Environmental Protection Authority
Te Mana Rauhī Taiao

# DECISION

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| **Date** | 4 December 2015 |
| **Application code** | APP202619 |
| **Application type** | To develop any new organism in containment under section 40(1) of the Hazardous Substances and New Organisms Act 1996 |
| **Applicant** | The University of Auckland |
| **Date application received** | 27 October 2015 |
| **Consideration date** | 4 December 2015 |
| **Considered by** | A decision-making committee of the Environmental Protection Authority (the Committee)[1]:<br>• Kerry Laing (Chair)<br>• Deborah Read |
| **Purpose of the application** | To develop 'reprogrammed' stem cell lines to study genes involved in vertebrate development and disease processes. |

## 1. Summary of decision

1.1. Application APP202619 to develop genetically modified (GM) organisms (GMOs) in containment to study genes involved in vertebrate development and disease processes was lodged under section 40(1) of the Hazardous Substances and New Organisms Act 1996 (the Act).

1.2. The application was considered in accordance with the relevant provisions of the Act and the HSNO (Methodology) Order 1998 (the Methodology).

1.3. The Committee **approved** the application to develop the GMOs (as described in Table 1) in accordance with section 45(1)(a) of the Act, subject to the controls set out in Appendix 1.

[1] The Committee referred to in this decision is the subcommittee that has made the decision on the application under delegated authority in accordance with section 18A of the Act.

# 2. Application process

### Application receipt

2.1. Application APP202619 was formally received for processing on 27 October 2015.

### Public notification

2.2. Section 53(2) of the Act provides that an application under section 40 of the Act may be publicly notified by the Environmental Protection Authority (EPA) if it considers that there is likely to be significant public interest.

2.3. The application was not considered to meet the threshold of significant public interest because the GMOs are not novel to New Zealand, and all research involving the GMOs will be conducted within containment facilities.

### Comments from Ministry for Primary Industries and Department of Conservation

2.4. In accordance with section 58(1)(c) of the Act, EPA staff advised the Ministry for Primary Industries (MPI), and the Department of Conservation (DOC) of the application, and invited them to provide information and/or comment. No concerns were raised.

### Consideration

2.5. The consideration of the application by the Committee took place on 8 December 2015.

### Information available for the consideration

2.6. The information available for the consideration comprised:

- the application and references provided therein; and
- the EPA staff advice memorandum.

2.7. The Committee considered that it had sufficient information to assess the application.

### Legislative criteria for the application

2.8. The Committee considered the application in accordance with section 45 of the Act, taking into account the matters specified in sections 37, 39, 43, Schedule 3 (Part 1), the relevant matters in Part 2 of the Act, and the Methodology.

2.9. The application was not considered under section 42A of the Act (rapid assessment) because c-Myc expression within transduced mammalian cell lines (as described in Table 1) triggers clause 1(e) of the Schedule of the HSNO (Low-Risk Genetic Modification) Regulations 2003, "*developments involving viral vectors whose host range includes human cells and that contain 1 or more inserted nucleic acid sequences coding for a product* ***that can lead to*** *uncontrolled mammalian cellular proliferation or be toxic to mammalian cells, or both*" are not low-risk genetic modifications.

# 3. Purpose of the application

3.1. The University of Auckland (the applicant) sought approval to develop in containment 'reprogrammed' stem cells to study genes involved in vertebrate development and disease processes. Specifically, the applicant proposes to reprogram differentiated mammalian cell lines to a pluripotent state[2] (induced pluripotent stem cells (iPSCs)) using genetically modified (GM) Sendai virus (SeV) vectors. SeV vectors are deleted/deactivated in the gene for the fusion protein and contain genes for transcription factors Oct3/4[3], Sox2, Klf4 and/or c-Myc.

3.2. Section 45(1)(a)(i) of the Act requires that the application be for one of the purposes specified in section 39(1) of the Act.

3.3. The Committee was satisfied the application is for a valid purpose; the development of any new organism, as provided for in section 39(1)(a) of the Act.

# 4. Adequacy of containment and controls imposed

4.1. Section 45(1)(a)(iii) of the Act requires that the Committee be satisfied that the GMOs (as described in Table 1) can be adequately contained. This is one of the criteria to be met before approving the application.

4.2. To evaluate the adequacy of containment, the Committee assessed the potential for the GMOs to escape from containment taking into account the:

- biological characteristics of the GMOs that relate to containment;
- containment regime; and
- potential pathways of escape of the GMOs from the containment facility.

4.3. The Committee noted that the applicant has considerable experience in the operation of containment facilities.

### Biological characteristics of the GMOs that relate to containment

4.4. The Committee noted that the modifications to Sendai virus (as described in Table 1) are not expected to increase the ability of the host organism to escape containment, nor confer any competitive advantage to the organism in the unlikely event of escape.

4.5. The Committee noted that mammalian cell lines are defined as low-risk host organisms (specifically category 1 host organisms as defined in the HSNO (Low-Risk Genetic Modification) Regulations 2003) in several containment approvals. The biological characteristics of low-risk host organisms are such that these organisms have limited ability to escape containment facilities. Further, the Committee noted that modifying mammalian cell lines with SeV vectors (as described in Table 1) is not expected to increase the ability of these cells to escape containment.

[2] Pluripotent cells can give rise to all of the cell types that make up the body (embryonic stem cells are considered pluripotent).
[3] Transcription factor Oct3/4 is also known as Oct3 and Oct4.

### The containment regime

4.6. Controls 1-24 (Appendix 1) have been imposed by the Committee to address containment. These controls address the matters detailed in Schedule 3 (Part 1) of the Act. These provisions address:

- the construction and maintenance of the facility and equipment;
- management, identification and security;
- access for personnel and equipment;
- laboratory and inspection procedures;
- transport, identification and packaging of material leaving the facility;
- registers and documentation;
- treatment of waste (solids, liquids and air);
- contingency plans; and
- staff training.

4.7. All containment facilities are initially inspected, approved and regularly audited by MPI for compliance with the controls of this approval.

4.8. The Committee noted that each containment facility will be operated in agreement with the facility's Containment Manual (which will describe a Quality Management System). The Quality Management System will contain details on how the applicant will meet the controls of this approval. MPI reviews the Quality Management System as part of the approval process of the containment facility.

4.9. The Committee was satisfied that the controls set out in Appendix 1 of this decision provides for each of the applicable matters specified in Schedule 3 (Part 1) of the Act, and will establish a containment regime that prevents the escape of the GMOs from containment.

### Potential pathways of escape of the GMOs from containment

4.10. The following potential pathways of escape were identified and addressed by the imposed controls:

- escape during transport to/between containment facilities;
- escape via unauthorised persons being present within the containment facility;
- escape in waste or on contaminated equipment;
- escape due to the presence of undesirable organisms (e.g. vermin);
- escape via laboratory personnel;
- escape via failure of the containment regime through inadequate maintenance/upkeep; and
- escape via failure of containment regime following fire or natural disaster.

*Escape during transport to/between containment facilities*

4.11. Escape during transport to or between containment facilities was identified as a potential pathway for escape. The Committee imposed controls 12-13 to specify requirements for moving the GMOs to or between containment facilities, including maintaining containment and accompanying documentation.

*Escape via unauthorised persons being present within the containment facility*

4.12. Unauthorised persons were identified as providing a potential pathway of escape as they may deliberately or accidentally remove the GMOs from the containment facility. The Committee imposed controls 14-16 to specify requirements for access to the facility, including the requirements to exclude unauthorised persons, and the identification of entrances.

*Escape in waste or on contaminated equipment*

4.13. The removal of waste and contaminated equipment from the facility was identified as a potential pathway of escape. The Committee imposed controls 17 and 18 to specify requirements for removing equipment (including personal protective equipment) and waste from the containment facility to prevent the escape of the GMOs. The Committee noted that when waste is treated off-site (to kill any approved organism or heritable material), the GMOs must be contained during transport to the treatment location.

*Escape due to the presence of undesirable organisms in the facility*

4.14. The presence of undesirable organisms, such as vermin, was identified as a possible pathway of escape. The Committee imposed control 19 to require the containment facility to be secured and monitored to ensure the exclusion of undesirable organisms that might compromise the containment of the GMOs.

*Escape via laboratory personnel*

4.15. Accidental/unintentional removal of the GMOs by laboratory personnel was identified as a potential pathway of escape. The Committee imposed control 7 to require persons entering and exiting the containment facility to do so in a way that does not compromise containment. The Committee imposed control 20 to require that any person entering the containment facility has sufficient training on the containment regime that they are able to meet their responsibilities.

*Escape via inadequate maintenance or failure of containment measures*

4.16. Escape as a result of failure of the containment regime through inadequate maintenance of the regime was identified as a potential pathway of escape. The Committee imposed control 6 to require the containment facility to be designed, constructed and maintained to prevent the GMOs from escaping. The Committee imposed control 23 to require the containment measures to be inspected, monitored and reviewed to ensure that containment is being achieved. Control 23 also requires that containment measures be inspected as soon as possible after any event that could compromise containment.

*Escape via failure of containment regime following fire or natural disaster*

4.17. Escape as a result of failure of the containment regime following fire or natural disaster has also been identified as a potential pathway of escape. The Committee imposed control 23 to require the

containment facility to be inspected as soon as possible after any event that could compromise containment – including fire, acts of God (such as flood, earthquake, tornado), or attempts to break into the facility.

### Conclusion on adequacy of the containment regime

4.18. The Committee concluded that it was highly unlikely that the GMOs could escape from containment, taking into account the:

- biological characteristics of the GMOs that relate to containment;
- containment controls; and
- potential pathways of escape of the GMOs from the containment facilities.

4.19. Therefore, the Committee concluded that the GMOs could be adequately contained. In particular, the Committee was satisfied that the controls imposed in Appendix 1 provide for each of the applicable matters specified in Schedule 3 (Part 1) of the Act (as required under section 45(2) of the Act).

4.20. While section 45(2) of the Act also provides that an approval may include controls that provide for any other matters in order to give effect to the purpose of the Act, the Committee considered that no additional controls were required to achieve the purpose of the Act.

## 5. Effects of the organism and any inseparable organism

5.1. The Committee is required by section 45(1)(a)(ii) of the Act to take into account all the effects of the organism and any inseparable organism, and consider whether the beneficial effects of having the organism in containment outweigh the adverse effects of the organism and any inseparable organism.

### Effects of any inseparable organism

5.2. The Committee did not identify any inseparable organisms.

### The ability to establish an undesirable self-sustaining population and the ease of eradication

5.3. Section 37 the Act requires the Committee to have regard to the ability of the GMOs to establish an undesirable self-sustaining population and the ease with which the GMOs could be eradicated if a population was established.

5.4. The Committee recognised that the potential for the GMOs to escape from containment and then form undesirable self-sustaining populations is limited by the containment regime.

5.5. Further, the Committee noted that controls 21 and 22 require contingency plans be documented for all approved organisms, and the implementation of those plans in the event of a breach of containment.

5.6. The Committee considered that in the highly unlikely event of SeV vectors escaping containment, it is highly unlikely these vectors will establish self-sustaining populations because they are unable to release infectious viral particles from the mammalian cells initially infected (SeV vectors are non-transmissible because they are deleted in the fusion gene; see Table 1).

5.7. The Committee recognised that GM cell lines rely on specific laboratory culture conditions for survival. Accordingly, the Committee considered that in the highly unlikely event of cells escaping containment, it is highly unlikely the cells will survive and establish self-sustaining populations.

## Assessment of adverse effects

5.8. The Committee considered the potential adverse effects of the GMOs on human health and safety, the environment, society and the community, Māori culture and traditions, the principles of the Treaty of Waitangi and the market economy.

5.9. When considering the adverse effects of the GMOs, the Committee took into account the adverse effects (if any) of having the GMOs in containment, the probability that the GMOs may escape containment after considering all the controls to which the GMOs will be subject to if the application was approved, and the effects of the GMOs if they were to escape (section 45(4) of the Act).

### Effects on the environment

5.10. The Committee considered the information provided on potential effects on the environment, and noted that all research involving the GMOs will be conducted in containment facilities with a Quality Management System which contains details on how the imposed controls (Appendix 1) will be met.

5.11. The Committee noted that the GMOs do not pose a serious risk to the environment if they escaped because of their limited ability to survive outside of a laboratory (see paragraphs 5.6 and 5.7).

5.12. The Committee noted that for any adverse effects on the environment to occur, the GMOs would first need to escape or be released from containment. The Committee considered that it was highly unlikely that such an adverse effect would eventuate taking into account the imposed controls.

5.13. After assessing all the information, the containment controls imposed, and the likelihood of escape from containment the Committee did not identify any non-negligible adverse effects on the environment from the development of the GMOs in containment.

### Effects on human health and safety

5.14. The Committee noted that SeV vectors can infect human cells, and recognised that laboratory personnel would be at risk of being inadvertently infected with SeV vectors via occupational exposure to these viral vectors (via inhalation of aerosolised high titre virus or skin exposure). As c-Myc overexpression is found in many human cancers, such inadvertent infection could lead to overexpression of c-Myc and adverse effects on human health. However, the Committee acknowledged that the applicant has stated that there is no evidence that c-Myc expressed in this way is hazardous; and SeV vectors are unlikely to be pathogenic to infected laboratory personnel because Sendai virus only causes respiratory disease in rodents.

5.15. Further, the Committee acknowledged that laboratory personnel working with SeV vectors and the transduced cell lines will be trained to safely handle these GMOs within a Biological Safety Cabinet,

and direct exposure will be limited by personal protective equipment (gloves, safety glasses and a laboratory coat) and good laboratory practices.

5.16. Further, the Committee considered it was highly unlikely that adverse effects on human health will occur taking into account the imposed controls (see Appendix 1).

5.17. After assessing all the information, the Committee did not identify any non-negligible adverse effects on human health and safety that may result from the development of the GMOs in containment.

### Effects on Māori and their culture and traditions and the principles of the Treaty of Waitangi (Te Tiriti o Waitangi)

5.18. The Committee took into account the effects on the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga, and the principles of the Treaty of Waitangi.

5.19. The Committee noted that the applicant discussed the application with Michael Steedman (Ngāti Whatua iwi representative on the applicant's Institutional Biological Safety Committee), during which it was acknowledged that iPSC research had significant potential to improve the health of Māori. Further dialogue between the applicant and additional Ngāti Whatua members has been proposed so as to continue the engagement and to disseminate stem cell knowledge amongst iwi.

5.20. Further, the Committee considered that the GMOs would first need to escape from containment to cause adverse effects on the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga, and the principles of the Treaty of Waitangi. The Committee considered that the imposed containment controls were sufficient to contain the GMOs, and considered the likelihood of escape as highly unlikely.

5.21. After assessing all the information, the Committee did not identify any non-negligible adverse effects on the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga from the development of the GMOs in containment.

5.22. Given the absence of identified effects to the outcomes of significance to iwi/Māori, the Committee considered the application to be broadly consistent with the principles of the Treaty of Waitangi.

### Effects on the market economy and society and community

5.23. The Committee took into account the effects of the GMOs on the market economy and society and community. The Committee noted that the GMOs will be held in containment facilities with a Quality Management System which contains details on how the imposed controls (Appendix 1) will be met.

5.24. The Committee noted that none of the GMOs (as described in Table 1) are novel as they have previously been assessed under the Act.

5.25. The Committee also noted that the modifications are not likely to confer any competitive advantage to the host organisms in the unlikely event of escape, which is consistent with many existing development in containment approvals.

5.26. Therefore, the Committee concluded that the GMOs under this approval (as described in Table 1) are not expected to cause greater potential adverse effects on the market economy or society and communities than the organisms currently held in containment facilities under other HSNO approvals.

5.27. However, for any adverse effects on the market economy or society or communities to occur, the GMOs would need to escape or be released from containment. The Committee considered that it was highly unlikely that such an adverse effect would occur taking into account the imposed controls.

5.28. After assessing all the information, the Committee did not identify any non-negligible adverse effects on the market economy or society and communities from the GMOs in containment.

### Conclusion on assessment of adverse effects

5.29. After considering the information provided, the Committee did not identify any non-negligible adverse effects of the development in containment of the GMOs. Therefore the Committee considered that any adverse effects will be negligible.

5.30. Since the Committee did not identify any non-negligible adverse effects from the development in containment of the GMOs, the Committee was not required to take into account the probability of occurrence or magnitude of any adverse effects.

## Assessment of beneficial effects

5.31. The Committee considered the potential beneficial effects on human health and safety, the environment, society and community, Māori culture and traditions, and the market economy from the development in containment of the GMOs.

5.32. The Committee identified the following potential beneficial effects of developing the GMOs in containment:

- increased understanding in many areas of biology, including, but not limited to, stem cell research, tissue engineering and cellular biology (normal and diseased cells); and
- the development of new iPSC-based therapeutic strategies for the treatment of disease.

5.33. The Committee considered that ongoing gains in biological scientific knowledge within the applicant's research faculty will be of moderate benefit to New Zealand. The Committee noted that the applicant has a proven track record for producing quality scientific research, and considered that it was highly likely that these benefits will eventuate. Therefore these beneficial effects were considered to be non-negligible.

### Conclusion on assessment of beneficial effects

5.34. After considering the information provided, the Committee considered that the beneficial effects will be non-negligible.

# 6. Overall evaluation and weighing of beneficial and adverse effects

6.1. The Committee considered that it had sufficient information to weigh the effects of the development of the GMOs in containment.

6.2. Overall, the Committee did not identify any non-negligible adverse effects from the development of the GMOs in containment.

6.3. Given that there were no non-negligible adverse effects identified, consideration of whether the adverse effects may aggregate, in order to assess any cumulative effects, was not relevant.

6.4. The Committee concluded that the beneficial effects accruing from the development of the GMOs in containment were non-negligible.

6.5. Therefore, the Committee considered the beneficial effects of the development of the GMOs in containment outweighed the adverse effects.

6.6. Section 6(f) of the Act requires the Committee to take into account New Zealand's international obligations when determining the applications. New Zealand has no obligations which are relevant to this approval.

6.7. The Committee, having considered all the effects of the GMOs and the matters outlined in section 45 of the Act, concluded that:

a) the application was for one of the purposes specified in section 39(1);

b) the approved organisms could be adequately contained; and

c) the beneficial effects of developing the GMOs in containment outweighed the adverse effects of the approved organisms.

# 7. Achieving the purpose of the Act

7.1. The purpose of the Act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms (section 4 of the Act).

7.2. In order to achieve the purpose of the Act, when considering this application the Committee recognised and provided for the following principles (section 5 of the Act):

a) the safeguarding of the life-supporting capacity of air, water, soil and ecosystems; and

b) the maintenance and enhancement of the capacity of people and communities to provide for their own economic, social and cultural well-being and for the reasonably foreseeable needs of future

generations.

7.3. The Committee took into account the following matters when considering this application in order to achieve the purpose of the Act (sections 6, 7 and 8 of the Act), and the Committee did not identify any such risk, cost, benefit or other impact on:

- the safeguarding of the life-supporting capacity of air, water, soil, and ecosystems;
- the sustainability of all native and valued introduced flora and fauna;
- the intrinsic value of ecosystems;
- public health;
- the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga;
- the economic and related benefits and costs of using the new organisms;
- New Zealand's international obligations;
- the need for caution in managing adverse effects where there is scientific and technical uncertainty about those effects; and
- the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

7.4. The Committee was satisfied that this approval is consistent with the purpose of the Act and the above principles and matters under the Act and the Methodology. Any substantive issues arising from the legislative criteria have been discussed in the preceding sections of this approval.

# 8. Associated approvals

8.1. The Committee noted that the approval granted under this decision does not affect the requirements of the Biosecurity Act 1993, including any authorisations or approvals that may be required under that Act (such as ongoing approval of containment facilities and manuals by MPI).

# 9. Decision

9.1. After reviewing all of the information contained in the application, the Committee was satisfied that the application met the requirements of section 40 of the Act.

9.2. The Committee considered that the threshold for approval under section 45 of the Act has been met. It was satisfied that the GMOs could be adequately contained and that the beneficial effects of the GMOs outweighed the adverse effects of the GMOs, taking into account all of the following:

- all the effects of the GMOs;
- the matters in section 37, 39, 43, 45, and Schedule 3 (Part 1) of the Act;
- the relevant matters in Part 2 of the Act; and
- the Methodology.

9.3. The Committee decided to exercise its discretion and approve the development in containment of the GMOs described in Table 1 under section 45(1)(a) of the Act. The Committee noted that in accordance with section 45(2) of the Act, the approval has been granted with controls (Appendix 1).


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| **Kerry Laing**<br>**Chair, Decision Making Committee**<br>**Environmental Protection Authority** | **4 December 2015** |

# New organisms approved to be developed

## Table 1: Genetically modified organisms approved to be developed

| Host organism | Modifications | Approval numbers |
|---|---|---|
| *Sendai virus (SeV)* | Modifications will include:<br>• the deletion/deactivation of the fusion (F) protein gene;<br>• the introduction of the gene for transcription factor Oct3/4[4], Sox2, Klf4 and/or c-Myc; and<br>• temperature sensitive mutations that assist SeV vector clearance from iPSCs.<br><br>SeV vectors may contain regulatory elements including promoters, regulatory element binding sites, transcriptional activators, enhancers, terminators, multiple cloning sites, site directed recombination sequences, and origins of replication.<br><br>Modifications will not include:<br>• human genetic material sourced directly from Māori; or<br>• modifications that result in the GMO having a greater ability to escape from containment than the unmodified host organism | GMD101906 |
| **Mammalian cell lines:**<br>*Homo sapiens* Linnaeus 1758 (including primary human cell lines) | iPSCs will be generated by modifying the mammalian cell lines using the genetically modified *Sendai virus (SeV) vectors* described in this table.<br><br>Human cell lines will not be sourced directly from Māori. | GMD101916 |
| *Mus musculus* Linnaeus 1758 | | GMD101908 |
| *Mus spretus* Latase 1883 | | GMD101907 |
| *Rattus norvegicus* Berkenhout 1769 | | GMD101915 |
| *Rattus rattus* Linnaeus 1758 | | GMD101911 |
| *Cricetus cricetus* Linnaeus 1758 | | GMD101909 |
| *Cricetulus griseus* Milne Edwards 1857 | | GMD101910 |
| *Canis familiaris* Linnaeus 1758 | | GMD101914 |
| *Mesocricetus auratus* Waterhouse 1839 | | GMD101913 |
| *Chlorocebus aethiops* Linnaeus 1758 | | GMD101912 |

[4] Transcription factor Oct3/4 is also known as Oct3 and Oct4.

# Appendix 1: Controls required by this approval[5]

*Any person importing and/or developing the approved organisms under the approval granted by this decision (each referred to as the approval holder) must ensure compliance with the controls set out below in respect of any activity they carry out under this approval in a facility under their control.*

### *Requirement for the containment of approved organisms*

1. The approved organism(s) (as described in Table 1) must be contained.

### *Requirements for accountability for compliance with controls*

2. The organisation, entity or person(s) responsible for the ownership, control and management of the containment facility where the approved organisms are held (including Board members and/or directors) must ensure compliance with the controls of this approval.

### *Requirement to specify how controls will be met*

3. Procedures that specify how the controls will be implemented and complied with must be documented, and these procedures must be reviewed at least annually to ensure they:
   a) are effective in maintaining containment and achieving their purpose,
   b) reflect any relevant changes in the facility and its operation, and
   c) incorporate any improvements to best practice.
4. The containment facility must be operated in compliance with the documentation specified in control 3.

### *Requirements for the containment regime*

5. The containment facility where the approved organisms will be held must be clearly defined, described, and documented, including the location and boundaries.
6. The containment facility must be designed, constructed, managed, and maintained to prevent the approved organism(s) from escaping.
7. Persons entering and exiting the containment facility must do so in a way that does not adversely affect containment of the approved organism(s).
8. The approved organism(s) must be identifiable as a new organism and be able to be linked to the relevant HSNO Act approval.

### *Requirements for notification to the EPA and/or MPI*

9. Notification must be given to MPI of any movement of approved organisms outside of the facility, or any proposed modification to the containment regime which may affect the integrity of containment of the approved organism(s), before the actions are undertaken.

[5] Compliance with the controls imposed under this approval does not affect the requirements of the Biosecurity Act 1993, including any authorisations or approvals that may be required under that Act (such as approval of containment facilities by MPI).

10. The EPA and MPI must be notified in writing before this HSNO Act approval is used for the first time.

11. MPI must be notified as soon as possible, and within 24 hours, of any escape and/or breach of containment and the actions taken in response to that incident.

### *Requirements for moving approved organisms*

12. The approved organism(s) must be contained during movement within, to, or from the containment facility.

13. When being moved outside of a containment facility, within New Zealand, the approved organism(s) must be accompanied by documentation stating the:
    a) Identity of the approved organism(s)
    b) Containment requirements
    c) Details of the sender
    d) Details of the receiving facility.

#### *Requirements to limit access to the containment facility*

14. Unauthorised persons must be excluded from the containment facility.

15. All containment facility entrances must be clearly identified including specifying who has the right of access.

16. The number and location of entrances to the containment facility where the approved organism(s) are held must be identified and documented.

### *Requirements for removing equipment and waste from the containment facility*

17. Any waste (including biological material) that may harbour the approved organism(s), or heritable material from the approved organism, must be treated to ensure that the approved organism or any heritable material is killed prior to disposal.

18. Any equipment, that may harbour the approved organism(s) or heritable material from the approved organism, must be treated to ensure that the approved organism or any heritable material is killed prior to the equipment being used for another purpose or being removed from the containment facility.

### *Requirement for dealing with undesirable organisms*

19. The containment facility must be secured and monitored to ensure the exclusion of undesirable organisms that might compromise the containment of the approved organism(s).

### *Requirements for instruction and training*

20. Any person (including contractors, staff, students, visitors, and volunteers) entering the containment facility must have received sufficient instruction on the containment regime to enable the person to meet their responsibilities in relation to containment.

*Requirements for contingency plans*

21. There must be a documented contingency plan for each approved organism held in the containment facility.

22. The contingency plan must be implemented immediately if there is any reason to believe that an approved organism has escaped or been released from the containment facility, or any other breach of containment has occurred.

*Requirements for internal inspections and monitoring*

23. To ensure containment is being achieved, containment measures must be:
    a) Inspected, monitored and reviewed as appropriate
    b) Inspected as soon as possible after any event that could compromise the containment regime, such as an Act of God (such as flood, earthquake) or any unauthorised attempt to enter the containment facility.

24. Any remedial requirements identified under control 23, or by any other means, must be actioned as soon as possible.

## Interpretation

25. In these controls, unless otherwise specified below, a word has the same meaning as it is defined in the HSNO Act (if any).

26. Unless the context otherwise requires:

| Term | Definition |
|---|---|
| **approved organism(s)** | New organisms approved for development in containment under application APP202619 (as described in Table 1) to study genes involved in vertebrate development and disease processes. |
| **authorised person** | Authorised persons are those identified in the containment facility documentation as being allowed to be in the containment facility or any part thereof. |
| **breach** | Escape of organism(s), unauthorised entry to the facility and/or the structural integrity of the facility being compromised. |
| **containment** | Restricting an organism to a secure location or facility to prevent escape (section 2 of the HSNO Act). |
| **containment facility** | A place approved by MPI in accordance with section 39 of the Biosecurity Act 1993, for holding approved organisms. |

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| **contingency plan** | A plan devised for a specific situation where things could go wrong, for example escape of an approved organism. It contains information, tasks and procedures that are necessary for timely decision-making and response to an unexpected event, or situation where the preferred plan fails. |
| **controls** | Any obligations or restrictions imposed on any approved organism, or on any person in relation to any approved organism, by the HSNO Act, or any regulations, rules, codes, or other documents made in accordance with the provisions of this or any other Act for the purposes of controlling the adverse effects of that organism on people or the environment (section 2 of the HSNO Act). |
| **disposal** | The action or process of discarding or getting rid of something, including but not limited to burial, incineration, or placing in the general waste.<br>[Excludes the act of transferring to another containment facility under section 29 of the Biosecurity Act] |
| **documentation** | Written or electronic records (including manuals, lists, diagrams, maps, policies, procedures, plans and protocols, records of training, access). |
| **EPA** | The Environmental Protection Authority. |
| **heritable material** | (In relation to an approved organism) viable biological material, including gametes and spores, arising from that organism that can, without human intervention, regenerate the organism or reproduce a new generation of the same species of the organism (section 2, HSNO Act). |
| **HSNO Act** | Hazardous Substances and New Organisms Act 1996. |
| **MPI** | Ministry for Primary Industries. |
| **new organism** | Defined by section 2A of the HSNO Act<br>(a) an organism belonging to a species that was not present in New Zealand immediately before 29 July 1998<br>(b) an organism belonging to a species, subspecies, infra-subspecies, variety, strain, or cultivar prescribed as a risk species, where that organism was not present in New Zealand at the time of promulgation of the relevant regulation<br>(c) an organism for which a containment approval has been given<br>(ca) an organism for which a conditional release approval has been given under the HSNO Act<br>(cb) a qualifying organism approved for release with controls<br>(d) a genetically modified organism<br>(e) an organism that belongs to a species, subspecies, infra-subspecies, variety, strain, or cultivar that has been eradicated from New Zealand. |
| **organism** | Defined in section 2 of the HSNO Act:<br>(a) Does not include a human being<br>(ab) Includes a human cell |

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| | (b) Includes a micro-organism<br>(c) Includes a genetic structure, other than a human cell, that is capable of replicating itself, whether that structure comprises all or only part of an entity, and whether it comprises all or only part of the total genetic structure of an entity<br>(d) Includes an entity (other than a human being) declare to be an organism for the purposes of the Biosecurity Act 1993<br>(e) Includes a reproductive cell or developmental stage of an organism. |
| **treat (with reference to waste)** | Kill all approved organisms and make heritable material non-viable. |
| **undesirable organism** | Organisms such as rodents, insects, and birds within the containment facility that could compromise containment (dependent on what organism is being contained). |
| **waste** | Unusable or unwanted substances or materials (including water, liquids, solids or air). |