Regulatory Impact Statement: Regulation of deposit of jettisoned material from space vehicle launches under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

Agency Disclosure Statement

This Regulatory Impact Statement (RIS) has been prepared by the Ministry for the Environment (MfE). It provides an analysis of options for controlling the deposit of jettisoned material from space vehicle launches under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (the Act). The regulations propose to classify the deposit of jettisoned material from space vehicle launches as "permitted".

There are a number of limitations associated with the analysis. There is uncertainty about some of the quantifiable benefits and costs of the options assessed in the RIS. Benefits and costs have been quantified as far as possible but depend on a range of unknown factors. The environmental risk assessment used to inform the assessment of environmental effects in the RIS has a number of limitations arising from the limited data on habitats and biota in the EEZ. However, the scale of the activity is small enough, that better information is unlikely to substantially alter the conclusion on the scale of the impact.

Given the minor or less than minor environmental impacts of space vehicles launches, there is likely to be no difference in environmental outcomes between the different options considered. Compared to the status quo, the options proposed are likely to reduce costs to businesses and improve the economic benefits to New Zealand from the development of a space vehicle industry. They are not likely to impair incentives for businesses to innovate, override fundamental common law principles, or impact on market competition in New Zealand.

There has been public consultation on this proposal. Government agencies have been consulted on the proposal and the RIS.

Glenn Wigley, Director, Ministry for the Environment

Date:

BACKGROUND AND CONTEXT

1. This Regulatory Impact Statement (RIS) summarises the regulatory impacts associated with promulgating regulations on the deposit of jettisoned material on the seabed from space vehicle launches under the Exclusive Economic Zone (EEZ) and Continental Shelf (Environmental Effects) Act (the Act).

Legislation

2. The area of jurisdiction covered by the Act is New Zealand's Exclusive Economic Zone (EEZ) and continental shelf. The EEZ is the water column extending from 12 to 200 nautical miles offshore and the continental shelf is the seabed and subsoil beneath the EEZ, extending to the outer edge of the continental margin (the point where the shelf drops into deeper water).

3. The purpose of the Act is to promote the sustainable management of the natural resources of the EEZ and continental shelf. The Act is a gap-filling piece of legislation and does not duplicate other legislation (e.g. allocation of resources, fishing or conservation). Therefore the scope of the Act is restricted to managing those environmental effects of activities that were not previously subject to environmental regulations, including depositing any thing in, on or under the seabed

Space vehicle launches

4. Space vehicle launches are a new activity in New Zealand. The Government has announced the development of a new regulatory regime for space and high altitude activities. The regulatory regime will contribute to the development of a peaceful, safe, responsible and secure space industry that meets New Zealand's international obligations. The space and high altitude regulatory regime will include a new law – The Outer Space and High Altitude Activities Bill has been introduced to the House in September 2016. In the interim, launch activities are regulated by the US Federal Aviation Administration, which includes the safety of launches.

5. A key player in the New Zealand space industry is Rocket Lab. It is planning to provide frequent, low cost rocket launch services to a growing, international, small satellite industry. Satellites enable the provision of critical every day services and infrastructure including banking, transportation, electricity, telecommunications, navigation, remote sensing (with applications ranging from agriculture and land-use monitoring to disaster management and climate change) and national security.

6. New Zealand's location is considered advantageous for launches as it provides access to particular launch angles, and relatively uncongested seas and airspace to enable frequent launches. Rocket Lab intends to commence rocket launches from the Mahia Peninsula.

STATUS QUO AND PROBLEM DEFINITION

7. After lift-off, rockets generally jettison parts, which fall back towards the Earth. The jettisoned material may burn up in the atmosphere but some of it may reach the earth's surface. The jettisoned material landing in the sea is likely to sink, either immediately or over time, to the seabed. The jettisoned material that reaches the seabed constitutes a deposit under the Act.

8. The deposit of jettisoned material on the seabed is a new activity that has not previously been classified under the EEZ Act. That means that it is automatically treated as a discretionary activity and therefore requires a fully notified marine consent.

9. The process for a marine consent can take up to 140 working days and costs between $350,000 to $1.2 million, as it is designed to enable consideration of activities that have the potential for significant and ongoing adverse effects. A marine consent can be sought for a programme of launches, rather than each launch being individually consented.

10. Table 1 below sets out the steps and potential costs involved in the marine consent process:

Table 1: Steps and potential costs of the marine consent process

Process	**Potential cost**
The applicant submitting an environmental impact assessment (EIA) to the EPA outlining the likely impacts of the activity and proposals to mitigate them	$100,000 - $500,000 (all costs met directly by the applicant)
The EPA assessing the adequacy of the EIA and requesting further advice if necessary	$250,000 - $700,000 (costs met initially by the EPA and recovered from the applicant)
The EPA publicly notifying the application for consent	
Hearings if deemed necessary by the EPA or requested by the applicant or a submitter	
The EPA deciding to grant or decline a marine consent.	
	Total: $350,000-$1,200,000

Benefit of space vehicle launch activity

11. Sapere have undertaken an economic impact analysis of the development of a space vehicle industry in New Zealand[1]. They estimate that in the base case scenario establishing a space vehicle launch industry will contribute between $400 and $1,150 million to New Zealand's GDP.

12. The establishment of the space vehicle launch industry in New Zealand is highly dependent on Rocket Lab's success. Sapere estimate that Rocket Lab is currently three years ahead of its competitors. Rocket Lab have plans to commence launches from New Zealand with test launches in 2016. Their commercial launches are fully booked until the second quarter of 2018.

13. The status quo puts these benefits at risk by imposing a delay on Rocket Lab's launch programme leading to a loss of competitive advantage and delays in the delivery of contracted satellite launches. This delay is the result of the length of time required to grant marine consents.

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[1] Moore, D; Ryan, M and Davies-Colley, M *Report prepared for the Ministry of Business, Innovation and Employment: Economic Impact Analysis of the Development of a Rocket Industry in New Zealand* Updated Report 9 June 2016. http://www.mbie.govt.nz/info-services/sectors-industries/space/pdf-library/Sapere%20Economic%20Impact%20Analysis%20of%20the%20Development%20of%20a%20Rocket%20Launch%20Industry%20-June%202016.pdf

OBJECTIVES

14. Through public consultation, a set of objectives have previously been developed for regulations under the Act[2]. These objectives draw on the purpose of the Act and matters required to be considered when making regulations under the Act. These objectives of regulations under the EEZ Act are to ensure:

    - New Zealand fulfils its obligations under relevant international conventions relating to the marine environment, such as United Nations Convention on the Law of the Sea (UNCLOS)
    - the natural resources of the EEZ and continental shelf are sustainably managed
    - classifications and conditions are cost-effective, with the cost to Government and users proportional to the level of environmental effects addressed
    - provide for the consideration of non-environmental impacts, including on existing interests, iwi and other matters set out in the EEZ Act, in a manner proportionate to the scale and effects of activities.

OPTIONS AND IMPACT ANALYSIS

Approach

15. This RIS presents the assessment against the high level objectives. In addition to assessment against objectives, the options were assessed for their impacts (costs and benefits). Where possible, quantitative analysis was used to determine the magnitude of the impacts. Where this was not possible then qualitative analysis and judgement were exercised instead. Policy conclusions were based upon a combination of assessment of impacts and assessment against objectives.

16. The environmental effects and impacts on other users are the same for the status quo and the other options [further analysis below]. The status quo and all options fulfil New Zealand's international obligations [further analysis below]. For these reasons, the second two objectives provide the only distinctions between the options.

Classifying new activities

17. When a new activity arises, it's appropriate to consider how it should be classified under the Act. The following framework has been used to guide previous decisions on this question:

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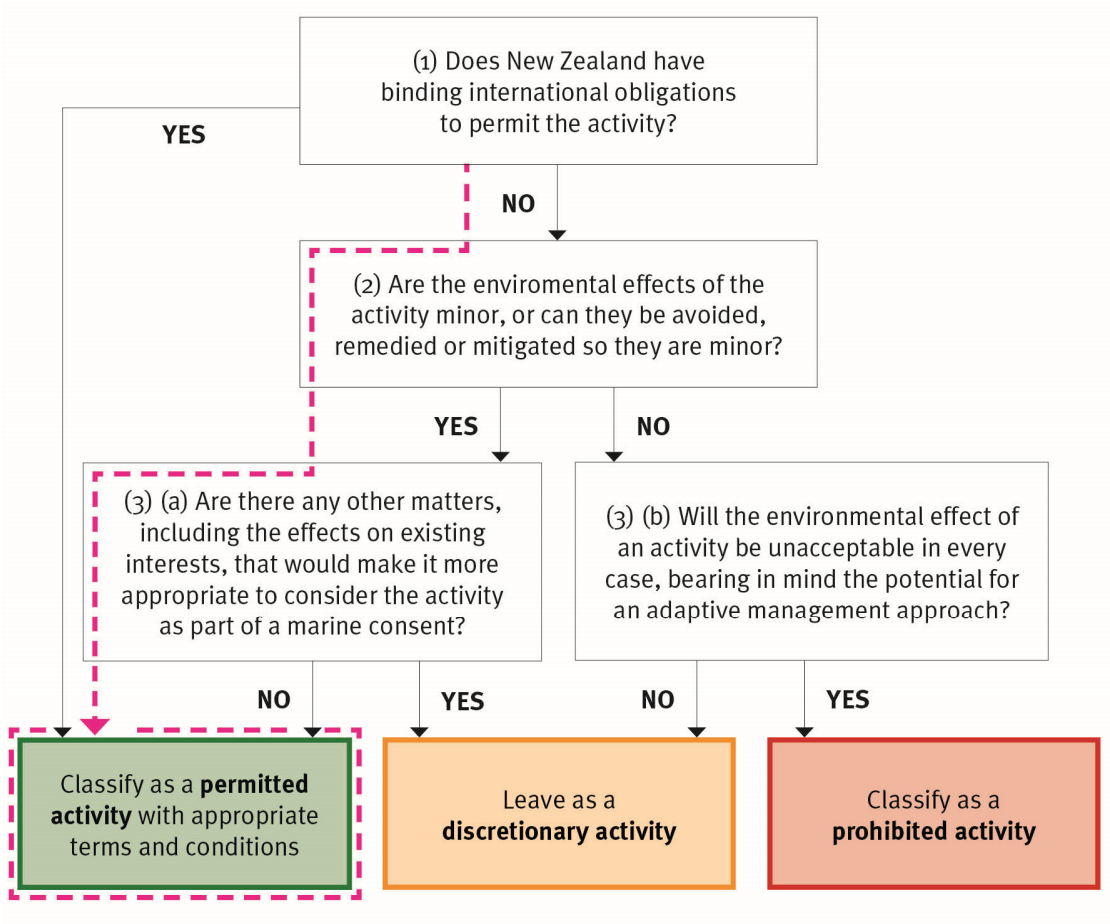
[2] Ministry for the Environment. 2012. *Managing our oceans: A discussion document on the regulations proposed under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Bill*. Wellington: Ministry for the Environment.



18. The main alternative option to a discretionary classification is to expressly make an activity permitted through regulations. Permitted activities can be carried out as of right, and may be made subject to any conditions set in regulations. The Act states that conditions can specify standards, methods and requirements for operators. However, conditions on permitted activities cannot include an element of discretion. Users need to be able to clearly comply with the conditions without relying on approval from the EPA or a third party to proceed with an activity.

19. The Act allows regulations to classify activities as permitted if they have up to a significant level of environmental effect. However, the Act also stipulates a cautious approach - favouring environmental protection when information is uncertain or inadequate.

20. A discretionary activity can be classified through regulations as being a non-notified activity meaning it is not subject to public notification and a hearing. However, to be classified as non-notified an activity must:

    - have a low probability of significant adverse effects on the environment or existing interests, and
    - be routine or exploratory in nature, or
    - brief in duration.

Options

21. The possible options to regulate the deposit of jettisoned material on the seabed in the EEZ from space vehicle launches are set out below. All options

except for the status quo require implementation through the promulgation of new regulations.

- Status quo – the activity is a fully notified discretionary activity requiring a marine consent from the EPA. Rocket Lab would apply for a marine consent and this would cost them somewhere between $350,000-$1,200,000 and take up to 140 working days (roughly seven months).
- Discretionary non-notified activity – a marine consent is still required but regulations prescribe the activity as being non-notified. Rocket Lab would apply for a marine consent and this would cost them about $350,000 and take up to 60 working days (roughly three months), after regulations have been put in place.
- Permitted activity – regulations prescribe the activity as being permitted. The proposed regulations would enable Rocket Lab to undertake weekly launches on specific trajectories of their rocket for a total of 100 launches. The regulations also expire after 5 years. The regulations do not enable other companies to launch or other types of rockets or launches from other sites.

22. For the purposes of the analysis, we have assumed that a marine consent is granted under the options that require one. This is not guaranteed, and so there is slightly more uncertainty about the effects for those options that require a marine consent.

23. Under all options, there would be pre and post-activity reporting to the EPA to monitor compliance with conditions of the activity.

Environmental effects

24. The Ministry for the Environment commissioned the National Institute of Water and Atmospheric Research (NIWA) [3]to undertake a marine environmental risk assessment of the effects of Rocket Lab's activities. The report assessed the ecological impact of jettisoned material from one and 10 weekly test launches, and from one to 10,000 weekly commercial launches. At one launch a week, it would take 200 years to reach 10,000 launches.

25. The report assesses the potential of environmental impacts of the threats arising from the fall of jettisoned material on five components of the ecosystem in the jettison zones. It assumes a worst case scenario where none of the jettisoned material burns up, but it all returns to Earth's surface and lands in the EEZ.

26. The jettisoned material from one and 10 test launches was found to have a low ecological risk for all ecosystem components. As in most cases the consequences of an effect would be negligible and the likelihood of it occurring remote, no further description is provided here.

27. For sun-synchronous and eastern jettison zones, the ecological risk was assessed to be low for all ecosystem components for up to 100 launches, and

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[3] National Institute of Water and Atmospheric Research. July 2016. *Marine ecological risk assessment of the cumulative impact of Electron Rocket launches.* Prepared for the Ministry for the Environment by the National Institute of Water and Atmospheric Research. Wellington: Ministry for the Environment.

low for the pelagic community of phytoplankton, zooplankton, fish and larger invertebrates at all levels of launch activity from one to 10,000 launches. A summary of the risk for all of the threats assessed is presented below:

- The toxic effects of the materials were assessed as low at all levels of launch activity.
- Floating jettisoned materials as shelter for pelagic organisms and the ingestion of jettisoned materials were both evaluated as having low risk at all levels of launch activity.
- Noise and disturbance to marine fauna above and below water is a potential consequence of the jettisoned materials falling into the jettison zone. This was assessed as a low risk for up to 100 launches over two years, a moderate risk for up to 1000 launches over almost 20 years, and a high risk for up to 10,000 launches over almost 200 years.
- The risk of direct strikes causing mortality to marine mammals or sea birds was low for up to 1000 launches.
- Smothering the feeding or respiratory structures of sea floor organisms by jettisoned materials was assessed as a low risk for all levels of launches up to 1000 launches.

Impacts on Other Users

28. The Automatic Identification System (AIS) is an automatic tracking system used on ships for identifying and locating vessels by electronically exchanging data with other nearby ships, AIS base stations, and satellites. AIS data has been used to provide information on the numbers of vessels in the jettison zones. For the test launch and sun synchronous trajectories, there are only about 10 cargo and container vessels that pass through these areas in a year. For the eastern trajectory, numbers are higher, but still less than 100. There is almost no fishing activity in the jettison zones, with the exception of some in the EEZ around Bounty Island, which the test launches could affect. Despite receiving the discussion document, neither the fishing nor shipping industries made any submissions on it.

29. There is no legal mechanism to exclude vessels from the jettison zones in the EEZ but Notices to Mariners and navigational warnings will alert vessels of activities taking place and the location of the jettison zones. The risk of a fishing vessel being struck by material in the jettison zone is less than 1 in 100,000. We are unsure of the extent to which vessels will choose to modify their routing choices, on the basis of the navigational warnings.

Costs to the Crown

30. The costs to the EPA of monitoring would be cost recovered. The costs of monitoring of activity are 80% cost recovered. The 20% cost accruing to the EPA is likely to be too small to require any adjustments to the EPA's Crown funding.

31. There is obviously also a cost to government of making regulations. While it is difficult to estimate, a group of researchers have developed a methodology

which gives an average of $530,000 to develop a set of regulations, and an estimate of $50,000 per page of regulations in New Zealand[4].

International Obligations

32. There are no relevant international conventions that specifically regulate the deposit of material jettisoned from space vehicles on the seafloor. There are relevant international obligations under UNCLOS, the Convention on Biological Diversity and the Noumea Convention:

33. In our view, all the options comply with these international obligations because:

    - the probability of significant adverse effects from the activity is low, and conditions can be set in either a marine consent or regulations to avoid, remedy or mitigate effects on the environment, biodiversity and existing interest.
    - to satisfy the Noumea Convention requirements, the Minister needs to consider whether the activity is a 'major project' for the purpose of the Noumea Convention. Through consultation with experts, including NIWA, officials have assessed the routine environmental effects of the activity as not significant, and concluded that the activity is therefore unlikely to be considered a major project.
    - although public participation is low with regulations or non-notified marine consents, this is proportionate to the likely level of effects on the interests of the public and iwi/Māori

[4] Wilson, N et al *Estimating the Cost of New Public Health Legislation* Bulletin of the World Health Organization 2012;90:532–539

Table 3: Options analysis

Option	Impacts	Assessment against objectives	Net impact
Option A: Status quo	ENVIRONMENTAL: Very low ecological risk. ECONOMIC: Higher compliance costs arising mainly from cost of delay. Risk of reducing potential positive impact of space vehicle industry on New Zealand economy. SOCIAL: High opportunity for public participation in decision-making.	<u>Sustainable management</u> The status quo would not achieve the economic aspects of sustainable management. The marine consent process would be time consuming and costly, creating an unnecessary and adverse economic effect for an activity with a minor or negligible environmental effect. <u>Cost effectiveness and proportionality</u> The status quo is neither cost effective nor proportionate for managing the effects of activities with minor or less effects. Requiring a marine consent for the deposit of jettisoned material from space vehicle flights is costly for operators, mainly due to the time required for the process. It creates a disproportionately compliance-heavy regime. The status quo treats small-scale deposit activities the same as, for example, a production phase petroleum drilling. There is no discretion for regulations to prescribe a more flexible marine consent process because it is already established in the Act and cannot be changed through regulations. <u>Non-environmental impacts</u> The status quo would involve a slightly greater level of consideration of all non-environmental	Higher compliance costs and risk of loss of economic benefit are not proportionate with the very low potential for environmental harm and opportunity for public participation.

		impacts as the other options as it would require further public consultation. However, the level of public interest and effects on existing interests is low.	
Option B: Activity remains discretionary but is classified as non-notified	ENVIRONMENTAL: Very low ecological risk. ECONOMIC: High compliance costs. Risk of reducing potential positive impact of space vehicle industry on New Zealand economy. SOCIAL: Proportionate level of public involvement	<u>Sustainable management</u> The status quo would not achieve the economic aspects of sustainable management. The marine consent process would be time consuming and costly, creating an unnecessary and adverse economic effect on an activity with a minor or negligible environmental effect. <u>Cost effectiveness and proportionality</u> Requiring a marine consent, even non-notified, is neither cost effective nor proportionate for managing the effects of activities with minor or less effects. Requiring a marine consent for the deposit of jettisoned material from space vehicle flights would be costly for operators. It creates a disproportionately compliance-heavy regime. <u>Non-environmental impacts</u> This option would still involve full consideration of all non-environmental impacts. This option allows for public participation through government consultation on the regulations. However, this is proportionate to the low level of public interest and	Better than status quo but possibly does not meet the requirements set out in the Act to be classified as a non-notified activity. This classification is considered to be disproportionate to the effects of the activity.

		effects on existing interests.	
Option C: Classify the deposit of jettisoned material from space vehicle flights as a permitted activity	ENVIRONMENTAL: Very low ecological risk. ECONOMIC: Low compliance costs. Higher chance of achieving potential positive impact of space vehicle industry on New Zealand economy. SOCIAL: Proportionate level of public involvement	<u>Sustainable management</u> This will offer the same level of protection for the environment as the status quo (as discussed above). This option achieves sustainable management better than the status quo because there would be fewer unnecessary barriers to economic activity. It will provide the same level of environmental protection and more certainty for users. Therefore this option will achieve the most sustainable management by allowing for the use of marine resources while sustaining their future potential and the environmental integrity of the EEZ. <u>Cost effectiveness and proportionality</u> This option is cost effective for Government to monitor and would impose only low compliance costs on users. <u>Non-environmental impacts</u> This option would still involve full consideration of all non-environmental impacts. This option allows for public participation through government consultation on the regulations. However, this is	Better than status quo and benefits outweigh costs.

		proportionate to the low level of public interest and effects on existing interests.	

Summary of options analysis

34. For the status quo and all the options, the environmental effects, impacts on other users and compliance with international obligations are the same.

35. For both options the compliance costs are lower than the status quo. For non-notified discretionary activities, the estimates from the EPA are that a marine consent process could cost an operator between $250,000 and $700,000 per consent. The costs to operators for the EPA reviewing monitoring reports for permitted activities could range from $10,000 to $100,000 (this includes an investigation). These costs are only indicative estimates by the EPA because the regime has not been tested. They are broad in range because of the potential wide range of complexity of permitted activities.

36. The most significant differences between the options are in the economic impacts. Under Option C, the space vehicle industry could contribute between $600 and $1,550 million of value add to New Zealand over 20 years. The status quo puts those benefits at risk by imposing a delay on Rocket Lab's launch programme leading to a loss of competitive advantage and delays in the delivery of contracted satellite launches.

37. Rocket Lab and the EPA will benefit from reduced compliance costs. A greater chance of a positive impact of the space vehicle industry on the New Zealand economy benefits the public with the greatest benefits accruing to the companies launching space vehicles and those associated with the industry.

CONCLUSIONS AND RECOMMENDATIONS

38. The deposit of jettisoned material in the EEZ from space vehicle launches has effects on the environment and existing interests that are considered to be minor. Officials recommend the deposit of jettisoned material in the EEZ from space vehicle launches be permitted through regulations under the EEZ Act subject to conditions. The conditions include:

    - Pre-activity reporting to the EPA
    - Post-activity reporting to the EPA
    - A limit of 100 launches
    - Expiry of the regulations after 5 years
    - Jettisoned materials are limited to those assessed and consulted on
    - Launch trajectories are limited to those assessed and consulted on.

39. Option C is likely to be as effective as the status quo for ensuring environmental protection. This is because the discretionary process of a consent application is unlikely to consider any different information to what is currently being considered or deliver a substantially different regulatory outcome. A discretionary process is unlikely to alter the nature or frequency of the deposit of jettisoned material. The most important impacts to consider in relation to these options are environmental and economic. Social impacts are less important because the activities in question are likely to be minor in effect and unlikely to impose significant social costs.

CONSULTATION

40. MfE consulted with the following agencies to discuss the problems identified with the status quo and the proposals in this RIS:

    - Ministry of Business, Innovation and Employment
    - Environmental Protection Authority
    - Maritime New Zealand
    - Department of Conservation
    - Ministry of Primary Industries
    - Ministry of Foreign Affairs and Trade
    - Te Puni Kōkiri
    - Treasury

41. All are supportive of the proposal. The Department of Prime Minister and Cabinet have been informed about the proposals.

42. The public, iwi and those with existing interests were provided a discussion document on the proposals to regulate the deposit of jettisoned material. The option for a non-notified marine consent was not consulted on, as there are questions over whether the activity meets the criteria for a non-notified activity. Fifteen submissions were received in total: three from industry groups, four from iwi, two from local government, five from individuals and one from a non-governmental organisation.

43. Views on the proposal were mixed. Six submitters agreed with the proposal to classify as a permitted activity the deposit on the seabed of jettisoned material from space launch vehicles. Two submitters suggested that the activity should be classified as discretionary. Two submissions suggested it should be prohibited. Three submitters expressed no view on this question. Two of the submitters opposed permitting the activity but didn't express an alternative and cited the lack of information. Submitters provided little factual information to support the analysis in the RIS. However, the submissions were useful in developing the conditions that will be imposed on a permitted activity. Many of the submitters concerns have been addressed through these conditions.

IMPLEMENTATION

44. This RIS informs Cabinet's final decision on the proposal to permit the deposit in the EEZ of jettisoned material from space vehicle launches. This would be implemented through regulations made pursuant to the EEZ Act. The regulations would be Gazetted and implemented through informing the public and key stakeholders of the content of the regulations.

MONITORING, EVALUATION AND REVIEW

45. As this is a new activity the Government considers it is important that the classification is reviewed, to ensure that the permitting regime is proportionate to the effects of the activity. This will ensure that there is consideration of how the activity is managed once the effects are better understood. To ensure that a review is undertaken, the regulations will expire after 5 years.

46. This consideration could include confirming the regulations are the appropriate tool for managing the activity, or choosing to regulate the activity in a different way e.g. through a different classification.

47. As the regulator, the EPA will be gathering information on the impacts of space vehicle launches through post-activity reporting. The EPA will be able to develop a picture of cumulative impacts.

48. As the responsible policy agency, MfE monitors the effectiveness of the overall EEZ regime. Part of this ongoing monitoring, evaluation and review may include:

    - evaluation of costs and the effectives of all EEZ functions including permitted activities
    - evaluation of how effective the EPA and other management agencies are in meeting the purpose of the Act