Appendix N Fuel Pellet Specification

Introduction

The existing coal-fired power plant at Simec Uskmouth Power Station (SUP) is converting to a power plant that generates electricity by combusting waste derived fuel pellets. The high calorific value and homogenous nature of the fuel pellet is specifically designed for combustion at SUP. The SUP conversion seeks to utilise (where possible) the existing infrastructure, the conversion process will entail modifications to existing power station to enable the fuel pellets to be stored, combusted and the resultant emissions controlled prior to release.

Provenance

Present day recycling techniques cannot recycle all waste materials and as a result there remains a significant quantity of materials sent for disposal, these non-recyclable materials are presently sent to landfill or diverted from landfill to purpose-built Energy from Waste (EfW) facilities . This currently non-recyclable waste stream is used as feedstock to produce the fuel pellets for the SUP conversion.

Fuel pellets comprise treated non-hazardous waste which has been processed to meet the stringent fuel specification with a similar calorific value to coal.

The stringent specification for the fuel pellets has been set out in a fuel supply agreement which has been used to inform the SUP system design.

Fuel pellets are manufactured by a separate company and transported to SUP via the existing rail unloading, replicating previous coal deliveries to SUP via rail.

SUP continue to investigate co-firing the fuel pellets with up to 1% biomass.

Pellet Descriptors

European Waste Code	19 12 10 combustible waste (refuse derived fuel). There is an intention on behalf of the proposed fuel supplier to apply for end of waste (EoW) status through the Environment Agency in England, where the fuel will be produced
Composition	50% plastic waste: 50% biogenic waste
Size	Length 25 mm X Width 6 mm

Image of Fuel Pellets

Emissions

SUP is engaged with Natural Resources Wales (NRW) to comply with the latest applicable emissions requirements through the Environmental Permit, providing useful and efficient energy recovery from materials which could otherwise have been directed to landfill.

Fuel pellets are composed of approximately 50 % biogenic waste, combustion of this biogenic component provides **net zero CO2** emissions.

Pellet Manufacture

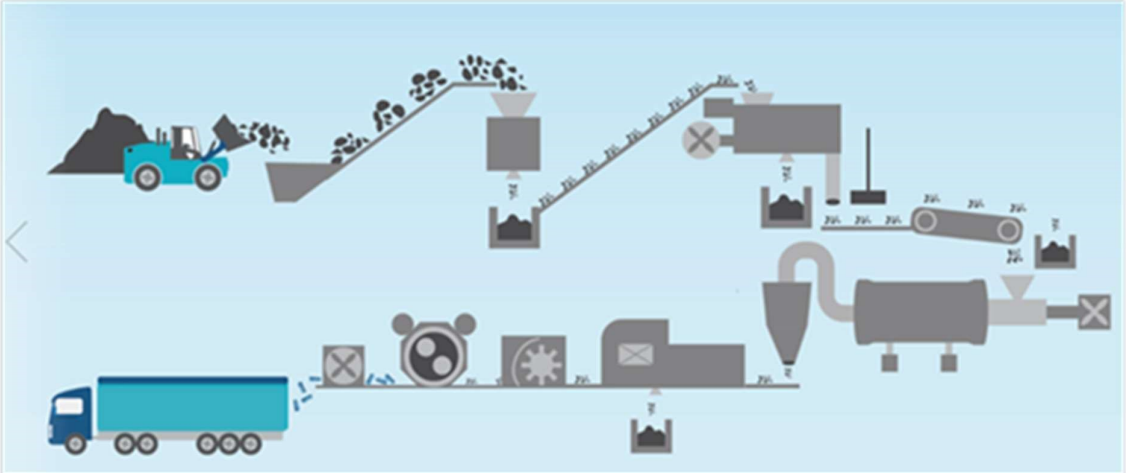

Diagram: Pellet Manufacture

The pelletising process has a number of defined steps, using specialized equipment the result of decades of development work.

Sorting - the process starts with the mixing of input streams, based on the chemical analyses of the incoming waste feedstock.

Shredding - the mixed waste streams are shredded to reduce the size of the materials.

Further sorting – the following are removed from pelletising process :

- ferrous and non-ferrous metals - recycled
- PVC plastics
- white paper
- non-combustible materials like sand, glass and stones.

Mixing – plastic and biogenic waste suitable for pelletising is mixed

Pelletising – mixed waste is pelletised to manufacture fuel pellets with the agreed stringent fuel specification

Pellet analysis at pellet plant to ensure fuel pellets comply with the stringent fuel pellet specification

Transport to SUP via rail

Pellet analysis at SUP to double check fuel pellets comply with the stringent fuel pellet specification

Fuel Pellet Storage

The fuel pellets need to be kept dry and therefore need to be stored. SUP intend to construct up to four primary storage silos on the coal stockyard each with a volume of up to 18,000 m3 to hold up to approximately 10,000 tonnes of pellets.

Two day silos will be used during transhipment of the fuel pellets from primary storage silos to the milling process and then on to combustion

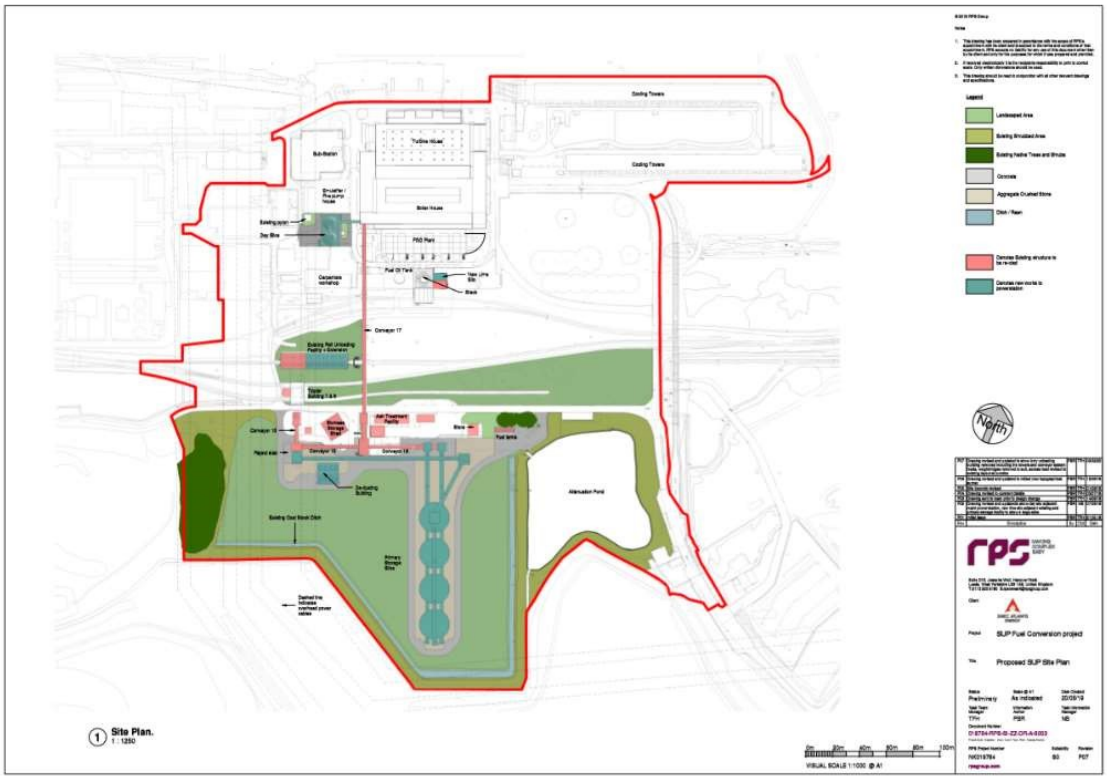

Figure: SUP Conversion site layout

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Acceptable variation around the design point for the fuel

The figures below represent the acceptable variation around the design point for the fuel.

Where figures are shown with a positive and negative variation (±) this indicates that both maximum and minimum acceptability criteria are applied to the measurand around the design value, where figures are shown with only positive (+) variation this indicates that only a maximum acceptability criteria is applied to the measurand alongside the design value.

For heavy metal species concentrations strict maxima apply only, these maxima have been determined to ensure that corresponding emissions limit values are achieved under all circumstances, as such no acceptable variation can be provided.

Ref. No.	Parameter	Unit	Acceptable Variation Around Design.
PROXIMATE ANALYSIS			
1	**Net Calorific Value**	ar MJ/kg	± 3
2	**Moisture**	ar wt %	± 2
3	**Ash content (determined at 550°C)**	ar wt %	± 1.5
4	**Volatile matter**	ar wt %	+ 4 / - 6
ULTIMATE ANALYSIS			
5	**Chlorine**	db wt %	+ 0.3
6	**Sulphur**	db wt %	+ 0.075
7	**Nitrogen**	ar wt %	+ 0.05
8	**Carbon**	ar wt %	± 4
9	**Hydrogen**	ar wt %	± 0.5
TRACE ELEMENTS (DRY BASIS)			
10	**Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V**	mg/kg	Strict maximum applied
11	**Cd + Tl**	mg/kg	Strict maximum applied
12	**Mercury (Hg)**	mg/kg	Strict maximum applied
PHYSICAL PROPERTIES			
13	**Bulk Density**	kg/m^3	± 50
14	**Biomass Content**	ar wt %	50 ± 5

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