WEALDEN WORKS 3Rs PERMIT VARIATION APPLICATION

Appendix D: Environmental Risk Assessment

JER8584
Wealden Environmental Risk Assessment
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08 October 2020

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Quality Management

Version	Revision	Authored by	Reviewed by	Approved by	Date
1	0	Alice Gibbs			9 September 2020
1	1	Alice Gibbs	Jennifer Stringer		11 September 2020
1	2	Alice Gibbs	Jennifer Stringer	Jennifer Stringer	18 September 2020
2	1	Alice Gibbs	Keith Riley		27 September 2020
2	2	Alice Gibbs	Jennifer Stringer	Jennifer Stringer	12 October 2020

Approval for issue

Jennifer Stringer Technical Director 12 October 2020

File Name

201012 R JER8584 AG Wealden Environmental Risk Assessment V2 R2

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1 INTRODUCTION

1.1.1 This Environmental Risk Assessment has been carried out in support of an application for an environmental permit for the Wealden Works 3Rs facility. It includes an assessment of the risk to the environment and human health from which comprise a waste transfer station, mechanical sorting and materials recovery (MSMR), including waste treatment and storage, and an energy recovery facility. The Environment Agency's 'Risk Assessments for your environmental permit'[1] covers a range of environmental risks. Those aspects relevant to the operation of the proposed Wealden 3Rs facility are covered within the following sections.

1.1.2 Section 2 provides the environmental risk assessment of 'Amenity and Accident' hazards associated with the Wealden 3Rs facility. Point source emissions to air and the global warming potential associated with the proposed facility have been assessed using the H1 assessment software tool, which can be found in Appendix D1 to this Environmental Risk Assessment. A summary of the H1 assessment of point source emissions to air and GWP is provided in Section 3.

1.1.3 This document provides the relevant risk assessments covering the above aspects.

[1] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

2 AMENITY AND ACCIDENTS

2.1.1 This section provides an assessment of risks to environmental amenity and from accidents that could arise from operation of the Wealden Works 3Rs facility. The assessment has been completed in accordance with the EA's 'Risk Assessments for your environmental permit'[1].

2.1.2 The scope of the assessment has covered the following aspects:

- odour;
- noise and vibration;
- fugitive emissions;
- visible emissions; and
- accidents.

2.1.3 The fugitive emissions section covers fugitive emissions to water and fugitive emissions of VOCs and ammonia to air. Fugitive emissions of dust are covered in the dust management plan in Appendix S to the main variation application document.

2.1.4 For each of the above, the approach to the assessment has followed the following four stage process:

1. identify the hazards;
2. assess the risks (assuming that any control measures proposed are in place);
3. choose appropriate further measures to control these risks (if required); and
4. present the assessment of overall risk.

2.1.5 Results of the assessment are provided in the following tables.

Table 2.2 Assessment of odour risks

Table 2.3 Assessment of noise and vibration risks

Table 2.4 Assessment of fugitive emission risks

Table 2.5 Visible emissions

Table 2.6 Accidents risk assessment and management plan

2.1.6 The risk assessment methodology has used a scoring mechanism whereby scores are assigned to:

- the likelihood of the hazard occurring; and
- the consequence of the hazard to the environment or human health.

2.1.7 Scores are assigned as low, medium or high.

2.1.8 The risk assessment has been completed by scoring the hazard areas outlined above using a risk matrix as shown inTable 2-1 below:

2.1.9 In completing the assessment, prevention and control measures proposed by Britaniacrest Recycling Limited ('Britaniacrest') are assumed to be in place. Where relevant, details of these measures are identified within the assessment.

Table 2-1: Risk Matrix

Consequence	Probability			
	High	Medium	Low	Very Low
High	High	Medium	Low	Low
Medium	Medium	Medium	Low	Very Low
Low	Low	Low	Low	Very Low
Not significant	Low	Very Low	Very Low	Very Low

Table 2.2: Odour risk assessment and management plan

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs, who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence.
Odour emissions from the waste processing hall, ERF bunker and delivery vehicles	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	The following odour control measures are proposed: The building will operate under a negative pressure and air from this area will be drawn into the furnace for combustion during operation of the plant, thereby destroying any potentially odorous compounds. The variation offers improved odour controls by having all permitted activities located inside a building. The capacity of the bunker will allow for up to 5 days' storage. High standards of housekeeping will be maintained to ensure that the waste materials are kept within the bunker area and that any material which is accidentally deposited outside of the bunker is cleared up immediately. Crane operators will be trained to ensure that the waste materials in the bunker are well mixed and that incoming waste is not being left within the bunker for excessive periods. The proposed odour controls and monitoring procedures are set out in the Odour Management Plan (Appendix O).These include monitoring odour by regular sniff testing at the site boundary or following an odour complaint. Records of any such inspections will be kept. In the event of a total plant shutdown, waste volumes in the bunker and waste processing area will have been run down prior to the shutdown to minimise the amounts of material remaining. Where possible, the shutdown will be timed to coincide with periods where Britaniacrest can minimise expected deliveries. Doors to the waste processing hall will remain closed at all times other than for access. Where access is required, fast-acting roller shutters will minimise the duration that doors are open. In the event of a complaint, the complaints procedure will be followed to record and act on the complaint and instigate appropriate action.	Low	Low Minor odour annoyance (at worst)	Low

Table 2.3: Noise and vibration risk assessment and management plan

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	What is at risk? What do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? If it occurs, who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence.
Noise from vehicle movements onsite and offloading	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	Deliveries to the Wealden 3Rs facility will mainly occur from 07:00 until 18:00 Monday to Saturday and deliveries will be timed to avoid peak hours wherever possible. The variation would not result in any significant increase in vehicles coming to site above those already permitted. Doors will be closed at all times other than for entry and exit to the processing hall. The noise assessment concluded that there would be no significant effect at noise sensitive receptors (see Appendix C of the main application for details). The noise management plan in Appendix U sets out further detail on the measures to be put in place at the site to minimise noise from the site activities. In the event of a complaint, the complaints procedure will be followed to record and act on the complaint and instigate appropriate action.	Medium	Low Noise modelling undertaken demonstrates that the noise effects of operational traffic will not be significant.	Low
Noise from main plant and generator buildings	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	The air cooled condensers would be selected such that they would not exceed a sound power level of 97 dB(A), which is the lowest practical level identified by the technology suppliers for the plant. Furthermore, acoustic screening would be installed around the perimeter of the air cooled condensers. Other significant items of plant would be located within buildings or enclosures which would be designed to reduce noise levels, as required. Specifically, the turbine hall, which contains the highest noise generating plant would be designed with a high specification façade and roof to reduce the noise levels emitted from these buildings. Furthermore, the plant would be designed such that it would not be tonal in character at the nearest NVSRs (see Appendix C of the main application for more details). In the event of a complaint, the complaints procedure will be followed to record and act on the complaint and instigate appropriate action.	Low due to distance of local residents	Low Unlikely to cause annoyance to sensitive receptors. Noise modelling undertaken demonstrates that the noise effects of plant operation are not significant	Low

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Vibration from the plant	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Land	Significant vibration effects are not anticipated for the plant. Any vibration issues associated with the plant will be resolved during commissioning. In the event of a complaint, the complaints procedure will be followed to record and act on the complaint and instigate appropriate action.	Low	Low Noise assessment considered that significant vibration effects from the Wealden 3Rs facility during its operation were unlikely.	Low

Table 2.4: Fugitive emissions risk assessment and management plan

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs, who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence.**
To Air						
VOCs from deliveries and storage of light fuel oil/diesel	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	Delivery vehicles will offload using a sealed connection. The storage vessel will have a vent to permit tank breathing. Emissions from this source are not considered to be significant since the material being stored will be relatively non-volatile. The integrity of all liquid storage containers will be subject to routine checks as part of daily site inspections.	Low	Low	Low
VOCs from deliveries and storage of transformer oils	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	Delivery vehicles will offload using a sealed connection. Transfer of oils will be fully enclosed. Transformer oil top-up will be infrequent and limited in amount. The integrity of transformers will be subject to routine checks as part of daily site inspections.	Very Low	Not Significant – expect volumes to be very small as limited to top-up,	Very Low
Ammonia fumes from storage and handling of ammonium hydroxide (if used)	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	Deliveries will be made using an enclosed road tanker with hose connection to the storage vessel. The storage vessel will be fitted with a scrubber or vent system to allow pressure to be maintained at the required level for storage and delivery. Level detection will be provided for the storage tank which will be linked via a switch to prevent overfilling. Any spillage of material during a delivery, for example during disconnection of the hose, would be cleared immediately. Transfer of material for use within flue gas treatment plant will be fully enclosed.	Low	Medium	Low
To Water						
Run off from waste treatment and storage areas	Boldings Brook, via surrounding drains and process effluent pit	Ground / surface drains	The ERF bunker and waste processing building will be designed to be watertight and will be constructed of thick concrete walls and base. Any moisture within the incoming waste will be fully contained and if in the residual waste will pass through the combustion stage with the waste. During shutdown periods, the bunker and waste processing area floor will be visually inspected as far as possible, to ensure that it is in a good state of repair. Sorted and bulked wastes will be removed from the site. The bunker will form part of the firewater containment system and therefore will be designed to partly contain firewater run-off into this part of the facility.	Very low	Medium – surface water/groundwater contamination	Low
Run off from bottom ash	Boldings Brook, via surrounding drains and process effluent pit	Ground / surface drains	The bottom ash storage will be designed to be watertight and be constructed of thick concrete walls and base. Run off from the conveyor and water that collects in the bottom ash storage area will be collected and returned to the bottom ash quench water system. Process areas will be appropriately surfaced and drains will collect waters for re-use.	Very low	Low	Low

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Transfer of bottom ash from plant to offsite ash processing plant	Boldings Brook, via surrounding drains and process effluent pit	Ground / surface drains	Bottom ash handling and transfer will be via a sheeted or enclosed vehicle to prevent loss of material. Excess water will have been removed prior to loading the ash for removal off site, therefore there is limited potential for discharge of significant amounts of run off during loading. Lorries will be parked within an enclosed building which will be suitably surfaced. Loading will take place on an impermeable surface. Vehicles will be checked to ensure not leaking prior to leaving the building. Any spillage of bottom ash would be cleaned up immediately using dry cleaning techniques.	Low	Low – any aqueous release reaching ground or surface drains would be small	Low
Leak of diesel/fuel oil from storage area	Boldings Brook, via surrounding drains and process effluent pit	Surface water drainage system	Deliveries will be overseen by a trained member of staff, who will ensure that there is sufficient capacity within the storage vessel for the delivery prior to filling. The storage tank will be within a bund to contain any spillage and a drip tray will be provided to contain any minor spillage during connection / disconnection of the delivery hose. Diesel/fuel oil storage area will be appropriately bunded in accordance with oil storage regulations. A hard, impermeable surface will underlie all chemical and oil storage areas to prevent fugitive emissions to groundwater should spills / leaks occur and drainage will be contained with interception. Spill kits will be available to contain and clean up any spills. A procedure will be designed to ensure that any damaged or leaking containers are dealt with and to allow regular inspections for any signs of deterioration.	Very low. A significant release would only occur in the event of an accident/incident and would require failure of both primary and secondary containment. Operational management procedures will prevent this from happening.	Medium/high Contamination of local water course	Very low/low
Runn-off/spillage from ammonium hydroxide storage (if used)	Boldings Brook, via surrounding drains and process effluent pit	Surface water drainage system to foul sewer	A hard, impermeable surface will underlie the ammonium hydroxide storage area to prevent fugitive emissions to groundwater should spills / leaks occur and drainage will be contained with interception. The ammonium hydroxide storage area will be appropriately bunded. A procedure will be designed to ensure that any damaged or leaking containers are dealt with as soon as practicable and to provide for regular inspections to identify as soon as possible any signs of deterioration. Regular visual and olfactory inspections of the ammonium hydroxide storage area will be completed to allow for early detection of any sign of damage/leaks and trigger immediate remedial action. Spill kits will be available to contain and clean up any spills. A procedure will be designed to ensure that any damaged or leaking containers are dealt with and to allow regular inspections for any signs of deterioration	Low	Low/medium	Low
Run off/spillage from maintenance oils storage	Boldings Brook, via surrounding drains and process effluent pit	Surface water drainage system to foul sewer	A hard, impermeable surface will underlie all chemical and oil storage areas to prevent fugitive emissions to groundwater should spills / leaks occur. The oil storage areas will be appropriately bunded. A procedure will be designed to ensure that any damaged or leaking containers are dealt with as soon as practicable and to provide for regular inspections to identify as soon as possible any signs of deterioration. Regular visual inspections of the maintenance oil storage area will be completed to allow for early detection of any sign of damage/leaks and trigger immediate remedial action. Spill kits will be available to contain and clean up any spills. A procedure will be implemented to ensure that any damaged or leaking containers are dealt with and to allow regular inspections for any signs of deterioration	Low A release would only occur in the event of an accident/incident and would require failure of both primary and secondary containment. Operational management procedures will prevent this from happening.	Low/medium Small volumes of maintenance oils will be stored on site	Low
Litter						
Waste release from waste tipping hall, waste processing hall and delivery vehicles	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Windblown to air	All waste will be transported to the facility in enclosed vehicles. Doors to the tipping hall and waste processing hall will remain closed at all times other than for access. Where access is required, fast-acting roller shutters will minimise the duration that doors are open. The waste will be delivered to and deposited in designated area(s) in the waste processing hall or bunker which will have been designed to hold the maximum quantities of waste required to ensure effective operation of the facility, whilst avoiding prolonged storage of the material. Good housekeeping procedures will be developed to ensure all waste is removed from vehicles before leaving the site. Any unexpected spillage would be cleaned up immediately.	Low	Low/medium Nuisance to local receptors	Low

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Pests						
Flies and other pests or vermin in waste storage area	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	The waste processing area and bunker will be within an enclosed building. In the event of a planned prolonged shutdown, material will have been run down prior to the event. Pest control measures will be applied in accordance with recommendations from a specialist pest control advisor.	Low Good site management procedures should prevent this occurring.	Low Nuisance	Low

Table 2.5: Visible emissions risk assessment and management plan

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs, who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence.**
Plume from exhaust stack	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air - visual	Visible plumes are not anticipated to occur for the majority of operational time due to the temperature at which the treated flue gas exits the stack. The air quality assessment (Appendix B) considered plume visibility and concluded effects were not significant.	Low	Low – minor visual disturbance	Low

Table 2.6: Accidents risk assessment and management plan

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
What has the potential to cause harm?	**What is at risk? What do I wish to protect?**	**How can the hazard get to the receptor?**	**What measures will you take to reduce the risk? If it occurs, who is responsible for what?**	**How likely is this contact?**	**What is the harm that can be caused?**	**What is the risk that still remains? The balance of probability and consequence.**
Overfilling of storage vessels	Local residents/Boldings Brook watercourse	Air (fumes)/Surface water drainage (liquids)	All filling operations will be supervised by a competent member of staff and tanks will be fitted with level alarms which will alert of a high level to allow filling to stop before the tank is full. Operators will check the tank level prior to commencing filling to ensure there is capacity to accept the delivery. Filling will take place on a hard, impermeable surface to prevent fugitive emissions to groundwater should spills / leaks occur. The chemical and oil storage areas will be appropriately bunded. Spill kits will be available to contain and clean up any spills. A procedure will be implemented to ensure that any damaged or leaking tanks/containers or defects in secondary containment are dealt with. Routine inspections will be carried out to inspect for any signs of deterioration of containment measures.	Low	Low/Medium	Low
Breach of containment of ERF (e.g. flue gas or steam leak)	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	The ERF has been designed to be airtight. Routine inspections and maintenance will be carried out to ensure the integrity of the plant and that any issues detected are rectified as soon as is practicable. The ERF monitoring system would alert operatives of a loss of pressure and allow corrective action to be taken. The system is designed to automatically shut down feed to the plant in the event of a critical breach of the plant containment. Spares of critical pieces of equipment will be kept on site for quick replacement in the event of failure.	Low	Low/Medium	Low
Combustion control failure	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT	Air	Control of the waste feed quality through the acceptance procedures will minimise the variation needed in combustion conditions. The plant has generally been designed to fail safe and automatically shut down where required. Site operatives will be trained in the control of the plant. In the event of a failure of the automatic control system operators will be training manual procedures to operate the ERF and where require to shutdown the plant.	Low	Medium	Low

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
	and Wienerberger Brickworks)		The combustion controls would be subject to routine inspection, testing and maintenance. Any issues detected will be recorded and rectified as soon as is practicable. Spares of critical equipment will be kept on site in case of a failure.			
Over-pressurisation of furnace/boiler	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	The control system would alert operators of increased pressure to allow corrective actions to prevent over pressurisation. Plant operators would be trained in abnormal and emergency procedures including actions to take to ensure operations are controlled safely and where required the plant is shutdown safely. Plant has been designed with safety systems including bursting discs.	Low	Medium/High	Low
Failure of CEMS	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	A procedure will be implemented to ensure maintenance and calibration of the CEMS is carried out regularly and that any issues detected are rectified as soon as is practicable. There will be duplicate (replacement) CEMS on site to be used in the event of a failure. In accordance with article 46(6) of the IED, the facility will not continue to incinerate waste for a period of more than 4 hours uninterrupted where emission limit values are exceeded. The cumulative duration of operation in such conditions over 1 year shall not exceed 60 hours. Abnormal operations have been assessed in the Air Quality Assessment of Abnormal Operations in Appendix K to the main variation document. The assessment concluded that there would be no significant effect or air quality under abnormal operations.	Low	Low Other plant monitoring would indicate if combustion processes and abatement plant are functioning as normal.	Low
Loss of boiler feedwater	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air/Water	The ERF control system will continuously monitor boiler water flow. Alarms would alert the operator in the event of reduced or a loss of boilerwater. In the event of a loss of boilerwater the plant would automatically shutdown. Plant operators would be trained in abnormal and emergency procedures including actions to take to ensure operations are controlled safely and where required the plant is shutdown safely. Spares of critical equipment will be kept on site in case of a failure. The boiler water system would be refilled (following any repairs if needed) prior to commencing start-up.	Low	Low	Low
Loss of compressed air system	Local residents (nearest receptors approx. 210 m from the installation) Industrial unit (nearest are adjacent Biffa MBT and Wienerberger Brickworks)	Air	ERF monitoring and control system will alert operator of any failure of the compressed air system and allow actions to be taken to ensure safe operation or shutdown of the plant. Where deemed critical to plant safety, plant items will be designed to fail safe. Spares of critical equipment will be kept on site in case of a failure.	Low	Low	Low
Operator error	Air/Boldings Brook water course/Land	Variable - dependent on nature of the error	All operational staff will be fully trained against the site operating procedures. Training will include raising awareness of key plant parameters and the potential implications of failure to control operations as designed and the associated potential impact on the environment. The ERF will be automatically controlled under normal and transient operation, thereby minimising the potential for operator error. The automatic control system will include alarms to alert the Operator of potential operational problems and where relevant will be triggered with sufficient safety margin to permit operator intervention to prevent an actual problem occurring.	Low	Variable depending upon nature of incident	Low
Loss of power generation	None	n/a	In the event of a loss of power generation during normal operation, the ERF will switch to island mode, by-passing the turbine and excess steam will pass directly to the condenser. The ERF will continue to operate in non-generation mode and power will be imported from the grid. In the event of a loss of power from the grid, a similar procedure will occur. If this happens during non-operational periods the plant may not be able to start-up and therefore no operations can commence. In the event that the boiler trips, the UPS and back-up generator will ensure a safe shutdown of the ERF.	n/a	n/a	n/a

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Loss of containment during storage or transfer of reagents, chemicals, fuels and oil (transformer and lubricating oil)	Boldings Brook and land	Site drainage system via sewage treatment works or direct contact with land	All bunds will be visually checked each day to ensure that they are empty. There will be limited liquids stored on site, primarily fuel oil, maintenance oils, ammonium hydroxide (if used) and small amounts of boiler water treatment chemicals. All process storage tanks will be built of suitable materials which are resistant to the vessel content. A maintenance programme will be established for the inspection of all storage tanks. Potential release to ground or surface/groundwater would require simultaneous failure of the storage tank and containment. Bulk deliveries will be overseen by a trained member of staff who will be responsible for checking that there is sufficient capacity in the storage vessel to receive the delivery. A site spill procedure will be developed and followed in the event of a spillage. Spill kits will be available to contain and clean up the spill. Solid raw materials will be cleaned using dry techniques. Incidents will be recorded and investigated appropriately according to the site incident procedure. Significant incidents will be reported to the EA in accordance with the requirements of the permit.	Very Low – requires multiple failure events	Medium/High Contamination of local water course - dependent on quantity and material released	Very Low/Low
Fire in waste bunker causing emissions to air	Air	Direct release of combustion gases to air	The plant has been designed such that the waste storage is physically separate from ignition sources. The ERF feed hopper will prevent backflow of material and will include a level alarm to alert the Operator that a low level of waste is present in the hopper. Fire protection systems will be in place in accordance with those set out in the fire prevention plan (FPP) in Appendix H. These will include sprinkler systems in the waste reception, storage and processing halls, and automatic water cannons over the waste bunker.	Low	Low / Medium Uncontrolled release of combustion gases to air – impacts likely to be short term	Low
Fire in bag filter causing emissions to air	Air	Direct release of combustion gases to air	There will be temperature monitoring in the baghouse which will alert the operator in the event of a fire.Spare filters/compartments will be kept on site for quick replacement if necessary. The filter compartments can be isolated for maintenance. Fire protection systems will be in place in accordance with those set out in the fire prevention plan (FPP) in Appendix H.	Low	Medium	Low
Failure to contain firewater	Boldings Brook, via surrounding drains and process effluent pit	Surface water drainage system	Measures are in place to protect against a fire. Fire response systems should ensure a rapid response thereby addressing the fire at the earliest point to avoid fire spread and therefore minimising the potential volumes of fire waters. The FPP in Appendix H sets out a commitment to providing further evidence of containment.. In the event of contaminated firewater on site outwith the bunker, the surface drainage system will be put into captive mode and the firewater will be contained on site and tested. If the pollutant level is unacceptable with respect to thresholds that will be agreed prior to operation of the facility, it will be removed by tanker.	Low – plant designed to contain firewater	Medium – although firewater would not be discharged to surface water	Low
APC equipment failure	Air	Stack	All abatement plant will be continuously monitored (i.e. reagent flow and consumption/bag filter pressure drops) to ensure that it is operating as designed and that the reagent feed systems are working. In addition, emissions to air from the process will be continuously monitored for key pollutants which would identify any potential increases in pollutant concentrations. All of these systems will include appropriate alarms to alert the Operator to a potential problem and permit appropriate action to be taken. Equipment spares will be kept on site in the event of a failure or breakage. The plant will be operated in accordance with IED requirements for abnormal operation. The plant will not incinerate waste for a period of more than 4 hours uninterrupted where emission limit values are exceeded and for a total of 60 hours per annum. Operational staff will be trained in the actions to take in the event of control system alarms being triggered.	Low – the APC system will be fully contained. During routine plant walkovers, any leakage would be identified.	Low/medium – potential for increased air emissions, quick identification of a problem will minimise release duration. It will also allow for fast repair or plant shutdown	Low
Vandalism	Air/water/land	Various	The site will be fenced and the plant manned 24/7. CCTV cameras are in operation for the current facility and will remain in place for the modified scheme.	Low due to security measures in place	Low/ Medium -depending on nature of the event. Potential contamination of local water course/air/land and/or local nuisance depending on nature of event.	Low
Flooding	Boldings Brook, via surrounding drains and process effluent pit	Surface water drainage system	Flood risk has been addressed in a Flood Risk Assessment which was prepared to support the planning application (Chapter 10 of the ES in Appendix T to the main variation application document) and concluded that there is a low risk of flooding from groundwater and reservoir failure and a very low risk of surface water flooding. The drainage system will ensure that overland flow generated on-site is retained on-site and can store excess surface water volumes. The plant layout and storage facilities for reagents and fuels will be designed to ensure all materials are contained and in the event of a flood, materials would not be released. As part of the site's emergency procedures, the appropriate procedures for responding to, reporting and investigation in the event of a flood will be assessed.	Very Low	Medium Potential contamination of flood waters.	Very low

3 EMISSIONS TO AIR

3.1.1 This section provides the relevant screening assessments of point source emissions to air that could arise from operation of the Wealden Works 3Rs facility. The assessment has been completed in accordance with the EA's *Risk Assessments for your environmental permit*[Error! Bookmark not defined.].

3.1.2 The scope of the assessment has covered the following aspects:

- Release point characteristics;
- Air emissions inventory and mass flows;
- Emissions screening for further assessment;
- Photochemical Ozone Creation Potential (POCP).

3.1.3 Air emissions screening using the H1 software has identified a subset of emissions whose significance warrants further modelling. The results of that modelling for these and a range of other emissions are presented in the air quality report in Appendix B to the main application document.

3.2 Release point

3.2.1 Point-source emissions to air from the Wealden Works 3Rs facility will be from a single 95 m stack, at an efflux velocity of 21.2 ms^{-1} and a normalised volumetric flow rate of 174,354 m^3/hr at 11% O_2.

3.2.2 The H1 screening assessment has considered both long-term and short-term emissions at Best Available Technique (BAT) associated emission limits (AELs) for the long-term emissions and at Industrial Emissions Directive (IED) half hourly emission limits for the short-term emissions. Polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) do not specifically have BAT-AELs; the following emission concentrations were used for these.

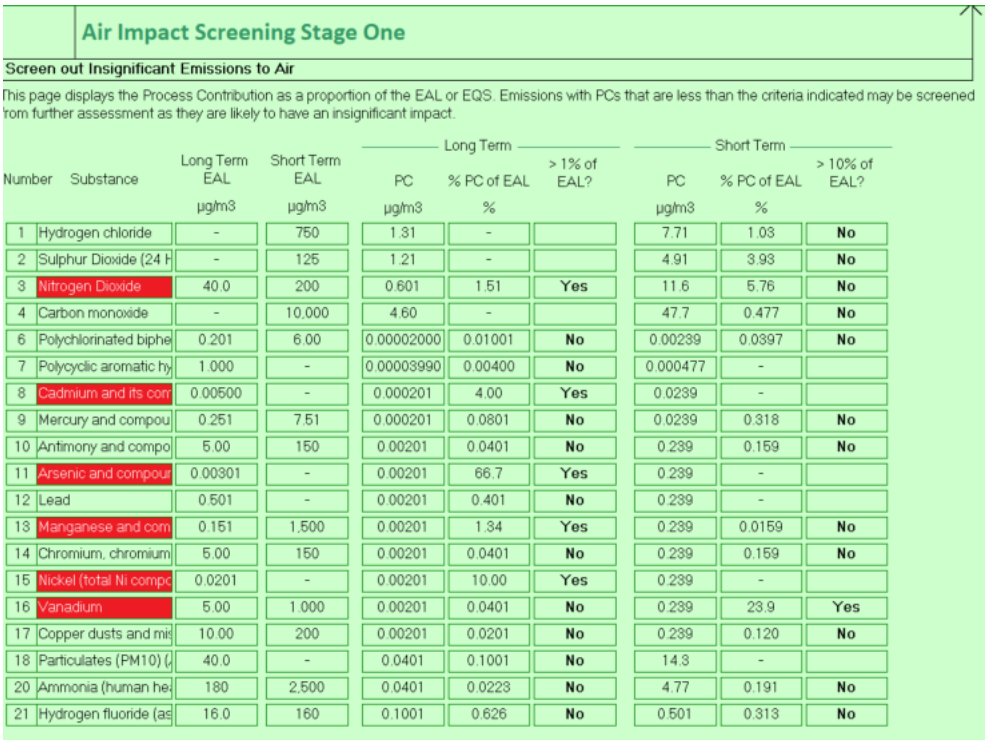
- Ammonia: 10 $mg.Nm^{-3}$
- PCBs: 0.005 $mg.Nm^{-3}$
- PAHs: 0.001 $mg.Nm^{-3}$

3.3 Emissions screening

3.3.1 Estimated emissions have been screened for significance against appropriate environmental standards for long-term and short-term exposure. Emissions standards are based on statutory air quality limits where available, and upon human health protection Environmental Assessment Levels (EALs) as given in H1 guidance.

3.3.2 Modelled concentrations have been included based on the data presented in the air quality assessment (Appendix B to the main application).

3.3.3 Process contributions (PCs) from the proposed Wealden 3Rs facility have been calculated using atmospheric dispersion modelling, details of which are given in Appendix C. Emissions which are lower than 1% of the relevant EAL for long-term exposure and lower than 10% of the relevant EAL for short-term exposure are screened out as insignificant. Figure 3.1 below shows the output of the H1 emissions screening of process contributions. Nitrogen dioxide, cadmium, arsenic, manganese, nickel and vanadium are all potentially significant.



Air Impact Screening Stage One

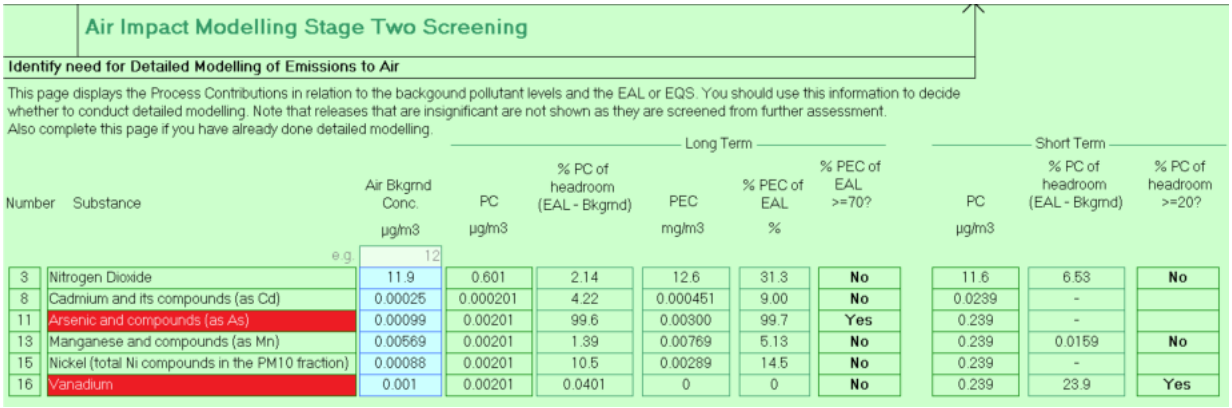
Screen out Insignificant Emissions to Air

This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened from further assessment as they are likely to have an insignificant impact.

Number	Substance	Long Term EAL µg/m3	Short Term EAL µg/m3	Long Term PC µg/m3	Long Term % PC of EAL %	Long Term > 1% of EAL?	Short Term PC µg/m3	Short Term % PC of EAL %	Short Term > 10% of EAL?
1	Hydrogen chloride	-	750	1.31	-		7.71	1.03	No
2	Sulphur Dioxide (24 h	-	125	1.21	-		4.91	3.93	No
3	Nitrogen Dioxide	40.0	200	0.601	1.51	Yes	11.6	5.76	No
4	Carbon monoxide	-	10,000	4.60	-		47.7	0.477	No
6	Polychlorinated biphe	0.201	6.00	0.00002000	0.01001	No	0.00239	0.0397	No
7	Polycyclic aromatic hy	1.000	-	0.00003990	0.00400	No	0.000477	-	
8	Cadmium and its com	0.00500	-	0.000201	4.00	Yes	0.0239	-	
9	Mercury and compou	0.251	7.51	0.000201	0.0801	No	0.0239	0.318	No
10	Antimony and compo	5.00	150	0.00201	0.0401	No	0.239	0.159	No
11	Arsenic and compour	0.00301	-	0.00201	66.7	Yes	0.239	-	
12	Lead	0.501	-	0.00201	0.401	No	0.239	-	
13	Manganese and com	0.151	1,500	0.00201	1.34	Yes	0.239	0.0159	No
14	Chromium, chromium	5.00	150	0.00201	0.0401	No	0.239	0.159	No
15	Nickel (total Ni compc	0.0201	-	0.00201	10.00	Yes	0.239	-	
16	Vanadium	5.00	1.000	0.00201	0.0401	No	0.239	23.9	Yes
17	Copper dusts and mis	10.00	200	0.00201	0.0201	No	0.239	0.120	No
18	Particulates (PM10) (/	40.0	-	0.0401	0.1001	No	14.3	-	
20	Ammonia (human he	180	2,500	0.0401	0.0223	No	4.77	0.191	No
21	Hydrogen fluoride (as	16.0	160	0.1001	0.626	No	0.501	0.313	No

Figure 3.1. Air Impact Screening Stage One

3.3.4 A second stage of screening assesses the predicted environmental concentration (PEC) against EALs for those pollutants that do not screen out at stage one. Assumed background concentrations are taken from air quality modelling, details of which are given in Appendix C to the main application. PECs which are lower than 70% of the relevant long-term EAL and lower than 20% of the relevant short-term EAL minus 2 * the background concentration are screened out as insignificant, as shown in Figure 3.2 below. Those not screened out as insignificant are recommended for further detailed assessment.



Air Impact Modelling Stage Two Screening

Identify need for Detailed Modelling of Emissions to Air

This page displays the Process Contributions in relation to the backgound pollutant levels and the EAL or EQS. You should use this information to decide whether to conduct detailed modelling. Note that releases that are insignificant are not shown as they are screened from further assessment.
Also complete this page if you have already done detailed modelling.

Number	Substance	Air Bkgrnd Conc. µg/m3	Long Term PC µg/m3	Long Term % PC of headroom (EAL - Bkgrnd)	Long Term PEC mg/m3	Long Term % PEC of EAL %	Long Term % PEC of EAL >=70?	Short Term PC µg/m3	Short Term % PC of headroom (EAL - Bkgrnd)	Short Term % PC of headroom >=20?
	e.g.	12								
3	Nitrogen Dioxide	11.9	0.601	2.14	12.6	31.3	No	11.6	6.53	No
8	Cadmium and its compounds (as Cd)	0.00025	0.000201	4.22	0.000451	9.00	No	0.0239	-	
11	Arsenic and compounds (as As)	0.00099	0.00201	99.6	0.00300	99.7	Yes	0.239	-	
13	Manganese and compounds (as Mn)	0.00569	0.00201	1.39	0.00769	5.13	No	0.239	0.0159	No
15	Nickel (total Ni compounds in the PM10 fraction)	0.00088	0.00201	10.5	0.00289	14.5	No	0.239	-	
16	Vanadium	0.001	0.00201	0.0401	0	0	No	0.239	23.9	Yes

Figure 3.2. Air Impact Screening Stage Two

3.3.5 The results suggest there is a need for further assessment of arsenic and vanadium. Detailed modelling has, in fact, been carried out for all expected emissions, and the results are given in Appendix B to the main variation application.

3.4 Photochemical ozone creation potential

3.4.1 The photochemical ozone creation potential (POCP) has been calculated in accordance with the H1 guidance. Three substances emitted to air by the facility are identified as having the potential to form ozone: nitrogen dioxide, sulphur dioxide and carbon monoxide. The total POCP score for the facility is calculated as 939.31.

3.4.2 The facility will be controlled to ensure that BAT-C and IED limits for the POCP pollutants are met; section 4 of the main application details the proposed measures for preventing and minimising the release of these pollutants and section 6 concludes that the proposed measures are BAT.

3.5 Global Warming Potential

3.5.1 The global warming potential (GWP) has been calculated in accordance with the H1 guidance. The total GWP score of 50,955 comprised the following main sources: carbon dioxide and nitrous oxide emissions from the process, including combustion of waste and light fuel oil / diesel used in auxiliary firing and during start-up.

3.5.2 The main contribution to the CO_2 emission figure is associated with CO_2 from burning the waste. A portion of this will be biogenic with a GWP of zero, therefore the actual GWP will be lower than that stated. The figure for CO_2 emissions from the Carbon Assessment also included nitrous oxide emissions and emissions from auxiliary burners.

3.5.3 The direct releases from the burning waste are consistent with BAT, which promotes maximising efficient burnout of the material and the conversion of its carbon content to carbon dioxide. These releases are therefore determined by the carbon content of the incoming waste and the desire to achieve BAT.

3.5.4 The CO_2 emissions value obtained from the planning-stage Carbon Assessment and used to inform the GWP score already includes direct process emissions from auxiliary and back-up firing. Supplementary burners are essential to ensure that the facility meets the IED limits from emissions at all stages of operation and their use is considered BAT.

4 CONCLUSIONS

4.1.1 The environmental risk assessment (ERA) report has been undertaken to assess the likelihood of risk from amenity and accidents, air emissions and global warming potential associated with the proposed 3Rs facility.

4.1.2 The results of the ERA have shown that the risk of odour, noise and vibration, fugitive emissions, visible plumes, and accidents range from ‘not significant’ to ‘low’.

4.1.3 Stack emissions to air for relevant air pollutants have been screened out to be insignificant. Those that weren’t screened out in the H1 have been screened out in the detailed dispersion modelling in Appendix B to the main application, which covers all pollutants including those which have screened out as insignificant in H1.

4.1.4 The POCP for the facility is calculated as 939.31. The use of BAT minimises the POCP from the facility.

4.1.5 The total GWP score of 50,955 is mostly contributed by carbon dioxide emissions from the combustion of waste.

REFERENCES

Environment Agency (2020), Risk assessments for your environmental permit. Available online: https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

Environment Agency (2016), Air emissions risk assessment for your environmental permit. Available online: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

Appendices

Appendix D.1.

H1 Tool