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Radiological Habits Survey: Barrow, 2025

Cefas contract C8490

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Glossary

ABP	Associated British Ports
ALARA	As Low As Reasonably Achievable
BAESML	BAE Systems Marine Limited
BSS	Basic Safety Standards
DoENI	Department of Energy Northern Ireland
DNSR	Defence Nuclear Safety Regulator
EA	Environment Agency
EU	European Union
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
IRR	Ionising Radiations Regulations
FSA	Food Standards Agency
FSS	Food Standards Scotland
HPA	Health Protection Agency
MOD	Ministry of Defence
NDAWG	National Dose Assessment Working Group
NIA	Nuclear Installations Act
NIEA	Northern Ireland Environment Agency
NRPB	National Radiological Protection Board
NRS	Nuclear Restoration Services
NRW	National Resources Wales
ONR	Office for Nuclear Regulation
RIFE	Radioactivity in Food and the Environment
RNLI	Royal National Lifeboat Institution
RREMS	Radiological Response and Emergency Management System
RSPB	Royal Society for the Protection of Birds
SEPA	Scottish Environment Protection Agency
UK	United Kingdom
UKHSA	United Kingdom Health and Security Agency

1. Highlights

- The last habits survey completed around the Barrow Shipyards nuclear site was in 2012. At the time of publishing, the 2012 Barrow report could be accessed via <https://www.cefas.co.uk/services/surveys/habits/>.
- A limited number of commercial fishing took place in the aquatic survey area. Three commercial fishermen were identified potting, netting and trawling in the survey area for a wide range of fish and crustacea.
- The collection and consumption of mussels, cockles, winkles, razor shells and samphire from the aquatic survey area were identified.
- The collection of seaweed for use as a fertiliser on an allotment plot was identified.
- Sheep and lambs were identified grazing on salt marsh within the aquatic survey area, and lamb was consumed.
- People were identified living on boats at Askam-in-Furness.
- Discharges from the Barrow Shipyards nuclear site were released to the Walney Channel via a wastewater treatment works. In 2025, there was a decrease in the occupancy rates of employees working in close proximity to liquid sewage sludge and dried sewage sludge, compared to 2012.
- Interviews were conducted at 13 working farms located within the terrestrial survey area, where beef, store cattle, cows' milk and lamb were produced. The production of arable crops for human consumption was not identified in the survey area.
- In 2025, changes of note in the consumption of terrestrial foods were increases in consumption rates of green vegetables, root vegetables, potato, cattle meat and sheep meat, and a decrease in consumption of rabbits/hares compared with 2012. The consumption of pig meat, poultry, wild fungi and freshwater fish were not identified in 2025.
- In 2025, the direct radiation survey area changed as it was determined using the Barrow Shipyards nuclear licensed site boundary and the Ministry of Defence (MOD) authorised site boundary, whereas only the nuclear licensed site boundary was used in 2012.
- The land within the direct radiation survey limit is heavily urbanised and comprised commercial, industrial, residential, and public areas. Many amenities were located within the direct radiation survey area, resulting in high occupancy rates for residents. The highest indoor, outdoor and total occupancy rates across the zones were for residents.

2. Summary

This report presents the results of a survey conducted in 2025 to determine the habits and consumption patterns of people living, working, and pursuing recreational activities in the vicinity of the Barrow Shipyards nuclear site, operated by BAE Systems Marine Limited (BAESML), located in Barrow-in-Furness. BAESML build, test and commission new nuclear submarines, and are currently responsible for the Astute Class and Dreadnought Class programmes. The MOD has an authorised site in the shipyard, where defence-related nuclear activities are undertaken, operating under a statutory authorisation regime under a Crown exemption from the Nuclear Installations Act 1965 (as amended) (NIA 65) (UK Parliament, 1965) without a nuclear site licence. The legal basis for this is the Defence Nuclear Safety Regulations and the Defence Nuclear Safety Regulator (DNSR) are the authorising authority.

The site discharges liquid radioactive wastes into the Walney Channel via a wastewater treatment works, gaseous radioactive wastes via stacks to the atmosphere, and contains sources of direct radiation. The discharges are minor compared with those from other nuclear sites located on the north-west coast of England. The coast and sea in the vicinity of Barrow-in-Furness and south-west Cumbria may be affected by discharges of liquid radioactive waste from the other sites, most notably Sellafield, and the results of this survey are also relevant to those sites.

Three areas were defined as most likely to be affected by discharges and radiation sources:

- The aquatic survey area (for liquid discharges)
- The terrestrial survey area (for deposition from gaseous discharges)
- The direct radiation survey area (for ionising radiation emanating directly from the site)

The occupancy data collected from the direct radiation survey area are also applicable to inhalation and external exposure arising from gaseous discharges from the site.

The following potential exposure pathways were investigated:

- The consumption of food from the aquatic survey area.
- Activities and occupancy over intertidal substrates.
- The handling of fishing gear and sediment.
- Activities and occupancy in and on water.
- Occupancy in close proximity to liquid sewage sludge and dried sewage sludge.
- The use of seaweed as fertiliser or animal feed.

- The consumption of food from the terrestrial survey area.
- The use and destination of produce originating from the survey areas.
- The consumption and use of groundwater and surface water in the terrestrial survey area.
- Activities and occupancy within the direct radiation survey area.
- Any new or unusual exposure pathways.

Information was collected from members of the public by means of interviews and the data obtained for 466 individuals are presented and discussed. High rates of consumption, occupancy over intertidal substrates and handling of sediment and fishing gear are identified using established methods comprising (a) a 'cut-off' to define the high-rate group and (b) 97.5th percentiles. The rates identified can be used in dose assessments. Additionally, profiles of integrated habits data are presented specifically for use in 'total dose' assessments.

The aquatic survey area

The aquatic survey area (Figure 6) covered the intertidal areas along the coast of Cumbria between Tarn Point in the north and Roosebeck in the south, and the adjacent sea area up to 10 km offshore. The Duddon Estuary, Walney Channel and the shore of Walney Island were included.

A limited number of commercial fishing took place in the survey area. The commercial fishermen were potting for whelks, brown crab and common lobster; netting (including trammel, gill, seine and tangle) and trawling for lemon sole, Dover sole, plaice, thornback ray, pollock and cod. It was reported that fishing boats based in Whitehaven were also fishing within the survey area.

Activities taking place on intertidal areas included angling, bait digging, dog walking, wildfowling, collecting peeler crabs, walking, undertaking rescue duties, undertaking coastguard duties, fixing moorings, collecting seaweed, tending livestock, undertaking water sports preparation, sitting on the beach, horse riding, oyster farming, jogging, metal detecting and playing. The collection of samphire, cockles, mussels, razor shells and winkles for consumption was identified within the survey area. Two individuals were identified living on houseboats located at Askam-in-Furness.

Activities at the wastewater treatment works were investigated because liquid waste from the Barrow Shipyards nuclear site was discharged via the sewerage system before entering the wastewater treatment works. During the sewage treatment process, solid matter settles out in tanks to form sludge. Following treatment, the liquid component was discharged via an outfall to the Walney Channel.

Activities taking place in and on water included kite surfing, wake foiling, wind foiling, wing foiling, jet skiing, kayaking, paddleboarding, sub-aqua diving, swimming, boat angling, canoeing, rowing, commercial fishing (potting, gill netting, trammel netting, tangle netting, seine netting) and trawling, power boating, sailing, wading, paddling, boat dwelling, undertaking boat maintenance and working on a boat.

Sheep and lambs were identified grazing on the salt marsh along the Duddon Estuary and were reared for human consumption.

The terrestrial survey area

The terrestrial survey area (Figure 7) covered the land within 5 km from the approximate Barrow Shipyards site centre. The land in the terrestrial survey area was primarily agricultural. Interviews were conducted at 13 working farms, where beef, store cattle, cows' milk and lamb were produced. The production of arable crops for human consumption was not identified in the survey area. Grass (for silage), hay, maize, barley and wheat were grown for animal feed.

Twenty-one allotment sites were identified within the terrestrial survey area where a wide variety of fruit and vegetables were grown. A small number of private gardens were also identified growing produce. No beekeepers were identified who kept hives in the survey area. Wild foods that were collected from within the survey area and consumed included blackberries and damsons. Game shooting was identified taking place on farmland in the terrestrial survey area, where rabbits were shot for pest control. Two people were identified consuming rabbits from the survey area.

Foods from the terrestrial survey area were consumed from the following 11 food groups: green vegetables; other vegetables; root vegetables; potato; domestic fruit; milk; cattle meat; sheep meat; eggs; wild/free foods; rabbits/hares. The mean consumption rates for the adult high-rate groups were above the national adult mean consumption rates that are used for comparison in habits surveys for the following 9 food groups: green vegetables; other vegetables; root vegetables; potato; domestic fruit; milk; cattle meat; sheep meat; eggs.

The consumption of groundwater by humans and livestock was not identified in the terrestrial survey area.

Representatives from BAESML were asked for information about the potential transfer of contamination off-site by wildlife, since radionuclides could enter the food chain or contaminate the environment through this pathway. The site did not undertake any routine controls, since the buildings are enclosed, and it is highly unlikely that wildlife could enter controlled areas.

The direct radiation survey area

The direct radiation survey area (Figure 8) covered the land and sea within 1.0 km of the Barrow Shipyards nuclear licensed site and the MOD authorised site boundaries. The direct radiation survey areas are usually defined from the nuclear licensed site boundary. However, the MOD authorised site was included to ensure that the commissioning of new nuclear submarines in the Devonshire Dock Quay were considered in the survey.

The occupancy data collected from the direct radiation survey area are also applicable to inhalation and external exposure pathways arising from gaseous discharges from the site.

The occupancy rates were analysed in zones according to the distance from the nuclear licensed site boundary. The zones were 0 – 0.25 km, >0.25 – 0.5 km and >0.5 – 1.0 km. The highest indoor, outdoor and total occupancy rates across all zones were for residents. It was noted that many amenities were located within the direct radiation survey area, resulting in high occupancy rates for residents.

Gamma dose rates were measured indoors and outdoors at most of the properties where interviews were conducted in the direct radiation survey area. Background readings were taken over grass at distances beyond 5 km from the approximate site centre of the Barrow Shipyards site. Of the 10 measurements taken indoors and the 21 measurements taken outdoors at locations within the direct radiation survey area, 22 readings were higher than the maximum background reading. However, all readings taken at the time of the survey were below or within the range observed for the Radiological Response and Emergency Management System (RREMS).

Comparisons with the previous survey

Comparisons for adults were made with the results from the previous Barrow habits survey in 2012. Reasons for changes in the consumption and occupancy rates were identified for certain pathways, and these are presented in Section 10 of the report.

For the consumption of foods from the aquatic survey area, the changes of note in 2025 were increases in consumption of molluscs, wildfowl and salt marsh grazed sheep meat, and a decrease in the consumption of crustaceans (Figure 1).

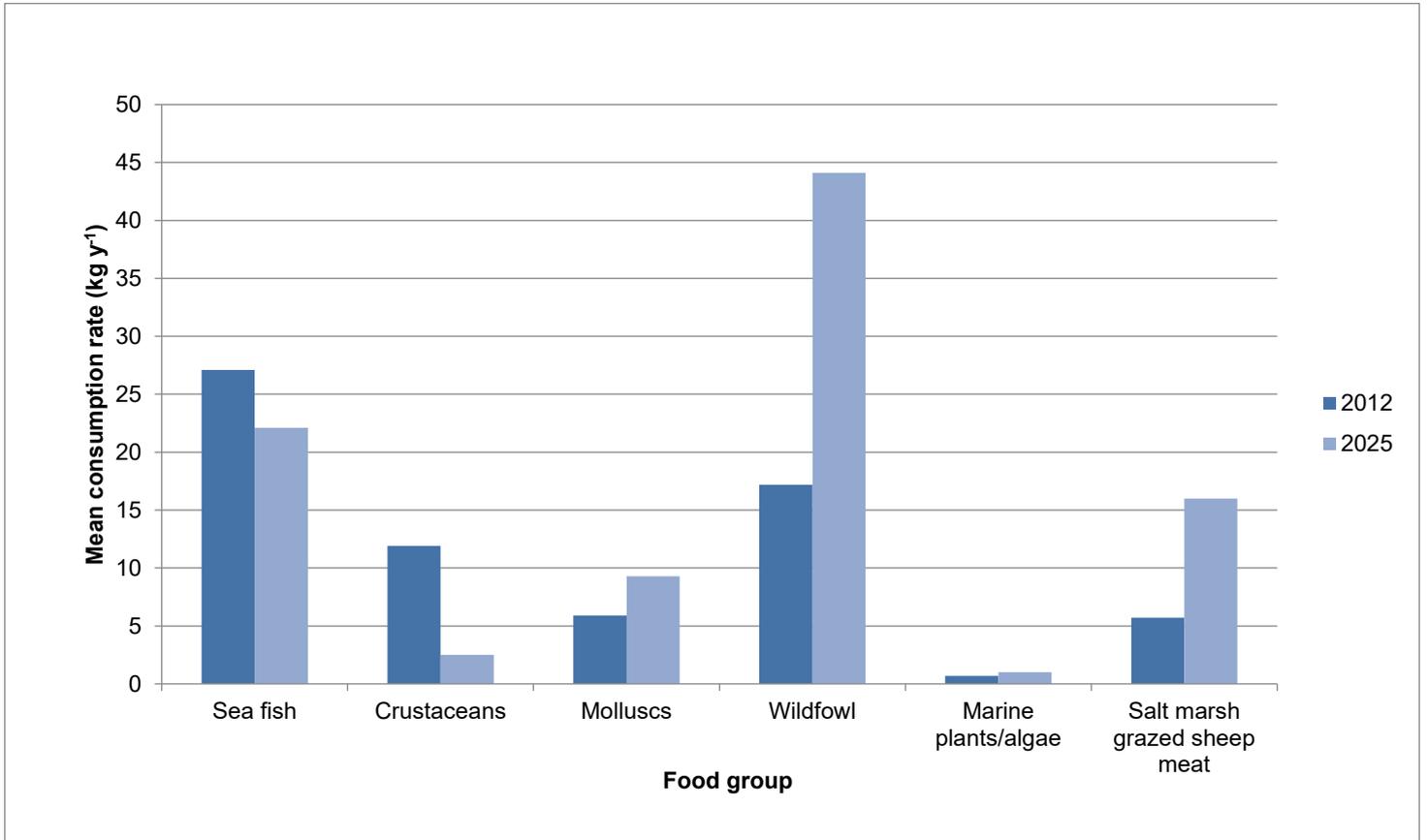


Figure 1. Comparison between 2012 and 2025 mean consumption rates for the high-rate groups for aquatic foods

The changes of note in 2025 for occupancy over intertidal substrates in 2025 (Figure 2) were an increase in occupancy over mud, and a decrease over mud and sand. In addition, an increase in handling sediment and decrease in handling fishing gear. Occupancy over stones was identified in 2025 but not in 2012.

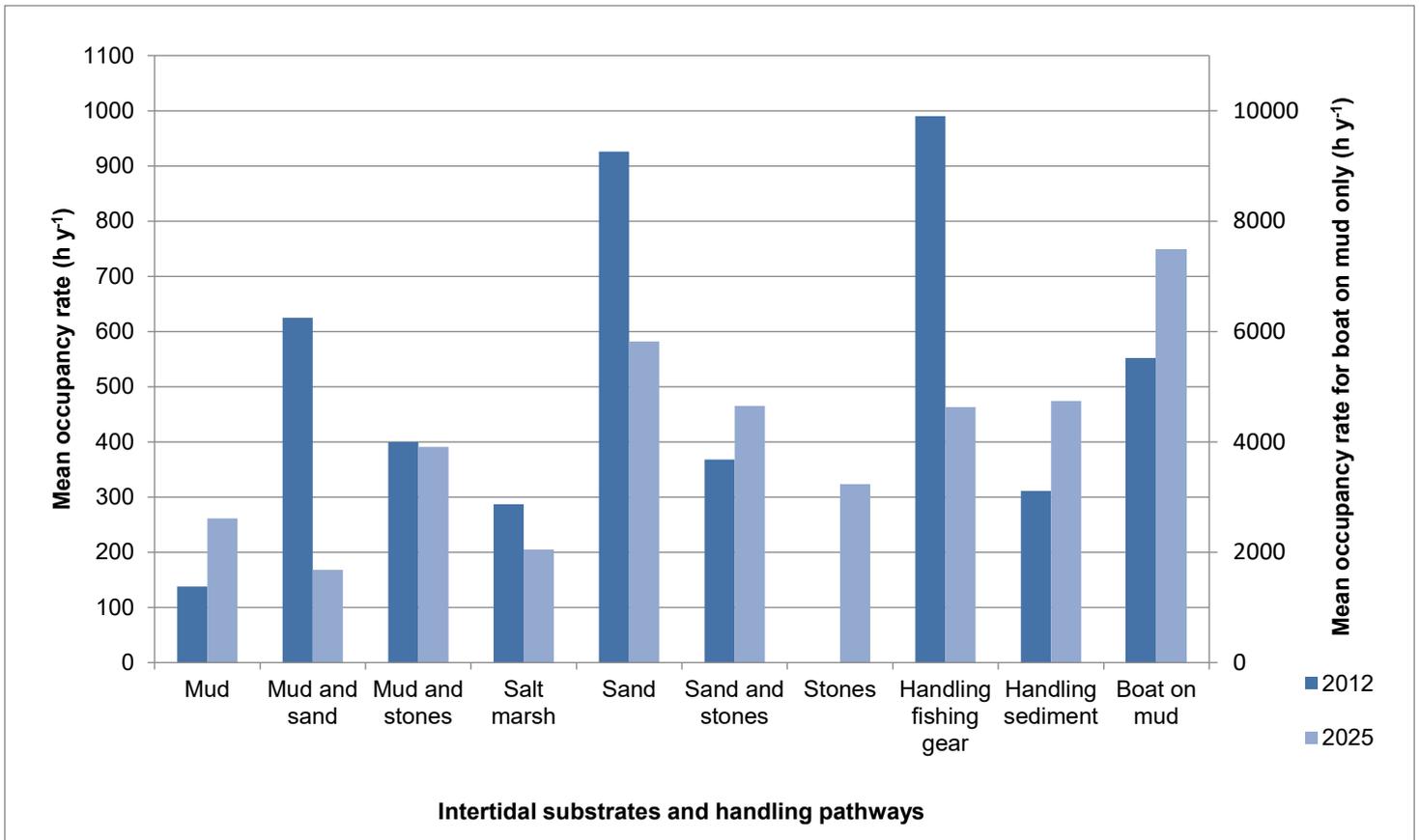


Figure 2. Comparison between 2012 and 2025 mean occupancy rates for the high-rate groups for occupancy over intertidal substrates, and handling pathways

In 2025, changes of note in the consumption of terrestrial foods were increases in consumption rates of green vegetables, root vegetables, potato, cattle meat and sheep meat, and decrease in consumption of rabbits/hares compared with 20212 (Figure 3). The consumption of pig meat, poultry, wild fungi and freshwater fish were not identified in 2025.

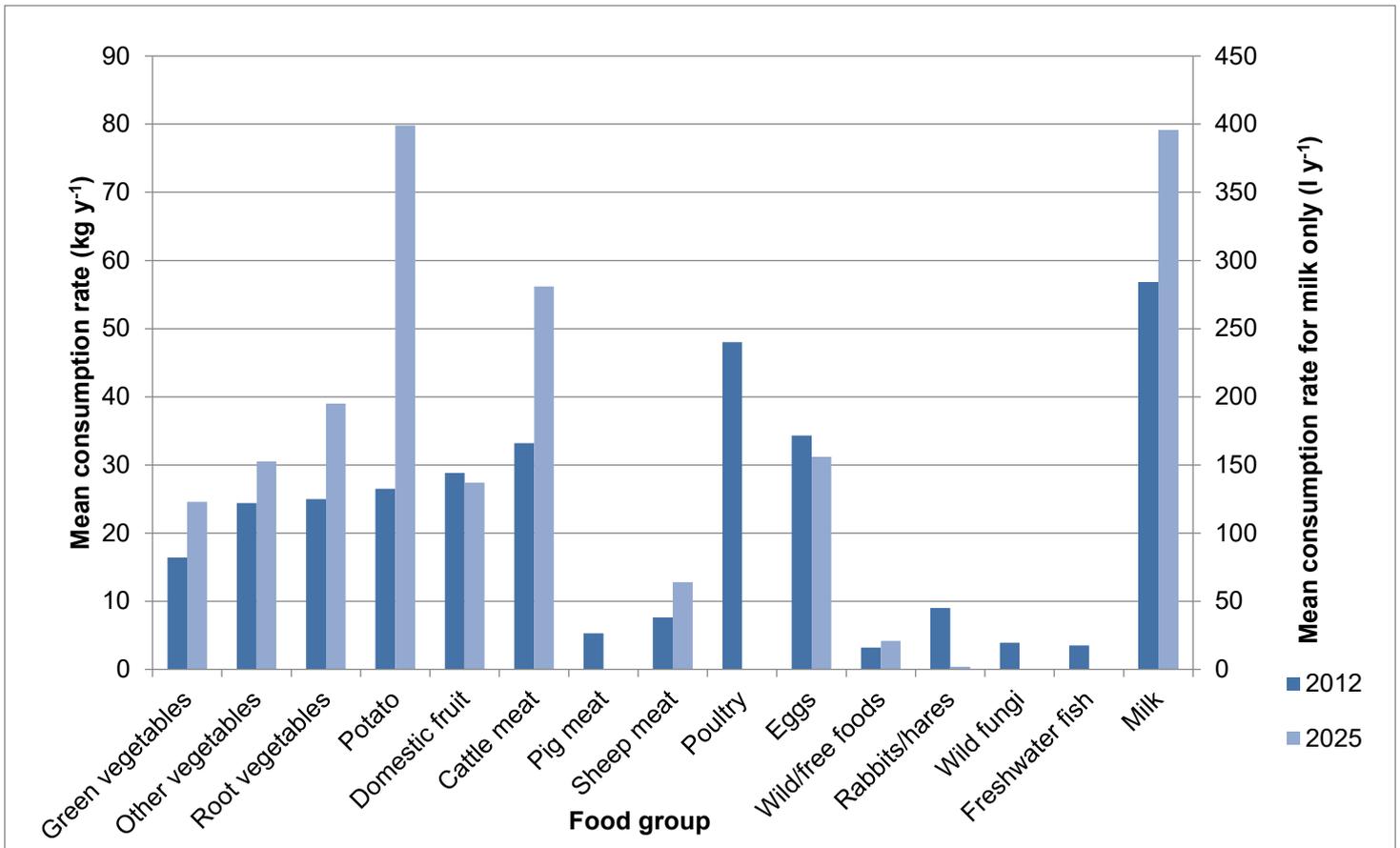


Figure 3. Comparison between 2012 and 2025 mean consumption rates for the high-rate groups for terrestrial foods

The occupancy rates in the direct radiation area were broadly similar in 2012 and 2025 across all zones (Figure 4).

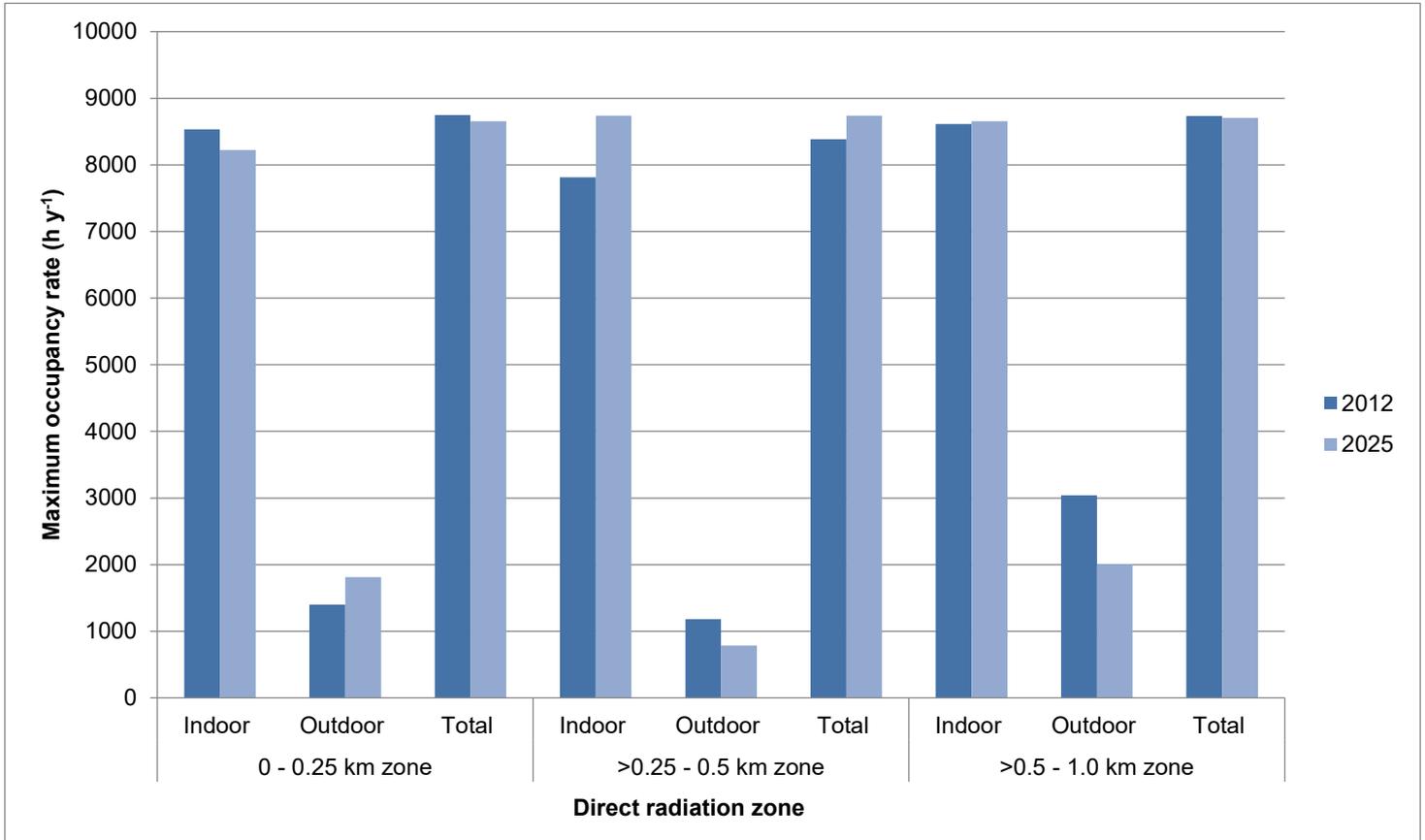


Figure 4. Comparison between 2012 and 2025 maximum direct radiation occupancy rates

Habits survey information for consideration when selecting samples and measurements for the Environment Agency and Food Standards Agency monitoring programmes

The foods and intertidal locations identified in the 2025 Barrow habits survey could be used to assist in the selection of samples and measurements for future monitoring programmes. The foods that were either consumed in the largest quantities in their food groups, or were the only food in their food group, are presented in Section 12.2. These foods could be considered for sample selection for the Food Standards Agency monitoring programme. The current environmental monitoring programme conducted for the Environment Agency adequately covers the Barrow area and no changes are suggested.

3. Introduction

Members of the public might be exposed to radiation as a result of the operations of the Barrow Shipyards nuclear site, either through the permitted discharges of liquid or gaseous radioactive wastes into the local environment, or from radiation emanating directly from the site. The MOD has an authorised site in the shipyard, and for the purpose of this survey, the authorised area and the nuclear licensed area were considered as one site.

This report provides information on activities carried out by members of the public in the vicinity of the nuclear site, which may influence their radiation exposure. This study has been funded by the Environment Agency (EA), the Food Standards Agency (FSA) and the Office for Nuclear Regulation (ONR) in order to support their respective roles in protecting the public from exposure to radiation.

UK policy on the control of radiation exposure has long been based on the recommendations of the International Commission on Radiological Protection (ICRP), which embody the principles of justification of practices, optimisation of protection and dose limitation. Radiological protection of the public is based on the concept of a 'representative person'. ICRP (2007) recommendations use the term 'representative person' for assessing doses to members of the public. It is defined as 'an individual receiving a dose that is representative of the more highly exposed individuals in the population'. The 'representative person' concept is considered equivalent to the previously used 'critical group'.

3.1. Regulatory framework

In England, the EA regulates the discharges of radioactive waste under Environmental Permitting (England and Wales) Regulations 2016 (UK Parliament, 2016). These regulations transpose parts of the revised EU Basic Safety Standards (BSS) Directive 2013/59/Euratom (EC, 2014) which embody the recommendations of the ICRP, particularly ICRP 103 (ICRP, 2007). The revised BSS Directive was adopted in 2013 to consolidate and update existing Euratom provisions for protection against the harmful effects of ionising radiation, by replacing 5 existing Directives and a Commission Recommendation into one Directive covering occupational, medical and public exposure (EC, 2014). Installation and operation of certain prescribed activities can only occur on sites if they are licensed under the Nuclear Installations Act 1965 (as amended) (NIA 65) (UK Parliament, 1965). The ONR has implemented this legislation and is also responsible for regulating, under the Ionising Radiations Regulations 2017 (IRR 17) (UK Parliament, 2017), the exposure of the public to direct radiation from the operations occurring on these sites.

Appropriate discharge limits are set by the EA, after wide-ranging consultations that include the FSA. The FSA is responsible for ensuring that any radioactivity present in food does not compromise food safety and that permitted discharges of radioactivity do not result in unacceptable doses to consumers via the food chain. The FSA also ensures that public radiation exposure via the food chain is within UK acceptable limits (1 mSv).

3.2. Radiological protection framework

Dose standards for the public are embodied in the national policy (UK Parliament, 2012; BEIS, 2018), in guidance from the International Atomic Energy Agency (IAEA), in the Basic Safety Standards for Radiation Protection (IAEA, 1996) and in European Community legislation in the EU BSS Directive 2013/59/Euratom (EC, 2014). The public dose standards were incorporated into UK law under IRR 17. The requirement to observe the conditions laid down in the BSS in England and Wales is incorporated in Environmental Permitting (England and Wales) Regulations 2016 (UK Parliament, 2016). These require that the environment agencies ensure, wherever applicable, that:

- All public radiation exposures from radioactive waste disposals are kept As Low As Reasonably Achievable (ALARA), with social and economic factors being taken into account.
- The sum of all exposures from authorised practices does not exceed the dose limit of 1 mSv a year.
- The dose received from any new source does not exceed 0.3 mSv a year.
- The dose received from any single site does not exceed 0.5 mSv a year.

The dose limit of 1 mSv per year to the public from all anthropogenic sources other than medical applications is also the recommendation made by the ICRP (ICRP, 2007).

The UK environment agencies are also required to ensure that the dose estimates are as realistic as possible for the population as a whole and for reference groups of the population. They are required to take all necessary steps to identify the reference groups of the population, considering the effective pathways of transmission of radioactive substances. Guidance on the principles underlying prospective radiological assessments (for assessments of potential future doses) were provided by the National Dose Assessment Working Group (NDAWG), which consisted of representatives of UK Government Bodies and other organisations with responsibilities for dose assessments (EA, SEPA, DoENI, NRPB and FSA, 2002). NDAWG also published principles underlying retrospective radiological assessment (for assessments of doses already received from past discharges) (Allott, 2005) and possible methods of carrying out these assessments using the data from combined habits surveys (Camplin and others, 2005). NDAWG agreed that the optimal method for performing retrospective dose assessments would be to use habits profiles (profiling method) as described in Camplin and others (2005). This

approach was adopted in Radioactivity in Food and the Environment (RIFE) publications, (for example: EA, FSA, FSS, NRW, NIEA and SEPA, 2025) [Radioactivity in food and the environment \(RIFE\) report - GOV.UK](#). NDAWG published reports on the collection and use of habits survey data in retrospective and prospective dose assessments (NDAWG, 2005; NDAWG, 2012); the principles described in these reports are consistent with those used here. The UK environment agencies, the Health Protection Agency (HPA) (currently United Kingdom Health Security Agency (UKHSA)), and the FSA jointly produced an update of the 2002 interim guidance and principles for assessing prospective doses (EA, SEPA, NIEA, HPA and FSA, 2012). The UKHSA (2021- present) were previously known as the National Radiological Protection Board (NRPB, up to 2005), the HPA (2005-2013) and Public Health England (PHE, 2013-2021).

4. The survey

4.1. Site activity

The Barrow Shipyards nuclear site is located in Barrow-in-Furness in north-west England. The nuclear site is managed and operated by BAE Systems Marine Limited (BAESML). BAESML build, test and commission new nuclear submarines, and are currently responsible for the Astute Class and Dreadnought Class programmes. The MOD has an authorised site in the shipyard, which includes, and extends beyond the boundary of, the nuclear licenced site. Within the nuclear licensed site activities are undertaken under the Nuclear Installations Act 1965 (as amended) (NIA65) (UK Parliament, 1965) which is the primary legislation governing the safety and licensing of nuclear installations. This site is regulated by the Office for Nuclear Regulation (ONR). Where the MOD authorised site extends beyond the boundary of the nuclear licensed site, defence related activities are undertaken under a Crown exemption from the Nuclear Installations Act 1965 (as amended) (NIA 65) (UK Parliament, 1965). The legal basis for this is the Defence Nuclear Safety Regulations and the Defence Nuclear Safety Regulator (DNSR) are the authorising authority.

Habits surveys usually use the nuclear licensed site boundary to define the direct radiation survey area. However, for this survey, the MOD authorised site beyond the nuclear licensed site boundary was included, to ensure the commissioning of new nuclear submarines in the Devonshire Dock Quay were considered. For the purpose of this survey, the Barrow Shipyards nuclear licensed site boundary and the MOD authorised site boundary (Figure 5), were combined as a continuous boundary to determine the direct radiation survey area. In this report, the combined boundary is referred to as 'the nuclear licensed site boundary'.

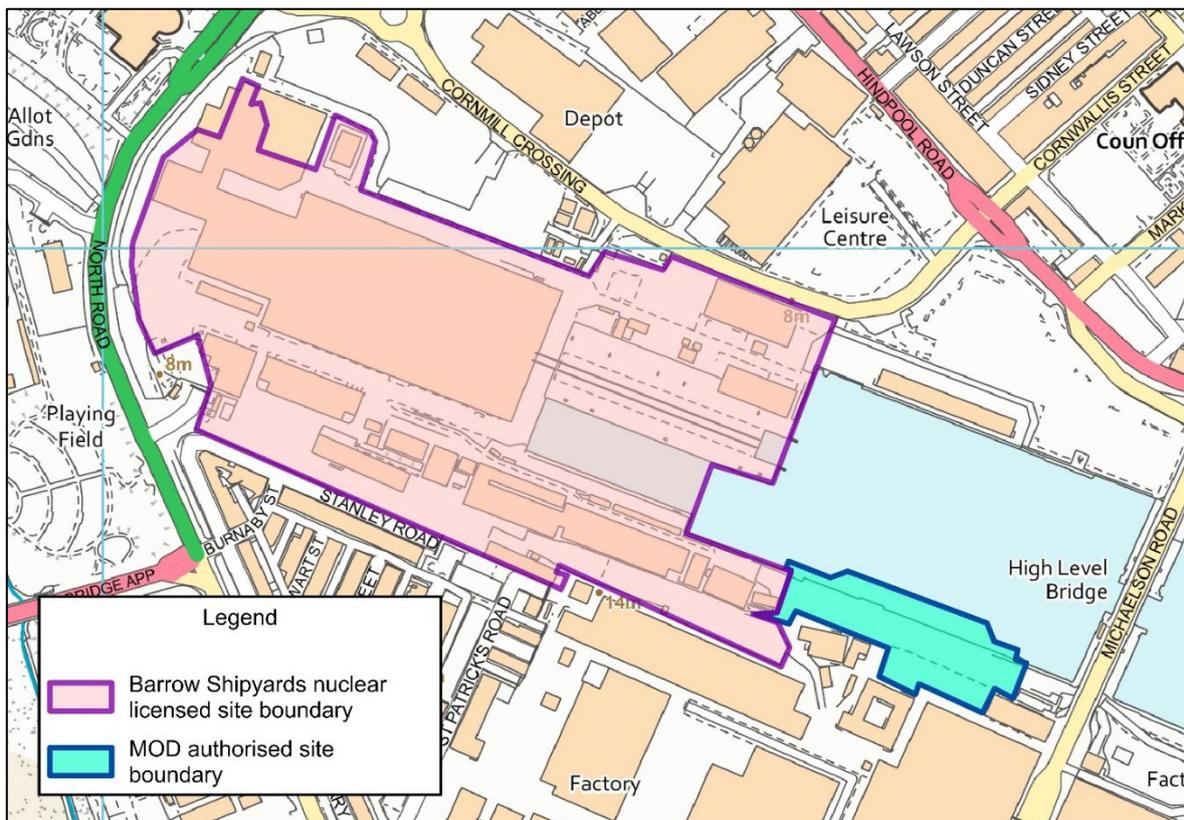


Figure 5. The boundaries of the Barrow Shipyards nuclear licensed site and MOD authorised site

Under the radioactive substances provisions of the Environmental Permitting (England and Wales) Regulations 2016 (UK Parliament, 2016), BAESML are permitted to undertake radioactive substances activities at the Barrow Shipyards site. This includes permission to discharge gaseous radioactive wastes via approved outlets to the atmosphere and liquid radioactive wastes to the local sewerage system. The sewage is processed at the local wastewater treatment plant, and the effluent is discharged into the Walney Channel. The site is licensed for the purposes of operating certain activities prescribed under the Nuclear Installations Act, 1965 (as amended). The site contains sources of direct radiation. The radioactive discharges from the Barrow Shipyards nuclear site are infrequent as they relate to submarine power range testing and launching of new submarines. Details of the amounts of gaseous and liquid radioactive waste discharged are published in the RIFE reports (for example: EA, FSA, FSS, NRW, NIEA and SEPA, 2025) [Radioactivity in food and the environment \(RIFE\) report - GOV.UK](#).

4.2. Survey objectives

The Centre for Environment, Fisheries & Aquaculture Science (Cefas) completed the Barrow habits survey in 2025 under contract to the EA, the FSA, and the ONR. The aim of the survey was to obtain comprehensive information on the habits of the public that might lead to their exposure to radiation via gaseous discharges, liquid discharges and direct radiation from the Barrow Shipyards nuclear site.

Specifically, investigations were conducted into the following:

- The consumption of food from the aquatic survey area.
- Activities and occupancy over intertidal substrates.
- The handling of fishing gear and sediment.
- Activities and occupancy in and on water.
- Occupancy in close proximity to liquid sewage sludge and dried sewage sludge.
- The use of seaweed as fertiliser or animal feed.
- The consumption of food from the terrestrial survey area.
- The use and destination of produce originating from the survey areas.
- The consumption and use of groundwater and surface water in the terrestrial survey area.
- Activities and occupancy within the direct radiation survey area.
- Any new or unusual exposure pathways.

Additionally, information on the potential transfer of contamination off-site by wildlife was obtained from the nuclear site operator.

4.3. Survey areas

The geographic extent of the potential effects of radioactivity varies depending on the pathway - liquid discharges, deposition from gaseous discharges, or direct radiation. Therefore, 3 separate survey areas were defined to cover each of these main sources of exposure. These were an aquatic survey area relating to liquid discharges, a terrestrial survey area relating to deposition from gaseous discharges, and a direct radiation survey area relating to ionising radiation emanating directly from the Barrow Shipyards nuclear licensed site.

The aquatic survey area (Figure 6) covered the intertidal areas along the coast of Cumbria between Tarn Point in the north and Roosebeck in the south, and the adjacent sea area up to 10 km offshore. The Duddon Estuary, Walney Channel and the shore of Walney Island were included.

The terrestrial survey area (Figure 7) covered all land and freshwater bodies within 5 km of the approximate site centre (National Grid Reference: SD 192 689), to encompass the main areas of potential deposition from gaseous discharges.

The direct radiation survey area (Figure 8) was defined as all land and sea within 1.0 km of the nuclear licensed site boundary, split into 3 zones, which were 0 – 0.25 km, >0.25 – 0.5 km and >0.5 – 1.0 km. The occupancy data collected from the direct radiation survey area is also applicable to inhalation and external exposure pathways arising from gaseous discharges from the site.

The same aquatic and terrestrial survey areas were used in the previous habits survey conducted by Cefas in the Barrow area, which was in 2012 (Garrod and others, 2013). In 2025, the direct radiation survey area changed, as it was determined using the nuclear licensed site boundary and MOD authorised site boundary, instead of only the nuclear licensed site boundary used in 2012.

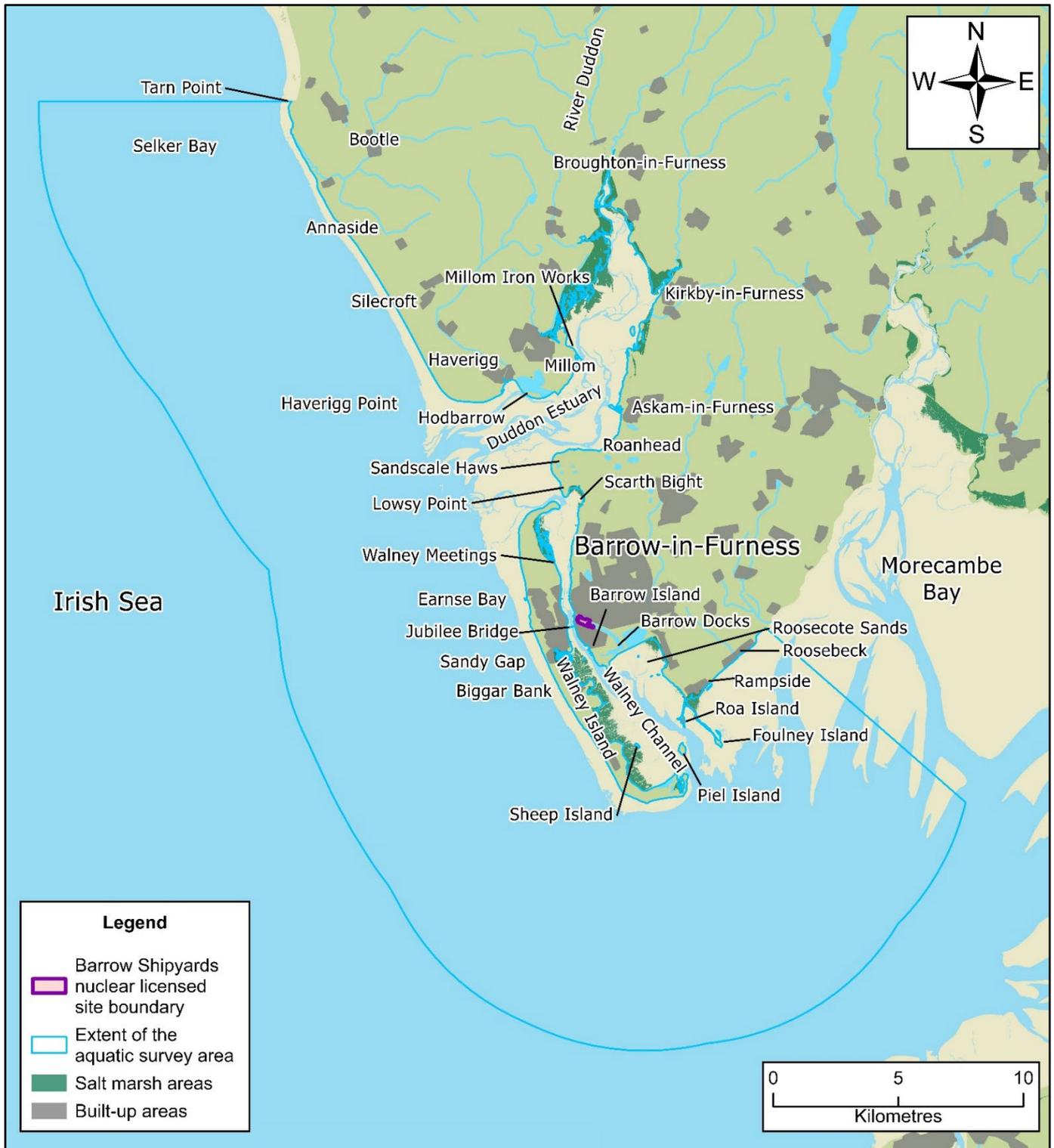


Figure 6. The Barrow aquatic survey area

Notes

For the purposes of the survey, the Barrow Shipyards nuclear licensed site boundary included the MOD authorised site and was treated as a single site.

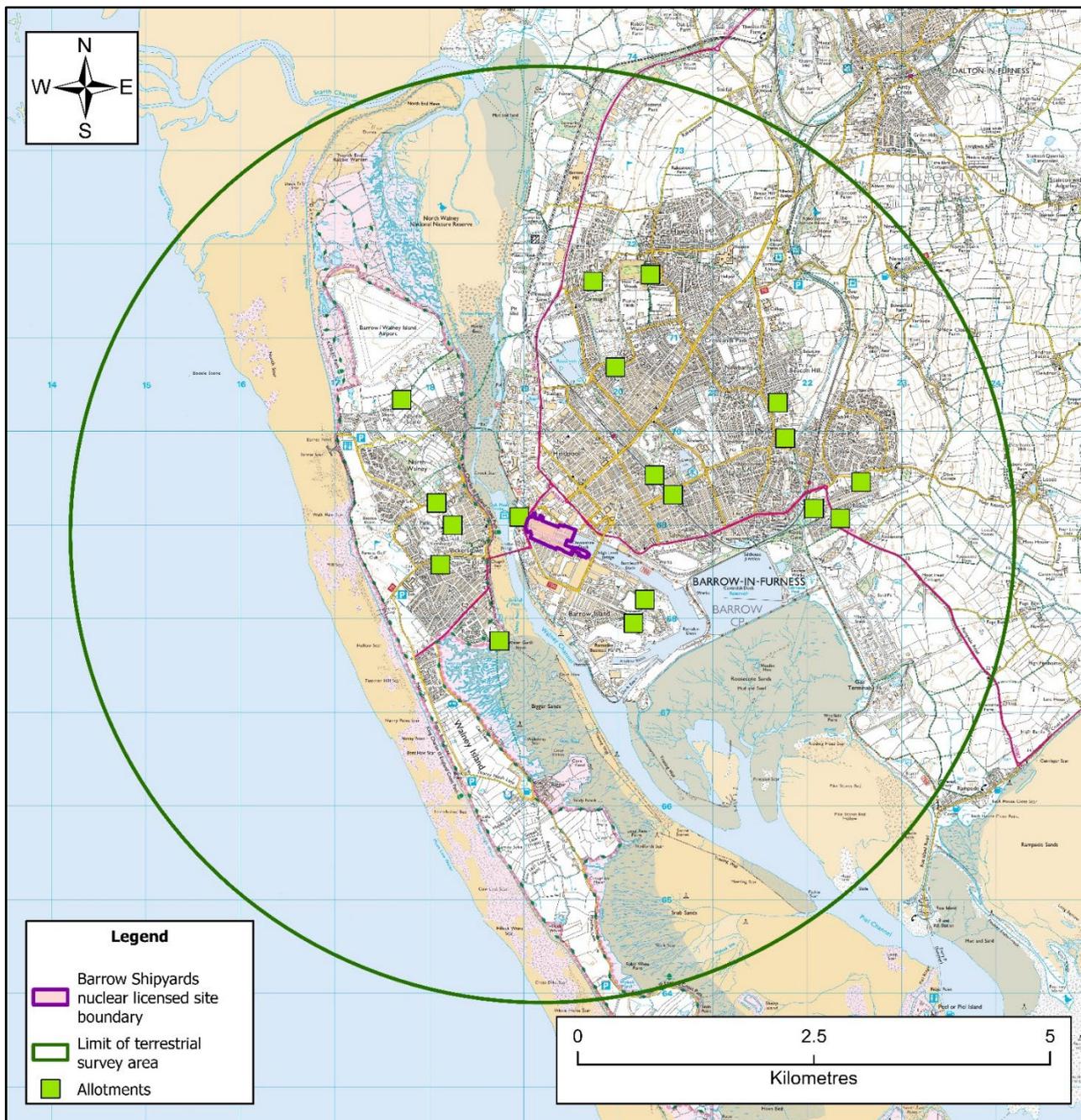


Figure 7. The Barrow terrestrial survey area

Notes

Some allotment sites may appear as a single point on the map due to their close proximity to each other.

For the purposes of the survey, the Barrow Shipyards nuclear licensed site boundary included the MOD authorised site and was treated as a single site.

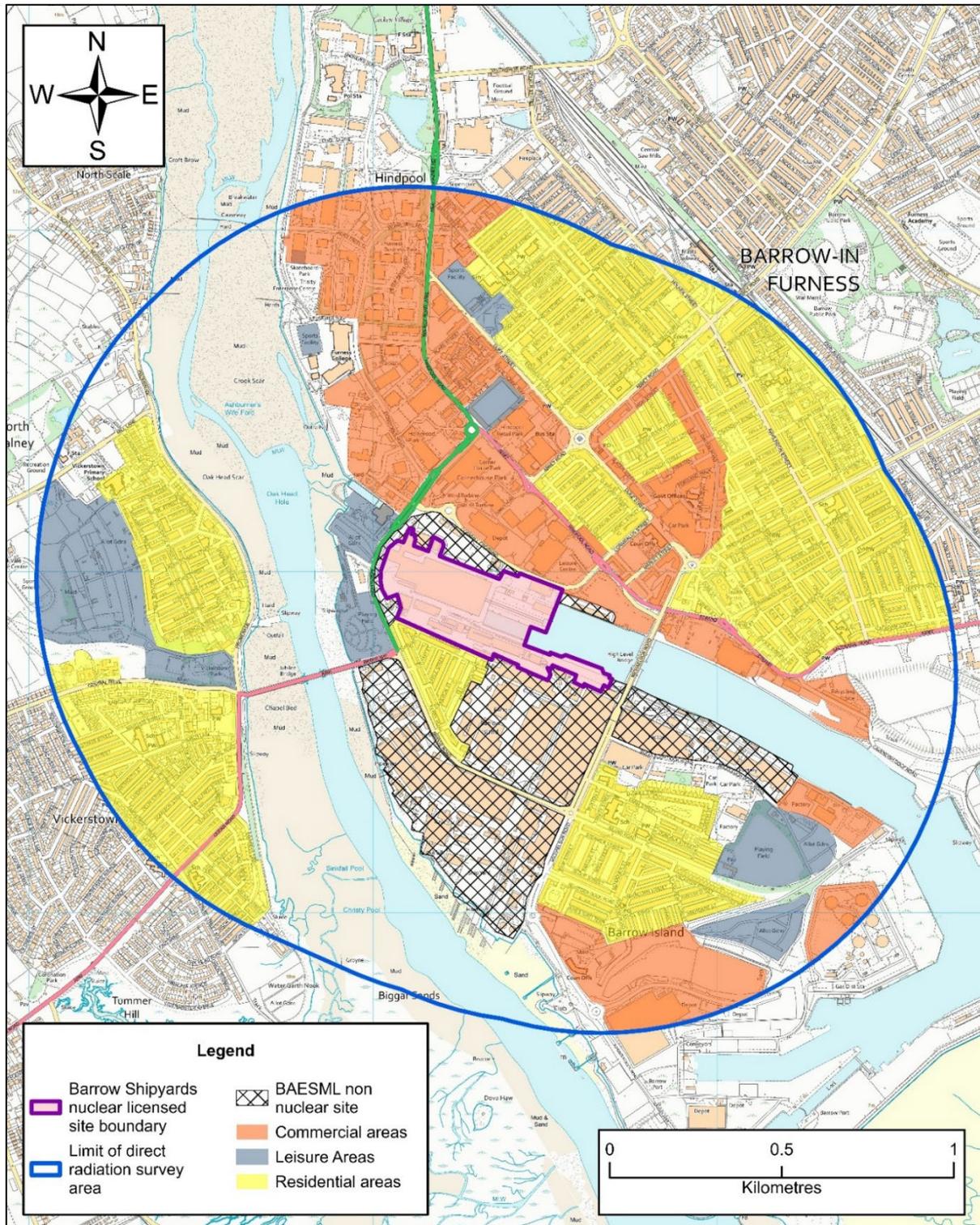


Figure 8. The Barrow direct radiation survey area

Notes

For the purposes of the survey, the Barrow Shipyards nuclear licensed site boundary included the MOD authorised site and was treated as a single site.

4.4. Conduct of the survey

As part of the pre-survey preparation, the EA, the FSA and the ONR were contacted to identify any additional site-specific requirements. Information relating to the activities of people in the aquatic and the terrestrial survey areas was obtained from internet searches, Ordnance Survey maps and from previous habits surveys undertaken around the Barrow Shipyards site. People with local knowledge of the survey area were contacted for information relevant to the various exposure pathways. These included representatives from Barrow Town Council who provided access to allotment sites, commercial fishermen who were able to provide local fisheries information and angling clubs who provided contacts for local anglers.

The fieldwork was carried out from the 6th to the 14th August 2025 using survey techniques consistent with the previous Barrow habits survey report (Garrod and others, 2013). During the fieldwork, a meeting was held between members of the survey team and representatives from BAESML. The discussion provided details about current site activities, local information, potential exposure pathways, activities in the area, and the potential for transfer of contamination off-site by wildlife.

The following information was obtained during the meeting:

- Routine site operations were being undertaken at the Barrow Shipyards site at the time of the survey.
- No changes had been made to the nuclear licensed site boundary of the Barrow Shipyards nuclear site since 2012. However, the combined boundary of the nuclear licensed site and MOD authorised site was used to determine the direct radiation survey area in 2025. This was to ensure the future commissioning of new nuclear submarines in the Devonshire Dock Quay were considered.
- No changes had been made to the locations of sources of direct radiation since 2012.
- It is highly unlikely that wildlife could enter controlled areas at the nuclear site and this was not considered by the site operator to be a risk. A control measure to introduce falcons onsite is planned to reduce bird populations nesting onsite.
- Information about potential exposure pathways and activities in the survey areas included angling locations, and activities in the direct radiation area.

Interviews were conducted with individuals who were identified in the pre-survey preparation and others that were identified during the fieldwork. These included, for example, people spending time on intertidal substrates, farmers, allotment holders and people spending time within the direct radiation survey area. Interviews were used to establish individuals' consumption, occupancy and handling rates relevant to the aquatic, terrestrial and direct radiation survey areas. Any other information of possible use to the

survey was also obtained. Gamma dose rate measurements were taken over intertidal substrates in the aquatic survey area, and indoors and outdoors at most properties in the direct radiation survey area where interviews were conducted. Background gamma dose rates were taken at a distance beyond 5 km from the approximate site centre. All gamma dose rate measurements were taken using multiple Thermo RadEye GX Survey Meters, each connected to a compensated Geiger-Müller tube.

For practical and resource reasons, the survey did not involve the whole population in the vicinity of the Barrow Shipyards nuclear site. Instead, it targeted subsets or groups, chosen in order to identify those individuals potentially most exposed to radiation pathways. However, it is possible that even within a subset or group there may have been people not interviewed during the survey. Therefore, to aid interpretation, the number of people for whom data were obtained in each group has been calculated as a percentage of the estimated complete coverage for that group (where it was possible to make such an estimate). The results are summarised in Table 25. These 'groups' are described and quantified, and the numbers of people for whom data were obtained are given as percentages of the totals. For certain groups, such as anglers, it can be virtually impossible to calculate the total number of people who undertake the activity in the survey area because it is difficult to quantify visitors from outside the area or occasional visitors during the year. Based on the most recent UK Office of National Statistics residential data for electoral wards (www.ons.gov.uk) there were approximately 53,000 people living in the terrestrial survey area, although information was obtained from a significantly smaller number of residents. The survey did not include employees or contractors at the nuclear licensed site while they were at work. This is because dose criteria applicable to these people whilst at work and the dose assessment methods (IRR 17) are different from those for members of the public. However, data were collected for employees and contractors while outside work if these people were encountered during the survey.

People were initially questioned about their habits relating to the survey area that their first identified activity occurred in and, where possible, they were also asked about their habits relating to the other 2 survey areas. For example, people in the terrestrial survey were initially questioned because it was known that they grew or produced significant quantities of terrestrial foodstuffs. However, they were also asked about habits that might lead to exposure to liquid discharges or direct radiation. During interviews with representatives from organisations such as local businesses, it was not possible to collect data for all pathways (for example, consumption of local foods) for each person. In these cases, enquiries were limited to data relating to the primary reason for the interview. For example, in the case of a business within the direct radiation survey area, the occupancy rates for the employees.

5. Methods for data analysis

5.1. Data recording and presentation

Data collected during the fieldwork were recorded in logbooks. On return to the laboratory, the data were examined, and any notably high rates were double-checked, where possible, by way of a follow-up phone call. In cases where follow-up phone calls were not possible (for example: interviewees who wished to remain anonymous), the data were either checked for reasonableness or accepted at face value. The raw data were entered into a data capture application and then uploaded to a habits survey database where each individual for whom information was obtained was given a unique identifier (Person ID number) to assist in maintaining data quality and traceability.

Where generalised data for groups of people were collected, such as occupancy rates in the direct radiation survey area for employees at businesses, only a limited number of representative individuals were included in the data entered into the database.

The results of the individuals' consumption, occupancy and handling rates collected during the survey were grouped and presented in tables with the high-rate group members indicated in bold, and with the calculated mean rates for the high-rate group and 97.5th percentile rates. The consumption rates, occupancy rates and handling rates for all groups are presented in Annex 1 for adults, Annex 2 for children and Annex 3 for infants, with the high-rate group members indicated in bold.

If accurate quantifiable data cannot be obtained from interviews, but pathways are known to exist, it is sometimes necessary to provide estimated habits data for use in dose assessments. In this series of habits survey reports such data is presented in Annex 4. It was not necessary to estimate data for the Barrow survey, but Annex 4 is included in this report to maintain consistency of presentation through the series of Habit survey reports.

5.2. Data conversion

During the interviews, people could not always provide consumption rates in kilograms per year for food or litres per year for milk. In these circumstances, interviewees were asked to provide the information in a different format. For example, some estimated the size and number of items (for example: eggs) consumed per year, whereas others gave the number of plants in a crop or the length and number of rows in which the crop was grown per year. The habits survey database converted these data into consumption rates (kg y^{-1} for food and l y^{-1} for milk) using a variety of conversion factors. These factors included produce weights (Hessayon, 1997 and 2015; Good Housekeeping, 1994), edible fraction data researched by Cefas, and information supplied by the Meat and Livestock Commission.

5.3. Rounding and grouping of data

The consumption and occupancy data in the text of this report are rounded to 2 significant figures, except for values less than 1.0, which are rounded to one decimal place. This method of presentation reflects the authors' expert judgement on the accuracy of the methods used. In the tables and annexes, the consumption rate data are presented to one decimal place. Occasionally, this rounding process causes the computed values (row totals, mean rates and 97.5th percentiles), which are based on un-rounded data, to appear slightly erroneous. Consumption rates less than 0.05 kg y⁻¹ are presented to 2 decimal places in order to avoid the value of 0.0 kg y⁻¹. External exposure data are quoted as integer numbers of hours per year.

For the purpose of data analysis, foodstuffs were aggregated into food groups as identified in Table 26. Specific food types relevant to this survey are presented in the subsequent tables. The data are structured into groups when it is reasonable to assume that consistent concentrations or dose rates would apply within the group. For example, when considering terrestrial food consumption, all types of root vegetables are grouped together in a food group called root vegetables. For external exposure over intertidal sediments, occupancy over the same substrate (for example: mud) are grouped together.

Data were structured into age groups because different dose coefficients (the factors which convert intakes of radioactivity into dose) can apply to different ages. The names used for the age groups, based on the recommendations in ICRP 103 (ICRP, 2007), are shown in Table 1.

Table 1. Names of age groups and range of ages within each age group

Name of age group	Age range in group
Infant	0 to 5 years old
Child	6 years old to 15 years old
Adult	16 years old and over

For direct radiation pathways, the data were grouped into distance zones from the nuclear licensed site boundary as a coarse indication of the potential dose rate distribution due to this source of exposure. The bands used in this report were: 0 – 0.25 km; >0.25 – 0.5 km; >0.5 – 1.0 km. These distance bands are also useful when assessing exposure to gaseous discharges.

5.4. Approaches for the identification of high rates

The habits data have been analysed to identify high rates of consumption, occupancy and handling, which can be used in radiological assessments. Two approaches have been used.

Firstly, the 'cut-off' method described by Hunt and others (1982) was used. With the 'cut-off' method, the appropriate high rate was calculated by taking the arithmetic mean of the values between the maximum observed rate and one third of the maximum observed rate. In this report, the term 'high-rate group' is used to represent the individuals derived by the 'cut-off' method. The mean of the high-rate group was calculated for each food group, intertidal substrate and handling pathway identified in the survey.

Secondly, the 97.5th percentile rate was calculated for each group. The use of percentiles accords with precedents used in risk assessments of the safety of food consumption described in Ministry of Agriculture Fisheries and Food (1996). It should be noted that the interviewees in this study are often selected and, therefore, the calculated percentiles are not based on random data.

Mean and 97.5th percentile consumption rates for adults, based on national statistics, are provided as a baseline for comparison with the observed rates. The rates based on national statistics are referred to as generic rates in this report and have been taken from Byrom and others (1995).

The mean rates for the high-rate groups for children's and infants' consumption, occupancy over intertidal substrates and handling pathways, have been calculated. However, if there are cases where few child or infant observations are identified, an alternative approach can be used for assessments to estimate the mean rates for the high-rate groups for children and infants by applying scaling ratios to the mean rates for the high-rate groups for adults as described in Dewar (2013). Ratios for this purpose for the consumption and occupancy of intertidal substrates pathways, based on generic 97.5th percentile rates, are provided in Annex 5. The age ranges within the age groups in Annex 5 do not correspond exactly with the age ranges within the age groups used throughout the rest of this report, but these ratios are the best available data for estimating child rates and infant rates from adult rates. Adult to child and adult to infant ratios are not available for handling pathways.

For use in assessments of prenatal dose, consumption and occupancy rates are provided in Annex 6 for women of childbearing age. The age range used in this report for women of childbearing age is 15 – 44 years old, which is based on the classification used by the Office of National Statistics (www.ons.gov.uk).

For the direct radiation pathway, the maximum occupancy rates are used instead of calculating the mean occupancy rates and 97.5th percentile rates. This is due to the

complex nature of the direct radiation dose rates, which are dependent on both the distance and direction from the primary sources of direct radiation on site (the spatial extent). Additional factors include the local geography and geology, as well as other structures, which can provide additional shielding between these sources on site and the local receptor points for direct radiation. For simple (cautious) dose assessment of direct radiation, it is appropriate to use the maximum dose and occupancy rates.

5.5. Profiles of habits survey data for use in ‘total dose’ assessments

The survey data have been analysed to produce profiles of consumption and occupancy rates according to the method described by Camplin and others, 2005. The profiles for adults are used to assess ‘total dose’ integrated across all pathways of exposure in the RIFE reports (for example: EA, FSA, FSS, NRW, NIEA, and SEPA, 2025) [Radioactivity in food and the environment \(RIFE\) report - GOV.UK](#).

Matrices of profiles for adults, children, infants and women of childbearing age are presented in Annex 7, Annex 8, Annex 9 and Annex 10. Within each matrix, the means for the high-rate groups, as determined by the ‘cut-off’ method, are emboldened and presented on the diagonal. Except for the direct radiation pathway, the figures across the rows are the means of the consumption and occupancy rates for the other pathways for the individuals within that profile. For the direct radiation pathway, the figure denotes the proportion of the individuals within that profile who spend time within the direct radiation survey area.

5.6. Data quality

To ensure the quality of the data collected during the survey fieldwork and presented in the report, the following procedures have been employed:

- Experienced scientific staff were used for the fieldwork and data analysis. They had been trained in the techniques of interviewing and obtaining data for all pathways that were relevant to the survey. Where individuals offered information during interview that was considered unusual, they were questioned further in order to double-check the validity of their claims.
- Where possible, interviewees were contacted again to confirm the results of the initial interview if, when final consumption or occupancy rates were calculated, observations were found to be high in relation to our experience of other surveys. Local factors were considered in these cases.
- Data were processed in a purpose-built habits survey database using a consistent set of conversion factors.

- Data were stored in a database in order to minimise transcription and other errors.
- Draft reports were reviewed by the EA, FSA and ONR.
- Final reports were only issued when the EA, FSA and ONR were entirely satisfied with the format and content of the draft reports.

6. Aquatic radiation pathways

6.1. Aquatic survey area

The aquatic survey area (Figure 6) covered the intertidal areas along the coast of Cumbria between Tarn Point in the north and Roosebeck in the south, and the adjacent sea area up to 10 km offshore. The Duddon Estuary, Walney Channel and the shore of Walney Island were also included. For the purposes of this survey the entire stretch of water between Walney Island and the mainland is referred to as the Walney Channel. The same aquatic survey area was used in the previous habits survey in 2012.

The shore along the survey area is a mix of sand, stones, and salt marsh. Large expanses of sand flats are exposed at low tide in the Duddon Estuary, where salt marsh areas line the shore. Further south, Walney Island is a large land mass off the coast of Barrow-in-Furness at the southern end of the survey area. The Walney Channel is located between Walney Island and the mainland, and comprises mud and stones with areas of soft mud at low tide.

The aquatic survey area is described in detail below from north to south.

Tarn Point to Haverigg Point

At the northern extent of the aquatic survey area, Tarn Point and Selker Bay comprise beaches of large stones with patches of sand exposed at low tide. The beaches were not easily accessible via road, but people could walk from Tarn Bay located beyond the extent of the survey area. The only activity identified taking place in this area at the time of the survey was angling. Access to the shore continued to be limited for a further 9 km south towards Silecroft and became increasingly sandy. However, angling was identified at the stone beach at Annaside.

Silecroft is a large beach with stones on the upper shore (Figure 9) and sand flats on the lower shore. A large public car park is located close to the shore with a stone slipway that could be used to launch small watercraft. A café and toilet facilities were located within the car park, and a holiday caravan site was located nearby. The beach was used by families visiting the area who were playing and sitting on the beach. The beach was a popular location for shore angling. At the time of the survey, an angling association had organised

a match with approximately 15 anglers attending. One person was identified collecting razor shells at low tide for their own consumption. It was reported to be a popular location at low tide for dog walking, and horse riding was observed.

South from Silecroft the shore continued as a band of stones with sand flats below. The stones reduced and the sand flats became more extensive towards the mouth of the Duddon Estuary at Haverigg Point.



Figure 9. Silecroft

Haverigg Point to Millom Iron Works

A broad area of sand dunes backed the shore at Haverigg Point and could only be accessed by foot from Haverigg village to the east. Haverigg village was a popular beach resort with a caravan park, large car park, café and play area bordering the beach. The beach was predominantly sand with areas of stones on the upper shore. At low tide, vast sand flats were exposed that extended into the Duddon Estuary. A tarmac slipway located near the car parking area was used to launch the Haverigg inshore rescue boat and small watercraft brought by road trailer. Activities undertaken at Haverigg included angling, dog walking, horse riding and undertaking coastguard duties. A small river enters the Duddon Estuary at the northern end of Haverigg beach. A few yachts and other pleasure boats were moored in the river or anchored just offshore and rested on sediment at low tide. The mouth of the river is reinforced with concrete sea defences which continue east around a former iron mine which has been flooded to form a large brackish lagoon. This area is now

the Royal Society for the Protection of Birds (RSPB) Hodbarrow Nature Reserve, and a small area of the lagoon is a water sports centre which offered activities such as wakeboarding and waterskiing. A track ran along the top of the concrete sea defence embankment and was used by people to walk around the nature reserve, but this was not tide washed.

The embankment ceases at a small peninsula where the sand and stone shore is backed by low rocky cliffs. The beach could be accessed via the embankment or a track around the landward side of the lagoon. Further north, the beach at Millom became sandier and is backed with sand dunes. This stretch of beach was popular with anglers, dog walkers, walkers and families spending time on the beach. The north end of the beach (Figure 10), known as Millom old pier, was popular with the local community who accessed the shore via public footpaths from Millom Town. Dog walking, angling and undertaking coastguard duties were identified at Millom at the time of the survey.



Figure 10. North Millom beach

A derelict quay extends north-west from Millom old pier which is popular with anglers at high tide. The privately owned quay can be accessed via a public footpath which continues inland past Millom Iron Works Nature Reserve. Several boats were moored in a small bay, and a concrete slipway was used to launch small boats to access the moored boats at high tide. The shore could also be accessed at Millom Iron Works via a track from a parking area at the end of an approach road. The shore is a mix of mud and stones. Several individuals were identified bait digging in the bay and collecting peeler crabs from pipes and old car tyres they had laid in the mud.

Millom Iron Works to Askam-in-Furness

Extensive areas of salt marsh line the Duddon Estuary between Millom and the River Duddon near Broughton-in-Furness, which were predominantly privately owned and were not accessible to the public. However, a public footpath on a raised embankment was reported to be used by people walking and dog walking. Sand flats were exposed at low tide in the Duddon Estuary. Farmers were identified grazing sheep on the salt marshes for large portions of the year and occasionally accessed the sand flats to rescue sheep that were stuck in quicksand. Members of a local wildfowling club were identified shooting on the salt marsh areas and on the sand flats.

The east side of the Duddon Estuary between Broughton-in-Furness and Askam-in-Furness is a mix of sand flats and salt marsh areas which are largely inaccessible to the public. Sheep were identified grazing on salt marsh areas at Kirkby-in-Furness and the farmer regularly spent time on the salt marsh tending to their livestock and undertaking rush cutting to help preserve the marshes. No other activities were identified being undertaken in this area.



Figure 11. North of Askam Pier

Askam-in-Furness was a popular location where a range of activities were undertaken. The shore could be accessed at multiple points from the town and parking is readily available. Many people accessed the beach at Askam Pier which is a prominent landmark within the survey area that stretched approximately 0.5 km into the Duddon Estuary. The pier was popular with dog walkers and anglers; however, the pier was not tide washed. North of the pier, the beach was sandy with large areas of salt marsh. Several boats were

moored on the salt marsh area (Figure 11). A public slipway and track were used to tow boats down to the beach for launching, including the Duddon Inshore Rescue boat. Cars and tractors were observed towing boats at low tide across the shore south of the pier to the deep-water channel.



Figure 12. South of Askham Pier

The beach to the south of the pier is backed with sand dunes and comprised sand and stones on the upper shore, and sand on the lower shore (Figure 12). A range of activities were recorded here including dog walking, walking, jogging, playing, bait digging, collecting peeler crabs, and undertaking coastguard duties.

Askam-in-Furness to Lowsy Point

The beach at Askam-in-Furness continues south to Roanhead. A small car park at the Sandscale Haws Nature Reserve provided easy access to the beach and sand dunes at Roanhead (Figure 13). The shore arcs west around the nature reserve at the mouth of the Duddon Estuary. At low tide, the sand flats of Duddon Sands are exposed, extending up to approximately 3 km from the shore. Activities identified taking place here include bait digging, dog walking, walking, jogging, playing and undertaking coastguard duties.



Figure 13. Roanhead beach looking towards Sandscale Haws

Lowsy Point is a small peninsula south of Sandscale Haws which marks the northern limit of the Walney Channel. Lowsy Point comprises large stone areas on the upper shore and sand and mud on the lower shore. Several former fishermen's huts located at the top of the shore have been converted into holiday homes and workspaces. Many of the owners had small boats, which they launched across the shore using tractors. One person had a small angling boat that rested on mud at low tide, and they spent time fixing moorings on the mud areas. Lowsy Point could be accessed via a rough track around a small bay at the north end of Walney Channel. Other activities identified taking place on the intertidal areas included dog walking and bait digging.

The west coast of Walney Island

A band of stones forms the upper shore along the whole length of the west coast of Walney Island, and the lower shore is composed of sand and stones. The area is close to the population centres of Vickerstown and Barrow-in-Furness and is popular with visitors.

The north-west coast of Walney Island could only be accessed by walking along the shore because the Walney Aerodrome and North Walney Nature Reserve were located on the land adjacent to the shore. Most activities were identified taking place close to Earnse Bay, Biggar Bank, Sandy Gap and south-west Walney Island.

The beach at Earnse Bay was backed with large sea defence boulders and areas of large stones (Figure 14). A large car park and concrete slipway were used by locals and holiday makers to access the sand beach at low tide. Dog walking, bait digging, walking,

rescue duties, sitting on the beach and metal detecting were all identified taking place at the time of the survey. A kitesurfing centre was located in the car park close to the beach and was a main hub for water sport activities. One person was undertaking lessons throughout the year for activities such as kite surfing, wake foiling, wind foiling and wing foiling.



Figure 14. Earnse Bay

Further south, the shore between Sandy Gap and Biggar Bank was easily accessible and attracted many visitors who were angling, bait digging, dog walking, walking, playing, sitting on the beach, metal detecting, swimming and paddling. A café, play park, 2 car parks and additional road parking were all located on the coast road between these locations.

The south-west shore of Walney Island was not as busy, but still popular with locals who were angling and dog walking on the beaches. Wildfowling was identified taking place along the length of Walney Island on the sand flats and salt marsh areas.

The Walney Channel

The north end of the Walney Channel dries out almost entirely at low tide, revealing wide sand flats and mud flats. There is a large area of salt marsh on the Walney Island side of the channel and a smaller area of salt marsh in Scarth Bight, on the mainland side. The central section of the Walney Channel (from Walney Meetings southwards to the entrance to Barrow Docks) is narrower and the substrate is a mix of mud, sand and stones. To the south of the dock entrance there are extensive sand flats and mud flats on both sides of

the channel with large areas of salt marsh on the Walney Island side and smaller areas of salt marsh at Roosecote on the mainland side. At the southern end of the Walney Channel there are 4 islands: Sheep Island, Piel Island, Roa Island and Foulney Island. Roa Island is accessible by road along a causeway from the mainland and Foulney Island can be reached on foot from the mainland by a path along a stone causeway. Piel Island and Sheep Island could only be accessed by boat.

A wide variety of activities took place in the Walney Channel. It was a very popular boating area with many yachts, pleasure boats, angling boats and fishing boats moored in the channel, mainly in the area close to the Jubilee Bridge. Many of the boats rested on sediment at low tide and individuals were identified maintaining their boats which were resting on mud and sand. Two private slipways were located on the east bank of the Walney Channel, and 2 public slipways were located on the west bank of the Walney Channel. These were used by members of clubs and members of the public to launch their boats or watercraft (Figure 15). Five clubs were located along the Walney Channel which included members who were boat angling, sailing, dinghy sailing and hobby fishing. Four of the clubs were using slipways to launch boats, however, one club located on the west bank of the Walney Channel moored their boats on a salt marsh area south of the Jubilee Bridge. The clubs ranged from 15 to 500 members. The Royal National Lifeboat Institution (RNLI) and a passenger ferry operating between Roa Island and Piel Island were also located on Roa Island.



Figure 15. West Walney Channel public slipway

The port at Barrow-in-Furness (comprising Ramsden Dock, Buccleuch Dock and Devonshire Dock) was used mainly by bulk-carrying cargo vessels and boats servicing the offshore wind farms. The port was enclosed by lock gates that retained the water level at low tide, so the vessels did not rest on sediment. Periodic dredging was undertaken in the port and its approaches at the southern end of the Walney Channel in order to maintain the water depth for ships to pass safely. Three clubs were located in the dock areas within the port including a canoe club, sub-aqua diving club and a youth sailing centre.

The upper shores of the Walney Channel were primarily used to access boats. However, dog walking and paddling was also identified taking place at the time of the survey (Figure 16). The lower shore of the channel is soft mud. People were observed collecting mussels from these muddy areas. Individuals were also identified collecting winkles and cockles for their consumption from the Walney Channel. A few individuals were identified bait digging and collecting peeler crabs (for use as angling bait), mainly in the area between Walney Meetings and just south of the Jubilee Bridge.

The shore which lines the road connecting Roa Island to the mainland was predominantly sand and stones to the west and salt marsh, sand and stones to the east. The beaches were used by individuals who were dog walking, collecting peeler crabs and undertaking boat maintenance.



Figure 16. East Walney Channel

Rampside to Roosebeck

The shore between Rampside and Roosebeck (Figure 17) changed from salt marsh to sand and stones on the upper shore. At low water, extensive sand flats are exposed, extending out into Morecambe Bay. A coastal road with parking runs close to the shore which is lined with concrete and boulder sea defences between these locations. The collection of mussels and cockles for consumption at Roosebeck was identified. Other activities identified at these locations include coastguard duties, dog walking, playing, horse riding and collecting samphire for consumption.



Figure 17. Shore between Rampside and Roosebeck

6.2. Commercial fisheries

A limited number of commercial fishing took place within the survey area. There were no harbours located within the survey area. However, 3 commercial fishermen commercial fisherman were identified in 2025 operating their boats within the survey area. The commercial fishermen were potting for whelks, brown crab and common lobster; netting (including trammel, gill, seine and tangle) and trawling for lemon sole, Dover sole, plaice, thornback ray, pollock and cod. It was reported that fishing boats based in Whitehaven were also fishing within the survey area.

Mussels and cockles were identified being collected commercially. The mussels were collected from Roosebeck on a quadbike and the cockles were collected from the Walney Channel and sold via a shellfish merchant. At the time of the survey, there was a byelaw in place restricting the collection of cockles from the survey area. It was reported that the number of mussel beds had significantly decreased since 2012. Commercial shellfish collection from the survey area had reduced in 2025 since the UK departed from the EU in 2020. Any shellfish collected from the grade B waters in the survey now require purifying prior to being exported to EU countries. One large shellfish merchant located in the area in 2012 has since ceased operations.

A commercial oyster farm located within the survey area used the seawater from the channel to supply their hatchery. The hatchery produced native oysters and Pacific oysters to seed oyster beds or supply oyster farms in the UK. At the time of the survey, the farm

was involved in a native oyster restoration project which involved seeding beds on the Norfolk coast with approximately 40,000 spat blocks. The oyster farm also produced full sized Pacific oysters at their second location within the survey area.

6.3. Destination of seafood originating from the aquatic survey area

A variety of sea fish species caught in the survey area were sold at a market and to a fishmonger and wholesaler. Mussels and cockles were sold to a shellfish merchant where they were purified prior to being sold locally. Whelks were sold privately. Fully grown Pacific oysters were sold internationally for consumption.

6.4. Hobby fishing and angling

In this report, the term 'hobby fishing' is used to describe recreational fishing on a small scale with gear such as nets or pots. It is usually carried out by fishermen who do not have commercial fishing licences and therefore it is illegal to offer the catch for sale. Hobby fishing was reported taking place across the survey area, with members of boating clubs undertaking netting and potting. It was also reported that recreational sub-aqua divers collected shellfish while diving in the Walney Channel and associated docks.

Boat angling was popular in the survey area and many private angling boats were moored along the Walney Channel and at Millom Iron Works, Askam-in-Furness, Lowsy Point, or launched from these locations via slipways, ramps or directly from the beach. Shore angling was identified throughout the survey area, and the most popular locations were Silecroft, Haverigg, Millom and the west coast of Walney Island. Angling was also popular from the pier at Askam-in-Furness. One angling association organised shore angling matches twice per month within the survey area. The main species consumed by anglers was bass and flounder.

The non-commercial collection of molluscs for consumption in the area was limited. One individual was identified collecting cockles from Roosebeck, one individual was identified collecting winkles from Walney Meetings and one individual was identified collecting razor shells from Silecroft.

6.5. Wildfowling

Wildfowling was popular along the salt marsh areas of the Duddon Estuary and Walney Island area. A variety of species, including Canada goose, mallard, wigeon, teal, pink-footed goose and greylag goose were shot and consumed.

6.6. Other pathways

Livestock grazing on salt marsh areas have potential to be affected by liquid discharges due to sea to land transfer of radioactivity. Therefore, consumption of meat from livestock grazed on salt marsh is included in this report as a potential aquatic exposure pathway. Farms were identified grazing livestock on the salt marsh and sand flats along the Duddon Estuary, and the farming families were identified consuming salt marsh lamb. The salt marsh lamb was sold at livestock markets.

Dredging was undertaken up to 10 weeks in the Walney Channel, south of the Jubilee Bridge, in order to maintain the water depth for ships to navigate to the port of Barrow-in-Furness. It was also undertaken at least once per year over a period of 5 to 6 weeks in the Ramsden Dock basin, which is the lock used to maintain the water level between the channel and the docks. The main Barrow dock system was not dredged but sediment from the area surrounding the Ramsden Dock basin gate was transferred to the basin with suction pumps operated by divers. The sediment was dumped at a spoil ground near Lightning Knoll, approximately 7 km south of Walney Island. The dredger carried between 7-13 crew, but the dredging process was highly automated, and they had little physical contact with the sediment.

Houseboats were identified within the survey area. The houseboats rested on salt marsh, mud and sand. It was reported that one houseboat was afloat for approximately 2 hours per year. The houseboat previously identified at Roa Island in 2012 was derelict and not used in 2025.

Several people collected small quantities of samphire for their consumption from the Walney Channel, Roosebeck and Rampside. One individual collected seaweed from Roa Island which was used on their allotment plot as a fertiliser. The consumption data for food produced on land where seaweed has been used as a fertiliser is detailed in Table 33.

Activities at the wastewater treatment works were investigated because liquid waste from the Barrow Shipyards nuclear site was discharged via the sewerage system where it was combined with other waste before entering the wastewater treatment works. During the sewage treatment process, solid matter settles out in tanks to form sludge. Following treatment, the liquid component was discharged via an outfall to the Walney Channel. Employees at the wastewater treatment works were identified spending time in close proximity (<10 metres) to the liquid sewage sludge and dried sewage sludge. Occupancy rates for these employees are presented in Section 6.11 and Table 48.

6.7. Food consumption data

Consumption data for locally produced foodstuffs potentially affected by liquid discharges are presented from Table 27 to Table 33 for adults and Table 34 to Table 38 for children

and infants. The mean consumption rates for the high-rate groups and the observed 97.5th percentile rates, calculated as described in Section 5.4, are given at the foot of each table.

Adults' consumption rates

The people consuming the greatest quantities of food from the aquatic survey area were anglers and wildfowlers.

Table 2 presents a summary of the adults' consumption rates for the following food groups: sea fish; crustaceans; molluscs; wildfowl; marine plants/algae; salt marsh grazed sheep meat. The table includes the mean consumption rates for the high-rate groups and the observed 97.5th percentile rates. For comparison, the table also includes mean consumption rates and 97.5th percentile consumption rates for sea fish, crustaceans and molluscs based on national data, which are referred to as 'generic' data in this report. No generic consumption rates are available for wildfowl, marine plants/algae and salt marsh grazed sheep meat.

Table 2. Summary of adults' consumption rates of foods from the aquatic survey area

	Food group					
	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep meat
Number of observations	36	7	13	4	7	11
Number of high-rate consumers	14	2	3	3	7	11
Observed maximum for the high-rate group (kg y ⁻¹)	39.0	3.3	9.3	44.1	1.3	24.0
Observed minimum for the high-rate group (kg y ⁻¹)	16.6	1.6	9.3	44.1	0.5	11.4
Observed mean for the high-rate group (kg y ⁻¹)	22.1	2.5	9.3	44.1	1.0	16.0
Observed 97.5 th percentile (kg y ⁻¹)	28.7	3.1	9.3	44.1	1.3	24.0
Generic mean (kg y ⁻¹)	15.0	3.5	3.5	Not determined	Not determined	Not determined
Generic 97.5 th percentile (kg y ⁻¹)	40.0	10.0	10.0	Not determined	Not determined	Not determined

The species of sea fish consumed by adults were bass, flounder, cod, mackerel, lemon sole, plaice, pollack, thornback ray and whiting. The sea fish were caught throughout the aquatic survey area. Of the sea fish consumed by the 14 people in the high-rate group, the percentage breakdown of species (rounded to the nearest 5%) was 65% bass, 20% flounder, 5% mackerel and 10% mix of cod, lemon sole, plaice and pollack.

The 2 species of crustaceans consumed by adults were brown crab and common lobster, which were caught at throughout the survey area. The only species of crustacean consumed by adults in the high-rate group was brown crab.

The species of mollusc consumed by adults were whelk, mussel, cockle, Pacific oyster, razor shell and winkle. Of the molluscs consumed from the area mussels were collected from Roosebeck; whelks were caught commercially throughout the survey area; cockles were collected from Roosebeck and Walney Channel; Pacific oysters were produced commercially within the survey area; razor shells were collected at Silecroft; winkles were collected at Walney Meetings. Of the molluscs consumed by the 3 people in the high-rate group, the percentage breakdown of species (rounded to the nearest 5%) was 85% whelk and 15% mussel.

The species of wildfowl consumed by adults were greylag goose, pink-footed goose, Canada goose, mallard, wigeon and teal. These were shot on the banks along the Duddon Estuary and Walney Island. Of the wildfowl consumed by the 3 people in the high-rate group, the percentage breakdown of species (rounded to the nearest 5%) was 35% greylag goose, 30% pink-footed goose, 20% Canada goose, 5% mallard, 5% wigeon and 5% teal.

The only species of marine plants/algae consumed by adults was samphire. The samphire was collected from the intertidal areas at Rampside, Roosebeck, Roa Island and Walney Channel.

Salt marsh lamb was consumed from sheep grazed on the salt marsh along the Duddon Estuary.

One individual was identified collecting seaweed from within the survey area for use on their allotment plot as a fertiliser. Food from the following food groups were identified being grown on the allotment plot: green vegetables, root vegetables, other vegetables, potatoes and domestic fruit.

Children's and infants' consumption rates

Table 3 and Table 4 presents a summary of children's and infants' consumption rates of foods originating from the aquatic survey area, respectively. Children were identified consuming sea fish, wildfowl and marine plants/algae. Infants were identified consuming

sea fish and wildfowl. The tables include the mean consumption rates for the high-rate group and the observed 97.5th percentile rates. No generic rates have been determined for the child or infant age groups.

Table 3. Summary of children’s consumption rates of foods from the aquatic survey area

	Food group		
	Sea fish	Wildfowl	Marine plants/algae
Number of observations	7	2	1
Number of high-rate consumers	5	1	1
Observed maximum for the high-rate group (kg y ⁻¹)	15.6	22.0	1.3
Observed minimum for the high-rate group (kg y ⁻¹)	8.3	22.0	1.3
Observed mean for the high-rate group (kg y ⁻¹)	14.2	22.0	1.3
Observed 97.5 th percentile (kg y ⁻¹)	15.6	21.5	Not applicable

Table 4. Summary of infants’ consumption rates of foods from the aquatic survey area

	Food group	
	Sea fish	Wildfowl
Number of observations	1	1
Number of high-rate consumers	1	1
Observed maximum for the high-rate group (kg y ⁻¹)	4.1	11.0
Observed minimum for the high-rate group (kg y ⁻¹)	4.1	11.0
Observed mean for the high-rate group (kg y ⁻¹)	4.1	11.0
Observed 97.5 th percentile (kg y ⁻¹)	Not applicable	Not applicable

6.8. Occupancy over intertidal substrates

Occupancy rates over intertidal areas for adults, children and infants are presented in Table 39, Table 40 and Table 41, respectively. It should be noted that there is often more than one substrate at one named location and that substrates at a given location are prone to change over time. Activities were assigned to the predominant substrate over which they were taking place.

Adults' occupancy rates over intertidal substrates

Table 5 presents a summary of the adults' occupancy rates over intertidal substrates in the aquatic survey area. The table includes the mean occupancy rates for the high-rate groups and the observed 97.5th percentile rates.

Table 5. Summary of adults' intertidal occupancy rates

	Intertidal substrate							
	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
Number of observations	35	6	3	16	146	68	41	3
Number of people in the high-rate group	2	3	1	6	35	7	4	2
Maximum of the high-rate group (h y ⁻¹)	261	195	391	360	1095	748	537	8290
Mean of the high-rate group (h y ⁻¹)	261	168	391	205	582	465	323	7483
Observed 97.5 th percentile (h y ⁻¹)	261	195	374	323	831	564	366	8210

Note: For boat on mud the substrate includes mud, sand and salt marsh.

The activities undertaken by people in the adult high-rate groups for occupancy over the following intertidal substrates included:

- For mud: bait digging in the Walney Channel.
- For mud and sand: bait digging at Roanhead; bait digging and collecting peeler crabs at Askam-in-Furness.
- For mud and stones: collecting peeler crabs at Millom Iron Works.
- For salt marsh: tending livestock along Duddon Estuary; wildfowling at Biggar Bank, Tummerhill, Snab Sands and North Walney Island; dog walking at Askam-in-Furness.
- For sand: dog walking at Askam-in-Furness, Earnse Bay, north-west Walney Island, Biggar Bank, Lowsy Point, Roanhead and Haverigg; collecting cockles and oyster farming within the survey area; angling at Sandy Gap, Millom and Haverigg; bait digging at

Biggar Bank, Sandy Gap, Lowsy Point and Askam-in-Furness; water sports preparation at Earnse Bay; walking at Earnse Bay, Roanhead, Sandy Gap and Walney Island; sitting on the beach at Earnse Bay and Sandy Gap; horse riding at Haverigg.

- For sand and stones: angling at Sandy Gap, south-west Walney Island and west Walney Island; dog walking at Rampside, Roosebeck, West Walney Island, Biggar Bank, south-west Walney Island and Sandy Gap; undertaking coastguard duties at Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft; horse riding at Biggar Bank.
- For stones: angling at Silecroft and Annaside.
- For boat on mud: boat dwelling within the survey area.

Children's and infants' occupancy rates over intertidal substrates

Table 6 and Table 7 present a summary of the children's and infants' occupancy rates over intertidal substrates in the aquatic survey area, respectively. The tables include the mean occupancy rates for the high-rate groups and the observed 97.5th percentile rates.

Table 6. Summary of children's intertidal occupancy rates

	Intertidal substrate					
	Mud	Mud and stones	Salt marsh	Sand	Sand and stones	Stones
Number of observations	1	2	1	17	7	2
Number of people in the high-rate group	1	2	1	8	1	1
Maximum of the high-rate group (h y ⁻¹)	4	52	4	104	156	33
Mean of the high-rate group (h y ⁻¹)	4	46	4	61	156	33
Observed 97.5 th percentile (h y ⁻¹)	Not applicable	52	Not applicable	104	136	33

The activities undertaken in the child age group high-rate groups for occupancy over each of the intertidal substrates were:

- For mud: wildfowling along the Duddon Estuary and Walney Island.
- For mud and stones: dog walking along the Walney Channel.
- For salt marsh: wildfowling along the Duddon Estuary and Walney Island.
- For sand: dog walking at Earnse Bay, Sandy Gap, Roanhead, Askam-in-Furness and Millom; angling at Millom and Haverigg; playing at Roanhead and Askam-in-Furness.
- For sand and stones: playing at west Walney Island.
- For stones: angling at Silecroft.

Table 7. Summary of infants' intertidal occupancy rates

	Intertidal substrate	
	Sand	Sand and stones
Number of observations	2	1
Number of people in the high-rate group	2	1
Maximum of the high-rate group (h y ⁻¹)	18	20
Mean of the high-rate group (h y ⁻¹)	15	20
Observed 97.5 th percentile (h y ⁻¹)	18	Not applicable

The activities undertaken in the infant age group high-rate groups for occupancy over each of the intertidal substrates were:

- For sand: playing at Askam-in-Furness and Silecroft.
- For sand and stones: playing at west Walney Island.

6.9. Gamma dose rate measurements

Gamma dose rate measurements were taken over 6 intertidal substrates. All measurements were taken at a height of 1 metre above the substrate. The results are presented in Table 42 and are summarised in Table 8.

Table 8. Summary of gamma dose rate measurements taken over intertidal substrates

	Substrate					
	Mud	Mud and stones	Salt marsh	Sand	Sand and stones	Stones
Number of measurements taken	1	1	1	5	6	2
Minimum gamma dose rate at 1 metre ^a ($\mu\text{Gy h}^{-1}$)	0.077	0.112	0.088	0.062	0.077	0.097
Maximum gamma dose rate at 1 metre ^a ($\mu\text{Gy h}^{-1}$)	0.077	0.112	0.088	0.069	0.092	0.112
Estimated natural background rates across the UK ^b ($\mu\text{Gy h}^{-1}$)	0.070	0.060	0.070	0.050	0.060	0.060

Notes

^a These measurements have not been adjusted for background dose rates.

^b These measurements have been taken from RIFE 30 (EA, FSA, FSS, NRW, NIEA and SEPA, 2025)

6.10. Handling of fishing gear and sediment

Handling fishing gear (nets and pots) that has become entrained with fine sediment particles, or handling sediment while undertaking activities such as bait digging or mollusc collecting, can potentially give rise to skin exposure from beta radiation. Doses to the skin are considered within the dose limitation system (ICRP, 1992).

Fishing gear can also be a source of gamma exposure due to occupancy in the vicinity of the gear. However, this pathway is minor compared with the exposure received during occupancy over intertidal areas and it has therefore been omitted from the report.

Handling of angling equipment (rod and line) was not considered to be a significant pathway. Therefore, as in previous surveys, data were not collected for this pathway.

Handling rates of fishing gear and sediment for adults are presented in Table 43. Handling rates of sediment for children are presented in Table 44. No children were identified handling fishing gear. No infants were identified handling sediment or fishing gear.

Adults' handling rates of fishing gear and sediment

Table 9 presents a summary of the handling rates of fishing gear and sediment for adults. The table includes the mean handling rates for the high-rate groups and the observed 97.5th percentile rates.

Table 9. Summary of adults' handling rates

	Handling activity	
	Handling fishing gear	Handling sediment
Number of observations	13	33
Number of people in the high-rate group	7	6
Maximum of the high-rate group (h y ⁻¹)	858	783
Mean of the high-rate group (h y ⁻¹)	463	474
Observed 97.5 th percentile (h y ⁻¹)	729	574

The activities undertaken by people in the high-rate groups for handling included:

- For handling fishing gear: handling nets and pots throughout the survey area and oyster farming within the survey area.
- For handling sediment: bait digging at Walney Channel, west Walney Island, Earnse Bay, Lowsy Point, Roanhead and Askam-in-Furnes; collecting peeler crabs at Millom Iron Works.

Children's handling rates of sediment

Table 10 presents a summary of the handling rates of sediment for children. The table includes the mean handling rates for the high-rate group.

Table 10. Summary of children's handling rates

	Handling sediment
Number of observations	1
Number of people in the high-rate group	1
Maximum of the high-rate group (h y ⁻¹)	9
Mean of the high-rate group (h y ⁻¹)	9
Observed 97.5 th percentile (h y ⁻¹)	Not applicable

The activity undertaken by the only child identified handling sediment was wildfowling along the Duddon Estuary and Walney Island.

6.11. Exposure to liquid sewage and dried sewage sludge

Activities at the wastewater treatment works were investigated because liquid waste from the Barrow Shipyards nuclear site is discharged via the sewerage system to the wastewater treatment works. The occupancy rates for employees in close proximity (<10 meters) to liquid sewage sludge and dried sewage sludge are presented in Table 48.

Employees undertaking the same activities had occupancy rates of 52 h y⁻¹ in close proximity (<10 meters) to liquid sewage sludge and 52 h y⁻¹ in close proximity (<10 meters) to dried sewage sludge.

6.12. Water based activities

Activities taking place in or on water can lead to ingestion of water and/or inhalation of spray. These pathways are generally considered to be of minor radiological importance in comparison with other exposure pathways such as the consumption of foods produced in the vicinity of a nuclear site. However, relevant data have been collected for consideration in dose assessments.

For habits surveys, activities involving a high likelihood of an individual ingesting water are classified as activities 'in water'. All other water-based activities are classified as activities 'on water'.

Occupancy rates for in and on water activities in the aquatic survey area are presented in Table 45 for adults, Table 46 for children and Table 47 for infants. Where generic data for groups of people were collected, for example, members of sailing clubs, only representative examples have been included in the data presented.

Activities in water

The activities identified taking place in water in the aquatic survey area were kite surfing, wake foiling, wind foiling, wing foiling, jet skiing, kayaking, paddleboarding, sub-aqua diving and swimming. These activities are classified as 'in water' activities since they are likely to lead to the ingestion of seawater. Twenty-six observations were recorded for adults and 23 were recorded for the child age group. Occupancy in water was not identified at the time of the survey for the infant age group. The highest occupancy rate for adults was 2000 h y⁻¹ for a person undertaking water sports at Earnse Bay. The highest occupancy rate for the child age group was 70 h y⁻¹ for a group of children who were undertaking a range of activities with a youth club.

Activities on water

The activities taking place on water in the aquatic survey area included boat angling, canoeing, rowing, potting, gill netting, trawling, seine netting, trammel netting, tangle netting, power boating, sailing, wading, paddling, boat dwelling, undertaking boat maintenance, and working on a boat. Sixty-six observations were recorded for adults, 37 were recorded for the child age group and 1 was recorded for the infant age group. The highest occupancy rate for adults was 1600 h y⁻¹ for a commercial fisherman who was potting and netting throughout the survey area. The highest occupancy rate for the child age group was 290 h y⁻¹ for children undertaking a range of activities with a youth club. The only occupancy rate for the infant age group was 3 h y⁻¹ for an infant who was paddling with their family at Silecroft.

7. Terrestrial radiation pathways

7.1. Terrestrial survey area

The terrestrial survey area (Figure 7) covered the land and freshwater bodies within 5 km of the Barrow Shipyards nuclear approximate site centre (National Grid Reference: SD 192 689).

The Barrow Shipyards nuclear site is located in the dock area on the southern edge of the town of Barrow-in-Furness. The urban area directly surrounding the site comprises residential, commercial and industrial areas. The agricultural land within the terrestrial survey area primarily surrounds the town of Barrow-in-Furness towards the boundary of the 5 km area to the east, and the southern area of Walney Island. A residential area, airfield and large nature reserve occupied the land on the northern peninsula of Walney Island. A freshwater reservoir is located near Ormsgill on the west side of Barrow-in-Furness and the Mill Beck stream flowed north to south through the eastern side of Barrow-in-Furness.

Interviews were conducted at 13 working farms in the terrestrial survey area. The farms produced the following: cows' milk, heifer dairy cattle, beef cattle, store cattle and lambs. The production of arable crops for human consumption was not identified in the survey area. Grass (for silage), hay, maize, barley and wheat were grown for animal feed. Farmers and their families were consuming their own produce including beef, lamb and milk.

Twenty-one allotment sites were located within the terrestrial survey area, with some located adjacent to each other. A wide variety of fruit and vegetables were grown on the allotments and some kept chickens for eggs. Many plot holders were using their plot as a garden rather than for growing food. This was likely due to a high number of residents in

Barrow-in-Furness not having access to private gardens. Produce was also grown in a small number of private gardens.

No beekeepers were identified who kept hives in the survey area. A freshwater fishery previously identified in 2012 at Millbeck had closed and the consumption of freshwater fish was not identified.

Wild foods that were collected within the survey area and consumed included blackberries and damsons. Game shooting was identified taking place on farmland in the terrestrial survey area, where rabbits were shot for pest control. Two people were identified consuming rabbits from the survey area.

The consumption of groundwater by humans and livestock was not identified in the terrestrial survey area.

7.2. Destination of commercially produced food originating from the terrestrial survey area

The destination of foods produced in the survey area included the following:

- Beef cattle were sold at livestock markets and to food processors.
- Store cattle were sold to farms located outside of the survey area.
- Lambs were sold to livestock markets and to food processors.
- Milk was sold for national distribution.
- Heifer dairy cattle were relocated to a farm outside of the survey area.

7.3. The potential transfer of contamination off-site by wildlife

Representatives from BAESML was asked for information about the potential transfer of contamination off-site by wildlife, since radionuclides could enter the food chain or contaminate the environment through this pathway. The site did not undertake any routine controls, since the buildings are enclosed, and it is highly unlikely that wildlife could enter controlled areas. However, BAESML is planning to introduce falcons onsite to reduce bird populations nesting onsite.

7.4. Food consumption data

Consumption data for locally produced foodstuffs potentially affected by deposition of gaseous discharges are presented from Table 49 to Table 59 for adults and Table 60 to

Table 74 for children and infants. The mean consumption rates for the high-rate groups and the observed 97.5th percentile rates, calculated as described in Section 5.4, are given at the foot of each table.

In order to provide information relevant to monitoring and assessments studies, the consumption rate data collected during the survey were analysed to indicate the percentage that each food type contributed to each food group. The data are summarised in Table 75.

Adults' consumption rates

Consumption of locally produced foods was identified in the following 11 food groups: green vegetables; other vegetables; root vegetables; potato; domestic fruit; milk; cattle meat; sheep meat; eggs; wild/free foods; rabbits/hares. The consumption of foods from the following food groups were identified in 2012, but not in 2025: pig meat; poultry; wild fungi; freshwater fish.

Table 11 presents a summary of the adults' consumption rates for the foods consumed from the terrestrial survey area. The table includes the mean consumption rates for the high-rate groups and the observed 97.5th percentile rates. For comparison, the table also includes mean consumption rates and 97.5th percentile consumption rates based on national data, which are referred to as 'generic' data in this report.

Table 11. Summary of adults' consumption rates of foods from the terrestrial survey area

	Food group										
	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/ hares
Number of observations	35	44	45	42	42	14	11	9	25	25	2
Number of high-rate consumers	13	9	11	14	9	6	7	5	10	2	2
Observed maximum for the high-rate group (kg y ⁻¹ or l y ⁻¹)	24.6	33.7	39.1	80.0	35.6	395.4	56.3	12.8	31.2	6.4	0.4
Observed minimum for the high-rate group (kg y ⁻¹ or l y ⁻¹)	8.5	15.2	18.9	30.5	12.2	273.8	28.5	12.8	12.5	2.7	0.4
Observed mean for the high-rate group (kg y ⁻¹ or l y ⁻¹)	18.6	24.1	26.3	57.1	22.9	314.3	36.4	12.8	21.8	4.5	0.4
Observed 97.5 th percentile (kg y ⁻¹ or l y ⁻¹)	24.6	30.5	39.0	79.8	27.4	395.4	56.2	12.8	31.2	4.2	0.4
Generic mean* (kg y ⁻¹ or l y ⁻¹)	15.0	20.0	10.0	50.0	20.0	95.0	15.0	8.0	8.5	7.0	6.0
Generic 97.5 th percentile* (kg y ⁻¹ or l y ⁻¹)	45.0	50.0	40.0	120.0	75.0	240.0	45.0	25.0	25.0	25.0	15.0

Notes

*Generic rates based on data from Byrom and others, 1995.

The observed mean consumption rate for the high-rate group was greater than the generic 97.5th percentile consumption rate for milk. Nine of the mean consumption rates for the high-rate groups exceeded the generic mean consumption rates. These were for green vegetables, other vegetables, root vegetables, potato, domestic fruit, milk, cattle meat, sheep meat and eggs. Three of the observed 97.5th percentile consumption rates exceeded the generic 97.5th percentile consumption rates, which were for milk, cattle meat and eggs.

Children's and infants' consumption rates

Six individuals in the child age group and 3 individuals in the infant age group were identified consuming foods from the terrestrial survey area.

Table 12 and Table 13 present a summary of children's and infants' consumption rates, respectively. The tables include the mean consumption rates for the high-rate groups and the observed 97.5th percentile rates. No generic data have been determined for the child and infant group. In the child age group, no consumption of foods from the following food groups was identified: cattle meat; sheep meat; rabbits/hares. In the infant age group, no consumption of foods from the following food groups was identified: milk; cattle meat; sheep meat; rabbits/hares.

Table 12. Summary of children's consumption rates of foods from the terrestrial survey area

	Food group							
	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Eggs	Wild/free foods
Number of observations	1	3	3	3	3	1	2	2
Number of high-rate consumers	1	3	3	1	3	1	2	2
Observed maximum for the high-rate group (kg y ⁻¹ or l y ⁻¹)	1.7	1.7	2.5	7.8	2.7	395.4	7.6	1.1
Observed minimum for the high-rate group (kg y ⁻¹ or l y ⁻¹)	1.7	0.7	1.4	7.8	1.1	395.4	7.6	1.1
Observed mean for the high-rate group (kg y ⁻¹ or l y ⁻¹)	1.7	1.0	1.8	7.8	1.6	395.4	7.6	1.1
Observed 97.5 th percentile (kg y ⁻¹ or l y ⁻¹)	Not applicable	1.6	2.5	7.5	2.6	Not applicable	7.6	1.1

Table 13. Summary of infants' consumption rates of foods from the terrestrial survey area

	Food group						
	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Eggs	Wild/free foods
Number of observations	1	2	2	2	2	1	1
Number of high-rate consumers	1	2	2	1	2	1	1
Observed maximum for the high-rate group (kg y ⁻¹)	0.9	0.8	1.3	3.9	1.3	3.8	0.5
Observed minimum for the high-rate group (kg y ⁻¹)	0.9	0.3	0.7	3.9	0.6	3.8	0.5
Observed mean for the high-rate group (kg y ⁻¹)	0.9	0.6	1.0	3.9	0.9	3.8	0.5
Observed 97.5 th percentile (kg y ⁻¹)	Not applicable	0.8	1.3	3.8	1.3	Not applicable	Not applicable

8. Direct radiation pathways

8.1. Direct radiation survey area

The direct radiation survey area (Figure 8) covered the land and water within 1.0 km of the Barrow Shipyards nuclear licensed site boundary. The direct radiation survey areas are usually defined from the nuclear licensed site boundary. However, the MOD authorised site was included to ensure that the commissioning of new nuclear submarines in the Devonshire Dock Quay was considered in the survey. For the purposes of the survey, the Barrow Shipyards nuclear licensed site boundary will include the MOD authorised site and will be treated as a single site. This change ensured the commissioning of new nuclear submarines in the Devonshire Dock Quay were considered. The survey area was split into 3 zones, which were 0 – 0.25 km, >0.25 – 0.5 km and >0.5 – 1.0 km from the Barrow Shipyards nuclear licensed site boundary. The occupancy data collected from the direct radiation survey area are also applicable to inhalation and external exposure pathways arising from gaseous discharges from the site.

The Barrow Shipyards nuclear licensed site is situated within the BAESML non-licensed site which takes up a large portion of Barrow Island. The land within the direct radiation survey area is heavily urbanised and comprised of commercial, industrial, residential, and public areas. These areas included schools, retail parks, industrial estates and allotments.

The Devonshire Dock and Buccleuch Dock, located in the port of Barrow-in-Furness extend south-east of the licensed site and beyond the survey area into the Walney Channel. The Walney Channel bisects the survey area from north to south on the western side of the direct radiation survey area, which separates Walney Island from Barrow-in-Furness on the mainland.

8.2. Residential activities

The direct radiation survey area was densely populated. The closest residences to the site are located adjacent to the nuclear licensed site boundary on Barrow Island. The main areas of residences within the survey area were located on Barrow Island to the south, in Hindpool to the north-east and in Vickerstown (Walney Island) to the west. Most of the residences were located in the outer zone north-west, south-west and west of the site, with a smaller number of residences overlapping into the middle and inner zones. Interviews were conducted at 19 residences. Six of these were in the 0 - 0.25 km zone, 6 were in the >0.25 - 0.5 km zone and 7 were in the >0.5 - 1.0 km zone. Many amenities were located within the direct radiation survey area, resulting in high occupancy rates for residents.

8.3. Leisure activities

Many leisure activities were undertaken in the direct radiation survey area.

A retail park with leisure facilities was located directly north of the site and was popular with locals. Other activities included dog walking, walking and playing at the local playparks.

The Barrow Rugby League Football Club stadium with an approximate capacity of 4600 was located north of the site in the >0.25 – 0.5 km zone. In addition to rugby games, the stadium was also used to host public events throughout the year. An additional rugby pitch was located approximately 200m north of the stadium and was used by a local rugby team. The Barrow Island Community and Sports Hub was located south-east of the site in Cavendish Park in the >0.5 – 1.0 km zone. The hub was established in 2015 and enables people to participate in a range of sports such as football, bowls and rugby. The hub also hosts events throughout the year for the community such as evening entertainment and lunches.

One allotment site with 10 plots was located directly west of the site in the 0 – 0.25 km zone, and 3 allotment sites with approximately 300 plots total were located in the >0.5 – 1.0 km zone to the west on Walney Island and south-east on Barrow Island. These allotment sites were used to grow a wide range of fruit and vegetables. Some allotment plots were also used as gardens for people who did not have access to an outdoor space at their homes.

The Walney Channel was a popular location for a range of activities. A fishing club, sailing club and 2 motorboat clubs were located along the channel. Two private and 2 public slipways were located on the east and west bank of the Walney Channel, respectively. These were used by club members and members of the public to launch their boats or watercraft and were located across the direct radiation survey area zones. Many boats were moored in the channel including sailing boats, angling boats and powerboats. At low tide, people were identified walking, dog walking and paddling on the intertidal areas of the Walney Channel.

The Youth Sailing Centre was located on Buccleuch Dock just outside the direct radiation survey area. However, approximately 40 children attend the youth club on a weekly basis and undertake a range of activities on the docks which extend across all direct radiation survey area zones.

8.4. Commercial activities

Barrow-in-Furness is a heavily commercialised town, with multiple industrial estates located to the north of the site and a large retail area located to the north and west of the site. The industrial estates were primarily located within the >0.5 – 1.0 km zone with a range of commercial activities being undertaken. The retail area was a popular location comprising of restaurants, supermarkets, retail outlets, a gym, a cinema and large car parking areas. The Barrow-in-Furness high street was located to the north-east of the site. These retail locations were located with the 0 – 0.25 km and >0.25 -0.5 km zones.

Of the interviews conducted at 6 businesses, 2 were located in 0 – 0.25 km zone, 2 were located in the >0.25 -0.5 km zone and 2 were located in the >0.5 – 1.0 km zone. The number of employees at these businesses ranged from 3 to 140.

8.5. Educational activities

Approximately 6 nursery schools, 9 primary and junior schools, and 1 college were located within the direct radiation survey area. The college and schools were located throughout Barrow-in-Furness, Vickerstown, Hindpool and Barrow Island. Of these educational organisations, 2 were located within the >0.25 -0.5 km zone, and 14 were located in the >0.5 – 1.0 km zone.

8.6. Occupancy rates

Table 76 presents indoor, outdoor and total occupancy data for adults, children and infants. An analysis of the data by distance zones and occupancy rates is shown in Table 77. A summary of occupancy rates in the direct radiation survey area is presented in Table 14. Where generic data for groups of people were collected, for example, employees of businesses, only representative examples have been included in the presented data.

Table 14. Summary of direct radiation occupancy rates

	Zone		
	0 - 0.25 km	>0.25 - 0.5 km	>0.5 - 1.0 km
Number of observations	39	40	72
Highest indoor occupancy (h y ⁻¹)	8225	8740	8656
Highest outdoor occupancy (h y ⁻¹)	1812	783	2009
Highest total occupancy (h y ⁻¹)	8656	8740	8708

0 – 0.25 km from the nuclear licensed site boundary

Occupancy data for 39 individuals in the 0 - 0.25 km zone were included in the analysis. The observations were for 15 residents, 18 employees, 2 commercial fishermen and 4 allotment holders. The highest indoor, outdoor and total occupancy rates were for residents.

>0.25 – 0.5 km from the nuclear licensed site boundary

Occupancy data for 40 individuals in the >0.25 - 0.5 km zone were included in the analysis. The observations were for 11 residents, 23 employees, 2 people undertaking boat maintenance, one person sailing, 2 people dog walking and one person dog walking and paddling in the Walney Channel. The highest indoor, outdoor and total occupancy rates were for residents.

>0.5 – 1.0 km from the nuclear licensed site boundary

Occupancy data for 72 individuals in the >0.5 - 1.0 km zone were included in the analysis. The observations were for 12 residents, 13 employees, 8 allotment holders, 26 people undertaking activities with a youth club, 9 people visiting their family and 4 people picking blackberries. The highest indoor, outdoor and total occupancy rates were for residents.

8.7. Gamma dose rate measurements

Gamma dose rates were measured indoors and outdoors at most properties where interviews were conducted in the Barrow direct radiation survey area. Where possible, outdoor measurements were taken approximately 5 to 10 metres from the nearest building and over grass. Gamma dose rate measurements were taken over grass at locations further than 5 km from the site centre to obtain background dose rates. All measurements were taken at a height of 1 metre above the substrate using multiple Thermo RadEye GX Survey Meters, each connected to a compensated Geiger-Müller tube. The indoor and outdoor measurements have not been adjusted for background dose rates. The results are presented in Table 78 and are summarised in Table 15.

Table 15. Summary of gamma dose rate measurements taken in the direct radiation survey area

Substrate	Number of measurements taken	Minimum gamma dose rate at 1 metre ($\mu\text{Gy h}^{-1}$)	Maximum gamma dose rate at 1 metre ($\mu\text{Gy h}^{-1}$)
Indoor measurements^a			
Concrete	5	0.066	0.110
Wood	5	0.110	0.120
Outdoor measurements^a			
Concrete	11	0.095	0.120
Tarmac	3	0.094	0.099
Grass	7	0.068	0.090
Background measurements			
Grass	4	0.077	0.088

Notes

^a These measurements have not been adjusted for background dose rates.

Of the 10 measurements taken indoors and the 21 measurements taken outdoors at locations within the direct radiation survey area, 22 readings were higher than the maximum background reading.

The gamma dose rates can be compared with readings taken by the RREMS programme, which continuously monitors radiation levels at a network of 97 fixed monitors and a number of mobile monitors distributed throughout the UK (www.gov.uk). The nearest RREMS station to Barrow was on Walney Island, which was approximately 2 km away. The ambient (background) gamma dose rates at Liscombe during the survey period ranged from $0.09 \mu\text{Gy h}^{-1}$ to $0.12 \mu\text{Gy h}^{-1}$. All readings taken at the time of the survey were below or within the range observed for the RREMS system.

9. Uses of habits data for dose assessments

9.1. Combined pathways

In determining habits data for the purposes of assessing radiological doses to the public, it may be necessary to consider a combination of pathways. Data are provided in Annex 1, Annex 2 and Annex 3 for adults, children and infants, respectively so that the full effect of combining pathways can be assessed for individual observations, given the concentrations and dose rates for a particular assessment. The rates for individuals in the high-rate groups are emboldened. In some circumstances, it will be possible to make simplifying assumptions and define the consumption and external exposure rates appropriate to a series of potential high-rate groups.

The most extensive combinations of pathways for adult dose assessment are shown in Table 80. Each of the 27 combinations shown in Table 80 represents an actual individual (or individuals) from Annex 1 who has positive data (irrespective of the magnitude), for each pathway marked with a cross. Other individuals from Annex 1 have combinations that are not listed in Table 80 because they have fewer pathways and a dose assessment for them would be adequately covered by one of the 27 listed combinations.

9.2. Prenatal dose assessment

Dose assessment of prenatal children was introduced routinely for the first time in the Radioactivity in Food and the Environment report for 2005 (EA, EHS, FSA and SEPA, 2006), following the publication of recommendations by the Radiation Protection Division of the United Kingdom Health Security Agency (UKHSA, formerly, Health Protection Agency) (National Radiological Protection Board, 2005). The adopted approach is to use the consumption and occupancy data for women of childbearing age in order to calculate the potential dose to prenatal children. Therefore, consumption and occupancy data collected during the Barrow habits survey for women of childbearing age are presented in Annex 6. The Office of National Statistics classifies women to be of childbearing age if they are between 15 and 44 years old (www.ons.gov.uk); this age range has been used in Annex 6. It was not possible to collect ages for all female observations during the habits survey. However, these females with unknown ages have been included in Annex 6 as they might be women of childbearing age.

9.3. 'Total dose' assessment

The UK environment agencies and the FSA have considered ways of using habits data to estimate 'total dose' retrospectively. The adopted approach is to use the adult consumption and occupancy data collected in each habits survey to create a matrix with a series of habits profiles for each site. The National Dose Assessment Working Group (NDAWG) considered this approach for assessing retrospective total doses (Camplin and others, 2005) and agreed that using habits profiles is an appropriate approach. The method used to estimate total dose integrated across pathways is provided in the RIFE reports (for example: EA, FSA, FSS, NRW, NIEA and SEPA, 2025) [Radioactivity in food and the environment \(RIFE\) report - GOV.UK](#).

The relevant matrix for the adults' profiled habits data is shown in Annex 7. Additionally, profiles have been created for the child and infant age groups, and for women of childbearing age. These are shown in Annex 8, Annex 9 and Annex 10 respectively. Most of the groups used for the pathways in the matrices are exactly analogous to the groups used throughout this habits survey report, although the names used are slightly different, for example 'Fruit – Domestic' rather than 'Domestic fruit'. However, in order to increase the robustness of the 'total dose' assessments, some of the groups that are used

throughout the rest of this report have been amalgamated together for use in the matrices. These are indicated in the notes at the foot of each matrix, where applicable. The 'Plume pathways' are related to inhalation and external exposure arising from gaseous discharges and use the total of the individuals' indoor and outdoor occupancy rates for each of the direct radiation zones. The 'Direct' pathway is expressed as the proportion of the profile members who are exposed to direct radiation.

10. Comparisons with the previous survey

The results from this 2025 survey were compared with results from the last habits survey undertaken at Barrow in 2012. The aquatic and terrestrial survey areas were the same in both surveys. The direct radiation survey area changed slightly in 2025 as it was based on the nuclear licensed site boundary and the MOD authorised site boundary, whereas only the nuclear licensed site boundary was used in 2012. Occupancy rates in the direct radiation area are compared for all age groups combined, while all other comparisons are for adults only.

10.1. Aquatic survey area

The activities identified in the aquatic survey area in 2025 were similar to those identified in 2012. However, the commercial collection of molluscs from the survey area had greatly reduced since the UK departed from the EU in 2020. Any shellfish collected from the grade B waters in the survey now require purifying prior to being exported to EU countries.

In 2012, commercial fishermen's catch included grey mullet, bass, cod, whelks and mixed whitefish, which were consumed by the fishermen and their families. In 2025, the commercial fishermen and their families were consuming plaice, lemon sole, pollock, thornback ray, whelk and brown crab.

A comparison between the main species consumed by the adult high-rate group for each food group in 2012 and 2025 is presented in Table 16.

Table 16. Comparison between 2012 and 2025 main aquatic species consumed by the adult high-rate group

Food group	2012	2025
Sea fish	Mackerel, bass and cod	Bass and flounder
Crustaceans	Brown shrimp	Brown crab
Molluscs	Whelks and cockles	Whelks and mussels
Wildfowl	Greylag goose and pink-footed goose	Greylag goose, pink-footed goose and Canada goose
Marine plants/algae	Samphire	Samphire
Salt marsh grazed sheep meat	Salt marsh grazed lamb	Salt marsh grazed lamb

A comparison between the consumption of aquatic foods in 2012 and 2025 is presented in Table 17.

Table 17. Comparison between 2012 and 2025 consumption rates of aquatic food groups for adults

Food group	2012			2025		
	Number in high-rate group	Maximum consumption rate (kg y ⁻¹)	Mean consumption rate for the high-rate group (kg y ⁻¹)	Number in high-rate group	Maximum consumption rate (kg y ⁻¹)	Mean consumption rate for the high-rate group (kg y ⁻¹)
Sea fish	8	47.2	27.1	14	39.0	22.1
Crustaceans	2	17.7	11.9	2	3.3	2.5
Molluscs	4	6.8	5.9	3	9.3	9.3
Wildfowl	9	28.6	17.2	3	44.1	44.1
Marine plants/algae	4	0.9	0.7	7	1.3	1.0
Salt marsh grazed sheep meat	6	5.7	5.7	11	24.0	16.0

The number of people in the high-rate group for sea fish consumption had increased in 2025 compared with 2012. However, the mean consumption rates of sea fish had decreased in 2025. Many of the anglers who were interviewed in 2025 stated that they were predominantly catching and releasing fish rather than taking it for consumption. It was reported by anglers that they had experienced an increase in fish populations off the west coast of Cumbria since the installation of wind farms. They thought the increase was

related to limited commercial fishing in these areas and the wind turbines created breeding grounds for the fish.

The consumption of crustaceans decreased in 2025 compared with 2012. A charter boat skipper who was consuming large quantities of brown crab and common lobster in 2012, had retired by 2025.

The consumption of wildfowl increased in 2025 due to a newly identified wildfowler who was shooting on mud and salt marsh along the Duddon Estuary. The wildfowler and their family were identified consuming a range of species in high quantities.

The consumption of samphire was identified in 2012 and 2025, and similar consumption rates were identified in both years.

The consumption of salt marsh grazed lamb increased in 2025 compared with 2012. A farm grazing sheep and lambs on salt marsh along the Duddon Estuary was identified in 2025, with the farming family consuming high quantities of salt marsh grazed lamb.

For intertidal occupancy in both 2012 and 2025, occupancy over intertidal substrates for adults was recorded over mud; mud and sand; mud and stones; salt marsh; sand; sand and stones; boat on mud. Occupancy over stones was identified in 2025, but not in 2012.

The following activities were undertaken by the individuals in the adult high-rate groups for occupancy over intertidal substrates:

- In 2012: collecting mussels, wildfowling, angling, boat maintenance, dog walking, collecting winkles, tending livestock, oyster farming, bait digging, sitting on the beach and boat dwelling.
- In 2025: bait digging, wildfowling, angling, dog walking, undertaking coastguard duties, collecting peeler crabs, tending livestock, horse riding, boat dwelling, water sports preparation, collecting cockles, walking, sitting on the beach and oyster farming.

The following activities were undertaken by the individuals in the adult high-rate groups for handling rates of fishing gear and sediment:

- In 2012: handling nets and pots for handling fishing gear, and oyster farming and wildfowling for handling sediment.
- In 2025: handling nets and pots and oyster farming for handling fishing gear, and bait digging and collecting peeler crabs for sediment.

A comparison between the 2012 and 2025 data for adult occupancy over intertidal substrates and handling pathways is shown in Table 18.

Table 18. Comparison between 2012 and 2025 intertidal occupancy rates and handling rates of fishing gear and sediment for adults

Intertidal substrate or handling pathway	2012			2025		
	Number in high-rate group	Maximum occupancy or handling rate (h y ⁻¹)	Mean occupancy or handling rate for the high-rate group (h y ⁻¹)	Number in high-rate group	Maximum occupancy or handling rate (h y ⁻¹)	Mean occupancy or handling rate for the high-rate group (h y ⁻¹)
Mud	7	220	138	2	261	261
Mud and sand	1	625	625	3	195	168
Mud and stones	3	420	400	1	391	391
Salt marsh	16	293	287	6	360	205
Sand	7	1460	926	35	1095	582
Sand and stones	17	616	368	7	748	465
Stones	Not identified	Not identified	Not identified	4	537	323
Boat on mud	3	7615	5517	2	8290	7483
Handling fishing gear	3	1485	990	7	858	463
Handling sediment	19	546	311	6	783	474

The most notable changes in occupancy rates for the adult high-rate group were an increase over mud, and a decrease over mud and sand. Occupancy over stones was identified in 2025, but not in 2012.

Occupancy over mud increased due to the identification of 2 people who were bait digging regularly at Roanhead. In 2012, one high-rate person was spending considerable time wildfowling over mud and sand, but they weren't identified in 2025 therefore the rate decreased. Additionally, the increase in occupancy over boat on mud was attributed to an individual living on a newly identified houseboat located within the survey area. A houseboat identified in 2012 at Roa Island was derelict and not in use in 2025.

The mean rates for the adult high-rate groups for handling fishing gear decreased in 2025 compared to 2012 due to a previously identified commercial fisherman spending less time fishing. The mean rates for the adult high-rate groups for handling sediment increased in 2025 compared with 2012 due to the identification of an individual who was bait digging at Lowsy Point and Askam-in-Furness.

The maximum adult occupancy rate for activities taking place in close proximity to liquid sewage sludge decreased from 1500 h y⁻¹ in 2012, to 52 h y⁻¹ in 2025. The maximum adult occupancy rate for activities taking place in close proximity to dried sewage sludge decreased from 1800 h y⁻¹ in 2012, to 52 h y⁻¹ in 2025. These decreases were attributed to the sewage treatment process now primarily being automated.

For activities taking place in water in the aquatic survey area, the maximum adult occupancy rate was 140 h y⁻¹ in 2012 for 2 people jet skiing and sub-aqua diving in the Walney channel and around Piel Island, which increased in 2025 to 2020 h y⁻¹ for an individual who was kite surfing, wake foiling, wind foiling and wing foiling at Earnse Bay.

For activities undertaken on the water in the aquatic survey area, the maximum adult occupancy rate was 3070 h y⁻¹ in 2012 for an individual undertaking rescue duties off Walney Island and along the Duddon Estuary. In 2025, the maximum adult occupancy rate decreased to 1600 h y⁻¹ for a commercial fisherman who was potting and netting throughout the survey area.

10.2. Terrestrial survey area

Activities in the terrestrial survey area in 2025 were broadly similar to those in 2012. The principal types of farm produce within the area continued to be cows' milk, beef and lamb. However, the production of pork was not identified in 2025. The growing of fruit and vegetables in gardens and on allotment sites, the collection of wild/free foods and game shooting on farmland were identified in both surveys.

The mean consumption rates for the adult high-rate groups for terrestrial food groups from the 2012 and 2025 surveys are shown in Table 19.

Table 19. Comparison between 2012 and 2025 mean consumption rates (kg y⁻¹ or l y⁻¹) for the adult high-rate groups for terrestrial food groups

Food group	2012	2025
Green vegetables	16.4	18.6
Other vegetables	24.4	24.1
Root vegetables	25.0	26.3
Potato	26.5	57.1
Domestic fruit	28.8	22.9
Milk	284.4	314.3
Cattle meat	33.2	36.4
Pig meat	5.3	Not recorded
Sheep meat	7.6	12.8
Poultry	48.0	Not recorded
Eggs	34.3	21.8
Wild/free foods	3.2	4.5
Rabbits/hares	9.0	0.4
Wild fungi	3.9	Not recorded
Freshwater fish	3.5	Not recorded

In 2025, compared to 2012, the mean consumption rates for the adult high-rate group increased in the following food groups: green vegetables; root vegetables; potato; milk;

cattle meat; sheep meat; wild/free foods. In 2025 the mean consumption rates for the adult high-rate groups decreased in the following food groups: other vegetables; domestic fruit; eggs; rabbits/hares. The most substantial increases in the consumption rates were for green vegetables, root vegetables, potato, cattle meat and sheep meat, whilst the most substantial decreases were for rabbits/hares. In 2025, the consumption of pig meat, poultry, wild fungi and freshwater fish were not identified.

The following reasons were identified for any changes in consumption rates:

- For the increase in milk consumption rates, the same farming families were interviewed in both years and were drinking less in 2025, which increased the number of people in the high-rate group and the mean consumption rate.
- For the increase in cattle meat and sheep meat consumption rates, less farming families were identified consuming beef and lamb produced on their farms in 2025, which increased the number of people in the high-rate groups and the mean consumption rates.
- In 2012, an allotment holder was consuming large quantities of rabbit, however, they were not identified in 2025. However, 2 people were identified consuming rabbits in 2025.
- In 2012, one farming family was identified consuming pork that was produced commercially on their farm. However, in 2025 the consumption of pork was not identified as the farming family were no longer rearing pigs on their farm.
- In 2012, 2 people were identified consuming brown trout from a freshwater fishery in the terrestrial survey area. In 2025, the fishery was no longer operational, and no freshwater fish were identified being consumed.

No specific reasons were identified for the other changes in consumption rates.

The human consumption of groundwater was not identified in 2012 and 2025. In 2012, livestock were drinking mains water, spring water and had access to streams, which was not identified in 2025.

10.3. Direct radiation survey area

Activities identified in the direct radiation survey area in 2012 and 2025 were similar and included people residing, working and undertaking recreational activities. In 2025, the direct radiation survey area changed slightly as it was determined using the nuclear licensed site boundary and MOD authorised site boundary, instead of only the nuclear licensed site boundary in 2012. A comparison between the 2012 and 2025 direct radiation occupancy rates for all age groups combined, by zone, is presented in Table 20.

Table 20. Comparison between 2012 and 2025 direct radiation occupancy rates (h y⁻¹) for all age groups

	2012	2025
0 - 0.25 km		
Highest indoor occupancy	8535	8225
Highest outdoor occupancy	1400	1812
Highest total occupancy	8750	8656
>0.25 - 0.5 km		
Highest indoor occupancy	7814	8740
Highest outdoor occupancy	1178	783
Highest total occupancy	8386	8740
>0.5 - 1.0 km		
Highest indoor occupancy	8612	8656
Highest outdoor occupancy	3039	2009
Highest total occupancy	8734	8708

The maximum occupancy rates in all 3 zones in 2012 and 2025 were broadly similar. In 2025, the highest indoor, outdoor and total occupancy rates were for residents in zones. In 2012, the highest indoor, outdoor and total occupancy rates were also for residents in zones except the highest outdoor occupancy rate in the 0 – 0.25 km zone was for an individual who worked in the area.

The gamma dose rate measurements were not taken in the same residences and businesses in 2025 and 2012 due to the survey area being highly populated.

10.4. Future developments in the vicinity of the Barrow Shipyards nuclear site

In 2023, the MOD awarded BAESML a contract to build a new generation of submarines, known as SSN-AUKUS, as part of the security pact between the US, UK and Australia. BAESML plan to begin manufacturing the SSN-AUKUS submarines in the late 2020's, with the first submarine due to be delivered in the late 2030's ([£3.95bn awarded for next phase of AUKUS submarine programme](#)).

In response to the news of a large investment into BAESML at the port of Barrow-in-Furness, Associated British Ports (ABP) have recognised the need for increased capacity for submarine construction. ABP has produced an initial plan for significant developments to the port of Barrow-in-Furness with the aim to be completed by 2040 ([Associated British Ports | Future Ports Barrow](#)). Future survey areas could include new or additional pathways from these developments, such as:

- A new residential estate within the direct radiation survey area to the east of the Barrow Shipyards nuclear site.

- A jetty capable of accommodating incoming gas vessels of up to 200m in length in the Walney Channel and improvements to Ramsden Dock. These works will be completed in the aquatic survey area.

11. Main findings

The survey investigated 3 potential sources of public radiation exposure from the Barrow Shipyards nuclear site, which were:

- Discharges of liquid radioactive waste via a wastewater treatment works into the Walney Channel
- Discharges of gaseous radioactive waste to the atmosphere
- Emissions of direct radiation

Information was obtained by conducting interviews with members of the public including, for example, anglers, people spending time on intertidal substrates, farmers, allotment holders and people spending time within the direct radiation survey area. These people were targeted because their diet and habits may cause them to be exposed to radioactivity from the site. However, it should be noted that the most exposed people can only be defined with the outcome of a dose assessment. Data for 466 individuals are presented in this report. All consumption rates recorded are only for foods produced, collected or caught from within the aquatic and terrestrial survey areas as defined in Section 4.3. The consumption and occupancy rates in this section are presented to 2 significant figures.

11.1. Aquatic survey area

The mean consumption rates for the adult high-rate groups (as defined in Section 5.4) for the separate aquatic consumption pathways for foods potentially affected by liquid discharges were:

- 22 kg y⁻¹ for sea fish
- 2.5 kg y⁻¹ for crustaceans
- 9.3 kg y⁻¹ for molluscs
- 44 kg y⁻¹ for wildfowl
- 1.0 kg y⁻¹ for marine plants/algae
- 16 kg y⁻¹ for salt marsh grazed sheep meat

The predominant foods consumed by the people in the adult high-rate groups were:

- For sea fish: bass

- For crustaceans: brown crab
- For molluscs: whelk
- For wildfowl: greylag goose and pink-footed goose
- For marine plants/algae: samphire
- For salt marsh grazed sheep meat: salt marsh grazed lamb

The use of seaweed as animal feed was not identified. However, seaweed was identified being used as fertiliser on one allotment plot.

The mean occupancy rates for the adult high-rate groups over the separate intertidal substrates were:

- 260 h y⁻¹ for mud
- 170 h y⁻¹ for mud and sand
- 390 h y⁻¹ for mud and stones
- 210 h y⁻¹ for salt marsh
- 580 h y⁻¹ for sand
- 470 h y⁻¹ for sand and stones
- 320 h y⁻¹ for stones
- 7500 h y⁻¹ for boat on mud

The mean rates for the adult high-rate groups for handling were:

- 460 h y⁻¹ for handling fishing gear (nets and pots)
- 470 h y⁻¹ for handling sediment

The maximum adult occupancy rates for water-based activities were:

- 2000 h y⁻¹ for 'in water'
- 1600 h y⁻¹ for 'on water'

Individuals in the child and infant age groups were recorded consuming aquatic foods and undertaking activities in the aquatic survey area.

11.2. Terrestrial survey area

The mean consumption rates for the adult high-rate groups for the separate consumption pathways for foods potentially affected by gaseous discharges were:

- 19 kg y⁻¹ for green vegetables
- 24 kg y⁻¹ for other vegetables
- 26 kg y⁻¹ for root vegetables
- 57 kg y⁻¹ for potato
- 23 kg y⁻¹ for domestic fruit
- 310 l y⁻¹ for milk
- 36 kg y⁻¹ for cattle meat
- 13 kg y⁻¹ for sheep meat
- 22 kg y⁻¹ for eggs
- 4.5 kg y⁻¹ for wild/free foods
- 0.4 kg y⁻¹ for rabbits/hares

The consumption of terrestrial foodstuffs was also recorded for individuals in the child and infant age groups.

The human consumption of groundwater was not identified.

11.3. Direct radiation survey area

The highest indoor, outdoor and total occupancy rates recorded for each zone were:

0 – 0.25 km zone

- 8200 h y⁻¹ for the indoor occupancy rate
- 1800 h y⁻¹ for the outdoor occupancy rate
- 8700 h y⁻¹ for the total occupancy rate

>0.25 – 0.5 km zone

- 8700 h y⁻¹ for the indoor occupancy rate
- 780 h y⁻¹ for the outdoor occupancy rate
- 8700 h y⁻¹ for the total occupancy rate

>0.5 – 1.0 km zone

- 8700 h y⁻¹ for the indoor occupancy rate
- 2000 h y⁻¹ for the outdoor occupancy rate
- 8700 h y⁻¹ for the total occupancy rate

The highest indoor, outdoor and total occupancy rates were for residents across all zones.

12. Habits survey information for consideration in the selection of samples and measurements for monitoring programmes

Habits surveys provide site-specific information on the consumption of locally produced foods and the location and types of activities which may affect the public's exposure to radiation. This information can be used to help in the selection of samples and measurements for the monitoring programmes by identifying foods that are consumed at high rates and the locations where people spend significant amounts of time.

In England and Wales, the monitoring programme for radioactivity in food is undertaken by the FSA, and the monitoring programme for radioactivity in the environment is conducted by the EA. The results of these programmes are published annually in the RIFE reports (for example: EA, FSA, FSS, NRW, NIEA and SEPA, 2025) [Radioactivity in food and the environment \(RIFE\) report - GOV.UK](#).

12.1. Summary of the monitoring programmes for Barrow

The 2024 monitoring programmes conducted by the EA and FSA relevant to the Barrow area included the samples and measurements listed in Table 21 to Table 23. The location names, foods and substrate classifications are taken directly from RIFE 30 (EA, FSA, FSS, NRW, NIEA and SEPA, 2025) [Radioactivity in food and the environment \(RIFE\) report - GOV.UK](#). Some of the samples and measurements taken for the monitoring programmes may be from outside the survey areas used for the 2025 Barrow habits survey, the rationale for some of the samples and measurements are to primarily assess impacts from Sellafield discharges.

Table 21. Aquatic environmental samples used in the 2024 EA environmental monitoring programme

Sample	Location
Sediment	Walney Channel (North of discharge point)
Sediment	Walney Channel (South of discharge point) ^a

Notes

^a Due to the infrequent nature of discharges from Barrow Shipyards nuclear site, this is an ad-hoc sample which coincides with a discharge from the site

Table 22. Gamma dose rate measurements over intertidal substrates used in the 2024 EA environmental monitoring programme

Location	Substrate
Askam Pier	Mud and sand
Askam Pier	Salt marsh
Askam Pier	Sand
Walney Channel, N of discharge point	Mud and sand
Roa Island	Mud and sand
Roa Island	Sand

Table 23. Terrestrial samples used in the 2024 EA and FSA monitoring programmes

Sample	Location
Beetroot	Barrow
Grass	Barrow

12.2. Information from the 2025 Barrow habits survey for use in the selection of samples and measurements for monitoring programmes

Food Standards Agency monitoring

The following foods presented in Table 24 were either consumed in the largest quantities in their food groups or were the only food in their food group and could be considered for potentially selecting samples for the FSA monitoring programme.

Table 24. Foods considered for potentially selecting samples for the FSA monitoring programme

Food	Food Group
Bass	Sea fish
Brown crab	Crustaceans
Whelk	Molluscs
Greylag goose	Wildfowl
Samphire	Marine plants/algae
Salt marsh grazed lamb	Salt marsh grazed sheep meat
Cabbage	Green vegetables
Tomato	Other vegetables
Onion	Root vegetables
Potato	Potato
Strawberry	Domestic fruit
Cows' milk	Milk
Beef	Cattle meat
Lamb	Sheep meat
Chicken egg	Egg
Blackberry	Wild/free foods
Rabbit	Rabbits/hares

Environment Agency monitoring

The current environmental monitoring programme adequately covers the Barrow area, and no changes are suggested.

13. Acknowledgements

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[Associated British Ports | Future Ports Barrow](#) – Last accessed 30/01/2026

Table 25. Survey coverage

Group	Criteria	Estimate of complete coverage	Number for whom positive data was obtained	Coverage for positive observations	Notes
Summary of all pathways					
All potential interviewees in the Barrow aquatic, terrestrial and direct radiation survey areas.	Number of people residing in the terrestrial survey area (excluding those resident in the direct radiation survey area) (See (B) Terrestrial pathways)	53,200 ^a	86 ^b	0.1%	The survey targeted individuals who were potentially the most exposed, mostly producers of local foods such as farmers and allotment holders.
	Number of people residing in the direct radiation survey area (See (C) Direct radiation pathways)	18,000	38 ^b	0.2%	Interviews were conducted with members of the public from 19 residences out of an estimated total of 9000 permanent residences.
	Number of people working, visiting and undertaking recreational activities in the direct radiation survey area (See (C) Direct radiation pathways)	Unknown	88 ^b	Unknown	Excluding employees and contractors at the nuclear licensed site. Where generalised data for groups of people were obtained, for example employees at some businesses, only a limited number of representative individuals have been included.
	Number of people affected by liquid discharges (excluding those assigned to other categories above) (See (A) Aquatic pathways)	Unknown	254 ^b	Unknown	Where generalised data for groups of people were obtained, for example, members of clubs, only a limited number of representative individuals have been included.
All potential interviewees in the Barrow aquatic, terrestrial and direct radiation survey areas.	Total for aquatic, terrestrial and direct radiation survey areas	Unknown	466 ^b	Unknown	

Group	Criteria	Estimate of complete coverage	Number for whom positive data was obtained	Coverage for positive observations	Notes
(A) Aquatic pathways					
People using the intertidal areas (for example: dog walkers, people playing, etc.)	Number of people undertaking activities on the intertidal areas in the aquatic survey area	Unknown	201	Unknown	Where generalised data for groups of people were obtained, for example, members of clubs, only a limited number of representative individuals have been included.
People undertaking activities in or on water (for example: swimming, rowing and kayaking etc.)	Number of people undertaking activities in or on water in the aquatic survey area	Unknown	104	Unknown	Where generalised data for groups of people were obtained, for example, members of clubs, only a limited number of representative individuals have been included.
Sea fish consumers	Number of people consuming sea fish from the aquatic survey area	Unknown	44	Unknown	
Crustacean consumers	Number of people consuming crustaceans from the aquatic survey area	Unknown	7	Unknown	
Mollusc consumers	Number of people consuming molluscs from the aquatic survey area	Unknown	13	Unknown	

Group	Criteria	Estimate of complete coverage	Number for whom positive data was obtained	Coverage for positive observations	Notes
(A) Aquatic pathways					
Wildfowl consumers (from waters or intertidal areas subject to liquid discharges)	Number of people consuming wildfowl from the aquatic survey area	Unknown	7	Unknown	
Marine plants and algae	Number of people consuming marine plants or algae from the aquatic survey area	Unknown	8	Unknown	The species of marine plants/algae identified being consumed was samphire.
Salt marsh grazed sheep meat consumers (from intertidal areas subject to liquid discharges)	Number of people consuming salt marsh grazed sheep meat from the aquatic survey area	Unknown	11	Unknown	
(B) Terrestrial pathways					
Farmers	Number of farmers and their family members consuming food from the terrestrial survey area	32	28	87.5%	Interviews were conducted at 13 farms out of an estimated 15 farms in the terrestrial survey area. Families at 5 of the farms interviewed did not consume any food from the terrestrial survey area.

Group	Criteria	Estimate of complete coverage	Number for whom positive data was obtained	Coverage for positive observations	Notes
(B) Terrestrial pathways					
Allotment holders and gardeners	Number of allotment holders, gardeners and their family members consuming food from the terrestrial survey area	2700	66	2.4%	Interviews were conducted with members of the public from 17 allotment plots out of an estimated total of 700 allotment plots.
(C) Direct radiation pathways					
Residents	Number of residents in the survey area	18,000	38	0.2%	Interviews were conducted with members of the public from 19 residences out of an estimated total of 9000 permanent residences.
Employees	Number of people working in the survey area	Unknown	56	Unknown	Excluding people who were living in the direct radiation survey area and employees and contractors at the nuclear licensed site. Where generalised data for groups of people were obtained, for example employees at some businesses, only a limited number of representative individuals have been included.
Visitors (people undertaking recreational activities or visiting relatives)	Number of people visiting the survey area	Unknown	33	Unknown	

Group	Criteria	Estimate of complete coverage	Number for whom positive data was obtained	Coverage for positive observations	Notes
Breakdown of age groups for people residing in the 5 km terrestrial survey area					
Adult	16 years old and over	44,000 ^a	174	0.4%	
Child	6 years old to 15 years old	5900 ^a	33	0.6%	
Infant	0 to 5 years old	3300 ^a	5	0.02%	

Notes

^a Estimate of the number of people residing in the 5 km terrestrial survey area based on data from www.ons.gov.uk.

^b The number of people for whom positive data was obtained for pathways (A) and (B) and (C) will usually not equal the relevant totals in the summary of all pathways. This is because in sections (A), (B) and (C) some individuals may be counted 2 or more times, for example someone who goes angling and consumes foods from the terrestrial area.

U – Unknown

Table 26. Typical food groups used in habits surveys

Food group	Examples of foods within the group
Green vegetables	Asparagus, broccoli, Brussels sprouts, cabbage, calabrese, cauliflower, chard, courgette, cucumber, gherkin, globe artichoke, herbs, kale, leaf beet, lettuce, marrow, spinach
Other vegetables	Aubergine, broad bean, chili pepper, French bean, kohlrabi, mangetout, pea, pepper, pumpkin, runner bean, sweetcorn, tomato
Root vegetables	Beetroot, carrot, celeriac, celery, chicory, fennel, garlic, Jerusalem artichoke, leek, onion, parsnip, radish, shallot, spring onion, swede, turnip
Potato	Potato
Domestic fruit	Apple, apricot, blackberry, blackcurrant, boysenberry, cherry, damson, fig, gooseberry, grape, greengage, huckleberry, loganberry, melon, nectarine, peach, pear, plum, raspberry, redcurrant, rhubarb, rowanberry, strawberry, tayberry, white currant
Milk	Cows' milk, cream, goats' milk, yoghurt
Cattle meat ^a	Beef
Pig meat ^a	Pork
Sheep meat ^a	Lamb, mutton
Poultry ^b	Chicken, duck, goose, grouse, guinea fowl, partridge, pheasant, pigeon, turkey, woodcock
Eggs	Chicken egg, duck egg, goose egg
Wild/free foods	Blackberry, chestnut, crab apple, damson, dandelion root, elderberry, nettle, rowanberry, sloe
Honey	Honey

Food group	Examples of foods within the group
Wild fungi	Mushrooms, other edible fungi
Rabbits/hares	Hare, rabbit
Venison ^a	Venison
Sea fish	Bass, brill, cod, ling, dab, Dover sole, flounder, gurnard, haddock, hake, herring, lemon sole, mackerel, monkfish, mullet, plaice, pollack, rays, saithe, salmon, sea trout, sprat, turbot, whitebait, whiting, witch, cuttlefish ^c , squid ^c
Fish (freshwater)	Brown trout, eel (river), perch, pike, rainbow trout, salmon (river)
Crustaceans	Brown crab, common lobster, crawfish, Nephrops, prawn, shrimp, spider crab, squat lobster, velvet swimming crab
Molluscs	Cockles, limpets, mussels, oysters, razor clam, scallops, whelks, winkles
Wildfowl ^b	Canada goose, greylag goose, mallard, pink-footed goose, pintail, shoveler, teal, wigeon

Notes

^a Including offal.

^b Domesticated ducks and geese are classified as poultry. Wild ducks and geese are classified as wildfowl.

^c Although squid and cuttlefish are molluscs, radiologically they are more akin to fish due to their mobility and physiology.

Table 27. Adults' consumption rates of sea fish from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Bass	Cod	Flounder	Lemon sole	Mackerel	Plaice	Pollack	Thornback ray	Whiting	Total
5102/1/1	39.0	-	-	-	-	-	-	-	-	39.0
4972/1/1	19.5	-	-	-	7.8	-	-	-	-	27.3
4972/3/1	19.5	-	-	-	7.8	-	-	-	-	27.3
4862/1/1	-	9.4	-	1.4	-	3.6	8.9	-	-	23.2
4878/1/1	10.4	-	10.4	-	-	-	-	-	-	20.9
4878/2/1	10.4	-	10.4	-	-	-	-	-	-	20.9
4878/3/1	10.4	-	10.4	-	-	-	-	-	-	20.9
4878/4/1	10.4	-	10.4	-	-	-	-	-	-	20.9
4878/7/1	10.4	-	10.4	-	-	-	-	-	-	20.9
4878/8/1	10.4	-	10.4	-	-	-	-	-	-	20.9
5045/2/1	17.9	-	-	-	-	-	-	-	-	17.9
5136/1/1	16.6	-	-	-	-	-	-	-	-	16.6
5136/2/1	16.6	-	-	-	-	-	-	-	-	16.6
5136/3/1	16.6	-	-	-	-	-	-	-	-	16.6
4877/1/1	9.7	-	-	-	-	-	-	-	-	9.7
4877/4/1	9.7	-	-	-	-	-	-	-	-	9.7
4866/1/1	-	-	-	-	-	3.8	-	5.7	-	9.6
4866/2/1	-	-	-	-	-	3.8	-	5.7	-	9.6
4866/3/1	-	-	-	-	-	3.8	-	5.7	-	9.6
5026/1/1	6.3	-	-	-	-	-	-	-	-	6.3
5045/4/1	6.0	-	-	-	-	-	-	-	-	6.0
5071/1/1	-	2.1	-	-	-	0.8	2.0	-	-	4.9
5111/1/1	4.5	-	-	-	-	-	-	-	-	4.5
4998/1/1	3.8	-	0.3	-	-	-	-	-	-	4.1

Person ID number	Bass	Cod	Flounder	Lemon sole	Mackerel	Plaice	Pollack	Thornback ray	Whiting	Total
4998/2/1	3.8	-	0.3	-	-	-	-	-	-	4.1
5140/1/1	-	-	-	-	-	2.8	-	-	-	2.8
5140/2/1	-	-	-	-	-	2.8	-	-	-	2.8
4857/1/1	2.2	-	-	-	-	-	-	-	-	2.2
4857/2/1	2.2	-	-	-	-	-	-	-	-	2.2
4975/1/1	1.0	-	-	-	-	-	-	-	-	1.0
4975/3/1	1.0	-	-	-	-	-	-	-	-	1.0
4975/4/1	1.0	-	-	-	-	-	-	-	-	1.0
5023/2/1	0.4	-	-	-	-	0.2	-	-	0.2	0.8
5023/4/1	0.4	-	-	-	-	0.2	-	-	0.2	0.8
5091/1/1	-	-	0.2	-	-	-	-	-	-	0.2
5091/2/1	-	-	0.2	-	-	-	-	-	-	0.2

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of fish for adults based on the 14 high-rate consumers is 22.1 kg y⁻¹

The observed 97.5th percentile rate based on 36 observations is 28.7 kg y⁻¹

Table 28. Adults' consumption rates of crustaceans from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Brown crab	Common lobster	Total
4862/1/1	3.3	-	3.3
5108/1/1	1.6	-	1.6
4857/1/1	-	0.2	0.2
4857/2/1	-	0.2	0.2
4975/1/1	0.05	0.1	0.1
4975/3/1	0.05	0.1	0.1
4975/4/1	0.05	0.1	0.1

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of crustaceans for adults based on the 2 high-rate consumers is 2.5 kg y⁻¹

The observed 97.5th percentile rate based on 7 observations is 3.1 kg y⁻¹

Table 29. Adults' consumption rates of molluscs from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Cockle	Mussel	Pacific Oyster	Razor shell	Whelk	Winkle	Total
5144/1/1	-	1.5	-	-	7.8	-	9.3
5144/2/1	-	1.5	-	-	7.8	-	9.3
5144/3/1	-	1.5	-	-	7.8	-	9.3
4862/1/1	1.3	1.2	-	-	-	-	2.5
5141/1/1	-	-	1.4	-	-	-	1.4
4981/1/1	-	-	-	0.7	-	-	0.7
5139/3/1	-	0.4	-	-	-	-	0.4
5139/4/1	-	0.4	-	-	-	-	0.4
5108/1/1	-	-	-	-	-	0.4	0.4
5071/1/1	0.2	-	-	-	-	-	0.2
4975/1/1	0.1	-	-	-	-	-	0.1
4975/3/1	0.1	-	-	-	-	-	0.1
4975/4/1	0.1	-	-	-	-	-	0.1

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of molluscs for adults based on the 3 high-rate consumers is 9.3 kg y⁻¹

The observed 97.5th percentile rate based on 13 observations is 9.3 kg y⁻¹

Table 30. Adults' consumption rates of wildfowl from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Canada goose	Greylag goose	Mallard	Pink-footed goose	Teal	Wigeon	Total
5136/1/1	9.9	15.5	3.2	12.0	1.1	2.5	44.1
5136/2/1	9.9	15.5	3.2	12.0	1.1	2.5	44.1
5136/3/1	9.9	15.5	3.2	12.0	1.1	2.5	44.1
5102/1/1	2.8	2.2	2.2	3.4	0.8	1.7	13.2

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of wildfowl for adults based on the 3 high-rate consumers is 44.1 kg y⁻¹

The observed 97.5th percentile rate based on 4 observations is 44.1 kg y⁻¹

Table 31. Adults' consumption rates of marine plants/algae from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Samphire
5139/3/1	1.3
5139/4/1	1.3
5139/6/1	1.3
5007/1/1	1.3
5007/2/1	1.3
4858/1/1	0.5
4858/2/1	0.5

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of marine plants/algae for adults based on the 7 high-rate consumers is 1.0 kg y⁻¹

The observed 97.5th percentile rate based on 7 observations is 1.3 kg y⁻¹

Table 32. Adults' consumption rates of salt marsh grazed sheep meat from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Salt marsh lamb
4979/1/1	24.0
4979/2/1	24.0
4979/3/1	24.0
4979/4/1	24.0
4980/1/1	11.4
4980/2/1	11.4
4980/3/1	11.4
4980/4/1	11.4
4980/5/1	11.4
4980/6/1	11.4
4980/7/1	11.4

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of salt marsh grazed sheep meat for adults based on the 11 high-rate consumers is 16.0 kg y⁻¹

The observed 97.5th percentile rate based on 11 observations is 24.0 kg y⁻¹

Table 33. Adults' consumption rates of vegetables and domestic fruit grown on land where seaweed has been used as a fertiliser (kg y⁻¹)

Other vegetables								
Person ID number	Aubergine	Chilli pepper	French bean	Pea	Pepper	Runner bean	Tomato	Total
5111/1/1	1.7	0.7	2.7	0.9	2.4	2.7	7.3	18.4
5111/2/1	-	-	-	0.9	-	-	7.3	8.2
Root vegetables								
Person ID number	Beetroot	Fennel	Garlic	Onion	Shallot	Spring onion	Total	
5111/1/1	3.6	0.7	0.8	14.1	18.0	1.9	39.1	
Domestic fruit								
Person ID number	Blackcurrant	Blueberry	Gooseberry	Grapes	Rhubarb	Total		
5111/1/1	0.7	1.8	1.4	7.3	1.0	12.2		
Green vegetables								
Person ID number	Courgette	Cucumber	Total					
5111/1/1	2.7	3.3	6.0					
Potato								
Person ID number	Potato							
5111/1/1	36.3							
5111/2/1	36.3							

Notes

These data are presented for use in studies of the potential dose arising from the possible transfer onto the land of radionuclides originating from liquid discharges made into the sea. However, these foods were grown in the terrestrial survey area and the primary reason for investigating them was to gain information about foods potentially subject to gaseous discharges. Therefore, they are also included in the terrestrial food tables presented later in this report, and, in order to avoid double accounting in assessments of total dose, are entered only once in the Annexes, where they are classified as terrestrial foods.

Table 34. Children's consumption rates of sea fish from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Bass	Flounder	Plaice	Whiting	Total
4878/5/1	7.8	7.8	-	-	15.6
4878/6/1	7.8	7.8	-	-	15.6
4878/9/1	7.8	7.8	-	-	15.6
4878/10/1	7.8	7.8	-	-	15.6
5136/4/1	8.3	-	-	-	8.3
5023/1/1	0.4	-	0.2	0.2	0.8
5023/3/1	0.3	-	0.2	0.2	0.6

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of sea fish for the child age group based on the 5 high-rate consumers is 14.2 kg y⁻¹

The observed 97.5th percentile rate based on 7 observations is 15.6 kg y⁻¹

Table 35. Infants' consumption rates of sea fish from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Bass
5136/5/1	4.1

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of sea fish for the infant age group based on the high-rate consumer is 4.1 kg y⁻¹

The observed 97.5th percentile is not applicable for one observation

Table 36. Children's consumption rates of wildfowl from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Canada goose	Greylag goose	Mallard	Pink-footed goose	Teal	Wigeon	Total
5136/4/1	4.9	7.7	1.6	6.0	0.6	1.2	22.0
5102/2/1	0.4	-	0.7	0.5	0.1	0.5	2.2

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of wildfowl for the child age group based on the high-rate consumer is 22.0 kg y⁻¹

The observed 97.5th percentile based on the 2 observations is 21.5 kg y⁻¹

Table 37. Infants' consumption rates of wildfowl from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Canada goose	Greylag goose	Mallard	Pink-footed goose	Teal	Wigeon	Total
5136/5/1	2.5	3.9	0.8	3.0	0.3	0.6	11.0

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of wildfowl for the infant age group based on the high-rate consumer is 11.0 kg y⁻¹

The observed 97.5th percentile is not applicable for one observation

Table 38. Children's consumption rates of marine plants/algae from the Barrow aquatic survey area (kg y⁻¹)

Person ID number	Samphire
5139/5/1	1.3

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of marine plants/algae for the child age group based on the 1 high-rate consumer is 1.3 kg y⁻¹

The observed 97.5th percentile is not applicable for 1 observation

Table 39. Adults' intertidal occupancy rates in the Barrow aquatic survey area (h y⁻¹)

Person ID number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
5014/1/1	Walney Channel	Bait digging	261	-	-	-	-	-	-	-
	Roanhead		-	195	-	-	-	-	-	-
	Millom and Haverigg	Angling	-	-	-	-	105	-	-	-
	Sandy Gap		-	-	-	-		-	-	-
	Earnse Bay	Bait digging	-	-	-	-	-	-	-	-
	South-west Walney Island	Angling	-	-	-	-	-	24	-	-
	Sandy Gap		-	-	-	-	-		-	-
Silecroft	-		-	-	-	-	-	-	16	-
5014/3/1	Walney Channel	Bait digging	261	-	-	-	-	-	-	-
	Roanhead		-	195	-	-	-	-	-	-
	Earnse Bay		-	-	-	-	65	-	-	-
5137/1/1	Biggar Bank, Tummerhill, Snab Sands and North Walney Island	Wildfowling	66	-	-	-	-	-	-	-
	Roanhead	Dog walking	-	-	-	-	232	-	-	-
	West Walney Island		-	-	-	-	-	232	-	-
5137/3/1	Biggar Bank, Tummerhill, Snab Sands and North Walney Island	Wildfowling	66	-	-	-	-	-	-	-
5137/3/2	Biggar Bank, Tummerhill, Snab Sands and North Walney Island	Wildfowling	-	-	-	153	-	-	-	-
			-	-	-	153	-	-	-	-
5137/3/3	Biggar Bank, Tummerhill, Snab Sands and North Walney Island	Wildfowling	66	-	-	-	-	-	-	-
			-	-	-	153	-	-	-	-
4849/1/1	Roa Island	Boat maintenance	66	-	-	-	-	-	-	-
5027/1/1	Roa Island	Collecting peeler crabs	50	-	-	-	-	-	-	-
	Millom and Haverigg	Angling	-	-	-	-	275	-	-	-
	Sandy Gap		-	-	-	-		-	-	
	Roanhead	Bait digging	-	-	-	-	-	-	-	-
	Sandy Gap	Angling	-	-	-	-	-	120	-	-
Silecroft	-		-	-	-	-	-	80	-	
5026/1/1	Roa Island	Collecting peeler crabs	26	-	-	-	-	-	-	-
	Millom and Haverigg	Angling	-	-	-	-	64	-	-	-
	Sandy Gap		-	-	-	-		-	-	
	Silecroft	Walking	-	-	-	-	-	-	-	-
	South-west Walney Island	Angling	-	-	-	-	-	24	-	-
	Sandy Gap		-	-	-	-	-		-	-
	Silecroft		-	-	-	-	-	-	-	537
Annaside and Silecroft	-		-	-	-	-	-	-	-	
4862/1/1	Walney Channel	Collecting cockles	24	-	-	-	-	-	-	-
	Roosebeck	Collecting mussels	-	-	-	-	30	-	-	-
5097/1/1	Walney Channel	Collecting samphire	21	-	-	-	-	-	-	-
	Earnse Bay	Walking	-	-	-	-	6	-	-	-

Person ID number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
5102/1/1	Duddon Estuary and Walney Island	Wildfowling	18	-	-	-	-	-	-	-
			-	-	-	18	-	-	-	-
	Millom, Haverigg and Sandy Gap	Angling	-	-	-	-	249	-	-	-
	West Walney Island	Bait digging	-	-	-	-		-	-	-
	Askam Pier	Dog walking	-	-	-	-	-	-	-	-
	South-west Walney Island, west Walney Island and Sandy Gap	Angling	-	-	-	-	-	259	-	-
Silecroft	-		-	-	-	-	-	16	-	
5030/1/1	Walney Channel	Collecting peeler crabs	13	-	-	-	-	-	-	-
	Foulney Island		-	13	-	-	-	-	-	-
	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	144	-	-	-
	Sandy Gap and south-west Walney Island		-	-	-	-	-	128	-	-
	Silecroft		-	-	-	-	-	-	16	-
5136/1/1	Duddon Estuary	Wildfowling	8	-	-	-	-	-	-	-
			-	-	-	8	-	-	-	-
	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	57	-	-	-
	Askam-in-Furness	Bait digging	-	-	-	-		-	-	-
	Sandy Gap, south-west Walney Island and west Walney Island	Angling	-	-	-	-	-	206	-	-
Silecroft	-		-	-	-	-	-	16	-	
5136/2/1	Duddon Estuary	Wildfowling	8	-	-	-	-	-	-	-
			-	-	-	8	-	-	-	-
5138/1/1	Duddon Estuary	Undertaking rescue duties	8	-	-	-	-	-	-	-
	Earnse Bay and Silecroft		-	-	-	-	16	-	-	-
5138/1/2	Duddon Estuary	Undertaking rescue duties	8	-	-	-	-	-	-	-
	Earnse Bay and Silecroft		-	-	-	-	16	-	-	-
5138/1/3	Duddon Estuary	Undertaking rescue duties	8	-	-	-	-	-	-	-
	Earnse Bay and Silecroft		-	-	-	-	16	-	-	-
5138/1/4	Duddon Estuary	Undertaking rescue duties	8	-	-	-	-	-	-	-
	Earnse Bay and Silecroft		-	-	-	-	16	-	-	-
5138/1/5	Duddon Estuary	Undertaking rescue duties	8	-	-	-	-	-	-	-
	Earnse Bay and Silecroft		-	-	-	-	16	-	-	-
5138/2/1	Duddon Estuary	Undertaking rescue duties	8	-	-	-	-	-	-	-
	Earnse Bay and Silecroft		-	-	-	-	16	-	-	-
5138/2/2	Duddon Estuary	Undertaking rescue duties	8	-	-	-	-	-	-	-
	Earnse Bay and Silecroft		-	-	-	-	16	-	-	-
5138/2/3	Duddon Estuary	Undertaking rescue duties	8	-	-	-	-	-	-	-
	Earnse Bay and Silecroft		-	-	-	-	16	-	-	-

Person ID number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
5139/3/1	Walney Channel and Duddon Estuary	Undertaking rescue duties	7	-	-	-	-	-	-	-
	Rampside	Collecting samphire	-	-	-	13	-	-	-	-
	Askam-in-Furness and Roanhead	Undertaking coastguard duties	-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	748	-	-
	Rampside	Dog walking	-	-	-	-	-	-	-	-
5139/1/1	Walney Channel and Duddon Estuary	Undertaking coastguard duties	7	-	-	-	-	-	-	-
	Askam-in-Furness and Roanhead		-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	18	-	-
5139/1/2	Walney Channel and Duddon Estuary	Undertaking coastguard duties	7	-	-	-	-	-	-	-
	Askam-in-Furness and Roanhead		-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	18	-	-
5139/1/3	Walney Channel and Duddon Estuary	Undertaking coastguard duties	7	-	-	-	-	-	-	-
	Askam-in-Furness and Roanhead		-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	18	-	-
5139/1/4	Walney Channel and Duddon Estuary	Undertaking coastguard duties	7	-	-	-	-	-	-	-
	Askam-in-Furness and Roanhead		-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	18	-	-
5139/1/5	Walney Channel and Duddon Estuary	Undertaking coastguard duties	7	-	-	-	-	-	-	-
	Askam-in-Furness and Roanhead		-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	18	-	-
5139/1/6	Walney Channel and Duddon Estuary	Undertaking coastguard duties	7	-	-	-	-	-	-	-
	Askam-in-Furness and Roanhead		-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	18	-	-
5139/1/7	Walney Channel and Duddon Estuary	Undertaking coastguard duties	7	-	-	-	-	-	-	-
	Askam-in-Furness and Roanhead		-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	18	-	-
5139/2/1	Walney Channel and Duddon Estuary	Undertaking coastguard duties	7	-	-	-	-	-	-	-
	Askam-in-Furness and Roanhead		-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	18	-	-
5139/2/2	Walney Channel and Duddon Estuary	Undertaking coastguard duties	7	-	-	-	-	-	-	-
	Askam-in-Furness and Roanhead		-	-	-	-	6	-	-	-
	Roosebeck, Rampside, Walney Island, Millom, Haverigg and Silecroft		-	-	-	-	-	18	-	-

Person ID number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
4850/1/1	Lowsy Point	Fixing moorings	6	-	-	-	-	-	-	-
	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
5108/1/1	Walney Meetings	Collecting winkles	4	-	-	-	-	-	-	-
4878/1/1	Askam-in-Furness	Bait digging and collecting peeler crabs	-	116	-	-	-	-	-	-
4877/1/1	Askam-in-Furness ad Duddon Estuary	Bait digging	-	30	-	-	-	-	-	-
	Roanhead and Askam-in-Furness	Dog walking	-	-	-	-	365	-	-	-
	Walney Island	Angling	-	-	-	-	-	130	-	-
5111/1/1	Roa Island	Collecting seaweed	-	2	-	-	-	-	-	-
5029/1/1	Milom Iron Works	Collecting peeler crabs	-	-	391	-	-	-	-	-
	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	390	-	-	-
	Sandy Gap and south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	366	-
5101/1/1	Walney Channel	Dog walking	-	-	52	-	-	-	-	
5032/1/1	Milom Iron Works	Collecting peeler crabs	-	-	30	-	-	-	-	-
	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	-	-	-	-
	Askam-in-Furness	Bait digging	-	-	-	-	112	-	-	-
	Millom	Dog walking	-	-	-	-	-	-	-	-
	Sandy Gap, South-west Walney Island and Walney Island	Angling	-	-	-	-	-	102	-	-
	Silecroft		-	-	-	-	-	-	28	-
	Silecroft		Dog walking	-	-	-	-	-	-	-
4979/1/1	Duddon Estuary	Tending livestock	-	-	-	360	-	-	-	-
4993/1/1	Askam-in-Furness	Dog walking	-	-	-	261	-	-	-	-
	Lowsy Point		-	-	-	-	652	-	-	-
5045/4/1	South-west Walney Island	Dog walking	-	-	-	78	-	-	-	-
	Biggar Bank, south-west Walney Island and Sandy Gap		-	-	-	-	-	352	-	-
	Biggar Bank	Horse riding	-	-	-	-	-	-	-	-
4980/1/1	Duddon Estuary	Tending livestock	-	-	-	61	-	-	-	-
			-	-	-	-	8	-	-	-
4980/4/1	Duddon Estuary	Tending livestock	-	-	-	61	-	-	-	-
			-	-	-	-	8	-	-	-
4992/1/1	Within the survey area	Boat dwelling	-	-	-	-	-	-	-	6676
	Askam-in-Furness	Walking	-	-	-	40	-	-	-	-
4858/1/1	Rampside and Roosebeck	Collecting samphire	-	-	-	2	-	-	-	-
		Dog walking	-	-	-	-	-	363	-	-
4858/2/1	Rampside and Roosebeck	Collecting samphire	-	-	-	2	-	-	-	-
		Dog walking	-	-	-	-	-	363	-	-
5008/1/1	Askam-in-Furness	Dog walking	-	-	-	-	1095	-	-	-

Person ID number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
4975/1/1	Earnse Bay	Water sports preparation and dog walking	-	-	-	-	1056	-	-	-
	Roosebeck	Collecting cockles	-	-	-	-		-	-	
4873/1/1	North-west Walney Island	Dog walking	-	-	-	-	924	-	-	-
	Biggar Bank and Sandy Gap	Bait digging	-	-	-	-		-	-	
5009/1/1	Askam-in-Furness	Dog walking	-	-	-	-	912	-	-	-
5048/1/1	Lowsy Point and Askam-in-Furness	Bait digging	-	-	-	-	783	-	-	-
4852/1/1	Earnse Bay, Roanhead and Sandy Gap	Walking	-	-	-	-	734	-	-	-
	Earnse Bay and Sandy Gap	Sitting on the beach	-	-	-	-		-	-	
4852/2/1	Earnse Bay, Roanhead and Sandy Gap	Walking	-	-	-	-	730	-	-	-
4975/3/1	Earnse Bay	Dog walking	-	-	-	-	730	-	-	-
4975/4/1	Earnse Bay	Dog walking	-	-	-	-	730	-	-	-
5007/1/1	Biggar Bank, Roanhead and Askam-in-Furness	Dog walking	-	-	-	-	730	-	-	-
5007/2/1	Biggar Bank, Roanhead and Askam-in-Furness	Dog walking	-	-	-	-	730	-	-	-
4854/2/1	Walney Island	Walking	-	-	-	-	548	-	-	-
5073/1/1	Askam-in-Furness	Dog walking	-	-	-	-	548	-	-	-
5078/2/1	Earnse Bay	Dog walking	-	-	-	-	548	-	-	-
5141/5/1	Within the survey area	Oyster farming	-	-	-	-	521	-	-	-
5141/6/1	Within the survey area	Oyster farming	-	-	-	-	521	-	-	-
5141/7/1	Within the survey area	Oyster farming	-	-	-	-	521	-	-	-
5141/8/1	Within the survey area	Oyster farming	-	-	-	-	521	-	-	-
5141/9/1	Within the survey area	Oyster farming	-	-	-	-	521	-	-	-
5040/1/1	Haverigg	Horse riding and dog walking	-	-	-	-	519	-	-	-
5040/3/1	Haverigg	Horse riding and dog walking	-	-	-	-	519	-	-	-
5008/2/1	Askam-in-Furness	Dog walking	-	-	-	-	456	-	-	-
5040/2/1	Haverigg	Horse riding	-	-	-	-	415	-	-	-
5040/4/1	Haverigg	Horse riding	-	-	-	-	415	-	-	-
5040/4/2	Haverigg	Horse riding	-	-	-	-	415	-	-	-
5040/4/3	Haverigg	Horse riding	-	-	-	-	415	-	-	-
5040/4/4	Haverigg	Horse riding	-	-	-	-	415	-	-	-
5040/4/5	Haverigg	Horse riding	-	-	-	-	415	-	-	-
5040/4/6	Haverigg	Horse riding	-	-	-	-	415	-	-	-
5040/4/7	Haverigg	Horse riding	-	-	-	-	415	-	-	-
4879/1/1	Askam-in-Furness	Dog walking	-	-	-	-	391	-	-	-
5018/1/1	Lowsy Point	Dog walking	-	-	-	-	366	-	-	-
5018/2/1	Lowsy Point	Dog walking	-	-	-	-	366	-	-	-
5010/1/1	Within the survey area	Boat dwelling	-	-	-	-	-	-	-	8290
	Askam-in-Furness	Dog walking	-	-	-	-	365	-	-	-
4880/1/1	Sandy Gap, Askam-in-Furness and Roanhead	Dog walking	-	-	-	-	365	-	-	-
5087/1/1	Earnse Bay	Dog walking	-	-	-	-	365	-	-	-

Person ID number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
5024/1/1	West Walney Island and Askam-in-Furness	Bait digging	-	-	-	-	313	-	-	-
	West Walney Island	Angling	-	-	-	-	-	652	-	-
		Dog walking	-	-	-	-	-		-	-
5024/2/1	West Walney Island and Askam-in-Furness	Bait digging	-	-	-	-	313	-	-	-
	West Walney Island	Angling	-	-	-	-	-	521	-	-
5106/1/1	Earnse Bay and Sandy Gap	Dog walking	-	-	-	-	298	-	-	-
	Askam-in-Furness	Walking	-	-	-	-		-	-	-
5013/1/1	Askam-in-Furness	Dog walking	-	-	-	-	260	-	-	-
	Askam-in-Furness	Playing	-	-	-	-		-	-	-
5137/2/1	Roanhead	Dog walking	-	-	-	-	232	-	-	-
	West Walney Island	Dog walking	-	-	-	-	-	232	-	-
5023/2/1	Millom and Haverigg	Angling	-	-	-	-	230	-	-	-
	Millom	Dog walking	-	-	-	-		-	-	-
	Silecroft	Angling	-	-	-	-	-	-	24	-
4881/2/1	Askam-in-Furness and Roanhead	Dog walking and jogging	-	-	-	-	222	-	-	-
4851/1/1	Roanhead, Askam-in-Furness and Walney Island	Dog walking	-	-	-	-	196	-	-	-
5012/1/1	Askam-in-Furness	Professional dog walking	-	-	-	-	183	-	-	-
		Dog walking	-	-	-	-		-	-	-
5012/2/1	Askam-in-Furness	Professional dog walking	-	-	-	-	183	-	-	-
		Dog walking	-	-	-	-		-	-	-
5142/1/1	Askam-in-Furness	Dog walking	-	-	-	-	182	-	-	-
4991/1/1	Roanhead and Askam-in-Furness	Dog walking	-	-	-	-	182	-	-	-
4991/2/1	Roanhead and Askam-in-Furness	Dog walking	-	-	-	-	182	-	-	-
5016/1/1	Roa Island, Earnse Bay and Roanhead	Dog walking	-	-	-	-	156	-	-	-
	Walney Island		-	-	-	-	-	52	-	-
5038/1/1	Haverigg	Dog walking	-	-	-	-	156	-	-	-
			-	-	-	-	-	-	52	-
5038/2/1	Haverigg	Dog walking	-	-	-	-	156	-	-	-
			-	-	-	-	-	-	52	-
5011/1/1	Askam-in-Furness	Dog walking	-	-	-	-	156	-	-	-
5011/2/1	Askam-in-Furness	Dog walking	-	-	-	-	156	-	-	-
5078/1/1	Earnse Bay	Dog walking	-	-	-	-	156	-	-	-
5033/1/1	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	144	-	-	-
	Roanhead	Bait digging	-	-	-	-		-	-	-
	Sandy Gap, south-west Walney Island and west Walney Island	Angling	-	-	-	-	-	154	-	-
	Silecroft		-	-	-	-	-	-	16	-
5106/2/1	Earnse Bay and Sandy Gap	Dog walking	-	-	-	-	137	-	-	-
5082/1/1	Earnse Bay	Bait digging	-	-	-	-	122	-	-	-
	Earnse Bay and Sandy Gap	Metal detecting	-	-	-	-		-	-	-
	Sandy Gap	Angling	-	-	-	-	-	38	-	-

Person ID number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
4870/1/1	Roosebeck and Rampside	Dog walking	-	-	-	-	104	-	-	-
			-	-	-	-	-	104	-	-
4881/1/1	Roanhead and Askam-in-Furness	Dog walking	-	-	-	-	104	-	-	-
5086/1/1	Earnse Bay and Sandy Gap	Dog walking	-	-	-	-	104	-	-	-
5076/1/1	Earnse Bay	Bait digging	-	-	-	-	78	-	-	-
5022/1/1	Hodbarrow	Angling	-	-	-	-	72	-	-	-
	Askam Pier and Milom Iron Works	Bait digging	-	-	-	-		-	-	-
	Silecroft	Angling	-	-	-	-	-	-	120	-
5079/1/1	Earnse Bay	Dog walking	-	-	-	-	58	-	-	-
	Biggar Bank	Walking	-	-	-	-		-	-	-
			-	-	-	-	-	6	-	-
5142/2/1	Askam-in-Furness	Dog walking	-	-	-	-	52	-	-	-
4975/2/1	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
4975/2/2	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
4975/2/3	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
4975/2/4	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
4975/2/5	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
4975/2/6	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
4975/2/7	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
4975/2/8	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
4975/2/9	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
4975/2/10	Earnse Bay	Water sports preparation	-	-	-	-	52	-	-	-
5020/1/1	Millom and Hodbarrow	Dog walking	-	-	-	-	52	-	-	-
5020/2/1	Millom and Hodbarrow	Dog walking	-	-	-	-	52	-	-	-
5023/4/1	Millom	Dog walking	-	-	-	-	42	-	-	-
5014/2/1	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	South-west Walney Island and Sandy Gap		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5014/5/1	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5014/5/2	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5014/5/3	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5014/5/4	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-

Person ID number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
5014/5/5	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5014/5/6	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5014/5/7	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5014/5/8	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5014/5/9	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5014/5/10	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	40	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	24	-	-
	Silecroft		-	-	-	-	-	-	16	-
5028/1/1	Sandy Gap, Millom and Haverigg	Angling	-	-	-	-	35	-	-	-
	Sandy Gap, south-west Walney Island		-	-	-	-	-	21	-	-
	Silecroft		-	-	-	-	-	-	14	-
5067/1/1	Roanhead and Askam-in-Furness	Playing	-	-	-	-	35	-	-	-
	Biggar Bank		-	-	-	-	-	7	-	-
5067/2/1	Roanhead and Askam-in-Furness	Playing	-	-	-	-	35	-	-	-
	Biggar Bank		-	-	-	-	-	7	-	-
5051/1/1	Roanhead	Walking	-	-	-	-	26	-	-	-
	West Walney Island		-	-	-	-	-	26	-	-
5051/2/1	Roanhead	Walking	-	-	-	-	26	-	-	-
	West Walney Island		-	-	-	-	-	26	-	-
5091/1/1	Milom Iron Works	Bait digging	-	-	-	-	26	-	-	-
	Silecroft	Angling	-	-	-	-	-	-	195	-
5091/2/1	Milom Iron Works	Bait digging	-	-	-	-	26	-	-	-
	Silecroft	Angling	-	-	-	-	-	-	195	-
4972/1/1	Earnse Bay	Bait digging	-	-	-	-	24	-	-	-
5106/4/1	Askam-in-Furness	Walking	-	-	-	-	24	-	-	-
5035/1/1	Silecroft	Playing	-	-	-	-	18	-	-	-
5035/2/1	Silecroft	Playing	-	-	-	-	18	-	-	-
4874/1/1	Askam-in-Furness	Bait digging	-	-	-	-	16	-	-	-
	Millom	Angling	-	-	-	-		-	-	-
	Silecroft	Angling	-	-	-	-	-	-	8	-

Person ID number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Stones	Boat on mud
4981/1/1	Silecroft and Tarn Point	Angling	-	-	-	-	14	-	-	-
	Silecroft	Collecting razor shells	-	-	-	-	-	-	-	-
	Silecroft and Tarn Point	Angling	-	-	-	-	-	-	12	-
4871/1/1	Roosebeck and Rampside	Playing	-	-	-	-	13	-	-	-
			-	-	-	-	-	13	-	-
4871/2/1	Roosebeck and Rampside	Playing	-	-	-	-	13	-	-	-
			-	-	-	-	-	13	-	-
4981/2/1	Silecroft and Tarn Point	Angling	-	-	-	-	12	-	-	-
			-	-	-	-	-	-	12	-
5044/4/1	Roosebeck	Horse riding	-	-	-	-	12	-	-	-
5079/2/1	Earnse Bay	Walking	-	-	-	-	6	-	-	-
5079/2/1	Biggar Bank	Walking	-	-	-	-	-	6	-	-
5043/1/1	Roosebeck	Dog walking	-	-	-	-	6	-	-	-
5045/6/1	Biggar Bank	Horse riding	-	-	-	-	-	78	-	-
5045/6/2	Biggar Bank	Horse riding	-	-	-	-	-	78	-	-
5045/6/3	Biggar Bank	Horse riding	-	-	-	-	-	78	-	-
5045/6/4	Biggar Bank	Horse riding	-	-	-	-	-	78	-	-
4850/2/1	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
4850/2/2	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
4850/2/3	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
4850/2/4	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
4850/2/5	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
4850/2/6	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
4850/2/7	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
4850/2/8	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
4850/2/9	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
4850/2/10	West Walney Island	Angling	-	-	-	-	-	28	-	-
	Silecroft		-	-	-	-	-	-	7	-
5058/1/1	West Walney Island	Playing	-	-	-	-	-	20	-	-
5058/2/1	West Walney Island	Playing	-	-	-	-	-	20	-	-
5058/5/1	West Walney Island	Playing	-	-	-	-	-	20	-	-
5144/1/1	Walney Channel	Undertaking boat maintenance	-	-	-	-	-	-	-	1043

Notes for Table 39

The emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over mud for adults based on 2 high-rate observations is 261 h y⁻¹

The observed 97.5th percentile rate based on 35 observations is 261 h y⁻¹

The mean intertidal occupancy rate over mud and sand for adults based on 3 high-rate observations is 168 h y⁻¹

The observed 97.5th percentile rate based on 6 observations is 195 h y⁻¹

The mean intertidal occupancy rate over mud and stones for adults based on 1 high-rate observations is 391 h y⁻¹

The observed 97.5th percentile rate based on 3 observations is 374 h y⁻¹

The mean intertidal occupancy rate over salt marsh for adults based on 6 high-rate observations is 205 h y⁻¹

The observed 97.5th percentile rate based on 16 observations is 323 h y⁻¹

The mean intertidal occupancy rate over sand for adults based on 35 high-rate observations is 582 h y⁻¹

The observed 97.5th percentile rate based on 146 observations is 831 h y⁻¹

The mean intertidal occupancy rate over sand and stones for adults based on 7 high-rate observations is 465 h y⁻¹

The observed 97.5th percentile rate based on 68 observations is 564 h y⁻¹

The mean intertidal occupancy rate over stones for adults based on 4 high-rate observations is 323 h y⁻¹

The observed 97.5th percentile rate based on 41 observations is 366 h y⁻¹

The mean intertidal occupancy rate over boat on mud for adults based on 2 high-rate observations is 7483 h y⁻¹

The observed 97.5th percentile rate based on 3 observations is 8210 h y⁻¹

Table 40. Children's intertidal occupancy rates in the Barrow aquatic survey area (h y⁻¹)

Person ID number	Location	Activity	Mud	Mud and stones	Salt marsh	Sand	Sand and stones	Stones
5102/2/1	Duddon Estuary and Walney Island	Wildfowling	4	-	-	-	-	-
	Duddon Estuary and Walney Island	Wildfowling	-	-	4	-	-	-
	West Walney Island	Playing	-	-	-	-	156	-
5101/3/1	Walney Channel	Dog walking	-	52	-	-	-	-
5101/2/1	Walney Channel	Dog walking	-	39	-	-	-	-
5086/2/1	Sandy Gap and Earnse Bay	Dog walking	-	-	-	104	-	-
5086/3/1	Sandy Gap and Earnse Bay	Dog walking	-	-	-	104	-	-
5023/1/1	Millom and Haverigg	Angling	-	-	-	67	-	-
	Silecroft	Angling	-	-	-	-	-	33
4991/3/1	Roanhead and Askam-in-Furness	Dog walking	-	-	-	52	-	-
4991/4/1	Roanhead and Askam-in-Furness	Dog walking	-	-	-	52	-	-
5023/3/1	Millom	Dog walking	-	-	-	42	-	-
5067/3/1	Roanhead and Askam-in-Furness	Playing	-	-	-	35	-	-
	Biggar Bank	Playing	-	-	-	-	7	-
5067/4/1	Roanhead and Askam-in-Furness	Playing	-	-	-	35	-	-
	Biggar Bank	Playing	-	-	-	-	7	-
5106/3/1	Askam-in-Furness	Walking	-	-	-	24	-	-
5035/3/1	Silecroft	Playing	-	-	-	18	-	-
4871/3/1	Roosebeck and Rampside	Playing	-	-	-	13	-	-
	Roosebeck and Rampside	Playing	-	-	-	-	13	-
4871/4/1	Roosebeck and Rampside	Playing	-	-	-	13	-	-
	Roosebeck and Rampside	Playing	-	-	-	-	13	-
4877/2/1	Roanhead and Askam-in-Furness	Dog walking	-	-	-	10	-	-
4877/3/1	Roanhead and Askam-in-Furness	Dog walking	-	-	-	10	-	-

Person ID number	Location	Activity	Mud	Mud and stones	Salt marsh	Sand	Sand and stones	Stones
5050/3/1	Askam-in-Furness	Dog walking	-	-	-	6	-	-
	Askam-in-Furness	Dog walking	-	-	-	3	-	-
5050/4/1	Askam-in-Furness	Dog walking	-	-	-	6	-	-
	Askam-in-Furness	Dog walking	-	-	-	3	-	-
4874/2/1	Millom	Angling	-	-	-	8	-	-
	Silecroft	Angling	-	-	-	-	-	8
5058/6/1	West Walney Island	Playing	-	-	-	-	20	-
5082/2/1	Sandy Gap	Angling	-	-	-	-	6	-

Notes

The emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over mud for the child age group based on 1 high-rate observation is 4 h y⁻¹

The observed 97.5th percentile is not applicable for 1 observation

The mean intertidal occupancy rate over mud and stones for the child age group based on 2 high-rate observations is 46 h y⁻¹

The observed 97.5th percentile rate based on 2 observations is 52 h y⁻¹

The mean intertidal occupancy rate over salt marsh for the child age group based on 1 high-rate observation is h y⁻¹

The observed 97.5th percentile is not applicable for 1 observation

The mean intertidal occupancy rate over sand for the child age group based on 8 high-rate observations is 61 h y⁻¹

The observed 97.5th percentile rate based on 17 observations is 104 h y⁻¹

The mean intertidal occupancy rate over sand and stones for the child age group based on 1 high-rate observations is 156 h y⁻¹

The observed 97.5th percentile rate based on 7 observations is 136 h y⁻¹

The mean intertidal occupancy rate over stones for the child age group based on 1 high-rate observations is 33 h y⁻¹

The observed 97.5th percentile rate based on 2 observations is 33 h y⁻¹

Table 41. Infants' intertidal occupancy rates in the Barrow aquatic survey area (h y⁻¹)

Person ID number	Location	Activity	Sand	Sand and stones
5035/4/1	Silecroft	Playing	18	-
5013/2/1	Askam-in-Furness	Playing	12	-
5058/7/1	West Walney Island	Playing	-	20

Notes

The emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over sand for the infant age group based on 2 high-rate observations is 15 h y⁻¹

The observed 97.5th percentile rate based on 2 observations is 18 h y⁻¹

The mean intertidal occupancy rate over sand and stones for the infant age group based on 1 high-rate observation is 20 h y⁻¹

The observed 97.5th percentile is not applicable for 1 observation

Table 42. Gamma dose rate measurements over intertidal substrates in the Barrow aquatic survey area ($\mu\text{Gy h}^{-1}$)

Location	National Grid Reference	Substrate	Gamma dose rate at 1 metre ^a
Roosebeck and Rampside	SD 249 670	Sand and stones	0.077
Roosebeck and Rampside	SD 249 670	Sand	0.069
Roa Island	SD 234 654	Sand and stones	0.086
Walney Channel	SD 186 688	Mud	0.077
South-west Walney Island	SD 205 627	Sand and stones	0.092
South-west Walney Island	SD 205 627	Sand	0.068
Sandy Gap	SD 174 680	Sand	0.062
Earnse Bay	SD 170 697	Sand	0.065
Lowsy Point	SD 185 739	Stones	0.097
Roanhead	SD 198 757	Sand and stones	0.084
Askam-in-Furness	SD 207 773	Salt marsh	0.088
Askam-in-Furness	SD 207 772	Sand	0.069
Millom Ironworks	SD 187 799	Mud and stones	0.112
Millom Beach	SD 192 792	Sand and stones	0.079
Haverigg	SD 160 784	Sand and stones	0.090
Tarn Point	SD 076 887	Stones	0.112

Notes

^a These measurements have not been adjusted for background dose rates

Table 43. Adults' handling rates of fishing gear and sediment in the Barrow aquatic survey area (h y⁻¹)

Person ID number	Location	Activity	Fishing gear	Sediment
4862/1/1	Throughout the survey area	Handling nets and pots	858	-
	Roosebeck Sands and Walney Channel	Collecting cockles and mussels	-	54
4866/1/1	Throughout the survey area	Handling nets and pots	430	-
5141/5/1	Within the survey area	Oyster farming	391	-
5141/6/1	Within the survey area	Oyster farming	391	-
5141/7/1	Within the survey area	Oyster farming	391	-
5141/8/1	Within the survey area	Oyster farming	391	-
5141/9/1	Within the survey area	Oyster farming	391	-
5141/1/1	Within the survey area	Oyster farming	230	-
5141/2/1	Within the survey area	Oyster farming	230	-
5141/3/1	Within the survey area	Oyster farming	230	-
5141/4/1	Within the survey area	Oyster farming	230	-
5137/1/1	Throughout the survey area	Netting	4	-
	Biggar Bank, Tummerhill, Snab Sands and North Walney Island	Wildfowling	-	219
5137/4/1	Throughout the survey area	Handling nets	4	-
5048/1/1	Lowsy Point and Askam-in-Furness	Bait digging	-	783
5014/1/1	Walney Channel, Roanhead and Earnse Bay	Bait digging	-	521
5014/3/1	Walney Channel, Roanhead and Earnse Bay	Bait digging	-	521
5029/1/1	Milom Iron Works	Collecting peeler crabs	-	391
5024/1/1	West Walney Island and Askam-in-Furness	Bait digging	-	313
5024/2/1	West Walney Island and Askam-in-Furness	Bait digging	-	313
5137/3/1	Biggar Bank, Tummerhill, Snab Sands and North Walney Island	Wildfowling	-	219
5137/3/2	Biggar Bank, Tummerhill, Snab Sands and North Walney Island	Wildfowling	-	219
5137/3/3	Biggar Bank, Tummerhill, Snab Sands and North Walney Island	Wildfowling	-	219
5102/1/1	West Walney Island and the Duddon Estuary	Bait digging and wildfowling	-	140
5027/1/1	Roanhead and Roa Island	Bait digging and collecting peeler crabs	-	125
4878/1/1	Askam-in-Furness	Bait digging and collecting peeler crabs	-	116
5033/1/1	Roanhead	Bait digging	-	104

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Person ID number	Location	Activity	Fishing gear	Sediment
5032/1/1	Askam-in-Furness and Milom Iron Works	Bait digging and collecting peeler crabs	-	90
5076/1/1	Earnse Bay	Bait digging	-	78
5136/1/1	Askam-in-Furness and the Duddon Estuary	Bait digging and wildfowling	-	34
4877/1/1	Askam-in-Furness and the Duddon Estuary	Bait digging	-	30
5026/1/1	Roa Island	Collecting peeler crabs	-	26
5030/1/1	Foulney Island and Walney Channel	Bait digging and collecting peeler crabs	-	26
5091/1/1	Milom Iron Works	Bait digging	-	26
5091/2/1	Milom Iron Works	Bait digging	-	26
4972/1/1	Earnse Bay	Bait digging	-	24
5082/1/1	Earnse Bay	Bait digging	-	18
5136/2/1	Duddon Estuary	Wildfowling	-	16
4873/1/1	Biggar Bank and Sandy Gap	Bait digging	-	12
5022/1/1	Askam Pier and Milom Iron Works	Bait digging	-	12
4874/1/1	Askam-in-Furness	Bait digging	-	8
4850/1/1	Lowsy Point	Fixing moorings	-	6
5108/1/1	Walney Meetings	Collecting winkles	-	4
4975/1/1	Roosebeck Sands	Collecting cockles	-	4
4981/1/1	Silecroft	Collecting razor shells	-	1

Notes

The emboldened observations are the high-rate individuals

The mean handling rate of fishing gear for adults based on the 7 high-rate observations is 463 h y⁻¹

The observed 97.5th percentile rate based on 13 observations is 729 h y⁻¹

The mean handling rate of sediments for adults based on 6 high-rate observations is 474 h y⁻¹

The observed 97.5th percentile rate based on 33 observations is 574 h y⁻¹

Table 44. Children's handling rates of sediment in the Barrow aquatic survey area (h y⁻¹)

Person ID number	Location	Activity	Sediment
5102/2/1	Duddon Estuary and Walney Island	Wildfowling	9

Notes

The emboldened observation is the high-rate individual

The mean handling rate of sediments for the child age group based on the high-rate observation is 9 h y⁻¹

The observed 97.5th percentile is not applicable for 1 observation

Table 45. Adults' occupancy rates in and on water in the Barrow aquatic survey area (h y⁻¹)

Person ID number	Location	Activity	In water	On water
4975/1/1	Earnse Bay	Kite surfing, wake foiling, wind foiling and wing foiling	2019	-
	Piel Island	Boat angling	-	18
4974/1/1	Piel Island and Walney Island	Jet skiing	678	-
4974/1/2	Piel Island and Walney Island	Jet skiing	678	-
4860/1/1	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
4860/1/2	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
4860/1/3	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
4860/2/1	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
4860/2/2	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
5016/1/1	Piel Island, Walney Island and Roa Island	Paddleboarding	65	-
4864/1/1	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285
4864/1/2	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285
4864/1/3	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285

Person ID number	Location	Activity	In water	On water
4864/1/4	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285
4864/1/5	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285
4864/1/6	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285
4864/1/7	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285
4864/1/8	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285
4864/1/9	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285
4864/1/10	Throughout the survey area	Sub-aqua diving	38	-
		Working on a boat	-	285
4976/1/1	Walney Island and Piel Island	Jet skiing	36	-
4976/2/1	Walney Island and Piel Island	Jet skiing	36	-
5097/1/1	Earnse Bay	Swimming	24	-
5086/1/1	Sandy Gap and Earnse Bay	Swimming	17	-
5087/1/1	Earnse Bay	Swimming	6	-
4852/1/1	Sandy Gap and Earnse Bay	Swimming	3	-
5106/4/1	Askam-in-Furness	Swimming	2	-
4862/1/1	Throughout the survey area	Commercial fishing	-	1560
4866/1/1	Throughout the survey area	Commercial fishing	-	1001
4849/1/1	Roa Island and Piel Island	Working on a boat	-	765
4849/2/1	Roa Island and Piel Island	Working on a boat	-	765

Person ID number	Location	Activity	In water	On water
4973/1/1	Walney Island and Piel Island	Power boating	-	678
4973/2/1	Walney Island and Piel Island	Power boating	-	678
4973/2/2	Walney Island and Piel Island	Power boating	-	678
4878/1/1	Duddon Estuary and Walney Channel	Boat angling	-	626
4859/2/1	Throughout the survey area	Sailing	-	599
5015/1/1	Jubilee Bridge and throughout the survey area	Boat angling, wading and boat maintenance	-	458
5015/2/1	Jubilee Bridge and throughout the survey area	Boat angling, wading and boat maintenance	-	458
5100/1/1	Walney Island and Walney Channel	Sailing	-	417
5098/7/1	Barrow Docks and Piel Island	Sailing	-	357
5098/7/2	Barrow Docks and Piel Island	Sailing	-	357
5098/7/3	Barrow Docks and Piel Island	Sailing	-	357
5098/8/1	Barrow Docks and Piel Island	Sailing and power boating	-	357
5098/8/2	Barrow Docks and Piel Island	Sailing and power boating	-	357
5098/8/3	Barrow Docks and Piel Island	Sailing and power boating	-	357
5098/8/4	Barrow Docks and Piel Island	Sailing and power boating	-	357
5098/8/5	Barrow Docks and Piel Island	Sailing and power boating	-	357
4849/3/1	Roa Island and Piel Island	Working on a boat	-	219
4972/1/1	Walney Island	Boat angling	-	209
4972/2/1	Walney Island	Boat angling	-	209
4972/2/2	Walney Island	Boat angling	-	209
4972/2/3	Walney Island	Boat angling	-	209
4972/2/4	Walney Island	Boat angling	-	209
5014/3/1	Walney Island and Piel Island	Boat angling	-	168
4850/1/1	Walney Channel	Boat angling	-	157
5014/1/1	Walney Island and Piel Island	Boat angling	-	84

Person ID number	Location	Activity	In water	On water
5014/2/1	Walney Island and Piel Island	Boat angling	-	84
4859/1/1	Throughout the survey area	Sailing	-	78
4859/1/2	Throughout the survey area	Sailing	-	78
4859/1/3	Throughout the survey area	Sailing	-	78
4859/1/4	Throughout the survey area	Sailing	-	78
4859/1/5	Throughout the survey area	Sailing	-	78
4859/1/6	Throughout the survey area	Sailing	-	78
4859/1/7	Throughout the survey area	Sailing	-	78
4859/1/8	Throughout the survey area	Sailing	-	78
4859/1/9	Throughout the survey area	Sailing	-	78
4859/1/10	Throughout the survey area	Sailing	-	78
5137/1/1	Throughout the survey area	Commercial fishing	-	45
5137/4/1	Throughout the survey area	Commercial fishing	-	45
5024/1/1	Throughout the survey area	Boat angling	-	42
5024/2/1	Throughout the survey area	Boat angling	-	42
4857/1/1	Piel Island and Walney Channel	Sailing	-	39
5067/1/1	Roanhead, Askam-in-Furness and Biggar Bank	Paddling	-	6
5067/2/1	Roanhead, Askam-in-Furness and Biggar Bank	Paddling	-	6
4992/1/1	Within the survey area	Boat dwelling	-	4
5035/1/1	Silecroft	Paddling	-	3
5035/2/1	Silecroft	Paddling	-	3

Table 46. Children's occupancy rates in and on water in the Barrow aquatic survey area (h y⁻¹)

Person ID number	Location	Activity	In water	On water
4860/3/1	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
4860/4/1	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
4860/5/1	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
4860/6/1	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
4860/7/1	Ramsden Dock	Kayaking and paddleboarding	70	-
		Canoeing	-	35
5098/1/1	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/1/3	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/2/1	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/2/2	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/3/1	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/3/2	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/4/2	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292

Person ID number	Location	Activity	In water	On water
5098/4/3	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/5/1	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/5/2	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/6/1	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/6/2	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/1/2	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/2/3	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/3/3	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/4/1	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/5/3	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5098/6/3	Barrow Docks and Piel Island	Kayaking	65	-
		Rowing, sailing and power boating	-	292
5014/4/1	Piel Island and Walney Island	Boat angling	-	168
4859/3/1	Throughout the survey area	Sailing	-	130
4859/3/2	Throughout the survey area	Sailing	-	130

Person ID number	Location	Activity	In water	On water
4859/3/3	Throughout the survey area	Sailing	-	130
4859/3/4	Throughout the survey area	Sailing	-	130
4859/3/5	Throughout the survey area	Sailing	-	130
4859/3/6	Throughout the survey area	Sailing	-	130
4859/3/7	Throughout the survey area	Sailing	-	130
5101/2/1	Walney Channel	Paddling	-	13
5067/3/1	Roanhead, Askam-in-Furness and Biggar Bank	Paddling	-	6
5067/4/1	Roanhead, Askam-in-Furness and Biggar Bank	Paddling	-	6
5086/2/1	Sandy Gap and Earnse Bay	Paddling	-	4
5086/3/1	Sandy Gap and Earnse Bay	Paddling	-	4
5035/3/1	Silecroft	Paddling	-	3

Table 47. Infants' occupancy rates on water in the Barrow aquatic survey area (h y⁻¹)

Person ID number	Location	Activity	On water
5035/4/1	Silecroft	Paddling	3

Table 48. Adult's occupancy rates in close proximity to liquid sewage sludge and dried sewage sludge (h y-1)

Observation number	Activity	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge
4999/1/1	Maintaining pumps, moving dried sewage sludge, and cleaning filters and grit rag traps	52	52
4999/1/2	Maintaining pumps, moving dried sewage sludge, and cleaning filters and grit rag traps	52	52
4999/1/3	Maintaining pumps, moving dried sewage sludge, and cleaning filters and grit rag traps	52	52
4999/1/4	Maintaining pumps, moving dried sewage sludge, and cleaning filters and grit rag traps	52	52
4999/1/5	Maintaining pumps, moving dried sewage sludge, and cleaning filters and grit rag traps	52	52

Table 49. Adults' consumption rates of green vegetables from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Broccoli	Brussel sprout	Cabbage	Calabrese	Cauliflower	Courgette	Cucumber	Kale	Lettuce	Total
5110/1/1	1.9	2.9	16.0	-	1.1	-	2.7	-	-	24.6
5110/2/1	1.9	2.9	16.0	-	1.1	-	2.7	-	-	24.6
5110/2/2	1.9	2.9	16.0	-	1.1	-	2.7	-	-	24.6
5060/1/1	6.8	9.1	-	-	-	-	-	4.6	4.0	24.5
5060/2/1	6.8	9.1	-	-	-	-	-	4.6	4.0	24.5
5074/1/1	-	4.4	2.0	-	-	-	5.4	9.5	-	21.3
5074/2/1	-	4.4	2.0	-	-	-	5.4	9.5	-	21.3
5058/1/1	-	4.0	-	4.0	0.8	4.4	-	-	2.4	15.6
5058/2/1	-	4.0	-	4.0	0.8	4.4	-	-	2.4	15.6
5084/2/1	-	-	10.7	-	-	-	4.8	-	-	15.5
5095/1/1	-	-	8.5	-	2.0	-	2.3	-	-	12.7
5097/1/1	-	-	-	-	4.1	2.0	3.0	-	-	9.1
5095/2/1	-	-	4.3	-	2.0	-	2.3	-	-	8.5
5065/1/1	4.1	-	-	-	3.4	-	-	-	-	7.5
5065/2/1	4.1	-	-	-	3.4	-	-	-	-	7.5
5071/1/1	-	-	-	-	-	-	6.0	-	1.2	7.2
5109/1/1	-	-	-	-	-	-	6.8	-	-	6.8
5084/1/1	-	-	4.6	-	-	-	2.0	-	-	6.6
5111/1/1	-	-	-	-	-	2.7	3.3	-	-	6.0
5095/3/1	-	-	4.3	-	-	-	-	-	-	4.3
5066/1/1	-	2.7	-	-	-	-	-	-	-	2.7
5066/2/1	-	2.7	-	-	-	-	-	-	-	2.7
5058/3/1	-	0.4	-	0.4	0.1	0.5	-	-	0.3	1.7
5058/4/1	-	0.4	-	0.4	0.1	0.5	-	-	0.3	1.7

Person ID number	Broccoli	Brussel sprout	Cabbage	Calabrese	Cauliflower	Courgette	Cucumber	Kale	Lettuce	Total
5058/5/1	-	0.4	-	0.4	0.1	0.5	-	-	0.3	1.7
5067/1/1	-	-	1.7	-	-	-	-	-	-	1.7
5067/2/1	-	-	1.7	-	-	-	-	-	-	1.7
5071/2/1	-	-	-	-	-	-	1.0	-	0.2	1.2
5071/3/1	-	-	-	-	-	-	1.0	-	0.2	1.2
5071/4/1	-	-	-	-	-	-	1.0	-	0.2	1.2
5071/5/1	-	-	-	-	-	-	1.0	-	0.2	1.2
5090/1/1	-	-	-	-	-	-	1.2	-	-	1.2
5090/2/1	-	-	-	-	-	-	1.2	-	-	1.2
5090/3/1	-	-	-	-	-	-	1.2	-	-	1.2
5090/4/1	-	-	-	-	-	-	1.2	-	-	1.2

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables for adults based on the 13 high-rate consumers is 18.6 kg y⁻¹

The observed 97.5th percentile rate based on 35 observations is 24.6 kg y⁻¹

Table 50. Adults' consumption rates of other vegetables from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Aubergine	Broad bean	Chilli pepper	French bean	Mangetout	Pea	Pepper	Runner bean	Squash	Sweetcorn	Tomato	Total
5109/1/1	-	-	-	-	-	9.1	2.0	-	-	-	22.7	33.7
5074/1/1	-	-	-	-	-	-	-	19.6	-	-	10.9	30.5
5074/2/1	-	-	-	-	-	-	-	19.6	-	-	10.9	30.5
5060/1/1	-	-	-	-	-	-	-	2.8	-	2.6	22.5	27.9
5060/2/1	-	-	-	-	-	-	-	2.8	-	2.6	22.5	27.9
5111/1/1	1.7	-	0.7	2.7	-	0.9	2.4	2.7	-	-	7.3	18.4
5071/1/1	-	3.0	-	-	-	-	-	3.0	-	-	12.0	18.0
5058/1/1	-	3.2	0.02	3.2	2.0	-	2.7	3.2	-	-	0.8	15.2
5058/2/1	-	3.2	0.02	3.2	2.0	-	2.7	3.2	-	-	0.8	15.2
5111/2/1	-	-	-	-	-	0.9	-	-	-	-	7.3	8.2
5110/1/1	-	-	-	1.4	-	-	2.7	-	-	-	3.8	7.9
5110/2/1	-	-	-	1.4	-	-	2.7	-	-	-	3.8	7.9
5110/2/2	-	-	-	1.4	-	-	2.7	-	-	-	3.8	7.9
5095/1/1	-	-	-	-	-	2.7	-	-	-	1.6	2.5	6.8
5095/2/1	-	-	-	-	-	2.7	-	-	-	1.6	2.5	6.8
5097/1/1	-	-	-	-	-	-	-	-	-	-	5.0	5.0
5084/2/1	-	3.2	-	-	-	-	-	-	-	-	-	3.2
5071/2/1	-	0.5	-	-	-	-	-	0.5	-	-	2.0	3.0
5071/3/1	-	0.5	-	-	-	-	-	0.5	-	-	2.0	3.0
5071/4/1	-	0.5	-	-	-	-	-	0.5	-	-	2.0	3.0
5071/5/1	-	0.5	-	-	-	-	-	0.5	-	-	2.0	3.0
5108/1/1	-	1.4	-	-	-	0.8	-	-	-	0.6	-	2.8
5108/2/1	-	1.4	-	-	-	0.8	-	-	-	0.6	-	2.8
5065/1/1	-	-	-	-	-	-	-	-	-	-	2.5	2.5

Person ID number	Aubergine	Broad bean	Chilli pepper	French bean	Mangetout	Pea	Pepper	Runner bean	Squash	Sweetcorn	Tomato	Total
5065/2/1	-	-	-	-	-	-	-	-	-	-	2.5	2.5
5066/1/1	-	-	-	-	-	-	-	-	2.5	-	-	2.5
5066/2/1	-	-	-	-	-	-	-	-	2.5	-	-	2.5
5085/1/1	-	-	-	-	-	-	-	-	-	-	2.3	2.3
5085/2/1	-	-	-	-	-	-	-	-	-	-	2.3	2.3
5085/3/1	-	-	-	-	-	-	-	-	-	-	2.3	2.3
5085/4/1	-	-	-	-	-	-	-	-	-	-	2.3	2.3
5058/3/1	-	0.4	0.01	0.4	0.2	-	0.3	0.4	-	-	0.1	1.7
5058/4/1	-	0.4	0.01	0.4	0.2	-	0.3	0.4	-	-	0.1	1.7
5058/5/1	-	0.4	0.01	0.4	0.2	-	0.3	0.4	-	-	0.1	1.7
5084/1/1	-	1.4	-	-	-	-	-	-	-	-	-	1.4
5090/1/1	-	-	-	-	-	-	-	-	-	-	1.0	1.0
5090/2/1	-	-	-	-	-	-	-	-	-	-	1.0	1.0
5090/3/1	-	-	-	-	-	-	-	-	-	-	1.0	1.0
5090/4/1	-	-	-	-	-	-	-	-	-	-	1.0	1.0
5067/1/1	-	-	-	-	-	-	-	0.8	-	-	-	0.8
5067/2/1	-	-	-	-	-	-	-	0.8	-	-	-	0.8
5108/3/1	-	0.3	-	-	-	0.2	-	-	-	0.2	-	0.7
5108/4/1	-	0.3	-	-	-	0.2	-	-	-	0.2	-	0.7
5108/5/1	-	0.3	-	-	-	0.2	-	-	-	0.2	-	0.7

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables for adults based on the 9 high-rate consumers is 24.1 kg y⁻¹

The observed 97.5th percentile rate based on 44 observations is 30.5 kg y⁻¹

Table 51. Adults' consumption rates of root vegetables from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Beetroot	Carrot	Celery	Fennel	Garlic	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
5111/1/1	3.6	-	-	0.7	0.8	-	14.1	-	-	18.0	1.9	-	-	39.1
5095/1/1	4.6	9.6	-	-	-	19.3	5.5	-	-	-	-	-	-	39.0
5095/2/1	4.6	9.6	-	-	-	19.3	5.5	-	-	-	-	-	-	39.0
5097/1/1	2.3	-	2.7	-	-	10.0	10.0	-	0.5	-	-	-	-	25.4
5109/1/1	-	-	-	-	-	-	23.6	-	-	-	-	-	-	23.6
5058/1/1	3.2	2.0	-	-	-	-	17.6	-	-	-	-	-	-	22.8
5058/2/1	3.2	2.0	-	-	-	-	17.6	-	-	-	-	-	-	22.8
5074/1/1	0.7	-	-	-	0.4	3.8	9.7	-	-	-	-	5.1	-	19.7
5074/2/1	0.7	-	-	-	0.4	3.8	9.7	-	-	-	-	5.1	-	19.7
5060/1/1	3.0	0.9	-	-	-	5.0	5.5	-	-	-	0.3	-	4.2	18.9
5060/2/1	3.0	0.9	-	-	-	5.0	5.5	-	-	-	0.3	-	4.2	18.9
5066/1/1	3.0	-	-	-	-	-	-	-	-	4.1	-	-	-	7.1
5066/2/1	3.0	-	-	-	-	-	-	-	-	4.1	-	-	-	7.1
5108/1/1	0.9	-	-	-	-	1.5	3.3	-	-	-	-	-	-	5.7
5108/2/1	0.9	-	-	-	-	1.5	3.3	-	-	-	-	-	-	5.7
5090/1/1	2.3	-	-	-	-	0.7	2.2	-	-	-	-	-	-	5.2
5090/2/1	2.3	-	-	-	-	0.7	2.2	-	-	-	-	-	-	5.2
5090/3/1	2.3	-	-	-	-	0.7	2.2	-	-	-	-	-	-	5.2
5090/4/1	2.3	-	-	-	-	0.7	2.2	-	-	-	-	-	-	5.2
5063/2/1	3.0	1.7	-	-	-	-	-	-	-	-	-	-	-	4.7
5110/1/1	-	1.5	-	-	-	-	2.4	-	-	-	-	-	-	3.9
5110/2/1	-	1.5	-	-	-	-	2.4	-	-	-	-	-	-	3.9
5110/2/2	-	1.5	-	-	-	-	2.4	-	-	-	-	-	-	3.9
5067/1/1	0.8	1.3	-	-	-	-	1.6	-	-	-	-	-	-	3.6

Person ID number	Beetroot	Carrot	Celery	Fennel	Garlic	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
5067/2/1	0.8	1.3	-	-	-	-	1.6	-	-	-	-	-	-	3.6
5071/1/1	1.8	1.2	-	-	-	-	-	-	-	-	-	-	-	3.0
5058/3/1	0.4	0.2	-	-	-	-	2.0	-	-	-	-	-	-	2.5
5058/4/1	0.4	0.2	-	-	-	-	2.0	-	-	-	-	-	-	2.5
5058/5/1	0.4	0.2	-	-	-	-	2.0	-	-	-	-	-	-	2.5
5063/1/1	1.5	0.9	-	-	-	-	-	-	-	-	-	-	-	2.4
5085/1/1	0.8	0.6	-	-	-	-	-	0.6	-	-	-	-	-	1.9
5085/2/1	0.8	0.6	-	-	-	-	-	0.6	-	-	-	-	-	1.9
5085/3/1	0.8	0.6	-	-	-	-	-	0.6	-	-	-	-	-	1.9
5085/4/1	0.8	0.6	-	-	-	-	-	0.6	-	-	-	-	-	1.9
5065/1/1	0.4	1.5	-	-	-	-	-	-	-	-	-	-	-	1.9
5065/2/1	0.4	1.5	-	-	-	-	-	-	-	-	-	-	-	1.9
5108/3/1	0.2	-	-	-	-	0.4	0.8	-	-	-	-	-	-	1.4
5108/4/1	0.2	-	-	-	-	0.4	0.8	-	-	-	-	-	-	1.4
5108/5/1	0.2	-	-	-	-	0.4	0.8	-	-	-	-	-	-	1.4
5084/2/1	-	1.1	-	-	-	-	-	-	-	-	-	-	-	1.1
5071/2/1	0.3	0.2	-	-	-	-	-	-	-	-	-	-	-	0.5
5071/3/1	0.3	0.2	-	-	-	-	-	-	-	-	-	-	-	0.5
5071/4/1	0.3	0.2	-	-	-	-	-	-	-	-	-	-	-	0.5
5071/5/1	0.3	0.2	-	-	-	-	-	-	-	-	-	-	-	0.5
5084/1/1	-	0.5	-	-	-	-	-	-	-	-	-	-	-	0.5

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables for adults based on the 11 high-rate consumers is 26.3 kg y⁻¹

The observed 97.5th percentile rate based on 45 observations is 39.0 kg y⁻¹

Table 52. Adults' consumption rates of potato from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Potato	Total
5060/1/1	80.0	80.0
5060/2/1	80.0	80.0
5058/1/1	70.0	70.0
5058/2/1	70.0	70.0
5074/1/1	70.0	70.0
5074/2/1	70.0	70.0
5095/1/1	68.0	68.0
5095/2/1	68.0	68.0
5110/1/1	40.0	40.0
5110/2/1	40.0	40.0
5110/2/2	40.0	40.0
5111/1/1	36.3	36.3
5111/2/1	36.3	36.3
5071/1/1	30.5	30.5
5063/2/1	13.6	13.6
5090/1/1	12.5	12.5
5090/2/1	12.5	12.5
5090/3/1	12.5	12.5
5090/4/1	12.5	12.5
5084/2/1	9.5	9.5
5085/1/1	9.1	9.1
5085/2/1	9.1	9.1
5085/3/1	9.1	9.1
5085/4/1	9.1	9.1
5058/3/1	7.8	7.8
5058/4/1	7.8	7.8
5058/5/1	7.8	7.8
5063/1/1	6.8	6.8
5066/1/1	6.3	6.3
5066/2/1	6.3	6.3
5108/1/1	6.1	6.1
5108/2/1	6.1	6.1
5071/2/1	5.1	5.1
5071/3/1	5.1	5.1
5071/4/1	5.1	5.1
5071/5/1	5.1	5.1
5065/1/1	5.0	5.0
5065/2/1	5.0	5.0

Person ID number	Potato	Total
5084/1/1	4.1	4.1
5108/3/1	1.5	1.5
5108/4/1	1.5	1.5
5108/5/1	1.5	1.5

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of potato for adults based on the 14 high-rate consumers is 57.1 kg y⁻¹

The observed 97.5th percentile rate based on 42 observations is 79.8 kg y⁻¹

Table 53. Adults' consumption rates of domestic fruit from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Apple	Blackcurrant	Blueberry	Fig	Gooseberry	Grapes	Melon	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Total
5084/2/1	-	-	3.2	-	6.4	6.4	8.6	-	-	5.6	-	-	5.6	35.6
5095/1/1	-	-	-	-	-	-	-	-	-	-	-	6.8	20.6	27.4
5095/2/1	-	-	-	-	-	-	-	-	-	-	-	6.8	20.6	27.4
5058/1/1	8.0	2.8	-	2.0	-	-	-	2.0	-	0.4	-	1.6	7.2	24.0
5058/2/1	8.0	2.8	-	2.0	-	-	-	2.0	-	0.4	-	1.6	7.2	24.0
5097/1/1	10.0	-	-	-	-	-	-	1.0	6.0	2.0	-	-	5.0	24.0
5109/1/1	-	11.3	-	-	-	-	-	-	-	-	-	5.0	-	16.3
5084/1/1	-	-	1.4	-	2.7	2.7	3.7	-	-	2.4	-	-	2.4	15.3
5111/1/1	-	0.7	1.8	-	1.4	7.3	-	-	-	-	-	1.0	-	12.2
5085/1/1	3.0	-	-	-	-	-	-	-	-	0.2	-	2.3	1.5	6.9
5085/2/1	3.0	-	-	-	-	-	-	-	-	0.2	-	2.3	1.5	6.9
5085/3/1	3.0	-	-	-	-	-	-	-	-	0.2	-	2.3	1.5	6.9
5085/4/1	3.0	-	-	-	-	-	-	-	-	0.2	-	2.3	1.5	6.9
5066/1/1	3.0	-	-	-	-	-	-	3.0	-	-	-	-	-	6.0
5066/2/1	3.0	-	-	-	-	-	-	3.0	-	-	-	-	-	6.0
5108/1/1	0.3	-	-	-	-	-	-	0.3	-	-	-	4.1	-	4.6
5108/2/1	0.3	-	-	-	-	-	-	0.3	-	-	-	4.1	-	4.6
5090/1/1	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8	3.6
5090/2/1	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8	3.6
5090/3/1	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8	3.6
5090/4/1	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8	3.6
5058/3/1	0.9	0.3	-	0.2	-	-	-	0.2	-	0.04	-	0.2	0.8	2.7
5058/4/1	0.9	0.3	-	0.2	-	-	-	0.2	-	0.04	-	0.2	0.8	2.7
5058/5/1	0.9	0.3	-	0.2	-	-	-	0.2	-	0.04	-	0.2	0.8	2.7
5043/1/1	1.8	-	-	-	-	-	-	-	-	-	0.2	-	-	2.0
5043/2/1	1.8	-	-	-	-	-	-	-	-	-	0.2	-	-	2.0
5042/1/1	0.8	-	-	-	-	-	-	-	0.8	-	-	-	-	1.5
5042/2/1	0.8	-	-	-	-	-	-	-	0.8	-	-	-	-	1.5
5042/3/1	0.8	-	-	-	-	-	-	-	0.8	-	-	-	-	1.5
5042/4/1	0.8	-	-	-	-	-	-	-	0.8	-	-	-	-	1.5
5071/1/1	-	-	-	-	-	-	-	-	-	-	-	1.2	-	1.2
5108/3/1	0.1	-	-	-	-	-	-	0.1	-	-	-	1.0	-	1.1
5108/4/1	0.1	-	-	-	-	-	-	0.1	-	-	-	1.0	-	1.1
5108/5/1	0.1	-	-	-	-	-	-	0.1	-	-	-	1.0	-	1.1
5060/1/1	-	-	-	-	-	-	-	-	-	-	-	-	1.0	1.0
5060/2/1	-	-	-	-	-	-	-	-	-	-	-	-	1.0	1.0
5063/2/1	-	-	-	-	-	-	-	-	0.4	-	-	-	-	0.4
5063/1/1	-	-	-	-	-	-	-	-	0.2	-	-	-	-	0.2
5071/2/1	-	-	-	-	-	-	-	-	-	-	-	0.2	-	0.2
5071/3/1	-	-	-	-	-	-	-	-	-	-	-	0.2	-	0.2

Person ID number	Apple	Blackcurrant	Blueberry	Fig	Gooseberry	Grapes	Melon	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Total
5071/4/1	-	-	-	-	-	-	-	-	-	-	-	0.2	-	0.2
5071/5/1	-	-	-	-	-	-	-	-	-	-	-	0.2	-	0.2

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit for adults based on the 9 high-rate consumers is 22.9 kg y⁻¹

The observed 97.5th percentile rate based on 42 observations is 27.4 kg y⁻¹

Table 54. Adults' consumption rates of milk from the Barrow terrestrial survey area (l y⁻¹)

Person ID number	Cows' milk
5112/1/1	395.4
5112/2/1	395.4
5000/1/1	273.8
5000/2/1	273.8
5000/3/1	273.8
5000/4/1	273.8
5003/1/1	129.5
5003/2/1	129.5
5044/1/1	121.7
5044/2/1	121.7
5044/3/1	121.7
5044/4/1	121.7
5044/5/1	121.7
5044/6/1	121.7

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of milk for adults based on the 6 high-rate consumers is 314.3 l y⁻¹

The observed 97.5th percentile rate based on 14 observations is 395.4 l y⁻¹

Table 55. Adults' consumption rates of cattle meat from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Beef
5137/1/1	56.3
5137/2/1	56.3
5045/1/1	28.5
5045/2/1	28.5
5045/3/1	28.5
5045/4/1	28.5
5045/5/1	28.5
5042/1/1	18.8
5042/2/1	18.8
5042/3/1	18.8
5042/4/1	18.8

Notes for Table 55

The emboldened observations are the high-rate consumers

The mean consumption rate of cattle meat for adults based on the 7 high-rate consumers is 36.4 kg y⁻¹

The observed 97.5th percentile rate based on 11 observations is 56.2 kg y⁻¹

Table 56. Adults' consumption rates of sheep meat from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Lamb
5045/1/1	12.8
5045/2/1	12.8
5045/3/1	12.8
5045/4/1	12.8
5045/5/1	12.8
5042/1/1	4.0
5042/2/1	4.0
5042/3/1	4.0
5042/4/1	4.0

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of sheep meat for adults based on the 5 high-rate consumers is 12.8 kg y⁻¹

The observed 97.5th percentile rate based on 9 observations is 12.8 kg y⁻¹

Table 57. Adults' consumption rates of eggs from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Chicken egg
5108/1/1	31.2
5108/2/1	31.2
5042/1/1	23.8
5042/2/1	23.8
5042/3/1	23.8
5066/1/1	17.8
5066/2/1	17.8
5067/1/1	17.8
5067/2/1	17.8
5084/2/1	12.5
5108/3/1	7.6
5108/4/1	7.6
5108/5/1	7.6
5003/1/1	7.4

Person ID number	Chicken egg
5003/2/1	7.4
5111/1/1	7.1
5110/1/1	7.1
5110/2/1	7.1
5110/2/2	7.1
5084/1/1	5.3
5090/1/1	4.1
5090/2/1	4.1
5097/1/1	0.7
5074/1/1	0.3
5074/2/1	0.3

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of eggs for adults based on the 10 high-rate consumers is 21.8 kg y⁻¹

The observed 97.5th percentile rate based on 25 observations is 31.2 kg y⁻¹

Table 58. Adults' consumption rates of wild/free foods from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Blackberry	Damson	Total
5084/2/1	6.4	-	6.4
5084/1/1	2.7	-	2.7
5066/1/1	1.0	1.0	2.0
5066/2/1	1.0	1.0	2.0
5111/1/1	1.5	-	1.5
5067/1/1	1.4	-	1.4
5067/2/1	1.4	-	1.4
5070/1/1	1.4	-	1.4
5070/2/1	1.4	-	1.4
5070/5/1	1.4	-	1.4
5070/6/1	1.4	-	1.4
5060/1/1	1.0	-	1.0
5060/2/1	1.0	-	1.0
5097/1/1	1.0	-	1.0
5097/2/1	1.0	-	1.0
5063/2/1	0.6	-	0.6
5043/1/1	0.5	-	0.5
5043/2/1	0.5	-	0.5
5085/1/1	0.5	-	0.5
5085/2/1	0.5	-	0.5

Person ID number	Blackberry	Damson	Total
5085/3/1	0.5	-	0.5
5085/4/1	0.5	-	0.5
5063/1/1	0.3	-	0.3
5140/1/1	0.3	-	0.3
5140/2/1	0.3	-	0.3

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of wild/free foods for adults based on the 2 high-rate consumers is 4.5 kg y⁻¹

The observed 97.5th percentile rate based on 25 observations is 4.2 kg y⁻¹

Table 59. Adults' consumption rates of rabbits/hares from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Rabbit
5140/1/1	0.4
5140/2/1	0.4

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of rabbits/hares for adults based on the 2 high-rate consumers is 0.4 kg y⁻¹

The observed 97.5th percentile rate based on 2 observations is 0.4 kg y⁻¹

Table 60. Children's consumption rates of green vegetables from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Brussels sprout	Calabrese	Cauliflower	Courgette	Lettuce	Total
5058/6/1	0.4	0.4	0.1	0.5	0.3	1.7

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of green vegetables for the child age group based on the high-rate consumer is 1.7 kg y⁻¹

The observed 97.5th percentile is not applicable for one observation

Table 61. Infants' consumption rates of green vegetables from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Brussels sprout	Calabrese	Cauliflower	Courgette	Lettuce	Total
5058/7/1	0.2	0.2	0.04	0.2	0.1	0.9

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of green vegetables for the infant age group based on the high-rate consumer is 0.9 kg y⁻¹

The observed 97.5th percentile is not applicable for one observation

Table 62. Children's consumption rates of other vegetables from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Broad bean	Chilli pepper	French bean	Mangetout	Pea	Pepper	Runner bean	Sweetcorn	Tomato	Total
5058/6/1	0.4	0.01	0.4	0.2	-	0.3	0.4	-	0.1	1.7
5108/7/1	0.3	-	-	-	0.2	-	-	0.2	-	0.7
5108/8/1	0.3	-	-	-	0.2	-	-	0.2	-	0.7

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables for the child age group based on the 3 high-rate consumers is 1.0 kg y⁻¹

The observed 97.5th percentile rate based on 3 observations is 1.6 kg y⁻¹

Table 63. Infants' consumption rates of other vegetables from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Broad bean	Chilli pepper	French bean	Mangetout	Pea	Pepper	Runner bean	Sweetcorn	Tomato	Total
5058/7/1	0.2	0.01	0.2	0.1	-	0.2	0.2	-	0.04	0.8
5108/6/1	0.2	-	-	-	0.1	-	-	0.1	-	0.3

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables for the infant age group based on the 2 high-rate consumers is 0.6 kg y⁻¹

The observed 97.5th percentile rate based on 2 observations is 0.8 kg y⁻¹

Table 64. Children's consumption rates of root vegetables from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Beetroot	Carrot	Leek	Onion	Total
5058/6/1	0.4	0.2	-	2.0	2.5
5108/7/1	0.2	-	0.4	0.8	1.4
5108/8/1	0.2	-	0.4	0.8	1.4

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables for the child age group based on the 3 high-rate consumers is 1.8 kg y⁻¹

The observed 97.5th percentile rate based on 3 observations is 2.5 kg y⁻¹

Table 65. Infants' consumption rates of root vegetables from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Beetroot	Carrot	Leek	Onion	Total
5058/7/1	0.2	0.1	-	1.0	1.3
5108/6/1	0.1	-	0.2	0.4	0.7

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables for the infant age group based on the 2 high-rate consumers is 1.0 kg y⁻¹

The observed 97.5th percentile rate based on 2 observations is 1.3 kg y⁻¹

Table 66. Children's consumption rates of potato from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Potato
5058/6/1	7.8
5108/7/1	1.5
5108/8/1	1.5

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of potato for the child age group based on the high-rate consumer is 7.8 kg y⁻¹

The observed 97.5th percentile rate based on 3 observations is 7.5 kg y⁻¹

Table 67. Infants' consumption rates of potato from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Potato
5058/7/1	3.9
5108/6/1	0.7

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of potato for the infant age group based on the high-rate consumer is 3.9 kg y⁻¹

The observed 97.5th percentile rate based on 2 observations is 3.8 kg y⁻¹

Table 68. Children's consumption rates of domestic fruit from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Apple	Blackcurrant	Fig	Pear	Raspberry	Rhubarb	Strawberry	Total
5058/6/1	0.9	0.3	0.2	0.2	0.04	0.2	0.8	2.7
5108/7/1	0.1	-	-	0.1	-	1.0	-	1.1
5108/8/1	0.1	-	-	0.1	-	1.0	-	1.1

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit for the child age group based on the 3 high-rate consumers is 1.6 kg y⁻¹

The observed 97.5th percentile rate based on 3 observations is 2.6 kg y⁻¹

Table 69. Infants' consumption rates of domestic fruit from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Apple	Blackcurrant	Fig	Pear	Raspberry	Rhubarb	Strawberry	Total
5058/7/1	0.4	0.2	0.1	0.1	0.02	0.1	0.4	1.3
5108/6/1	0.03	-	-	0.03	-	0.5	-	0.6

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit for the infant age group based on the 2 high-rate consumers is 0.9 kg y⁻¹

The observed 97.5th percentile rate based on 2 observations is 1.3 kg y⁻¹

Table 70. Children's consumption rates of milk from the Barrow terrestrial survey area (l y⁻¹)

Person ID number	Cows' milk
5112/3/1	395.4

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of milk for the child age group based on the 1 high-rate consumer is 395.4 l y⁻¹

The observed 97.5th percentile is not applicable for 1 observation

Table 71. Children's consumption rates of eggs from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Chicken egg
5108/7/1	7.6
5108/8/1	7.6

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of eggs for the child age group based on the 2 high-rate consumers is 7.6 kg y⁻¹

The observed 97.5th percentile rate based on 2 observations is 7.6 kg y⁻¹

Table 72. Infants' consumption rates of eggs from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Chicken egg
5108/6/1	3.8

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of eggs for the infant age group based on the 1 high-rate consumer is 3.8 kg y⁻¹

The observed 97.5th percentile is not applicable for 1 observation

Table 73. Children's consumption rates of wild/free foods from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Blackberry
5067/3/1	1.1
5067/4/1	1.1

Notes

The emboldened observations are the high-rate consumers

The mean consumption rate of wild/free foods for the child age group based on the 2 high-rate consumers is 1.1 kg y⁻¹

The observed 97.5th percentile rate based on 2 observations is 1.1 kg y⁻¹

Table 74. Infant's consumption rates of wild/free foods from the Barrow terrestrial survey area (kg y⁻¹)

Person ID number	Blackberry
5070/4/1	0.5

Notes

The emboldened observation is the high-rate consumer

The mean consumption rate of wild/free foods for the infant age group based on the 1 high-rate consumer is 0.5 kg y⁻¹

The observed 97.5th percentile is not applicable for 1 observation

Table 75. Percentage contribution each food type makes to its terrestrial food group for adults

Food group	Food	Percentage
Green vegetables	Cabbage	28.1%
	Cucumber	18.6%
	Brussels sprout	16.2%
	Kale	9.0%
	Broccoli	8.8%
	Cauliflower	6.4%
	Lettuce	5.0%
	Courgette	4.8%
	Calabrese	3.0%
Other vegetables	Tomato	51.4%
	Runner bean	19.1%
	Broad bean	6.4%
	Pepper	5.9%
	Pea	5.8%
	French bean	4.4%
	Sweetcorn	3.2%
	Squash	1.6%
	Mangetout	1.5%
	Aubergine	0.5%
	Chilli pepper	0.2%
Root vegetables	Onion	40.6%
	Leek	18.7%
	Beetroot	15.4%
	Carrot	11.2%
	Shallot	6.7%
	Swede	2.6%
	Turnip	2.1%
	Celery	0.7%
	Spring onion	0.7%
	Parsnip	0.6%
	Garlic	0.4%
	Fennel	0.2%
	Radish	0.1%
Potato	Potato	100.0%
Domestic fruit	Strawberry	29.2%
	Apple	18.2%
	Rhubarb	15.4%
	Blackcurrant	8.7%
	Grapes	5.5%
	Pear	4.2%
	Melon	4.1%

Food group	Food	Percentage
Domestic Fruit	Raspberry	3.9%
	Gooseberry	3.5%
	Plum	3.2%
	Blueberry	2.1%
	Fig	1.6%
	Redcurrant	0.2%
Milk	Cows' milk	100.0%
Cattle meat	Beef	100.0%
Sheep meat	Lamb	100.0%
Eggs	Chicken egg	100.0%
Wild/free foods	Blackberry	93.6%
	Damson	6.4%
Rabbits/hares	Rabbit	100.0%

Notes

Percentages are based on the consumption of all adults in the survey consuming that particular food group

Table 76. Direct radiation occupancy rates for adults, children and infants in the Barrow area (h y⁻¹)

Person ID number	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
0 – 0.25 km zone				
4984/1/1	Residing	7468	1188	8656
4984/3/1	Residing	7468	1188	8656
4856/2/1	Residing	8225	379	8604
4856/1/1	Residing	7938	379	8317
4856/3/1	Residing	7141	1098	8239
4854/1/1	Residing	7764	379	8143
4855/2/1	Residing	7689	366	8055
5097/1/1	Residing	5460	1812	7272
4984/2/1	Residing	7129	26	7156
4855/3/1	Residing	6467	458	6924
4855/4/1	Residing	5902	824	6726
5051/2/1	Residing	6494	224	6718
4854/2/1	Residing	6084	379	6463
4855/1/1	Residing	4740	366	5106
5051/1/1	Residing	4067	202	4269
5047/1/1	Working	2060	26	2086
5047/1/2	Working	2060	26	2086
4862/1/1	Working as a commercial fisherman	-	1616	1616
4995/1/1	Working	1322	14	1336
4995/1/2	Working	1322	14	1336
4995/1/3	Working	1322	14	1336
4995/1/4	Working	1322	14	1336
4995/1/5	Working	1322	14	1336

Person ID number	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
0 – 0.25 km zone				
4995/1/6	Working	1322	14	1336
4995/1/7	Working	1322	14	1336
4995/1/8	Working	1322	14	1336
5047/2/1	Working	1225	26	1251
5047/2/2	Working	1225	26	1251
5047/2/3	Working	1225	26	1251
5047/2/4	Working	1225	26	1251
5047/2/5	Working	1225	26	1251
5047/2/6	Working	1225	26	1251
5047/2/7	Working	1225	26	1251
5047/2/8	Working	1225	26	1251
5144/1/1	Working as a commercial fisherman	-	1043	1043
5063/1/1	Tending to allotment	-	626	626
5063/2/1	Tending to allotment	-	626	626
5073/1/1	Tending to allotment	-	91	91
5073/2/1	Tending to allotment	-	91	91
>0.25 – 0.5 km zone				
4853/1/1	Residing	8740	-	8740
4983/1/1	Residing	8183	358	8541
4852/1/1	Residing	7378	495	7874
5055/1/1	Residing	7060	637	7697
4852/2/1	Residing	6961	182	7144
5055/3/1	Residing	6984	100	7084
5093/1/1	Residing	5903	783	6686

Person ID number	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
>0.25 – 0.5 km zone				
5055/2/1	Residing	5739	537	6276
4852/3/1	Residing	5686	52	5738
5093/2/1	Residing	4909	352	5261
5107/1/1	Residing	2129	26	2155
4985/1/1	Working	1742	8	1749
4985/2/1	Working	1742	8	1749
4985/1/2	Working	1742	8	1749
4985/1/3	Working	1742	8	1749
4985/1/4	Working	1742	8	1749
4986/1/1	Working	1348	165	1513
4986/2/1	Working	1418	95	1513
4985/3/1	Working	1411	8	1418
4985/4/1	Working	1411	8	1418
4985/4/2	Working	1411	8	1418
4985/4/3	Working	1411	8	1418
4985/4/4	Working	1411	8	1418
4986/3/1	Working	406	20	426
5015/1/1	Undertaking boat maintenance	-	417	417
5015/2/1	Undertaking boat maintenance	-	417	417
5100/1/1	Sailing	-	209	209
5101/1/1	Dog walking	-	52	52
5101/2/1	Dog walking and paddling	-	52	52
5101/3/1	Dog walking	-	52	52
5139/1/1	Working	-	6	6
5139/2/1	Working	-	6	6

Person ID number	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
>0.25 – 0.5 km zone				
5139/3/1	Working	-	6	6
5139/1/2	Working	-	6	6
5139/2/2	Working	-	6	6
5139/1/3	Working	-	6	6
5139/1/4	Working	-	6	6
5139/1/5	Working	-	6	6
5139/1/6	Working	-	6	6
5139/1/7	Working	-	6	6
>0.5 – 1.0 km zone				
5056/1/1	Residing	8343	365	8708
5092/2/1	Residing	8656	-	8656
5140/1/1	Residing	8149	419	8568
5140/2/1	Residing	8149	419	8568
5065/1/1	Residing	6542	2009	8551
5092/1/1	Residing	8186	365	8551
5090/1/1	Residing	7552	992	8544
5090/2/1	Residing	8442	102	8544
5108/1/1	Residing	7058	1432	8490
5108/2/1	Residing	7774	716	8490
5095/1/1	Residing	6688	1800	8489
5095/2/1	Residing	8100	154	8255
5048/1/1	Working	2192	26	2218
5048/2/1	Working	2192	26	2218
5048/3/1	Working	2192	26	2218

Person ID number	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
>0.5 – 1.0 km zone				
4987/1/1	Working	1726	47	1773
4987/2/1	Working	1726	47	1773
4987/1/2	Working	1726	47	1773
4987/2/2	Working	1726	47	1773
4987/1/3	Working	1726	47	1773
4987/2/3	Working	1726	47	1773
4987/1/4	Working	1726	47	1773
4987/1/5	Working	1726	47	1773
4987/1/6	Working	1726	47	1773
4987/1/7	Working	1726	47	1773
5110/1/1	Tending to allotment	-	1096	1096
5109/1/1	Tending to allotment	-	731	731
5084/1/1	Tending to allotment	-	685	685
5084/2/1	Tending to allotment	-	685	685
5085/1/1	Tending to allotment	-	548	548
5085/2/1	Tending to allotment	-	548	548
5074/1/1	Tending to allotment	-	531	531
5074/2/1	Tending to allotment	-	531	531
5098/1/1	Attending a youth club	-	357	357
5098/2/1	Attending a youth club	-	357	357
5098/3/1	Attending a youth club	-	357	357
5098/4/1	Attending a youth club	-	357	357
5098/5/1	Attending a youth club	-	357	357
5098/6/1	Attending a youth club	-	357	357
5098/7/1	Attending a youth club	-	357	357

Person ID number	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
>0.5 – 1.0 km zone				
5098/8/1	Attending a youth club	-	357	357
5098/1/2	Attending a youth club	-	357	357
5098/2/2	Attending a youth club	-	357	357
5098/3/2	Attending a youth club	-	357	357
5098/4/2	Attending a youth club	-	357	357
5098/5/2	Attending a youth club	-	357	357
5098/6/2	Attending a youth club	-	357	357
5098/7/2	Attending a youth club	-	357	357
5098/8/2	Attending a youth club	-	357	357
5098/1/3	Attending a youth club	-	357	357
5098/2/3	Attending a youth club	-	357	357
5098/3/3	Attending a youth club	-	357	357
5098/4/3	Attending a youth club	-	357	357
5098/5/3	Attending a youth club	-	357	357
5098/6/3	Attending a youth club	-	357	357
5098/7/3	Attending a youth club	-	357	357
5098/8/3	Attending a youth club	-	357	357
5098/8/4	Attending a youth club	-	357	357
5098/8/5	Attending a youth club	-	357	357
5108/3/1	Visiting family	-	18	18
5108/4/1	Visiting family	-	18	18
5108/5/1	Visiting family	-	18	18
5108/6/1	Visiting family	-	18	18
5108/7/1	Visiting family	-	18	18
5108/8/1	Visiting family	-	18	18

Person ID number	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
>0.5 – 1.0 km zone				
5070/1/1	Picking wild blackberries	-	8	8
5070/2/1	Picking wild blackberries	-	8	8
5070/3/1	Picking wild blackberries	-	8	8
5070/4/1	Picking wild blackberries	-	8	8
5092/3/1	Visiting family	-	4	4
5092/4/1	Visiting family	-	4	4
5092/5/1	Visiting family	-	4	4

Table 77. Analysis of direct radiation occupancy rates for adults, children and infants in the Barrow area (h y^{-1})

0 – 0.25 km zone	
Number of hours	Number of observations
>8000 to 8760	7
>7000 to 8000	2
>6000 to 7000	4
>5000 to 6000	1
>4000 to 5000	1
>3000 to 4000	0
>2000 to 3000	2
>1000 to 2000	18
0 to 1000	4
0 to 8760	39
>0.25 – 0.5 km zone	
Number of hours	Number of observations
>8000 to 8760	2
>7000 to 8000	4
>6000 to 7000	2
>5000 to 6000	2
>4000 to 5000	0
>3000 to 4000	0
>2000 to 3000	1
>1000 to 2000	12
0 to 1000	17
0 to 8760	40
>0.5 – 1.0 km zone	
Number of hours	Number of observations
>8000 to 8760	12
>7000 to 8000	0
>6000 to 7000	0
>5000 to 6000	0
>4000 to 5000	0
>3000 to 4000	0
>2000 to 3000	3
>1000 to 2000	11
0 to 1000	46
0 to 8760	72

Table 78. Gamma dose rate measurements ($\mu\text{Gy h}^{-1}$) for the Barrow direct radiation survey area

	Indoor substrate	Indoor gamma dose rate at 1m ^a	outdoor substrate	Outdoor gamma dose rate at 1 metre ^a
Residences				
Residence 1	Not recorded	Not recorded	Concrete	0.120
Residence 2	Not recorded	Not recorded	Concrete	0.120
Residence 3	Wood	0.120	Concrete	0.120
Residence 4	Concrete	0.110	Concrete	0.120
Residence 5	Not recorded	Not recorded	Concrete	0.120
Residence 6	Not recorded	Not recorded	Concrete	0.120
Residence 7	Wood	0.110	Concrete	0.110
Residence 8	Wood	0.110	Concrete	0.110
Residence 9	Wood	0.110	Concrete	0.100
Residence 10	Not recorded	Not recorded	Concrete	0.098
Residence 11	Wood	0.120	Tarmac	0.099
Residence 12	Not recorded	Not recorded	Tarmac	0.096
Businesses				
Business 1	Not recorded	Not recorded	Tarmac	0.094
Business 2	Concrete	0.071		
Business 3	Concrete	0.092	Concrete	0.095
Business 4	Not recorded	Not recorded	Grass	0.090
Business 5	Concrete	0.066	Grass	0.088
Business 6	Concrete	0.075	Grass	0.079
Allotments				
Allotment 1	Not applicable	Not applicable	Grass	0.085
Allotment 2	Not applicable	Not applicable	Grass	0.079
Allotment 3	Not applicable	Not applicable	Grass	0.074
Allotment 4	Not applicable	Not applicable	Grass	0.068

Notes

^a These measurements have not been adjusted for background dose rates

Table 79. Background gamma dose rate measurements for the Barrow survey area ($\mu\text{Gy h}^{-1}$)

	Substrate	Gamma dose rate at 1 metre
Background 1	Grass	0.088
Background 2	Grass	0.077
Background 3	Grass	0.082
Background 4	Grass	0.081

Table 80. Combinations of adult pathways for consideration in dose assessments in the Barrow area

Combination number	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the nuclear licensed site boundary	Outdoor occupancy within 1 km of the nuclear licensed site boundary					
1												X			X																					
2																				X											X		X			
3	X		X				X	X	X	X	X																									
4																					X					X					X					
5																							X			X										
6												X											X			X										
7						X																X	X													
8							X	X	X	X	X														X											
9																							X	X						X						
10			X		X													X			X	X	X								X		X			
11	X																											X			X					
12		X	X					X	X	X	X				X			X										X			X		X			
13	X	X	X																				X					X	X	X						
14	X	X	X																				X				X	X	X			X		X		
15	X																						X	X					X							
16													X									X	X	X			X	X			X					
17											X		X	X	X																					
18	X												X	X									X													
19			X																				X		X				X							
20																							X	X	X				X							
21																		X	X				X	X	X				X			X				
22	X															X	X															X		X		
23	X						X	X	X	X	X				X	X				X																
24							X	X	X	X	X				X	X																X		X		
25							X	X	X		X				X	X							X							X			X		X	
26							X	X	X						X	X							X	X								X				
27	X			X																			X	X	X	X			X							

Notes

The food groups and external pathways marked with a cross are combined for the corresponding combination number. For example, combination number 3 represents an individual (or individuals) from Annex 1 who had positive data for the following pathways: sea fish, molluscs, green vegetables, other vegetables, root vegetables, potato and domestic fruit.

For boat on mud the substrate includes mud, sand and salt marsh.

Annex 1. Adults' consumption rates (kg y⁻¹ and l y⁻¹) and occupancy rates (h y⁻¹) in the Barrow area

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary	
4849/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66	-	-	-	-	-	-	-	-	-	765	-	-	-	-	
4849/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	765	-	-	-	-
4849/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	219	-	-	-	-
4850/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	28	7	-	-	6	-	157	-	-	-	-
4850/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4850/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4850/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4850/2/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4850/2/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4850/2/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4850/2/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4850/2/8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4850/2/9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4850/2/10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	7	-	-	-	-	-	-	-	-	
4851/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	196	-	-	-	-	-	-	-	-	-	
4852/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	734	-	-	-	-	3	-	-	-	7378	495
4852/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	-	-	-	-	-	-	-	-	6961	182
4853/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8740	-	
4854/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7764	379	
4854/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	548	-	-	-	-	-	-	-	-	6084	379
4855/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4740	366	
4855/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7689	366	
4856/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7938	379	
4856/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8225	379	
4856/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7141	1098	
4857/1/1	2.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	
4857/2/1	2.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4858/1/1	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	363	-	-	-	-	-	-	-	-	-	-
4858/2/1	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	363	-	-	-	-	-	-	-	-	-	-
4859/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
4859/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
4859/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary	
4859/1/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	
4859/1/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
4859/1/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
4859/1/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
4859/1/8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
4859/1/9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
4859/1/10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
4859/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	599	-	-	-	-
4860/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	-	-
4860/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	-	-
4860/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	-	-
4860/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	-	-
4860/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	-	-
4862/1/1	23.2	3.3	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	30	-	-	-	858	54	-	1560	-	-	-	-	1616
4864/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4864/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4864/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4864/1/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4864/1/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4864/1/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4864/1/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4864/1/8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4864/1/9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4864/1/10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	285	-	-	-	-
4870/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	104	-	-	-	-	-	-	-	-	-	-
4871/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	13	-	-	-	-	-	-	-	-	-	-
4871/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	13	-	-	-	-	-	-	-	-	-	-
4873/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	924	-	-	-	12	-	-	-	-	-	-	-
4874/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	8	-	8	-	-	-	-	-	-	-
4877/1/1	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	-	-	365	130	-	-	-	30	-	-	-	-	-	-	
4877/4/1	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4878/1/1	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	116	-	-	-	-	-	-	-	116	-	-	626	-	-	-	-
4878/2/1	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4878/3/1	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4878/4/1	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary	
4878/7/1	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4878/8/1	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4879/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	391	-	-	-	-	-	-	-	-	-	-	-	
4880/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	365	-	-	-	-	-	-	-	-	-	-	-	
4881/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	-	-	-	-	
4881/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	222	-	-	-	-	-	-	-	-	-	-	-	
4972/1/1	27.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	24	-	209	-	-	-	-	
4972/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-	-	
4972/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-	-	
4972/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-	-	
4972/2/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-	-	
4972/3/1	27.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4973/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	678	-	-	-	
4973/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	678	-	-	-	
4973/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	678	-	-	-	
4974/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	678	-	-	-	-	
4974/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	678	-	-	-	-	
4975/1/1	1.0	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1056	-	-	-	-	4	2019	18	-	-	-	-	
4975/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/2/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/2/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/2/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/2/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/2/8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/2/9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/2/10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
4975/3/1	1.0	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	-	-	-	-	-	-	-	-	-	-	-	
4975/4/1	1.0	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	-	-	-	-	-	-	-	-	-	-	-	
4976/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	
4976/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	
4979/1/1	-	-	-	-	-	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	360	-	-	-	-	-	-	-	-	-	-	-	-	
4979/2/1	-	-	-	-	-	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4979/3/1	-	-	-	-	-	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary	
4979/4/1	-	-	-	-	-	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4980/1/1	-	-	-	-	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61	8	-	-	-	-	-	-	-	-	-	-	-	-
4980/2/1	-	-	-	-	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4980/3/1	-	-	-	-	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4980/4/1	-	-	-	-	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61	8	-	-	-	-	-	-	-	-	-	-	-	-
4980/5/1	-	-	-	-	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4980/6/1	-	-	-	-	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4980/7/1	-	-	-	-	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4981/1/1	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	12	-	-	1	-	-	-	-	-	-	-
4981/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	12	-	-	-	-	-	-	-	-	-	-
4983/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8183	358
4984/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7468	1188
4985/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1742	8
4985/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1742	8
4985/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1742	8
4985/1/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1742	8
4985/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1742	8
4985/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1411	8
4985/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1411	8
4985/4/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1411	8
4985/4/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1411	8
4985/4/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1411	8
4986/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1348	165
4986/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1418	95
4986/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	406	20
4987/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47
4987/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47
4987/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47
4987/1/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47
4987/1/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47
4987/1/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47
4987/1/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47
4987/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47
4987/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47
4987/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary	
4991/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	-	-	-	-	-	-	-	-	-	
4991/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	-	-	-	-	-	-	-	-	-
4992/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	6676	-	-	-	4	-	-	-	-	
4993/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	261	652	-	-	-	-	-	-	-	-	-	-	-	
4995/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1322	14
4995/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1322	14
4995/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1322	14
4995/1/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1322	14
4995/1/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1322	14
4995/1/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1322	14
4995/1/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1322	14
4995/1/8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1322	14
4998/1/1	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4998/2/1	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4999/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	52	-	-
4999/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	52	-	-
4999/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	52	-	-
4999/1/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	52	-	-
4999/1/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	52	-	-
5000/1/1	-	-	-	-	-	-	-	-	-	-	-	273.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5000/2/1	-	-	-	-	-	-	-	-	-	-	-	273.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5000/3/1	-	-	-	-	-	-	-	-	-	-	-	273.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5000/4/1	-	-	-	-	-	-	-	-	-	-	-	273.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5003/1/1	-	-	-	-	-	-	-	-	-	-	-	129.5	-	-	7.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5003/2/1	-	-	-	-	-	-	-	-	-	-	-	129.5	-	-	7.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5007/1/1	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	-	-	-	-	-	-	-	-	-
5007/2/1	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	-	-	-	-	-	-	-	-	-
5009/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5010/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5011/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5011/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5012/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5012/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5013/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5014/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	261	195	-	-	105	24	16	-	-	521	-	84	-	-	-	-

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary	
5014/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	84	-	-	-	-	
5014/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	261	195	-	-	65	-	-	-	-	521	-	168	-	-	-	-	-
5014/5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5014/5/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5014/5/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5014/5/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5014/5/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5014/5/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5014/5/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5014/5/8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5014/5/9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5014/5/10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	24	16	-	-	-	-	-	-	-	-	-	
5015/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	458	-	-	-	417	
5015/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	458	-	-	-	417	
5016/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	52	-	-	-	-	65	-	-	-	-	-	
5018/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	366	-	-	-	-	-	-	-	-	-	-	-	
5018/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	366	-	-	-	-	-	-	-	-	-	-	-	
5020/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
5020/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	
5022/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	120	-	-	12	-	-	-	-	-	-	
5023/2/1	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	24	-	-	-	-	-	-	-	-	-	
5023/4/1	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	-	-	-	-	-	-	-	-	-	-	-	
5024/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	313	652	-	-	-	313	-	42	-	-	-	-	
5024/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	313	521	-	-	-	313	-	42	-	-	-	-	
5026/1/1	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	64	24	537	-	-	26	-	-	-	-	-		
5027/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	-	275	120	80	-	-	125	-	-	-	-	-		
5028/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	21	14	-	-	-	-	-	-	-	-		
5029/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	390	24	366	-	-	391	-	-	-	-	-	-	
5030/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	13	-	-	144	128	16	-	-	26	-	-	-	-	-		
5032/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	112	102	28	-	-	90	-	-	-	-	-		
5033/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144	154	16	-	-	104	-	-	-	-	-		
5035/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	3	-	-	-	-	
5035/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	3	-	-	-	-	
5038/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	52	-	-	-	-	-	-	-	-	-	
5038/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	52	-	-	-	-	-	-	-	-	-	

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary		
5040/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	519	-	-	-	-	-	-	-	-	-	-	-	-	
5040/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-	-	-	-	-	-	-	-
5040/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	519	-	-	-	-	-	-	-	-	-	-	-	-
5040/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-	-	-	-	-	-	-	-
5040/4/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-	-	-	-	-	-	-	-
5040/4/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-	-	-	-	-	-	-	-
5040/4/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-	-	-	-	-	-	-	-
5040/4/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-	-	-	-	-	-	-	-
5040/4/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-	-	-	-	-	-	-	-
5040/4/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415	-	-	-	-	-	-	-	-	-	-	-	-
5042/1/1	-	-	-	-	-	-	-	-	-	-	1.5	-	18.8	4.0	23.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5042/2/1	-	-	-	-	-	-	-	-	-	-	1.5	-	18.8	4.0	23.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5042/3/1	-	-	-	-	-	-	-	-	-	-	1.5	-	18.8	4.0	23.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5042/4/1	-	-	-	-	-	-	-	-	-	-	1.5	-	18.8	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5043/1/1	-	-	-	-	-	-	-	-	-	-	2.0	-	-	-	-	0.5	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	
5043/2/1	-	-	-	-	-	-	-	-	-	-	2.0	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5044/1/1	-	-	-	-	-	-	-	-	-	-	-	121.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5044/2/1	-	-	-	-	-	-	-	-	-	-	-	121.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5044/3/1	-	-	-	-	-	-	-	-	-	-	-	121.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5044/4/1	-	-	-	-	-	-	-	-	-	-	-	121.7	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-
5044/5/1	-	-	-	-	-	-	-	-	-	-	-	121.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5044/6/1	-	-	-	-	-	-	-	-	-	-	-	121.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5045/1/1	-	-	-	-	-	-	-	-	-	-	-	-	28.5	12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5045/2/1	17.9	-	-	-	-	-	-	-	-	-	-	-	28.5	12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5045/3/1	-	-	-	-	-	-	-	-	-	-	-	-	28.5	12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5045/4/1	6.0	-	-	-	-	-	-	-	-	-	-	-	28.5	12.8	-	-	-	-	-	-	-	78	-	352	-	-	-	-	-	-	-	-	-	-	-
5045/5/1	-	-	-	-	-	-	-	-	-	-	-	-	28.5	12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5045/6/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-	-	-	-	-
5045/6/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-	-	-	-	-
5045/6/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-	-	-	-	-
5045/6/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-	-	-	-	-
5047/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2060	26	
5047/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2060	26	
5047/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26	
5047/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26	

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary		
5047/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26		
5047/2/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26	
5047/2/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26	
5047/2/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26	
5047/2/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26	
5047/2/8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26	
5048/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2192	26
5048/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2192	26
5048/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2192	26
5051/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	26	-	-	-	-	-	-	-	-	-	4067	202
5051/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	26	-	-	-	-	-	-	-	-	-	6494	224
5055/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7060	637
5055/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5739	537
5056/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8343	365
5058/1/1	-	-	-	-	-	-	15.6	15.2	22.8	70.0	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5058/2/1	-	-	-	-	-	-	15.6	15.2	22.8	70.0	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5058/3/1	-	-	-	-	-	-	1.7	1.7	2.5	7.8	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5058/4/1	-	-	-	-	-	-	1.7	1.7	2.5	7.8	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5058/5/1	-	-	-	-	-	-	1.7	1.7	2.5	7.8	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5060/1/1	-	-	-	-	-	-	24.5	27.9	18.9	80.0	1.0	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5060/2/1	-	-	-	-	-	-	24.5	27.9	18.9	80.0	1.0	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5063/1/1	-	-	-	-	-	-	-	-	2.4	6.8	0.2	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	626
5063/2/1	-	-	-	-	-	-	-	-	4.7	13.6	0.4	-	-	-	-	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	626
5065/1/1	-	-	-	-	-	-	7.5	2.5	1.9	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6542	2009
5065/2/1	-	-	-	-	-	-	7.5	2.5	1.9	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5066/1/1	-	-	-	-	-	-	2.7	2.5	7.1	6.3	6.0	-	-	-	-	17.8	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5066/2/1	-	-	-	-	-	-	2.7	2.5	7.1	6.3	6.0	-	-	-	-	17.8	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5067/1/1	-	-	-	-	-	-	1.7	0.8	3.6	-	-	-	-	-	-	17.8	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
5067/2/1	-	-	-	-	-	-	1.7	0.8	3.6	-	-	-	-	-	-	17.8	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
5070/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
5070/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8
5070/5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5070/6/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5071/1/1	4.9	-	0.2	-	-	-	7.2	18.0	3.0	30.5	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5071/2/1	-	-	-	-	-	-	1.2	3.0	0.5	5.1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary		
5071/3/1	-	-	-	-	-	-	1.2	3.0	0.5	5.1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
5071/4/1	-	-	-	-	-	-	1.2	3.0	0.5	5.1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
5071/5/1	-	-	-	-	-	-	1.2	3.0	0.5	5.1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
5073/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	548	-	-	-	-	-	-	-	-	-	-	91	
5073/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91		
5074/1/1	-	-	-	-	-	-	21.3	30.5	19.7	70.0	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	531	
5074/2/1	-	-	-	-	-	-	21.3	30.5	19.7	70.0	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	531	
5076/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	78	-	-	-	-	-	-	
5078/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-	-	-	-	-	
5078/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	548	-	-	-	-	-	-	-	-	-	-	-	
5079/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	6	-	-	-	-	-	-	-	-	-	-	
5079/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	6	-	-	-	-	-	-	-	-	-	-	
5082/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	122	38	-	-	-	18	-	-	-	-	-	-	
5084/1/1	-	-	-	-	-	-	6.6	1.4	0.5	4.1	15.3	-	-	-	5.3	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	685	
5084/2/1	-	-	-	-	-	-	15.5	3.2	1.1	9.5	35.6	-	-	-	12.5	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	685	
5085/1/1	-	-	-	-	-	-	-	2.3	1.9	9.1	6.9	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	548	
5085/2/1	-	-	-	-	-	-	-	2.3	1.9	9.1	6.9	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	548	
5085/3/1	-	-	-	-	-	-	-	2.3	1.9	9.1	6.9	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5085/4/1	-	-	-	-	-	-	-	2.3	1.9	9.1	6.9	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5086/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	17	-	-	-	-	-	
5087/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	365	-	-	-	-	6	-	-	-	-	-	-	
5090/1/1	-	-	-	-	-	-	1.2	1.0	5.2	12.5	3.6	-	-	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7552	992	
5090/2/1	-	-	-	-	-	-	1.2	1.0	5.2	12.5	3.6	-	-	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8442	102	
5090/3/1	-	-	-	-	-	-	1.2	1.0	5.2	12.5	3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5090/4/1	-	-	-	-	-	-	1.2	1.0	5.2	12.5	3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5091/1/1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	195	-	-	26	-	-	-	-	-	-	
5091/2/1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	195	-	-	26	-	-	-	-	-	-	
5092/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8186	365	
5092/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8656	-	
5092/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
5093/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5903	783	
5093/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4909	352	
5095/1/1	-	-	-	-	-	-	12.7	6.8	39.0	68.0	27.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6688	1800	
5095/2/1	-	-	-	-	-	-	8.5	6.8	39.0	68.0	27.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8100	154
5095/3/1	-	-	-	-	-	-	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary	
5097/1/1	-	-	-	-	-	-	9.1	5.0	25.4	-	24.0	-	-	-	0.7	1.0	-	21	-	-	-	6	-	-	-	-	-	24	-	-	-	5460	1812	
5097/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5098/7/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	357	-	-	-	357	
5098/7/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	357	-	-	-	357	
5098/7/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	357	-	-	-	357	
5098/8/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	357	-	-	-	357	
5098/8/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	357	-	-	-	357	
5098/8/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	357	-	-	-	357	
5098/8/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	357	-	-	-	357	
5098/8/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	357	-	-	-	357	
5100/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	417	-	-	-	209	
5101/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	52	
5102/1/1	39.0	-	-	13.2	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	18	249	259	16	-	-	140	-	-	-	-	-	-	
5106/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	298	-	-	-	-	-	-	-	-	-	-	-	
5106/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	137	-	-	-	-	-	-	-	-	-	-	-	
5106/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	2	-	-	-	-	-	
5107/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2129	26	
5108/1/1	-	1.6	0.4	-	-	-	-	2.8	5.7	6.1	4.6	-	-	-	31.2	-	-	4	-	-	-	-	-	-	-	-	4	-	-	-	-	7058	1432	
5108/2/1	-	-	-	-	-	-	-	2.8	5.7	6.1	4.6	-	-	-	31.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7774	716	
5108/3/1	-	-	-	-	-	-	-	0.7	1.4	1.5	1.1	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
5108/4/1	-	-	-	-	-	-	-	0.7	1.4	1.5	1.1	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
5108/5/1	-	-	-	-	-	-	-	0.7	1.4	1.5	1.1	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
5109/1/1	-	-	-	-	-	-	6.8	33.7	23.6	-	16.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	731
5110/1/1	-	-	-	-	-	-	24.6	7.9	3.9	40.0	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1096
5110/2/1	-	-	-	-	-	-	24.6	7.9	3.9	40.0	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5110/2/2	-	-	-	-	-	-	24.6	7.9	3.9	40.0	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5111/1/1	4.5	-	-	-	-	-	6.0	18.4	39.1	36.3	12.2	-	-	-	7.1	1.5	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5111/2/1	-	-	-	-	-	-	-	8.2	-	36.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5112/1/1	-	-	-	-	-	-	-	-	-	-	-	395.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5112/2/1	-	-	-	-	-	-	-	-	-	-	-	395.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5136/1/1	16.6	-	-	44.1	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	8	57	206	16	-	-	34	-	-	-	-	-	-	
5136/2/1	16.6	-	-	44.1	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	8	-	-	-	-	-	16	-	-	-	-	-	-	
5136/3/1	16.6	-	-	44.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5137/1/1	-	-	-	-	-	-	-	-	-	-	-	-	56.3	-	-	-	-	66	-	-	153	232	232	-	-	4	219	-	45	-	-	-	-	
5137/2/1	-	-	-	-	-	-	-	-	-	-	-	-	56.3	-	-	-	-	-	-	-	-	232	232	-	-	-	-	-	-	-	-	-	-	-

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary	
5137/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66	-	-	153	-	-	-	-	-	219	-	-	-	-	-	-	
5137/3/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66	-	-	153	-	-	-	-	-	219	-	-	-	-	-	-	
5137/3/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66	-	-	153	-	-	-	-	-	219	-	-	-	-	-	-	
5137/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	45	-	-	-	-	
5138/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	
5138/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	
5138/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	
5138/1/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	
5138/1/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	
5138/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	
5138/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	
5138/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	
5139/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	6	18	-	-	-	-	-	-	-	-	-	6	
5139/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	6	18	-	-	-	-	-	-	-	-	-	6	
5139/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	6	18	-	-	-	-	-	-	-	-	-	6	
5139/1/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	6	18	-	-	-	-	-	-	-	-	-	6	
5139/1/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	6	18	-	-	-	-	-	-	-	-	-	6	
5139/1/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	6	18	-	-	-	-	-	-	-	-	-	6	
5139/1/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	6	18	-	-	-	-	-	-	-	-	-	6	
5139/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	6	18	-	-	-	-	-	-	-	-	-	6	
5139/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	6	18	-	-	-	-	-	-	-	-	-	6	
5139/3/1	-	-	0.4	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	13	6	748	-	-	-	-	-	-	-	-	-	-	6
5139/4/1	-	-	0.4	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5139/6/1	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5140/1/1	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8149	419	
5140/2/1	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8149	419	
5141/1/1	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-	-	-	
5141/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-	-	-	
5141/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-	-	-	
5141/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	230	-	-	-	-	-	-	-	
5141/5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	521	-	-	-	391	-	-	-	-	-	-	-	
5141/6/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	521	-	-	-	391	-	-	-	-	-	-	-	
5141/7/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	521	-	-	-	391	-	-	-	-	-	-	-	
5141/8/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	521	-	-	-	391	-	-	-	-	-	-	-	
5141/9/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	521	-	-	-	391	-	-	-	-	-	-	-	

Person ID number	Sea fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Rabbits/hares	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Intertidal occupancy over boat on mud	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Occupancy in close proximity (<10 m) to liquid sewage sludge	Occupancy in close proximity (<10 m) to dried sewage sludge	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
5142/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	-	-	-	-	-	-	-	-	-
5142/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-
5143/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1095	-	-	-	-	-	-	-	-	-	-	-
5143/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	456	-	-	-	-	-	-	-	-	-	-	-
5144/1/1	9.6	-	9.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1043	430	-	-	1001	-	-	-	1043
5144/2/1	9.6	-	9.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5144/3/1	9.6	-	9.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes

The emboldened observations are the high-rate individuals
 For boat on mud the substrate includes mud, sand and salt marsh.

Annex 2. Children's consumption rates (kg y⁻¹ and l y⁻¹) and occupancy rates (h y⁻¹) in the Barrow area

Person ID number	Fish	Wildfowl	Marine plants/algae	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Eggs	Wild/free foods	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the nuclear licensed site boundary	Outdoor occupancy within 1 km of the nuclear licensed site boundary	
4852/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5686	52	
4855/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6467	458
4855/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5902	824
4859/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	
4859/3/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	
4859/3/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	
4859/3/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	
4859/3/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	
4859/3/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	
4859/3/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	
4860/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	
4860/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	
4860/5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	
4860/6/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	
4860/7/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	
4871/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	13	-	-	-	-	-	-	
4871/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	13	-	-	-	-	-	-	
4874/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	8	-	-	-	-	-	
4877/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	
4877/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	
4878/5/1	15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4878/6/1	15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4878/9/1	15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4878/10/1	15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4984/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7129	26	
4991/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	
4991/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	
5014/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	168	-	-	
5023/1/1	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	67	-	33	-	-	-	-	-	
5023/3/1	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	42	-	-	-	-	-	-	-	

Person ID number	Fish	Wildfowl	Marine plants/algae	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Eggs	Wild/free foods	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the nuclear licensed site boundary	Outdoor occupancy within 1 km of the nuclear licensed site boundary
5035/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	3	-	-
5055/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6984	100
5058/6/1	-	-	-	1.7	1.7	2.5	7.8	2.7	-	-	-	-	-	-	-	20	-	-	-	-	-	-
5067/3/1	-	-	-	-	-	-	-	-	-	-	1.1	-	-	-	35	7	-	-	-	6	-	-
5067/4/1	-	-	-	-	-	-	-	-	-	-	1.1	-	-	-	35	7	-	-	-	6	-	-
5082/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-
5086/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	4	-	-
5086/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	4	-	-
5092/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
5092/5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
5098/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/3/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/3/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/4/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/4/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/5/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/5/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/5/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/6/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/6/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5098/6/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	292	-	357
5101/2/1	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-	-	13	-	52
5101/3/1	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	52
5102/2/1	-	2.2	-	-	-	-	-	-	-	-	-	4	-	4	-	156	-	9	-	-	-	-
5106/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-
5108/7/1	-	-	-	-	0.7	1.4	1.5	1.1	-	7.6	-	-	-	-	-	-	-	-	-	-	-	18

Person ID number	Fish	Wildfowl	Marine plants/algae	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Eggs	Wild/free foods	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stones	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the nuclear licensed site boundary	Outdoor occupancy within 1 km of the nuclear licensed site boundary
5108/8/1	-	-	-	-	0.7	1.4	1.5	1.1	-	7.6	-	-	-	-	-	-	-	-	-	-	-	18
5112/3/1	-	-	-	-	-	-	-	-	395.4	-	-	-	-	-	-	-	-	-	-	-	-	-
5136/4/1	8.3	22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5139/5/1	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5142/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-
5142/4/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-

Notes

The emboldened observations are the high-rate individuals

Annex 3. Infants' consumption rates (kg y⁻¹) and occupancy rates (h y⁻¹) in the Barrow area

Person ID number	Fish	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Eggs	Wild/free foods	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy on water	Indoor occupancy within 1 km of the nuclear licensed site boundary	Outdoor occupancy within 1 km of the nuclear licensed site boundary
4984/3/1	-	-	-	-	-	-	-	-	-	-	-	-	7468	1188
5013/2/1	-	-	-	-	-	-	-	-	-	12	-	-	-	-
5035/4/1	-	-	-	-	-	-	-	-	-	18	-	3	-	-
5058/7/1	-	-	0.9	0.8	1.3	3.9	1.3	-	-	-	20	-	-	-
5070/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	8
5070/4/1	-	-	-	-	-	-	-	-	0.5	-	-	-	-	8
5108/6/1	-	-	-	0.3	0.7	0.7	0.6	3.8	-	-	-	-	-	18
5136/5/1	4.1	11.0	-	-	-	-	-	-	-	-	-	-	-	-

Notes

The emboldened observations are the high-rate individuals

Annex 4. Qualitative and estimated data for use in dose assessments

Details of activity	Exposure pathways involved	Estimated rate
Not identified	Not identified	Not applicable

Annex 5. Ratios for determining consumption and occupancy rates for children and infants

Group	Ratio ^a	
	Child ^e /adult	Infant ^e /adult
Sea fish ^b	0.200	0.050
Crustaceans ^b	0.250	0.050
Molluscs ^b	0.250	0.050
Green vegetables	0.444	0.222
Other vegetables	0.500	0.200
Root vegetables	0.500	0.375
Potato	0.708	0.292
Domestic fruit	0.667	0.467
Milk	1.000	1.333
Cattle meat	0.667	0.222
Pig meat	0.625	0.138
Sheep meat	0.400	0.120
Poultry	0.500	0.183
Eggs	0.800	0.600
Wild/free foods ^c	0.490	0.110
Game ^d	0.500	0.140
Honey	0.789	0.789
Wild fungi	0.450	0.150
Freshwater fish ^b	0.250	0.050
External exposure over aquatic substrates ^b	0.500	0.030

Notes

^aExcepting notes b and c, consumption ratios were derived from Byrom and others (1995) which presented data for infants aged 6 to 12 months and children aged 10 to 11 years.

^bRatios were derived from Smith and Jones (2003) which presented data for infants and children of unspecified ages.

^cRatios were derived from FSA data for wild fruit and nuts for infants and children of 10 years old.

^dGame includes rabbits/hares and venison.

^eNote that the age ranges within the age groups in this table do not correspond exactly with the age ranges within the age groups used throughout the rest of this report.

Annex 6. Consumption rates (kg y⁻¹ and l y⁻¹) and occupancy rates (h y⁻¹) for women of childbearing age^a in the Barrow area

Person ID number	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the nuclear licensed site boundary	Outdoor occupancy within 1 km of the nuclear licensed site boundary	
4852/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	734	-	3	-	7378	495	
4860/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	
4860/1/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	
4860/1/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	
4871/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	13	-	-	-	-	
4878/4/1	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4878/8/1	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4881/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	222	-	-	-	-	-	
4972/3/1	27.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4975/4/1	1.0	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	-	-	-	-	-	
4979/3/1	-	-	-	-	-	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4979/4/1	-	-	-	-	-	24.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4980/3/1	-	-	-	-	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4980/5/1	-	-	-	-	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4984/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7468	1188	
4985/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1742	8	
4985/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1411	8	
4987/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47	
4987/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47	
4987/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1726	47	
4991/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	-	-	-	
5000/2/1	-	-	-	-	-	-	-	-	-	-	-	273.8	-	-	-	-	-	-	-	-	-	-	-	-	
5011/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	
5012/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183	-	
5023/4/1	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	-	
5035/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	
5042/3/1	-	-	-	-	-	-	-	-	-	-	1.5	-	18.8	4.0	23.8	-	-	-	-	-	-	-	-	-	-
5042/4/1	-	-	-	-	-	-	-	-	-	-	1.5	-	18.8	4.0	-	-	-	-	-	-	-	-	-	-	
5044/3/1	-	-	-	-	-	-	-	-	-	-	-	121.7	-	-	-	-	-	-	-	-	-	-	-	-	
5044/4/1	-	-	-	-	-	-	-	-	-	-	-	121.7	-	-	-	-	-	-	-	-	-	-	12	-	
5045/1/1	-	-	-	-	-	-	-	-	-	-	-	-	28.5	12.8	-	-	-	-	-	-	-	-	-	-	
5045/6/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	

Person ID number	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Salt marsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Sheep meat	Eggs	Wild/free foods	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the nuclear licensed site boundary	Outdoor occupancy within 1 km of the nuclear licensed site boundary
5045/6/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
5045/6/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
5045/6/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-
5047/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26
5047/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26
5047/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26
5047/2/4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26
5047/2/5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26
5047/2/6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26
5047/2/7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26
5047/2/8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1225	26
5051/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	26	-	-	6494	224
5055/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5739	537
5056/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8343	365
5058/3/1	-	-	-	-	-	-	1.7	1.7	2.5	7.8	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-
5070/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-	-	-	-	-	8
5079/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	6	-	-	-	-
5085/4/1	-	-	-	-	-	-	-	2.3	1.9	9.1	6.9	-	-	-	-	0.5	-	-	-	-	-	-	-	-
5086/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	17	-	-	-
5092/3/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
5101/1/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	52
5108/3/1	-	-	-	-	-	-	-	0.7	1.4	1.5	1.1	-	-	-	7.6	-	-	-	-	-	-	-	-	18
5108/4/1	-	-	-	-	-	-	-	0.7	1.4	1.5	1.1	-	-	-	7.6	-	-	-	-	-	-	-	-	18
5108/5/1	-	-	-	-	-	-	-	0.7	1.4	1.5	1.1	-	-	-	7.6	-	-	-	-	-	-	-	-	18
5110/2/1	-	-	-	-	-	-	24.6	7.9	3.9	40.0	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-
5110/2/2	-	-	-	-	-	-	24.6	7.9	3.9	40.0	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-
5112/2/1	-	-	-	-	-	-	-	-	-	-	-	395.4	-	-	-	-	-	-	-	-	-	-	-	-
5112/3/1	-	-	-	-	-	-	-	-	-	-	-	395.4	-	-	-	-	-	-	-	-	-	-	-	-
5136/3/1	16.6	-	-	44.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5138/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	16	-	-	-	-	-
5138/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	16	-	-	-	-	-
5138/2/3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	16	-	-	-	-	-
5139/2/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	6	18	-	-	-	6
5139/2/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	6	18	-	-	-	6
5139/6/1	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes for Annex 6

^a Based on National Statistics guidelines, women were deemed to be of childbearing age if they were between 15 and 44 years old. Women of unknown age were included as they were potentially women of childbearing age.

Annex 7. Summary of profiles for adults in the Barrow area for use in the assessment of total dose

Profile Name	Pathway Name	Number of Individuals	Notes Units	Crustacea	Direct	Eggs	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Gamma ext - Houseboat	Gamma ext - Salt marsh	Gamma ext - Sediments	Marine plants/algae	Meat - Cow	Meat - Game	Meat - Salt Marsh Grazed Sheep	Meat - Sheep	Meat - Wildfowl	Milk	Mollusca	Occupancy In water	Occupancy On water	Plume (IN; 0-0.25 km)	Plume (MID; 0.25-0.5 km)	Plume (OUT; 0.5-1.0 km)	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root		
				kg	1	kg	kg	kg	kg	h	h	h	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	h	h	h	h	h	kg	kg	kg	kg
				2	3	4	5	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Crustacea Consumers		2		2.5	1.0	15.6	11.6	2.3	-	-	-	29	-	-	-	-	-	-	-	1.4	-	780	810	-	4250	-	1.4	3.1	2.9		
Occupants for Direct Radiation		123		0.04	1.0	1.0	0.3	1.5	0.1	8	1	38	0.01	-	0.01	-	-	-	-	0.1	1	55	880	660	1100	1.2	1.2	3.6	1.8		
Egg Consumers		10		0.2	0.3	21.8	-	6.1	1.3	-	-	9	-	5.6	-	-	1.2	-	-	0.04	-	1	-	-	1770	2.4	1.5	3.4	3.4		
Sea Fish Consumers		14		0.2	0.1	-	22.1	-	-	-	2	74	-	2.0	-	-	0.9	10.4	-	0.2	-	170	120	-	-	-	-	-	-		
Domestic Fruit Consumers		9		-	0.7	2.8	0.5	22.9	1.3	-	-	8	-	-	-	-	-	-	-	-	3	-	810	-	2090	10.7	11.7	36.2	23.7		
Wild Fruit and Nut Consumers		2		-	1.0	8.9	-	25.5	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	690	11.1	2.3	6.8	0.8		
Occupants over Houseboat		2		-	-	-	-	-	-	7480	20	180	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-		
Occupants over Salt marsh		6		-	-	-	-	-	-	-	210	230	-	9.4	-	4.0	-	-	-	-	-	8	-	-	-	-	-	-	-		
Occupants over - Sediments		44		0.01	0.1	-	1.3	-	-	-	10	620	0.1	2.6	-	-	-	0.3	-	0.02	46	9	150	340	50	-	-	-	-		
Consumers of Marine Plants and Algae		7		-	0.1	-	-	-	-	-	2	420	1.0	-	-	-	-	-	-	0.1	-	-	-	1	-	-	-	-	-		
Cattle Meat Consumers		11		-	-	-	3.4	-	-	-	33	190	-	36.4	-	-	9.1	-	-	-	-	6	-	-	-	-	-	-	-		
Game Meat Consumers		2		-	1.0	-	2.8	-	0.3	-	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	8570	-	-	-		
Salt Marsh Grazed Sheep Meat Consumers		11		-	-	-	-	-	-	-	44	1	-	-	-	16.0	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sheep Meat Consumers		5		-	-	-	4.8	-	-	-	16	70	-	28.5	-	-	12.8	-	-	-	-	-	-	-	-	-	-	-	-		
Wildfowl Consumers		3		-	-	-	16.6	-	-	-	5	98	-	-	-	-	-	44.1	-	-	-	-	-	-	-	-	-	-	-		
Milk Consumers		6		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	314.3	-	-	-	-	-	-	-	-	-	-		
Mollusca Consumers		3		-	0.3	-	9.6	-	-	350	-	-	-	-	-	-	-	-	-	9.3	-	330	350	-	-	-	-	-	-		
Occupants In Water		3		0.04	-	-	0.3	-	-	-	350	-	-	-	-	-	-	-	-	0.04	1130	6	-	-	-	-	-	-	-		
Occupants On Water		9		0.4	0.2	-	6.0	-	-	120	-	26	-	-	-	-	-	-	-	1.3	-	820	300	-	-	-	-	-	-		
Local Occupants (0-0.25 km)		11		-	1.0	0.1	-	2.2	0.1	-	-	62	-	-	-	-	-	-	-	-	2	-	7260	-	-	0.8	0.5	-	2.3		
Local Occupants (>0.25-0.5 km)		8		-	1.0	-	-	-	-	-	-	180	-	-	-	-	-	-	-	-	1	-	-	7280	-	-	-	-	-		
Local Occupants (> 0.5-1.0 km)		12		0.1	1.0	5.9	0.5	5.9	0.1	-	-	1	-	-	0.1	-	-	-	-	0.03	-	-	-	-	8530	2.6	2.0	14.9	8.5		
Green Vegetable Consumers		13		-	0.5	2.7	-	12.7	0.7	-	-	5	-	-	-	-	-	-	-	-	2	-	560	-	1510	18.6	14.8	54.3	18.4		
Other Domestic Vegetable Consumers		9		-	0.3	0.9	1.0	8.9	0.4	-	-	5	-	-	-	-	-	-	-	0.02	-	-	-	-	200	15.9	24.1	56.3	20.9		
Potato Consumers		14		-	0.4	2.1	0.7	8.4	0.2	-	-	3	-	-	-	-	-	-	-	0.02	-	-	-	-	1350	16.5	16.4	57.1	18.2		
Root Vegetable Consumers		11		-	0.5	0.8	0.4	14.3	0.4	-	-	6	-	-	-	-	-	-	-	-	2	-	660	-	1690	15.1	19.8	55.7	26.3		

Notes for Annex 7

- 1) Direct radiation is expressed as proportion of group who are present within 1.0 km of site boundary.
- 2) Gamma external - Houseboat represents occupancy over boat on mud, sand and salt marsh.
- 3) Gamma external – Salt Marsh represents occupancy over salt marsh.
- 4) Gamma external - Sediments represents occupancy over intertidal substrates including mud; mud and sand; mud and stones; sand; sand and stones; stones.
- 5) Marine plants/algae represents consumption of samphire.
- 6) Meat – Game represents consumption of rabbits/hares.
- 7) Plume times are the sum of individuals' indoor and outdoor times.

The means of the high-rate groups are determined by the 'cut-off' method and are emboldened on the diagonal.

Except for the direct radiation pathway, the figures across the rows are the means of the consumption and occupancy rates for the other pathways for the individuals within that profile.

Annex 8. Summary of profiles for the child age group (6 years old to 15 years old) in the Barrow area for use in the assessment of total dose

Profile Name	Pathway Name	Number of Individuals	Notes Units	Direct	Eggs	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Gamma ext – Salt marsh	Gamma ext - Sediments	Marine plants/algae	Meat - Wildfowl	Milk	Occupancy In water	Occupancy On water	Plume (IN; 0-0.25 km)	Plume (MID; 0.25-0.5 km)	Plume (OUT; 0.5-1.0 km)	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
				1	kg	kg	kg	kg	h	h	h	h	h	h	h	h	h	h	h	h	kg	kg
Occupants for Direct Radiation		29		1.0	0.5	-	0.1	-	-	3	-	-	-	40	180	720	450	220	-	0.05	0.1	0.1
Egg Consumers		2		1.0	7.6	-	1.1	-	-	-	-	-	-	-	-	-	-	18	-	0.7	1.5	1.4
Sea Fish Consumers		5		-	-	14.2	-	-	-	-	-	4.4	-	-	-	-	-	-	-	-	-	-
Domestic Fruit Consumers		3		0.7	5.0	-	1.6	-	-	7	-	-	-	-	-	-	-	12	0.6	1.0	3.6	1.8
Wild Fruit and Nut Consumers		2		-	-	-	-	1.1	-	42	-	-	-	-	6	-	-	-	-	-	-	-
Occupants over Salt marsh		1		-	-	-	-	-	4	160	-	2.3	-	-	-	-	-	-	-	-	-	-
Occupants over Sediments		4		-	-	0.2	-	-	1	120	-	0.6	-	-	2	-	-	-	-	-	-	-
Consumers of Marine Plants and Algae		1		-	-	-	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-
Wildfowl Consumers		1		-	-	8.3	-	-	-	-	-	22.0	-	-	-	-	-	-	-	-	-	-
Milk Consumers		1		-	-	-	-	-	-	-	-	-	395.4	-	-	-	-	-	-	-	-	-
Occupants In Water		23		0.8	-	-	-	-	-	-	-	-	-	66	240	-	-	280	-	-	-	-
Occupants On Water		26		0.7	-	-	-	-	-	-	-	-	-	45	240	-	-	250	-	-	-	-
Local Occupants (0-0.25 km)		3		1.0	-	-	-	-	-	-	-	-	-	-	-	6940	-	-	-	-	-	-
Local Occupants (>0.25-0.5 km)		2		1.0	-	-	-	-	-	-	-	-	-	-	-	-	6410	-	-	-	-	-
Local Occupants (> 0.5-1.0 km)		18		1.0	-	-	-	-	-	-	-	-	-	65	290	-	-	360	-	-	-	-
Green Vegetable Consumers		1		-	-	-	2.7	-	-	20	-	-	-	-	-	-	-	-	1.7	1.7	7.8	2.5
Other Domestic Vegetable Consumers		3		0.7	5.0	-	1.6	-	-	7	-	-	-	-	-	-	-	12	0.6	1.0	3.6	1.8
Potato Consumers		1		-	-	-	2.7	-	-	20	-	-	-	-	-	-	-	-	1.7	1.7	7.8	2.5
Root Vegetable Consumers		3		0.7	5.0	-	1.6	-	-	7	-	-	-	-	-	-	-	12	0.6	1.0	3.6	1.8

Notes

- 1) Direct radiation is expressed as proportion of group who are present within 1.0 km of site boundary.
- 2) Gamma external – Salt Marsh represents occupancy over salt marsh.
- 3) Gamma external - Sediments represents occupancy over intertidal substrates including mud; mud and stones; sand; sand and stones; stones.
- 4) Marine plants/algae represent consumption of samphire.
- 5) Plume times are the sum of individuals' indoor and outdoor times.

The means of the high-rate groups are determined by the 'cut-off' method and are emboldened on the diagonal.

Except for the direct radiation pathway, the figures across the rows are the means of the consumption and occupancy rates for the other pathways for the individuals within that profile.

Annex 9. Summary of profiles for the infant age group (0 to 5 years old) in the Barrow area for use in the assessment of total dose

Profile Name	Pathway Name	Number of Individuals															
			Notes	Direct	Eggs	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Gamma ext - Sediments	Meat - Wildfowl	Occupancy On water	Plume (IN; 0-0.25 km)	Plume (OUT; 0.5-1.0 km)	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
			Units	1	kg	kg	kg	kg	h	kg	h	h	h	kg	kg	kg	kg
Occupants for Direct Radiation		4		1.0	1.0	-	0.1	0.1	-	-	-	2160	9	-	0.1	0.2	0.2
Egg Consumers		1		1.0	3.8	-	0.6	-	-	-	-	-	18	-	0.3	0.7	0.7
Sea Fish Consumers		1		-	-	4.1	-	-	-	11.0	-	-	-	-	-	-	-
Domestic Fruit Consumers		2		0.5	1.9	-	0.9	-	10	-	-	9	0.4	0.6	2.3	1.0	
Wild Fruit and Nut Consumers		1		1.0	-	-	-	0.5	-	-	-	8	-	-	-	-	-
Occupants over Sediments		3		-	-	-	0.4	-	17	-	1	-	-	0.3	0.3	1.3	0.4
Wildfowl Consumers		1		-	-	4.1	-	-	-	11.0	-	-	-	-	-	-	-
Occupants On Water		1		-	-	-	-	-	18	-	3	-	-	-	-	-	-
Local Occupants (0-0.25 km)		1		1.0	-	-	-	-	-	-	-	8660	-	-	-	-	-
Local Occupants (> 0.5-1.0 km)		3		1.0	1.3	-	0.2	0.2	-	-	-	-	11	-	0.1	0.3	0.2
Green Vegetable Consumers		1		-	-	-	1.3	-	20	-	-	-	-	0.9	0.8	3.9	1.3
Other Domestic Vegetable Consumers		2		0.5	1.9	-	1.0	-	10	-	-	9	0.4	0.6	2.3	1.0	
Potato Consumers		1		-	-	-	1.3	-	20	-	-	-	-	0.9	0.8	3.9	1.3
Root Vegetable Consumers		2		0.5	1.9	-	1.0	-	10	-	-	9	0.4	0.6	2.3	1.0	

Notes

- 1) Direct radiation is expressed as proportion of group who are present within 1.0 km of site boundary.
- 2) Gamma external - Sediments represents occupancy over intertidal substrates including sand; sand and stones.
- 3) Plume times are the sum of individuals' indoor and outdoor times.

The means of the high-rate groups are determined by the 'cut-off' method and are emboldened on the diagonal.

Except for the direct radiation pathway, the figures across the rows are the means of the consumption and occupancy rates for the other pathways for the individuals within that profile.

Annex 10. Summary of profiles for women of childbearing age^a in the Barrow area, for use in assessments of total dose to prenatal children

Profile Name	Pathway Name	Number of Individuals	Notes Units	Crustacea	Direct	Eggs	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Gamma ext - Sediments	Marine plants/algae	Meat - Cow	Meat - Salt Marsh Grazed Sheep	Meat - Sheep	Meat - Wildfowl	Milk	Molluscs	Occupancy IN water	Occupancy ON water	Plume (IN; 0-0.25 km)	Plume (MID; 0.25-0.5 km)	Plume (OUT; 0.5-1.0 km)	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root			
				kg	1	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	h	h	h	h	h	kg	kg	kg	kg
Crustacea Consumers		1		0.1	-	-	1.0	-	-	730	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-		
Occupants for Direct Radiation		26		-	1.0	0.9	-	0.1	0.1	35	-	-	-	-	-	-	-	1	-	980	670	540	-	0.1	0.2	0.2			
Egg Consumers		1		-	-	23.8	-	1.5	-	-	-	18.8	-	4.0	-	-	-	-	-	-	-	-	-	-	-	-			
Sea Fish Consumers		4		-	-	-	21.4	-	-	-	-	-	-	-	11.0	-	-	-	-	-	-	-	-	-	-	-			
Domestic Fruit Consumers		2		-	-	-	-	4.8	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	2.0	8.4	2.2			
Wild Fruit and Nut Consumers		1		-	1.0	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-			
Occupants over Sediments		2		0.1	0.5	-	0.5	-	-	730	-	-	-	-	-	-	0.1	2	-	-	3940	-	-	-	-	-			
Consumers of Marine Plants and Algae		1		-	-	-	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Cattle Meat Consumers		3		-	-	7.9	-	1.0	-	-	-	22.0	-	6.9	-	-	-	-	-	-	-	-	-	-	-	-			
Salt Marsh Grazed Sheep Meat Consumers		4		-	-	-	-	-	-	-	-	-	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-			
Sheep Meat Consumers		1		-	-	-	-	-	-	-	-	28.5	-	12.8	-	-	-	-	-	-	-	-	-	-	-	-			
Wildfowl Consumers		1		-	-	-	16.6	-	-	-	-	-	-	-	44.1	-	-	-	-	-	-	-	-	-	-	-			
Milk Consumers		3		-	-	-	-	-	-	-	-	-	-	-	-	354.9	-	-	-	-	-	-	-	-	-	-			
Mollusca Consumers		1		0.1	-	-	1.0	-	-	730	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-			
Occupants In Water		3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	-	-	-	-	-			
Occupants On Water		3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	35	-	-	-	-	-	-	-			
Local Occupants (0-0.25 km)		2		-	1.0	-	-	-	-	26	-	-	-	-	-	-	-	-	-	7690	-	-	-	-	-	-			
Local Occupants (>0.25-0.5 km)		2		-	1.0	-	-	-	-	370	-	-	-	-	-	-	-	2	-	-	7070	-	-	-	-	-			
Local Occupants (> 0.5-1.0 km)		1		-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8710	-	-	-	-			
Green Vegetable Consumers		2		-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.6	7.9	40.0	3.9			
Other Domestic Vegetable Consumers		2		-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.6	7.9	40.0	3.9			
Potato Consumers		2		-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.6	7.9	40.0	3.9			
Root Vegetable Consumers		7		-	0.4	5.3	-	1.8	1.0	-	-	-	-	-	-	-	-	-	-	-	-	8	7.3	3.1	14.5	2.3			

Notes for Annex 10

^a Based on National Statistics guidelines, women were deemed to be of childbearing age if they were between 15 and 44 years old. Women of unknown age were included as they were potentially women of childbearing age.

- 1) Direct radiation is expressed as proportion of group who are present within 1.0 km of site boundary.
- 2) Gamma external - Sediments represents occupancy over intertidal substrates including mud; mud and stones; sand; sand and stones.
- 3) Marine plants/algae represents consumption of samphire.
- 4) Plume times are the sum of individuals' indoor and outdoor times.

The means of the high-rate groups are determined by the 'cut-off' method and are emboldened on the diagonal.

Except for the direct radiation pathway, the figures across the rows are the means of the consumption and occupancy rates for the other pathways for the individuals within that profile.

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