Headquarters,
Johnstown Castle Estate,
County Wexford, Ireland

GREENHOUSE GAS EMISSIONS PERMIT

Permit Register Number: IE-GHG093-10394-5

Operator: Mannok Cement Limited
Scotchtown
Ballyconnell
Cavan

Installation Name: Scotchtown Cement Works

Site Name: Scotchtown Cement Works

Location: Scotchtown
Ballyconnell
Cavan
Ireland

Introductory Note

This introductory note does not form a part of the Greenhouse Gas Emissions Permit.

This Greenhouse Gas Emissions Permit authorises the holder to undertake named activities resulting in emissions of Carbon Dioxide from the listed emission sources. It also contains requirements that must be met in respect of such emissions, including monitoring and reporting requirements. This Greenhouse Gas Emissions Permit places an obligation on the Operator to surrender allowances to the Agency equal to the annual reportable emissions of carbon dioxide equivalent from the installation in each calendar year, no later than four months after the end of each such year.

Contact with Agency:

If you contact the Agency about this Greenhouse Gas Emissions Permit please quote the following reference: Greenhouse Gas Emissions Permit Nº IE-GHG093-10394.

All correspondence in relation to this permit should be addressed to:

Email: help.ets@epa.ie

By Post: Climate Change Unit, Environmental Protection Agency
P.O. Box 3000, Johnstown Castle Estate,
Co. Wexford

Updating of the permit:

This Greenhouse Gas Emissions Permit may be updated by the Agency, subject to compliance with Condition 2. The current Greenhouse Gas Emissions Permit will normally be available on the Agency's website at www.epa.ie and ETSWAP.

Surrender of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially surrendered, a written application must be made to the on-line ETS portal, and written permission received from, the Agency through ETSWAP.

Transfer of the permit or part of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially transferred to another Operator a joint written application to transfer this Greenhouse Gas Emissions Permit must be made (by both the existing and proposed Operators) to, and written permission received from, the Agency through the on-line ETS portal ETSWAP.

Licence held pursuant to the Environmental Protection Agency Act 1992, as amended. (as of the date of this permit)**:**

IPC/IE Licence Register Number
P0378-03

Status Log

Current Permit

Permit number	Date application received	Date Permit issued	Comment
IE-GHG093-10394-5	26 March 2021	25 June 2021	1.Operator name changed to Mannok Cement Limited. 2. Update to methodology in relation to determination of CO2 emissions arising from non carbonate carbon input.

Previous Permits

Permit number	Change Type	Date application received	Date Permit issued	Comment
IE-GHG093-10394-1	GHG Permit Application	18 May 2013	22 May 2013	
IE-GHG093-10394-2	GHG Variation	07 October 2014	26 February 2015	• Addition of Solid Recovered Fuel (SRF) as a source stream • Inclusion of Acetylene and LPG as source streams, their related emission sources and emission points; update of site map, sampling plan and uncertainty calculation; • Update of Measurement Devices Table to include replacement bag weigher and in relation to gas oil stocks and kerosene. • Update of Analysis Table to include SRF and in relation to change of laboratory for coal analysis; • Update of management procedures.

Permit number	Change Type	Date application received	Date Permit issued	Comment
IE-GHG093-10394-3	GHG Variation	30 September 2016	06 December 2017	Reclassification of the source stream F2 (Gas oil) from de minimis to a minor source stream; change to the frequency of analysis for R1 (N on Carbonate Carbon in raw meal); update of Measurement Devices Table to reflect the new weighbridge references.
IE-GHG093-10394-4	GHG Variation	23 August 2018	03 July 2019	1) CKD (cement kiln dust) added as a source stream associated with emission source Kiln1 (S1) and emission points A2-01/A2-03 (A1); 2) Reference to IE Licence number updated

End of Introductory Note

Glossary of Terms

For the purposes of this permit the terms listed in the left hand column shall have the meaning given in the right hand column below:

The Agency	Environmental Protection Agency.
Agreement	Agreement in writing.
Allowance	Permission to emit to the atmosphere one tonne of carbon dioxide equivalent during a specified period issued for the purposes of Directive 2003/87/EC by the Agency or by a designated national competent authority of a Member State of the European Union.
Annual Reportable Emissions	Reportable Emissions of carbon dioxide made in any calendar year commencing from 1 January 2005 or the year of commencement of the activity, whichever is the later.
A & V Regulation	Commission Regulation (EU) No 600/2012 of 21 June 2012 on the verification of greenhouse gas emission reports and tonne-kilometre reports and the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Category A Installation	As defined in Article 19.2 (a) of the M&R Regulation.
Category B Installation	As defined in Article 19.2 (b) of the M&R Regulation.
Category C Installation	As defined in Article 19.2 (c) of the M&R Regulation.
The Directive	Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.
Emissions	The release of greenhouse gases into the atmosphere from sources in an installation.
EPA	Environmental Protection Agency.
Fall-Back Methodology	As defined in Article 22 of the M&R Regulation.
GHG	Greenhouse gas.
GHG Permit	Greenhouse gas emissions permit.
Greenhouse Gas	Any of the gases in Schedule 2 of the Regulations.
IPC/IE	Integrated Pollution Control/Industrial Emissions.
Installation	Any stationary technical unit where one or more activities listed in Schedule 1 to the Regulations are carried out. Also any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution. References to an installation include references to part of an installation.

Installation with low emissions	As defined in Article 47 of the M&R Regulation.
Major Source Streams	As defined in Article 19.3 (c) of the M&R Regulation.
M&R Regulation	Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Mis-statement	An omission, misrepresentation or error in the Operators reported data, not considering the uncertainty permissible pursuant to Article 12(1)(a) of Regulation (EU) no 601/2012.
N/A	Not applicable.
Monitoring Plan	The Plan submitted and approved in accordance with Condition 3.1 of this permit and attached at Appendix 1.
Non-conformity	Any act or omission by the Operator, either intentional or unintentional, that is contrary to the greenhouse gas emissions permit and the requirements of the Monitoring Plan.
The National Administrator	The person so designated in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC.
The Operator (for the purposes of this permit)	Mannok Cement Limited
"operator"	Any person who operates or controls an installation or to whom decisive economic power over the functioning of the installation has been delegated.
Person	Any natural or legal person.
Reportable emissions	The total releases to the atmosphere of carbon dioxide (expressed in tonnes of carbon dioxide equivalent) from the emission sources specified in Table 2 and arising from the Schedule 1 activities which are specified in Table 1.
The Regulations	European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 (S.I. No 490 of 2012) and any amendments or revisions thereto.
The Verifier	A legal person or another legal entity carrying out verification activities pursuant to Regulation (EU) No 600/2012 and accredited by a national accreditation body pursuant to Regulation (EC) No 765/2008 and Regulation (EU) No 600/2012 or a natural person otherwise authorised, without prejudice to Article 5(2) of Regulation (EC) No 765/2008, at the time a verification report is issued.
The Registry	The Registry as provided for under Article 19 of Directive 2003/87/EC.

Schedule 1	Schedule 1 to the Regulations.

Reasons for the Decision

The Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of this permit, the Operator is capable of monitoring and reporting emissions in accordance with the requirements of the Regulations.

Activities Permitted

Pursuant to the Regulations the Agency issues this Greenhouse Gas Emissions Permit, subject to any subsequent revisions, corrections or modifications it deems appropriate, to:

The Operator:

Mannok Cement Limited
Scotchtown
Ballyconnell
Cavan

Company Registration Number: 320388

to carry out the following

Categories of activity:

Annex 1 Activity
Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day

at the following installation(s):

Scotchtown Cement Works **Installation number:** 72

located at

Scotchtown
Ballyconnell
Cavan
Ireland

subject to the five conditions contained herein, with the reasons therefor and associated tables attached thereto.

Conditions

Condition 1. The Permitted Installation

1.1 This permit is being granted in substitution for the previous GHG permit granted to the Operator as listed in the Status Log of this GHG permit.

1.2 The Operator is authorised to undertake the activities and/or the directly associated activities specified in Table 1 below resulting in the emission of carbon dioxide:

Table 1 - Activities which are listed in Schedule 1 of the Regulations and other directly associated activities carried out on the site:

Installation No.: 72

Activity Description
Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day

Directly Associated Activity Description
N/A

1.3 Carbon dioxide from Schedule 1 activities shall be emitted to atmosphere only from the emission sources as listed in Table 2 below:

Table 2 Emission Sources and Capacities:

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
Kiln 1 (S1)	Kiln	4182	tonnes/day
S2	Generator	1.25	MW
S3	Office Boiler	0.23	MW
S4	Canteen Boiler	0.07	MW
S5	Workshop Boiler 1	0.06	MW
S6	Workshop Boiler 2	0.06	MW
S7	Acetylene Maintenance area	0.1	MW

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S8	LPG Maintenance area	0.1	MW
S9	Kiln Ignition (Acetylene)	0.1	MW

1.4 The activity shall be controlled, operated and maintained so that emissions of carbon dioxide shall take place only as set out in this GHG Emissions Permit. The permit does not control emissions of gases other than carbon dioxide. All agreed plans, programmes and methodologies required to be carried out under the terms of this permit, become part of this permit.

1.5 This GHG Permit is for the purposes of GHG emissions permitting under the European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 and any amendments to the same only and nothing in this permit shall be construed as negating the Operator's statutory obligations or requirements under any other enactments or regulations unless specifically amended by the Regulations.

1.6 Any reference in this permit to 'installation' shall mean the installation as described in the Greenhouse Gas Emissions Permit application and any amendments approved by the Agency.

Reason: To describe the installation and clarify the scope of this permit.

Condition 2. Notification

2.1 No alteration to, or reconstruction in respect of, the activity or any part thereof which would, or is likely to, result in a change in:

2.1.1 the nature or functioning of the installation;

2.1.2 the capacity of the installation as detailed in this permit;

2.1.3 the fuels used at the installation;

2.1.4 the range of activities to be carried out at the installation

that may require updating of the GHG permit shall be carried out or commenced without prior notice to and without the prior written agreement of the Agency.

2.2 The Operator shall notify the Agency in writing of the cessation of all or part of any activity listed in Table 1 of this permit no later than one month from the date of cessation or by 31 December of the year of cessation, whichever is sooner.

2.3 The Operator shall apply for an update of this GHG Permit where there is a change to the Operator name and/or registered address of the Operator, within seven days of the change.

2.4 For installations or parts of installations which have not come into operation when the application for this permit was made the Operator shall notify the Agency of the date of commencement of the activity within seven days of commencement.

2.5 The Operator shall notify the Agency in writing within three days of becoming aware of any factors which may prevent compliance with the conditions of this permit.

2.6 The Operator shall submit to the Agency by 21 January of each year a declaration of operability. The declaration submitted shall be in the format required by the Agency.

2.7 All notifications required under Condition 2 above shall be made to the address given in the Explanatory Note included with this permit.

2.8 The Operator shall submit to the Agency by 31 December of each year all relevant information about any planned or effective changes to the capacity, activity level and operation of an installation. The information submitted shall be in the format required by the Agency.

Reason: To provide for the notification of updated information on the activity.

Condition 3. Monitoring and Reporting

3.1 The Operator shall monitor and record greenhouse gas emissions on site in accordance with the M&R Regulation and the approved Monitoring Plan attached at Appendix 1 to this GHG permit and in compliance with any other guidance approved by the Agency for the purposes of implementing the Directive and/or the Regulations.

3.2 The Operator shall modify the monitoring plan in any of the following situations:

3.2.1 new emissions occur due to new activities carried out or due to the use of new fuels or materials not yet contained in the monitoring plan;

3.2.2 the change of availability of data, due to the use of new measurement instrument types, sampling methods or analysis methods, or for other reasons, leads to higher accuracy in the determination of emissions;

3.2.3 data resulting from the previously applied monitoring methodology has been found incorrect;

3.2.4 changing the monitoring plan improves the accuracy of the reported data, unless this is technically not feasible or incurs unreasonable costs;

3.2.5 the monitoring plan is not in conformity with the requirements of the M&R Regulation and the Agency requests a change;

3.2.6 it is necessary to respond to the suggestions for improvement of the monitoring plan contained in the verification report.

The Operator shall notify any proposals for modification of the monitoring plan to the Agency without undue delay. Any significant modifications of the monitoring plan, as defined in Article 15 of the M&R Regulation, shall be subject to approval by the Agency. Where approved these changes shall be implemented within a timeframe agreed by the Agency.

3.3 Temporary changes to the monitoring methodology:

3.3.1 Where it is for technical reasons temporarily not feasible to apply the tier in the monitoring plan for the activity data or each calculation factor of a fuel or material stream as approved by the Agency, the Operator shall apply the highest achievable tier until the conditions for application of the tier approved in the monitoring plan have been restored. The Operator shall take all necessary measures to allow the prompt restoration of the tier in the approved monitoring plan. The Operator shall notify the temporary change to the monitoring methodology without undue delay to the Agency specifying:

(i) The reasons for the deviation from the tier;

(ii) in detail, the interim monitoring methodology applied by the Operator to determine the emissions until the conditions for the application of the tier in the monitoring plan have been restored;

(iii) the measures the Operator is taking to restore the conditions for the application of the tier in the approved monitoring plan;

(iv) the anticipated point in time when application of the approved tier will be resumed.

3.3.2 A record of all non-compliances with the approved monitoring plan shall be maintained on-site and shall be available on-site for inspection by authorised persons of the Agency and/or by the Verifier at all reasonable times.

3.4 The Operator shall appoint a Verifier to ensure that, before their submission, the reports required by Condition 3.5 below are verified in accordance with the criteria set out in Schedule 5 of the Regulations, the A&V Regulation and any more detailed requirements of the Agency.

3.5 The written report of the verified annual reportable emissions and the verification report in respect of each calendar year shall be submitted to the Agency by the Operator no later than 31 March of the following year. The reports shall be in the format required by the Agency and meet the criteria set out in the M&R and A&V Regulations.

3.6 The Operator shall enter the verified annual reportable emissions figure for the preceding year into the Registry no later than 31 March of the following year. This figure shall be electronically approved by the Verifier in the registry no later than 31 March of each year.

3.7 Where an Operator is applying the Fall-Back methodology, the Operator shall assess and quantify each year the uncertainties of all parameters used for the determination of the annual emissions in accordance with the ISO Guide to the Expression of Uncertainty in Measurement or another equivalent internationally accepted standard and include the verified results in the written report of the verified annual reportable emissions to be submitted to the Agency by 31 March each year.

3.8 An Operator shall submit to the Agency for approval a report containing the information detailed in (i) or (ii) below, where appropriate, by the following deadlines:

(a) for a category A installation, by 30 June every four years;

(b) for a category B installation, by 30 June every two years;

(c) for a category C installation, by 30 June every year.

(i) Where the Operator does not apply at least the tiers required pursuant to the first subparagraph of Article 26(1) and to Article 41(1) of the M&R Regulation, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply the required tiers. Where evidence is found that measures needed for reaching those tiers have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan and submit proposals for implementing appropriate measures and its timing.

(ii) Where the Operator applies a fall-back monitoring methodology, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply at least tier 1 for one or more major or minor source streams. Where evidence is found that measures needed for reaching at least tier 1 for those source streams have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan, submit proposals and a timeframe for implementing appropriate measures.

3.9 Where the verification report states outstanding non conformities, misstatements or recommendations for improvements the Operator shall submit a report to the Agency for approval by 30 June of the year in which the verification report is issued. This requirement does not apply to the Operator of an installation with low emissions where the verification report contains recommendations for improvements only. The report shall describe how and when the Operator

has rectified or plans to rectify the non-conformities identified and to implement recommended improvements. Where recommended improvements would not lead to an improvement of the monitoring methodology this must be justified by the Operator. Where the recommended improvements would incur unreasonable costs the Operator shall provide evidence of the unreasonable nature of the costs. The Operator shall implement the improvements specified by the Agency in response to the report submitted in accordance with this Condition in accordance with a timeframe set by the Agency.

3.10 The Operator shall make available to the Verifier and to the Agency any information and data relating to emissions of carbon dioxide which are required in order to verify the reports referred to in Condition 3.5 above or as required by the Agency to facilitate it in establishing benchmarks and/or best practice guidance.

3.11 Provision shall also be made for the transfer of environmental information, in relation to this permit, to the Agency's computer system, as may be requested by the Agency.

3.12 The Operator shall retain all information as specified in the M&R Regulation for a period of at least 10 years after the submission of the relevant annual report.

3.13 A record of independent confirmation of capacities listed in this permit shall be available on-site for inspection by authorised persons of the Agency at all reasonable times.

3.14 The Operator shall keep records of all modifications of the monitoring plan. The records shall include the information specified in Article 16.3 of the M&R Regulation.

3.15 The Operator shall ensure that members of the public can view a copy of this permit and any reports submitted to the Agency in accordance with this permit at all reasonable times. This requirement shall be integrated with the requirements of any public information programme approved by the Agency in relation to any other permit or licence held by the Operator for the site.

Reason: To provide for monitoring and reporting in accordance with the Regulations.

Condition 4. Allowances

4.1 Surrender of Allowances

4.1.1 The Operator shall, by 30 April in each year, surrender to the Agency, or other appropriate body specified by the Agency, allowances equal to the annual reportable emissions in the preceding calendar year.

4.1.2 The number of allowances to be surrendered shall be the annual reportable emissions for the preceding calendar year plus such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due. This includes allowances to cover the amount of any annual reportable emissions in respect of which allowances were not surrendered in accordance with Condition 4.1.1 in the previous year, and the amount of any reportable emissions which were discovered during the previous year to have been unreported in reports submitted under Condition 3 in that or in earlier years.

4.1.3 In relation to activities or parts of activities which have ceased to take place and have been notified to the Agency in accordance with Condition 2.2 above, the Operator shall surrender to the Agency allowances equal to the annual reportable emissions from such activities in the preceding calendar year or part thereof, together with such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due as described in Condition 4.1.2 above.

4.1.4 The Operator may, from 2008 onwards, subject to the provisions of the Regulations and the relevant National Allocation Plan for that compliance year, surrender emission reduction units (ERUs) and certified emission reduction units (CERs) in place of allowances.

4.2 The holding, transfer, surrender and cancellation of allowances shall be in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC, any amendment or revision to the same and any guidance issued by the Agency or the National Administrator.

4.3 The Operator shall provide the National Administrator with all the necessary information for the opening of an Operator holding account for the installation described in Condition 1 of this permit within twenty working days of the issue of this permit, unless such an account is already open.

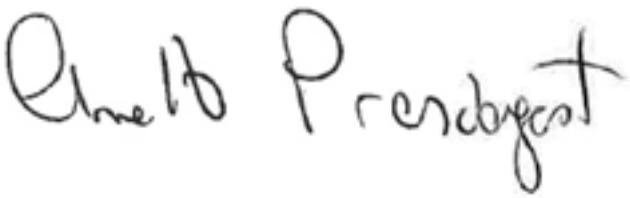
Reason: *To provide for the surrendering, holding, transfer and cancellation of allowances in respect of reported emissions.*

Condition 5. Penalties

5.1 Any Operator who fails to comply with Condition 4.1 above shall be subject to the provisions of the Regulations, including, but not limited to the payment of penalties.

Reason: To provide for the payment of excess emissions penalties as required under the Regulations.

Signed by the Authorised Person on this the 25 June 2021:



Ms. Annette Prendergast
Inspector/ Authorised Person

Appendix 1 to Greenhouse Gas Emissions Permit Number IE-GHG093-10394

Monitoring Plan

1. Guidelines & Conditions

1. Directive 2003/87/EC as amended by Directive 2009/29/EC (hereinafter "the (revised) EU ETS Directive") requires operators of installations which are included in the European Greenhouse Gas Emission Trading Scheme (the EU ETS) to hold a valid GHG emission permit issued by the relevant Competent Authority and to monitor and report their emissions and have the reports verified by an independent and accredited verifier.

The Directive can be downloaded from:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003L0087:20090625:EN:PDF

2. The Monitoring and Reporting Regulation (Commission Regulation (EU) No 601/2012) (hereinafter the "MRR") defines further requirements for monitoring and reporting.

The MRR can be downloaded from:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:181:0030:0104:EN:PDF

Article 12 of the MRR sets out specific requirements for the content and submission of the monitoring plan and its updates. Article 12 outlines the importance of the Monitoring plan as follows:

The monitoring plan shall consist of a detailed complete and transparent documentation of the monitoring methodology of a specific installation [or aircraft operator] and shall contain at least the elements laid down in Annex I.

Furthermore Article 74(1) states:

Member States may require the operator and aircraft operator to use electronic templates or specific file formats for submission of monitoring plans and changes to the monitoring plan as well as for submission of annual emissions reports tonne-kilometre data reports verification reports and improvement reports. Those templates or file format specifications established by the Member States shall at least contain the information contained in electronic templates or file format specifications published by the Commission

3. All Commission guidance documents on the Monitoring and Reporting Regulation will be published at the link below as they become available:

http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

(a) Information sources:

EU Websites:

EU-Legislation: http://eur-lex.europa.eu/en/index.htm
EU ETS general: http://ec.europa.eu/clima/policies/ets/index_en.htm

Monitoring and Reporting in the EU ETS: http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

Environmental Protection Agency Website:

http://www.epa.ie

Environmental Protection Agency Contact:

GHGpermit@epa.ie

2. Application Details

The Installation Name, Site Name and the address of the site of the installation are detailed below. The Site Name and address can be updated from the Organisation Details Page on the ETSWAP website. The Installation Name can only be updated by your Competent Authority.

Installation name	Scotchtown Cement Works
Site name	Scotchtown Cement Works
Address	Scotchtown Ballyconnell Cavan Ireland
Grid reference of site main entrance	227500 320500
Licence held pursuant to the Environmental Protection Agency Act 1992, as amended.	Yes

IPC/IE Licence Register Number	Licence holder	Competent body
P0378-03	Mannok Cement Limited	EPA

Has the regulated activity commenced at the Installation?	Yes
Date of Regulated Activity commencement	01 January 2008

This information is only required to identify the first relevant reporting year of an installation. If the installation was in operation from the beginning of 2008 and held a Greenhouse Gas Emissions Permit from this point, 1 January 2008 will be used where the actual date of commencement is not readily known.

3. About the Operator

The information about the "Operator" is listed below. The "Operator" is defined as the person who it is proposed will have control over the relevant Regulated Activities in the installation in respect of which this application is being made.

(b) Operator Details

The name of the operator and where applicable the company registration number are detailed below. These details can only be updated by the Environmental Protection Agency.

Operator name	Mannok Cement Limited
Company Registration Number	320388

Operator Legal status

The legal status of the operator is:	Company / Corporate Body

(c) Company / Corporate Body

Is the trading / business name different to the operator name?	No

Registered office address

Address Line 1	Scotchtown
Address Line 2	N/A
City/Town	Ballyconnell
County	Cavan
Postcode	N/A

Principal office address

Is the principal office address different to the registered office address?	No

Holding company

Does the company belong to a holding company?	No

(d) Operator Authority

Does the operator named above have the authority and ability to:

a.	manage site operations through having day-to-day control of plant operation including the manner and rate of operation	Yes
b.	ensure that permit conditions are effectively complied with	Yes
c.	control monitor and report specified emissions	Yes
d.	be responsible for trading in Allowances so that at the end of a reporting period allowances can be balanced against reported emissions.	Yes

4. Service Contact

e. Service Contact

Address	Scotchtown Ballyconnell County Cavan Ireland

5. Installation Activities

f. Installation Description

Below is a description of the installation and its activities, a brief outline description of the site and the installation and the location of the installation on the site. The description also includes a non-technical summary of the activities carried out at the installation briefly describing each activity performed and the technical units used within each activity.

Mannok Cement Ltd operate a cement manufacturing facility located at Scotchtown, Ballyconnell, County Cavan. The plant is located approximately 3km north of the town of Ballyconnell and covers an area of approximately 35-hectares. The facility is operational 24-hours per day for approximately 330-days per year, allowing time for scheduled shut-down periods. The facility currently produces Portland Cement (CEM1) and Portland Limestone Cement (CEMII A/L 6-20% Limestone), which are composite mixtures consisting of synthetic minerals exhibiting hydraulic properties upon mixing with water. The main raw materials used in the process are limestone (rich in calcium) and shale (rich in silica). As the chemical composition of these materials can be variable, small quantities of other materials including sand, silt, bauxite and iron ore are used as additives in order to obtain the required blend. The raw materials are processed by crushing, blending and milling to produce a homogenous “raw meal”. This raw meal is then passed through a high temperature kiln, where a thermal process produces a synthetic “clinker”. The clinker and additives are then milled into a fine powder - “cement”.

The main unit operations carried out at the plant are:

- Raw material handling;
- Raw milling;
- Clinker production;
- Cement milling; and,
- Cement despatch.

All the process activities, with exception of cement despatch, are controlled from the Central Control Room where numerous critical plant operational parameters are monitored. The performance of the process is continuously monitored by operatives and interventions are made where necessary to ensure process stability and product quality.

g. Annex 1 Activities

The table below lists the technical details for each Annex 1 activity carried out at the installation.

Note that 'capacity' in this context means:

- Rated thermal input (for combustion installations) which is defined as the rate at which fuel can be burned at the maximum continuous rating of the installation multiplied by the calorific value of the fuel and expressed as megawatts thermal.
- Production capacity for those specified Annex I activities for which production capacity determines ETS eligibility.

Annex 1 Activity	Total Capacity	Capacity units	Specified Emissions
Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day	4182	tonnes/day	Carbon Dioxide

h. Site Diagram

The table below lists attachments (if available) that provide a simple diagram showing emissions sources source streams sampling points and metering/measurement equipment.

Attachment	Description
BALLYCONNELL ETS Route plus SRF.pdf	BALLYCONNELL ETS Route Model

i. Estimated Annual Emissions

Detail of the estimated annual emission of CO_2 equivalent. This information enables categorisation of the installation in accordance with Article 19 of the MRR and is based on the average verified annual emissions of the previous trading period data OR if this data is not available or is inappropriate a conservative estimate of annual average emissions including transferred CO_2 excluding CO_2 from biomass.

Estimated Annual Emissions (tonnes $CO_{2(e)}$)	1099423
Justification for the use of a conservative estimate of CO_2 emissions.	Over Phase 2 (2008 to 2012) the average clinker:CO2 ratio was 1.11. If we applied this to the Baseline Data of 1,220,359 tonnes clinker, this would give a CO2 estimation of 1,099,423 tCO2

Installation Category: C

6. Emissions Details

j. About your emissions

Annex I of the Monitoring and Reporting Regulations (MRR) requires that monitoring plans include a description of "the installation" and activities to be carried out and monitored including a list of emission sources and source streams. The information provided in this template relates to the Annex I activity(ies) comprised in the installation in question and should relate to a single installation. It includes any activities carried out by the operator and does not include related activities carried out by other operators.

k. Emission Sources

The table below lists all the emission sources at the installation, which may include directly associated activities/excluded activities.

Emission Source Reference	Emission Source Description
Kiln 1 (S1)	Kiln
S2	Generator
S3	Office Boiler
S4	Canteen Boiler
S5	Workshop Boiler 1
S6	Workshop Boiler 2
S7	Acetylene Maintenance area
S8	LPG Maintenance area
S9	Kiln Ignition (Acetylene)

The table below lists the emission sources which are linked to the Regulated Activities at the installation.

Emission Source Reference	Emission Source Description
Kiln 1 (S1)	Kiln
S2	Generator
S3	Office Boiler
S4	Canteen Boiler
S5	Workshop Boiler 1
S6	Workshop Boiler 2
S7	Acetylene Maintenance area
S8	LPG Maintenance area
S9	Kiln Ignition (Acetylene)

l. Emission Points

The table below lists all the emission points at the installation, which may include directly associated activities/excluded activities.

Emission Point Reference	Emission Point Description
A2-01/A2-03 (A1)	Main stack (ESP/Coal mill/bag filter)
A2-08-DG (A2)	Generator Exhaust
A2-04-OB (A3)	Office Boiler Exhaust
A2-05-CB (A4)	Canteen Boiler Exhaust
A2-06-WSB (A5)	Workshop Boiler 1 Exhaust
A2-07-WSB (A6)	Workshop Boiler 2 Exhaust
A2-08-MA (A7)	Maintenance area

m. Source Streams (fuels and/or materials)

The table below lists the source streams which are used in Schedule 1 Activities at the installation.

Source Stream Reference	Source Stream Type	Source Stream Description
F1 (Coal)	Combustion: Solid fuels	Coal
F2 (Gas Oil)	Combustion: Commercial standard fuels	Diesel
M1 (Clinker CaO)	Cement clinker: Clinker output (Method B)	Clinker (M1) CaO
M2 (Clinker MgO)	Cement clinker: Clinker output (Method B)	Clinker (M2) MgO
R1 (Non-Carbonate Carbon in Raw Meal)	Cement clinker: Non-carbonate carbon	Raw Meal
F3 (Kerosene)	Combustion: Commercial standard fuels	Kerosene (other than jet kerosene)
CKD	Cement clinker: CKD	Cement Kiln Dust
F4 (Acetylene)	Combustion: Other gaseous & liquid fuels	Acetylene
F5 (LPG)	Combustion: Commercial standard fuels	Liquefied Petroleum Gases
F6 (SRF)	Combustion: Solid fuels	Solid Recovered Fuel

n. Emissions Summary

The table below provides a summary of the emission source and source stream details in the installation.

Source streams (Fuel / Material)	**Emission Source Refs.**	**Emission Point Refs.**	**Annex 1 Activity**
F1 (Coal)	Kiln 1 (S1)	A2-01/A2-03 (A1)	Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
F2 (Gas Oil)	Kiln 1 (S1),S2,S3,S4	A2-01/A2-03 (A1),A2-04-OB (A3),A2-05-CB (A4),A2-08-DG (A2)	Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
M1 (Clinker CaO)	Kiln 1 (S1)	A2-01/A2-03 (A1)	Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
M2 (Clinker MgO)	Kiln 1 (S1)	A2-01/A2-03 (A1)	Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
F3 (Kerosene)	S5,S6	A2-06-WSB (A5),A2-07-WSB (A6)	Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
F4 (Acetylene)	S7,S9	A2-01/A2-03 (A1),A2-08-MA (A7)	Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
F5 (LPG)	S8	A2-08-MA (A7)	Production of cement clinker in rotary kilns with a production capacity

Source streams (Fuel / Material)	Emission Source Refs.	Emission Point Refs.	Annex 1 Activity
			exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
F6 (SRF)	Kiln 1 (S1)	A2-01/A2-03 (A1)	Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day
CKD	Kiln 1 (S1)	A2-01/A2-03 (A1)	Production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day

o. Excluded Activities

Certain activities that result in greenhouse gas emissions may be excluded under the EU ETS Directive for example truly mobile sources such as vehicle emissions.

Do you have any excluded activities which need to be identified in your monitoring plan? No

7. Low Emissions Eligibility

p. Low Emissions Eligibility

The operator may submit a simplified monitoring plan for an installation where no nitrous oxide activities are carried out and it can be demonstrated that:

(a) the average verified annual emissions of the installation during the previous trading period was less than 25 000 tonnes $CO_{2(e)}$ per year or;

(b) where this data is not available or inappropriate a conservative estimate shows that emissions for the next 5 years will be less than 25 000 tonnes $CO_{2(e)}$ per year.

Note: the above data shall include transferred CO_2 but exclude CO_2 stemming from biomass.

Does the installation satisfy the criteria for installations with low emissions (as defined by Article 47 of the MRR)? No

8. Monitoring Approaches

q. Monitoring Approaches

Emissions may be determined using either a calculation based methodology ("calculation") or measurement based methodology ("measurement") except where the use of a specific methodology is mandatory according to the provisions of the MRR. [MRR Article 21].

Note: the operator may subject to competent authority approval combine measurement and calculation for different sources. The operator is required to ensure and demonstrate that neither gaps nor double counting of reportable emissions occurs.

Please specify whether or not you propose to apply the following monitoring approaches. Select all monitoring approaches that are applicable to you. The consecutive sections will become mandatory based on the selected approaches.

Calculation	Yes
Measurement	No
Fall-back approach	No
Monitoring of N_2O	No
Monitoring of PFC	No
Monitoring of transferred / inherent CO_2	No

9. Calculation

r. Approach Description

The calculation approach including formulae used to determine annual CO_2 emissions:

The site comprises of a scheduled activity fed primarily by coal (F1) and Solid Recovered Fuel (SRF F6) . Minor amounts of gas oil/diesel (F2), and de-minimis amounts of kerosene (F3), Acetylene (F4) and LPG (F5) are also used onsite. These form the basis of combustion emissions from the Site. There are process emissions resulting from the calcination of limestone. Calculations are carried out separately for combustion and process emissions and the total is calculated from the addition of CO2 (tonnes) produced from both aspects of the process.

In accordance with Article 24 of MRR CO2: CO2 emissions = Activity data*emission factor* oxidation factor where the activity data is the energy content of fuel consumed.

CO2 (Total Fuel Emissions) = CO2 (Coal F1) + CO2 (SRF F6) + CO2 (Diesel Oil F2) + CO2 (kerosene F3) + CO2 (Acetylene F4) + CO2 (LPG F5).

Coal consumption is calculated using a mass balance approach beginning by recording all loads that cross the weighbridge. Activity data is (coal consumption FC = FP + (FS - FE) - FO) * NCV, where FC is fuel consumed, FP is fuel purchased, FS is opening stock, FE is closing stock and FO is fuel used for other purposes. Fuel consumption *NCV* emission factor * oxidation factor provide total CO2.The emission factor (tCO2/TJ) is calculated using the carbon content (tC/t), the standard molecular conversion factor (3.664 tCO2/tC as of Article 36 of MRR) and the NCV (TJ/t). Coal is analysed for NCV and Carbon Content in an ISO 17025 laboratory in accordance with Article 34 MRR . The

oxidation of materials is complete and so is taken as 1. A coal weighted system is used for the different sources of coal used when carrying out calculations in relation to the stocks.

SRF consumption is calculated using a mass balance approach beginning by recording all loads that cross the weighbridge. Activity data is SRF consumption FC = FP + (FS - FE)* NCV, where FC is fuel consumed, FP is fuel purchased, FS is opening stock, FE is closing stock. Fuel consumption *NCV* emission factor * oxidation factor provide total CO2.The emission factor (tCO2/TJ) is calculated in accordance with Article 38 (2) (the emission factor of the mixed fuel shall be calculated and reported as the preliminary emission factor determined in accordance with Article 30 multiplied by the fossil fraction of the fuel). The preliminary emission factor of the mixed fuel will be calculated using the carbon content (tC/t) and the standard molecular conversion factor (3.664 tCO2/tC as of Article 36 of MRR) . Every delivery of SRF is sampled in accordance with the standard method for sampling solid recovered fuels (EN 15442:2011).The Non-biomass (fossil) & Biomass fraction (t CO2/T SRF) of the mixed fuel is independently determined by an external laboratory (ISO 17025) and the SRF is analysed for Carbon Content and NCV in an ISO 17025 laboratory in accordance with Article 34 MRR . The oxidation of materials is complete and so is taken as 1.

Gas oil/ diesel (a Commercial Standard Fuel) consumed on site is classified as a Minor Source Stream . All gas oil/diesel delivered to the site is measured across a calibrated weighbridge. The quantity of gas oil/diesel used in the kiln (S1) is calculated by a mass balance approach beginning by recording all loads that cross the weighbridge, FC (fuel consumed) in the kiln = FP + (FS -FE), where FP is fuel purchased (from weighbridge records), FS is opening stock (for kiln gas oil) and FE is closing stock (for kiln gas oil). Gas Oil/ Diesel consumption in S2, S3 and S4 is based on weighbridge records only during the year (assuming all purchases are consumed in the year of purchase). Kiln (S1) diesel/gas oil consumption and S2,S3 and S4 gas oil/diesel consumption are then combined to give total gas oil/diesel consumption. Finally diesel used in forklifts for transport is subtracted from the total using the delivery quantity from the suppliers flow meter on the delivery truck. CO2 emissions arising from gas oil (diesel) will be calculated as follows;

CO2 emission= Activity data (TJ) *emission factor*oxidation factor.

The Activity Data (TJ) is the Fuel Consumed (FC) (kTonnes) * NCV (TJ/kt)

The emission factor and NCV used are country specific and the oxidation factor is assumed to be 1.0.

LPG, Acetylene and Kerosene consumed on site is de-minimis, calculation is based on supplier delivery records only during AEM year (assumption all purchases are consumed in year of purchase). The activity data (TJ) will be calculated by purchases x NCV. CO2 emission will be calculated in accordance with Article 24 of MRR CO2 emission= Activity data (TJ) *emission factor*oxidation factor. The emission factor and NCV used are country specific and the oxidation factor is assumed to be 1.0.

The process emissions are calculated based on the mass balance clinker output Standard methodology formulae 2 as highlighted in Annex IV of MRR . Process CO2 is a combination of CO2 emissions from clinker, CO2 emissions from non-carbonate carbon and CO2 emissions from discarded cement kiln dust (CKD). The CO2 (tonnes) is the product of Activity x EF x CF. CO2 emissions from CKD taken out of the process is determined from weighbridge records of the quantity sent off-site (and taking into account any stocks by carrying out an annual survey of any CKD from the process in stock on site). Cement kiln dust (CKD) is classed as a minor source stream and therefore in accordance with Annex IV Section 9.C "Emissions related to discarded dust", Tier 2 is applied for determination of the emission factor based on analysis of representative samples carried out at least 4 times a year in an ISO 17025 accredited laboratory. In calculating CO2 emissions from clinker the clinker activity is recorded via the cement output over the weighbridges plus bagged cement sales. The Clinker Activity is the sum of cement despatched – the difference in cement and clinker stocks – filler used. Filler is calculated: [filler P + (Filler S – Filler E)], where filler P is that purchased, filler S is opening stock and filler E is closing stock. Filler is corrected for moisture content, Mannok Cement carries out internal quarterly moisture tests. The emission factor is to be calculated consistent with the tiers outlined in Section 4.3 of Annex II of MRR Tier 3 for the clinker output method B. Mannok Cement carries out tests internally and also sends composite monthly samples to an ISO 170125 accredited laboratory for analysis. Composition data is converted into emission factor using Stoichiometric emission factor for process emissions from Annex VI, section 2, Table 3 of MRR . Conversion factor of 1 shall be used.

CO2 emissions from non-carbonate carbon activity data uses total clinker * conversion to clinker. A No tier approach is applied for the determination of activity data for non-carbonate carbon as it is a de-minimis source stream. It is

calculated by multiplying clinker activity data by the inverse production factor to raw meal. The inverse production factor is equal to the industry best practice. This is calculated yearly based on clinker raw material input; Raw meal clinker mass ratio = Clinker raw material usage - stocks + purchases divided by Clinker production.The emission factor applied is Tier 2 as outlined in Section 9.D of Annex IV MRR . Raw meal composite samples will be tested quarterly in an accredited laboratory. Conversion factor of 1 shall be used.

s. Measurement Devices

Below is a description of the specification and location of the measurement systems used for each source stream where emissions are determined by calculation

Also a description of all measurement devices including sub-meters and meters used to deduct non-Annex I activities to be used for each source and source stream.

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
F1 (Coal),F2 (Gas Oil),M1 (Clinker CaO),M2 (Clinker MgO),F6 (SRF)	Kiln 1 (S1)	MCWB IN	Weighbridge	400-50000	kg	0.12	The metering device for all fuel and filler materials entering the site is located at the entrance to the facility
F1 (Coal)	Kiln 1 (S1)	SK 01	Stocktake	N/A	N/A	10	Coal Shed
M1 (Clinker CaO),M2 (Clinker MgO),CKD	Kiln 1 (S1)	MCWB OUT	Weighbridge	400-50000	kg	0.12	The metering device for all materials leaving site is situated at the Site exit
M1 (Clinker CaO),M2 (Clinker MgO)	Kiln 1 (S1)	SK 02	Stocktake	N/A	N/A	10	Clinker Shed, Filler Material Bins, Cement Silos and Bagged cement on pallets
R1 (Non-Carbonate Carbon in Raw Meal)	Kiln 1 (S1)	Estimate by design engineers	Estimate by design engineers	N/A	N/A	N/A	Kiln Input and Output
F3 (Kerosene)	S5,S6	Supplier Delivery Dockets (Kerosene-	Supplier Delivery Dockets	N/A	N/A	N/A	Deminimis - Supplier Delivery

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
		commercial standard fuel)					Dockets (All purchases consumed in year of purchase)
F1 (Coal),F6 (SRF)	Kiln 1 (S1)	MCWB FAST TRACK IN	Weighbridge	400-50000	kg	0.12	The metering device for all fuel entering the site is located at the entrance to the facility
M1 (Clinker CaO),M2 (Clinker MgO)	Kiln 1 (S1)	MCWB SWAD	Weighbridge	1000-80000	kg	0.19	The metering for materials leaving the site on the Swalinbar haul road exit from the site
M1 (Clinker CaO),M2 (Clinker MgO)	Kiln 1 (S1)	2195644	Bag weigher Mettler	0-60	kg	0.004	This metering device is located in the Bagging Plant.
CKD	Kiln 1 (S1)	SK 04	Stocktake	N/A	N/A	10	CKD Storage
F2 (Gas Oil)	Kiln 1 (S1)	SK 03	Gas Oil Stock Level Probe	N/A	Inches	2.5	Diesel Tank
F4 (Acetylene)	S7,S9	Delivery Dockets (Acetylene)	Docket	N/A	N/A	N/A	Deminimis - Supplier Delivery Dockets (All purchases consumed in year of purchase)
F5 (LPG)	S8	Delivery Dockets (LPG)	Docket	N/A	N/A	N/A	Deminimis - Supplier Delivery

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
							Dockets (All purchases consumed in year of purchase)
F6 (SRF)	Kiln 1 (S1)	SK 05	Stocktake	N/A	N/A	10	SRF Storage
F2 (Gas Oil)	Kiln 1 (S1),S2,S3,S4	Delivery Docket (Gas Oil)	Delivery Docket for fork lift diesel deduction	N/A	litres	0.05	Supplier Flow Meter on Delivery Truck

Source Stream Refs.	Measurement Device Ref.	Determination Method	Instrument Under Control Of	Conditions Of Article 29(1) Satisfied	Invoices Used To Determine Amount Of Fuel Or Material	Trade Partner And Operator Independent
F1 (Coal),F2 (Gas Oil),M1 (Clinker CaO),M2 (Clinker MgO),F6 (SRF)	MCWB IN	Batch	Operator	N/A	N/A	N/A
F1 (Coal)	SK 01	Continual	Operator	N/A	N/A	N/A
M1 (Clinker CaO),M2 (Clinker MgO),CKD	MCWB OUT	Batch	Operator	N/A	N/A	N/A
M1 (Clinker CaO),M2 (Clinker MgO)	SK 02	Continual	Operator	N/A	N/A	N/A
R1 (Non-Carbonate Carbon in Raw Meal)	Estimate by design engineers	Batch	Operator	N/A	N/A	N/A
F3 (Kerosene)	Supplier Delivery Dockets (Kerosene-commercial standard fuel)	Batch	Trade partner	Yes	Yes	Yes
F1 (Coal),F6 (SRF)	MCWB FAST TRACK IN	Batch	Operator	N/A	N/A	N/A
M1 (Clinker CaO),M2	MCWB SWAD	Batch	Operator	N/A	N/A	N/A

Source Stream Refs.	Measurement Device Ref.	Determination Method	Instrument Under Control Of	Conditions Of Article 29(1) Satisfied	Invoices Used To Determine Amount Of Fuel Or Material	Trade Partner And Operator Independent
(Clinker MgO)						
M1 (Clinker CaO),M2 (Clinker MgO)	2195644	Batch	Operator	N/A	N/A	N/A
CKD	SK 04	Batch	Operator	N/A	N/A	N/A
F2 (Gas Oil)	SK 03	Batch	Operator	N/A	N/A	N/A
F4 (Acetylene)	Delivery Dockets (Acetylene)	Batch	Trade partner	Yes	Yes	Yes
F5 (LPG)	Delivery Dockets (LPG)	Batch	Trade partner	Yes	Yes	Yes
F6 (SRF)	SK 05	Batch	Operator	N/A	N/A	N/A
F2 (Gas Oil)	Delivery Docket (Gas Oil)	Batch	Trade partner	Yes	Yes	Yes

t. Applied Tiers

The table below identifies the tiers applied against the relevant input data for each source stream and confirms whether a standard (MRR Article 24) or mass balance (MRR Article 25) approach is applied.

(i) The highest tiers as defined in Annex II of the MRR should be used by Category B and C installations to determine the activity data and each calculation factor (except the oxidation factor and conversion factor) for each major source stream. Category A installations should apply as a minimum the tiers listed in Annex V.

(ii) Operators may apply a tier one level lower than those referred to in sub paragraph (i) above for Category C installations and up to two levels lower for Category A and B installations with a minimum of tier 1 if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier. The justification for not applying the higher tier should be recorded when completing the tier table.

(iii) The competent authority may allow an operator to apply even lower tiers than those referred to in the sub paragraph (ii) with a minimum of tier 1 for a transition period of up to three years if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier and provides an improvement plan detailing how and by when at least the tier referred to in sub paragraph (ii) will be achieved. The improvement plan should be referenced in subsequent table and provided to the competent authority at the time of submission of this plan.

(iv) For minor source streams operators shall apply the highest tier which is technically feasible and will not lead to unreasonable costs with a minimum of tier 1 for activity data and each calculation factor. For de-minimis source streams operators may use conservative estimations rather than tiers unless a defined tier can be achieved without additional effort (MRR Article 26(2)).

(v) Installations with low emissions as identified in section 6(d) may apply as a minimum tier 1 for determining activity data and calculation factors for all source streams unless higher accuracy is achievable without additional effort.

* Note 1: For commercial standard fuels the minimum tiers listed in Annex V of the MRR may be applied for all activities in all installations.

* Note 2: If you are intending to apply a fall-back approach please complete the table below and select "n/a" for the tiers to be applied for each source stream where a fall-back approach is used. Section 10 "Fall-back" must also be completed for these source streams.

* Note 3: For biomass or mixed fuels the emission factor is the preliminary emission factor as defined in Definition 35 Article 3 of the MRR.

Source Stream Refs.	**Emission Source Refs.**	**Measurement Device Refs.**	**Overall Metering Uncertainty (less than +/- %)**	**Applied Monitoring Approach**	**Activity Data Tier Applied**	**Net Calorific Value Tier Applied**	**Emission Factor Tier Applied**	**Carbon Content Tier Applied**	**Oxidation Factor Tier Applied**	**Conversion Factor Tier Applied**	**Biomass Fraction Tier Applied**	**Estimated Emissions $tCO_{2(e)}$**	**% of Total Estimated Emissions**	**Source Category**	**Highest Tiers Applied**	**Justification for not applying the highest tiers**	**Improvement Plan Reference (where applicable)**
F1 (Coal)	Kiln 1 (S1)	MCWB FAST TRACK IN,MCWB IN,SK01	<1.5%	Standard	4	3	3	N/A	1	N/A	N/A	242547.1	23	Major	Yes	n/a	n/a
F2 (Gas Oil)	Kiln 1 (S1),S2,S3,S4	Delivery Docket (Gas Oil),M	<1.5%	Standard	4	2a	2a	N/A	1	N/A	N/A	1200	0.11	Minor	Yes	n/a	n/a

Source Stream Refs.	Emission Source Refs.	Measurement Device Refs.	Overall Metering Uncertainty (less than +/- %)	Applied Monitoring Approach	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied	Estimated Emissions $tCO_{2(e)}$	% of Total Estimated Emissions	Source Category	Highest Tiers Applied	Justification for not applying the highest tiers	Improvement Plan Reference (where applicable)
		CWB IN,SK 03															
M1 (Clinker CaO)	Kiln 1 (S1)	MCWB OUT,MCWB SWAD, SK 02	<1.5%	Standard	2	N/A	3	N/A	N/A	1	N/A	637314	60.43	Major	Yes	n/a	n/a
M2 (Clinker MgO)	Kiln 1 (S1)	MCWB OUT,MCWB SWAD, SK 02	<1.5%	Standard	2	N/A	3	N/A	N/A	1	N/A	10500	1	Minor	Yes	n/a	n/a
R1 (Non-Carbonate Carbon in Raw Meal)	Kiln 1 (S1)	Estimate by design engineers	N/A	Standard	No tier	N/A	2	N/A	N/A	1	N/A	12500	1.19	De-minimis	N/A	n/a	n/a
F3 (Kerosene)	S5,S6	Supplier Delivery Docket	N/A	Standard	No tier	2a	2a	N/A	1	N/A	N/A	22	0	De-minimis	N/A	n/a	n/a

Source Stream Refs.	Emission Source Refs.	Measurement Device Refs.	Overall Metering Uncertainty (less than +/- %)	Applied Monitoring Approach	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied	Estimated Emissions $tCO_{2(e)}$	% of Total Estimated Emissions	Source Category	Highest Tiers Applied	Justification for not applying the highest tiers	Improvement Plan Reference (where applicable)
		s (Kerosene-commercial standard fuel)															
CKD	Kiln 1 (S1)	MCWB OUT,SK 04	<1.5%	Standard	2	N/A	2	N/A	N/A	N/A	N/A	1916	0.18	Minor	Yes	n/a	n/a
F4 (Acetylene)	S7,S9	Delivery Dockets (Acetylene)	N/A	Standard	No tier	1	1	N/A	1	N/A	N/A	4.12	0	De-minimis	N/A	n/a	n/a
F5 (LPG)	S8	Delivery Dockets (LPG)	N/A	Standard	No tier	2a	2a	N/A	1	N/A	N/A	0.69	0	De-minimis	N/A	n/a	n/a
F6 (SRF)	Kiln 1 (S1)	MCWB FAST TRACK IN,MCWB IN	<1.5%	Standard	4	3	3	N/A	1	N/A	2	148657.9	14.1	Major	Yes	n/a	n/a

Total Estimated Emissions for Calculation (tonnes $CO_{2(e)}$)	1054661.81

u. Uncertainty Calculations

The table below lists evidence attached to the application that demonstrates compliance with the applied tiers in accordance with Article 12 of the MRR.

Attachment	**Description**
Stock taking accuracy justification 10%.pdf	Stock Uncertainity 10%
Bag Weigher calibration cert 2020.pdf	Bag Weigher Calibration Certificate
CKD Uncertainty Assessment.xls	CKD Uncertainty Assessment
Coal Uncertainty Assessment.xls	Coal Uncertainty Assessment
Clinker uncertainty Assessment.xls	Clinker Uncertainty Assessment
SRF Uncertainty Assessment.xls	SRF Uncertainty Assessment
Diesel Uncertainty Assessment.xls	Diesel Uncertainty Assessment
Weighbridge Uncertainty.xls	Weighbridge Uncertainty
MCWB SWAD Mannok Build Swalinbar Weighbridge 01F123456.pdf	MCWB SWAD
MCWB FAST TRACK IN Mannok Cement Fast Track In 01F893241....pdf	MCWB FAST TRACK IN
MCWB OUT Mannok Cement OUT Weighbridge 01F893243.pdf	MCWB OUT
MCWB IN Mannok Cement In Weighbridge 02F893241.pdf	MCWB IN

v. Applied tiers

Applied tiers for each source stream

Source Stream Ref.	Emission Source Refs.	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied
F1 (Coal)	Kiln 1 (S1)	4	3	3	N/A	1	N/A	N/A
F2 (Gas Oil)	Kiln 1 (S1),S2,S3,S4	4	2a	2a	N/A	1	N/A	N/A
M1 (Clinker CaO)	Kiln 1 (S1)	2	N/A	3	N/A	N/A	1	N/A
M2 (Clinker MgO)	Kiln 1 (S1)	2	N/A	3	N/A	N/A	1	N/A
R1 (Non-Carbonate Carbon in Raw Meal)	Kiln 1 (S1)	No tier	N/A	2	N/A	N/A	1	N/A
F3 (Kerosene)	S5,S6	No tier	2a	2a	N/A	1	N/A	N/A
CKD	Kiln 1 (S1)	2	N/A	2	N/A	N/A	N/A	N/A
F4 (Acetylene)	S7,S9	No tier	1	1	N/A	1	N/A	N/A
F5 (LPG)	S8	No tier	2a	2a	N/A	1	N/A	N/A
F6 (SRF)	Kiln 1 (S1)	4	3	3	N/A	1	N/A	2

w. Justification for Applied tiers

Justifications for the applied tiers for each major source stream where highest tiers are not currently achieved.

Source Stream Ref.	Emission Source Refs.	Justification for the applied tier	Improvement Plan Reference (where applicable)
N/A	N/A	N/A	N/A

10. Calculation Factors

x. Default Values

The table below lists, for each parameter, where default values are to be used for calculation factors.

Source Stream Refs.	Emission Source Refs.	Parameter	Reference Source	Default Value applied (where appropriate)
F2 (Gas Oil)	Kiln 1 (S1),S2,S3,S4	NCV and Emission Factor	Ireland's National Greenhouse Gas Inventory	n/a
F3 (Kerosene)	S5,S6	NCV and Emission Factor	Ireland's National Greenhouse Gas Inventory	n/a
F4 (Acetylene)	S7,S9	NCV and Emission Factor	Tier 1 Factors on EPA Website	n/a
F5 (LPG)	S8	NCV and Emission Factor	Ireland's National Greenhouse Gas Inventory	n/a
R1 (Non-Carbonate Carbon in Raw Meal)	Kiln 1 (S1)	Activity Data	Cement Industry Standard	Annual Calculated value: Raw meal/tonne of Clinker
F1 (Coal),F2 (Gas Oil),F3 (Kerosene),F4 (Acetylene),F5 (LPG),F6 (SRF)	Kiln 1 (S1),S2,S3,S4,S5,S6,S7,S8,S9	Oxidation Factor	MRR	1.0
M1 (Clinker CaO),M2 (Clinker MgO),R1 (Non-Carbonate Carbon in Raw Meal)	Kiln 1 (S1)	Conversion Factor	MRR	1.0

Sampling and Analysis

Do you undertake sampling and analysis of any of the parameters used in the calculation of your CO_2 emissions? Yes

y. Analysis

The table below lists, for each source stream, where calculation factors are to be determined by analysis.

Source Stream Refs.	Emission Source Refs.	Parameter	Method of Analysis	Frequency	Laboratory Name	Laboratory ISO17025 Accredited	Evidence Reference
F1 (Coal)	Kiln 1 (S1)	NCV	In-house method conforming to ISO 1928:2009	Every 20,000 tonnes of fuel and at least six times a year	Knight Energy Services Ltd	Yes	n/a
R1 (Non-Carbonate Carbon in Raw Meal)	Kiln 1 (S1)	Emission Factor	DIN EN 13639 - determination of total organic carbon	Depending on the type of material and the variation, amounts of material corresponding to 50,000 tonnes of CO2 and at least four times a year	FIZ GmbH	Yes	n/a
M1 (Clinker CaO),M2 (Clinker MgO)	Kiln 1 (S1)	Emission Factor	Documented In-House methods using XRF for the determination of CaO and MgO	Monthly (and at least every 50,000 tonnes of material)	AMG Superalloys UK Limited trading as AMG Analytical	Yes	n/a
F1 (Coal)	Kiln 1 (S1)	Emission Factor	Documented In-House Method for carbon content (based on Instrumental Determination) conforming to ASTM D5373	Every 20,000 tonnes of fuel and at least six times a year	Knight Energy Services Ltd	Yes	n/a

Source Stream Refs.	Emission Source Refs.	Parameter	Method of Analysis	Frequency	Laboratory Name	Laboratory ISO17025 Accredited	Evidence Reference
F6 (SRF)	Kiln 1 (S1)	NCV	In-house method conforming to BS EN 15400:2011	Every 5,000 tonnes and at least four times a year	Knight Energy Services Ltd	Yes	n/a
F6 (SRF)	Kiln 1 (S1)	Emission Factor	In-House method for carbon content conforming to BS EN 15407:2011	Every 5,000 tonnes and at least four times a year	Knight Energy Services Ltd	Yes	n/a
F6 (SRF)	Kiln 1 (S1)	Biomass Fraction	In-house method conforming to BS EN 15440:2011	Every 5,000 tonnes and at least four times a year	Knight Energy Services Ltd	Yes	n/a
CKD	Kiln 1 (S1)	Emission Factor	Degree of calcination using DIN EN 196-2	Depending on the type of material and the variation, amounts of material corresponding to 50,000 tonnes of CO2 and at least four times a year	FIZ GmbH	Yes	n/a

Detail about the written procedures for the above analysis.

Where a number of procedures are used details of an overarching procedure which covers the quality assurance of analyses methods and links together individual analytical methods is listed.

Title of procedure	EM ET 07 Sampling and Analysis EM ET 13 Sampling Plan Scotchtown
Reference for procedure	EM ET 07 EM ET 13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of these procedures is to describe the standard methods used for the sampling and analysis of fuels and materials and to describe the sampling method and the analysis performed for each fuel and material. A representative sample of coal is sent by either the coal supplier or Mannok Cement laboratory to be analysed in an ISO 17025 accredited laboratory for NCV and carbon content from each shipment and at least 6 times per year in accordance with Annex VII Minimum Frequency of Analyses of the MRR. A representative sample of Solid Recovered Fuel is sent by either supplier or Mannok Cement laboratory to be analysed in an ISO 17025 accredited laboratory for NCV, biomass fraction and carbon content every 5000 t and at least 4 times per year in accordance with Annex VII Minimum Frequency of Analyses of the MRR. A daily composite sample of clinker is analysed internally using XRF analysis and composite samples are sent to an ISO 17025 accredited laboratory for analysis to determine the amount of relevant metal oxides stemming from the decomposition of carbonates. This analysis is used to calculate the emission factor. Raw meal is analysed quarterly in an ISO 17025 accredited laboratory to determine the non-carbonate carbon content. CKD is also analysed quarterly in an ISO 17025 accredited laboratory to determine the degree of calcination.
Post or department responsible for the procedure and for any data generated	The Operator is responsible for ensuring that all fuels are sampled accordingly.
Location where records are kept	Environmental Advisor
Name of IT system used	N/A
List of EN or other standards applied	N/A

z. Sampling Plan

Details about the procedure covering the sampling plan for the analysis table above.

The procedure below covers the elements of a sampling plan as required by Article 33 of the MRR. Where a number of procedures are used, details of an overarching procedure which covers the sampling methods and links together individual sampling methods are listed.

Attachment	**Description**

Attachment	**Description**
EM ET 07 Sampling and Analysis.doc	EM ET 07 Sampling and Analysis
EM ET 13 Sampling Plan Scotchtown.doc	EM ET 13 Sampling Plan Scotchtown

Title of procedure	EM ET 07 Sampling and Analysis EM ET 13 Sampling Plan Scotchtown
Reference for procedure	EM ET 07 EM ET 13
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of these procedures is to describe the standard methods used for the sampling and analysis of fuels and materials and to describe the sampling method and the analysis performed for each fuel and material. A representative sample of coal is sent by either the coal supplier or Mannok Cement laboratory to be analysed in an ISO 17025 accredited laboratory for NCV and carbon content from each shipment and at least 6 times per year in accordance with Annex VII Minimum Frequency of Analyses of the MRR and the sampling plan. A representative sample of Solid Recovered Fuel is sent by either supplier or Mannok Cement laboratory to be analysed in an ISO 17025 accredited laboratory for NCV,biomass fraction and carbon content every 5000 t and at least 4 times per year in accordance with Annex VII Minimum Frequency of Analyses of the MRR and the sampling plan. A daily composite sample of clinker is analysed internally using XRF analysis and a composite sample is sent to an ISO 17025 accredited laboratory for analysis to determine the amount of relevant metal oxides stemming from the decomposition of carbonates. This analysis is used to calculate the emission factor. Raw meal is analysed quarterly in an ISO 17025 accredited laboratory to determine the non-carbonate carbon content. CKD is also analysed quarterly in an ISO 17025 accredited laboratory to determine the degree of calcination.
Post or department responsible for the procedure and for any data generated	The Operator is responsible for ensuring that all fuels are sampled accordingly.
Location where records are kept	Environmental Advisor
Name of IT system used	N/A
List of EN or other standards applied	N/A

aa. Sampling Plan Appropriateness

The procedure to be used to revise the appropriateness of the sampling plan.

Title of procedure	Review and Corrective Action
Reference for procedure	EM ET 10
Diagram reference	N/A

Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to establish a process for handling and investigating non-conformances regarding the sampling plan for the monitoring and reporting of greenhouse gas emissions. Quarterly checks will be carried out on the Monitoring & Reporting Plan and the Sampling plan to ensure that the monitoring plan and sampling plan are appropriate to the current practices on site and any changes in operation or improvement are reflected in the plan and to ensure that the derived samples of fuels or materials are representative for the relevant batch or delivery period and free from bias. Checks will include updating the monitoring plan and sampling plan for process changes when applicable, updating the GHG permit on the basis of external audit findings.
Post or department responsible for the procedure and for any data generated	Environmental Advisor
Location where records are kept	Record of CAR, EMS Records folder
Name of IT system used	N/A
List of EN or other standards applied	N/A

Are stock estimates carried out as part of the emission calculations?	Yes

bb. Year-end reconciliations

The procedure to be used to estimate stocks at the beginning/end of a reporting period where applicable. This should include any source streams monitored using batch metering e.g. where invoices are used.

Title of procedure	GHG Calculation Procedure
Reference for procedure	EM ET 05
Diagram reference	N/A
Brief description of procedure.	The purpose of this procedure is to establish and maintain procedures for the calculation of CO2 from both process and combustion emissions. Annual stock takes will be carried out at the beginning (opening stock take) and the end (closing stock take) of each year. The stocktake will be done in-house and will be witnessed by an independent competent person. The independent witness will provide a written statement of the year end stocks. In-house stock takes will be carried out each month to record stock movement. Stock moved between plants e.g clinker is weighed in and out over the weighbridge and recorded as part of the Monitoring Plan.
Post or department responsible for the procedure and for any data generated	Accounts Department
Location where records are kept	Environmental Advisor
Name of IT system used	N/A
List of EN or other standards applied	N/A

cc. Tracking Instruments

The procedure used to keep track of instruments installed in the installation used for determining activity data.

Title of procedure	Calibration and Maintenance of Measurement Equipment
Reference for procedure	EM ET 06
Diagram reference	N/A
Brief description of procedure.	This procedure covers the requirement that all measuring equipment is tracked, calibrated, adjusted and checked at regular intervals. The weighbridges are calibrated at pre-determined intervals by an external contractor registered with BSI and UKAS against measurement standards traceable to international standards. In addition the Legal Metrology Service test the weighbridges to ensure that they are in conformity with the requirements of the Metrology Acts 1980-1998. Internal Calibration and maintenance is carried out by the Quality Control Department to cross check belt weigher used for addition of additives to cement and as secondary metering devices for process mass balance calculation with the weighbridge as the primary metering device. All calibration reports and certificates are submitted to the Environmental Advisor and held on file.
Post or department responsible for the procedure and for any data generated	Quality Control Department
Location where records are kept	EMS Database GHG Procedures
Name of IT system used	N/A
List of EN or other standards applied	N/A

11. Management

dd. Monitoring and Reporting Responsibilities

Responsibilities for monitoring and reporting emissions from the installation are listed below:

Relevant job titles/posts and provide a succinct summary of their role relevant to monitoring and reporting are listed below.

Job Title / Post	Responsibilities
Environmental Advisor	Environmental Advisor is responsible for the collection, collation, recording and reporting of data/information from the various departments involved in the monitoring and reporting of GHG emissions. It is the responsibility of the Environmental Advisor to complete all necessary correspondence with the Competent Authorities through ETSWAP The Environmental Advisor drafts the GHG procedures and communicates the responsibility of furnishing information for accurate reporting of emissions to each department.
General Manager	Overall responsibility for the management and co-ordination of procedures and responsibilities regarding the monitoring and reporting of GHG emissions
Accounts Department	Supply the necessary data to the Environmental Advisor.
Stores	Supply the necessary data to the Environmental Advisor.
The Operator	The Operator (Mannok Cement Ltd./ Mannok) has the over all responsibility for the management and co-ordination of procedures and responsibilities regarding the monitoring and reporting of GHG emissions. The Operator has the responsibility of obtaining the necessary certificates for coal and diesel from the suppliers and thus submitting these certificates to the Environmental Advisor. The Operator has the responsibility of submitting reports of additives purchased to the Environmental Advisor on a monthly basis. The operator is also responsible for the appointment of external accredited auditors and verifiers

Attachment	Description
Organisational Chart 2020.vsd	Organisational Chart 2020

ee. Assignment of Responsibilities

Details of the procedure used for managing the assignment of responsibilities for monitoring and reporting within the installation and for managing the competencies of responsible personnel in accordance with Article 58(3)(c) of the MRR:

This procedure identifies how the monitoring and reporting responsibilities for the roles identified above are assigned and how training and reviews are undertaken.

Title of procedure	Responsibilities and Competences
Reference for procedure	EM ET 03
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to define, document and communicate the roles and responsibilities of the key personnel involved in the monitoring and reporting of GHG emissions as accurately as defined by the calculation method of the Directive and the tiered approach of the M&R Plan. This procedure outlines the various monitoring and reporting roles assigned to key personnel involved in the monitoring and reporting of GHG emissions. Responsibilities of the Operator (Mannok Cement Ltd), The Environmental Advisor, The Weighbridge Supervisor, The Shift co-ordinator, The Sales Manager/supervisor, The Weighbridge Supervisor, The Technical Manager, The Quality Department and Plant and Production Management are outlined in this procedure. As part of the EM ET 03 Responsibilities and Competences Procedure, the Environmental Advisor communicates the responsibility of furnishing information for accurate reporting of emissions to each key personnel. The Environmental Advisor meets with all key ETS personnel to review and establish if additional training is required.
Post or department responsible for the procedure and for any data generated	Environmental Advisor
Location where records are kept	EMS database GHG Procedures
Name of IT system used	N/A
List of EN or other standards applied	N/A

ff. Monitoring Plan Appropriateness

Details of the procedure used for regular evaluation of the monitoring plan's appropriateness covering in particular any potential measures for the improvement of the monitoring methodology:

Title of procedure	Review and Corrective Action

Reference for procedure	EM ET 10
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to establish a process for handling and investigating non-conformances regarding the monitoring and reporting of greenhouse gas emissions. Quarterly checks will be carried out on the Monitoring & Reporting Plan to ensure that the monitoring plan is appropriate to the current practices on site and any changes in operation or improvement are reflected in the plan. Checks will include updating the monitoring plan for process changes when applicable, updating the GHG permit on the basis of external audit findings. (2) Quarterly checks on the data and the system including the sampling plan will be carried out to assess the performance of the current year's data as it is being compiled and EUETS compliance. This will be done by comparing the data to the previous year's verified and collated data and auditing compliance with the Monitoring and Reporting Plan and the sampling plan.
Post or department responsible for the procedure and for any data generated	Environmental Advisor
Location where records are kept	Environmental Advisor
Name of IT system used	N/A
List of EN or other standards applied	N/A

gg. Data Flow Activities

Details of the procedures used to manage data flow activities in accordance with Article 57 of the MRR:

Title of procedure	Sequence and Interaction of Monitoring and Reporting
Reference for procedure	EM ET 04
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The procedure outlines the system in place, which deals with the monitoring and reporting of GHG emissions and illustrates the flow of data through the installation. The procedures covers the requirement for the co-ordination and interaction of the various roles and responsibilities assigned to key personnel in different departments who are involved in the monitoring and reporting of GHG emissions.
Post or department responsible for the procedure and for any data generated	Environmental Advisor
Location where records are kept	Environmental Advisor
Name of IT system used	N/A
List of EN or other standards applied	N/A
List of primary data sources	Accounts Weighbridge

	IT Sales Laboratory Analysis
Description of the relevant processing steps for each specific data flow activity. Identify each step in the data flow and include the formulas and data used to determine emissions from the primary data. Include details of any relevant electronic data processing and storage systems and other inputs (including manual inputs) and confirm how outputs of data flow activities are recorded	Coal consumption is calculated using a mass balance approach beginning by recording all loads that cross the weighbridge. Activity data is (coal consumption FC = FP + (FS - FE) - FO) * NCV, where FC is fuel consumed, FP is fuel purchased, FS is opening stock, FE is closing stock and FO is fuel used for other purposes. Fuel consumption *NCV* emission factor * oxidation factor provide total CO2. Coal is analysed for NCV and Carbon Content in an ISO 17025 laboratory in accordance with Article 34 MRR . The oxidation of materials is complete and so is taken as 1. SRF consumption is calculated using a mass balance approach beginning by recording all loads that cross the weighbridge. Activity data is SRF consumption FC = FP + (FS - FE)* NCV, where FC is fuel consumed, FP is fuel purchased, FS is opening stock, FE is closing stock. Fuel consumption *NCV* emission factor * oxidation factor provide total CO2.The Non-biomass (fossil) & Biomass fraction (t CO2/T SRF) of the mixed fuel is independently determined by an external laboratory (ISO 17025) and the SRF is analysed for Carbon Content and NCV in an ISO 17025 laboratory in accordance with Article 34 MRR . The oxidation of materials is complete and so is taken as 1. Gas oil/ diesel (a Commercial Standard Fuel) consumed on site is classified as a Minor Source Stream . All gas oil/diesel delivered to the site is measured across a calibrated weighbridge. The quantity of gas oil/diesel used in the kiln (S1) is calculated by a mass balance approach beginning by recording all loads that cross the weighbridge, FC (fuel consumed) in the kiln = FP + (FS -FE), where FP is fuel purchased (from weighbridge records), FS is opening stock (for kiln gas oil) and FE is closing stock (for kiln gas oil). Gas Oil/ Diesel consumption in S2, S3 and S4 is based on weighbridge records only during the year (assuming all purchases are consumed in the year of purchase). Kiln (S1) diesel/gas oil consumption and S2,S3 and S4 gas oil/diesel consumption are then combined to give total gas oil/diesel consumption. Finally diesel used in forklifts for transport is subtracted from the total using the delivery quantity from the suppliers flow meter on the delivery truck. CO2 emissions arising from gas oil (diesel) will be calculated as follows; CO2 emission= Activity data (TJ) *emission factor*oxidation factor. The Activity Data (TJ) is the Fuel Consumed (FC) (kTonnes) * NCV (TJ/kt)

The emission factor and NCV used are country specific and the oxidation factor is assumed to be 1.0.

LPG, Acetylene and Kerosene consumed on site is de-minimis, calculation is based on supplier delivery records only during AEM year (assumption all purchases are consumed in year of purchase). The activity data (TJ) will be calculated by purchases x NCV. CO2 emission will be calculated in accordance with Article 24 of MRR CO2 emission= Activity data (TJ) *emission factor*oxidation factor. The emission factor and NCV used are country specific and the oxidation factor is assumed to be 1.0. Process CO2 is a combination of CO2 emissions from clinker, CO2 emissions from non-carbonate carbon and CO2 emissions from discarded CKD (Cement Kiln Dust). The CO2 (tonnes) is the product of Activity x EF x CF. CO2 emissions from CKD taken out of the process is determined from weighbridge records of the quantity sent off-site (and taking into account any stocks by carrying out an annual survey of any CKD from the process in stock on site). Cement kiln dust (CKD) is classed as a minor source stream and therefore in accordance with Annex IV Section 9.C "Emissions related to discarded dust", Tier 2 is applied for determination of the emission factor based on analysis of representative samples carried out at least 4 times a year in an ISO 17025 accredited laboratory. In calculating CO2 emissions from clinker the clinker activity is recorded via the cement output over the weighbridges plus bagged cement sales. The Clinker Activity is the sum of cement despatched – the difference in cement and clinker stocks – filler used. Filler is calculated: [filler P + (Filler S – Filler E)], where filler P is that purchased, filler S is opening stock and filler E is closing stock. Filler is corrected for moisture content, Mannok Cement carries out internal quarterly moisture tests. Mannok Cement carries out tests internally and also sends composite monthly samples compiled daily to an ISO 170125 laboratory for analysis. Composition data is converted into emission factor using Stoichiometric emission factor for process emissions from Annex VI, section 2, Table 3 of MRR . Conversion factor of 1 shall be used. CO2 emissions from non-carbonate carbon activity data uses total clinker * conversion to clinker. The activity data for non-carbonate carbon is given no tier as it is a de-minimis source stream, it is calculated by multiplying clinker activity data by the inverse production factor to raw meal. The inverse production factor is equal to the industry best practice.This is calculated yearly based on clinker raw material input; Raw meal clinker mass ratio = Clinker raw material usage - stocks + purchases divided by Clinker production.The emission factor applied is Tier 2 as outlined in Section 9.D of Annex IV MRR . Raw meal composite samples will be tested quarterly in an accredited

laboratory. Conversion factor of 1 shall be used. See also attached flow diagram.

Submit relevant documents to record data flow activities

Attachment	Description
EM ET 04 Sequence and Interaction of monitoring and reporting.doc	EM ET 04 Sequence and Interaction of Monitoring and Reporting

hh. Assessing and Controlling Risks

Details of the procedures used to assess inherent risks and control risks in accordance with Article 58 of the MRR:

Title of procedure	Review and Corrective Action
Reference for procedure	EM ET 10
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	In the review and corrective action procedure highlights the principal risks and the associated mitigation measures. Quarterly checks on the data and the system including the sampling plan will be carried out to assess the performance of the current year's data as it is being compiled and EU ETS compliance. These quarterly checks include a review of risks. When new risks are identified the table will be updated by the environmental advisor and mitigation measures will be put into place to minimise risk.
Post or department responsible for the procedure and for any data generated	Environmental Advisor
Location where records are kept	Environmental Advisor
Name of IT system used	N/A
List of EN or other standards applied	N/A

ii. Quality Assurance of Metering / Measuring Equipment

Details of the procedures used to ensure quality assurance of measuring equipment in accordance with Article 58 and 59 of the MRR.

Title of procedure	Calibration and Maintenance of Measurement Equipment
Reference for procedure	EM ET 06
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure to establish and maintain procedures for the calibration and maintenance of

	measurement equipment used for monitoring of greenhouse gas emissions. This procedure covers the requirement that all measuring equipment is calibrated, adjusted and checked at regular intervals. These checks will be rated against and traceable to international measurement standards.
Post or department responsible for the procedure and for any data generated	Calibration contractors will carry out external calibration and maintenance of the weighbridge.
Location where records are kept	EMS database GHG Procedures
Name of IT system used	N/A
List of EN or other standards applied	N/A

jj. Quality Assurance of Information Technology used for Data Flow Activities

Details of the procedures used to ensure quality assurance of information technology used for data flow activities in accordance with Article 58 and 60 of the MRR:

Title of procedure	Quality Assurance of Information Technology
Reference for procedure	EM ET 11
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to ensure quality assurance of information technology used for data flow activities in accordance with the MRR.This procedure covers the requirement to control access, back up, recovery, continuity planning and security of data. All information supplied by IT is backed up on a nightly basis and by an external company who provide a recovery service in the event of complete failure of internal back-up. Access to IT is restricted to authorised personnel only.
Post or department responsible for the procedure and for any data generated	The Operator has overall responsibility for the retention of information, The Environmental Advisor is responsible for recording and archiving this information, The IT department is responsible for the backup of information and data.
Location where records are kept	IT
Name of IT system used	IT
List of EN or other standards applied	N/A

kk. Review and Validation of Data

Details of the procedures used to ensure regular internal reviews and validation of data in accordance with Articles 58 and 62 of the MRR.

Title of procedure	Review and Corrective Action
Reference for procedure	EM ET 10
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to establish a process for handling and investigating non-conformances regarding the monitoring and reporting of greenhouse gas emissions. This procedure describes the process for investigating sources of non-conformances and thus implementing corrective and preventive actions. Quarterly checks on the data and the system including the sampling plan will be carried out to assess the performance of the current year's data as it is being compiled and EUETS compliance. This will be done by comparing the data to the previous year's verified and collated data and auditing compliance with the Monitoring and Reporting Plan and the sampling plan. If the data is unexplainably awry, then there is a possibility of (a) an error in the data, (b) an error in the manner the data has been reported (c) an error in the flow of data through the organisation (d) an error in the metering devices (calibration) (e) an error in the analysis of the fuel, clinker analysis (f) change to the process not yet accounted for (g) New activities beginning at the installation (h) Installation of abatement Equipment, use of alternative fuels (i) Incorrect Emission Factors, Net calorific values being used (j) Unaccounted for contributors to the emission levels A Corrective Action Request is raised by a responsible person and communicated to Production Management.
Post or department responsible for the procedure and for any data generated	Environmental Advisor
Location where records are kept	EMS database, Records
Name of IT system used	N/A
List of EN or other standards applied	N/A

ll. Corrections and Corrective Actions

Details of the procedures used to handle corrections and corrective actions in accordance with Articles 58 and 63 of the MRR:

Title of procedure	Review and Corrective Action
Reference for procedure	EM ET 10
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to establish a process for handling and investigating non-conformances regarding the monitoring and reporting of greenhouse gas emissions. This procedure describes the process for investigating sources of non-conformances and thus implementing corrective and preventive actions.
Post or department responsible for the procedure and for any data generated	Enviromental Advisor
Location where records are kept	EMS database, Records
Name of IT system used	N/A
List of EN or other standards applied	N/A

mm. Control of Outsourced Activities

Details of the procedures used to control outsourced processes in accordance with Articles 59 and 64 of the MRR.

Title of procedure	Sampling and Analysis Procedure, Calibration and maintenance of measuring equipment Procedure,Review and Corrective Action procedure
Reference for procedure	EM ET 07 EM ET 06 EMET10
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Outsourced Activities include sampling by third parties, analysis in ISO 17025 accredited laboratories and calibration and maintenance of measurement equipment (weighbridges). In accordance with Article 64 of MRR the accreditation of each laboratory will be reviewed on an annual basis to ensure validity and to the scope is valid for the contracted analysis, dependent on this review a Corrective Action Request may be raised and communicated to Production Management. External sampling and laboratory analyses will also the checked for quality of data. This will be done be comparing analyses to previous years analyses. In accordance with Article 64 of MRR EC Weighbridge Verification Certificates will be reviewed on an annual basis to ensure validity, dependent on this review a Corrective Action Request may be raised and communicated to Production Management.
Post or department responsible for the procedure and for any data generated	N/A

Location where records are kept	N/A
Name of IT system used	N/A
List of EN or other standards applied	N/A

nn. Record Keeping and Documentation

Details of the procedures used to manage record keeping and documentation:

Title of procedure	EM ET 08 Retention of Information
Reference for procedure	EM ET 08
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure is to establish and maintain a system for the retention of information relating to the installations emissions from all sources of greenhouse gases specified in the permit according to Annex IX of MRR . This procedure allows reproducibility of the determination of emissions by the verifier or another third party.
Post or department responsible for the procedure and for any data generated	Environmental Advisor
Location where records are kept	EMS database GHG Procedures
Name of IT system used	N/A
List of EN or other standards applied	N/A

oo. Risk Assessment

The results of a risk assessment that demonstrates that the control activities and procedures are commensurate with the risks identified:

Attachment	Description
ETS Risk Assessment 2020.pdf	Risk Assessment

pp. Environmental Management System

Does your organisation have a documented Environmental Management System?	Yes
Is the Environmental Management System certified by an accredited organisation?	Yes

System is certified:

12. Changes in Operation

qq. Changes in Operation

Article 24(1) of Commission Decision 2011/278/EC requires that Member States must ensure that all relevant information about any planned or effective changes to the capacity activity level and operation of an installation is submitted by the operator to the competent authority by 31 December each year. Article 12(3) of the MRR further provides that Member States may require information to be included in the monitoring plan of an installation for the purposes of meeting these requirements.

Details of the procedure used to ensure regular reviews are carried out to identify any planned or effective changes to the capacity activity level and operation of the installation that have an impact on the installation's allocation:

The procedure specified below cover the following:

- planning and carrying out regular checks to determine whether any planned or effective changes to the capacity activity level and operation of an installation are relevant under Commission Decision 2011/278/EC; and
- Procedures to ensure such information is submitted to the competent authority by 31 December of each year.

Title of procedure	Activity Level Review
Reference for procedure	EM ET 12
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The purpose of this procedure to establish a process for reviewing the activity level in order to determine if a change of activity level has occurred. It describes the provisions in place at the installation to ensure that all relevant information about any planned or effective changes to the capacity, activity level and operation of an installation is regularly reviewed to identify any changes that have an impact on the installation's allocation under COMMISSION IMPLEMENTING REGULATION (EU) 2019/1842 of 31 October 2019 laying down rules for the application of Directive 2003/87/EC of the European Parliament and of the Council as regards further arrangements for the adjustments to free allocation of emission allowances due to activity level changes. An annual report on the activity level of each sub-installation in the preceding calendar year shall be submitted to the

EPA in accordance with the requirements of the Regulation.

Post or department responsible for the procedure and for any data generated	Environmental Advisor
Location where records are kept	Environmental Advisor
Name of IT system used	N/A

13. Abbreviations

rr. Abbreviations Acronyms or definitions

Abbreviations acronyms or definitions that have been used in this monitoring plan:

Abbreviation	**Definition**
SRF	Solid Recovered Fuel
ETS	Emissions Trading System
EF	Emissions Factor
NCV	Net Calorific Value
OF	Oxidation Factor
KF	Kiln Feed
CKD	Cement Kiln Dust

14. Additional Information

Any other information:

Attachment	**Description**
17025_Bauwesen_FIZ_EN.pdf	FIZ GmbH ISO 17025 accreditation.
1091 AMG Analytical Testing Single.pdf	AMG Analytical ISO 17025 Accreditation.
1765 Knight Energy Services Limited Testing Multiple.pdf	Knight Energy Services Ltd ISO 17025 Accreditation.

15. Confidentiality

ss. Confidentiality Statement

It is the Environmental Protection Agency's policy to make information received by it in the course of its work open to inspection by any person on request. This is in accordance with the provisions of the European Communities (Access to Information on the Environment) Regulations 2007 to 2011.

In the event that you considered that some of the information being submitted of a confidential nature, then the nature of this information and the reasons why it should be considered confidential, with reference to the European Communities (Access to Information on the Environment) Regulations 2007 to 2011 and any amendments must be explicitly requested using the facility below. The Board of the Environmental Protection Agency will consider the requests and if the information can be deemed as confidential and necessary.

Notwithstanding any request for confidentiality, the Environmental Protection Agency explicitly reserves the right to release data to the Commission, including emissions and allocations to the public, on the basis that the data will be used for the purposes foreseen in Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

Please tick this box if you consider that any part of your form should be treated as commercially confidential/sensitive:	false

END of Appendix I.