Appendix 1
Form I
Pre-activity Notice
Regulation 11(a) Exclusive Economic Zone and Continental Shelf (Environmental Effects-Permitted Activities) Regulations 2013

Operation name:
Name used by operator to reference the activity described in this form:

Details of person undertaking permitted activity

<table>
<thead>
<tr>
<th>Company name:</th>
<th>Japan Agency for Marine-Earth Science and Technology (JAMSTEC)</th>
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<tbody>
<tr>
<td>Contact person:</td>
<td>Shinji Tsuchida</td>
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<td>Phone number:</td>
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<td>Mobile number:</td>
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<td>Email address:</td>
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General description of permitted activity

<table>
<thead>
<tr>
<th>Type of activity: (e.g. Marine scientific research, prospecting)</th>
<th>Deep-sea scientific research by using a public Japanese vessel, R/V YOKOSUKA, supervised by the Ministry of Education, Culture, Sports, Science and Technology of Japan:</th>
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<tr>
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<td>Objectives of the research are to:</td>
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<td>Investigate biodiversity of seamounts of the Louisville Seamount chain and Kermadec Arc to determine the succession of faunal communities on subducting seamounts (Louisville), and compare with active volcanoes (Kermadec Arc). Main subjects of this research are as follows;</td>
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<td>A – Composition and Endemicity of seamount communities - Understanding geological and geochemical settings of the seamount communities - Discovery of faunal composition of the hydrothermal vent communities in the northern Kermadec Arc - Description of changes with depth of benthic communities on the Louisville seamounts - Evaluating environmental drivers of benthic community structure - Understanding community structure including faunal and microbial composition (diversity), distribution patterns and trophic structure in comparison with those at other known sites.</td>
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<td>B - Biogeography and Evolution - Understanding phylogeny of benthic organisms - Comparison of biogeographic patterns and distribution of seamount communities - Understanding adaptation and tolerance for extreme</td>
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environmental conditions
- Physiological and molecular studies of symbiotic associations
C - Applied Biology, exploring of useful microorganisms (Bioprospecting)
- Screening for useful agents and metabolisms from isolated microorganisms
- Isolation of culturable microorganisms
- Investigation of enzymes in microorganisms
D - Geochemistry and Geology on the seamounts
- Estimating age of seamounts
- Understanding geological evolution of the seamounts
- Understanding geochemistry associated with communities on seamounts

Description of methods to be used to undertake the activity:
- Manned submersible vehicle SHINKAI6500 for recording video images, sampling of benthic organisms, deep-sea water, sediment and rock from the seafloor and measuring sea water conductivity, temperature and pressure, profiles of oxygen, nutrients and pH;
- SEABEAM2112 bathymetric survey system for measuring bathymetric data, sea bottom reflectivity and surface sediment structure;
- Expendable bathythermograph or expendable CTD for measuring vertical profiles of sea conductivity, temperature and pressure;
- LaCoste&Romberg surface ship gravity meter for measuring gravity acceleration;
- Shipboard magnetometer for measuring 3-component magnetic field;
- ADCP(acoustic doppler current profiler) for measuring the speed and direction of ocean currents;
- Ship-borne compact system for measuring atmospheric trace gas column densities on board
- Air sampled by a pump is analyzed by Non Dispersive InfraRed (NDIR) method

Timing of permitted activity

Proposed commencement date: 24th October, 2013 (Diving operations of the SHINKAI6500 will be from 26th to 30th October)

Approximate duration of activity (in days): Ten days (Five days for SHINKAI6500 dives)

Timetable:  
Departure from Tonga on 24th October  
Arrive at Auckland on 2nd November  
Planned dates of SHINKAI6500 dives 26th – 30th October
Location of permitted activity

Co-ordinates of area where activity will be undertaken:

(latitude and longitude)

25°40'S-29°S and 173°W-178°W

Description of the current state of the area and the surrounding environment, including any known sensitive environments:

The Louisville Ridge is a hotspot chain of seamounts extending several thousand km NW-SE in the western Pacific to the east of New Zealand. It consists of more than 70 seamounts, with summit depths of only several hundred m to over 4000 m depth. There are few biological samples from the Louisville seamounts. However, deepwater seamount benthic invertebrates have been found on the summits of a number of seamounts in the chain, including deep-sea corals, starfish, crabs and urchins. It is highly likely that species new to science, or new records for the NZ region, will be discovered. Some of the stony coral species likely to be found can form extensive reef-like structures on seamounts, but it is unknown whether these occur in the sampling area.

The Louisville seamounts further south than the survey area have been heavily fished for orange roughy (Hoplostethus atlanticus). Some long-lining operations may have taken place further north, but the depth of the seamounts that we will survey suggest that there has been little human disturbance apart from several deep-sea drilling operations carried out as part of the International Offshore Drilling Programme (IODP).

The Kermadec arc, which extends northeasterly from New Zealand, comprises about 40 seamounts within the New Zealand region, of which many are active. A number of the seamounts of the northern Kermadec Arc have been previously surveyed, with a focus on their physical and geochemical characteristics, and their biology is unknown. The sites of survey interest, Hinepuia and Putoto volcanoes, are largely unaffected by human activities. There is no known bottom trawling (New Zealand data), and no mining licenses issued.

There are likely to be sensitive environments, and hydrothermal vent faunal communities, associated with the two Kermadec Arc volcanoes. Benthic animals may include tubeworms, stalked barnacles, and mussels, as well as the less vent-specific species that are associated with the high abundance of the highly adapted vent animals.

Description of the likely effects of the activity on the environment:
Minimal.

Several of the activities are non-invasive in that no instruments touch the seafloor. These are SEABEAM multibeam, ship-based gravity, magnetometer, and current profiler systems. The atmospheric measurements will also have no impact on the marine environment. The video and still cameras on the submersible will have no impact, apart from lighting. Direct sampling will have some impacts (described more below), and any expendable bathythermograph or CTD casts will leave behind a small weight and a length of very fine copper wire.

The Shinkai 6500 will undertake up to 5 dives. The submersible will settle on the seafloor after descent from the ship, and before starting any dive operation, iron ballast weights will be released (these vary in size and weight, between 1000-1200kg). These will cover about 0.25 m² per dive. They are the only part of the submersible operation that will remain on the seafloor. During the dive transect, Shinkai will move slowly upslope, at a height of about 2 m above the bottom, filming the seafloor. The fauna on the seamounts is unknown, and so direct sampling with either the manipulator arm or suction sampler is required to capture specimens to confirm their species identification (photographs cannot be used for reliable identification). Should any sensitive environments be revealed during video profiles direct sampling will comprise the minimum number of samples to achieve objectives and minimize the “environmental footprint” of the survey. As well as biological samples, several push-cores will be taken to collect sediment, and rocks sampled to determine the composition and origin of the seafloor habitat.

The combined footprint of all potential direct sampling of organisms and rocks will probably be less than 50 m², compared to a total seamount area of about 5,000 km².

Other information

| Name of ship involved in activity: | R/V YOKOSUKA (Public Vessel of Japan) |
| International call sign or vessel number of the ship: | JCOY |
| Associated licence number (under the Continental Shelf Act 1964): | |
| Associated permit number (under the Crown Minerals Act 1991): | |

Signature of authorised contact person Date 17 September 2013

Name: Shinji Tsuchida

Title: Dr.

Note: A signature is not required for electronic (email) forms.