Biosecurity Management Plan

66. Notwithstanding the requirements of Conditions 38 - 39, the Consent Holder shall, prior to the commencement of iron sand extraction activities, and following consultation with the Ministry for Primary Industries and a nominated representative from Aquaculture New Zealand, prepare, and implement, a Biosecurity Management Plan (“BMP”) which shall, as a minimum, contain or require the following:
- a. For overseas vessels, describe the ‘acceptable measures’ for biofouling management that will be implemented to meet the ‘Clean Hull’ requirement of the CRMS, or demonstrate an equivalent level of risk;
 - b. For all vessels, both overseas and domestic, prepare a vessel-specific ‘Biofouling Management Plan’, in accordance with the International Marine Organisation 2011 ‘Guidelines for the Control and Management of Ships’ Biofouling to Minimize the Transfer of Invasive Aquatic Species’ (“the IMO Guidelines”), or any subsequent version thereof. The Biofouling Management Plan shall include or require the following:
 - i. Details of the anti-fouling systems and operational practices or treatments to be used, including those for niche areas (e.g. ‘sea chests’);
 - ii. Identification of hull locations susceptible to biofouling, and a schedule of planned inspections, repairs, maintenance and renewal of anti-fouling systems;
 - iii. Details of the recommended operating conditions suitable for the chosen anti-fouling systems and operational practices;
 - iv. Other relevant details as described in Appendices 1 and 2 of the IMO Guidelines, including maintenance of a ‘Biofouling Record Book’, which records details of all inspections and biofouling management measures undertaken on the vessel;
 - c. For overseas vessels that are to be permanently located in the vicinity of the project area, the BMP shall consider additional special measures that can be implemented to minimise biosecurity risk. These could include, but are not limited to, any of the following:
 - i. Using new-build vessels that have appropriate anti-fouling systems;
 - ii. Minimising the time vessels spend idle in water before departure from the overseas source port, in order to minimise the risk of colonisation by biofouling organisms;
 - iii. Ensuring appropriate measures are in place for sources of risk in addition to biofouling, such as cleaning and removal of sediment; and
 - iv. Acquiring vessels from regions that are not ‘climatically matched’ to the project area, in order to further mitigate any residual risk.

The BMP shall be prepared by a suitably qualified and experienced person(s) and submitted to the EPA for approval in a technical certification capacity that the requirements of this condition have been met.

The BMP shall be updated as necessary to reflect the most up-to-date marine standards and guidelines, and any amendments to the BMP shall be submitted to the EPA for approval in a technical certification capacity, and shall only be implemented following confirmation from the EPA that the amended BMP meets the requirements of this condition. Where approval for an amended plan is not received, the Consent Holder shall continue to use the plan which was in place prior to the lodgement of the amended plan.

The activities authorised by these consents shall be undertaken in accordance with the EPA approved BMP and a copy of the approved BMP, or any subsequent amendment, shall be held on-board each of the Consent Holder’s project vessels and at the Consent Holder’s head office.

RELATIONSHIP WITH TANGATA WHENUA

67. The relationship of tangata whenua, including but not limited to Ngati Ruanui, Ngaa Rauru Kiitahi and Ngaruahine, with the South Taranaki Bight is to be recognised and provided for by the Consent Holder through:
- a. Provision for the establishment and maintenance of a Kaitiakitanga Reference Group (Condition 68);
 - b. Provisions for involvement of the Kaitiakitanga Reference Group, in accordance with their defined role, in:
 - i. The TRG (Condition 56); and
 - ii. The Kaimoana Monitoring Programme (Condition 72).
68. Within one (1) month of the commencement of these consents, the Consent Holder shall provide to tangata whenua, including but not limited to Ngati Ruanui, Ngaa Rauru Kiitahi and Ngaruahine, a written offer to establish and maintain a Kaitiakitanga Reference Group, the purpose of which is to:
- a. Recognise the kaitiakitanga of tangata whenua, including but not limited to Ngati Ruanui, Ngaa Rauru Kiitahi and Ngaruahine, and their relationship with the South Taranaki Bight;
 - b. Review and advise the Consent Holder on the suitability of the Kaimoana Monitoring Programme (Condition 72);
 - c. Provide for the on-going involvement of tangata whenua, who have a relationship with the South Taranaki Bight as kaitiaki, in monitoring the effects of the activities authorised by these consents, including a process for considering any future change to the membership of the Kaitiakitanga Reference Group;
 - d. Provide for kaitiaki responsibilities and values to be reflected in the monitoring of the iron sand extraction area and of the surrounding marine environment undertaken under these consents, including:
 - i. To advise the Consent Holder on monitoring for changes to risk, or threat to, the cultural values of the South Taranaki Bight;
 - ii. To evaluate the data obtained from physical monitoring insofar as it relates to the cultural values of the South Taranaki Bight and the effects on those values from the iron sand extraction and, in the event that changes to effects are identified, advise the Consent Holder on possible monitoring or operational responses;
 - iii. To advise the Consent Holder on the appropriateness of any operational responses as they relate to cultural values, proposed by others;
 - iv. To provide a means of liaison between tangata whenua, including but not limited to Ngati Ruanui, Ngaa Rauru Kiitahi and Ngaruahine, and the Consent Holder through providing a forum for discussion about the implementation of these consents; and
 - e. Be responsible for receiving requests for, and facilitating the provision of, any cultural ceremonies by tangata whenua, including but not limited to Ngati Ruanui, Ngaa Rauru Kiitahi, Ngaruahine, and other tangata whenua groups who have a relationship with the South Taranaki Bight.

Advice note: The Consent Holder records its commitment to implementing this condition in good faith and to using the services of an independent mediator, as necessary, in doing so.

69. Once the Kaitiakitanga Reference Group is formed the Consent Holder shall provide details of its membership, and any subsequent changes, to the EPA.

70. The Consent Holder shall:

- a. Be entitled to appoint one member of the Kaitiakitanga Reference Group.
- b. Facilitate and fund the administration of each formal meeting of the Kaitiakitanga Reference Group. The first Kaitiakitanga Reference Group meeting shall convene within three (3) months of the formation of the Kaitiakitanga Reference Group. As a minimum, meetings shall be held at a sufficient frequency to ensure that the obligations of the Kaitiakitanga Reference Group are met, but in any event, shall not be less than one time per year.
- c. Take minutes of the Kaitiakitanga Reference Group meetings, which shall be forwarded to members and the EPA, within twenty (20) working days of each meeting being held.
- d. Give members at least twenty (20) working days' notice of the date, time and location of the next Kaitiakitanga Reference Group meeting.
- e. Ensure that, where appropriate, the agreed outcomes from the Kaitiakitanga Reference Group meetings are available to other tangata whenua groups and the wider public.

71. The Consent Holder shall meet the actual and reasonable costs incurred by the Kaitiakitanga Reference Group for providing the services required of it by these consents, subject to normal business practice of invoicing and accounting.

72. At least one (1) month prior to the commencement of any iron sand extraction activities authorised by these consents, the Consent Holder shall prepare, and implement, a Kaimoana Monitoring Programme following consultation with the Kaitiakitanga Reference Group.

The objective of the Kaimoana Monitoring Programme is to provide for the monitoring of species important to customary needs, including from customary fishing grounds around the site, of Maori who have a relationship to the site and shall identify as a minimum:

- a. The roles and responsibilities of parties who are to conduct the kaimoana monitoring;
- b. The methodology to be employed in the kaimoana monitoring, including to minimise the risks to health and safety, and the environment;
- c. The kaimoana indicators to be monitored and any thresholds for desired actions that may arise from monitoring as a result of effects from the activities authorised by these consents;
- d. Any components of the EMMP that provide information on the kaimoana values and indicators; and
- e. A reporting mechanism for results of the kaimoana monitoring to the Consent Holder, who shall provide them to the EPA.

The Kaimoana Monitoring Programme may be amended at any time during the term of these consents. Any proposed changes to the Kaimoana Monitoring Programme shall be prepared by the Consent Holder following consultation with the Kaitiakitanga Reference Group.

The Consent Holder shall ensure that the EPA has a copy of the most update version of the Kaimoana Monitoring Programme at all times.

73. The Consent Holder shall use its best endeavours to engage tangata whenua representatives, including but not limited to Ngati Ruanui, Ngaa Rauru Kiiitahi, Ngaruahine and Te Tai Hauauru Regional Fishing Forum representatives, to undertake the monitoring identified in the Kaimoana Monitoring Programme (Condition 72).

The Consent Holder shall meet the actual and reasonable costs of implementing the Kaimoana Monitoring Programme subject to the receipt of itemized invoices.

74. Following the commencement of iron sand extraction activities, the Consent Holder shall provide Ngati Ruanui, Ngaa Rauru Kiitahi and Ngaruahine, an annual fund of [\$XX] per year to be used for environmental initiatives and/or for the cultural well-being of tangata whenua.
75. In the event that a Kaitiakitanga Reference Group has not been established twelve (12) months following the date of the offer made by the Consent Holder required by Condition 68, and the Consent Holder has demonstrated, to the satisfaction of the EPA, that it has acted in good faith, the Consent Holder shall have no further obligation under Conditions 68 - 74.

COMMUNITY RELATIONSHIPS

76. The Consent Holder shall provide the public with up to date information on the iron sand extraction activities and environmental monitoring, including the pre-commencement environmental monitoring, undertaken in accordance with the conditions of these consents.

The information shall be made available through a website maintained by the Consent Holder for the duration of these consents.

77. For the duration of these consents, the Consent Holder shall provide for and facilitate community meetings to keep the public informed of the iron sand extraction activities and any recent monitoring results and / or actions, or other matters that may be of interest to the public.

The community meetings shall be held six (6) monthly (during the months of February and July of each year) for the first five (5) years of the iron sand extraction activities and annually at all other times.

At least four (4) weeks prior to the date of any community meeting, notice shall be placed on the Consent Holder’s website (Condition 76) and by way of advertisements in the regional newspapers, including the Taranaki Daily News, the South Taranaki Star and the Wanganui Chronicle, and on local radio stations. Notice shall include the date, time and location of the meeting and contact details of the meeting facilitator.

78. Following the commencement of iron sand extraction activities, the Consent Holder shall provide an annual fund of \$50,000 per year to be administered by the South Taranaki District Council in collaboration with the Consent Holder. The annual fund shall be inflation adjusted.

The purpose of the fund is to assist in the establishment of projects for the benefit of the South Taranaki community, in particular for the social and economic wellbeing of the community.

79. Within twelve (12) months of the commencement of the construction of the IMV associated with these consents, the Consent Holder shall establish and maintain a training facility located in the township of Hawera.

The purpose of the training facility is to provide technical and marine skills based training to prospective trainee process operators and maintenance support staff from the South Taranaki communities who then can be employed by the Consent Holder as part of the iron sand extraction activities.

In establishing the training facility, the Consent Holder shall consult with the Hawera business community, local iwi, South Taranaki District Council and Accredited Education providers to ensure that the purpose of the training facility is being met.

Advice note: The Consent Holder has confirmed that it will, where practicable, offer training positions to members of local iwi and the community.

80. Prior to the commencement of any iron sand extraction activities authorised by these consents, the Consent Holder shall establish and maintain a geotechnical and environmental monitoring base located in the port of Whanganui.

The purpose of the base is to support the iron sand extraction activities by providing, as a minimum:

- a. A permanent berthing site for a vessel;

- b. A secure laydown area;
- c. A storage area and warehouse;
- d. An operation and maintenance workshop;
- e. Administration offices; and
- f. Scientific Laboratory.

Advice note: The Consent Holder is committed to employing suitably qualified and experienced local residents at the base.

Advice note: The Consent Holder is committed to acquiring any additional consents required to enable the construction and operation of the Support Base. Construction of the base and associated berthing site will occur subject to any such consents being granted

FISHING INDUSTRY RELATIONSHIP

81. The Consent Holder shall provide for six (6) monthly meetings between itself and representatives of the commercial fishing industry including any representatives nominated by Fisheries Inshore New Zealand. The purpose of the meetings shall be to enable both parties to share relevant information and to establish a coordinated approach between the iron sand extraction activities and commercial fishing activities, including communications protocols.

The first meeting shall occur no later than six (6) months prior to the commencement of the iron sands extraction activities.

The Consent Holder shall:

- a. Facilitate and fund the administration of each formal meeting; and
- b. Take minutes of each meeting, which shall be forwarded to attendees and the EPA, within twenty (20) working days of each meeting being held.

OPERATIONAL DOCUMENTATION

Operational Assessment Report

82. No less than three (3) months prior to the commencement of any iron sand extraction activities authorised by these consents, and every twelve (12) months thereafter the Consent Holder shall prepare, and provide to the EPA, an Operational Assessment Report which shall include but not be limited to:
- a. An outline of the area where removal of seabed material, targeting the extractable resource of titanomagnetite iron sand, will take place during the next twelve (12) month period, and the timing thereof;
 - b. Bathymetry of the seabed in the area where removal of seabed material is planned;
 - c. Bathymetry of the pits and mounds created during the extraction and deposition of sediments;
 - d. Extraction plan schedules;
 - e. Identification of the occurrence of fine sediments (<8 µm) in the area subject to extraction via grade control drilling conducted in accordance with the requirements for a 'measured' resource by "The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 or subsequent editions (the "JORC" standard) (see 1.1 Definitions). The

Operational Assessment Report is to demonstrate how compliance with Condition 5 has been achieved; and

- f. Procedures for avoiding identified fine sediments to the extent necessary to meet the requirements of Conditions 5, 6 and 8.

Where extraction activities within the following 12 month period will occur within the area of Petroleum Mining Licence #38146, the Consent Holder shall also provide the Kupe Operator with a copy of the Operational Assessment Report at the same time the report is provided to the EPA.

Training of Personnel

- 83. Pursuant to s25(1)(b)(i) of the EEZ Act, the Consent Holder shall ensure that all personnel on-board project related vessels receive the appropriate training prior to taking part in any duties related to any activity associated with these consents.

Training shall be appropriate to ensure compliance with the conditions of these consents is achieved, including but not limited to training on:

- a. The Consent Holder’s obligations under these consent conditions, including any obligations under the EMMP and associated management plans;
- b. Their responsibilities under any condition, the EMMP or management plan and how to meet those responsibilities; and
- c. Their obligations under the Marine Mammals Protection Act 1978 and Marine Mammals Protection Regulations 1992, or any superseding legislation.

A record of all training carried out in accordance with this condition shall be maintained by the Consent Holder and made available to the EPA upon request.

Complaints Register

- 84. The Consent Holder shall maintain a permanent register of any complaints received by any person or company about activities authorised by these consents.

The register shall include:

- a. The contact details of the complainant, including the name and address of the complainant;
- b. The nature of the complaint, and the time which it was received;
- c. The location, date and time of the complaint and of the event associated with the complaint;
- d. The cause or likely cause of the event and any factors, such as weather conditions (including wind direction and approximate wind speed, the real-time New Zealand Met Service forecast for the iron sand extraction area and any forecast warning for the area and the presence of precipitation, fog or any other weather related impact on visibility), that may have influenced its severity;
- e. The outcome of any investigation into the complaint, including the nature and timing of any measures implemented by the Consent Holder to remedy or mitigate any adverse effects, if associated with the event;
- f. Details of any steps taken to prevent the reoccurrence of similar events; and
- g. Any other relevant information.

This register shall be held in the form of a Complaints Log at the Consent Holder’s head office and should be made available to the EPA upon request.

The Log shall be updated within forty eight (48) hours following the receipt of any new complaint and should also be included as part of the Quarterly Operational Report required by Condition 98.

MARINE SAFETY MATTERS

85. The Consent Holder shall ensure that the design and construction of the IMV complies with ‘best practice’ international marine standards and, as a minimum, shall include:
- a. A thruster assisted mooring system that meets the requirements of America Bureau of Shipping (“ABS”) TAM-R notation with the system built, installed and commissioned to the satisfaction of ABS Survey;
 - b. A thruster system, including power, distribution, control and position reference systems that meet the redundancy requirement of ABS DPS-2 with the system built, installed and commissioned to the satisfaction of ABS Survey. Additionally, a Failure Modes, Effects, and Criticality Analysis (“FMECA”) of the system shall be completed as an extension of the FMEA process required by class for achieving many of the special or optional Classification notations ACC, ACCU and DPS-2. (Ref: ABS GUIDANCE NOTES ON FAILURE MODE AND EFFECTS ANALYSIS (FMEA) FOR CLASSIFICATION. 2015);
 - c. Compliance with the ABS notation for Station Keeping Performance (“SKP”) for the specified limiting environmental conditions in the South Taranaki Bight;
 - d. A mooring system that complies with the design requirements for a permanent mooring system as specified in API 2SK, and that clearly defines the system's mode of operation, including its normal operating condition limits and performance in severe environmental conditions (including its proposed return period); and
 - e. Incorporation of an operational vessel motion monitoring and forecasting software system.
86. Prior to the IMV being used in the iron sand extraction operations, the IMV’s mooring design shall be independently reviewed, in a technical capacity, by a suitably qualified and internationally recognised person or body. The review shall confirm that the IMV mooring is fit for purpose and complies with ‘best practice’ international marine standards and the standards specified in Condition 85 above. The review shall also:
- a. Confirm that approval from ABS for the IMV mooring concept has been provided;
 - b. Consider the final mooring and thruster design assessment and confirm it is appropriate for the intended operational purposes (including in relation to proximity to the first de-ored sediment mound);
 - c. Confirm that the thruster capacity is adequate to maintain the IMV position/heading in the event of a mooring failure;
 - d. Confirm that the operational (limit) environmental conditions specified for the IMV are appropriate for / consistent with the mooring system design.
 - e. Confirm that the location and design of the fairleads on the IMV are capable of accommodating the large changes expected in departure angle without the mooring rope clashing with deck structures or the articulation limits of the fairleads; and
 - f. Confirm the operation of the TAM system and the segregation of thruster power supply, control and distribution from that required for mining operations is fit for purpose.

The recommendations of the review shall be incorporated into the final design of the IMV mooring system.

Advice note: The independent reviewer shall be mutually agreed between the Consent Holder and the Kupe Operator. In the event that the Consent Holder and the Kupe Operator cannot reach agreement, each party shall recommend one a suitably qualified independent reviewer to the Chief Executive of the EPA who will decide on the reviewer to be appointed from the two recommendations. The costs of the review will be met by the Consent Holder.

87. Annually, on the anniversary of the commencement of the iron sand extraction operations, or where notice is received from the Kupe Operator providing confirmation of a commitment to deploy a 'Jack-up Drill Rig' within the Project Area identified in Schedule 1, the Consent Holder shall prepare a Geotechnical Report for the previous twelve (12) months iron sand extraction activities for the identified location (where confirmation of a commitment to deploy has been received in accordance with this condition).

Each Geotechnical Report shall report on the geotechnical properties of the backfilled mining lanes and include, as a minimum, the following information:

- a. A detailed explanation of the geotechnical investigations undertaken, including the location of the investigations and the methodology undertaken, for the previous 12 month period;
- b. All of the data / results from the geotechnical investigations including but not limited to:
 - i. Particle / grain size distribution;
 - ii. In-situ bulk density; and
 - iii. Cone penetrometer or shear strength value.
- c. A summary of the findings from the geotechnical investigations and the properties of the seabed investigated.

The Consent Holder shall provide each Geotechnical Report to the EPA and the Kupe Operator within ninety (90) working days of the completion of the annual geotechnical investigations or within one hundred and eighty (180) working days of the receipt by the Consent Holder of notice from the Kupe Operator providing the confirmation above.

88. Annually, and within twenty (20) working days after each anniversary of the commencement of the iron sand extraction operations, the Consent Holder shall undertake an assessment of the impact of de-ored sediment discharges on the cathodic protection systems associated with the Integrated Mining Vessel's safety critical systems.

The Consent Holder shall provide a copy of its assessment report to the Kupe Operator within twenty (20) working days of the completion of the assessment outlined above and will make the report available to the EPA upon request.

89. Following the completion of the pre-commencement monitoring required by Condition 43, the Consent Holder shall commission an assessment of the visibility limits at the Kupe Platform and at the inshore border of the Project Area identified in Schedule 1.

The results of this assessment shall be provided to the Kupe Operator within twenty (20) working days of its completion.

90. The Consent Holder shall install and have operational, a Barge Management System for all of its vessels operating within the area of Petroleum Mining Licence #38146.

A display from the Barge Management System shall be made available to the Kupe Operator's control room for the Kupe assets at all times.

91. The Consent Holder shall ensure that no iron ore transshipments take place when any aspect of the thruster or mooring system of the IMV or the Floating Storage and Off-loading vessel is inoperative due to maintenance or failure.

92. The Consent Holder shall ensure that activities within the 'Kupe Platform Safety Zone' do not occur without prior approval in accordance with the requirements of the SIMOPP (Condition 65).

Approval under this condition is not required during an emergency situation.

The Consent Holder shall keep records of any related correspondence with the Kupe Operator and these records shall be made available to the EPA upon request.

93. The Consent Holder shall undertake bathymetric surveys annually around the boundaries of the Kupe Operator's exclusion zones (existing or future), and representative points around the Kupe Well Head Platform and along the pipeline and umbilical route, to determine any migration of the mound and pit bathymetry. Access by the Consent Holder to representative points around the Kupe Well Head Platform and pipeline and umbilical route will be agreed with the Kupe Operator in advance in accordance with the SIMOPP (Condition 65).

The Consent Holder shall supply results of these surveys to the Kupe Operator within twenty (20) days of their completion.

94. The Consent Holder shall ensure that the Kupe Operator retains all rights to explore and develop assets within the Petroleum Mining Licence area #38146 to the extent provided for in that permit where it overlaps with the Project Area identified in Schedule 1.
95. The Consent Holder shall ensure that all operations proposed by the Kupe Operator within the area of Petroleum Mining Licence #38416 have precedence over the Consent Holder's operations provided that the Kupe Operator gives at least twelve (12) months' notice its intentions to undertake such operations and provides specific details not less than six (6) months prior to the scheduled commencement of such operations.
96. For the duration of this consent, the Consent Holder shall maintain a 500 m protection zone around all wellheads (except Kupe South 4 wellhead where the size of the protection zone will be sufficient to ensure that the Consent Holder's activities do not result in the well-casing being exposed at any time), and a 1.5 km protection zone around the Kupe Well Head Platform.

Advice note: The Kupe South 4 wellhead refers to the abandoned wellhead located within the Consent Holder's Mineral Mining Permit area.

97. Notwithstanding any of the requirements of the conditions above, the Consent Holder shall manage all activities associated with the iron sand extraction operations, including the project vessels and their operation, to ensure that the activities authorised by this consent do not result in any adverse effects on the Kupe assets.

REPORTING REQUIREMENTS

Quarterly Operational Report

98. The Consent Holder shall prepare a Quarterly Operational Report summarising the iron sand extraction activities undertaken for the previous quarter (three (3) months). The Quarterly Operational Report shall, as a minimum, include the following operational information:
- a. GPS positions of anchor placements on the seabed and coordinates illustrated on a map with the iron sand extraction area clearly marked;
 - b. GPS positions of the Crawler placement and tracks during iron sand extraction activities and coordinates illustrated on a map with the extraction area clearly marked;
 - c. Any bathymetry measurements of the seabed measured in the reporting period for the area where removal of seabed material has taken place. (Note: Bathymetry will be assessed on a six (6) monthly basis);
 - d. Quantity and rate of removed and deposited seabed material including the PSD data recorded to assess compliance with Condition 5;

- e. Maximum and average depth of seabed removed by the Crawler throughout each mining lane (from bathymetry);
- f. Average and maximum depth, and GPS position of any unfilled pits remaining after completion of a mining lane (from bathymetry);
- g. Average and maximum height, and GPS position of any mounds created during the deposition of seabed material (from bathymetry);
- h. Location and height above the seabed of discharge pipe whilst discharging seabed material;
- i. Details of any complaints received, including the Complaints Log; and
- j. Details of any investigations, including recommendations, undertaken by the Consent Holder, the TRG or the Kaitiakitanga Reference Group including a summary of any commentary or recommendations from the TRG and, where necessary, an explanation as to why any TRG recommendation has not been accepted;
- k. Actual 25, 50, 80 and 95th percentile SSC values during the preceding three (3) month period, including a comparison with the “naturally occurring” values predicted by the validated OSPM;
- l. A record of pre-start observations as required by Condition 32; and
- m. Any other components required by the conditions of these consents.

The Consent Holder shall provide the Quarterly Operational Report to the EPA and the Kupe Operator within forty (40) working days of each quarter ending (being 31 March, 30 June, 30 September and 31 December) during the iron sand extraction activities authorised by these consents.

Annual Report

99. Notwithstanding the requirements of Condition 98, or the reporting requirements outlined in the EMMP provided in accordance with Condition 50, the Consent Holder shall prepare an Annual Report for the previous twelve (12) month period from the commencement of iron sand extraction activities authorised under these consents. Subsequently, an Annual Report shall be prepared for each twelve (12) month period following the anniversary of commencement of the iron sand extraction activities.

Each Annual Report shall, as a minimum, include the following information:

- a. An Extraction Schedule detailing:
 - i. The areas in which extraction and deposition is proposed to occur over the next twelve (12) month period;
 - ii. The timing of proposed extraction and deposition activities in areas identified in Condition 99 (a)(i);
 - iii. The volume and mass of materials extracted and deposited during the previous twelve (12) month period;
 - iv. GPS locations or chart references detailing the location of extraction and deposition in the previous twelve (12) month period;
 - v. Depths of extraction that are scheduled to occur; and
 - vi. All updates of the extraction schedule that were notified to the EPA.
- b. A summary report on all monitoring undertaken in the previous twelve (12) months in accordance with the EMMP required under Condition 50;
- c. Details of monitoring proposed for the next twelve (12) months in accordance with the EMMP required under Condition 50;

- d. Details of any exceedances of the limits as identified in Conditions 5, 6, 7, or 8, as well as any management / mitigation action(s) implemented in response to any exceedance including details of any investigations;
- e. A record of all fuel used, and the sulphur content of the fuel, for each project related vessel as required under Condition 37;
- f. A record of pre-start observations as required by Condition 32;
- g. Details of the TRG review of the annual monitoring data and the EMMP, along with recommendations for any actions or changes to the EMMP or the iron sand extraction activities, and how these were provided for as well as any reasoning as to why recommendations were not accepted; and
- h. Any other component required by the conditions of these consents.

The Consent Holder shall provide the Annual Report to the EPA and the Kupe Operator within sixty (60) working days of the completion of each twelve (12) month monitoring period and at any other times upon request, the Consent Holder shall provide a copy of any previously issued Annual Report.

100. The Consent Holder shall inform the EPA of any modified operational extraction and deposition areas or periods which differ from those identified in the “the next twelve (12) month” period of any Annual Report required by Condition 99.

Where any such changes are in the Petroleum Mining Licence area #38146, or the project area immediately adjacent to the Kupe assets, the Consent Holder shall also inform the Kupe Operator of any modified operational extraction and deposition areas or periods which differ from those identified.

The EPA, and where necessary the Kupe Operator, shall be informed of any such changes no later than five (5) working days prior to commencement of works in the modified areas.

REVIEW CONDITION

101. Within one (1) month of the receipt of either the Quarterly Report or Annual Report, or following the Consent Holder receiving a recommendation from the TRG, including any recommendations not accepted or implemented by the Consent Holder, the EPA may serve notice on the Consent Holder, in accordance with ss76 and 77 of the EEZ Act, of its intention to review the conditions of these consents for the purpose of:

- a. Adding, amending or cancelling any discharge limits, environmental limits, or operational controls (Conditions 5 - 42); and / or
- b. Including any new discharge limits, environmental limits, or operational controls; and / or
- c. Dealing with any adverse effects on the environment that may arise from the exercise of the consents and which it is appropriate to deal with after the consent(s) have been granted; and / or
- d. Reviewing the adequacy of monitoring.

RISK MANAGEMENT

102. The Consent Holder shall, while giving effect to these consents, maintain public liability insurance for a sum not less than NZ\$500,000,000 (2016 dollar value) for any one claim or series of claims arising from giving effect to these consents to cover costs of environmental restoration and damage to the assets of existing interests (including any environmental restoration as a result of damage to those assets), required as a result of an unplanned event occurring during the exercise of these consents.

103. The Consent Holder shall submit a certificate demonstrating that it holds the insurance required by Condition 102 prior to giving effect to these consents and an updated certificate annually by 1 July of each year for the term of these consents to the EPA.

SCHEDULE 1 – GRID REFERENCES OF THE PROJECT AREA

Point	Longitude	Latitude
1	174° 10' 51" E	39° 49' 39" S
2	174° 13' 03" E	39° 51' 21" S
3	174° 12' 16" E	39° 51' 56" S
4	174° 09' 02" E	39° 53' 42" S
5	174° 07' 21" E	39° 54' 29" S
6	174° 05' 37" E	39° 54' 23" S
7	174° 04' 33" E	39° 54' 16" S
8	174° 03' 49" E	39° 53' 52" S
9	174° 02' 52" E	39° 53' 12" S
10	174° 02' 09" E	39° 52' 38" S
11	174° 02' 12" E	39° 51' 20" S
12	174° 02' 28" E	39° 51' 04" S
13	174° 03' 18" E	39° 51' 53" S
14	174° 06' 30" E	39° 51' 43" S
15	174° 06' 30" E	39° 51' 39" S
16	174° 06' 40" E	39° 51' 34" S
17	174° 07' 23" E	39° 51' 45" S
18	174° 08' 10" E	39° 51' 28" S
19	174° 09' 46" E	39° 50' 33" S

Datum: NZGD2000

SCHEDULE 2 - SUSPENDED SEDIMENT CONCENTRATION (SSC) LIMITS

South Taranaki Bight Sites	SSC Limit (Surface)	SSC Limit (Seabed)
Rolling Grounds (WGS 1984 39 57 22.58780 S 174 22 29.90885 E)	1.1	15.3
Graham Bank (WGS 1984 39 53 16.22020 S 174 24 40.68384 E)	4.5	84
Source A to Whanganui 1 km (WGS 1984 39 51 22.41692 S 174 13 46.13207 E)	2.7	44.2
Source A to Whanganui 20 km (WGS 1984 39 53 14.34932 S 174 27 08.62846 E)	5.9	76.6
South Traps (WGS 1984 39 51 53.21010 S 174 32 48.75387 E)	11.1	97.4
North Traps (WGS 1984 39 51 02.22374 S 174 31 10.63364 E)	12.4	115
Tuteremoana (WGS 1984 39 55 00.03802 S 174 47 41.29085 E)	13.6	62.5

Note 1: The source of the numerical values of the levels of “naturally occurring” background limits contained in Schedule 2 above have been derived from the sediment plume modelling (“no mining” scenario) which was informed by measurements of background sediment concentrations and other oceanographic parameters addressed by NIWA, as set out in the NIWA Oceanographic Measurements Report, the Nearshore Measurements Report, and the Remote Sensing Report.

For the purposes of operational management, the SSC Limits contained in Schedule 2 above are to be considered as inclusive of both natural and mining derived suspended sediment concentrations.

Note 2: Turbidity may be used as a proxy for suspended sediment concentrations when assessing against the limits in Schedule 2.

Note 3: The numerical values of Schedule 2 that represent the 95th percentile limit at a location may be amended by way of the process set out in Condition 46 but any change to the percentiles themselves (for instance amending 95th percentile to 90th) can only be changed by way of Condition 101 or by Sections 87 or 87J of the EEZ Act.

SCHEDULE 3 – METHODOLOGY FOR REVIEWING THE SUSPENDED SEDIMENT CONCENTRATION ‘RESPONSE LIMIT’ AND ‘COMPLIANCE LIMIT’ NUMERICAL VALUES IN SCHEDULE 2

The suspended sediment concentrations collected as part of the Pre-commencement Environmental Monitoring Programme (PCEMP) will be used to calibrate and validate the Operational Sediment Plume Model and provide data to verify the SSC Limit numerical values set in Schedule 2. As per Condition 48, calibration and validation of the Operational Sediment Plume Model will occur every six (6) months during the PCEMP and for the first three years of iron sand extraction activities, and then every 24 months thereafter with independent peer review as per Condition 47.

Validation will occur by statistically comparing the modelled and actual measured values to provide a measure of the Operational Sediment Plume Model accuracy. The aim of the validation process is to assess whether the actual measurements differ from the predicted values and if so by what margin, and over how much of the period that was being reviewed (i.e. the percentage of time the values differ and the range, median, mean, etc. of this difference). A range of statistical techniques (within suitable statistical programmes) can be employed to assess any differences, including, but not limited to, scatterplots of predicted vs actual concentrations (and examining the adjusted R^2 value), residual plots (observed – predicted values) and calculating the root mean squared error (or standard error of the regression).

If the actual measured suspended sediment concentration values do not fall within 10% of the modelled values listed in Schedule 2 for 95% of time within each six (6) month review period, the model will be revised using the actual data to update the response and compliance limit values. Long term time series data are preferable for comparison with the Schedule 2 statistical limits. Therefore, as the measured data accumulates over the BEMP period comparisons are to make use of as much of the aggregated time-series data as possible.

As per Condition 46, in the event that the updated numerical values of the SSC Limits are different from the numerical values of the SSC Limits in Schedule 2, then the updated numerical values of the SSC Limits shall supersede the numerical values of the SSC Limits in Schedule 2. Any updated numerical values of the SSC Limits shall represent “background” conditions and not be influenced by any actual or model simulated iron sand extraction activity.

SCHEDULE 4 – PLAN OF CONSENTED INTEGRATED MINING VESSEL MOORING AREA BOUNDARY

