Chapter 1 – Non-Technical Summary – v1.0

Introduction:

1. Lifecycle Oils (LCO) already holds an EA Permit (EPR/HB3502XY) for a non-hazardous waste transfer and treatment facility at its current site at Woodwards Road, Walsall, WS2 9SL but intends to move and expand its activity to a new site at 5 Moorcroft Drive, Wednesbury, WS10 7ED (OS Grid Ref: 937949). Activity on site will include the storage (R13) and recycling/reclamation of non-hazardous organic substances (R3) as specified at Table 1.1 below.

2. The Wednesbury site is planned as the first of 4-7 further sites that will be set-up across the UK to establish a nationwide network for fresh cooking oil distribution and Used Cooking Oil (UCO) collection and waste recovery.

3. UCO will be processed mechanically, with no chemicals used, by physical treatment (heating, settling and filtration) to remove impurities (organic and non-organic solid matter and water) to render it suitable for use as a biofuel for electrical power generation on- and off-site (designated as "LF100"), or for use as a feedstock in biodiesel or Sustainable Aviation Fuel (SAF) production (designated as "5&2").

Table 1.1 – Waste Types:

Waste Code	Description of waste
02	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing.
02.02	Wastes from the preparation and processing meat, fish and other foods of animal origin.
02.02.03	Materials unsuitable for consumption or processing.
02.02.99 *	Oils and fats used in the cooking, preparation and processing of foods of animal or part animal origin and any food residues contained therein.
02.03	Wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
02.03.04	Materials unsuitable for consumption or processing.
02.03.99 *	Oils and fats used in the cooking, preparation and processing of foods of vegetable or part vegetable origin and any food residues contained therein.
02.06	Waste from the baking and confectionary industry
02.06.01	Materials unsuitable for consumption or processing.
02.06.99 *	Oils and fats used in the cooking, preparation and processing of baked foods or confectionary and any food residues contained therein.

19	Materials from waste and water treatment
19.08	Waste water treatments plants not otherwise specified
19.08.09	Grease and oil mixture from oil/water separation containing edible oil and fats

20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions
20.01	Separately collected fractions (except 15.01)
20.01.08	Biodegradeable kitchen and canteen waste
20.01.25	Edible oil and fat

** Specified '99' codes included as advised by local area EA team during application for permit EPR/HB3502XY (Lifecycle Oils' current Walsall site) to cover material received/collected from food manufacturing facilities, as opposed to the standard 20.01.25 which, we were advised, applies only to restaurants/cafes/take-aways etc.*

4. For simplicity, in this document, all of the above will be referred to as UCO although some of it may, more correctly, be referred to as waste cooking oil or food waste (ie cooking oil that has not been 'used', per se, but may be either contaminated or

at/near/past its expiry date and therefore no longer fit for human consumption or use as animal feed) or "FOGs" (Fats, Oils and Greases).

5. Collection/delivery of UCO will be from other bulk collectors/aggregators and/or "Points of Origin" (the point at which the UCO becomes a waste – ie food processing factories and smaller scale restaurants, cafes and food outlets).

6. This will be achieved either directly from this site or via a supporting network of smaller 'micro-sites' (off-site 'warehouses' dedicated to the distribution of fresh cooking oil and the collection of UCO on a small scale).

7. Delivery will be by a combination of road/vacuum tanker; or trailers/vans carrying 1,000L industrial bulk containers (IBCs); sealed barrels or drums (60-120L capacity); 'Fattboxes' (purpose built, wheeled containers with sealable lids and 60 or 120L capacity); or returned 20L drums/tins.

8. These items will, collectively, hereafter be referred to as "units".

9. All material received on site will be measured by weighbridge or pallet scale, both of which will be calibrated and verified for trade use annually. LCO will apply a standardised conversion ratio of 1 metric tonne (minus the weight of packaging) to 1,098 litres (based on the average specific gravity of the UCO collected). The tonnage/volume of material received will be accurately recorded and reported iaw standards set by the International Sustainability and Carbon Commission (ISCC).

Operating Capacity:

10. At capacity, operating up to a maximum 24/7 rhythm for 50 weeks per year, LCO expects to be able to safely receive, process and dispatch the volumes of UCO and recovered product/bi-product volumes at Table 1.2, below:

Table 1.2 – Operating Capacity:

Waste to be Processed:	**Anticipated Maximum Volumes (L):**		
	Daily	**Weekly**	**Annually**
Used/Waste Cooking Oil (UCO) (100%)	200,000	1,400,000	70,000,000
Primary/Secondary Waste Streams for Recovery:			
Processed/dried UCO ("LF100" or "5&2") (97% of recovery)	186,000	1,302,000	65,100,000
Bi-Products/Tertiary Waste Streams for Disposal Off-Site:			
Wastewater (est 5% of recovery)	10,000	70,000	3,500,000
Food Residue (est 2% of recovery)	4,000	28,000	1,400,000

Storage Capacity:

11. The processing volume will be achieved by throughput. The intention is for all incoming units received to be triaged, processed and transferred to the bunded tank system for storage and settling within 24 hours (48 hours maximum).

12. Maximum UCO storage capacity will be as follows:

- Dedicated 'goods inward' reception and temporary storage area.
  - space for 300 x double-stacked pallets + 40 quadruple-stacked IBCs.
  - max 200,000L/day in individual units.
  - secondary containment bund surround.

- 6 x 12 IBC/pallet, double-stacked heater/storage units.
  - total max capacity 72,000L.
  - each integrally bunded.

- 48 x 32,000L storage/settling tanks.
  - total max capacity 1,536,000L.
  - arranged into 6 'tank rooms', each bunded iaw current regulations.

- An additional max 45,000L
  - in other processing machinery, pipework and bi-product storage.
  - all to be bunded as appropriate

- **Total Max Storage Capacity = 1,853,000L or 1,688mt**

Site and Management:

13. A full description of the site at which the waste recovery operation will take place is provided at *Chapter 2: Site Condition Report.*

14. The Directors and Senior Management of LCO have substantial experience in a range of areas within the biofuels and waste recovery sectors and other areas of business/services.

15. **The Company's Head of Compliance holds a valid WAMITAB qualification (Level 4 Medium Risk Operator Competence for Non-Hazardous Waste Treatment and Transfer - MROC1) and will perform the duty of Technically Competent Manager for the site** until a suitably qualified replacement is specifically engaged as Site Manager**.**

16. LCO's management systems will be compliant with the requirements of the International Sustainability and Carbon Commission (ISCC) which sets out detailed parameters for the handling of sustainable material, including biofuels and UCO, and the bi-products derived from their processing. ISCC certification requires an annual independent audit by an authorised certification body (in LCO's case, SGS Germany).

17. A copy of the company's current ISCC certificate is at *Appendix 1*. As the company grows, it will also undertake to work towards relevant ISO certifications.

18. More detail on the group management systems, structure and personnel, including the staffing plan for this specific site, can be found at *Chapter 3: Management Systems and Personnel.*

19. The waste recovery process has been designed and sourced to be undertaken, where practicable, indoors, in an enclosed, bunded environment.

20. Additional control and risk reduction measures will be implemented, in line with the *Environmental Risk Assessment (see Appendix 2)* to ensure that:

- only non-hazardous materials within the scope of the Environmental Permit are accepted on site *(see Table 1.1, above, and Chapter 4: Waste Acceptance Plan)*;

- the risk of spillages or other environmental contamination is minimised *(see Appendix 2: Environmental Risk Assessment and Chapter 5: Operational Techniques);*

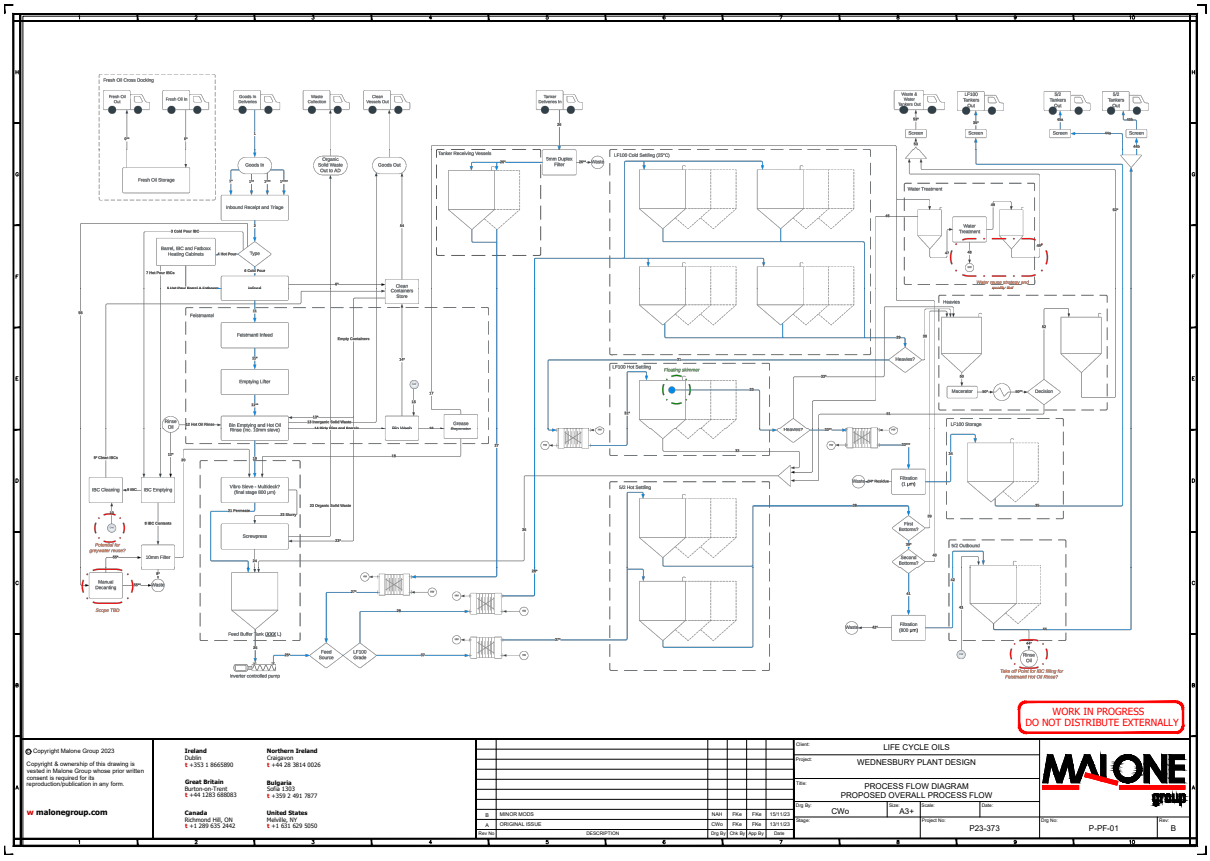
- and any incident/accidents that do occur are promptly and effectively managed with no further detriment to the site or its environs *(see Chapter 6: Accident Management Plan).*

21. Wastewater treatment will require the use of some chemicals for flocculation and coagulation but, where possible, organic chemicals will be sourced and they will be stored in a bunded, locked, secure area, and handled and disposed of in accordance with appropriate Care of Substances Hazardous to Health (COSHH) regulations

Process Overview:

22. Fig 1.1, below, shows the process flows for the various waste recovery streams that will be carried out on-site. This is best viewed in a larger scale so a standalone version that can be expanded electronically and/or printed (A3 minimum recommended) has been provided at *Appendix 3.*

Fig 1.1: Lifecycle Oils Ltd Process Flow Diagram for Waste Recovery



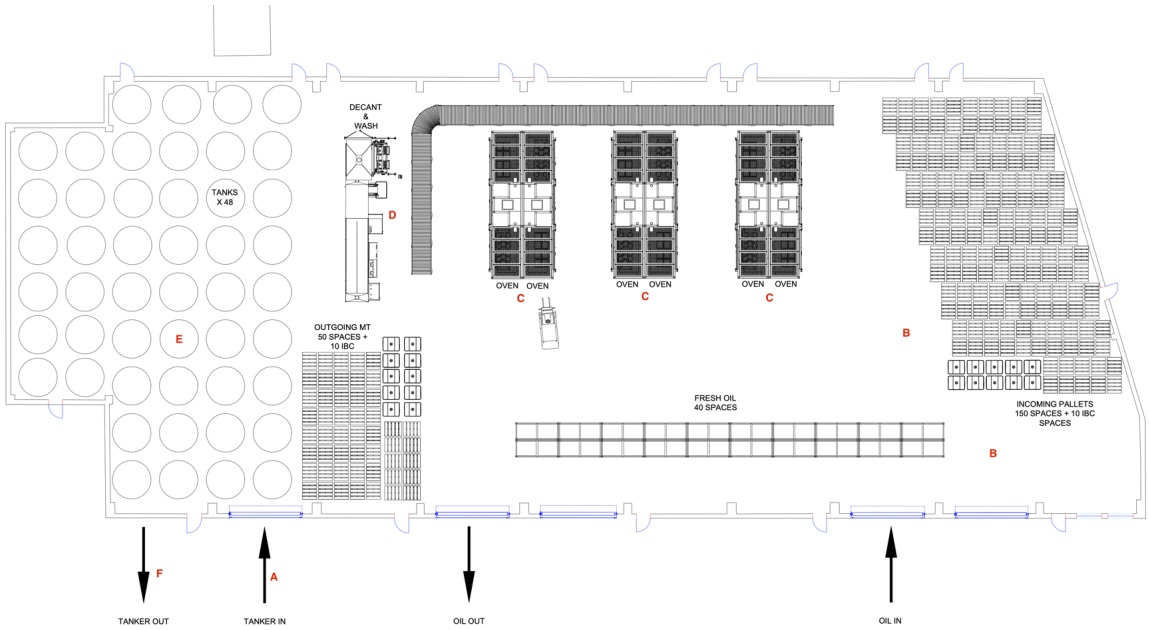
23. A non-technical summary explanation of those process flows can be found at paras 24-43 below with further detail added at *Chapter 5: Operational Techniques.*

24. Fig 1.2, below, shows the plant/equipment layout on-site. Physical movement of material around the site will flow from right to left from 'goods inward" and triage, through processing, to settling/filtering and dispatch. Much of the material will be recycled multiple times through the process.

25. A standalone version of Fig 1.2 that can be expanded electronically and/or printed is at *Appendix 4.*

26. More detail of the equipment/machinery to be installed and the processes to be carried out can be found at *Chapter 5: Operational Techniques* as referenced below.

Fig 1.2: Lifecycle Oils Ltd Interior Plant/Equipment Layout



27. "Goods Inwards" will be received as per *Chapter 4: Waste Acceptance Plan.*

28. Bulk deliveries by road fuel tanker will be received directly into the storage/settling tanks positioned within the main bund wall via an external, bunded delivery system (Point A on Fig 1.2) *(see paras 5.10-16 for further technical/process description).*

29. Upon receipt, other units will be offloaded into the bunded reception area (B) where they will undergo a visual assessment to determine their processing requirements and product suitability. In general terms, this can be split into 2 'types' of material:

- "Hot-Pour" – material that is solid/semi-solid at ambient temperatures and that needs to be heated to become liquid (typically fats and palm oils) to facilitate flow and prevent downstream blockages.

- "Cold-Pour" – material that remains liquid at ambient temperatures and can be poured (mostly oil with low fat content).

30. Units identified as Hot-Pour will be moved to one of 6 x 12 IBC/pallet, double-stacked, self-bunded, heater/storage units (C) *(see paras 5.17-19)* where they will

either be heated in a low temperature oven (not exceeding 80°C) or stored overnight for next day processing.

31. Cold-Pour material will be moved directly to the self-bunded decanting machinery (D).

32. Units will be mechanically emptied and cleaned and will have inorganic solids (rubbish found in the containing unit, including plastic wrappers, cardboard, metal lids etc) removed *(see paras 5.20-28).*

33. Effluent from the cleaning process will be sent for treatment via a grease separator (see para 39 below).

34. UCO from the emptied units will be screened and processed to separate organic solid particulates. The resulting slurry will be further processed via a screw press to remove embedded UCO, leaving dry matter. This material will be stored in sealable waste bins until disposal/removal off-site.

35. The screened mixture will then be transferred to LF100 cold settling tanks (E) for phase separation (separation into oil, fats and water). Bottom-settled content ("Heavies") will be sent for further treatment *(see paras 5.29-30).*

36. The remaining LF100 cold settling content will undergo heating and settling for further phase separation. As above, bottom-settled "Heavies" will be sent for further treatment and a final 1μm filter will be applied before storage and dispatch *(see para 5.31).*

37. 5&2 feedstock and recirculated "Heavies" will also undergo heating and settling for phase separation. Bottom-settled "Heavies" will again sent for further treatment with an 800μm filter applied before storage and dispatch *(see para 5.32).*

38. Non-water components from "Heavies" will undergo separation via fat trap/grease separator and will be returned to the process *(see para 5.33).*

39. Effluent from container cleaning and water extracted from "Heavies" undergoes water treatment before clean water is removed from the site either by discharge to a controlled drain, if within relevant effluent consent levels, or, if not, transferred off-site for disposal or treatment through an appropriate route *(see paras 5.34-35).*

40. Solid waste (organic and non-organic) is collected by licensed waste carriers.

41. Clean containers are distributed to customers alongside fresh cooking oil.

42. Drums/tins will be crushed and baled and moved to temporary on-site storage (metal skip) prior to removal off-site and disposal/recycling at an appropriately certified plastic/metal recycling facility *(see paras 5.48-50).*

43. LF100 biofuel and 5&2 will be discharged from the tank system via an external, bunded delivery system (F), to a road tanker for sale/transport off-site to an appropriately permitted recipient *(see paras 5.10-15).*

** Note: LCO operates its own vehicle fleet and holds both a valid Operator Licence and an Upper Tier Waste Carrier Licence. It may also contract out some movements to other haulage companies.*

Emissions:

44. Noise and odour emissions from the site and process, and their impact on the surrounding environment, will be negligible.

45. No finished or bi-products will be released to drain other than water within correct effluent consent parameters.

46. The single point emission source will be the exhaust from the generators that will provide the primary power to the site.

47. Emissions are covered in more detail at *Chapter 2: Site Condition Report.*