Schedule 5 Response - Substantial Variation
Celsa Manufacturing (UK) Ltd,
Tremorfa New Melt Shop. Tremorfa Works,
Seawall Road, Cardiff, CF24 5TH
Permit Ref: EPR/TP3639BH

On behalf of:
Celsa Manufacturing (UK) Ltd

Project Reference:
021-1892

Revision:
REV00

Date:
July 2023

Earth & Marine Environmental Consultants Ltd
7th Floor, West One, Forth Banks,
Newcastle Upon Tyne, NE1 3PA, UK
enquiry@eame.co.uk | www.eame.co.uk

United Kingdom | Iraq | Kurdistan Region of Iraq | Guyana

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00	24/07/22	MS	SPR	First Issue to Client

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Abbreviations

ASR	Application Site Report
BAT	Best Available Technique
BGS	British Geological Survey
BREF	Best Available Techniques Reference Documents
DEFRA	Department for Environment Food and Rural Affairs
EA	Environment Agency
EAME	Earth & Marine Environmental Consultants Ltd
EMS	Environmental Management System
FCA	Flood Consequences Assessment
FPMP	Fire Prevention Mitigation Plan
IPPC	Integrated Pollution Prevention and Control
mg/l	milligrams per litre
NGR	National Grid Reference
NRW	Natural Resources Wales
PPM	Planned Preventative Maintenance
SAB	Sustainable Drainage Approval Body
SCR	Site Condition Report
SINC	Sites of Interest for Nature Conservation
SSSI	Site of Special Scientific Interest
µg/l	micrograms per litre

Bibliography

European Comission. (2018). *Best Available Techniques (BAT) Reference Document for Waste Treatment.* Retrieved from https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/JRC113018_WT_Bref.pdf

European Comission. (2018). *Establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU*. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018D1147&from=EN

1 Introduction

1.1 Background

This document has been prepared by Celsa Manufacturing (UK) Ltd ("Celsa") and its environmental consultant Earth & Marine Environmental Consultants Ltd ("EAME") in support of a substantial permit variation as required under Regulation 20 (variation) of the *Environmental Permitting (England and Wales) Regulations 2016* in relation to current activities and proposed activities to be undertaken at Tremorfa New Melt Shop. Tremorfa Works, Seawall Road, Cardiff, CF24 5TH (Permit No. EPR/TP3639BH).

A permit application (variation) was submitted by Celsa Manufacturing (UK) Ltd on 27th July 2022. The following key dates are outlined below:

- 27th October 2022 – Email from NRW stating 5-month delay.
- 4th November 2022 – Email from NRW stating permit determination has been assigned to NRW officer.
- 8th February 2023 – Celsa/NRW conference call asking questions.
- 9th February 2023 – NRW issued request for more information PAN-018725 (EPR/TP3639BH/V010).
- 6th March 2023 – EAME response to NRW in letter (Ref. 021-1892 Celsa Shredder NRW Response March 2023 REV00).
- 6th March 2023 – Revised application package generated (REV01) and sent to Celsa.
- 17th March 2023 – Confirmation of application duly made – (Start of 4-month determination).
- 25th May 2023 – Schedule 5 notice (I) (Ref. PAN-018725 (EPR/TP3639BH/V011)) issued by NRW. A response was required by 09/06/23.
- 30th May 2023 – EAME responded to Schedule 5 (I).
- 23rd June 2023 Schedule 5 notice (II) (Ref. PAN-018725 (EPR/TP3639BH/V010) issued by NRW. A response is required by 24/07/23.

This report relates to Schedule 5 (II). All attachments have been provided as electronic files only as per the original application. Questions and requests for further information from Schedule 5 (II) are outlined within the blue boxes.

1.2 Additional Evidence

Given NRW requested additional information this has been provided (in electronic format) in a series of organised folders (**Table *1-1***). Previously submitted information has not been provided unless it has been subject to amendment and update.

Table 1-1: *Additional evidence submitted*

Folder	Document Reference
Baseline Soil and Groundwater Data	Folders organised by investigation date: **2010 Reports** R-010-003 CELSA Slag Yard Permit Extension SCR (version 01) **2014 Reports** 10652r2_Cardiff Groundwater Investigation Operational Testing **2019 Reports** Environmental & Geo Technical Ground Survey Terra Firma 14958 - Site Investigation Report **2022 Reports** 220615 Ground Conditions Assessment **2023 Reports** 17250 - CELSA Monitoring Wells 2022 021-1892 Celsa Rover Way Baseline Ground Information REV00 *This plan provides an overview summary of the previous investigations.*
BAT Assessment	021-1892 Celsa Cardiff Variation - BAT Assessment REV02 *This is provided as both an Excel filter (with filters) and as a PDF.*
Environmental Management System	Aspect Register 2023 Celsa UK Environmental Policy CPA002_EMS Manual CPB028_EMS Aspect Register_V4.0_2023 CPB032 Emergency Plan ECP14 Waste Management_8 ECP34 Emergency Action Plans

Folder	Document Reference
Groundwater Risk Assessment	021-1892 Celsa Cardiff Variation - Hydrogeological Risk Assessment REV00 **ConSim Model Files** Celsa_Two Layer.csm
Infiltration System	Aqua-Xchange test certificate British Water Code Surface Water Treatment Mitigation indices for SDS Ltd November 2018 PDS033_Standard_Geotextiles polystorm-r_datasheet_-_issue_4_-_sept_17 Terram_T1000_CE_DoP_iss_4_1
Noise Impact Assessment	E3590 - Celsa Noise Report **CadnaA Model Files** E3590 - Noise Model_210723.cna
Quality Management System	CELSA Quality Policy ISO 9001 CARES_21
Risk Assessments	CRUK-OPS-ARA-002-00-Cardiff

Folder	Document Reference
Safe Working Procedures	CRUK-TRA-CRM-001 Shear maintenance CRUK-TRA-CRM-002 telehandler-forklift CRUK-TRA-CRM-003 Material handler CRUK-TRA-CRM-004 Grab attachment CRUK-TRA-CRM-005 360 excavator CRUK-TRA-CRM-006 mobile scissors CRUK-TRA-CRM-007 interceptor CRUK-TRA-CRM-008 Generator CRUK-TRA-CRM-009 Diesel tank and pump CRUK-TRA-CRM-010 Shovel loader CRUK-TRA-CRM-011 Magnet attachment] CRUK-TRA-CRM-012 Leimbach blade change CRUK-TRA-CRM-013 Linderman blade change CRUK-TRA-CRM-014 Copex blade change CRUK-SWP-OPS-001-01 Unloading of materials Rev1 CRUK-SWP-OPS-002-01 Scrap Inspection Rev1 CRUK-SWP-OPS-003-01 Loading of materials Rev1 CRUK-SWP-OPS-004-01 Vehicle and pedestrian movements
Sustainability	9432 CELSA Steel Sustainability Report 2023_AW_Print Celsa UK Mandatory Climate Disclosure - June 2023 crcular_ingles_web_22baja Suststeel Certification 2021-2026

It is important to note that most of the documents listed in **Table 1-1** form part of the active Quality, Environmental, Health and Safety Management System (QEHS) management systems used across the facility *i.e.* they are subject to periodic review and update. All information provided is for information purposes only *i.e.* is not part of the Celsa document management system processes.

2 Groundwater Discharge

NRW Request – We would expect as a minimum monitoring be installed (see BAT 7 of the waste treatment BRef), such as monitoring wells both up-gradient and down-gradient of the filter strips to determine both the groundwater baseline quality and the quality of the groundwater after the filter strips have been able to filter out contaminants. The monitoring should reveal no net change from background water quality, up- gradient compared to down-gradient monitoring. Submit details of proposed groundwater monitoring or provide a more detailed explanation and justification as to why it is not possible to monitor groundwater discharge from the soakaways.

Celsa Manufacturing (UK) Ltd has already undertaken characterisation of the soils and groundwater conditions on the Rover Way permitted installations as part of the Site Condition Report (SCR) (various phases) and as part of the baseline geoenvironmental assessments that are part of the design process for the shredder.

A full package of historic and current ground information has been included within this Schedule 5 submission (2010 – 2023). Most of this information has been provided as part of previous submissions to NRW.

However, Celsa can now provide some new (post permit submission) borehole data and groundwater monitoring (specific to the shredder area). Celsa would propose to utilise these six new monitoring wells (shallow and deep pairs) as part of the installation monitoring programme (**Figure *2-1***) *i.e.*

- BH01/22D (321427E - 176353N) and BH01/22S (321428E - 176352N)
- BH02/22D (321500E - 176299N) and BH02/22S (321499E - 176300N)
- BH03/22D (321595E - 176279N) and BH03/22S (321594E - 176278N)

BH04/22D (321624E - 176354N) and BH04/22S (321624E - 176353N) has been decommissioned due to the construction works in that area.

Celsa does not feel it would be entirely useful to drill and install further monitoring wells near the infiltration systems given the likely tidal influence of the Severn estuary on the shallow groundwater regime (*i.e.* it would be hard to distinguish groundwater quality up and down gradient from the infiltration system). Therefore, given the location of the existing monitoring wells, Celsa would not propose to drill any further monitoring wells.

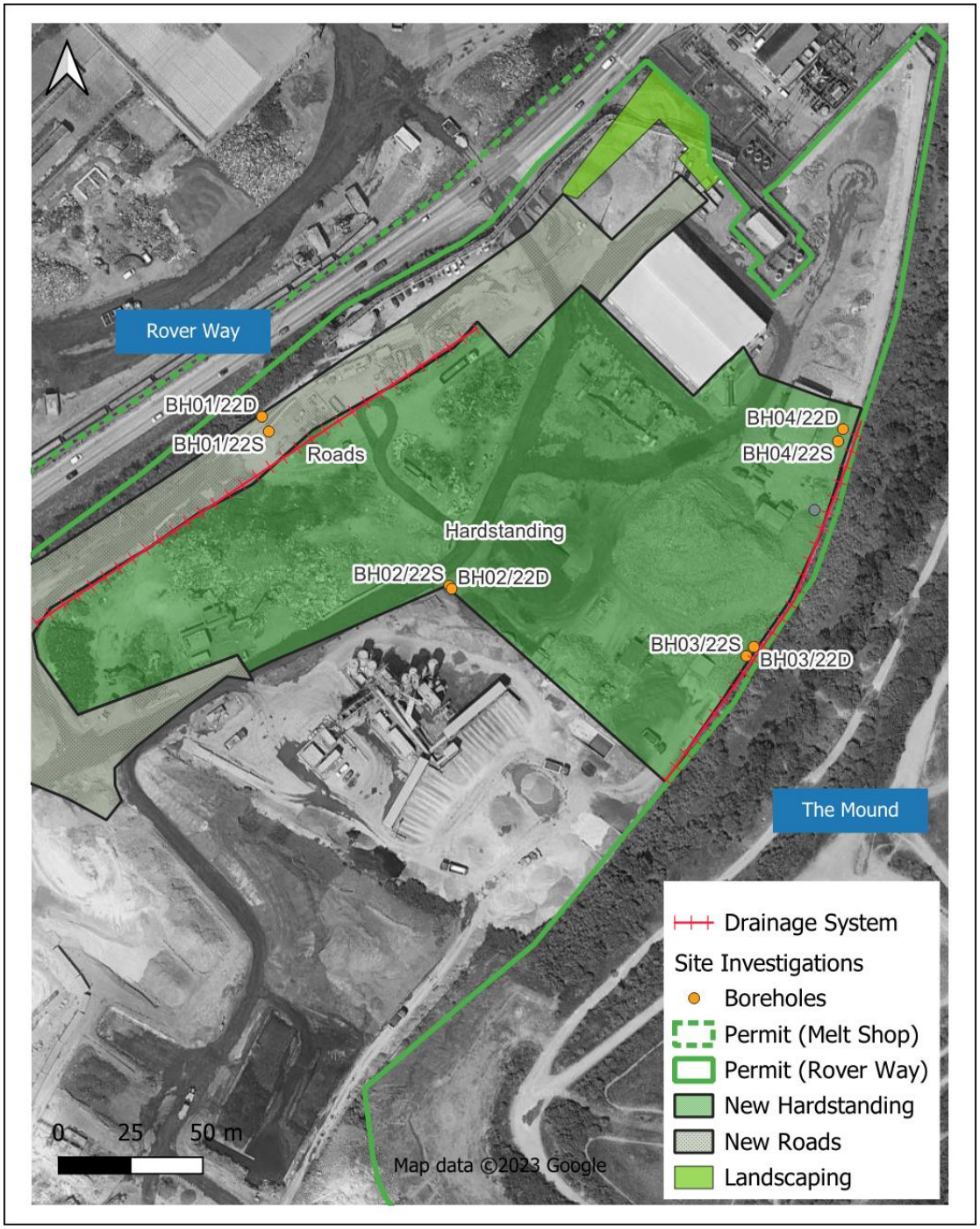

Figure 2-1: *Proposed groundwater monitoring wells*

BH04 will not be available for monitoring purposes. It is shown on **Figure 2-1** as this is new information not previously provided to NRW.

Groundwater Monitoring Frequency

The table within the BATC document (European Comission, 2018) has now been included within the BAT Assessment (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02) and has been filtered to show those parameters considered relevant to the installation, this is produced below (**Table *2-1***).

Table 2-1: *BAT-7 Emissions to Water (Monitoring)*

Substance/Parameter	Frequency (1)	Waste treatment process	Standards
Hydrocarbon oil index (HOI) (4)	Monthly	Mechanical treatment in shredders of metal waste	EN ISO 9377-2
Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Nickel (Ni), Lead (Pb), Zinc (Zn) (3) (4)	Monthly	Mechanical treatment in shredders of metal waste	EN ISO 11885, EN ISO 17294-2, EN
Mercury (Hg) (3) (4)	Monthly	Mechanical treatment in shredders of metal waste	EN ISO 17852, EN ISO 12846
PFOA (3)	Six Months	All waste treatments	None
PFOS (3)	Six Months	All waste treatments	None
Total organic carbon (TOC) (5) (6)	Monthly	All waste treatments except treatment of water-based liquid waste	EN 1484
Total suspended solids (TSS) (6)	Monthly	All waste treatments except treatment of water-based liquid waste	EN 872

Notes

(1) Monitoring frequencies may be reduced if the emission levels are proven to be sufficiently stable.

(2) In the case of batch discharge less frequent than the minimum monitoring frequency, monitoring is carried out once per batch.

(3) The monitoring only applies when the substance concerned is identified as relevant in the wastewater inventory mentioned in BAT 3.

(4) In the case of an indirect discharge to a receiving water body, the monitoring frequency may be reduced if the downstream wastewater treatment plant abates the pollutants concerned.

(5) Either TOC or COD is monitored. TOC is the preferred option, because its monitoring does not rely on the use of very toxic compounds. COD has been removed from the schedule.

Substance/Parameter	Frequency (1)	Waste treatment process	Standards
(6) The monitoring applies only in the case of a direct discharge to a receiving water body.			

All collected groundwater samples would be transferred to approved laboratory supplied glassware before analysis at an appropriate IS17025/MCERTS laboratory with the analytical suite aligned to **Table *2-1***.

Based on the BAT-7 requirements Celsa would propose monthly monitoring of the monitoring wells. However, if after 6 months of monitoring the groundwater concentrations are sufficiently stable, Celsa would propose to decrease the frequency to quarterly. In the event of deterioration or significant change Celsa would review the monitoring frequency in consultation with NRW.

Celsa is concerned that the proposed redevelopment of the mound (located between the Celsa permitted installation and the Severn Estuary) which was granted planning permission in November 2021 (*Planning Ref. 21/02182/MJR | The Removal of Fill Material and the Construction of up to 50,000 Sqm of Industrial Accommodation (B8 Use Class), New Access Roads And Associated Landscaping Works | Land At Rover Way Pengam Cardiff* [1]) could have a detrimental impact on the water quality in the local area and, more specifically, associated with Celsa's permitted area. If the development does go ahead Celsa may proactively choose to increase groundwater monitoring frequency especially along the boundary with the mound.

Supporting Evidence Submitted – Document Reference
R-010-003 CELSA Slag Yard Permit Extension SCR (version 01)
10652r2_Cardiff Groundwater Investigation Operational Testing
Environmental & Geo Technical Ground Survey
Terra Firma 14958 - Site Investigation Report
220615 Ground Conditions Assessment
17250 - CELSA Monitoring Wells 2022
021-1892 Celsa Rover Way Baseline Ground Information REV00

NRW Request – Provide a more detailed technical description on how the Aqua-Xchange works for potential contaminants that they were not designed to filter out. How have you

1 https://www.cardiffidoxcloud.wales/publicaccess/applicationDetails.do?keyVal=ZZZHX9ECDR475&activeTab=summary

considered these contaminants when selecting the material and have you considered if Aqua-Xchange materials use potentially facilitates the discharge of contaminants that it was not designed to filter out. What additional measures would be in place to mitigate or prevent the discharge of containments that the filter material cannot filter out.

Introduction

The drainage design works were undertaken by James and Nicholas and reported within the drainage strategy (Ref. 230217 21121 Issue 3 Scrap Handling Facility, Tremorfa - Drainage Strategy). This strategy was developed after various phases of consultation and discussion with the SuDS Approving Body (SAB).

CIRIA SuDS Manual C753 (2015) is the key document that must be followed to achieve SAB approval. Therefore, all designs have strictly followed this document. The CIRIA C753 guidance provides pollution indices based on land use type. In this instant the highest pollution hazard level was selected as appropriate *i.e.* Total suspended solids (0.8), Metals (0.8) and Hydrocarbons (0.9).

It is therefore critical that the SuDS components selected are suitable to ensure that all surface water is captured and treated sufficiently before being infiltrated into the ground.

The site is currently comprised of unsurfaced ground and therefore any surface water infiltrates into the ground. The proposal involves surfacing of the yard areas with concrete ensuring that all water is captured and directed to a filter strip type infiltration system. The development of the proposed scheme significantly reduces direct infiltration across the current site area.

It is proposed to use a proprietary multi-layered filter strip all along the northern and southern edges of the shredder yard. The SDS Aqua-Xchange is an enhanced engineered filter media that use ionic exchange and filtration to remove soluble pollutants (such as metals), suspended solids and hydrocarbons.

Information supplied by SDS shows that, for a properly installed SDS Aqua-Xchange system, the pollution mitigation indices are for Total suspended solids (0.8), Total Metals (0.9), Soluble metals (1.0) and Hydrocarbons (0.6).

As stated in the Drainage Strategy using one layer of Aqua-Xchange would not be sufficient to satisfy the hydrocarbon index. CIRIA C753 states when an individual component is insufficient and two or more components in series will be required then following formula applies:

- Total SuDS Mitigation Index = Mitigation Index + 0.5 (Mitigation Index)

It is therefore proposed to use two layers of SDS Aqua-Xchange which will be separated with a 250 mm clean stone layer. This will therefore give the filter strips the following pollution mitigation indices and satisfy all the CIRIA criteria, as follows:

- Total Suspended Solids (TSS) – 0.8 + 0.4 = 1.2
- Total Metal Mitigation – 0.9 + 0.45 = 1.35
- Soluble Metal Mitigation – 1.0 + 0.5 = 1.5
- Hydrocarbons – 0.6 + 0.3 = 0.9

Potential Contaminants

It is important to note that the design specification for the proposed treatment system aligns with the BATC requirements (European Comission, 2018) *i.e.* it aims to address Total organic carbon (TOC), Total suspended solids (TSS), Hydrocarbon oil index (HOI), Arsenic (expressed as As), Cadmium (expressed as Cd), Chromium (expressed as Cr), Copper (expressed as Cu), Lead (expressed as Pb), Nickel (expressed as Ni), Mercury (expressed as Hg) and Zinc (expressed as Zn).

Given the potential contaminants identified the filter media and design was selected on that basis. It is important to note that the filter strip design has been designed to deal with surface water run-off from the concrete pad during normal operating conditions. During an abnormal or emergency scenario (*e.g.* fire or uncontained spill) the discharge into the filter strips would be stopped. Therefore, the Aqua-Xchange infiltration system will only be used to treat the stated potential contaminants at the designed flow rates and concentrations.

Isolation

As stated in the drainage strategy (Ref. 230217 21121 Issue 3 Scrap Handling Facility, Tremorfa - Drainage Strategy) during an abnormal or emergency situation (*e.g.* fire) the surface water flows will be isolated and contained by the use of penstock valves located at each discharge point in the concrete bund wall thus preventing the release to ground of potentially untreatable substances.

Supporting Evidence Submitted – Document Reference
Aqua-Xchange test certificate
British Water Code Surface Water Treatment
Mitigation indices for SDS Ltd November 2018
PDS033_Standard_Geotextiles
polystorm-r_datasheet_-_issue_4_-_sept_17
Terram_T1000_CE_DoP_iss_4_1

NRW Request – To what degree has the filter strip design taken into account climate change factors such as tidal surge and extreme rainfall.

The proposed drainage strategy (Ref. 230217 21121 Issue 3 Scrap Handling Facility, Tremorfa - Drainage Strategy) has been developed in accordance with the following:

- CIRIA SuDS Manual C753 published in 2015.
- Sewers for Adoption 7th Edition by WRc plc.
- Geotechnical Site Investigation Report by Terra Firma (Wales) Ltd ref. DE/17250/New Road and dated 8th June 2022.
- Flood Consequences Assessment (FCA) Report ref. JBAU-XX-XX-RP-Z-0001-S3-P01 by JBA Consulting dated June 2022.
- Guidance Note 16 Fire Prevention & Mitigation Plan Guidance – Waste Management dated August 2017 by Natural Resources Wales.

The FCA report has fully considered the implications of tidal flooding and extreme rainfall. The drainage strategy has therefore fully considered information and advice contained in the FCA.

NRW Request – The environmental quality of the specific ground materials and conditions within which the filter strips will be constructed and will operate, must be characterised and assessed as the historic site investigations performed to date have not focused sufficiently and specifically on the filter strip areas.

This information submission includes some new (post permit submission) borehole data and groundwater monitoring. Celsa would propose to utilise these new monitoring wells as part of the installation monitoring programme (**Figure *2-1***) *i.e.*

- BH01/22D (321427E - 176353N) and BH01/22S (321428E - 176352N)

- BH02/22D (321500E - 176299N) and BH02/22S (321499E - 176300N)
- BH03/22D (321595E - 176279N) and BH03/22S (321594E - 176278N)

Celsa feels that the installation area has been sufficiently characterised, both within the infiltration installation area (*i.e.* maximum installation depth) and the underlying geological profile. Therefore, given the provided additional information, Celsa would not propose to conduct any further ground condition assessments.

Supporting Evidence Submitted – Document Reference
R-010-003 CELSA Slag Yard Permit Extension SCR (version 01)
10652r2_Cardiff Groundwater Investigation Operational Testing
Environmental & Geo Technical Ground Survey
Terra Firma 14958 - Site Investigation Report
220615 Ground Conditions Assessment
17250 - CELSA Monitoring Wells 2022
021-1892 Celsa Rover Way Baseline Ground Information REV00

NRW Request – Submit a detailed risk assessment on the proposed discharge to ground including a H1 assessment for the substances in line with the environment agencies guidance Groundwater risk assessment for your environmental permit - GOV.UK (www.gov.uk). This should also reference the possible contaminants that could be discharged to ground (with reference to BAT-AEL as described within in BAT 20 of the Waste Treatment BRef).

EAME discussed the nature of the proposed releases via the infiltration system with NRW on 28/06/23 *i.e.* it is more akin to a diffuse linear release than a point source release. EAME also discussed the suitability of using H1 to make this assessment. EAME did consider the use of the Infiltration Worksheet but the H1 Guidance states:

Specifically, we have developed the Infiltration Worksheet to help determine the risk to groundwater from discharges of treated effluent via infiltration systems (such as a drainage field designed to British Standards) and it should only be used in this context.

Given that statement, and after discussions with our groundwater modeller (Philip Lewis – LMB Geosolutions Limited) it was concluded that ConSim (a detailed quantitative risk assessment) might be more appropriate.

A standalone Hydrogeological Risk Assessment is provided within the Schedule 5 submission.

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - Hydrogeological Risk Assessment REV00
Celsa_Two Layer.csm

3 Best available techniques (BAT for waste treatment)

NRW Request – Provide an updated BAT (best available techniques) assessment for waste treatment as outlined in the BAT Reference (BRef) document (here) assessment demonstrating that all applicable BAT conclusions are met. Insufficient evidence has not been submitted against the following BAT Conclusions to demonstrate compliance.

A revised BAT assessment has been provided that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02 CPA002_EMS Manual

NRW Request – BAT 1 - While an ISO14001 certified environment management system (EMS) will meet most of the requirements of BAT 1 it does not meet all of the requirements such as following cleaner technologies, whole life plan consideration, regular sectoral benchmarking *etc.* Review and provide additional information to demonstrate compliance with all 15 features described within BAT 1.

The term 'following cleaner technologies' is not defined within the BATC Guidance but is generally used to mean the avoidance of environmental damage through use of materials, processes, or practices to eliminate or reduce the creation of pollutants or wastes. It is important to remember that the installation is a scrap metal shredder designed to recover metals for processing and recycling within the adjacent Electric Arc Furnace (EAF). This is inherently a cleaner technology than the standard Blast Furnace-Basic Oxygen Furnace approach (*i.e.* use of primary materials).

CELSA Group is an integrated company with a fully circular industrial process: all the products it manufactures are 100% recyclable countless times; the steel it produces contains 93.5% recycled steel (scrap); recovers 90% of the waste generated in its processes; it contributes to the recovery and recycling of 9.5 Mt of waste each year. Celsa Group is already a low-emission company today, with CO_2 emissions of scope 1, 2 and 3, six times lower than those of the traditional steel manufacturing route, thanks to the production via EAF.

Celsa Steel UK's long-term goals and commitments to the circular economy are outlined within the provided Sustainability Statement 2023. Cleaner technology and improvement are a core company objective.

A revised BAT assessment has been provided that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02
9432 CELSA Steel Sustainability Report 2023_AW_Print
Celsa UK Mandatory Climate Disclosure - June 2023
crcular_ingles_web_22baja
Suststeel Certification 2021-2026

NRW Request – BAT 2 - Provide more details on how your waste acceptance criteria meets the requirements of BAT 2 a-g.

A revised BAT assessment has been provided that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

NRW Request – BAT 3 - Provide more details on how your EMS meets all relevant points within this BAT conclusion (BAT 3 i-iii).

A revised BAT assessment has been included that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

In addition, a new table has been added to the BAT assessment that screens and summarises the relevant parameters related to the emissions to air (related to shredders).

Table 3-1: *BAT-8 Emissions to Air (Monitoring)*

Substance/Parameter	Frequency (1)	Waste treatment process
Brominated flame retardants (2)	Annual	Mechanical treatment in shredders of metal waste
Dioxin-like PCBs	Annual	Mechanical treatment in shredders of metal waste (2)
Dust	Six monthly	Mechanical treatment of waste

Substance/Parameter	Frequency (1)	Waste treatment process
Metals and metalloids except mercury (*e.g.* As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Tl, V) (2)	Annual	Mechanical treatment in shredders of metal waste
PCDD/F (2)	Annual	Mechanical treatment in shredders of metal waste
TVOC	Six monthly	Mechanical treatment in shredders of metal waste

Notes

(1) Monitoring frequencies may be reduced if the emission levels are proven to be sufficiently stable.

(2) The monitoring only applies when the substance concerned is identified as relevant in the waste gas stream based on the inventory mentioned in BAT 3.

(3) Instead of EN 1948-1, sampling may also be carried out according to CEN/TS 1948-5.

(4) The odour concentration may be monitored instead.

(5) The monitoring of NH3 and H2S can be used as an alternative to the monitoring of the odour concentration.

(6) The monitoring only applies when solvent is used for cleaning the contaminated equipment.

The relevant BAT-AELs are outlined in BAT25. A dust BAT-AEL of 5 mg/Nm^3 has been proposed for emission point A11. This is aligned to the BATC requirement.

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

NRW Request – BAT 4 - Provide more details on how your procedures will meet the requirements of the points (BAT 4 a-d) of this BAT conclusion.

A revised BAT assessment has been included that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

NRW Request – BAT 6 - Provide more details and summarise how your proposed drainage strategy achieves the requirements of this BAT conclusion.

The response in relation to BAT-6 is combined with BAT-7 below.

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

NRW Request – BAT 7 - Provide more details on how you will achieve this BAT and monitor for emissions to water. In the BAT statement you have said that you will meet this BAT but in the not duly made response it was stated that monitoring would not be done.

The response below relates solely to surface water entering the filter strips. Groundwater sampling and analysis is outlined within *Section 2*.

The BAT-7 table within the BATC document (European Comission, 2018) has now been included within the BAT Assessment (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02) and has been filtered to show those parameters considered relevant to the installation (based on the BATC requirements), this is outlined in **Table *2-1***.

It is important to note that the 'emissions to water' from the installation are to be made via a combined infiltration treatment system (**Figure *3-1***) not via a single point source release, therefore the provision and installation of automatic sampling devices tested and certified to the MCERTS performance standard are not considered practicable.

Figure 3-1: *Simplified drainage strategy*

The drainage strategy (Ref. 230217 21121 Issue 3 Scrap Handling Facility, Tremorfa - Drainage Strategy) states that:

- **Northern boundary filter strip** – Two filter strips that will be separated between the precast fencing. Both filter strips will have a length of 196 metres.
- **Southern boundary filter strip** – Single filter strip that will have a length of 142 metres.
- **Road filter strip** – The proposed filter strip will be spilt into three sections due to the positioning of the roundabout. Road filter strip has an overall length of 81 metres.

Given the length of the filter strips it is therefore suggested that periodic composite sampling is undertaken when surface water is flowing from the engineered hardstanding into the infiltration treatment systems. Each of the infiltration treatment systems is to be installed with a minimum 150 mm freeboard between the engineered slab and the filter strip. This should allow the temporary placement of a suitable collection vessel (**Figure *3-2***).

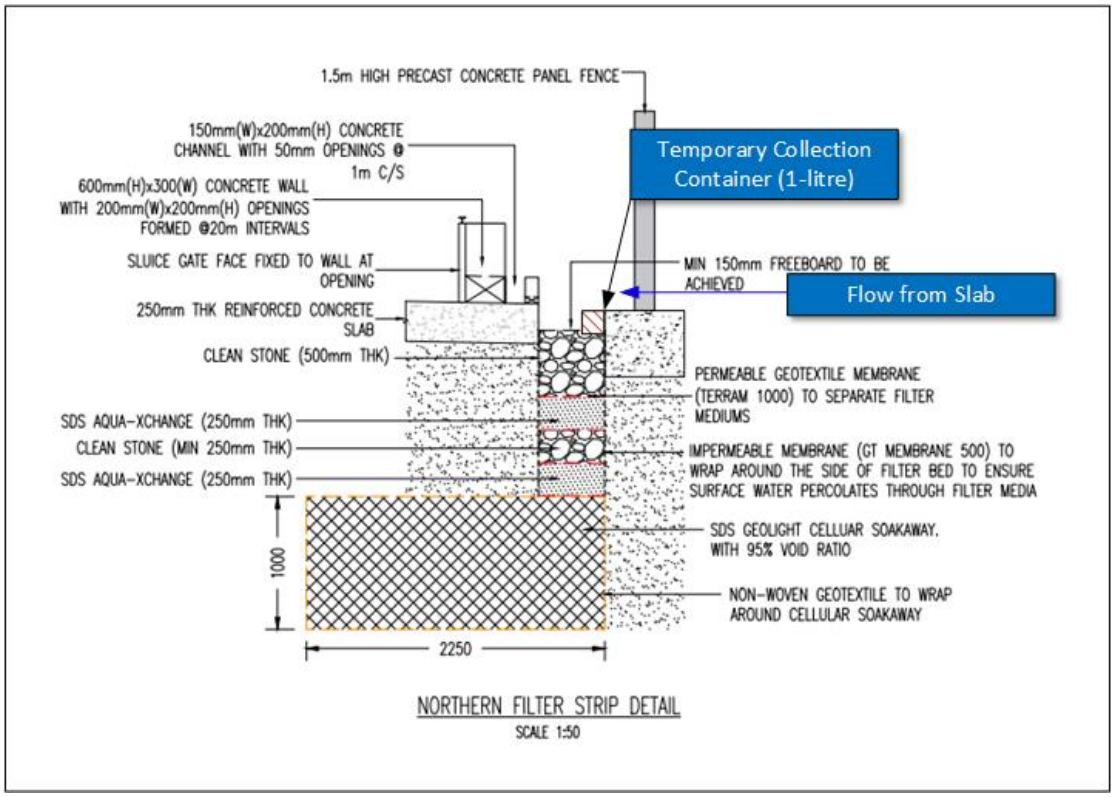

Figure 3-2: *Surface water run-off sample collection*

Celsa appreciates that the sample collection method is unusual and falls slightly outside the standard guidance[2] but it would allow the operator to demonstrate the water quality entering the filter strip treatment system.

All collected samples would be transferred from the collection vessel to approved laboratory supplied glassware before analysis at an appropriate IS17025/MCERTS laboratory with the analytical suite aligned to **Table *2-1***.

Celsa would propose that one sample point is installed (agreed with NRW) in each of the filter strips (3 in total). The sample points would be agreed post completion of the filter strips.

Based on the BAT-7 requirements Celsa would propose monthly monitoring of the surface water run-off (where possible). It is important to note that, during dry periods there will be no discharge via the filter strips and hence no sampling will be undertaken. If after 6 months of monitoring the concentrations are sufficiently stable, Celsa would propose to decrease the

2 https://www.gov.uk/guidance/monitoring-discharges-to-water-guidance-on-selecting-a-monitoring-approach#approaches-to-monitoring-discharges

frequency to quarterly. In the event of deterioration or significant change Celsa would review the monitoring frequency in consultation with NRW.

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

NRW Request – BAT 9 - Provide more details on which of the individual techniques outlined in this BAT are to be implemented in order to achieve the requirements of BAT 9.

BAT9 states - BAT is to monitor diffuse emissions of organic compounds to air from the regeneration of spent solvents, the decontamination of equipment containing POPs with solvents, and the physico-chemical treatment of solvents for the recovery of their calorific value, at least once per year using one or a combination of the techniques given below.

a. Measurement

b. Emission Factors

c. Mass balance

The installation relates to the processing of scrap metals not solvents.

A revised BAT assessment has been included that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02). BAT-9 is shown as N/A.

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

NRW Request – BAT 11 - Provide more details on how you achieve the requirements of this BAT. The original submission only made reference to monitoring of water consumption for dust abatement but have not mentioned the other aspects of this BAT conclusion.

A revised BAT assessment has been included that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

Supporting Evidence Submitted – Document Reference

NRW Request – BAT 14 - Summarise which of the technique(s) (one or more) of BAT 14 (BAT 14 a-h) are applied to meet the requirements of this BAT conclusion.

A revised BAT assessment has been included that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

NRW Request – BAT 19 - Provide more detail on which of the individual techniques outlined in this BAT (BAT 19 a-i) are to be implemented at the site in order to meet the requirements of this BAT conclusion.

A revised BAT assessment has been included that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

NRW Request – BAT 20 - Provide more details and summaries on how the drainage strategy and use of filtration strips achieve the BAT. Provide which substances list with BAT-AELs for direct discharge are likely to be within the discharge to ground through the soakaway (both before and after the filtration) and how the techniques applied will allow to reach these limits. If the substance are not applicable provide justification on the reason why they do not apply.

A revised BAT assessment has been included that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02). The revisions include three new worksheets:

- BAT20 – Wastewater treatment techniques
- BAT20 – BAT-associated emission levels (BAT-AELs) for direct discharges to a receiving water body (Table 6.1)
- BAT20 – BAT-associated emission levels (BAT-AELs) for indirect discharges to a receiving water body (Table 6.2).

Wastewater Treatment Techniques

The BATC wastewater treatment techniques (BAT20) have been reviewed against the proposed drainage strategy (Ref. 230217 21121 Issue 3 Scrap Handling Facility, Tremorfa - Drainage Strategy) provided within the variation application.

The direct infiltration of surface water run-off (from the installation) to soil (without treatment) would not be acceptable and therefore would not meet the required BATC standard. However, James and Nicholas have designed the drainage strategy (with treatment) to meet the requirements outlined within CIRIA C753 and the BATC Guidance.

The application of a SDS Aqua-Xchange material (multiple layers) in combination with clean stone (multiple layers), Terram 1000 geotextile (multiple layers) and Polystorm R-attenuation crates aligns to the BATC options with respect to the available treatment techniques *i.e.* techniques based on adsorption, ion exchange and filtration.

EAME contacted Dr David Ward (Senior Lecturer in Energy Systems and Sustainability) of the Faculty of Science, Business and Enterprise, Department of Physical, Mathematical and Engineering Sciences, University of Chester who undertook the original British Water Code of Practice testing of the proposed SDS Aqua-Xchange material. A summary of his comments is provided below:

- The British Water Code of Practice is very specific in that it limits the test to the behaviour of just copper and zinc (expressed as Cu and Zn). However, both these metals can be considered reasonable surrogates for the behaviour of the other metals listed below (as outlined in **Table *3-2***). He recalls doing related work for lead (expressed as Pb) and the results were at least similarly as effective.

- Regarding Total suspended solids (TSS), although this was not measured during the British Water Code of Practice testing, the ion exchange bed material should also act as a filter and will ultimately work to trap solid particles within its packed structure. Dr. Ward recalls observing that the material in its "as received" state did release some fine solids to the outlet stream (*i.e.* stream initially appeared cloudy). However, this was finite as the outlet stream eventually became visibly clear state as testing progressed. Although he tested the material in isolation (*i.e.* as a single layer), he understands that in practice the material is installed as part of a multi-layered bed in which the other sub-layers would work to capture and contain any intrinsic fines released.

- Dr David Ward had no direct experience with Total organic carbon (TOC) and Hydrocarbon oil index (HOI) with respect to the tested material, but he is aware that similar materials have a positive impact with regards both these metrics. Certainly, a proportion of the incoming TOC can be expected to be in particulate form and will be captured as part of the TSS.

Additional information has been obtained from the supplier outlining the mitigation indices for the Aqua-Xchange material with respect to TSS, total metals, soluble metals and hydrocarbons.

It is important to remember that the surface water treatment technique has been designed to deal with surface water run-off generated during normal operational conditions. In the event of an abnormal or emergency situation *e.g.* leak or spill the contaminant will be contained and removed at source. In the event of a fire which generates fire water the entire drainage system will be isolated.

BAT-EALs (direct release to water)

The BAT-associated emission levels (BAT-AELs) for direct discharges to a receiving water body have been filtered based on the BATC criteria. The filtered list of applicable BAT-AELs is outlined in **Table *3-2***.

Table 3-2: *Relevant BAT-EALs – direct discharge to water*

Substance/Parameter	BAT-AEL	Comments
Total organic carbon (TOC)	10 – 60 mg/l	According to the BATC Guidance TOC monitoring is the preferred option because it does not rely on the use of very toxic compounds. COD has not therefore been included.
Total suspended solids (TSS)	5 – 60 mg/l	-
Hydrocarbon oil index (HOI)	0.5 – 10 mg/l	-
Arsenic (expressed as As)	0.01– 0.05 mg/l	-
Cadmium (expressed as Cd)	0.01 – 0.05 mg/l	-
Chromium (expressed as Cr)	0.01 – 0.15 mg/l	-
Copper (expressed as Cu)	0.05 – 0.5 mg/l	-
Lead (expressed as Pb)	0.05 – 0.3 mg/l	According to the BATC Guidance the upper end of the range is 0.3 mg/l for mechanical treatment in shredders of metal waste.
Nickel (expressed as Ni)	0.05 – 0.5 mg/l	-
Mercury (expressed as Hg)	0.5 – 5 µg/l	-

Substance/Parameter	BAT-AEL	Comments
Zinc (expressed as Zn)	0.1 – 2.0 mg/l	According to BATC Guidance the upper end of the range is 2 mg/l for mechanical treatment in shredders of metal waste.

BAT-EALs (indirect release to water)

An indirect discharge is classified by the BAT Guidance as a 'Discharge which is not a direct discharge'. A direct discharge is classified as a 'Discharge to a receiving water body without further downstream wastewater treatment'. The BAT-AELs associated with Table 6.2 therefore do not apply to the application.

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02
British Water Code Surface Water Treatment
Mitigation indices for SDS Ltd November 2018
PDS033_Standard_Geotextiles
Terram_T1000_CE_DoP_iss_4_1
Aqua-Xchange test certificate
polystorm-r_datasheet_-_issue_4_-_sept_17

NRW Request – BAT 21 - Provide more details on how the systems in place will meet the induvial BAT conclusions (BAT 21 a-c).

A revised BAT assessment has been included that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

A copy of the current accident plan (CPB032 Emergency Plan) and associated actions plans (ECP34 Emergency Action Plans) has been provided within this submission. It is important to note that these are live documents within the EMS that are subject to review and update.

The other specific protection measures mentioned in the BATC Guidance are outlined within the previously submitted ECPXX Shredder and Shear - Deflagration Management Plan - Rev 0 and ECPXX Shredder and Shear - Fire Prevention Management Plan - Rev 0.

The management of accidents, Incidents, complaints, and non-conformances are managed through the existing processes that form part of the ISO 14001 EMS. These processes are

detailed within various SWPs (*e.g.* CRUK-SWP-OPS-002-01 Scrap Inspection Rev1) and the EMS Manual (Ref. CPA002).

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02
CPB032 Emergency Plan
ECP34 Emergency Action Plans
CPA002_EMS Manual

NRW Request – BAT 26 - Provide more details on how the site's accident management plan (or any other associated documents) meets the requirements of this BAT (including the individual points BAT 26 a-c).

A revised BAT assessment has been included that provides the additional requested information (Ref. 021-1892 Celsa Cardiff Variation - BAT Assessment REV02).

The primary compliance mechanism is the application of the Safe Working Procedure for Scrap Inspection (Ref. CRUK-SWP-002-01). This SWP also includes processes for dealing with non-complaint loads that could, if processed, give rise to unplanned emissions. The Celsa Emergency Action Plans (ECP34, April 2023) are then in-place to mitigate and manage emergency situations.

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02
CPB032 Emergency Plan
ECP34 Emergency Action Plans
CRUK-SWP-OPS-002-01 Scrap Inspection Rev1

NRW Request – BAT 27 and BAT 28 - These BAT conclusions are also applicable to mechanical treatment of metal waste by shredding but are not listed in the BAT assessment document (submitted 06/03/2023). Provide details on what techniques are applied to meet the requirements of these BAT conclusions (BAT 27a, BAT 27b and/or BAT 27c and BAT 28).

This was a print to PDF error in the original submission (*i.e.* the assessment of BAT27 and BAT28 were in the original spreadsheet). The export has been checked and BAT27 and BAT28 are now included.

Supporting Evidence Submitted – Document Reference
021-1892 Celsa Cardiff Variation - BAT Assessment REV02

4 Noise Impact Assessment

NRW Request – Submit a revised noise impact assessment and amended modelling files that does not propose the use of temporary waste piles as a noise barrier.

The Noise Impact Assessment Section 5.3 (Ref. 021-1892 E3195 Celsa Noise Impact Assessment Report_v1-1) states that:

Plant items have been modelled in the locations presented in Figure 1. Allocated material piles indicated on the layout plan have been modelled as 3m barriers. These piles will be near continuous in their generation and have been considered as permanent. No other consideration of possible screening afforded by walls and barriers within the surrounding area has been included.

The previous noise assessment did not state that the temporary waste piles were located to act as a noise barrier. The location of the piles relates to the shredder/shear input/output storage locations. Without waste piles (unprocessed/processed) the shredder/shear will not function *i.e.* the waste piles would be considered a direct associated activity (to the stationary technical unit) as defined under the Limb (ii) definition outlined within RGN2 (Appendix 2)[3].

With respect to the size of the piles modelled it was assumed that these would (on average) be 3 metres which is less than the 4-metre maximum allowed (for loose waste stacks) as stated within the current Fire Prevention & Mitigation Plan (FPMP) Guidance[4]. This was considered a realistic pile size during operation as materials are added to/removed from input/output piles. However, considering NRW's comments Entran has remodelled the installation assuming no waste piles are present on-site within the revised installation area.

Supporting Evidence Submitted – Document Reference
E3590 - Celsa Noise Report E3590 - Noise Model_210723.cna

3 Environment Agency (2019). Regulatory Guidance Series, No RGN 2, Understanding the meaning of regulated facility, version 4, April 2019.

4 NRW (2017). Fire Prevention & Mitigation Plan Guidance –Waste Management, Guidance Note 16, Document Owner: Regulatory Business Board, Version 2, August 2017.

Annex A: Noise Impact Assessment

Annex B: Groundwater Risk Assessment

Annex C: BAT Assessment

Annex D: Other Supporting Information