

# NON-TECHNICAL SUMMARY

Environmental Innovation Centre, Campbeltown Road, Birkenhead, England, CH41 9HP

**Smart Creative Technologies Ltd**

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## Document History:

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# **1 Introduction**

- 1.1 This Non-Technical Summary accompanies the above application to operate the site at Environmental Innovation Centre, Campbeltown Road, Birkenhead, England, CH41 9HP as a physical treatment facility for hazardous waste comprising the acceptance, storage and treatment of Waste Electrical and Electronic Equipment from the industrial sector in the form of scrap printed circuit boards (PCBs).
- 1.2 The site is located at Environmental Innovation Centre, Campbeltown Road, Birkenhead, Wirral, CH41 9HP as shown on Drawing No. CAM/3020/02. The national grid reference for the site is SJ 32752 87508
- 1.3 The site is located within an industrial business park with the surrounding land being predominantly light industrial.

## **2 Application proposals**

- 2.1 Smart Creative Technologies Ltd will hold and operate an Environmental Permit (EP) for the acceptance, storage and treatment of Waste Electrical and Electronic Equipment (WEEE) from the industrial sector comprising scrap printed circuit boards (PCBs) and x-ray film.
- 2.2 Waste treatment processes to be carried out on site will include chemically treating PCBs and x-ray film using nitric acid and ferric chloride in a batch process. The PCBs and x-ray film are immersed in processing liquor and then the solution is neutralised with sodium hydroxide to precipitate the metals from the solution. The precipitate is filtered, washed and then oven dried. The remaining components are segregated and then dispatched for further processing and recycling off site.
- 2.3 The throughput of the site will be limited to approximately 2 – 3 tonnes per day which equate to a maximum of 1,000 tonnes per annum. To break this down further, approximately 750 tonnes per annum for PCBs and 250 tonnes per annum for x-ray film.
- 2.4 The Environmental Permit is required for the storage (keeping) prior to removal, and treatment of waste. The proposed waste storage and treatment processes to be carried out on site will include those shown in the table overleaf including waste recovery operations:

**Table 2.1 – Permitted Operations**

Description of activities	Limits of activities
<b>R3:</b> Recycling/reclamation of organic substances which are not used as solvents	Waste types as specified in the EP.
<b>R4:</b> Recycling/reclamation of metals and metal compounds	Wastes shall be stored for no longer than 3 years prior to recovery.
<b>R5:</b> Recycling or reclamation of other inorganic materials	All treatment of waste shall be carried out inside a building.
D15: Storage of waste pending disposal (The D15 code refers to the storage of such waste pending its disposal)	All storage and treatment of waste must take place on an impermeable surface with sealed drainage.
<b>R13:</b> Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	

2.4.1 The site will be open during the following hours for the delivery, receipt and processing of waste:

Monday to Friday	08:00 – 17:30
Saturday	Closed
Sundays, Bank/Public holidays	Closed

2.5 The physical treatment aspect can process approximately 20 tonnes before it needs filtering and neutralising meaning this process will take place every 2 weeks. It will take approximately 4-5 hours to perform the neutralisation process.

### **3 Proposed EWC codes**

3.1 The proposed EWC codes to be accepted as part of the application are as follows:

- 09 01 07 - photographic film and paper containing silver or silver compounds comprising x-ray film only
- 16 02 15\* - hazardous components removed from discarded equipment comprising printed circuit boards only

3.2 The main materials produced from the process include used PCBs, microchips, wire, copper coils, aluminium, plastic, mixed filter cake. These are then sent off site for further processing and recovery. The plastic and filter cake are likely to comprise hazardous waste so this will be sent to a suitable permitted hazardous waste facility, all other waste is considered non-hazardous and will be sent to a suitably permitted metal recycling site. The material produced from x-ray film is likely to comprise silver which will also be sold, exported or sent to a suitably permitted site.



## 4 Documentation and fees

### 4.1 Application fee

4.1.1 Oaktree Environmental Ltd have sought guidance from the Environment Agency charging scheme.

**Table 4.1 – Base Application Fee Table**

EPR Charging Scheme Ref	EPR Charging Scheme Ref & Description	Type of application (Ref)	Fee
1.16.13	Main Application Fee	Bespoke	£7,930
		<b>TOTAL</b>	<b>£7,930</b>

### 4.2 Documentation and additional charges

4.2.1 In addition to the above, as the site is accepting and storing combustible waste, the operator will be submitting a Fire Prevention Plan (FPP) and the following table sets out the additional charges.

**Table 4.2 – Additional Application Fees Table - Charges for plans and assessments**

General	Consideration	Document & Ref	Fee
Environmental Management System	Required due to permitted activities	CAM-3020-A	N/A
Fire Prevention Plan (Table Ref 1.19.3)	Required due to permitted activities	CAM-3020-B	£1,241
Non-Technical Summary	N/A	CAM-3020-C	N/A
Environmental Risk Assessment	Required due to permitted activities	CAM-3020-D	N/A
Site Condition Report	N/A	CAM-3020-E	N/A
<i>Habitats Assessment</i>	Required due to site location	N/A	£779
		<b>TOTAL</b>	<b>£2,020</b>

4.2.2 In addition to the above table, the following forms have been submitted as part of this application:

- Application forms Parts A, B2, B4 & F1

4.2.3 Based on the above, the total fee payable to the Environment Agency on submission will be **£9,950.00**.

4.2.4 The table below summarises which parts of the application forms request the above documentation which would normally be completed in Application Form Part F1; Section 6:

**Table 4.3 – Application Form Reference Table**

<b>Application Form</b>	<b>Question Ref</b>	<b>Page No.</b>	<b>Document Ref</b>
Part A	Q5	2	3020_Director's_Info
Part B2	3B	5	CAM-3020-G
Part B2	3D	6 & 7	CAM-3020-A
Part B2	5A	7	CAM/3020/01, CAM/3020/02, CAM/3020/03 – also found in Appendices of main documentation
Part B2	5B	7	CAM-3020-E
Part B2	5C	8	CAM-3020-C
Part B2	5D	8	CAM-3020-B
Part B2	6	8	CAM-3020-D
Part F1	1 Table 1, 2 & 3	1	CAM-3020-C

### 4.3 **Justification for no further assessments**

#### **NOISE**

4.4 The Best Practicable Means (BPM) will be employed on site at all times to ensure that all plant and equipment used will not produce excessive noise beyond the site boundary. It is unlikely that site operations will cause a noise nuisance or vibration problem due to the scale and location of the site, and type of plant/equipment to be used as part of the operation.

### **ODOUR**

- 4.4.1 In terms of odour, the site will not accept any odorous wastes and if any odorous waste is identified, they will be removed, rejected and stored in a sealed quarantine skip.

### **DUST**

- 4.4.2 In terms of dust, all treatment of waste will be treated by baling only which will not create a dust issue at the site.

### **PESTS**

- 4.4.3 The site will not accept wastes which give rise to pests or vermin.

## **5 Summary of waste treatment procedure**

### **5.1 Waste Treatment, Handling & Storage**

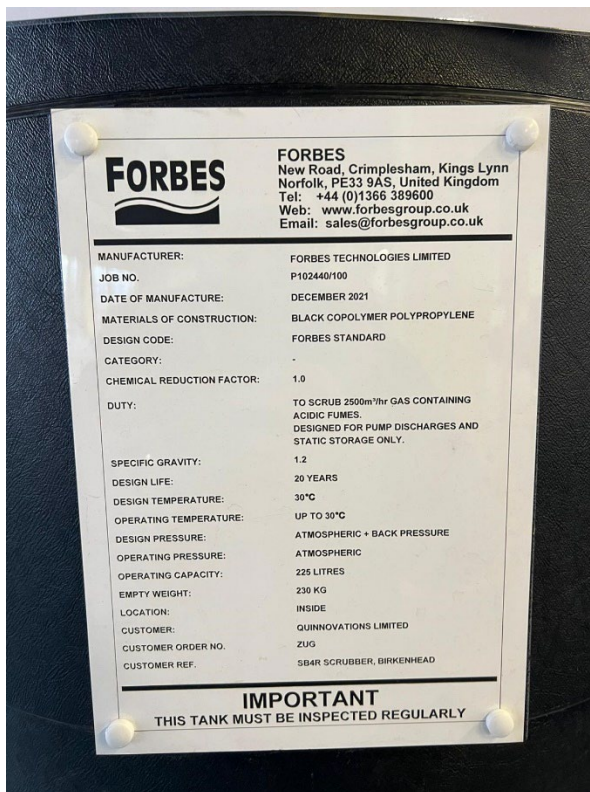
5.1.1 Once a consignment of PCBs or X-ray film has been accepted (in accordance with Section 3.1) and is found to comply with the conditions of the environmental permit the following procedure will apply:

- i) The consignment will be checked, the weight of Smart Creative Technologies Ltd will be recorded for the purpose of producing evidence notes for the Smart Creative Technologies Ltd and as part of the data required for the process. It will then be taken to the Smart Creative Technologies Ltd processing and storage area within building.
- ii) During the treatment process, the procedures shown below will be undertaken:
  - All valves will be checked they are in the correct running position.
  - In terms of the PCBs, all large components e.g. copper coils, heat sinks on the PCBs will be removed.
  - The nitric acid/ferric chloride solution is prepared for the ultrasonic bath.
  - The PCBs/film will be placed into the plastic basket will is then loaded into the ultrasonic bath containing the nitric acid and ferric chloride solution.
  - Extraction hood is placed on top of the bath and switched on. The extraction hood will be used to extract nitric acid/hydrochloric acid vapours through the scrubber as detailed in section 3.6.3. The extraction hood and scrubber is then linked then discharges the clean emissions into the atmosphere via a 2.7m high, 0.4m wide flue from the roof of the existing building.
  - The process temperature and time the PCBs and film are submerged will be carefully recorded. The boards are immersed for 30 minutes under ultrasonic agitation.
  - When the PCBs and film are clean the ultrasonic process is switched off, but the extraction system is left running for 10 more minutes and then switched off.

- The plastic basket is raised using the electric hoist to enable the PCBs and boards to drain.
- The basket is then transferred and lowered into the wash tank and the PCBs and film are hosed down which may result in the small components detaching themselves from the PCBs and film.
- These components will be collected and segregated. All the components of the PCBs and film will be removed and placed in segregated containers for removal off site for further processing or recovery.
- The PCBs / film are then removed from the basket and loaded into one tonne sacks for sale and despatch
- When the acid solution is exhausted it is transferred to the main reactor passing through a 1/16" mesh strainer.
- The drain valve on the ultrasonic bath is open and the recycle valve to the bath is closed.
- Once the drain valve is closed the agitator is switched on. The air pump is started. This continues for 15 minutes ensuring all protective covers and drainage trays are in position on the plate and frame filter press.
- The reactor drain pump is switched on to allow the solution to pass through the filter press.
- The solution is pumped from the filter press through PVC pipework into an IBC. When the reactor vessel is empty the valves are closed, protective covers from the filter press removed, the press is then vented to the IBC.
- The operator then finally releases the pressure on the filter plates, the plates are opened, and the filter cake is removed. The cake is transferred into plastic drums to await dispatch off site.

5.1.2 The temperature of the extraction solution in the processing tank must be continuously measured and documented. The same applies during the preparation of the extraction solution in the mixing tank. Appropriate measures and technical aids must be taken to prevent the temperature from rising above 35 degrees Celsius (e.g. absolute compliance with the order in which individual substances are added).

5.1.3 The air above the extraction bath and the exhaust air from the mixing tank is routed through a gas scrubber. The efficiency of the elimination process is to be demonstrated by means of continuous, quantitative analysis for nitrous gases, chlorine and nitrosyl chloride on a quarterly basis and consecutive production days at the gas scrubber outlet. The scrubber is capable to scrub 2,500m<sup>3</sup>/hr of the gas containing these acidic fumes. Details of the scrubber are shown below:



5.1.4 The main materials produced from the process include used PCBs, microchips, wire, copper coils, aluminium, plastic, silver and mixed filter cake. These are then sent off site for further processing and recovery. The plastic and filter cake are likely to comprise hazardous waste so this will be sent to a suitable permitted hazardous waste facility, all other waste is considered non-hazardous and will be sent to a suitably permitted metal recycling site. The material produced from x-ray film is likely to comprise silver which will also be sold, exported or sent to a suitably permitted site.

5.1.5 The filter cake, the filtrate (extraction solution) and the rinsing water will be analysed quantitatively for each batch (corresponds to an exhausted extraction solution) by a laboratory accredited in the UK (taking into account the limits of determination possible according to the state of the art) for at least the following substances:

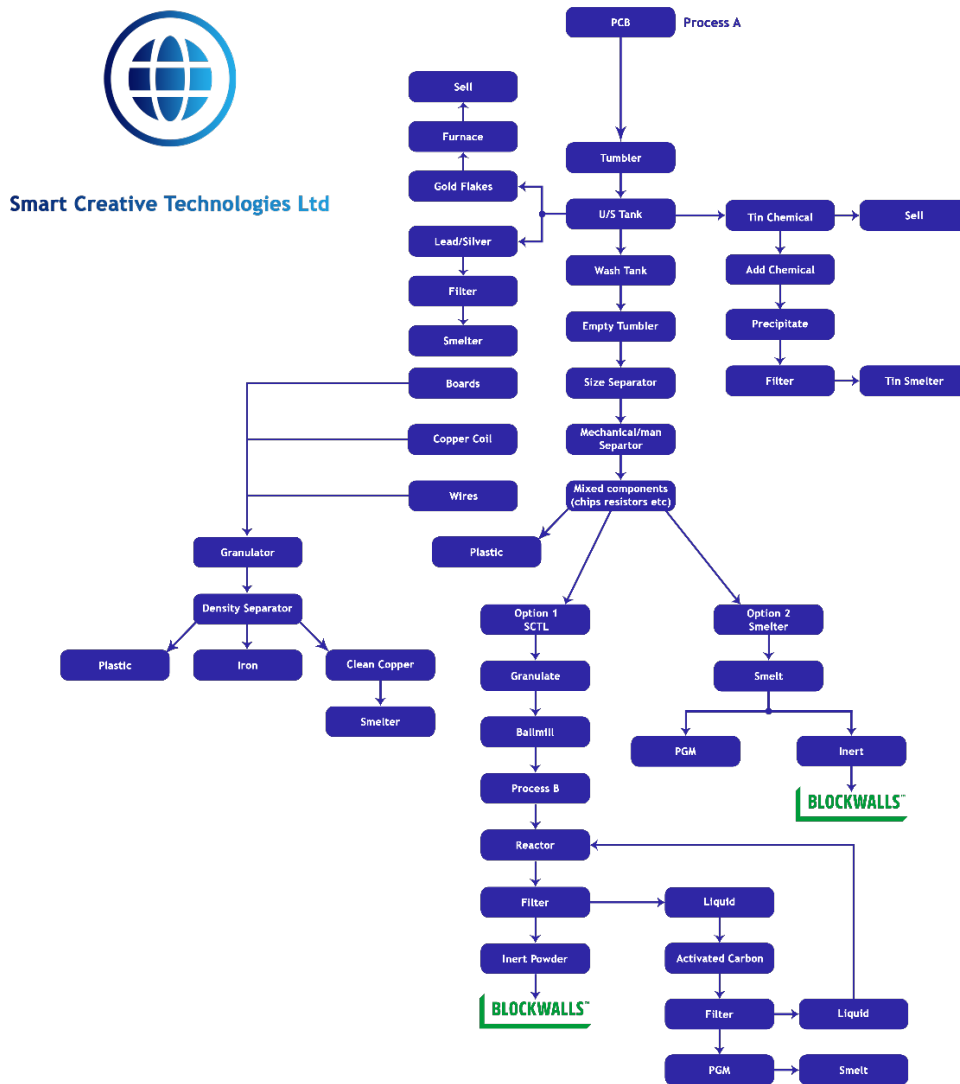
- PCB
- Mercury
- Cadmium
- Hexavalent Chromium
- Polybrominated biphenyls
- Polybrominated diphenyl ethers
- Bis(2-ethylhexyl)phthalate
- -butyl benzyl phthalate
- -dibutyl phthalate
- diisobutyl phthalate
- benzotriazole
- imidazole
- benzimidazole

5.1.6 The exhausted extraction solution (filtrate) and the water from the three washing tanks are to be collected in suitable (sealed) IBCs and sent to a suitably permitted hazardous waste facility.

5.1.7 The operator will not mix or treat the PCBs and film in the same process, they will be subject to the same treatment procedure but during occurrences to prevent cross-contamination of any potential POPs material arising from the PCB processing as detailed in the next section.

## 5.2 Flow diagram

5.2.1 A flow diagram of the treatment process is clearly shown below.



## 5.3 Waste generation/removal & export

5.3.1 If chemicals escape during delivery or removal, the liquid in the retention basin (lift shaft) must be properly disposed of as hazardous waste. The lift shaft must be empty before every delivery and every removal.

5.3.2 Containers containing oil and other water-polluting liquids of 20 litres, and more are to be stored above drip pans. The volume of the collection tray must be at least as large



as the contents of the largest container stored above this tray. The container store must be reported to the AFU before the system is put into operation. For the storage of chemicals, this will be done so in accordance with .