

## Appendix C2 – rev. 1

### Releases, techniques and monitoring

#### 1. Normal operating conditions: Releases, techniques and monitoring

Table 1.1 Normal operating conditions: Releases, techniques and monitoring

Activity	Emissions to...	App. C1 ref and plant ref.	Emissions	Control type	Emission point reference / location	Current Monitoring	Past results	Comments
Pattern making	Air	Para 3	Wood dust and chippings	Abatement – Vents internally LEV-20 LEV-21	Appendix B3-3: X2, X3 Internal to Jubilee building	Environmental Management System (EMS) / Site housekeeping	--	
New sand delivery /	Air	Para 2.1 Hopper H3	TPM	Abatement through LEV-09, vents internally	Appendix B3-2: X1 Internal to Foundry building	EMS / Site housekeeping		
Sand storage Hoppers	Air	Para 4 Hopper H1, H2, H4, H5, H6, H7	TPM	Abatement through LEV-09, LEV-03 and LEV-22	Appendix B3-2, X1, X4 and X5 Internal to Foundry Building	EMS / Site housekeeping		
Floor mould and core making sand mills, producing air-set resin bonded sand	Air	Para 4 Plant EP-02, EP-03, EP-04	Formaldehyde Phenol Esters	Extraction through general building ventilation roof fans	Appendix B3-2, as marked on drawing	Daily observation of emission and odour	No trend of adverse results	

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(cont...) Table 1.1 Normal operating conditions: Releases, techniques and monitoring

Activity	Emissions to...	App. C1 ref and plant ref.	Emissions	Control type	Emission point reference / location	Current Monitoring	Past results	Comments
Firing off of mould coatings	Air	Para 4	TPM Oxides of carbon Propan-2-ol	Extraction through general building ventilation roof fans	Appendix, as marked on drawing	Daily observation of emission and odour	No trend of adverse results	
Operating 2t and 10t induction furnaces	Air	Para 6, plant ref E and H	TPM Metals Combustion gases	--	--	Daily observation of emission and odour		Metal charges are controlled to minimise and exclude foreign non-metal content – e.g. plastics, coatings, oil etc.

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(cont.) Table 1.1 Normal operating conditions: Releases, techniques and monitoring

Activity	Emissions to...	App. C1 ref and plant ref.	Emissions	Control type	Emission point reference / location	Current Monitoring	Past results	Comments
Operating 2.75t and 5t EAFs	Air	Para 6, Plant ref C and F	TPM Metals Combustion gases	Abatement through LEV-14	Appendix B3-2, X6 To atmosphere, located on storage yard above and adjacent to Leek Road	Continuous indicative monitoring with alarm level set at 80% of emission limit  Daily observation of emission and odour  24 monthly manual extractive test of emissions for Total Particulate Matter (TPM) , Cd, Cu, Pb Sum of Ni Co Cr Sn and Cd	No trend of adverse results  All results on manual extractive test are under the prescribed limits	Note all metals tested for on the manual extractive test are element and their compounds

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(cont...) Table 1.1 Normal operating conditions: Releases, techniques and monitoring

Activity	Emissions to...	App. C1 ref and plant ref.	Emissions	Control type	Emission point reference / location	Current Monitoring	Past results	Comments
Operating nominal 9t AOD vessel	Air	Para 6, plant ref G	TPM Metals	Abatement through LEV-14	Appendix B3-2, X6 To atmosphere, located on storage yard above and adjacent to Leek Road	Continuous indicative monitoring with alarm level set at 80% of emission limit  Daily observation of emission and odour  24 monthly manual extractive test of emissions for TPM, Cd, Cu, Pb Sum of Ni Co Cr Sn and Cd	No trend of adverse results  All results on manual extractive test are under the prescribed limits	Note all metals tested for on the manual extractive test are element and their compounds
Operating two off 20t induction furnaces	Air	Para 6, plant ref J and K	TPM Metals Combustion gases	Abatement through LEV-23	Appendix B3-3, X-11	Continuous qualitative monitoring with alarm level set at 80% of emission limit		

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						24 monthly manual extractive test of emissions for TPM, Cd, Cu, Pb Sum of Ni Co Cr Sn and Cd		
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(cont.) Table 1.1 Normal operating conditions: Releases, techniques and monitoring

Activity	Emissions to...	App. C1 ref and plant ref.	Emissions	Control type	Emission point reference / location	Current Monitoring	Past results	Comments
Tapping molten metal, inc. Ca-wire injection of ladles	Air	Para 6, plant C, E, F, H, G, L, M	TPM Carbon oxides	Extraction through general building ventilation roof fans	Appendix, as marked on drawing	Daily observation of emission and odour	No trend of adverse results	
Operation of induction furnaces, arc furnaces	Air	Para 6 Plant C, E, F, H	Water vapour	Cooling towers	Appendix B3-3, as marked on drawing Located on rear yard adjacent to Leek Road	COSHH / Legionnaires control records	No trend of adverse results	Note 2 off 20t induction furnaces will not utilise cooling towers
Casting of molten metal	Air	Para 7	TPM Carbon oxides Formaldehyde Phenols Aromatics	Extraction through general building ventilation roof fans	Appendix, as marked on drawing	Daily observation of emission and odour	No trend of adverse results	
Sand reclamation	Air	Para 9, plant ref EP-01	TPM	Abatement through LEV-10	Appendix B3-3, X7 To atmosphere, located on storage yard above and adjacent to Leek Road	Daily observation of emission and odour High water level alarm Low water level alarm  24 monthly manual extractive test for TPM	No trend of adverse results	

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(cont...) Table 1.1 Normal operating conditions: Releases, techniques and monitoring

Activity	Emissions to...	App. C1 ref and plant ref.	Emissions	Control type	Emission point reference / location	Current Monitoring	Past results	Comments
Shot-blasting of castings	Air	Para 10, EP-6 (enclosed cabinet), EP-05 (enclosed cabinets), EP-07 (man-blast)	TPM	EP-06 and EP-05 (enclosed cabinets) abatement through LEV-11  EP-07 abatement through LEV-12(man-blast)	Appendix B3-3, X9 (enclosed cabinets) To atmosphere, located on storage yard above and adjacent to Leek Road  Appendix B3-3, X10 (man-blast) vents internally in Foundry Building	Daily observation of emission and odour  Continuous qualitative monitoring with alarm level set at 80% of emission limit 24 monthly manual extractive test - TPM	No trend of adverse results	
Thermal treatment of castings	Air	Para 11	Combustion gases from natural gas	Vented through flues in Foundry and Jubilee Roof	--	--	--	--

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(cont...) Table 1.1 Normal operating conditions: Releases, techniques and monitoring

Activity	Emissions to...	App. C1 ref and plant ref.	Emissions	Control type	Emission point reference / location	Current Monitoring	Past results	Comments
Mechanical fettling	Air	Para 12, EP08, EP09	TPM	Abatement through LEV-08 and LEV-11	Appendix B3-3, X8 To atmosphere through stack in Foundry roof  X9 - To atmosphere, located on storage yard above and adjacent to Leek Road	Daily observation of emission and odour  Continuous qualitative monitoring with alarm level set at 80% of emission limit  24 monthly manual extractive test for TPM	No trend of adverse results	



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(cont...) Table 1.1 Normal operating conditions: Releases, techniques and monitoring

Activity	Emissions to...	App. C1 ref and plant ref.	Emissions	Control type	Emission point reference / location	Current Monitoring	Past results	Comments
Thermal cutting	Air	Para 12, EP-10 (Dressers') EP 11 (welders')	TPM Metals	EP-10 = abatement through LEV-08  EP-11 – abatement through LEV-23	Appendix B3-3, X8, (EP-10 – dressers' side)  To atmosphere through stack in Foundry roof  (EP11 – welders' side) Appendix B3-3, X11, To atmosphere through stack located on storage yard above and adjacent to Leek Road	Daily observation of emission and odour  Continuous qualitative monitoring with alarm level set at 80% of emission limit  24 monthly manual extractive test of emissions for TPM, Cd, Cu, Pb Sum of Ni Co Cr Sn and Cd	No trend of adverse results	Note all metals tested for on the manual extractive test are element and their compounds
General Site operations – Foundry / Jubilee	Land	As generally described in Appendix F	n/a	None anticipated – concrete hardstanding / floors throughout site	--	EMS / Housekeeping	No trend or significant occurrences recorded	--

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(cont.) Table 1.1 Normal operating conditions: Releases, techniques and monitoring

Activity	Emissions to...	App. F ref and plant ref.	Emissions	Control type	Emission point reference / location	Current Monitoring	Past results	Comments
General Site Operations – Foundry	Water	Hygiene facilities, NDT, DT, and general site run off	--	Discharge to drains  Foundry site yard run-off discharges via interceptor tank located on Storage yard	As indicated on Appendix D and Appendix E	--	--	Severn Trent Discharge consent (confirmed date 24.03.2022 refers

## 2. Foreseen start-up, shut-down, breakdowns and accidents – Releases, techniques and monitoring

No exceptional or additional releases are anticipated in start-up and shut-down situations for the processes described in Appendix F.

All processes can be stopped or adjusted if a breakdown occurs (including filter failure) of the associated abatement plant, except for those further details in table 2.1 below.

Details of releases for accident situations are also included in table 2.1 below.

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Table 2.1 - Foreseen start-up, shut-down, breakdowns and accidents – Releases, techniques and monitoring

Activity	Emissions to...	App. F ref and plant ref.	Circumstance	Emissions	Likely emission point reference / location	Current action	Comments
Pneumatic conveying of sand	Air	Para 2, para 4 – sand hoppers and associated internal pipework	Abrasion of pipework leading to leaks	Particulate	Internal to foundry building	Pipework is routinely visually inspected and repaired  Spilt sand is routinely cleared	
Operating nominal 9t AOD vessel	Air	Para 6, plant ref G	Filter failure of associated filter plant  Power failure to associated filter plant / power cut to site	Unabated particulate / Smoke, fume Metals	Building doorways / roof vents	Vessel can be tilted manually and placed flat on its 'belly' for short period if power cut  Tap out vessel asap or tip metal into safety pit	Vessel requires input of oxygen to keep metal molten and at temperature. It is not possible to wholly suspend processing for any significant duration as the metal will start to solidify in the vessel.

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(cont...) Table 2.1 - Foreseen start-up, shut-down, breakdowns and accidents – Releases, techniques and monitoring

Activity	Emissions to...	App. F ref and plant ref.	Circumstance	Emissions	Likely emission point reference / location	Current action	Comments
Operating nominal 9t AOD vessel	Air	Para 6, plant ref G	Addition of wet or damp scrap or alloys to molten bath	Unabated fugitive emissions of particulates  Smoke / fume from ignition of fire from ejection of molten metal	Building doorways / roof vents	Purchasing procedure, incoming material inspection, charging practices, operator competence  Additions for AOD are stored internally	
Operating EAFs	Air	Para 6, plant ref F and C	Explosion in furnace from contaminated scrap, e.g. sealed vessel, water ingress	Unabated fugitive emissions of particulates  Smoke / fume from ignition of fire from ejection of molten metal	Building doorways / roof vents	Purchasing procedure, incoming material inspection, charging practices, operator competence	

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Activity	Emissions to...	App. F ref and plant ref.	Circumstance	Emissions	Likely emission point reference / location	Current action	Comments
Operating induction furnaces	Air	Para 6, plant E, H, J, K	<p>Explosion in furnace from contaminated scrap, e.g. sealed vessel, water ingress</p> <p>Uncontrolled discharge from furnace from bridging of charge</p> <p>Furnace failure from refractory failure / coil failure causing water ingress</p>	Smoke / fume from ignition of fire from uncontrolled discharge of molten metal	Building doorways / roof vents	Purchasing procedure, incoming material inspection, charging practices, operator competence in melting practice inc. earth leakage tests, monitoring of furnace linings	

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Activity	Emissions to...	App. F ref and plant ref.	Circumstance	Emissions	Likely emission point reference / location	Current action	Comments
Air-set resin bonded sand – storage / use of resins and hardeners	Land Water	Appendix F – Para 4	Leak or rupture of container  Leak in pipework	Emissions to land Emissions to drains	As indicated on Appendix D	In-use containers and tanks are internal to the Foundry building on concrete floors.  No large scale leaks have occurred but minor leaks are cleared with sand which is then put through the reclamation system.	

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Activity	Emissions to...	App. F ref and plant ref.	Circumstance	Emissions	Likely emission point reference / location	Current action	Comments
Casting of large moulds	Air	Appendix F- para 7	Run-out of Molten metal from the mould	Smoke / fume from ignition of fire from molten metal	Buildings and doorways, roof vents / fans	<p>Moulds are clamped and checked prior to pouring</p> <p>Combustibles are generally not stored adjacent to casting areas.</p> <p>Large moulds are cast in safety pits</p>	Occasionally scaffolding is used to construct a safe access platform for ladle operators when casting large moulds and there is a risk that any wooden boards used in the scaffolding can be affected.