Volume 2

Section 2 Description of the Development

Contents

List of Figures

List of Tables

2.1 Description of Development

2.1.1 General Overview

Existing Rendering Process

The process flow diagram of the production line in the existing College Proteins rendering plant is presented in figure 1 below. Raw material is received into the factory and off-loaded in the Raw material building. From there it is fed through crushers to reduce the particle size. The crushed material is fed via a lamella pump to a preheating system. Waste water from the raw material area and crushing area is collected in an isolated sump and fed into the pre-heating system. All areas in the factory are kept under negative pressure at all times and the malodorous air is treated in the bio filters.

The material is pressed after pre-heating, the solids go to the driers and the liquid is decanted. The oil is cleaned in a filter system and sterilised before it is sent to tallow storage tanks. The waste liquid (stick water) is sent to a waste heat evaporation plant to be evaporated and the solids are conveyed to the drier. The evaporated / concentrated liquid is then sent to the drier for further processing. Once in the drier the material is heated according to Department of Agriculture and EC regulations (1069/2009).

After drying, the material now called meal is discharged and goes on to be sterilised, cooled, milled and stored for dispatch. Vapours which are driven off at the drying stage are drawn by a fan to a waste heat evaporator, while excess vapours go to the thermal oxidiser. There is backup alternative abatement in the form of air cooled condensers, boilers and biofilters which will be used in the event of a thermal oxidiser malfunction. The condensate liquid generated in the evaporation plant condenser is directed to the WWTP.

The process area where these processes take place is ventilated by the bio filter system and thus kept under negative pressure. All waste waters arising from this area as a result of washing and cleaning are directed to the Waste Water Treatment Plant (WWTP).

Proposed Biodiesel Manufacturing Facility

The proposed development consists of the construction of a biodiesel production plant adjacent to the existing College Proteins' meat rendering plant at College Road, Nobber, Co. Meath.

The biodiesel plant will be capable of producing 25,000 tonnes per annum of high quality biodiesel from tallow and used cooking oil (UCO). Side products of this production are crude glycerine and Bio heating oil (BHO). The plant consists of a process building, loading/unloading stations and a tank farm. In addition, the proposed development will also provide for a new Security Building and additional car parking area adjoining the entrance to the site.

College Group also propose to install a cogeneration unit which is fired by natural gas. The intended unit will can produce 800Kw of electricity and 406Kw of recovered heat from the cooling circuits in the form of Low Temperature Hot Water (LTHW). In addition to this College

Group intend to improve efficiency further by recovering exhaust heat energy with the use of a waste heat boiler. Approximately 25% of the usable energy of the fuel gas is released in the exhaust of the gas engine. This will be captured for cogeneration in a combined heat and power plant. This heat exits the engine at ~450oC as 'high grade heat', contrasting to 'low-grade heat' available from the generator cooling circuits. This high temperature and flow makes it well suited for utilization in a waste heat boiler. There will be 1500Kg/h of steam at 9 bar pressure available for utilization with nearby steam users in the rendering plant. This steam production also reduces the load on the current steam generation system allowing the existing system to run less of the time.

The 800 kw of electricity produced will be more than double the about required to run the biodiesel plant. Therefore, there will be a reduction in Maximum Input Capacity (MIC) for the overall site.

The LTHW being generated will supply heat exchangers in the office block to heat the offices.

This plant will result in the following benefits:

- Reduced base load electricity supply.
- Additional security of supply.
- Stabilized electricity costs over a fixed period.
- Increased diversity on heating and hot water.
- Steam raising capabilities.
- Reduced primary energy use.
- Reduced CO_2 emissions.
- Additional carbon legislation compliance.
- Reduced transmission losses from the grid.
- Enhanced operational efficiency to lower overhead costs.
- Reduced energy waste, thereby increased energy efficiency.
- Provides greater energy independence by moving a portion of the load off the grid.

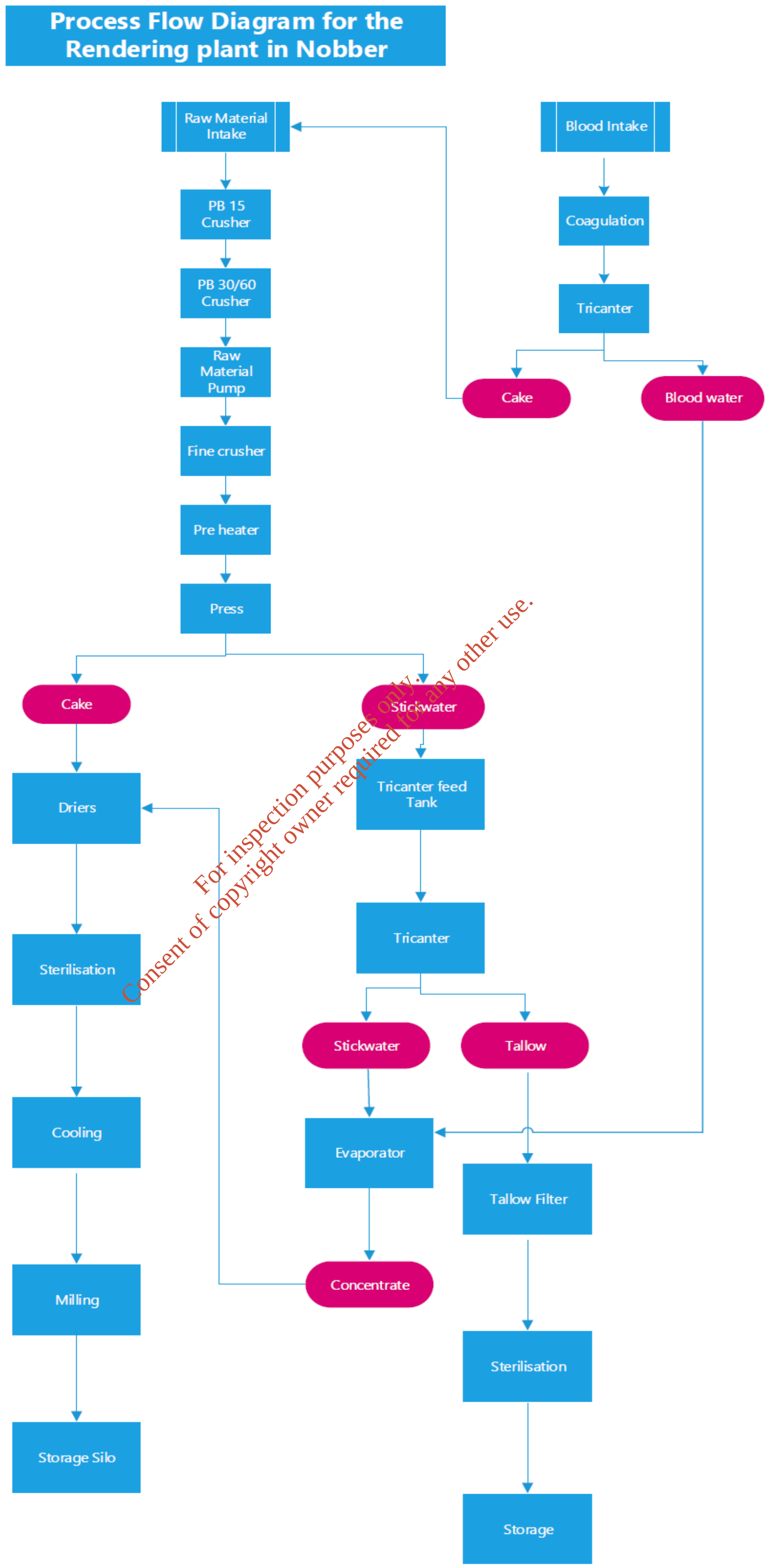

Figure 1 Existing Rendering Plant Process

2.2 Description of the Process

2.2.1 General Description of the Biodiesel Process

Used cooking oil (UCO) and animal fat (AF) represent a very high-grade source of energy (fuel for diesel engines) when they are chemically changed (transesterified). In chemical respect, fats and oils consist mainly of free fatty acids and triglycerides (i.e. three long-chain fatty acids are attached to a trihydric alcohol, the glycerine). These components can be transformed into Fatty Acid Methylester (FME) also called Biodiesel, a fuel directly useable in diesel engines, fulfilling the worldwide strictest quality standard (EN14214).

The process can be divided in two main parts:

1. Esterification and transesterification of the raw material to Biodiesel
2. By-product treatment.

The process technology for the production of Biodiesel has been developed thoroughly and is focused on the environmental compatibility, i.e. by-products represent valuable products, which increase the economic output. The improvement to the technology that is proposed is an acid catalysed transesterification process which can result in the production in two grades of biodiesel, standard use biodiesel and cold use biodiesel.

In the original process 1 distillation column was proposed to produce one biodiesel product. It is now proposed to produce 2 biodiesel products C16 & C18 using fractional distillation columns. The fractional distillation columns are what requires the building to be wider at the top.

During fractional distillation mono glycerides will remain in the C16 fraction of the biodiesel from the first distillation column. The Mono glycerides have a low Cold filter plugging point (CFPP) and therefore cannot be used as a winter fuel.

This is important as in cold temperate countries, a high cold filter plugging point will clog up vehicle engines and therefore it is important to separate this fraction.

The C18 fraction is the standard use biodiesel and can be used in cold countries as it has the monoglycerides separated from it.

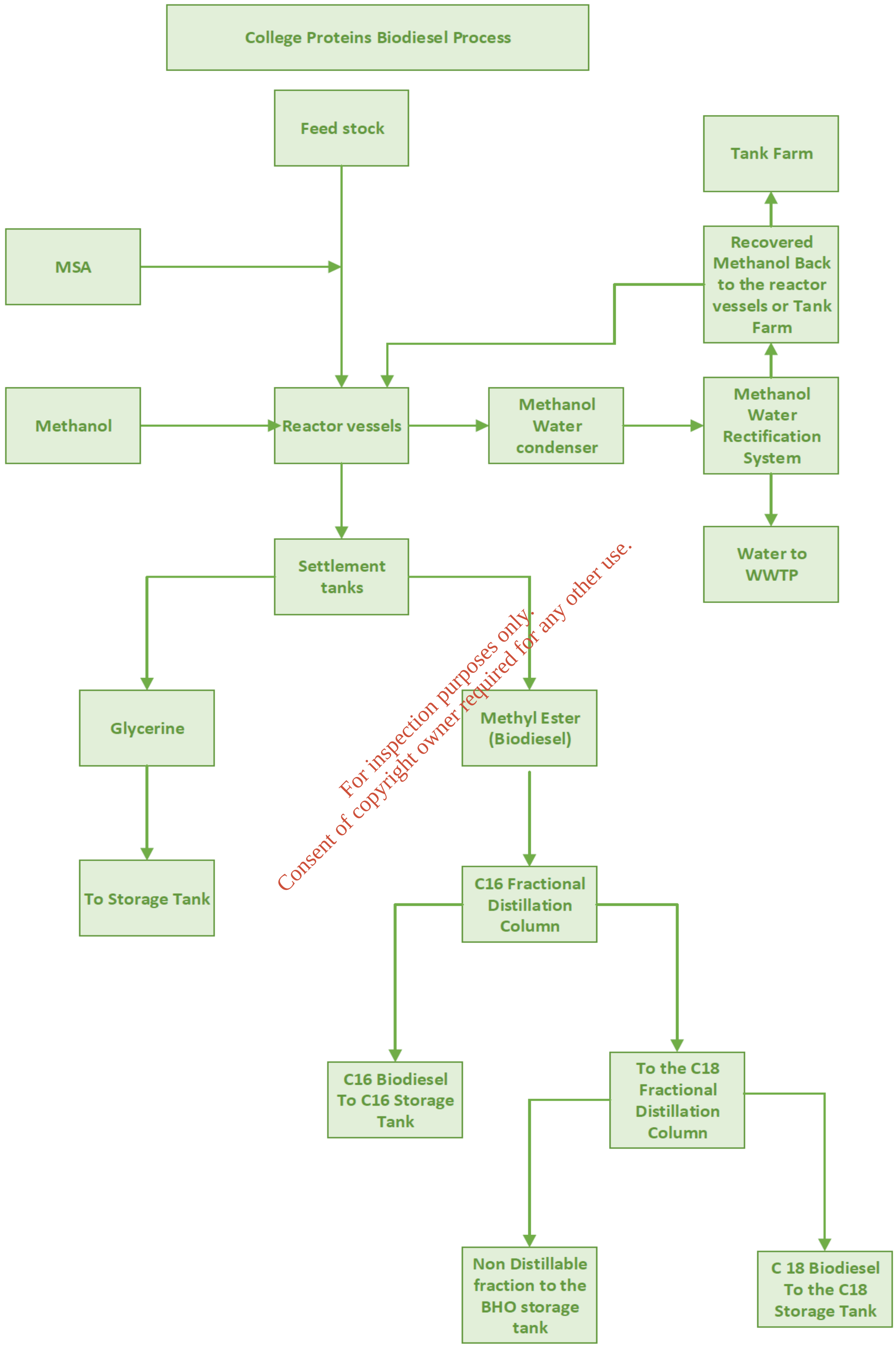

Figure 2 Biodiesel Process

2.2.2 Process Description

The proposed Biodiesel plant at College Proteins is designed to produce 25,000 tonnes of Biodiesel per annum. UCO and animal fat (cat.1 and cat3) are used as feedstock for this plant. See Figure 2 Process Flow Diagram biodiesel.

Acidic Esterification and Transesterfication

The esterification of fatty acids or the transesterification of triglycerides with methanol is carried out according to the reaction equations listed below. This is an acid-catalysed equilibrium reaction.

Esterification: $\text{fatty acid} + \text{methanol} \xrightleftharpoons{H^+} \text{FAME} + \text{water}$

Transesterification: $\text{triglycerides} + 3\ \text{methanol} \xrightleftharpoons{H^+} 3\ \text{FAME} + \text{glycerine}$

The reaction is catalysed by H+ ions so that any acid can be used as a catalyst. However, it is important to select the correct acid in terms of corrosion (HCl), contamination (H_3PO_4) or side reactions (H_2SO_4). This avoids issues in the evaporation units of glycerine/water as well as sulphates or sulphonates of methyl esters.

Methane sulfonic acid (H_4CSO_3, MSA) is used as a catalyst to minimize the above-mentioned issues. This biodegradable catalyst prevents the formation of methyl ester sulfonate and the biodiesel produced in this way is free of sulphur.

The following list of process steps occur:

1. The feedstock is fed into 2 batch reactor vessels.
2. The feedstock is preheated using steam through heating coils inside the reactors.
3. The catalyst MSA is added to the reactor vessels along with the feed stock during filling.
4. Methanol is continuously metered into the reactor.
5. A circulation pump will re-circulate and mix the contents of the tank.
6. The esterification reaction is carried out at a slight overpressure and a temperature of approx. 108°C.
7. At the same time, reaction water is continuously removed.
8. In addition to the reaction water, the excess methanol is also evaporated.
9. The methanol/water mixture is condensed in a condenser system and is collected in a tank
10. As the 1st stage of the reaction comes near an end the condensate produced consists mainly of methanol.
11. The methanol/water mixture is processed further in the methanol rectification process. There, the methanol is freed from the water and transported to the tank farm with a purity of > 99.5 %.
12. Fatty acids are esterified until the amount of fatty acid in the reactor has fallen below 10%.

13. The temperature in the reactor is then increased to max. 140°C and an operating pressure in the reactor of approx. 5 bar is set. Acidic transesterification takes place under these reaction conditions.
14. As with esterification, the methanol is continuously added here and the excess methanol is continuously condensed via the condenser and added back to the reaction.
15. The crude ester is then pumped out of the reactors after a residence time of approx. 4h into the settlement tanks.
16. Due to the difference in density between Biodiesel (methyl Ester) and glycerol/water, this is deposited as a heavy phase at the bottom of the settlement tank. The methyl ester then lies as a light phase above the heavy phase.
17. The different phases are then pumped out of the settlement tanks. The glycerol/water is pumped to the tank farm before being transported off site as a by-product. The methyl ester is sent for further processing in the Fractional distillation system into the various C fractions.

Methyl Ester Fractional Distillation

1. The methyl ester mixture is pumped over a preheater and dryer into the C16 fractionation column.
2. In the column there structured packings and the feed is distributed evenly over the packing via a special distributor.
3. Methyl ester mixture from the sump of the fractionation column circulates through the pump and the thermal oil-heated falling film evaporator.
4. The system operates at a vacuum of approx. 10-35 mbar and a temperature in the circulating sump product of approx. 220-230°C.
5. Evaporated methyl esters rise through the structured packings to the top of the column.
6. The methyl ester enriched with C18 is discharged from the C16 fractionation column and fed to the C18 distillation column.
7. The methyl ester enriched with C18 is discharged from the C16 fractionation column and fed to the C18 distillation column.
8. The methyl ester mixture from the sump of the column circulates through the thermal oil-heated falling film evaporator.
9. The system operates at a vacuum of approx. 25-30 mbar and a temperature in the circulating sump product of approx. 220-230°C.
10. C18 methyl esters evaporate and are thus separated from non-distillable components.
11. The ascending methyl ester vapours pass through a highly effective structured packing to reach the main condenser.
12. The methyl ester vapours are condensed in the C18 condenser and collected in a storage tank.
13. The non- distillable components also known as the bio heating oil (BHO). Is collected from the tank bottoms and sent to the tank farm before dispatch as a by-product.

2.2.3 The advantages of the acid Trans esterification process

The following are the advantages of the proposed process:

- There is no generation of soaps.
- No salts/fertiliser are created in the process as there is no sodium or potassium used for the reaction.
- Phase separation happens quickly and naturally there is no need for mechanical separators.
- No foam is formed.
- Acidic Transesterification only requires 1 catalyst.

In addition to the reaction being more efficient with less wastage we also propose to produce a more refined better-quality product. In the original process we were proposing 1 distillation column to produce one biodiesel product. It is now proposed to produce 2 biodiesel products C16 & C18 using fractional distillation columns. The fractional distillation columns require the building to be wider at the top.

2.2.4 Mass Balance

See table 2.1 below for the mass balance figures for the operation of the Biodiesel plant. These figures represent the maximum input and outputs of materials.

Table 2.1 Mass Balance Biodiesel plant.

	Material	Tonnes Per Annum
INPUT	Animal Fat Category 1	12,705
	Animal Fat Category 3	10,588
	Used Cooking Oil (UCO)	3,176
	Methanol	2,548
	Sodium Hydroxide	600
	Methane sulfonic acid	500
	Process Water	1,200
	Steam	500
	Nitrogen	78
	TOTAL	**31,895**
OUTPUT	Biodiesel	25,000
	Crude Glycerine	3,400
	Bio-heating Agent	1,213
	Waste Gas	82
	Waste water	2,200
	TOTAL	**31,895**

2.2.5 Description of the Biodiesel plant

The proposed Biodiesel plant at Nobber is designed by CPM SKET who are based in Germany and operate internationally. The facility is designed by O'Hagan & Associates Architects, Newry Co. Down. CPM-SKET is a specialist in the field of planning design engineering and world-wide supply, installation and commissioning of complete plants for the production of alternative fuel (biodiesel) from renewable resources.

The Biodiesel plant consists of the following parts: (See Figure 2 overleaf)

- process structure
- office building including also the control room, changing room, and laboratories.
- utilities close to the office building (logistic room, workshop, electrical control room, compressed air station, chilling system, steam boiler, storage for chemicals, waste storage)
- tank farm including electrical room, cooling tower and truck loading/unloading station.

A gas warning system is installed to observe the methanol concentration at the bottom of the process structure. If the system detects a change in methanol concentration, the plant shuts down automatically.

The process equipment consists of vessels, pumps, heat exchangers, and controls. The equipment is connected with pipelines, fittings and control equipment.
The building on the site includes one room for laboratory activities for 'wet' and 'dry' analytics. For quality and production control, samples will be taken periodically and analyzed on certain parameters. The analyses will be carried out according to the analysis instructions. At all times analysis will be carried out in an appropriate manner. Specialized equipment is provided to ensure efficiency and safety.

The main building for the Biodiesel process will be of structural steel construction with double skinned metal cladding. The building will have five access levels with platforms at levels of 3.500, 7.000, 11.000, 15.000 and 18,000 meters. From these platforms equipment such as vessels, heat exchangers, pipes and other plant can be accessed. The entire inside main steel construction is painted. The railings, ladders and gratings are designed according to EN ISO 14122 1-4 and are galvanized. The process roof and the column tower roof are parapet and have fall arrest systems if access is required.

The main building for the Biodiesel process will be of structural steel construction with double skinned metal cladding. The building will have five access levels with platforms at levels of 3.500, 7.000, 11.000, 15.000 and 18,000 meters. From these platforms equipment such as vessels, heat exchangers, pipes and other plant can be accessed. The entire inside main steel construction is painted. The railings, ladders and gratings are designed according to EN ISO 14122 1-4 and are galvanized. The process roof and the column tower roof are parapet and have fall arrest systems for maintenance access when required.

Both roof levels have a fall to the dewatering points. There are internal stairs which allow access to all levels. There will be a bund wall around the base plate with a depth of 500mm (in order to catch 110% of the volume of the biggest vessel and fire-fighting foam) and channels which feed into pump sumps.

The Process Building will have a concrete floor construction, and where required a metal grid floor system will be employed to facilitate several cut outs in the floors for process equipment. There will be a bund with a capacity of 110% of the biggest vessel and channels which reach into pump sumps. The floor will be coated. Escape doors on each level allows for emergency exit.

The Administration Building will be of structural steel construction with double skinned metal cladding to both external walls and roof. The floors will also be constructed in concrete.

A Chemical storage room will be integrated in the administration building and made of concrete with coated floor. The Workshop adjacent is accessed via a sectional door (2.4 x 3m) or a separate pedestrian escape door. For some media a bund will be provided for secure storage.

A concrete steam boiler room with an area for an air compressor will be constructed. The main access will be via sectional gates (2.4 x 3 m.) or a separate pedestrian escape door. The room next to the boiler room will contain a storage tank for the thermal oil. This will be contained within a 1.5 metre bund.

The Electrical control room will be integrated in the administration building with a double floor (500mm). The room has to be air conditioned (cooled) and there will be a maintenance door (2x2.1m) to outside.

Figure 3 overleaf shows details of the layout of the tank farm, the dimensions of the tanks and the purpose of each tank.

These are also detailed in table 2.2 below.

Table 2.2 Description and dimensions tanks on tank farm

Tank No.	Material	Capacity (m^3)	Capacity days	Tank diameter (m)	Tank height (m)
T 1.1	Feed Stock Storage	213	2.5	4.55	13.09
T 1.2	Feed Stock Storage	213	2.5	4.55	13.09
T 1.3	Feed Stock Storage	213	2.5	4.55	13.09
T2	Methanol Storage	116	3.9	4.00	9.215
T3	Glycerine Tank	116	9.9	4.00	9.215
T4	Methanol/Water Collection Tank	116	5.1	4.00	9.215
T 5.1	Crude Ester Tank	213	7.3	4.55	13.09
T 5.2	Crude Ester Tank	213	7.3	4.55	13.09
T 5.3	Crude Ester Tank	213	7.3	4.55	13.09
T 6.1	C18 Day Tanks	167	5.6	4.25	11.805
T 6.2	C18 Day Tanks	167	5.6	4.25	11.805
T 7.1	C16 Day Tanks	54	3.9	2.75	9.18
T 7.2	C16 Day Tanks	54	3.9	2.75	9.18
T 8.1	C18 Storage Tanks	213	10.7	4.55	13.09
T 8.2	C18 Storage Tanks	213	10.7	4.55	13.09
T 8.3	C18 Storage Tanks	213	10.7	4.55	13.09
T 9	C16 Storage Tank	213	15.5	4.55	13.09
T10.1	C18/C16Blend Tanks	213		4.55	13.09
T10.2	C18/C16Blend Tanks	213		4.55	13.09
T 11	BHO Tank	54	30.2	2.75	9.18
T 12	Nitrogen Storage Tank	5	17.3	2.0	7.50

2.2.6 Storage, Loading and Unloading

2.2.6.1 Biodiesel storage

Biodiesel pumped from the manufacturing process into two Biodiesel quality tanks for C18 each with a capacity of 167 m^3 and two Biodiesel quality tanks for C16 each with a capacity of 54 m^3 where additives are mixed with the product. These tanks are each in use on an alternative basis. Once the Biodiesel has been determined to comply with the European Biodiesel standard EN14214 (ascertained by analysis) it is pumped from the quality tank to four dedicated long term storage tanks each with a capacity of 213 m^3 biodiesel (three for C18 and one for C16). In addition there are two blend tanks where C16 and C18 can be blended together if required. Biodiesel can be loaded to road tankers from any storage tank by means of a top loading device which will be installed at the loading station. All Biodiesel storage tanks will be equipped with heating coils and with thermal insulation.

2.2.6.2 Feedstock storage

The feedstock will be pumped from the rendering plant through a pipeline into 3 feedstock storage tanks each with a capacity of 213 m^3. The tanks will be equipped with heating coils to prevent plugging of the feedstock at lower (ambient) temperatures. All feedstock tanks will also be equipped with thermal insulation.

2.2.6.3 Crude Glycerine storage

Crude Glycerine, one of the side products of the Biodiesel process, will be stored in a dedicated tank with a capacity of maximum 116 m^3. The tank will be equipped with a heating coil and thermal insulation. Loading will be executed by a separated top loading device at the loading station.

2.2.6.4 Methane Sulfonic Acid (MSA).

MSA will be stored in a dedicated twin wall storage tank with a capacity of 21 m^3, which will be located in a separate bund inside the building. The unloading process from the road tankers will take place at the unloading station.

2.2.6.5 Distillation Side Product (BHO)

Distillation by-product will be stored in a storage tank with a capacity of 54 m^3. The tank will be equipped with a heating coil and thermal insulation.

2.2.6.6 Methanol

Methanol will be stored in a dedicated storage tank with a capacity of 116 m. The unloading from the road tankers will take place at the unloading station. By filling the storage tank the displaced gas volume will be vented back to the emptied road tanker by a separate pipe. There will be no emissions of evaporated liquid or displaced gas during the loading action. The flame arrestor at the tank ventilation guarantees that the displacement of gases will take place by having a certain pressure loss. There is also a nitrogen blanket on this tank.

2.2.6.7 Loading System

Biodiesel, BHO and Crude Glycerine will be pumped from the storage tanks to the loading system. The road tankers will be filled by movable top loading arms. A flow meter will count the amount of the loaded product. A maximum level switch will stop the loading procedure for safety reasons. The loading will take place within a concrete loading bay.

2.2.7 Seveso

Methanol is required in the process to create Biodiesel. Methanol will be present on site in the process equipment and in the methanol tank (tank farm). Methanol is listed in the Council Directive 2012/18/EU of 4 July 2012 (called Seveso III – directive) on the control of major-accident hazards involving dangerous substances. In Annex 1, Part 1 of the directive methanol is listed and thresholds are given above which the regulation applies. For methanol a threshold of 500 tons of methanol on site is given.

It is stated, that mixtures and preparations shall be treated in the same way as pure substances provided they remain within concentration limits set according to their properties. Substances are classified according to the regulation 1272/2008/EC. In Annex 1 concentration limits for preparations are given. The concentration limit for methanol is 10%, that's to say, preparations containing methanol have to be treated as methanol if the methanol concentration is equal to or exceeding 10%.

For the calculation of the total amount of methanol on site, only preparations and mixtures with a methanol content >10% have to be considered.

The sum of methanol on site is < 500 tons, therefore the regulation does not need to be applied.

2.2.8 Security Building and Car Park Area

The proposed development includes a new security building and weighbridge system. All vehicles entering and leaving the Biodiesel plant will be controlled from this building and all movements in and out recorded. There is also additional car parking proposed as part of this development.

See Figure 4 Site Layout.

2.3 Environmental Management

The existing facility operates under an Industrial Emissions License number P0037-03. The proposed activities will be subject to licensing under the European Union (Industrial Emissions Regulations) 2013, S.I 138 of 2013. A review of the current license is now being sought from the EPA and the activities licensed by the Agency.

The existing facility operates an Environmental Management System that is certified to ISO 14001 standard. This EMS will be developed to encompass the proposed Biodiesel facility and ensure that this facility is operated to the highest environmental standards.

The schedule of the EMS covers the following:

1. Introduction
2. Environmental Policy
3. Management and Reporting Structure: Company Organisation Chart
4. Schedule of Environmental Objectives and Targets

5. Environmental Management Programme (EMP)
6. Environmental Management Documentation System / Document Index
7. Corrective Action
8. Emergency Response Procedures and Incident Notification
9. Accident Prevention
10. Awareness and Training
11. Communications Programme
12. Environmental Aspect Register
13. Legislation Register
14. Efficient Process Control
15. Odour Management Plan
16. Schedule of Documents and Drawings
17. Restoration / Contingency Plan
18. Copy of the Licence granted by the EPA
19. Safety Statement and Red Book

As with any processing facility there exists the possibility of emissions and the emissions associated with the College Proteins Biodiesel facility are detailed below. These are discussed in detail in the relevant chapters of this EIAR together with any predicted impacts and where appropriate the proposed mitigation measures.

2.3.1 Water Emissions

The following water emissions are predicted:

- Waste water from Biodiesel production
- Waste water from process building (cleaning)
- Waste water from drying of compressed air
- Waste water from steam boiler building
- Waste water from process water preparation.
- Waste water from process building and security building toilets and wash facilities.
- Surface water from tank farm, loading/unloading areas
- Precipitation water from roofs, roads, car park and building services

With the exception of the precipitation water from roofs, roads and building services all other water will be treated in the onsite waste water treatment plant prior to discharge.

The rainwater from the roofs and buildings will be directed to the proposed attenuation area prior to discharge offsite.

2.3.2 Process Waste

The proposed technology is designed so that little or no process waste is generated and any by-products are purified and surplus material streams are recycled, e.g. waste water or excess methanol is purified and reused in the process.

All liquid wastes will be stored either inside the main building, in dedicated containers, or in the tank farm. All working areas of the site will be of concrete hardstand with surface water drains going via a high specification interceptor system. It is not expected that there will be any impact on water or ground condition arising from the storage of wastes at the site

All waste material being sent offsite for recycling or disposal will be collected by a suitably permitted waste contractor and records maintained on site in compliance with the conditions of the EPA licence.

2.3.3 Emissions to Atmosphere

The following gas emissions may arise as a result of the process:

- Emission of Process (ventilation system)
- Emissions of Process building ventilation
- Emission of Tank farm
- Emission of steam and thermal oil boilers
- Exhaust emissions from vehicles.

These potential environmental impact of these emissions together with dispersion modelling and where appropriate, mitigation measures are addressed in detail in Volume 2 Section 3.11 of this EIAR.

2.3.4 Noise

The noise sources from the biodiesel facility will be pumps, air fans and pressure relief valves and the cogeneration unit. There will also be traffic related noise from vehicles delivering and receiving material and product. The potential impact and mitigation measures are addressed in detail in Volume 2 Section 3.6 of this EIAR.

2.3.5 Acceptance of Tallow and UCO

All material accepted at the facility will be in line with the acceptance procedures as developed in compliance with the conditions of the EPA Licence.

All incoming material will be delivered to the site by the operator's own vehicles or suitably permitted/licensed contractors. The first point of inspection is at source. The receptacle containing the material is visually inspected by the vehicle operator and if non-conforming material is present it will not be accepted. All materials entering the facility must first be inspected by the weighbridge operative and weighed. A new weighbridge is proposed for the Biodiesel operation. EWC code, source, date and time, vehicle registration, and gross weight will be recorded on the weighbridge software system. This weighbridge system ensures fully compliant, and accurate recording of all incoming loads. The driver of the vehicle is then directed to the appropriate unloading area depending on what material type they are carrying, each area is clearly labelled. The weighbridge operators use the CB Radio System to inform the Processing Supervisor of the load approaching and its classification.

After the vehicle has been unloaded it will proceed back to the weighbridge where a tare weight is taken to provide a nett weight. The weighbridge ticket is then automatically completed and printed out.

The load is inspected by the Processing Supervisor upon tipping to make sure that the material is conforming to the site's acceptance criteria and to ensure accurate record keeping. They can then confirm the EWC Code (material type) to the weighbridge or ask them to amend it using the radio system. The weighbridge can communicate with the Processing Supervisor via the CB radio system. This allows the characterisation to be changed on the weighbridge if required.

Any unacceptable or non- conforming material types are rejected and returned to source.

If the material presented is found to be unacceptable at any time after it has entered the site it is immediately loaded back into the container in which it arrived.

2.3.6 Process Emissions Abatement

The ventilation gas from the process vessels will pass through a combined abatement system, which will consist of a condenser and a wet scrubber, prior to discharge to the atmosphere. Technically, the condenser is a plate heat exchanger, cooled by water as cooling medium. The temperature of the cooling medium is approximately 0 - 5°C and the gas flow is cooled down to 5 – 10°C to condense volatile organic compounds (main component methanol) of the gas stream. The condensed methanol is reused in the process.

The cooled gas stream is led to an exhaust gas cleaning column. The system will use a packed column with water as scrubbing medium. The column will have a structured packing. The exhaust gas will be fed at the bottom and pass up through fine water sprays. The spent scrubbing solution comprising water and methanol will be reused in the Biodiesel process. The cleaned exhaust gas will be emitted through a stack at the top of the process building. Fresh process water will be used as the feed water.

The scrubber will be designed with a capacity high enough to cope with the maximum gas flow during start-up.

The temperature and differential pressure in the cooling system will be continuously monitored and fitted with alarms that are activated if the chilling energy fails. If a failure in supply of cooling media occurs, by default the plant will not operate and will shut down.

An activated carbon filter system will be employed to manage any potential odour emissions from the feedstock tanks. Activated carbon is used as an adsorbent to remove odorous gas molecules from the waste air stream. Note that the total emissions from the feedstock tanks to the carbon filter are not expected to exceed levels that would cause any odour even if a carbon filter was not employed.

2.4 Proposed Construction Phase

This section of the EIAR describes the construction phase of the proposal including the infrastructure. The proposed development will require the construction of;

- Biodiesel processing facility complete with electrical control rooms, laboratory, offices and workshops, storage areas and steam boiler room
- Tank farm with control room and loading station
- Security building.
- Cogeneration and Boiler
- Additional concrete hardstand area
- Additional car parking areas.

It is expected that the proposed works will be completed within 12 months of a grant of planning permission, with the new building being fully operational by the end of the last quarter of 2018. In general, the construction works for the proposed development will comprise the steps set out below.

2.4.1 Site Development Works

Enabling Works have commenced on site so that the programme identified in the EIS for the permitted Bio Diesel Plant is maintained

The following works have commenced on site

1) Identification of existing services on site;
2) Diversion of necessary services e.g. electricity supply, etc.;
3) Undertaking of groundworks;
4) Construction of below ground services to the new building-
5) Construction of additional hardstanding area surrounding proposed buildings;

The site development works will be undertaken as follows

6) Construction of main process building
7) Construction of tank farm.
8) Construction of storage sheds
9) Construction of security building and car parking.
10) Completion of all ancillary works.

2.4.2 Preliminary Works

The Preliminary works for the permitted Bio Diesel Plant have commenced on site as enabling works. The first step of the initial site development works was to identify all the existing site services i.e. surface water and electricity, etc.

It was necessary for excavations to occur to achieve a level foundation for the proposed new buildings. This was carried out using standard construction methods. Hardcore was also be imported at this stage of the development to establish the formation level of the proposal. The foundations for the permitted Process Building are currently being constructed.

2.4.3 Construction Works

The construction of all the proposed below ground services to the site will be installed prior to the commencement of this stage.

Once all of the steps above have been carried out the site will be ready for the construction of the process building and tank farm. The overall construction phase will be short and is estimated to take 12 months to completion of all significant works.

2.4.4 Construction Procedures

The contractor will be required to manage the works and control dust emissions, run-off, noise, traffic, stockpiling etc. As the proposed construction works are relatively small in nature and extent there will not be any significant impacts from this stage of the development.

Works are programmed to commence immediately following receipt of a commencement notice from Meath County Council.

Site development works will be restricted to normal working hours with the exception of essential activities such as repairs and refuelling. Generally, site work will not be permitted on Sunday or at night-time except where programme constraints or safety concerns necessitate it. The site will be managed by the main contractor. The site manager will oversee all of the construction activities including:

- Traffic management on site i.e. scheduling of deliveries, minimising disruption to normal activities etc.;
- Site security;
- Control and management of site services; and
- Approval of development proposals.

2.4.5 Wastes and Emissions

During the construction phase the generation of waste and emissions on site will be as follows;

2.4.5.1 Solid Waste

Where possible solid waste (soil and stones) arising during the construction phase of the proposal will be retained on site. However, if there is any material not suitable for re-use it will be removed off-site in accordance with a waste management plan that shall be agreed with Meath County Council and the EPA. Due to the nature of the construction works proposed it is anticipated that construction related waste will be maintained at a low level.

2.4.5.2 Emissions to Atmosphere

The operation of mobile plant and equipment will give rise to emissions to atmosphere of combustion gasses, sulphur dioxide, oxides of nitrogen and particulates. Fugitive dust emissions will arise through wind assisted dust generation during groundworks in particular the importation of material for construction of the internal access road. A mobile rotary atomiser probe is part of the on-site equipment and will be deployed in areas of activity if dust nuisance arises or is anticipated. As required, water bowsers will be used to dampen down soil or aggregates, thereby minimising fugitive dust emissions. A temporary wheelwash and road sweeper will also be used to control and minimise the effects of dust generation on the site

2.4.5.3 Noise

The operation of mobile plant and equipment, will give rise to temporary noise emissions during the construction stage of the proposed building. However, the nature of the proposed development means that construction will be minimal and as such any increase in noise will not be for a prolonged period. All construction equipment will comply with SI 320 of 1998: EC (Construction Plant and Equipment Permissible Noise Levels) Regulations, 1998, with consideration to be given to BS 5228 1984: Noise Control in Construction and Open Sites. Tipping of loads of imported aggregates that may be used in construction will only take place during daytime hours and over a short period of time.

2.4.5.4 Employment

Employment within the construction stage of the proposal is estimated at 10-20 employees which will be construction based employment.

2.5 Decommissioning and Aftercare

In compliance with Condition 15 of the existing EPA licence number P0037-03 The Applicant has set out decommissioning plans in the unlikely event of the facility shutting down, or a planned cessation greater than six months of all or part of the site involved in the rendering activity.

In the event of the above College Proteins will decommission, render safe or remove for disposal/recovery, all materials, waste, ground, plant and equipment that may result in environmental pollution in accordance with the conditions of the License. This plan will be reviewed annually by all concerned. This plan will be extended to take into account the Biodiesel plant.

Following implementation of the decommissioning plan The Applicant will commission a validation report that demonstrates its successful implementation. This report will confirm that there is no continuing risk of environmental pollution to the environment from the site. It will be submitted to Meath County Council or the EPA within three months of execution of the plan and shall address the following:

- Disposal of any raw material remaining on-site;
- Disposal of wastes;
- Decommissioning of plant and equipment;
- Disposal of obsolete equipment;
- Results of monitoring and testing; and
- The need for ongoing monitoring or investigations.