Project Description Statement

C.G.L. Oil Blenders Ltd.
PA 3816/18 - Proposed internal addition to existing factory including a biodiesel production unit and an extension to the existing factory including a Bio. Plant with PV Panels on the roof

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michaelsant@econsultingmalta.com

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Cover image from Google Earth (2016)

Introduction

1. C.G.L. Oil Blenders Ltd. consists of an industrial operation involved in the management of automotive, industrial and marine lubricants. This Project Description Statement (PDS) describes the addition of infrastructure intended to allow the reception and storage of used edible oil (EWC 20 01 25 edible oil and fat) collected from households and commercial premises, and the processing of such material to produce biodiesel.

2. The operations of the plant are planned to be carried out at the CGL Oil Blenders Ltd. facilities in Hal Far, where PA 3816/18 – '*Proposed internal addition to existing factory including a Bio. Diesel Production unit and an extension to the existing factory including a Bio. Plant with PV Panels on the roof*' - has been approved.

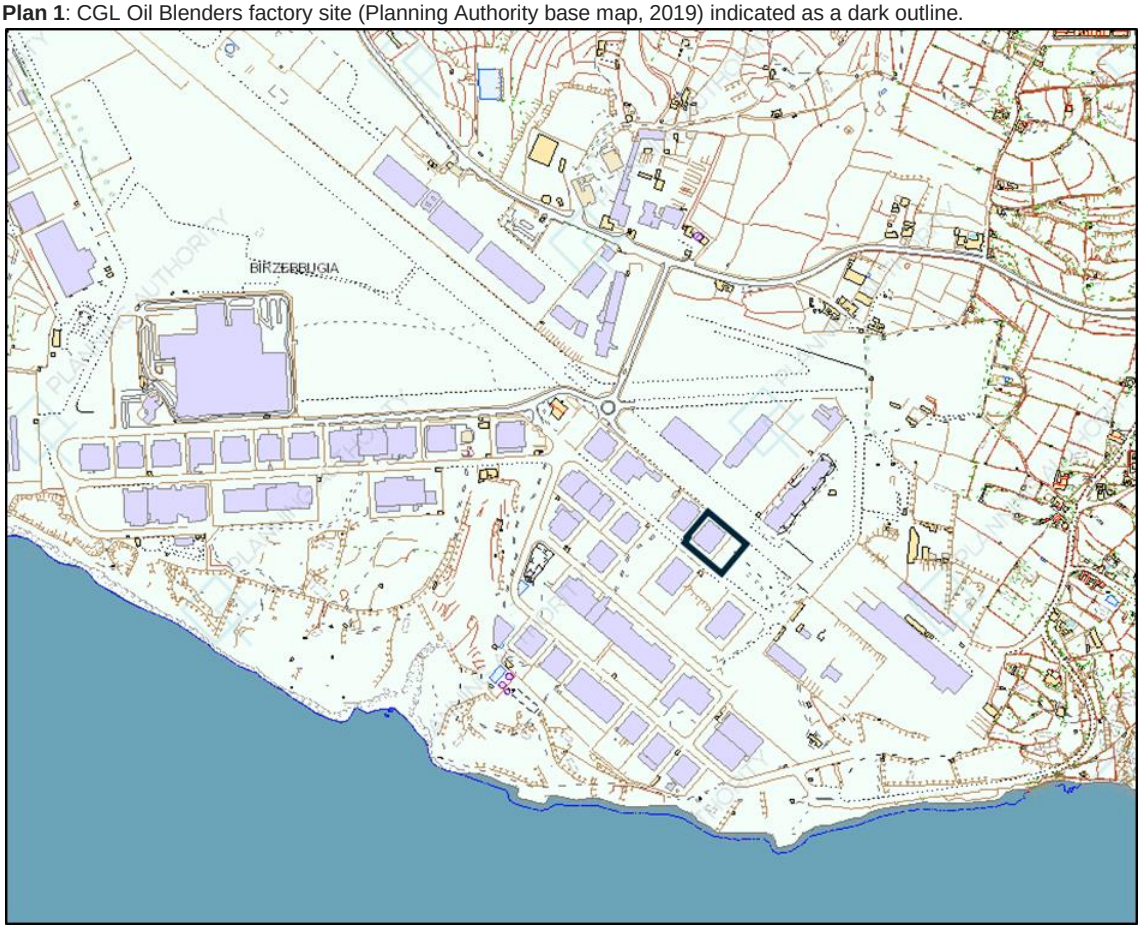
3. The process of production of biodiesel is achieved through the reaction of organic oils of biological origin (waste edible oils) with methanol to produce biodiesel –processes known as esterification and transesterification. This is performed within industrial plant designed specifically for this purpose.

Site Description and Context

4. Plan 1 illustrates the location of the CGL Oil Blenders facility, which located in the centre of the Hal Far Industrial Estate, Birzebbuga. The area of the site is circa 5,650m^2, and is surrounded on all sides by established industrial operations. Surrounding natural features are at the edge of the industrial estate:

- The cliff edge over 400m away to the south;
- Wied Znuber over 330m away to the west; and
- The agricultural areas circa 400m away in a northerly direction.

Plan 1: CGL Oil Blenders factory site (Planning Authority base map, 2019) indicated as a dark outline.



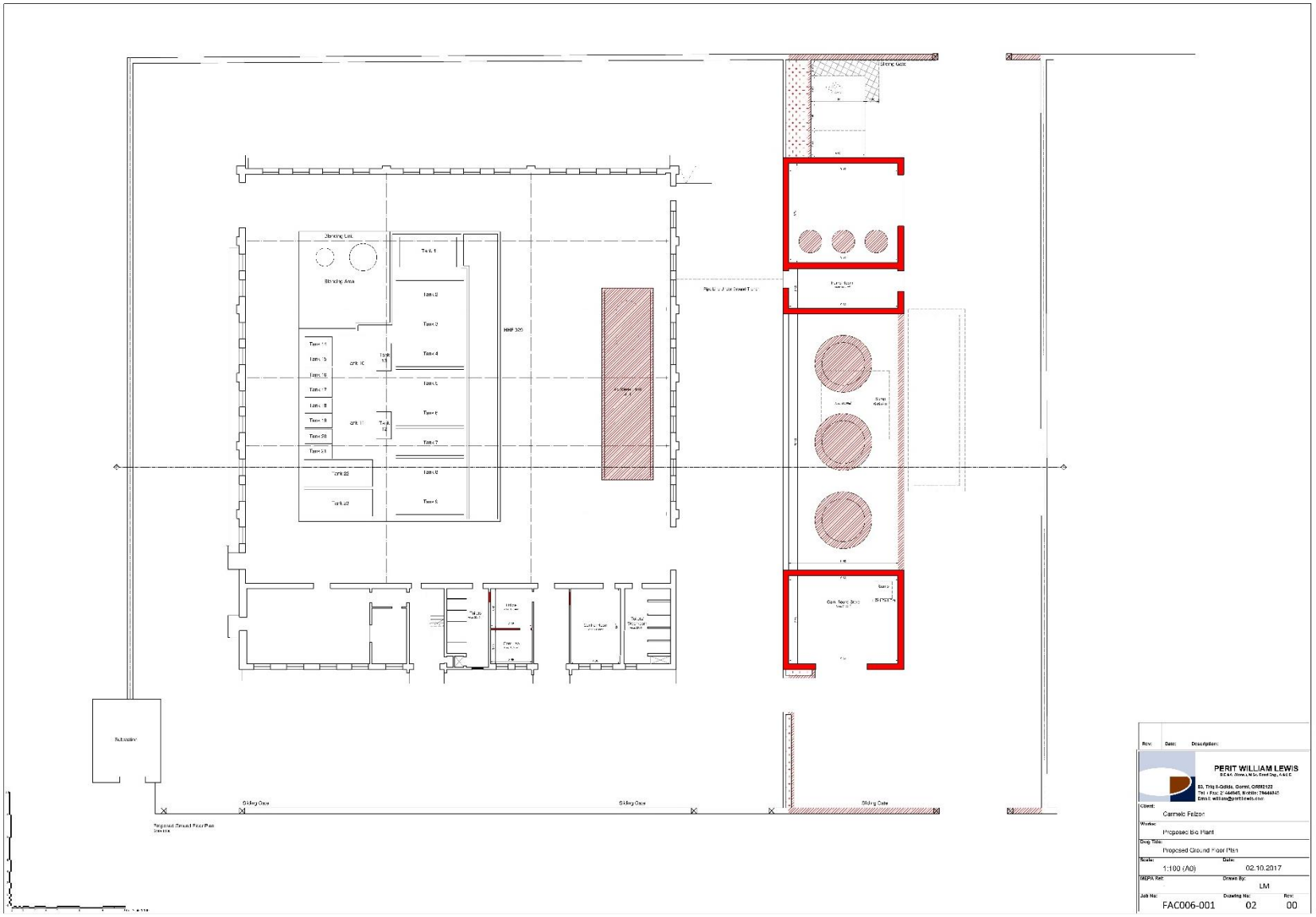
6. Existing features on site are illustrated in Plan 2. These essentially include a factory building with two entrances onto a curtilage that surrounds the building on all sides. The façade of the building includes office space and sanitary facilities. The interior of the building is organised into storage areas for tanks of lubricating oils, with their associated bunding systems. The only process that is carried out on site consists of the blending of limited volumes of lubricating oils (as per specifications given by CGL Ltd. clients).

7. The additions to the existing facilities are illustrated in Plan 2 in red. These include:

   i. The development of an adjacent area into a small tank farm, consisting of three tanks and bunds for storage of raw materials and biodiesel;
   ii. Pump room connecting the tanks to the process area;
   iii. A storage room for methanol tanks; and
   iv. Development of a process area within the factory so as to accommodate the biodiesel production plant.

   The main buildings are connected to the national electricity grid and water supply. Moreover, the buildings are connected to the main sewer for black waters, but not trade effluent.

Plan 2: ground floor block plan (additions in red). (Perit William Lewis)**.**



michaelsant@econsultingmalta.com

The Project and its General Objectives

8. The scope of the development permit submitted consists of the installation of equipment to allow production of biodiesel. This will involve the following processes:

    - Process A – reception of edible oil brought in from collectors' rounds;
    - Process B – storage of waste oil and process chemicals (methanol); and
    - Process C – pre-treatment of used cooking oil by esterification
    - Process D – production of biodiesel in the reaction vessel via transesterification.

9. **Process A**: this will involve the reception of collector vehicles that will be licensed waste carrier vehicles. These will collect waste edible oils from domestic and commercial sources, and bring them on site, where the tanks will be decanted into tanks and pumped into the large storage tanks on site.

10. **Process B**: storage of materials will be performed as follows:

    i. The storage of lubricating oils in indoor bunded tanks will continue;
    ii. The storage of methanol will be carried out in a dedicated tank storage room equipped with the required emissions abatement and fire control systems; and
    iii. Biodiesel and waste edible oils will be stored in a dedicated storage facility.

11. **Process C**: The free fatty acids (FFAs) in the used cooking oil is removed through esterification. Initially, the feedstock oil is cleaned by regenerative heating to about 70^0C using preheated clean oil or steam. Phosphoric acid is injected at a controlled rate to precipitate gums, metal compounds and other impurities depending on the quality of waste feedstock used. The acid conditioned oil is then reacted with an alkaline solution which is injected at a controlled rate into a neutralization mixer where the excess fatty acids are thus neutralized. Any excess phosphoric acid forms soap stock which is removed with the excess lye and other impurities in a soap stock separator.

The discharged heavy phase is then transferred by gravity to a soap stock buffer tank and then to a storage tank. The next step is to remove any small amount of soaps which would have formed with the neutralized oil. The oil is heated to 85 – 90^{0}C in a washing heater and mixed thoroughly with hot water in a mixer. By then, the excess soap would be dissolved into the water phase and removed from the oil via a washing separator.

In certain circumstances it might be necessary to eliminate any remaining traces of soap by dosing a small quantity of citric acid solution into the oil after the washing separator. The final FFA of the oil should be reduced from between 4 to 5%, which are typical parameters of the oil after cooking, to a maximum of 0.05%.

12. **Process D**: this will involve the management of the esterification reaction used to produce biodiesel i.e. through the reaction of biodiesel with methanol in plant designed specifically for this purpose. This plant allows the controlled reaction to take place in a reaction vessel that is maintained at the required temperature.

    The oil is first heated to 65^{0}C inside a heating tank and then transferred into a reactor tank. Methanol is then added, typically between 18 to 20% by volume followed by the dosing of a catalyst which is usually potassium methylate or sodium methylate. The exact dosing of the catalyst depends on the final FFA of the neutralized oil at the end of the pre-treatment process.

    The oil is mixed with these chemicals for a period of around 45minutes to form fatty acid methyl ester (FAME) and glycerol. The mixture is then transferred into a separator tank where the FAME is separated from the glycerol, after which the FAME is transferred into another heating tank and its temperature increased to 65^{0}C. The final steps consist of passing the FAME through columns of ion exchange resin to remove any excess soaps which would have formed during the transesterification process. Finally, the same liquid is passed through a methanol flash drum where the residual methanol is removed under vacuum. The final product will be biodiesel which conforms to European standard EN 14214.

    The production of biodiesel also results in the production of glycerol, which is a by-product in its own right if the material produced is of the required grade. The plant will be equipped with various features consistent with Best Available Techniques, including the scavenging of methanol from the final product through a vacuum distillation process. In some occasions, it might be necessary to distil the biodiesel in order to conform with the above standard and plans to incorporate distillation means in the equipment have already been made, however under normal circumstances this should not be needed.

The biodiesel is then transferred into storage tanks to be located within a tank farm where it would be ready to be distributed to other plants via road tankers.

13. The above processes will be the subject of an application for an IPPC permit, which is being submitted in parallel with this Project Description Statement. This proposal includes measures consistent with Best Available Technique to ensure:

- mitigation of emissions to air (particularly from the methanol tanks);
- control of waste waters and rainwaters on site;
- measures to ensure safety of operations in terms of fires and operational spills; and
- proper waste management in terms of reception of wastes on site, as well as management of wastes generated on site.

The application also includes a proposal for a monitoring plan to evaluate the actual impact of operations, and a proposal for eventual decommissioning once operations on site are eventually halted.

Process of Construction

14. Access to the site will be through the existing gate, until the construction of the alternative entrances and exits will be completed. No other areas will be involved in the construction processes as detailed below:

    - **Earthworks**: removal of existing surfaces, soils, and excavation of rock to the required levels;
    - **Civil works**: construction of structures in in-situ reinforced concrete, precast and prestressed concrete elements, steel structures, walls in hollow concrete blocks and limestone, as well as waterproofing;
    - **Building services**: installation of foul water system, mains water distribution, electrical distribution, firefighting systems, lighting, security systems, etc
    - **Internal and external finishing works**: installation of external and internal apertures, flooring, wall and ceiling finishes, sanitary ware, signage etc., and
    - **External landscaping and paving works**: laying of hardstanding, paving works, setting of concrete kerbs and line marking.

15. It is expected that duration of the works shall be of not more than 12 months.

16. The main volume of waste to be generated is the waste generated during excavation; those materials that cannot be reused on site will be disposed of appropriately in a permitted facility. All materials will be transported in covered trucks (tarpaulins) using main arterial routes.

17. The wastes to be generated by the project are those typical of construction works, as it is projected that all other wastes on site will have been removed as described above. Wastes generated during works will be accumulated in designated storage areas and disposed of in permitted facilities. All wastes sent off site will be carried in an appropriate manner in vehicles licensed for such use as per the provisions of LN 106 of 2007. The contractor will be committed to maximise reuse of materials and minimise use of landfill. Waste management will be aimed at minimising the waste generated by the construction and maximising the recycling/reuse of materials.

Environmental Risks, Impacts & Mitigation

18. An environmental impact may be positive, neutral or negative, depending on the effect a causative agent would have on the environment. Impacts from this project can arise from either of two stages:

    A. the *construction stage*, and
    B. the *operational stage*, which is that where facility will be operated

19. The following are the environmental risks (see table 2) associated with the construction phase.

Table 1: environmental risks and mitigation measures during construction phase

Risk	Mitigation measure
Generation of dust	• Using water or pre-soaking to control dust generation; • Removing accumulations of dust on site, and on roads accessing the site; • Preventing dust and particulates from coming into contact with storm waters • Using barriers and containment over areas where sanding or blasting may be applied • Using blasting and sanding equipment that is equipped with appropriate dust extraction and recovery
Contamination of water	Management of any storm waters accumulating on site during works; avoiding all off-site discharges.
Noise	Avoidance of works that involve generation of noise during periods indicated within SL 552.09.
Waste generation (see also point 27 above)	• Segregation of wastes generated, and storage in designated areas prior to disposal • Transport of waste off site as soon as possible, utilising waste carriers licensed under LN 106/07 • Disposal of wastes at licensed facilities
Traffic & Logistics	Keep traffic volumes to the minimum requirement; avoid peak traffic hours as far as reasonable possible.

20. The following are the environmental risks (see table 2) associated with the operational phase.

Table 2: environmental risks and mitigation measures during operational phase

Process	Risk	Mitigation measure
Reception	Fire	• Clear storage plans and layout • Segregation of flammable materials in areas where containment and response are facilitated • Installation and maintenance of fire detection and response infrastructure
	Loss of containment	• Proper containment and bunding
	Contamination of water	• Isolate all storage areas from water ingress. See also entry below for all processes.
	Traffic	• Expected to be than 5 trucks per day.
	Emissions to air	• Wastes to be stored in proper containment in sealed tanks.
	Waste generation in terms of rejects, operational wastes	• Designation and maintenance of quarantine areas for hazardous wastes discovered in incoming streams, or generated during operations • Storage of reject materials not fit for recovery, prior to disposal at an authorised facility
Biodiesel production and storage facilities	Emissions to air	• Hermetically sealed plant • Emissions from facility through a carbon filter
	Spillage	• Avoidance of decanting of liquids (except cans of edible oils) and use of filled lines • Regular inspection and proper maintenance • Bunding of all liquid stores
	Emissions to water	• Avoidance of decanting of liquids (except cans of edible oils) and use of filled lines • Regular inspection and proper maintenance • Segregation of rainwaters from other waters • Bunding of all stored liquids • Impermeable surface and presence of an interceptor prior to site water storage
	Waste generation	• Proper waste management processes consistent with Best Available Technique • Reuse of containers wherever feasible • Avoidance of waste generation through production of by-products (e.g. glycerol), and recycling wherever possible • Proper disposal of wastes at licensed facilities.

Table 2 (continued): environmental risks and mitigation measures during operational phase

Process	Risk	Mitigation measure
All processes	Contamination of water	• Maintenance of proper containment of all wastes, and eliminate potential exposure to rainwater by operating in covered areas • Impermeable hardstanding on site for all operational and/or traffic bearing areas, with gutters directing water flows to reservoir via an interceptor • Spill kits to collect operational spills from damaged equipment
	Noise	• Limitation of operating hours • Maintaining all equipment in enclosed structures to ensure noise abatement
	Ground contamination	• Impermeable surfaces, and proper containment of all wastes on site.

21. In general terms, **mitigation measures** that are applicable to the construction phase are those that are contemplated in the Environmental Management Construction Site regulations (S.L. 552.09, as amended). Mitigation measures that are applicable to the operational phase are those that may be applicable under the Best Available Techniques (BAT) Reference Document for Waste Treatment.

22. **Biodiversity**: Given that the site is distant from protected areas in the region, no impacts should result in terms of biodiversity.

23. **Cumulative impacts**: the operational risks detailed above are expected to be transient and fully reversible. Through application of mitigation, risks associated with emissions to air or water, or contamination of the ground should be negligible; risks associated with fire or with health and safety should be managed through risk assessments and management plans.

24. **Visual impact** is not considered significant, given that this is an industrial development located in the heart of an industrial estate.

25. **Environmental monitoring**: this will be required through all project phases. Monitoring requirements for the operational phase should be determined via an application for an environmental permit.

26. **Resource consumption**: the main resources consumed will be the methanol and the waste edible oil; energy consumption shall be subsided through the onsite generation of energy via the solar panels. Water consumption shall be improved through the storage of rain waters for reuse on site through construction of a reservoir.

27. **Generation of wastes**: generation of wastes during construction will be limited to some excavation material that cannot be reutilised on site. Wastes generated from operations will mainly be the generation of used containers that are no longer fit for purpose in terms of reuse.

    Glycerol will be a by-product of the biodiesel production process; however, every effort will be made to produce this material to a standard that would render it fit for resale as a viable product that can be used as a chemical feedstock in other industries.