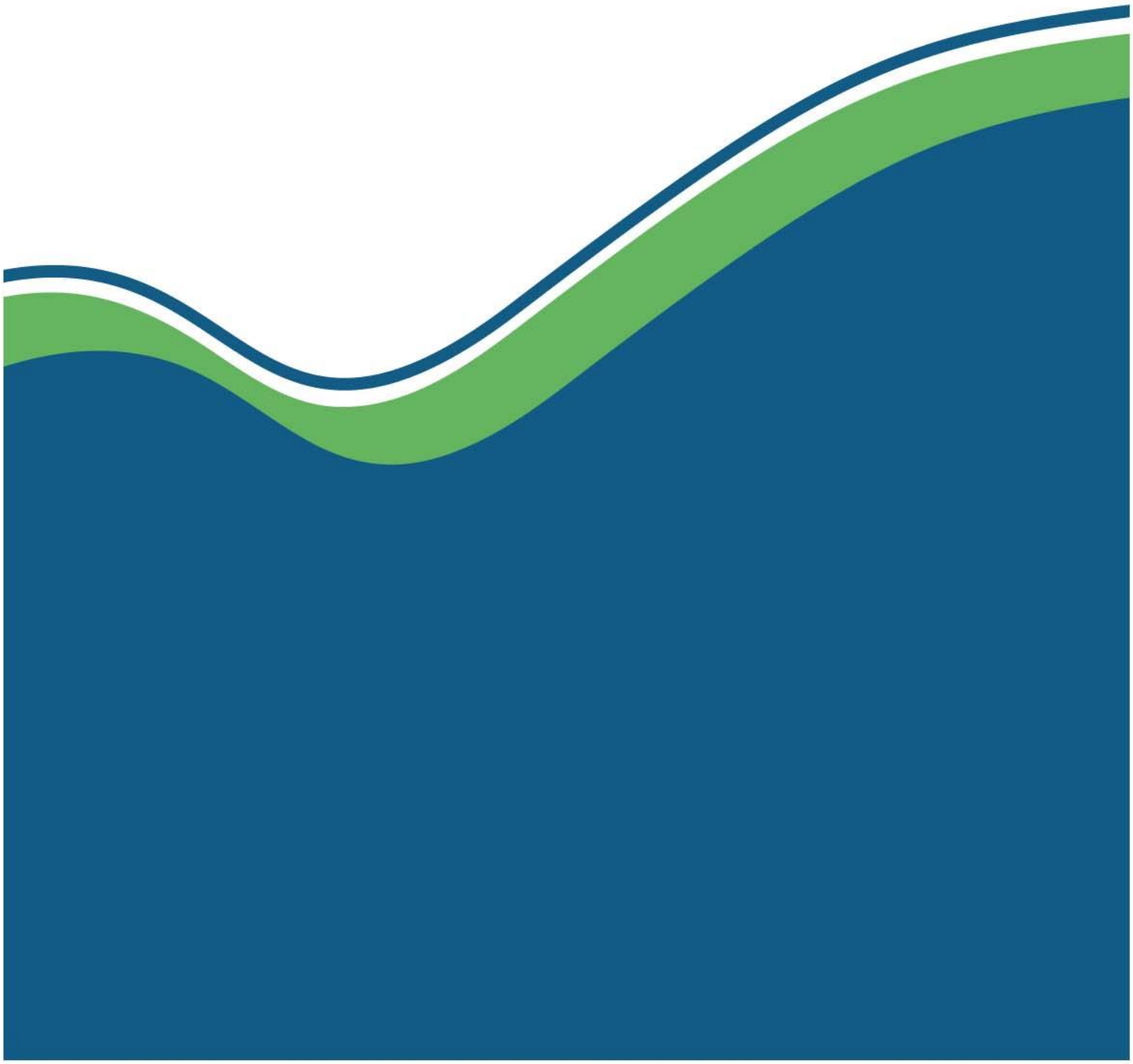
Scottish Pollutant Release Inventory Reporting

General Operator Guidance

2017



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1 Introduction

The Scottish Pollutant Release Inventory (SPRI) is a publicly accessible electronic database of releases of pollutants to all environmental media and transfers of waste. This document is designed to provide background information and to assist you in preparing your submission to SPRI.

1.1 The Inventory description and background

SPRI data has been gathered since 2002 and is published via SEPA's website. The data collated in the inventory was originally used to comply with the European Pollutant Emission Register (EPER) and the United Nations Economic Commission for Europe (UNECE) Aarhus Convention. Changes to the inventory took place in 2007 to ensure the data gathered would:

- Deliver the system by which Scotland would comply with the requirements of the EC Regulation on the implementation of a European Pollutant Release Transfer Register (E-PRTR)
- Help facilitate discussions and public participation in environmental matters and decision-making;
- Support the prevention and reduction of pollution;
- Aid delivery for data for policy-makers, academics and the public;
- Provide generic information on the pollutants.

Within the UK, SPRI provides data to the National Atmospheric Emission Inventory (NAEI), and the UK Pollutant Release Transfer Register, internationally the data is also used to fulfil the reporting requirements of the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC).

1.2 Who has to report and when

Operators of certain activities (67 activities covering 10 major sectors) above specified capacity thresholds are obliged to report to SPRI on an annual basis. The activities and thresholds are largely determined by European reporting requirements but some thresholds have been lowered to be relevant to pollutant releases in the UK and Scotland. Below is a brief summary of the SPRI activities and thresholds:

- All marine-caged fish farms (no capacity limit);
- All nuclear installations (including plants undergoing decommissioning) and all non-nuclear installations holding authorisation for air, water and waste water releases;
- Municipal sewage treatment works with a design population equivalent of >15,000 population equivalent (where population equivalent has the meaning given in the Urban Waste Water Treatment (Scotland) Regulations (UWWTR);
- All industrial wastewater treatment plants with a capacity to treat at least 10,000 m^3/d (cubic metres per day);
- All opencast mining and quarrying sites where the surface area of the area effectively under extractive operation equals 25 hectares and above and includes all underground mining;
- Most Part A processes defined in the Pollution Prevention and Control (Scotland) Regulations 2012 (as amended), together with any directly associated activities. These are the bigger industrial activities covering the energy, mineral, metal, chemical, waste management, food and drink, paper and pulp and intensive agricultural sectors;
- All sites having a waste management licence (WML) with a capacity to accept at least 50 tonnes/day for the disposal of non-hazardous waste and sites with a capacity of receiving 10 tonnes/day for the recovery and disposal of hazardous waste.

Sites which are required to report to SPRI will have been notified by SEPA via the means of a Pollution Prevention and Control (PPC) Regulation 63(2) Notice or a notification letter.
Important dates to note are shown in the table below:

Date	Event
December 2017	Schedule to the Regulation 63(2) notice available via the SPRI website at www.sepa.org.uk/sprioperator/
1 January 2018	SPRI Operator Electronic Reporting Website open and ready to accept 2017 data
21 February 2018	Reminder e-mail issued to all operators where returns have not been submitted to SEPA 7 days before the reporting deadline.
28 February 2018	Deadline for your company's data to be fully returned to SEPA (this is stated on your company's PPC Regulation 63(2) Notice and letter). Note – any operators NOT submitting data by this deadline will receive automated reminder e-mails after this deadline.
March – September 2018	SPRI data is audited by SEPA.
September 2018	All SPRI verified data is published via SEPA's website.
October 2018	The publication of the SPRI data on SEPA's website
December 2018	SPRI data that meets the E-PRTR requirements is published via the UK-Pollutant Release and Transfer Register (UK-PRTR).

1.3 Sector Guidance

A range of sector-specific guidance and tools have been produced to assist you in completing the SPRI reporting form. It is not compulsory that you use this guidance, however where there is SPRI sector guidance for your process, this should take precedence over other emission factors or calculation formulae (the exception is where these are part of your agreed permit conditions with SEPA). Operators relying on the same SPRI guidance and factors will ease the burden on reporting and aid consistency within that sector. The current guidance available is published on SEPA's website and covers the following sectors, listed below:

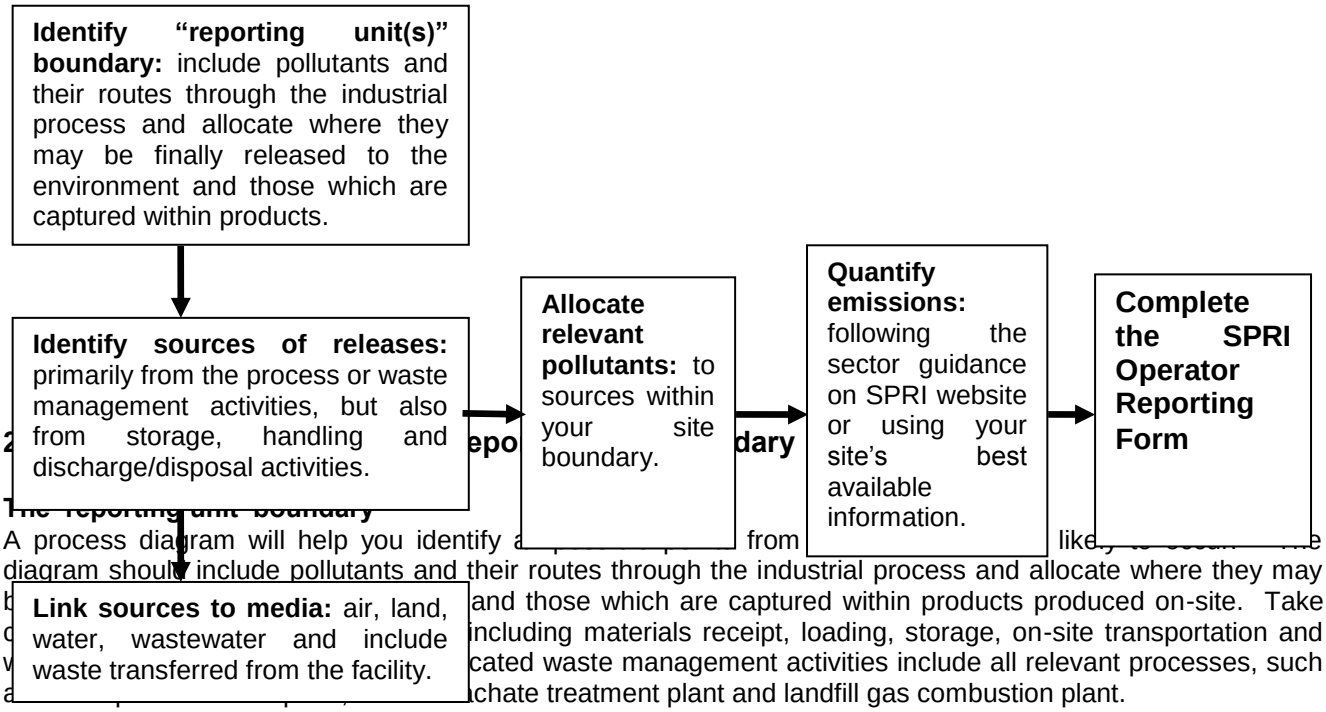
- Intensive agriculture;
- Radioactive substances;
- Petroleum;
- Combustion;
- Incineration;
- Ferrous and non-ferrous metals;
- Cement and lime;
- Paper and pulp;
- Chemicals;
- Quarry;
- Opencast coal;
- GasSim landfill gas estimator tool;
- Non-landfill – oil estimator tool and waste treatment; and
- Landfill.

2 General method on how to determine emissions being released from your site

The reporting requirements for SPRI cover releases from the whole of the 'reporting unit' including point sources, non-point sources and fugitive releases. The SPRI reporting process for emissions follow six basic steps:

Step 1 – Identify 'reporting unit' boundary;
Step 2 – Identification of sources releases;
Step 3 – Link sources to media;
Step 4 – Identify relevant pollutants;
Step 5 – Quantification of emissions; and
Step 6 – Complete the SPRI Operator Reporting Form as defined in Section 3.

Flowchart 1 – The "steps" to make your SPRI return to SEPA



2 epo dary

The reporting unit boundary

A process diagram will help you identify a from likely to occur. The diagram should include pollutants and their routes through the industrial process and allocate where they may b and those which are captured within products produced on-site. Take c including materials receipt, loading, storage, on-site transportation and w cated waste management activities include all relevant processes, such a chate treatment plant and landfill gas combustion plant.

An example is shown in Appendix 1 of this document.

2.2 Step 2 – Identification of sources of releases

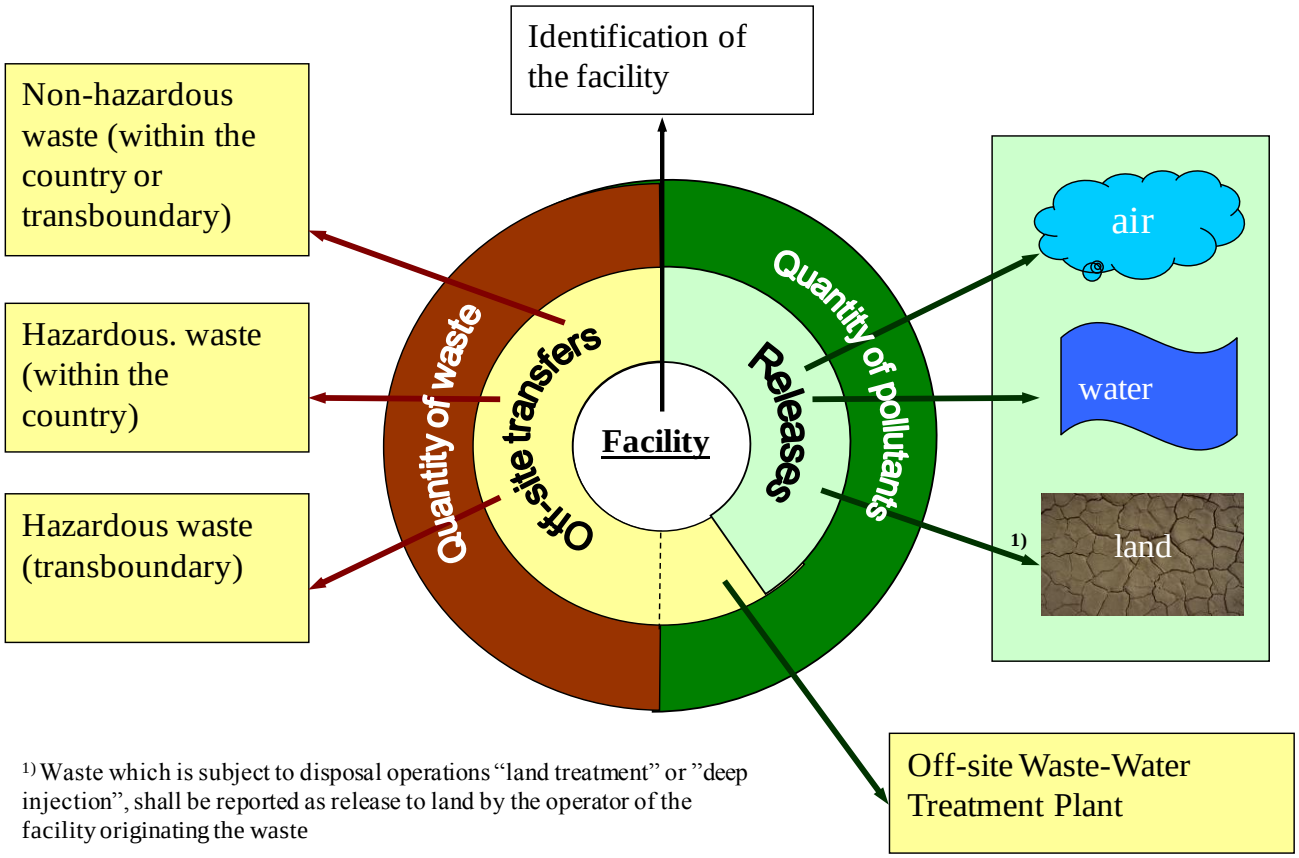
The sources of releases
Once the 'reporting unit' boundary and all associated elements have been defined, it should then be possible to carry out a desktop study in order to identify potential sources of releases. Such a study will help you review exactly what emissions are likely to be released from the process or waste management activities, but also from storage, handling and discharge/disposal.

Emissions can include point source and non-point source (also termed "fugitive") sources; examples of non-point sources are leakages from pipe seals and emissions during product transfers between tanks. Point source emissions include those emitted from the process into a pipe, vent or stack; i.e. A single point source emitted to atmosphere. These are known and are typically monitored under permit conditions. Fugitive emissions can be much more difficult to identify and quantify. These emissions should include deliberate, accidental, routine and non-routine emissions of substances.

An example is shown in Appendix 2 of this document

2.3 Step 3 – Link sources to media

This is a diagram that shows the information operators should consider for different media to be reported to SPRI.



[1)] Waste which is subject to disposal operations "land treatment" or "deep injection", shall be reported as release to land by the operator of the facility originating the waste

2.4 Step 4 – Identify relevant pollutants

The indicative list is an example of the pollutants which may be released from a specified E-PRTR relevant activity. The indicative list can be found on SEPA's website.

The table is indicative and should not be interpreted as a standard list of parameters for specific sectors. To decide which parameters are relevant to each specific installation, consider the pollutants that are shown within your SPRI reporting form together with information contained in Environmental Impact Assessment (EIAs), permit applications, site inspection reports, process flow sheets, material balances, read-across of similar operations elsewhere, engineering judgements, published and peer-reviewed literature and the results of previous measurement exercises. As a result, it might be that for a certain activity fewer or possibly more pollutants than indicated have to be considered. The full list of SPRI pollutants and reporting thresholds is available on the SEPA website, contained within the document 'The 2018 Schedule to the notice under Regulation 63(2) of the Pollution and Prevention Control (Scotland) Regulations 2012 (as amended).

2.5 Step 5 – Quantification of emissions

If a pollutant is released from your site the amount emitted should be established. In general, there are five types of Release Emission Techniques (RETs) that may be used to evaluate emissions:

- Sampling or direct monitoring;
- Emission factors;
- Mass balance or other engineering calculations;
- Indirect monitoring;
- Engineering judgement.

More detail on the types of release emission techniques and how to quantify your emissions is available in the SEPA RET guidance which can be found on the SEPA website.

An example is shown in Appendix 2 of this document

There are cases where mandatory RETs exist, such as when reporting emissions under European Union (EU) Directives or in accordance with authorisation or permit conditions, an example of this is the EU Emissions Trading System (EU ETS). For consistency you should also consider extending the use of such mandatory methods to additional parts of the site that are not subject to the mandatory requirement, but that have SPRI reporting obligations.

3 How to return your data to SEPA

3.1 SPRI on-line reporting form

The SPRI Operator Reporting Form is available via the SEPA website. For a step by step guide on how to report using the SPRI Operator Reporting Form you can consult the 'SPRI Operator Reporting System Guidance' Document.
The electronic form is split into Sections as listed below:

- Section A – Address and Contact Information;
- Section B – Economic and Process Activities;
- Section C – Pollutant Emissions;
- Section D – Waste Transfers;
- Section E – Waste Inputs (This section is not active- please ignore);
- Section F – LCPD (This section is not active); and
- Section G – Voluntary Information.

3.2 Section A – Address and contact information

Section A of the online reporting form contains important information on the following:

Site Details
This is the facility obligated to report data to SPRI. According to Article 2(4) of the E-PRTR Regulation "facility" means "one or more installations on the same site that are operated by the same natural or legal person". The 'same site' means the same location and is a question of judgment for each facility. A site does not become two sites merely because two parcels of land are separated by a physical barrier such as a road, a railway or a river or if the facility has multiple permits/licenses.

Company Details
A parent company (Registered Company) is a company that owns or controls the company operating the facility (for example by holding more that 50% of the company's share capital or a majority of voting rights for the shareholders or associates).

Contact Details
The contact is the person responsible for submitting the online reporting form, and who we may contact in relation to changes to the reporting requirements, or for further information on reported pollutants or waste transfers during the data verification (audit) process.

Note – Contact details are not published via SEPA's website and are solely used for SEPA contacting the operator or their agent.

3.3 Section B – Economic and process activities

Often the primary activity is similar to the main economic activity of the facility. When the main economic activity is not representative of the processes undertaken at the facility the primary activity could be associated with the most polluting activity of the facility.

Main Economic Activity
The main economic activity is defined by the Standard Industrial Classification (SIC) codes. The code should represent the main economic activity of your facility. A comprehensive list of SIC codes is available on the SEPA website or by using the search function within the Operator Reporting Form

Primary Activity at the installation
The primary activity is defined by a PRTR Code. This code should represent the main process of the 'reporting unit'; the main process will be identified within your site permit/licence. A list of PRTR codes is available on the SEPA website or by using the search function within the Operator Reporting Form.

Sub-activity at the installation
A sub-activity is a process technically-associated with the main primary activity. The sub activity at the installation is also defined by a PRTR Code. This code should represent any other processes relating to the facility and will also be identified within your site permit/licence as associated activities.

An example is shown below:

Example 1

A chemical plant producing vinyl chloride (VC) and polyvinyl chloride (PVC), with a 100 MW fuel combustion plant on site.

The most appropriate SIC code is found under:

20.1 Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms.

20.14 Manufacture of other organic basic chemicals.

20.16 Manufacture of plastics in primary forms.

The UK SIC code to be applied to your return is **20.16** Manufacture of plastics in primary forms.

The PRTR code to identify the primary activity and applied to the return is:

4(a) (viii) Basic plastic materials (polymers, synthetic fibres and cellulose-based fibres).

and

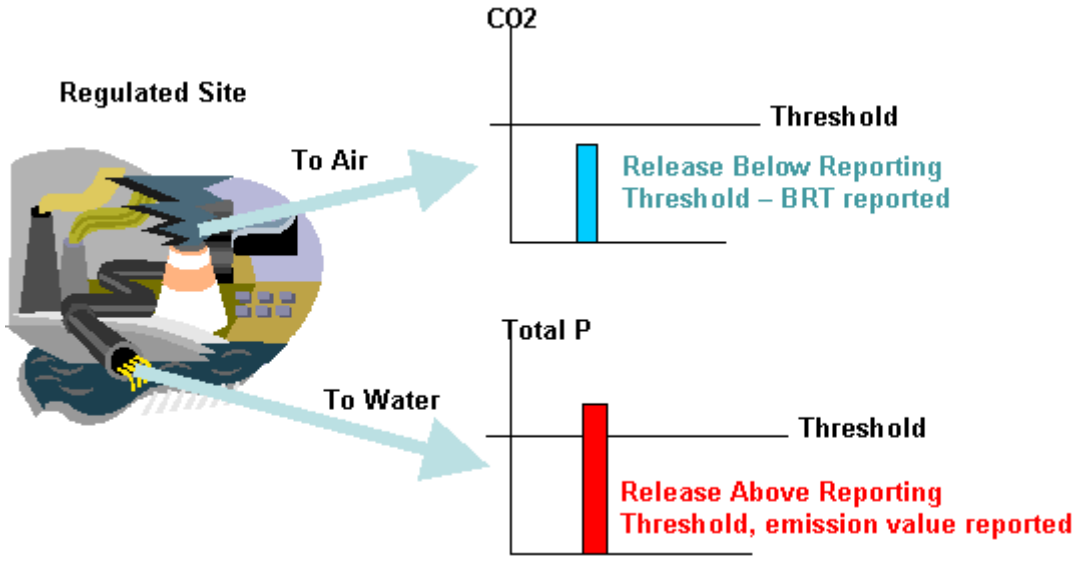
The PRTR code to identify the sub activity and applied to your return is:

1(c) Thermal power stations and other combustion installations.

Note: The PRTR code populates the indicative list of pollutants within the Operator Reporting Form.

3.4 Section C – Pollutant releases

Once all the releases have been identified (established by following the steps in Section 2 of this Note) the release value then has to be determined where the total emission sits against the pollutant threshold. Thresholds for pollutants are specified within the 'Schedule' and are also shown within the SPRI system. The following diagram illustrates pollutants thresholds and how to report.



Total emissions
This is the annual mass emissions calculated for each pollutant during normal operating conditions for your 'reporting units(s)', including point source and non-point source emissions, as well as any accidental emission(s). Each specified pollutant should be reported to each medium in the "Total emissions" column on the SPRI reporting form.

Accidental emissions
As well as reporting normal operating condition emissions you should report any accidental emissions. All accidental emissions should be entered as there is no pollutant threshold and you will also have to enter a full description of why an accidental release occurred. For accidental emissions you should not include any emissions resulting from routine maintenance, such as the release associated with recharging cooling fluids.

An example of an accidental emission could be a leaking intermediate bulk container (IBC) which has resulted in pollutants being discharged to the environment (air, water, wastewater and possibly resulting in a hazardous/non-hazardous waste transfer).

Report "Above Reporting Threshold" (ART)
Where the annual emission has been determined and found to be above the indicated annual reporting threshold within the Schedule or the operator reporting form.

Report "Below Reporting Threshold" (BRT)
Where the annual emission has been determined and found to be below the indicated annual reporting threshold.

Report "No Longer Applicable" (NLA)
If a pollutant was released in the previous year and no emission of the substance occurred within the reporting year, a reason is required to be provided for the removal of the pollutant.

Emissions from your site have to be reported as a mass emission in Kg units per calendar year and the following conventions apply:

- Figures should be **rounded to three significant figures** (e.g. 0.06658 should be reported as 0.0666 kg/y);
- Pollutant emissions to air, water, and wastewater are **reported in kg/y** (kilograms per year);
- Waste transfers of hazardous and non-hazardous waste are reported in **tonnes/y** (tonnes per year);
- You are not required to report liquid waste disposed for land treatment, where it is for agricultural benefit, such as use as a soil improver;
- Sites reporting radioactive substances (RS) emissions have zero thresholds, so all emissions must be reported and are reported in MBq/year (Mega Becquerels per year). RS waste transferred off-site is currently not required to be reported to SPRI; and
- A full description of the method used and any UK or international standard applied must be stated against each pollutant reported.

3.4.1 How to decide which 'Measurement Type' and 'Method' code to use

Measurement
Reporting shall be carried out based on measurement, calculation or estimation of releases.

a) Measured
Release data is based on measurements. Additional calculations are needed to convert the results of measurements into annual release data. For these calculations the results of flow determinations are needed. "Measured" should also be used when the annual releases are determined based on the results of short-term and spot measurements. "Measured" is used when the releases of a facility are derived from direct monitoring results for specific processes at the facility, based on actual continuous or discontinuous measurements of pollutants concentrations from a given release route.

b) Calculation

Release data is based on calculations. "Calculation" is used when the releases are based on calculations using activity data (e.g. fuel used, production rate, etc.) and emission factors or mass balances. In some cases more complicated calculation methods can be applied, using variables like temperature, global radiance, etc.

c) Estimated

Release data is based on non-standardised estimations. Estimations are used when the releases are determined by best assumptions or expert guesses that are not based on publicly available references or in case of absence of recognised emission estimation methodologies or good practice guidelines.

Where the total release of a pollutant at a facility is determined by more than one determination method (e.g. measured and calculated), the determination method with the highest release value is chosen for reporting (e.g. the release of an air pollutant occurs at two stacks (Stack A and Stack B). The total release exceeds the relevant release threshold. The release at stack A is measured and amounts to 100 kg/year. The release at Stack B is calculated and amounts to 50 kg/year. Since the highest amount of release (100 kg/year) is measured, the total release (150 kg/year) should be indicated as being based on measurement).

Method Code

Data collection should be prepared in accordance with internationally approved methodologies, where such methodologies are available. The following methodologies are considered as internationally approved:

- CEN and ISO standards as measurement methodologies; and
- The "Guidelines for the monitoring and reporting of greenhouse gas emissions under the Emission Trading Scheme", the "IPCC Guidelines" and the "UN-ECE/EMEP Atmospheric Emission Inventory Guidebook" as calculation methodologies.

Equivalent methodologies may be used other than the internationally approved methodologies, even when available, if one of the following conditions is fulfilled:

1. The operator uses one or more measurement, calculation or estimation methodologies already prescribed by the competent authority in a licence or an operating **per**mit for that facility (method name to be reported: **PER**);
2. A **n**ational or **r**egional **b**inding measurement, calculation or estimation methodology is prescribed by legal act for the pollutant and facility concerned (method name to be reported: **NRB**);
3. The operator has shown that the **alt**ernative measurement methodology used is equivalent to existing CEN/ISO measurement standards (method name to be reported: **ALT**);
4. The operator uses an equivalent methodology and demonstrated its performance equivalence by means of **C**ertified **R**eference **M**aterials (**CRMs**) according to ISO 17025 and ISO Guide 33 together with an acceptance by the competent authority (method name to be reported: **CRM**);
5. The methodology is a **ma**ss **b**alance method (e.g. the calculation of NMVOC releases into air as difference from process input data and incorporation into product) and is accepted by the competent authority (method name to be reported: **MAB**); and
6. The methodology is a European-wide **s**ector **s**pecific **c**alculation method, developed by industry experts, which has been delivered to the European Commission to the European Environment Agency and the relevant international organisations (e.g. IPCC, UN-ECE/EMEP). The methodology could be used unless it is rejected by the international organisations (method name to be reported: **SSC**).

Other methodologies shall only be used if internationally approved or equivalent methodologies are not available (method name to be reported: **OTH**).

The table below shows examples of how a method is applied to a measurement. Where you have difficulty deciding on what measurement type and or method to choose, then contact the SPRI Team for assistance.

Table 2 – Reporting of method used for "Measurement" and "Calculation"

Method used for determination of releases/off-site transfers	Designation of the method used
Measurement methodologies	
Internationally approved measurement standard.	**INT*** short designation of the relevant standard (e.g. BS, EN 14385:2004; CEN; ISO)
Measurement methodology already prescribed by the competent authority (SEPA) in a licence or an operating permit for that facility.	**PER***
National or regional binding measurement methodology prescribed by legal act for the pollutant and facility concerned.	**NRB***
Alternative measurement method in accordance with existing CEN/ISO measurement standards.	**ALT***
Measurement methodology the performance of which is demonstrated by means of certified reference materials and accepted by competent authority.	**CRM***
Other measurement methodology.	**OTH***
Calculation methodologies	
Internationally approved calculation method.	**INT*** short designation of the method used: EU-ETS, IPCC, UNECE/EMEP
Calculation methodology already prescribed by the competent authority (SEPA) in a licence or an operating permit for that facility.	**PER***
National or regional binding calculation methodology prescribed by legal act for the pollutant and facility concerned	**NRB***
Mass balance method which is accepted by the competent authority (SEPA).	**MAB***
European-wide sector specific calculation method.	**SSC***
Other calculation methodology.	**OTH***
* In addition to the three letter abbreviation (e.g. NRB) the short designation (e.g. VDI 3873) or a description of the methodology should be given within the method description field of the Operator Reporting Form.	

Examples of designation of method

An operator has reported chromium (Cr) as being released to water as a measurement of 230 kg. For the method Cr is part of their permit conditions and therefore can be entered as **PER** (prescribed by the competent authority in a licence or an operating permit for that facility) and for the method description the following text would be added to describe how they produced the 230 kg figure. "Measured as part of our CAR permit compliance sampling. Calculation is average annual measured concentration Cr multiplied by annual effluent discharge concentration".

A landfill operator is reporting CO_2 emissions to air and has used a GASSIM 2.0 model to produce figures. They would record the annual emission figure of 27,000,000 kg with 0 Kg accidental emissions, the measurement type is calculated and method is **MAB** (mass balance method which is accepted by the competent authority). For the method description they would enter "Used the modelling tool GASSIM v 2.5 based on 4 x 1MW engines and 1 x 2000 cubic metres back up flare. Total landfill gas processed = X cubic metres; Y via engines and Z via flare".

Where waste is weighed this should be recorded as measured or if you rely on waste contactor invoices and calculate the annual tonnages from the number of lorry movements of waste in the year then this should be recorded as calculation and you should state the calculation within the method description.

3.4.2 Biomass percentage

Biomass percentage can only be allocated to the pollutant carbon dioxide (CO_2). This is a percentage of the total CO_2 emissions attributable to solely biomass fuels. Where you have determined the release to be below the reporting threshold, you can still enter a percentage within the "Biomass Percentage" field within the operator reporting form. The CO_2 total release to be reported includes both fossil fuel emissions as well as biomass-derived releases.

3.4.3 Qualification box

The Operating Reporting Form has been set up to pre-populate an error message if the value entered requires further explanation. This explanation should answer the question asked within the 'error message'. A qualification reason is required to be entered if the following occurs:

- This pollutant was not reported in the previous year;
- This year's value is more than 50% greater than the previous year;
- This year's value is more than 50% smaller than the previous year;
- Previous year's value was BRT but this year's value is ART.

Where you have selected "No Longer Applicable "against a pollutant, you are also required to provide an explanation of why the pollutant is no longer released.

Examples of Qualification

Qualification – "You reported BRT last year and have now reported ART. Please provide a Qualification"

In this instance you should fully explain why there has been a change in mass emission values between the years.

The answer entered into the Qualification box in this example could be:

Answer – "During 2018 part of the process plant was upgraded and ran for only 6 months, in the other 6 months no emissions were released. In 2018 there was an increase in production volume due to new processing equipment."

Qualification – "The pollutant was not reported in the previous year ".

The answer entered into the Qualification box in this example could be:

Answer - "In 2018 silver oxide was replaced by copper oxide which is no longer economic to include in the process, hence the inclusion of this new substance. This has been added to our SPRI return as now a reporting requirement under our new SEPA licence number CAR/M/000898".

3.5 Section D – Off-site waste transfers

Offsite transfers of waste are required to be reported if determined to be above the reporting threshold of 2,000 tonnes/year for non-hazardous and 2 tonnes/year for hazardous wastes (also termed "Special Waste"). All data have to be expressed in tonnes/year of (normal) wet waste and to 3 significant figures. Landfill leachate which is removed by road tanker or other container to be treated off-site should be recorded within section D.

With respect to the threshold value the sum of the waste transferred off-site is relevant, irrespective of whether it is treated within the country (United Kingdom) or it is transferred to another country or whether it is disposed of or recovered (e.g. if a facility has transferred 1.5 tonnes of hazardous waste within the country for recovery and 1.5 tonnes of hazardous to other countries for disposal, it has to report since the total exceeds the threshold value (2 tonnes/year)).

Where you have exceeded the threshold and assigned the waste to either hazardous or non-hazardous waste you are also required to indicate whether the waste is destined for recovery or disposal. If the waste is destined for waste treatment that includes recovery and disposal operations (e.g. sorting), the treatment operation for which more than 50% of the waste destined should be reported. In those rare cases where the facility is not able to trace whether more than 50% of the waste is disposed or recovered, then disposal should be used.

For transboundary movements of hazardous waste (outwith the United Kingdom), the name and address of the recoverer or the disposer of the waste and the actual recovery or disposal site have to be reported.

For off-site waste transfers where your data is obtained using weighing records report this as measured. The method description should give a description of how you calculated your waste transfers for the year.

3.6 Section E – (This section is not currently active)

3.7 Section F – (This section is not currently active)

3.8 Section G – Voluntary information

Section G of the Operator Online Reporting form is voluntary; however it will allow the public viewing SPRI data some context of your facility. For example where there has been a large variation in emissions from the previous year to the present, such as a planned shut-down or the commissioning of a site, it may be prudent to enter details within Section G's first box entitled "*Please include a brief description of the activities or processes carried out at your site or installation (Max 4 lines)"*. This helps explain such variance in emissions from previous years.

4 How to amend and correct data

It is important to note that once you have completed all of your SPRI data and have submitted it to SEPA, by formally signing the "Declaration Details", your data cannot be amended. If you require the data to be changed contact the SPRI team.

5 How to contact the SEPA's SPRI team for help

Enquiries about any aspect of the SPRI can be made to the following email address, note that there is no weekend cover available to any SPRI enquiries made: SPRIAdministration@SEPA.org.uk

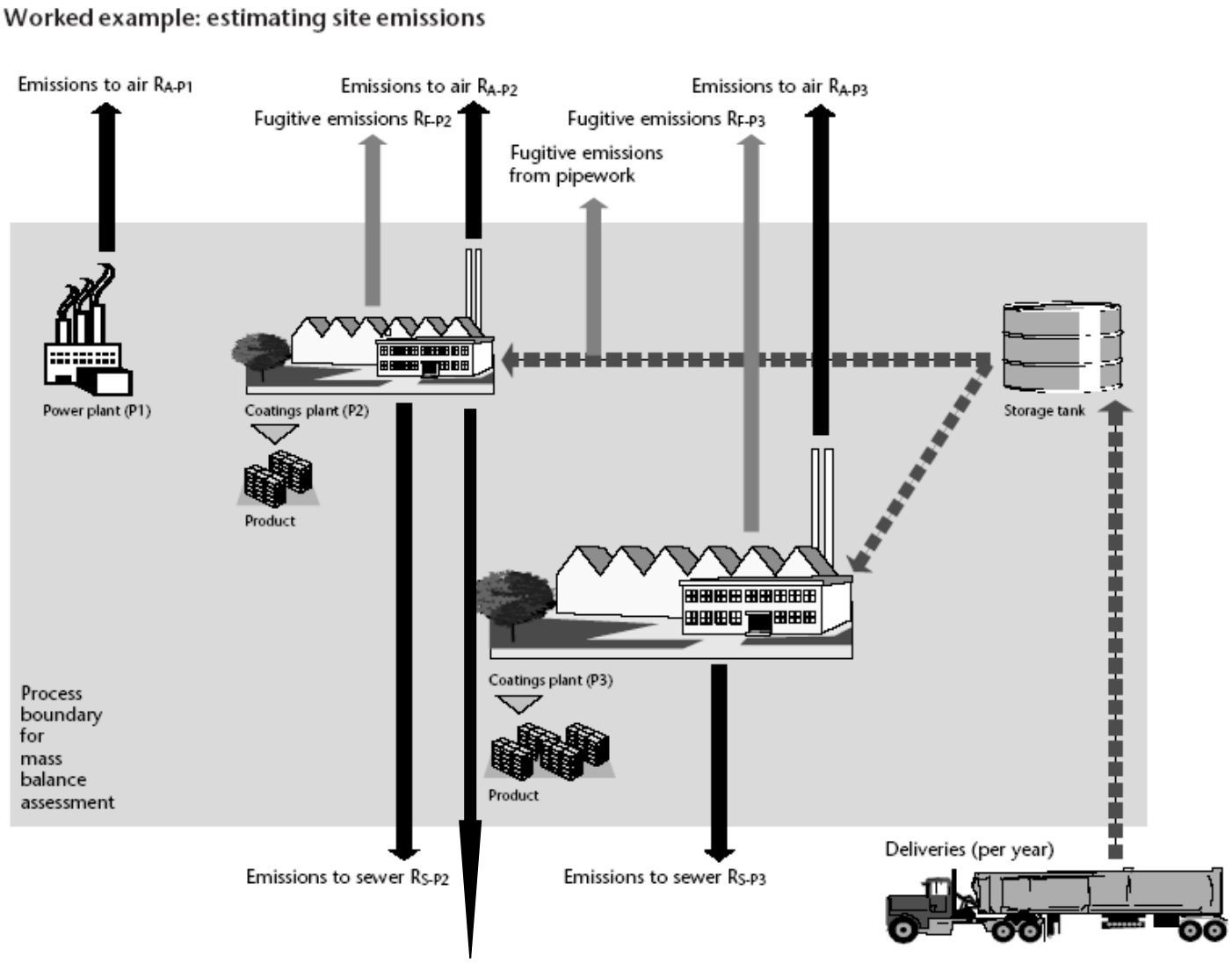
In all correspondence please quote your company's/organisations registered name and site address and your unique NIC (National Identity Code) number, this will help us deal more efficiently with your enquiry.

You can also contact a SPRI Support Officer at the following office location:

SEPA Stirling Office
Strathallan House
The Castle Business Park
Stirling
FK9 4TZ

Tel No: 01786 457700
Fax No: 01786 446885

Appendix 1 – Worked example for estimating site releases



Waste Transfers

The example considers an installation that has three processes on-site, operated by the same operator. The diagram above shows a simplified version of the plant.

One process (P1) generates power for the plant, and has releases to air (RA-P1). One process (P2) coats materials, and has releases to air and sewer (RA-P2 & RS-P2) and fugitive releases from flanges, valves, etc. (RF-P2). One process (P3) is similar but not identical to P2 with smaller throughput and has releases to air and sewer (RA-P3 & RS-P3) and fugitive releases from flanges, valves, etc. (RF-P3).

A liquid effluent stream from P2 and P3 is treated via a wastewater treatment works, and then discharged to a local sewer. Other fugitive releases occur from the pipe work leading from the raw material storage tank to the plants. For simplicity only a limited number of possible SPRI pollutants that could be emitted from each process have been considered. The type of releases and the type and frequency of monitoring from all the processes on the site are summarised in the table below.

Type of Release and Monitoring Regime

Process	Type of release	Source of releases	Code for release source	Example of pollutants emitted	Monitoring regime
P1 (power generation plant)	Air	Stack	RA-P1	SO_2, NO_x	Continuous for some pollutants, but calibration problems meant data unreliable and has been rejected
	Sewer	(none)			
	Fugitive	(none)			
P2 (coating process)	Air	Vent	RA-P2	NMVOC	Continuous
	Sewer	Treatment plant	RS-P2		Spot reading every month (lasting 1hr); reading taken in effluent before it enters local sewer
	Fugitive	Storage/flanges/ pipes, etc.	RF-P2		Not applicable
	Off-site waste transfers	P2 Coating Process	Product manufacture	Off specification product/waste as part of process	Weigh bridge records and consignment notes.
P3 (coating process)	Air	Vent	RA-P3	NMVOC	2 spot readings (3 hrs each) over the year
	Sewer	Treatment plant	RS-P3		Spot reading every month (1 hr); reading taken in effluent before it enters local sewer
	Fugitive	Storage/flanges/ pipes,etc.	RF-P3		None
	Off-site waste	P3 Coating Process	Product manufacture	Off specification product/waste as part of process	Weigh bridge records and consignment notes.

The table below summarises which approach (from monitoring, estimation or calculation) could be used in this example to enable reporting of annual mass releases from each route from each process. It is deliberately not prescriptive, as the operator will always have to use some judgement about which is the best approach to reporting releases. The most important point is to use the approach that is likely to give the best estimate of the annual mass release from the process being considered.

Source of releases	Pollutants considered	Calculation approach for releases (M,C or E)	Method to complete the calculations	Notes
RA-P1 (to air)	SO_2	C or E	Releases of for example SO_2 could be assessed by calculating (C) the product of the annual fuel burnt by sulphur content of the fuel. Releases of SO_2 and other combustion gases could also be assessed by calculation (C, possibly E) from the products of suitable release factors and the quantity of fuel burnt.	Ideally, releases would have been assessed from the monitoring data. It might be necessary to take into account variations in the sulphur content of the fuel if approach (C) is used.
RA-P2 (to air)	NMVOC	M	Releases of total NMVOC could be assessed from the results of the continuous monitoring (M) and the volumetric flow rates.	The NMVOC releases could be speciated by using the NAEI approach.
RA-P3 (to air)	NMVOC	M or C	Releases of total NMVOC could be assessed from the results of the spot measurement data (M) assuming it is representative of releases over the whole year or could be assessed by applying the monitoring data from P2 to this process (C).	The operator will have to consider how applicable the continuous monitoring for process P2 is to process P3 before approach (C) is used. The NMVOC releases could be speciated using the NAEI approach web address to link
RS-P2 (to sewer)	Not applicable			
RS-P3 (to sewer)	Not applicable			
RF-P2 (to air)	NMVOC	C	Releases of total NMVOC could be assessed by a mass balance approach (C). This would be determined from (quantity in the storage tank at the beginning of the year – quantity in the storage tank at the end of the year) + quantity delivered during the year = overall use by P2 and P3 and then fugitive NMVOC releases from P2 = quantity used by P2 – (releases to air through vents + quantity converted/contained in the product).	Here, it is assumed that no NMVOC is emitted to the sewer but this may need to be considered.
RF-P3 (to air)	NMVOC	C	See method above	

The next step is to summarise all releases of the pollutants from all the on-site processes according to the discharge route, and then enter the total annual releases on the SPRI 2018 reporting form. Here, just the total NMVOC releases to air are considered:

VOC releases		Code	% of total annual releases	Calculation approach	Summary of method
Air	From vents and stacks	RA-P1	(none)		
		RA-P2	42	M	Sum of continuous monitored concentration multiplied by flow rate.
		RA-P3	30	M	Calculated from spot measurement of concentration multiplied by flow rate.
	From fugitive releases	RF-P2	17	C	Calculated by mass balance by subtracting the amount in the product from the amount vented through vents and from the amount used.
		RF-P3	11	C	Calculated by mass balance by subtracting the amount in the product from the amount vented through vents and from the amount used.
Sewer	Via the treatment works	RS-P2 & RS-P3	(none emitted to the sewer)		

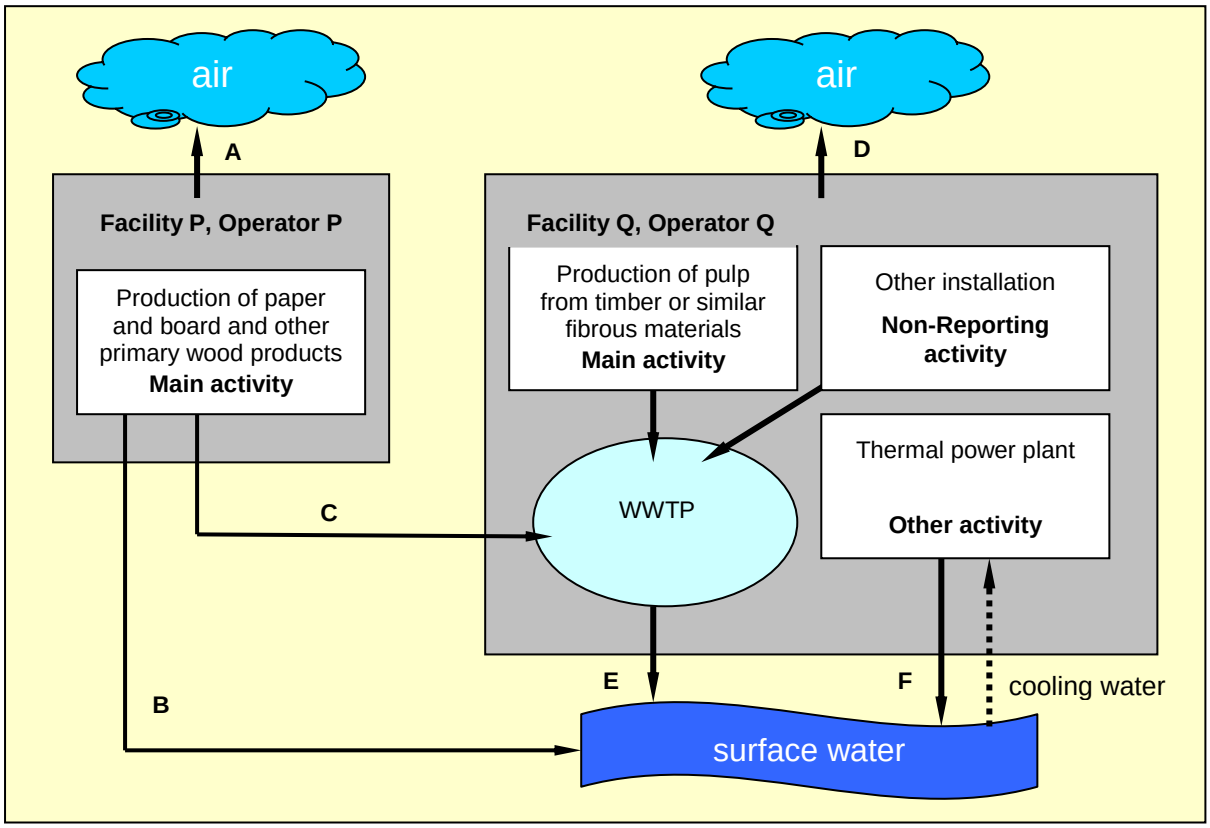
Here, the operator would record the total annual NMVOC release to air on the reporting form and enter M as the method of assessment since the majority (72%) of releases are measured. Releases of NMVOCs to sewer are assumed to be 0 and nothing would be entered against the appropriate substances in Section C of the reporting form.

Appendix 2 – Examples for reporting releases and off-site transfers

Two examples of realistic situations with various industrial activities at facilities and demonstrates the reporting of releases and off-site transfers by the facilities.

Information on the identification of the facility and optional information related to the facility have to be reported

Example 1
Represents an industrial site with two facilities P and Q. The main primary activity of facility P is the production of paper and board and other primary wood products. The main primary activity of facility Q is the production of pulp from timber or fibrous materials. Facility Q also includes a combustion plant and a waste-water treatment plant all run by operator Q. In addition operator Q runs another installation as part of facility Q, which is a non-reporting activity.



The table below shows the reporting requirements for facilities P and Q.

Reporting facility	Activity	Release/ Off-site transfer	Reporting requirements	Comments
Facility P	Production of paper and board and other primary wood products	A B C	To be reported as release to air To be reported as release to water To be reported as off-site transfer of pollutants in wastewater	
Facility Q	Production of pulp from timber or similar fibrous materials Thermal power station Wastewater treatment plant Other installation (non-reporting activity)	D F E	Sum of releases to be reported as release to air Sum of all releases (E+F) to be reported as release to water	Background loads may be subtracted from releases via cooling water (Release F) Non-reporting activities may be excluded

Facility P

The only main primary activity of facility P is the production of paper and board. The table below shows the coding of the activity.

PRTR-code	IPPC-code	Activity name according to E-PRTR Regulation
6.(b)	6.1	Industrial plants for the production of paper and board and other primary wood products (such as chipboard, fibreboard and plywood)

Facility P releases pollutants to air (Release A) and water (Release B) and reports all pollutants which exceed the threshold values specified within the 'Schedule' column 1a and column 1b respectively. A part of the wastewater is transferred off-site (Off-site transfer C) to the external wastewater treatment plant which is situated at facility Q. Facility P reports all pollutants which exceed the threshold value specified in the 'schedule', column 1b as off-site transfer of pollutants in waste water destined for wastewater treatment.

The table below shows the reporting on releases and off-site transfers for facility P.

Pollutant		Method	Quantity	
Name	M/C/E	Method used	T (total) kg/year	A (accidental) kg/year
Releases to air (release A)				
Nitrogen oxides (NO_X)	M	ISO 10849: 1996	149,000	-
Particulate matter (PM_{10})	M	ISO 9096:2003	145,000	-
Releases to water (release B)				
Total organic carbon (TOC)	M	EN 1484:1997	70,000	-
Off-site transfer of pollutants in waste water (release C)				
Zinc and its compounds (as Zn)	M	EN ISO 11885:1997	320	-
Total organic carbon (TOC)	M	EN 1484:1997	536,000,000	-

Facility Q

The main economic activity of facility Q is the production of pulp from timber or fibrous materials. This is also the **main primary** activity to be reported. Facility Q also includes a combustion plant of greater than 50 MW capacity. The wastewater is treated in a wastewater treatment plant operated by the facility. The Table below shows the coding of the activities for facility Q.

PRTR-code	IPPC-code	Activity name according the E-PRTR Regulation
6.(a)	6.1	Industrial plants for the production of pulp from timber or similar fibrous materials
1.(c)	1.1.	Thermal power stations and other combustion installations

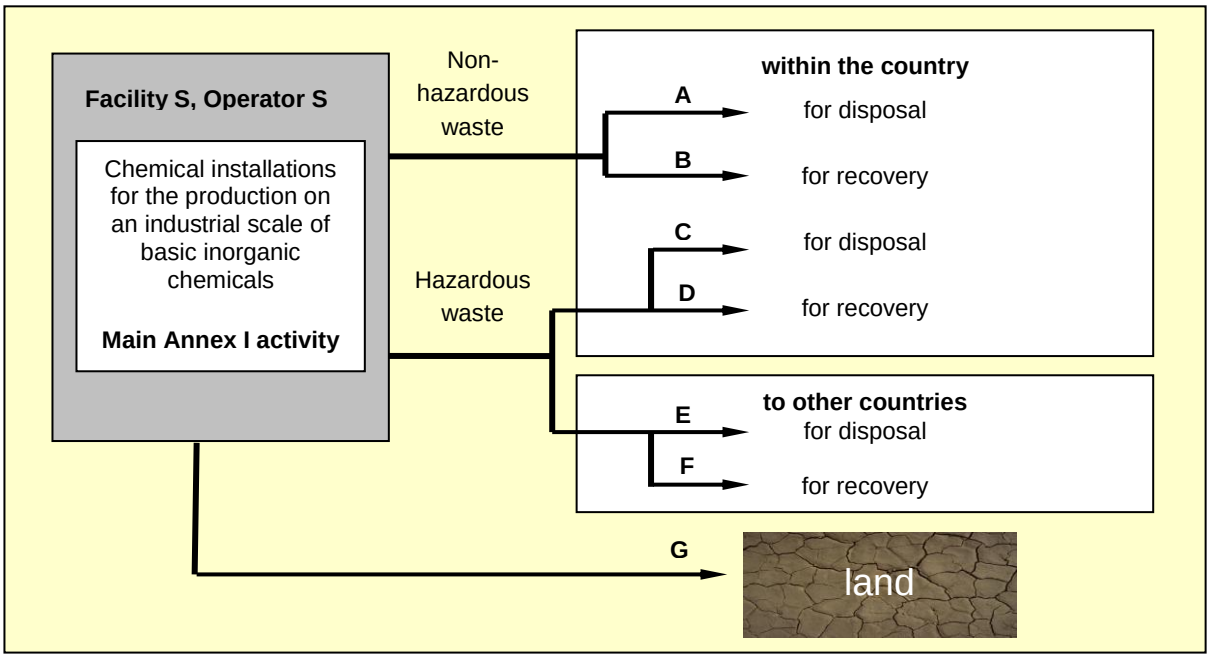
For Facility Q the total of releases of pollutants to air (Release D) where the threshold values specified in the 'schedule', column 1a are exceeded have to be reported as releases to air. The wastewater is transferred to their own wastewater treatment plant. The facility uses water from a nearby river for cooling processes. It releases the water into the same water body. The facility reports all pollutants where the sum of the releases (Releases E plus F) exceeds the threshold values specified in the 'schedule', column 1b as release to water. It is allowed to subtract background loads from the extracted cooling water. The released water contains total organic carbon (TOC), cadmium (Cd) and lead (Pb) above the threshold values. The releases from non-reporting activities are allowed to be excluded from the report. However, it might be pragmatic and cost-effective, e.g. in the case of highly interlaced sewer systems, where no sampling point exists for the non-reporting activity, to report the releases from non-reporting activities together with those from reported activities.

The Table below shows the reporting of releases to water of facility Q (the data on releases to air are not shown).

Releases to water (releases E + F)				
Pollutant		**Method**	**Quantity**	
Name	**M/C/E**	**Method used**	**T (total) kg/year**	**A (accidental) kg/year**
Cadmium and its compounds (as Cd)	M	EN ISO 5961	9.85	
Lead and its compounds (as Pb)	M	EN ISO 11885	28.0	-
Total organic carbon (TOC)	M	EN 1484:1997	781,000,000	-

Example 2

Example 2 represents a facility for the production of basic inorganic chemicals. The facility produces hazardous and non-hazardous waste which is transferred to other facilities for disposal or recovery and transfers salt solutions off-site for deep injection.



The table below shows the reporting requirements for facility S.

Reporting facility	Activity	Release/Off-site transfer	Reporting requirements
Facility S	Chemical installations for the production on an industrial scale of basic inorganic chemicals	A	To be reported as off-site transfer of non-hazardous waste for disposal
		B	To be reported as off-site transfer of non-hazardous waste for recovery
		C	To be reported as off-site transfer of hazardous waste for disposal within the country
		D	To be reported as off-site transfer of hazardous waste for recovery within the country
		E	To be reported as off-site transfer of hazardous waste for disposal to other countries
		F	To be reported as off-site transfer of hazardous waste for recovery to other countries
		G	To be reported as release to land

The only primary activity of facility S is the production of basic inorganic chemicals and therefore is also the main activity. The table below shows the coding of the activity.

PRTR-code	IPPC-code	Activity name according to the E-PRTR Regulation
4.(b)	4.1	Chemical installations for the production on an industrial scale of basic inorganic chemicals

More than 2,000 t/year of non-hazardous and more than 2 t/year of hazardous waste are transferred off-site and have to be reported. The waste is transferred off-site within the country for disposal (Transfers A, C) or for recovery (Transfer B, D). Part of the hazardous waste is transferred outside the country for disposal (Transfer E) or for recovery (Transfer F). As a consequence the name and address of the site and the actual recoverer/disposer receiving the transfer have to be reported. Another part of waste transferred off-site is subject to deep injection. This has to be reported as release to land (Release G) for pollutants which exceed the threshold values in the 'schedule'. The quantities of waste transferred off-site have been determined by the method of weighing the waste with the exception of the quantity of non-hazardous waste for disposal which has been determined on the basis of an estimated waste generation factor.

The table below shows the reporting of off-site transfers for non-hazardous waste.

Off-site transfer of non-haz. waste			Quantity (t/year)	Waste treatment operation	M/C/E	Method used
	1,000	R	M	weighing		
	10,000	D	E			

The table below shows the reporting for the off-site transfer of hazardous waste.

Off-site transfer of haz. waste	Quantity (t/year)	Waste treatment operation	M/ C/E	Method used	Name of recoverer/ disposer	Address of recoverer/ disposer	Address of actual recovery/disposal site
Within the country	5.25	R	M	weighing			
	3.00	D	M	weighing			
To other countries	0.500	R	M	weighing	Sunshine Components Ltd.	Sun Street, Flowertown south, PP12 8TS, United Kingdom	Sun Street, Flowertown south, PP12 8TS, United Kingdom
	0.750	D	M	weighing	BEST Environmental Ltd.	Kings Street, Kingstown, Highlands, AB2 1CD, United Kingdom	Kingstown Waste to Energy Plant, Kings Street, Kingstown, Highlands, AB2 1CD, United Kingdom
Note – only in the case of transboundary movements of hazardous waste, the name and address of the recoverer or the disposer of the waste and the actual recovery or disposal site have to be reported.							

The table below shows the reporting for the release to land for facility S.

Pollutant	Method		Quantity	
Name	M/C/E	Method used	T (total) kg/year	A (accidental) kg/year
Chlorides (as total Cl)	M	EN ISO 10304-1	2,540,000	-

6 Glossary

Accidental emission – are all releases which are not deliberate, routine or non-routine, and result from uncontrolled developments in the course of the operation of the SPRI reporting site. An accidental emission is one which has resulted from a failure in the "normal" operation at your SPRI sites' reporting activity, such as emissions due to equipment failure. Note: topping up of refrigeration systems is not considered an accidental release.

CAR – The Water Environment (Controlled Activities) (Scotland) Regulations 2011 these regulations are designed to deliver Water Framework Directive (WFD) obligations as well as EC and Scottish ones and gives powers over a number of water-related activities.

Pollution Prevention and Control (PPC) Regulation 63(2) notice – this is the formal information notice issued to most SPRI operators and can cover up to 3 years.

Schedule – this is the formal list of substances and their thresholds to all media (air, water, waste water transfer, land and off-site waste transfer) which site operators are expected to review and where appropriate report in the reporting year. It is available via the SPRI website, at the operator log in page http://apps.sepa.org.uk/sprioperator/ or from SPRI Administration.

Total emissions – this is the sum of all emissions from the SPRI-reporting site and should include deliberate, non-routine emissions and accidental emissions.

Threshold – this is the pollutant specific value listed in the current years' schedule which you have to report against. For nuclear and non-nuclear sites from reporting year 2013 these have been set to have a threshold of zero.

UK SIC Code – the UK standard industrial classification code is used to classify business establishments according to their type of economic activities. Full details are available on SEPA's website.

Non-routine – these activities are extraordinary activities that are carried out under controlled operation of your site's processes and that may lead to increased releases of pollutants; for example shut-down and start-up processes before and after maintenance operations.

7 Acronyms

ACI	Animal Carcass Incineration
ALT	Alternative (measurement method)
AOX	Adsorbable Organic Halogens
APC	Air Pollution Control
ART	Above Reporting Threshold
As	Arsenic
BaP	Benzo(a)pyrene
BAT	Best Available Techniques
BCA	British Cement Association
BDEs	Brominated Diphenylethers
BOS	Basic Oxygen Steelmaking
BRT	Below Reporting Threshold
BS	British Standard
BSI	British Standards Institute
BTX	Benzene, Toluene, Xylene
CAR	Water Environment (Controlled Activities) (Scotland) Regulations 2011
CCGT	Combined Cycle Gas Turbine
CCU	Catalytic Cracking Unit
CEMS	Continuous Emission Monitoring System
CEN	European Committee for Standardisation
Cd	Cadmium
CF	Conversion Factor
CFCs	Chlorofluorocarbons
CH_4	Methane
CHP	Combined Heat and Power
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
CoT	Committee on Toxicity
CN	Cyanide
Cr	Chromium
CRM	Certified Reference material
Cu	Copper
CWI	Clinical Waste Incineration
D&R	Disposal and Recovery
DI	Drum Incineration
EAF	Electric Arc Furnace
EC	European Commission
EEA	European Environment Agency
EF	Emission Factor
EGR	Exhaust Gas Recirculation
EIA	Environmental Impact Assessment
ELV	Emission Limit Value
EPER	European Pollutant Emission Register
ESI	Electricity Supply Industry
ESP	Electrostatic Precipitator
ETP	Effluent Treatment Plant
EU	European Union
EU ETS	European Union Emissions Trading System
E-PRTR	European Pollutant Release and Transfer Register
ESP	Electrostatic Precipitator
EWC	European Waste Catalogue
FCCU	Fluidised Catalytic Cracking Unit
FGD	Flue Gas Desulphurisation
FGR	Flue Gas Recirculation

FSF	Fully Slatted Floor
GCV	Gross Calorific Value
FID	Flame Ionisation Detector
GHG	Greenhouse Gas
HCFCs	Hydrochlorofluorocarbons
HCl	Hydrogen Chloride
HCN	Hydrogen Cyanide
HF	Hydrogen Fluoride
HFCs	Hydrofluorocarbons
HFO	Heavy Fuel Oil
Hg	Mercury
H_2S	Hydrogen Sulphide
HW	Hazardous Waste
HWI	Hazardous Waste Incineration
IBC	Intermediate Bulk Container
IED	Industrial Emissions Directive
INT	Internationally Approved (measurement standard)
IOWWTP	Independently-operated Wastewater Treatment Plant
IPC	Integrated Pollution Control
IPPC	Integrated Pollution Prevention and Control
I-TEF	International Toxicity Equivalency Factor
I-TEQ	International Toxicity Equivalents of Dioxins
JEP	Joint Environment Programme
K	Kelvin (unit of temperature)
LOD	Limit of Detection
LPG	Liquefied Petroleum Gas
LRTAP	Long-range transboundary air pollution (convention on)
LVOC	Large Volume Organic Chemicals
MAB	Mass Balance Method
MBq	Mega Becquerel
MCERTS	(Environment Agency's) Monitoring Certification Scheme
Mg(OH)2	Magnesium Hydroxide
Mn	Manganese
MRR	Monitoring and Reporting Requirements
MSW	Municipal Solid Waste
MWI	Municipal Waste Incineration
NAEI	National Atmospheric Emissions Inventory
NCV	Net Calorific Value
Ni	Nickel
NH_3	Ammonia
NIC	National Identity Code
NLA	No Longer Applicable
NO_X	Oxides of nitrogen (mixture of NO and NO_2)
NO_2	Nitrogen Dioxide
NO	Nitric Oxide
N_2O	Nitrous Oxide
NRB	National or Regional Binding (measurement method)
OCC	Opencast Coal
OTH	Other (measurement method)
NMVOCs	Non-methane Volatile Organic Compounds
PAHs	Polycyclic Aromatic Hydrocarbons
Pas	Publically Available Standard
Pb	Lead
PCBs	Polychlorinated Biphenyls

PCDDs	Polychlorinated Dibenzodioxins PCDF Polychlorinated Dibenzofurans
PER	Measurement method already prescribed by the competent authority (SEPA) in a license or permit for that facility
PF	Pulverised Fuel
PFBC	Pulverised Fued Bed Combustion
PFCs	Polyfluorinated Hydrocarbons
PI	Pollution Inventory
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter (<2.5µm aerodynamic diameter)
PM_{10}	Particulate Matter (<10µm aerodynamic diameter)
PPC	Pollution Prevention and Control (Scotland) Regulations 2012 (as amended)
Ppm	Parts per million
Ppmv	Parts per Million by Volume
PSF	Partially Slatted Floor
PVC	Polyvinyl Chloride
RCF	Recycled Fibre
RET	Release Estimation Technique
RS	Radioactive Substances
Sb	Antimony
SCR	Selective Catalytic Reduction
SIC	Standard Industry Classification
SLF	Substitute Liquid Fuel
Sn	Tin
SNCR	Selective Non-catalytic Reduction
SO_x	Oxides of Sulphur (mixture of SO_2 and SO_3)
SO_2	Sulphur Dioxide
SO_3	Sulphur Trioxide
SRU	Sulphur Recovery Unit
SSC	Sector Specific Calculation
SSI	Sewage Sludge Incineration
SWS	Sour Water Scrubber
SPRI	Scottish Pollutant Release Inventory
TOC	Total Organic Carbon
TPM	Total Particulate Matter
TSS	Total Suspended Solids
UKSIC	United Kingdom Standard Industry Classification
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
USEPA	United States Environmental Protection Agency
UWWTP	Urban Wastewater Treatment Plant
V	Vanadium
VC	Vinyl Chloride
VDU	Vacuum Distillation Unit
VOCs	Volatile Organic Compounds
WESP	Wet Electrostatic Precipitator
WEWS	Water Environment and Water Services (Scotland) Act 2003
WHO	World Health Organisation
WHO-TEF	WHO Toxicity Equivalency Factor
WHO-TEQ	Toxicity Equivalents of Dioxins
WML	Waste Management Licence
WWTP	Wastewater Treatment Plant
Zn	Zinc

8 Useful links

1. Scottish Pollutant Release Inventory website
2. The Pollution Prevention and Control (Scotland) Regulations 2012 (as amended) SSI 2012 No. 360
3. SEPA Scottish Pollutant Release Inventory General Guidance Document
4. Scottish Pollutant Release Inventory (SPRI) Operator Guidance on Release Estimation Techniques (RET)
5. Scottish Pollutant Release Inventory Sector Guidance
6. UK-PRTR website
7. E-PRTR website
8. Industrial Emissions Directive (2010/75/EU)
9. European Union Emissions Trading System (EU ETS) Directive
10. EU Emissions Trading System guidelines for the monitoring and reporting of greenhouse gas emissions
11. European Commission