

Environmental Authorisations (Scotland) Regulations 2018
Guidance on the Application Form for a PERMIT for
the management of RADIOACTIVE SUBSTANCES
not involving Sealed Sources

V4

May 2022

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Introduction

This guidance document relates to SEPA's Radioactive Substances Activity Permit Modular Application Form, which will allow you to apply under the Environmental Authorisations (Scotland) Regulations 2018 (EASR), for a permit for the management of unsealed radioactive material and/or radioactive waste or to vary an existing permit of this type.

What this application can be used for

This modular application form is suitable for applying for new permits, as well as variations of existing permits. It is suitable for applications from nuclear and non-nuclear operators.

The purpose of the modular application form is to allow you to only have to complete those sections of the form that are relevant to what you are applying for. SEPA would expect that the amount and detail of the information submitted would be proportional to the complexity of the proposed application.

Please note that the modular application form does NOT cover applications relating to:

1. Sealed Source Permits (new or variation)
2. Radioactive Substances Permit or Registration Transfers
3. Radioactive Substances Registrations (new)
4. Full or partial surrender of any permit or registration

Please consult the SEPA website for the appropriate application form. Full information on how to submit your completed application form and the relevant fee can be found within the Application Information Note on the SEPA website (<https://www.sepa.org.uk/regulations/authorisations-and-permits/application-forms/#RSA>)

SECTION 1: General Information

This section is applicable to all applications made on this form.

TYPE OF APPLICATION

1a. Please state which of the following applications you are making

Please indicate which type of application is being made by ticking the appropriate box. If you are varying an existing EASR permit, list the relevant permit reference.

Please refer to the *EASR Charging Definition Guidance* to determine whether your variation is substantial or standard. If in doubt, please contact SEPA prior to submitting your application form.

1b. Is the application relating to a nuclear site?

A “nuclear site” is defined as (i) any site in respect of which a nuclear site licence under the Nuclear Installations Act 1965 is for the time being in force, or (ii) any site in respect of which, after the revocation or surrender of a nuclear site licence, the period of responsibility of the licensee has not yet come to an end.

1c. To meet with the requirements of this application you must have a recognised Justified Practice.

All uses of radioactive material require to be justified in accordance with the Justification of Practices Involving Ionising Radiation Regulations 2004, as amended. Scottish Ministers are the competent authority for this legislation; however, SEPA cannot issue a permit unless a practice is justified.

A list of justified practices can be obtained from the gov.uk website.

PLEASE NOTE THAT FAILURE TO TICK THIS BOX WILL RESULT IN THE APPLICATION BEING RETURNED TO YOU.

APPLICANT DETAILS

1d. Please provide details of the legal person who will hold this permit.

The person who will hold the permit may be an individual (or group of individuals), a partnership, a registered company or a public body. If the legal person is a partnership or a group of incorporated individuals, you may need to attach additional pages to the application to list these people.

Any permit issued by SEPA is a legally binding document. Therefore, it is imperative that you are correctly described in legal terms on the permit.

Depending on exactly what your legal status is will determine what information SEPA needs. There are 4 categories of legal status, and you will fall into only one of these categories. The required information to describe the applicant’s legal status has been broken down into four options:

Individual/sole trader

Organisation of individuals/partnership

Public body

Company or corporate body

Please select one option. If in doubt, please contact SEPA before making the application.

Organisation of individuals may be a club or similar organisation.

SITE DETAILS – onshore premises

1e. Please provide details of the premises to which this application refers

Please provide the address of the premises where you will carry out the radioactive substances activities, including its post code and the main telephone of the site (e.g., reception).

For mobile source permits, this address would be the one where the radioactive material is usually kept, including that usually kept in other parts of the UK or abroad.

1f. Please give the grid reference of the main entrance to the premises

Please provide the 10-digit national grid reference (NGR) for the main entrance to the site. This should consist of 2 letters followed by 8 numbers, for example, SJ 1234 5678.

SITE DETAILS – offshore premises

1g. Please provide details of the offshore premises where the radioactive substances activity will be carried out.

For offshore premises please provide the offshore installation/vessel name, block number where it is situated, and the 10-digit national grid reference (NGR).

1h. Please state the local government area in which the premises are situated

Please choose which local government area the site is in (e.g., Aberdeenshire, Dumfries and Galloway, etc.). If you are based in England, Wales, Northern Ireland or further afield please select “outwith Scotland”.

CONTACT DETAILS

1i. Please provide details about the individual that we may contact about the application

This question refers to the person authorised by you to be the primary contact for queries about the application. This could include a person within your organisation or those outside of the organisation

such as consultants or Radioactive Waste Advisers (RWAs) or Radiation Protection Advisers (RPAs). Queries are likely to be of a technical nature.

1j. Please provide details of the contact and billing address for invoices to be sent

The granting of a permit will attract an annual subsistence fee as set out in the Environmental Regulation (Scotland) Charging Scheme, available from SEPA's website. This section identifies where any invoices from SEPA should be sent.

REMITTANCE INFORMATION

Please provide payment details for the application. Most applications will attract an application fee, although some applications will not. For more information on the fee (or the reason why no fee is required) and the acceptable means of paying, please refer to the Environmental Regulation (Scotland) Charging Scheme which is available from SEPA's website. If you have any doubt, please contact SEPA before submitting the application.

On the application, please indicate whether your application requires a fee (if not, why), the amount paid, and the method of payment used.

FAILURE TO PAY THE RELEVANT APPLICATION FEE WILL RESULT IN THE APPLICATION BEING RETURNED TO YOU.

DECLARATION

This section must be signed by a person that is authorised to sign on your behalf.

If the declaration is being signed by someone outside of your organisation, he/she will also need to provide written evidence that they have been authorised to sign in that capacity.

Any person named on the application form should be informed that they have been so named and the contents of SEPA's Data Protection Notice made known to them.

APPLICATION CHECKLIST

This is an aide memoire to help you ensure all the required information has been included in the application.

Please ensure that you have ticked which other sections of the application form you have completed and included in the application.

If you have included any other documents or additional pages to support your application, please make sure that you have listed them here.

FAILURE TO LIST ALL SUPPORTING DOCUMENTS MAY RESULT IN THE APPLICATION BEING RETURNED TO YOU

SECTION 2: Further Information

Questions 2a, 2b, 2c and 2d must be completed for all kinds of application.

2a. Provide a brief overview of the radioactive substances activity that you are applying to carry out, including any arrangements for management of any waste generated.

It is essential that both you and SEPA to have an overview of the process involved in managing the radioactive substances. A flow diagram may be an easier method of providing this information.

Please note that this is a summary of the inputs and outputs, and more detail will be asked for in Sections 3, 4, 5, 6, 7, 8 and/or 9, as appropriate.

For applications for a new permit, this overview covers the entire lifecycle of the radioactive substances activities involving radioactive material and radioactive waste. For applications relating solely to the management of radioactive waste, the amount of information required on the radioactive material that gave rise to the waste is limited to that necessary to characterise the waste.

For variations to an existing permit, the overview must cover any changes to the radioactive substances activities that you are carrying out.

2b. Please indicate what activities you intend to carry out, or if you are varying an existing permit, which activities are affected by your proposed changes.

Please tick all applicable boxes. If none of the boxes reflect the changes you wish to make, please tick "other" and give details.

Introduction of radioactive material into organisms includes humans.

It is SEPA practice to automatically authorise the transfer of all types of radioactive waste to anyone who is legally entitled to receive the waste. This is set out in Section C of the standard conditions for radioactive substances activities, available on SEPA's website.

2c. For any radioactive waste generated, please describe the means considered for:

- (i) Minimising the volume and activity of waste requiring transfer or disposal; and**
- (ii) Minimising the impact to the environment of waste disposals**

If a permit is granted by SEPA, it will require you to use Best Practicable Means (BPM) to prevent the generation of unnecessary radioactive waste requiring transfer or disposal as well as minimising the volume and activity of the waste that is transferred or disposed of. In addition, it is required that all transfers or disposals of radioactive waste will be conducted in such a manner and such a time as to minimise the impact to the environment. The applicable standard conditions, which are available on the SEPA website, are in sections B.1, B.2 and G.1.

In this section, please provide details on how you will minimise the generation of radioactive waste and optimise the management of each radioactive waste stream in order to minimise the impact on the environment. Give details in brief as full inspection of procedures will be undertaken.

For variations where a new radionuclide or waste stream will not affect BPM considerations for existing radionuclides or waste streams, it is only necessary to provide information on new waste streams or new radionuclides.

The use of the minimum amount of radioactivity necessary to accomplish your task (e.g., experiment, procedure, etc.), the use of filtration (e.g., HEPA or ion exchange) or the use of decay storage to reduce the activity of waste prior to discharge are examples that satisfy sub-section (i). The discharge of liquid radioactive waste to estuarine or coastal waters during an ebb tide or the discharge of gaseous radioactive waste from a stack that is sufficiently high above ground level to ensure good mixing are examples that would satisfy (ii).

Please note that if you intend to treat the waste prior to discharge or transfer, it may result in secondary wastes requiring disposal. In this case, you may need to complete other sections of this form. It is also recommended that consideration is given to the service and maintenance of the discharge system which may periodically result in contaminated articles, such as traps and pipework, since you will be required to keep a list of such items.

2d. Have you submitted a transboundary consideration assessment considering whether plans to dispose of radioactive waste are liable to result in the radioactive contamination, significant from the point of view of health, of water, soil or airspace of notifiable countries?

The Transboundary Radioactive Contamination (Scotland) Direction 2021

[The Transboundary Radioactive Contamination \(Scotland\) Direction 2021](#) (the Direction) requires SEPA to consider whether plans to dispose of radioactive waste are liable to result in the radioactive contamination of notifiable countries i.e., EU member states and Norway.

If your EASR permit/variation application includes plans to dispose of radioactive waste arising from one or more of the operations specified in the Direction, then you must submit with your application your assessment of whether those plans are liable to result in the radioactive contamination, significant from the point of view of health, of water, soil or airspace of any of the notifiable countries (a transboundary consideration assessment). You do not need to submit a transboundary consideration assessment if the proposed variation to the planned disposal of radioactive waste envisages unchanged or more restrictive authorised limits and associated requirements than in the existing permit, or if your plans amount to trivial operations.

Scope of the Direction

Paragraph 2.(1) of the Direction lists the operations that are within its scope, for which a transboundary consideration assessment may be required. You must review the paragraph to determine whether the Direction applies to the radioactive substances activity you intend to carry out on the premises.

In the Direction, SEPA considers that the following sub-paragraphs under paragraph 2.(1):

- (g) the handling and processing of artificial radioactive substances on an industrial scale
- and
- (k) the industrial processing of naturally occurring radioactive materials subject to a discharge authorisation

both mean managing quantities of such radioactive substances above the levels contained in Schedule 1 to the [Radiation \(Emergency Preparedness and Public Information\) Regulations 2019](#) at any one point in time. Where more than one radionuclide is involved, you should use the sum of fractions calculation to determine if your operation falls within this meaning. You should exclude from your calculations the activities of any sealed radioactive sources you manage.

Trivial operations

You are not required to submit a transboundary consideration assessment if your plans for disposal of radioactive waste, considered in their entirety, amount to trivial operations. The Direction states that “trivial operations” means operations that have no or negligible radiological impact in notifiable countries.

However, for the purposes of the Direction, SEPA considers that neither of the operations listed in the following sub-paragraphs under paragraph 2.(1):

- (a) the operation of nuclear reactors except research reactors whose maximum power does not exceed 1 MW continuous thermal load)

and

- (b) the reprocessing of irradiated nuclear fuel

can be trivial operations.

SEPA considers the following to be trivial operations for the purposes of the Direction:

- Those operations listed in 2.(1)(c) to (i) and (k) of the Direction, if the assessed maximum exposure levels from releases in normal conditions to adults, children and infants in the vicinity of the operation are below 10 µSv per year and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs, to notifiable countries.
- The operation listed at 2.(1)(k) if it takes place within the Scottish area of the United Kingdom’s offshore area, more than 20km from the tidal limit, and is subject to an EASR permit to discharge no more than 2GBq each per year of Ra-226, Ra-228, Pb-210 and Po-210. This is supported by SEPA’s offshore model for NORM discharges in the North Sea.
- The operation listed at 2.(1)(j), the emplacement of radioactive waste above or under the ground without the intention of retrieval, if the assessed maximum exposure levels from post closure releases in normal conditions to adults, children and infants in the vicinity of the operation are below 1 mSv per annum and there are no exceptional pathways of exposure, e.g. involving the export of foodstuffs to notifiable countries.

Transboundary consideration assessment

If, after reviewing the above, you determine that you are required to submit a transboundary consideration assessment with your application, please refer to [COMMISSION RECOMMENDATION of 11 October 2010 on the application of Article 37 of the Euratom Treaty](#) Annex I for the information you need to include in your transboundary consideration assessment. You must submit this assessment to SEPA with your EASR application for a new permit or variation to your existing permit.

NEW PERMIT APPLICATIONS ONLY

Schedule 8, paragraph 15(2) of EASR requires specific questions to be included in applications for new radioactive substances activities permits, and the relevant questions have been reproduced in this section of the form. SEPA will inspect you to confirm that the information is present and to a suitable and sufficient standard.

Please note that if you are applying for a variation or surrender, these questions do not need to be answered.

Many of the requirements that SEPA will include in your permit are standard conditions and can be found on SEPA's website along with the guidance. It is recommended that you read these conditions prior to making application. The specific standard conditions have been referenced to each question, where possible.

Some of these requirements will overlap with Health and Safety legislation requirements (e.g., local rules). There is no need to create separate documentation just to satisfy the requirements of your permit. However, SEPA does recommend that you ensure that any existing documentation does cover public exposure situations.

In the interests of data protection, we recommend that you only use job or post titles and not individual names in answering these questions.

2e. Please provide information on who is responsible and the organisational arrangements for protection and safety with regard to public exposure from the management of the radioactive substances.

SEPA is looking for how you will control access to the radioactive substances. For example, the site manager is the only person who holds the keys to the room where the radioactive sources are kept, and the keys will only be released if they have been signed for. An organogram of the relevant part(s) of the organisation may be helpful to illustrate the relationships discussed.

The applicable standard conditions are A.2, A.3, A.4, A.6, B.4, and B.7.

Please note that this reflects your internal arrangements and should not be confused with the Fit and Proper Person test that SEPA undertakes to ensure that you are in control of the radioactive substances activity.

2f. Please provide information on the competencies and training of staff involved in managing the radioactive substances.

SEPA expects that all staff who will be involved in the management of the radioactive substances will have appropriate training. Training can include formal qualifications, specific radiation protection courses, toolbox talks and mentoring and should be commensurate with the level of responsibility the individual has in relation to the sealed sources.

The applicable standard conditions are A.2 and A.5.

2g. Please provide details of the design features of your premises and equipment that will ensure adequate protection against public exposure?

SEPA expects that the design of your facilities and equipment will prevent a member of the public receiving an exposure as well as not creating new, additional, or more difficult to dispose of waste to manage should you cease carrying on the authorised activities.

The applicable standard conditions are A.6, B. 4 and G.1.

2h. Please provide the anticipated public exposures in normal operation of your radioactive substances activity.

The purpose of this assessment is to assess the quality and extent of protection and safety provisions needed, including engineering features and administrative procedures and to define the operational limits and condition of operation. The assessment will support your application and any limits you have applied for.

The applicable standard conditions are A.3, A.6, B.4, B.7, G.1, G.2 and H.1.

2i. Have you carried out an assessment of the activity and the premises in order to-

- (i) Estimate, to the extent practicable, the probability and magnitude of a potential public exposure.**
- (ii) Assess the quality and extent of protection and safety provisions, including engineering features as well as administrative procedures; and**
- (iii) Define the operational limits and conditions of operation?**

SEPA expects that, in accordance with international recommendations, you will have carried out an assessment of your planned activity that will have considered the above points. The assessment should be commensurate with the level of risk that the radioactive substances activity presents.

The assessment will have considered a much wider spectrum of issues; however, for the purposes of this application, SEPA is interested in the aspects that may affect public exposure and what measures you will take to minimise this.

The applicable standard conditions are A.3, A.6, B.4, B. 7, G.1 and H.1.

2j. Do you have emergency procedures relating to the radioactive substances activities?

SEPA expects that you will have appropriate emergency procedures in the event of an emergency. These procedures must include informing SEPA as soon as reasonably practicable.

The applicable standard conditions are A.9 and B.9.

2k. Do you have arrangements to maintain, test, inspect and service the relevant equipment and facilities to continue to meet the design requirements, operational limits, and conditions of operation throughout their lifetime?

SEPA expects that you will inspect, and maintain where necessary, the equipment and facilities associated with the radioactive substances activities to ensure that the potential for an unexpected public exposure is minimised. The level of inspection, testing, maintenance, and servicing should be commensurate with the exposure consequences. The arrangements may include service contracts by external specialists.

The applicable standard conditions are A.6, A.7 and B.4.

2l. Please provide details of how you intend to provide quality assurance for the radioactive substances activity.

SEPA expects that you will know how you intend to comply with the conditions and limitations of your permit and that you will periodically check that you continue to comply. This may be demonstrated by suitable environmental management systems that require audits of compliance against your permit. Accreditation against an ISO standard is unlikely to be sufficient by itself. The level of quality assurance should be commensurate with the risk.

In addition, please provide information on how you intend to demonstrate compliance with any limits applied for. For example, do you intend to directly measure the discharge or is it arrived at by calculation?

If you intend to directly measure or sample the discharge, please provide the following information:

- how you will carry out the measurement/sampling.
- who will carry out the measurement/sampling (including their training).
- the parameters to be analysed for (both radioactive and non-radioactive).
- the frequency of measurement/sampling; and
- the equipment to be used (including its calibration).

If you intend to demonstrate compliance by calculation, please explain why this method is preferable to direct measurement, what assumptions you have made in the calculations and how often you intend to review the method.

The applicable standard conditions are A.1 and A.2.

2m. Have you included documentation confirming that the person you intend to transfer your radioactive waste to is willing, in principle, to accept the waste?

It is required that you include a copy of a letter from each person intended to receive the radioactive waste for disposal showing the official name, official address, site name, site address and environmental permit reference (if applicable) and indicating their willingness, in principle, to accept the radioactive waste in question.

SECTION 3: Radioactive Material Holdings

This section must be completed if you intend to apply for a new permit, or to vary an existing permit, that involves the management of radioactive material in the form of unsealed sources. This section is not applicable to nuclear sites.

If you intend to receive samples, contaminated items (e.g., laundry or NORM contaminated components) from another person or place that contains radioactive substances (either radioactive material or radioactive waste), please complete Section 7 Receipt of Radioactive Waste Contaminated Items or Samples from Another Person or Place.

“Radioactive material” and “unsealed source” have the same meaning as the in Schedule 8 of EASR.

Please note: to apply for a registration for sealed radioactive sources, you must complete a separate application form. The modular application form is not suitable for this type of application and no information relating to sealed sources must be entered on this form.

3a. Please provide details in the table below of the radioactive material to be managed

Please complete the table with the unsealed sources you intend to keep and use:

- ‘Radionuclide’ - state the full name of the element followed by the mass number of the isotope (e.g., ‘Carbon-14’).
- ‘Maximum Activity’ - State the maximum quantity of each radionuclide that will be on the premises at any one time. This must be quoted in becquerels (Bq), or multiples thereof (e.g., kBq, MBq, GBq), and must consider all radioactive material comprising the radionuclide in question including stocks, samples, aliquots etc. but **DOES NOT** include waste.
- ‘Expected Monthly Usage’ - The maximum amount of each radionuclide that is expected to be used each month in becquerels (Bq) or multiples thereof; and
- ‘Purpose for which Radioactive Material will be used’ - List all the purposes for the specified radionuclide. Please use generic categories where possible (e.g., medical diagnosis and, treatment, scientific research). SEPA may ask for more detailed information during the determination process. Please note that the purpose will usually be more descriptive of how you are using the source than the justified practice.

For variations, it is only necessary to complete the table where you intend to hold new radionuclides or where there is a proposed change in the number/activity/purpose of an existing radionuclide. In such cases, all unsealed sources must be listed, including those already appearing on an existing permit to avoid confusion on what is to be authorised. It may be necessary to provide additional information on a separate sheet.

Please also indicate the type of change requested by selecting ‘new request’, ‘increase requested’, ‘reduction requested’ or ‘unchanged’ from the drop-down menu for each radionuclide.

3b. Please describe how the limits being applied for were determined.

SEPA expects a robust methodology to be submitted including a full list of all assumptions used and calculations made in arriving at the limits for each radionuclide in the above table. The starting point is for you to determine the minimum activity you need to carry out whatever task you intend (e.g., experiment, imaging, etc.). It is recommended that you take account of other considerations other than just the minimum activity required for the task, such as what size pots are commercially available and the shelf-life of the chemical components which may degrade more quickly than the radioactive half-life of the radionuclide.

Example 1: a laboratory expects to conduct 2 experiments using 10 MBq of C-14 every week, therefore needing 20 MBq every week. The sources will be ordered monthly, so a stock of 80 MBq is required to get through a four-week month and 100 MBq for a five-week month. Discussions with the supplier indicates that the radionuclide can only be supplied in 37.5 MBq pots, so to have enough for a five-week month, the laboratory will need to order 3 pots per month ($3 \times 37.5 \text{ MBq} = 112.5 \text{ MBq}$). Therefore, allowing for some variability in pot activity, the laboratory applies for a limit of 115 MBq.

Example 2: a hospital intends to increase its usage of Tc-99m from their existing limit of 500 MBq. The increase in usage is expected to be 2 doses of 37.5 MBq each morning and afternoon during clinics held 3 times a week ($4 \times 37.5 \text{ MBq} = 150 \text{ MBq}$). Since Tc-99m decays relatively quickly, the doses are supplied at higher activity than that required, so a limit for the “new” usage has headroom of 50 MBq added to allow for the decay ($150 \text{ MBq} + 50 \text{ MBq} = 200 \text{ MBq}$). The new total limit applied for is 700 MBq (existing 500 MBq + 200 MBq new usage).

Examples 3: a laboratory analyses routine samples from a client for total alpha activity. Five samples are received monthly and kept for a further six months after analysis for QC purposes, before being disposed of as waste. Therefore, thirty samples are held on site at any one time. The client has advised previous data indicate the activity per sample is no more than 100 Bq/g, and the sample size will be 500 g, meaning a maximum activity of 1.5 MBq held on site. The lab also holds a 1 MBq mixed isotope unsealed source to use as a tracer in the analytical procedure. Therefore, a limit of 2.5 MBq alpha emitting radionuclides is applied for.

3c. Please provide details of how the radioactive material will be stored when not in use

You will be required to demonstrate that radioactive materials will be kept securely, preventing loss, theft, or damage to the radioactive materials through contact with other hazardous substances (e.g., flammable, corrosive, explosive) and by unauthorised persons. You will also be required to demonstrate that suitable arrangements are in place to account for radioactive material. Only a brief description of the measures should be provided on the application form. The full arrangements, including procedures, will be examined when the premises are inspected.

3d. Please state how you intend to transfer or dispose any radioactive waste generated

The purpose of this question is to make sure that any radioactive waste generated will have a transfer or disposal route. It may be that the route is being applied for as well. If so, please indicate this here.

For variations, you only need to detail any new waste streams that will be generated or if, as a result of the proposed changes, your arrangements for transfer or disposal have significantly changed.

3e. For applications relating to the introduction of radioactive material into the environment or into organisms that leave the authorised place, you must submit a suitable dose assessment in relation to public exposure.

If you intend to introduce radioactive material into the environment or introduce it into organisms that will leave the authorised place, SEPA would expect that the application is supported by a suitable dose assessment. In particular, the assessment should highlight any situations where waste arising from the introduction requires special precautions in its management. This may overlap with assessments for other purposes (e.g., occupational exposure).

Please note that introducing radioactive material into organisms that do not leave the authorised place, for example injecting animals in laboratory where the animals remain in the laboratory, does not require a dose assessment to be submitted. However, you still may need to submit a dose assessment if you intend to discharge radioactive waste into the environment via another means (e.g., sewer disposal).

SEPA does not recommend any particular model for carrying out dose assessments. However, whatever model is used, it is imperative that all assumptions used, and calculations made are clear and the outcome can be replicated. SEPA will use its own confirmatory modelling to ensure that the outcome submitted is reasonable. You may require assistance from an RWA to undertake these assessments.

SECTION 4: Limits for Liquid Discharges to the Environment

You must complete this section if you are applying for:

- (i) a new permit to discharge liquid radioactive waste directly to the environment or the public sewer, drain, conduit, etc.; or
- (ii) a variation to add or change a liquid disposal route or a limit associated with a liquid disposal route in an existing permit.

This section is **not** to be used for offshore disposals from installations directly to sea or re-injection. These types of disposals are captured in Section 8.

Please note that Section G.4 of the standard conditions for radioactive substances activities will allow you to dispose of small quantities of radioactive aqueous liquid waste to a relevant sewer, relevant river, or the sea. You are only required to apply for bespoke limits if you require a higher limit than the standard condition provides.

4a. Please indicate by which route you intend to discharge liquid radioactive waste to the environment

Please indicate where your radioactive liquid effluent will be discharged:

- the public sewer, as defined in the Sewerage (Scotland) Act 1968 and the name of the wastewater treatment plant that receives the liquid radioactive waste discharge. If your premises discharge liquid radioactive waste to more than one wastewater treatment plant, all plants must be listed. In this case, it is also recommended that a site drawing is included to indicate which buildings/facilities discharge to which wastewater treatment plants.
- a watercourse (including rivers, estuaries, burns and lochs) and the name of the watercourse (e.g., River Forth). If there is more than one discharge point for liquid radioactive waste, then the names for all discharge points must be included. In this case, it is recommended that a site drawing is included to indicate which buildings/facilities discharge to which water body at which location.
- by disposal to sea from a land-based facility.
- other (e.g., soakaway). If this option is chosen, please provide more details in the space provided.

For variations, it is only necessary to indicate any new discharge routes being applied for.

4b. Please provide the information requested in the table below

Please provide a breakdown of the liquid waste to be discharged with the following information:

- radionuclide (or group of radionuclides) - state the full name of the element followed by the mass number of the isotope (e.g., 'Carbon-14').

- what liquid limit you are applying for in becquerels (Bq) or multiples thereof (kBq, MBq, GBq) per unit of time (e.g., day, week, month, year); and
- name (or descriptor) of the discharge point(s) if it has one.

If you have multiple discharge points that feed into a common drain (e.g., designated sinks), you are only required to name or describe the point that the common drain enters the watercourse or sewer.

For variations, it is only necessary to complete the table where you intend to dispose of new radionuclides or there are changes to an existing limit. In such cases, all authorised liquid disposals to the environment must be listed, including those already appearing on an existing permit to avoid confusion on what is to be authorised. It may be necessary to provide additional information on a separate sheet.

4c. Please describe how the limits being applied for were determined

Please provide information on how the liquid limits for each radionuclide or group of radionuclides applied for were determined, including all assumptions made.

Example 1: one laboratory on a premises intends to carry out 2 experiments a week using tritium that results in 5 MBq of liquid waste per experiment being generated ($2 \times 5 \text{ MBq} = 10 \text{ MBq/week}$; assume 50 MBq/month). The activity has been empirically determined as the maximum activity generated per experiment. Another laboratory on the premises intends to carry out different experiments using tritium 2-3 times per month which has been calculated to result in a maximum activity of 8 MBq of liquid waste per experiment ($3 \times 8 \text{ MBq} = 24 \text{ MBq/month}$). However, the second experiment will also result in aliquots being generated which will be retained for up to 3 months for QA purposes. Each aliquot has a maximum activity of 1 MBq, and there will be a maximum of 10 aliquots produced per experiment ($3 \text{ experiments} \times 10 \text{ aliquots} \times 1 \text{ MBq} = 30 \text{ MBq/month}$). It is intended that these aliquots will be disposed of on a rolling basis at the end of the month after the 3-month retention period. Therefore, the applicant will require a minimum tritium limit of 104 MBq/month. Allowing for some headroom, a limit of 110 MBq/month for tritium has been applied for.

Example 2: a hospital intends to introduce a new procedure using Tc-99m that will produce liquid waste with an activity in excess of the hospital's current authorised limit. Each procedure is expected to require a nominal 600 MBq dose to the patient and it is anticipated that a maximum of 40 patients can be treated in the course of a month ($4 \text{ patients/day} \times 2 \text{ clinics/week} \times 5 \text{ weeks/month}$). Using the IPEM Medical & Dental Guidance Notes and SEPA's RASPAN 2010-02, the liquid waste disposal factor for Tc-99m is 30%. Therefore, the hospital will need to be able to accommodate another 7.2 GBq in the liquid limit for Tc-99m ($40 \text{ patients/month} \times 600 \text{ MBq/patient} \times 30\% \text{ disposal factor}$).

Example 3: an applicant intends to collect and accumulate liquid waste containing S-35 on his premises and discharge the waste via a non-radioactively permitted discharge pipe to the local burn once a week. The original intention had been to apply for a monthly limit which was supported by the results of the dose assessment. However, the liquid waste also contained non-radioactive hazardous properties in the form of heavy metals that would have exceeded the existing permit's limits for that substance. Therefore, the applied for limits for S-35 were constrained by the heavy metal limits in the existing permit.

For variations, it is only necessary to provide information on new radionuclides or changes to an existing limit.

4d. Please provide details of any significant non-radioactive properties of the radioactive waste you intend to discharge and what arrangements you have made to mitigate against these hazards

It is your responsibility to ensure that any liquid radioactive discharges do not contain any non-radioactive properties (i.e., heavy metals, solvents, hydrocarbons, etc.) that may render it unsuitable for discharge to the chosen route (e.g., radioactive solvents discharged to the public sewer that might affect the receiving wastewater treatment plant's biological treatment ability). To demonstrate that these non-radioactive properties have been considered, and to determine whether SEPA requires setting appropriate limits or conditions in any permit issued, the information below is required.

- Name and/or chemical composition of each non-radioactive substances.
- Concentration of each non-radioactive substance in the waste to be discharged; and
- Measures taken to minimise the non-radioactive substances in the waste to be discharged.

For variations, it is only necessary to provide information on new waste streams, new radionuclides and any non-radioactive properties that have not been considered in an existing permit.

4e. Have you submitted a dose assessment demonstrating that your proposed discharges will not adversely affect the public?

If you are applying for:

- (i) a new permit to discharge liquid radioactive waste directly to the environment or the public sewer; or
- (ii) a variation to add a liquid discharge route or add or increase a limit associated with a liquid discharge route in an existing permit.

You must assess the dose to the most likely exposed individual(s) who are **NOT** involved in the work with the radioactive substances and provide a copy of the results as well as the calculations used, and assumptions made.

SEPA does not recommend any particular model for carrying out dose assessments. However, whatever model is used, it is imperative that all assumptions used, and calculations made are clear and the outcome can be replicated. SEPA will use its own confirmatory modelling to ensure that the outcome submitted is reasonable.

Please note if application is being made for more than one discharge route, the dose assessment must consider the dose from all possible routes for the most exposed individual, i.e., dose from solid + liquid + gaseous disposals must be less than the dose constraint of 300 micro-Sieverts/year and preferably beneath the threshold for optimisation of 20 micro-Sieverts/year. SEPA will typically not seek to secure further reductions in the exposure of members of the public below this level provided it is satisfied that the applicant intends to use Best Practicable Means (BPM) to limit discharges.

SECTION 5: Limits for Gaseous Discharges to the Environment

You must complete this section if you are applying for:

- (i) a new permit to discharge gaseous radioactive waste directly to the environment; or
- (ii) a variation to add or change a gaseous disposal route or a limit associated with a gaseous disposal route in an existing permit.

Gaseous radioactive waste means radioactive waste in the form of gases and associated mists and particulate matter.

Please note that Section G.5 of the standard conditions for radioactive substances activities will allow you to dispose of small quantities of radioactive gaseous waste to the environment in the form of fugitive emissions from a container. You are only required to apply for bespoke limits if you require more substantial discharges.

5a. Please provide the information requested in the table below

Please provide a breakdown of the gaseous waste to be discharged with the following information:

- radionuclide (or group of radionuclides) - state the full name of the element followed by the mass number of the isotope (e.g., 'Carbon-14').
- what gaseous limit you are applying for in becquerels (Bq) or multiples thereof (kBq, MBq, GBq) per unit of time (e.g., day, week, month, etc.); and
- name (or descriptor) of the gaseous discharge point(s). This may be a stack, fume hood discharge point or exhaust vent from a piece of plant/lab equipment used for discharging radioactive waste.

For variations, it is only necessary to complete the table where you intend to dispose of new radionuclides or there are changes to an existing limit. In such cases, all authorised gaseous disposals to the environment must be listed, including those already appearing on an existing permit to avoid confusion on what is to be authorised. It may be necessary to provide additional information on a separate sheet.

5b. Please describe how the limits being applied for were determined

Please provide information on how the gaseous limits for each radionuclide or group of radionuclides applied for were determined, including all assumptions made.

Example 1: a laboratory wishes to carry out work with I-125 which will result in approximately 2.5 MBq per experiment being vented to atmosphere via a fume cupboard. Only 3 such experiments can be carried out per month due to staff time restrictions. Therefore, the applicant will need approximately 7.5 MBq per month to accommodate the planned work. Allowing some headroom for the variability of the activity released a limit of 8 MBq has been applied for.

Example 2: a facility intending to carry out the removal of NORM scale from offshore components plans to install an extraction system to remove any airborne particulate from the area where the components are cleaned. The facility's RWA has calculated that the maximum activity that could be discharged per month if the facility were running at full capacity would be 1 MBq of alpha-emitting radionuclides. The dose assessment for the discharge indicates that this amount of activity would have negligible environmental consequences. Although the operator intends to install HEPA filters as part of the extraction system, which would significantly reduce the activity discharged, a limit of 1 MBq has been applied for.

For variations, it is only necessary to provide information on new radionuclides or changes to an existing limit.

5c. Please provide details of any significant non-radioactive properties of the radioactive waste you intend to discharge and what arrangements you have made to mitigate against these hazards.

It is your responsibility to ensure that any gaseous radioactive discharges do not contain any non-radioactive properties (i.e., heavy metals, solvents, hydrocarbons, etc.) that may render it unsuitable for discharge to the environment. To demonstrate that these non-radioactive properties have been considered, and to determine whether SEPA requires setting appropriate limits or conditions in any permit issued, the information below is required.

- Name and/or chemical composition of each non-radioactive substances.
- Concentration of each non-radioactive substance in the waste to be discharged; and
- Measures taken to minimise the non-radioactive substances in the waste to be discharged.

For variations, it is only necessary to provide information on new waste streams, new radionuclides and any non-radioactive properties that have not been considered in an existing permit.

5d. Have you submitted a dose assessment demonstrating that your proposed discharges will not adversely affect the public?

If you are applying for:

- (i) a new permit to discharge gaseous radioactive waste directly to the environment; or
- (ii) a variation to add a gaseous disposal route or add or increase a limit associated with a gaseous disposal route in an existing permit

You must consider the dose to the most likely exposed individual(s) who are **NOT** involved in the work with the radioactive substances. Please provide a copy of the results as well as the calculations used, and any assumption made.

SEPA does not recommend any particular model for carrying out dose assessments. However, whatever model is used, it is imperative that all assumptions used, and calculations made are clear and the outcome can be replicated. SEPA will use its own confirmatory modelling to ensure that the outcome submitted is reasonable.

Please note if application is being made for more than one route, the dose assessment must consider the dose from all possible routes for the most exposed individual, i.e., dose from solid + liquid + gaseous disposals must be less than the dose constraint of 300 micro-Sieverts/year and preferably beneath the threshold for optimisation of 20 micro-Sieverts/year. SEPA will typically not seek to secure further reductions in the exposure of members of the public below this level provided it is satisfied that the applicant intends to use Best Practicable Means (BPM) to limit discharges.

SECTION 6: Disposal of Radioactive Waste on Your Site

You must complete this section if you are applying for:

- (i) a new permit to dispose of radioactive waste on or in the authorised place; or
- (ii) a variation to add or change a bespoke condition or limit associated with an existing permit.

Disposal has the same meaning as in Schedule 8 and 9 of EASR and includes abandonment, burial, and deposit.

6a. Please provide details of:

- (i) what types of waste will be disposed of on site
- (ii) where on site the disposals will occur
- (iii) the quantity of waste to be disposed of on site.

Except for the most straightforward disposals, SEPA expects that this information would be contained in an Environmental Safety Case as set out in *the Near-surface disposal facilities on land for solid radioactive wastes: Guidance on Requirements for Authorisation (GRA)* or a Site Wide Environmental Safety Case as set out in the *Management of radioactive waste from decommissioning of nuclear site: Guidance on Requirements for Release from Radioactive Substances Regulation (GRR)*.

The type of waste refers to the general description of the waste in which the radioactive substances are found (e.g., contaminated rubble).

The location of the disposal is usually best described using a site plan.

The quantity is the total mass or volume of waste to be disposed of, not just the radioactive content.

6b. Please provide the information requested in the table below.

Please complete the table with the requested information:

- 'Physical form of the waste' - solid, liquid or gas.
- 'Radionuclide or group of radionuclides' - state the full name of the element followed by the mass number of the isotope (e.g., 'Carbon-14').
- 'Maximum Activity of each radionuclide' - State the maximum quantity of each radionuclide that will be disposed of. This must be quoted in becquerels (Bq), or multiples thereof (e.g., kBq, MBq, GBq). Each radionuclide should only be listed once.

For variations, it is only necessary to complete the table where you intend to dispose of new radionuclides or where there is a proposed change in the activity of an existing authorised radionuclide. In such cases, all radionuclides must be listed, including those already appearing on an existing permit to avoid confusion on what is to be authorised. It may be necessary to provide additional information on a separate sheet or report.

6c. Please give details of any significant non-radioactive properties of the radioactive waste and confirmation that the chosen disposal route is suitable for its non-radioactive properties.

It is your responsibility to ensure that any radioactive waste disposals do not contain any non-radioactive properties (i.e., heavy metals, solvents, hydrocarbons, etc.) that may render it unsuitable for disposal. To demonstrate that these non-radioactive properties have been considered, and to determine whether SEPA requires setting appropriate limits or conditions in any permit issued, the information below is required:

- Name and/or chemical composition of each non-radioactive substances.
- Concentration of each non-radioactive substance in the waste to be disposed of; and
- Measures taken to minimise the non-radioactive substances in the waste to be disposed.

For variations, it is only necessary to provide information on new waste streams, new radionuclides and any non-radioactive properties that have not been considered in an existing permit.

6d. Please describe what (if any) limits you are applying for and how they were determined.

Due to the wide range of disposals this section caters for, it is not possible to provide meaningful guidance. It is strongly recommended that you engage with SEPA at the earliest opportunity to discuss the methodology you intend to use.

6e. Please describe how this disposal represents Best Practicable Means (BPM)

If a permit is granted by SEPA, it will require you to demonstrate that the chosen disposal route is optimised and represents Best Practicable Means (BPM). You are required to evaluate all practicable options for the management of the waste and when evaluating the options to consider a range of attributes to ensure that the proposed disposal route represents BPM for the management of that waste. These attributes are set down in the permit and include (where relevant) the following:

- Economic costs
- Social benefits
- Radiological exposures to the public
- Occupational radiological exposures
- Radiological impact on the environment
- Conventional safety
- Consistency with the Waste Hierarchy
- Impact from the non-radioactive properties of the radioactive waste, including climate change emissions
- Applicable Government policy.

For further guidance on BPM, please refer to “Satisfying the ALARA requirements and the role of Best Practicable Means”, available on SEPA’s website (<https://www.sepa.org.uk/regulations/radioactive-substances/guidance-and-reports/>)

6f. Have you submitted a dose assessment demonstrating that your proposed disposals will not adversely affect the public?

You must assess the dose to the most likely exposed individual(s) who are **NOT** involved in the work with the radioactive substances and provide a copy of the results as well as the calculations used, and assumptions made. If both liquid and solid waste disposals are expected, then the doses are additive if to the same exposed individuals.

SEPA does not recommend any particular model for carrying out dose assessments. However, whatever model is used, it is imperative that all assumptions used, and calculations made are clear and the outcome can be replicated. SEPA will use its own confirmatory modelling to ensure that the outcome submitted is reasonable.

Please note, if an application is being made for a multi-media discharge permit, the dose assessment must consider the dose from all possible routes for the most exposed individual. Calculations must assume the worst case and that all work activities are occurring and therefore available for uptake of dose from that activity at the same time.

The dose from all solid + liquid + gaseous disposals from the installation to the environment must be less than the dose constraint of 300 micro-Sieverts/year and preferably beneath the threshold for optimisation of 20 micro-Sieverts/year. SEPA will typically not seek to secure further reductions in the exposure of members of the public below 20 micro-Sieverts provided it is satisfied that the applicant intends to use Best Practicable Means (BPM) to limit discharges.

SECTION 7: Receipt of Radioactive Waste, Contaminated Items or Samples from Another Person or Place

You must complete this section if you are applying for:

- (i) a new permit to receive radioactive waste, contaminated items or samples at the authorised place from another person or another place; or
- (ii) a variation to add or change a bespoke condition or limit associated with an existing permit.

All contaminated items on the site, whether generated on the site or elsewhere, must be authorised. The receipt of radioactive material does not require specific authorisation; however, it may require inclusion in the table of authorised holdings, especially if items contaminated elsewhere are routinely brought to the site, for example NORM contaminated components for cleaning.

Samples may be either radioactive material or radioactive waste.

Please note that this does **not** include receiving radioactive waste, contaminated items or samples from other buildings that form part of your intended authorised place (e.g., campus-style authorisation).

7a. Please provide details of:

- (i) **what you intend to do with the waste/contaminated items/samples on your site**
- (ii) **how you intend to transfer/dispose of the received waste/contaminated items/samples once you are finished; and**
- (iii) **how you intend to manage any secondary wastes that arise.**

If you intend to accept radioactive waste, contaminated items, or samples, you must supply details on:

- what you intend to do with the received waste, contaminated items, or samples whilst it is on your site (e.g., to bulk up into a commercially viable load, for treatment prior to disposal, analysis of samples). The more complex the treatment is, the more detailed the information will require to be provided; and
- how you intend to transfer or dispose of the waste/contaminated items/samples; and
- what you intend to do with any secondary wastes generated as part of the management of the waste/contaminated items/samples. The proposed transfer/ disposal route may form part of the application.

“Treatment” is not a separate authorised activity in EASR. For the purposes of this application, treatment means any physical, chemical, or biological activity that is subjected to the radioactive substance as part of its management but **DOES NOT** include decay storage. Examples of treatment in this context are compaction of waste to minimise its volume and the removal of radioactive contamination (e.g., by laundering, descaling, etc.) from items prior to transfer/disposal or returning the item to use.

The type of information required includes but is not limited to the following:

- a description of the management/treatment process (e.g., laundering of radioactively contaminated clothing, analysis of samples for radioactive content).
- the throughput or capacity of the plant used to treat the radioactive substance (e.g., 15 garments per hour).
- types of secondary waste(s) generated including:
 - its physical form (solid, sludge, liquid, gaseous).
 - its radionuclide content - the full name of the element followed by the mass number of the isotope (e.g., 'Carbon-14').
 - its activity in becquerels (Bq) or multiples thereof (e.g., kBq, MBq, GBq).
 - the volume produced per unit of time (e.g., 1000 litres of wash water per day).
 - any significant hazardous non-radioactive properties associated with the waste(s) (e.g., detergents, hydrocarbons, heavy metals).

For variations that do involve treatment, it is only necessary to complete this box for those new waste streams that are being applied for or if there is a change in the way an existing waste stream will be managed. In such cases, all authorised radioactive wastes that are to be managed must be listed, including those already appearing on an existing permit to avoid confusion on what is to be authorised. It may be necessary to provide additional information on a separate sheet or report.

7b. Please provide the information requested in the table below on the incoming waste, contaminated items, or samples

Please provide the following information on the radioactive waste, contaminated items or samples you intend to receive:

- Type of received waste/item/samples - the physical form (solid, liquid, gaseous), who produced it (i.e., name of organisation) and what process gave rise to it (e.g., laboratory, hospital, etc.), if known.
- radionuclide (or group of radionuclides) - state the full name of the element followed by the mass number of the isotope (e.g., 'Carbon-14').
- mass, in kilograms (kg), or volume in cubic metres (m³) received per unit time (e.g., day, month, year)

For variations, it is only necessary to complete the table where you intend to receive new types of waste/items/samples or where there is a proposed change to an existing limit. In such cases, all types of radioactive wastes, contaminated items or samples authorised to be received must be listed, including those already appearing on an existing permit to avoid confusion on what is to be authorised. It may be necessary to provide additional information on a separate sheet.

Please also indicate the type of change requested by selecting “new request”, “increase requested”, “reduction requested” or “unchanged” from the drop-down menu for each type of waste or sample.

7c. Please provide the information requested in the table below on the storage of the incoming waste, contaminated items, or samples

Please provide the following information on the radioactive waste, contaminated items, or samples you intend to store after receiving them:

- Type of received waste/item/samples - this should reflect the information provided in question 7b.
- Maximum radioactivity stored (by radionuclide and in Bq) - state the maximum activity of each radionuclide in the received waste/item/sample that will be stored on the premises at any one time. State the full name of the radionuclide followed by the mass number of the isotope (e.g., “Carbon-14”). The activity must be quoted in becquerels (Bq) or multiples thereof (e.g., kBq, MBq, GBq).
- Maximum storage time - state the maximum length of time that each type of waste/item/sample will be stored on the premises before it is transferred or disposed of in an appropriate time period (e.g., days, weeks, months).
- Maximum mass or volume to be stored - state the mass, in kilograms (kg), or volume, in cubic metres (m³) of the received waste/items/samples that will be stored at any one time on the premises.

For variations, it is only necessary to complete the table where you intend to receive new types of waste/items/samples or where there is a proposed change to an existing limit. In such cases, all types of radioactive wastes, contaminated items or samples authorised to be received must be listed, including those already appearing on an existing permit to avoid confusion on what is to be authorised. It may be necessary to provide additional information on a separate sheet.

Please also indicate the type of change requested by selecting “new request”, “increase requested”, “reduction requested” or “unchanged” from the drop-down menu for each type of waste or sample.

7d. Please describe how the values in the tables above were determined

Please explain how the information you have provided in the tables for both the receipt and storage of the waste or samples has been derived, including all assumptions made.

7e. Please give details of your proposed waste/contaminated item/sample acceptance criteria and how they will be implemented.

SEPA expects that you will have arrangements to ensure that any radioactive substances received on to your site can be managed in accordance with your permit. One of the main controls is the conditions for acceptance or acceptance criteria that you have developed to demonstrate that the received waste, contaminated items or samples will not contravene your permit.

The acceptance criteria should be developed by determining the limits of acceptability of what your site can safely manage and what your permit will allow. For the more complex situations, it may be necessary to develop an Environmental Safety Case as set out in the *Near-surface disposal facilities on land for solid radioactive wastes: Guidance on Requirements for Authorisation (GRA)*.

The level of detail required should be commensurate with the risk posed by the received waste, contaminated items, or samples, and may include restrictions on physical form (e.g., solid items only), radionuclide content/concentration (e.g., only H-3/C-14 waste < 100kBq per item), measurements, sampling, provenance of the waste (e.g., only healthcare wastes) or any combination of the above. Consideration must also be given to the non-radioactive properties of the received waste.

The manner in which the acceptance criteria are implemented is also important. SEPA expects that appropriate arrangements will be in place to ensure that checks are carried out in a robust fashion by suitably qualified and trained staff and that all checks are recorded and available for inspection.

SECTION 8: Radioactive Waste Disposals to the Offshore Environment

You must complete this section if you are applying for:

- (i) a new permit in order to discharge radioactive waste directly to the sea, excluding produced water, at annual limits greater than 2 gigabecquerels (GBq) for radium-226, radium-228, polonium-210 or lead-210; or
- (ii) an installation that is within 20 kilometres of shore; or
- (iii) reinjection of radioactive waste into the reservoir from an offshore installation; or
- (iv) a variation to add or change a disposal route to the sea or by reinjection or a limit associated with a disposal route to the sea or by reinjection in an existing permit from an offshore installation.

Please note that if your expected disposals of radioactive waste excluding produced water is less than 2 GBq for each of the radionuclides listed above (Ra-226, Ra-228, Po-210, Pb-210), you do not require bespoke conditions for other authorised activities (e.g., receipt of radioactive waste from another person or site), and you are applying for a single installation operating at a single location you may be eligible for a registration instead of a permit.

In this section, radioactive waste refers to wastes in both liquid and solid form. Liquid waste includes produced water and any liquids used for flushing or any liquids generated by the draining of vessels and/or systems during decontamination or cleaning operations.

8a. Please indicate by which route you intend to discharge radioactive waste to the environment

Please indicate where you intend to dispose of your radioactive waste:

- To the sea (>2 GBq of Ra-226, Ra-228, Po-210 and/or Pb-210)
- To the sea (<2 GBq of Ra-226, Ra-228, Po-210 and/or Pb-210) where a registration is not applicable
- Offshore reinjection; or
- Other. If this option is chosen, please provide further details in the space provided.

For variations, it is only necessary to indicate any new disposal routes being applied for.

8b. Please provide the information requested in the table below

Please provide a breakdown of the radioactive waste to be discharged to sea or re-injected with the following information:

- radionuclide - SEPA is looking for specific radionuclides (Ra-226, Ra-228, Pb-210, and Po-210) and these have been pre-populated on the form. Any other radionuclides can be added below these specified radionuclides. For these unspecified radionuclides, state the full name of the element followed by the mass number of the isotope (e.g., 'Uranium-238');

- activity concentration of the waste to be disposed of in becquerels (Bq) or multiples thereof (e.g., kBq, MBq, GBq) per gram (Bq/g); and
- what limit you are applying for in becquerels (Bq) or multiples thereof (e.g., kBq, MBq, GBq) per year.

For variations, it is only necessary to complete the table where you intend to dispose of new radionuclides or where there are changes to an existing limit. In such cases, all authorised radioactive disposals to the environment must be listed, including those already appearing on an existing permit in order to avoid confusion on what is to be authorised. It may be necessary to provide additional information on a separate sheet and list it under the Application Checklist part of Section 1.

8c. Please provide the information requested on Produced Water in the tables below

In the first table please provide a breakdown of the produced water that the installation disposes of to the marine environment with the following information:

- radionuclide - SEPA is looking for specific radionuclides (Ra-226, Ra-228, Pb-210, and Po-210) and these have been pre-populated on the form. Any other radionuclides can be added below these specified radionuclides. For these unspecified radionuclides, state the full name of the element followed by the mass number of the isotope (e.g., 'Uranium-238');
- activity concentration of the waste to be disposed of in becquerels (Bq) or multiples thereof (e.g., kBq, MBq, GBq) per gram (Bq/g).

In the second table please provide information on the volume of produced water that the installation disposes of to the marine environment in a year. It is not SEPA's intention to set limits on the disposal of produced water; however, this information is necessary in assessing the dose consequences of all radioactive disposals from the installation.

8d. Please describe how the waste activity limits being applied for were determined

Please provide information on how the limits for each radionuclide or group of radionuclides applied for were determined, including all assumptions made.

Example: using the 'best result' (i.e., not accounting for sampling/analytical errors), take the worst-case sample analysis for the measured activity of the waste and multiply by the proposed waste volume to be generated.

For projection of the maximum activity to be disposed, taking the worst-case analysis is acceptable; however, when reporting annual waste disposals taking an average activity over a number of analysed samples may be justified.

For variations, it is only necessary to provide information on new radionuclides or changes to an existing limit.

8e. How do you intend to demonstrate compliance with the radioactive waste activity limits being applied for?

Please provide information on how you intend to demonstrate compliance with the limits applied for. For example, do you intend to directly measure the discharge or is it arrived at by calculation?

If you intend to directly measure or sample the discharge, please provide the following information:

- how you will carry out the measurement/sampling;
- who will carry out the measurement/sampling (including their training);
- the parameters to be analysed for (both radioactive and non-radioactive);
- the frequency of measurement/sampling; and
- the equipment to be used (including its calibration).

If you intend to demonstrate compliance by calculation, please explain why this method is preferable to direct measurement, what assumptions you have made in the calculations and how often you intend to review or retrospectively validate the calculations.

SEPA will inspect against the authorised limits, and it is expected that robust methodology will be in place in order to ensure that any data supplied in support of compliance will be as accurate as reasonably practicable.

For variations, it is only necessary to provide information on new radionuclides or changes to an existing limit.

8f. Please describe the contingency arrangements if your waste discharge route(s) become unavailable.

Please provide information on your contingency plans if the disposal route to sea or by reinjection becomes unavailable for any reason. This provides assurance that you have considered this possibility and have put in place suitable contingency plans.

For example, if the authorised disposal route to the sea or by reinjection were to become unavailable, the radioactive waste will be disposed of by transfer to a contractor until such time as the route is restored. Please note that this particular contingency plan is dependent on you either having applied for this disposal route or it already existing in your permit.

8g. Have you carried out a dose assessment relating to the discharge(s) and included it with the application?

If you are applying for:

- (i) a new authorisation in order to discharge radioactive waste directly to the marine environment greater than 2 GBq of Ra-226, Ra-228, Po-210 and/or Pb-210; or
- (ii) a variation to add a disposal route to the environment or add or increase a limit associated with a disposal route to the environment in an existing permit.

You must assess the dose to the most likely exposed individual(s) who are NOT involved in the work with the radioactive substances and provide a copy of the results as well as the calculations used, and assumptions made. If both liquid and solid waste disposals are expected, then the doses are additive if to the same exposed individuals.

SEPA does not recommend any particular model for carrying out dose assessments. However, whatever model is used, it is imperative that all assumptions used, and calculations made are clear and the outcome can be replicated. SEPA will use its own confirmatory modelling to ensure that the outcome submitted is reasonable.

Please note, if an application is being made for multi-media discharge authorisation, the dose assessment must consider the dose from all possible routes for the most exposed individual, including doses from operational liquid produced water disposals as well as the solid and liquid disposals resulting from decontamination and cleaning operations. Calculations must assume the worst case and that all work activities are occurring and therefore available for uptake of dose from that activity at the same time.

The dose from all solid + liquid + gaseous disposals from the installation to the environment must be less than the dose constraint of 300 micro Sieverts/year and preferably beneath the threshold for optimisation of 20 micro Sieverts/year. SEPA will typically not seek to secure further reductions in the exposure of members of the public below 20 micro Sieverts provided it is satisfied that the applicant intends to use Best Practicable Means (BPM) to limit discharges.