



tonnes of biodiesel per day, equating to a total of approximately 120,000 tonnes per year (143 ML/year). Approximately 12,200 tonnes per year of pharmaceutical grade glycerine would also be produced from the process. A similar plant train (stage two) would be installed in future.

The processing plant would produce B100 (indicating 100% biodiesel) grade of biodiesel. The biodiesel would then be transferred to Vopak Site B tank farm area and stored in a dedicated storage tank (Tk0625). From this tank, the biodiesel would be exported by ship or electronically blended with mineral diesel as per customer requirements (e.g. for B5, B10 or B20) via the loading rack at the Site B road tanker loading gantry.

The cost of the proposed development would be in the order of \$30 million for the first stage. The construction period would take approximately 40 weeks and would employ between 30 – 50 staff during different phases of construction.

Refer to the attachment for a preliminary plant layout.

1.4.2 Storage tanks

A significant proportion of the existing Site A storage tankage is to be utilised for the stage one development. Stage two of the project would require the removal and replacement of several existing Site A tanks with larger tanks.

Overall, the proposal includes 12 new tanks and 20 reused tanks. Tank height ranges from 6m to 18m and tank volumes range from 20m³ to of 4,550 m³. Total storage capacity of the proposal is approximately 30,700 m³. The products to be stored in tanks include:

- ▶ Feed stock (e.g. palm oil, palm kernel oil and canola oil);
- ▶ Hydrochloric acid and liquid caustic (e.g. HCl Acid);
- ▶ Glycerine feed inputs;
- ▶ Biodiesel (B100);
- ▶ Pharmaceutical glycerine;
- ▶ Methanol; and
- ▶ Sodium methylate.

All new storage tanks would be designed and constructed in accordance with:

- ▶ AS1940: The storage and handling of flammable and combustible liquids; and
- ▶ AS1692: Tanks for flammable and combustible liquids; or
- ▶ API: 650 Welded Steel Tanks for Oil Storage and will comply with all other required regulations.

Condition 23 from the Sydney Port Corporation Preliminary Development Requirements (1997) states:

"Separate height restrictions will be applied by the SPC to the various zones within the development. The height of tanks and other structures in the petroleum products area shall not exceed 24.0m and in the liquid chemical and petro-chemical products area the maximum height shall be 18.0m. Varying height limitations will apply to the different sections of the dry products storage areas"

The Lurgi Plant Module is of the order of 15m in height but the design includes distillation columns, which will be of the order of 29.5m in height. Therefore the proponent will need to obtain dispensation from the



Sydney Ports Corporation from Condition 23.

1.4.3 Product throughput

For the 2 train model the following product throughput would be required/generated:-

- ▶ **Input:**
 - “Feed Oils” @ 240,000 tonnes per year (ship every 3 weeks @ 14 000 t (17 ships per annum));
 - Methanol @ 24,500 tonnes per year (ship every 2 months @ 4000 t (6 ships per annum));
 - Sodium Methylate @ 4,000 tonnes per year (18 ISO containers per month);
 - Caustic Soda @ 400 tonnes per year (1 ISO container every 3 weeks); and
 - Hydrochloric Acid @ 2,400 tonnes per year (10 ISO containers per week).
- ▶ **Output:**
 - Biodiesel @ 240,000 tonnes per year all to Tk0625;
 - Pharma Glycerine @ 24,400 tonnes per year (24 ISO containers per week); and
 - Waste water and fatty residue (unspecified amount at this stage).

1.4.4 Pumps

The existing site consists of an integrated pump network to transport petroleum and chemical based products. The proposal would require pump product changes, relocation and new pumps to transport feed stock and processed product. The proposal includes:

- ▶ Reuse of existing pumps where practicable;
- ▶ Nine new pumps;
- ▶ Relocation of three existing pumps; and
- ▶ Removal of one pump.

1.4.5 Pipeline transfers

To facilitate efficient export of biodiesel to road tankers and/or ship, a 3,000 m³ capacity tank at Vopak Site B would be allocated to biodiesel. A new pipeline will be required to connect Site A (finished biodiesel tank farm area) to the main transfer manifold in Vopak Site B.

Finished (certified) biodiesel would be transferred to the Site B tank on a daily basis. The proposal would therefore require pipelines to integrate with the biodiesel processing plant and the Vopak Site B facility for ultimate distribution to the market. This includes the following lines:

- ▶ A new 150 mm pipeline connecting Site A to Site B dedicated biodiesel tank farm area; and
- ▶ Integrated pipelines to transport feed-stock and processed materials to the storage tanks, processing plant and output lines within the Vopak Site A Terminal.

Existing lines to and from the Sydney Ports Corporation Bulk Liquids Berth wharf and Vopak Site A would also be utilised for import product feed and export of biodiesel.



1.4.6 Processing plant train

The processing plant would consist of five units integrated into one plant structure to perform the following processes in order to create biodiesel:

- ▶ Transesterification;
- ▶ Methyl ester drying;
- ▶ Glycerin water treatment;
- ▶ Glycerin water evaporation; and
- ▶ Glycerin distillation.

The processing plant would occupy an area of 17 m x 36.5 m. The majority of equipment, fittings and pipes would be stainless steel and operate under low temperatures and fittings. An example of an existing biodiesel plant process train is depicted in Figure 2.

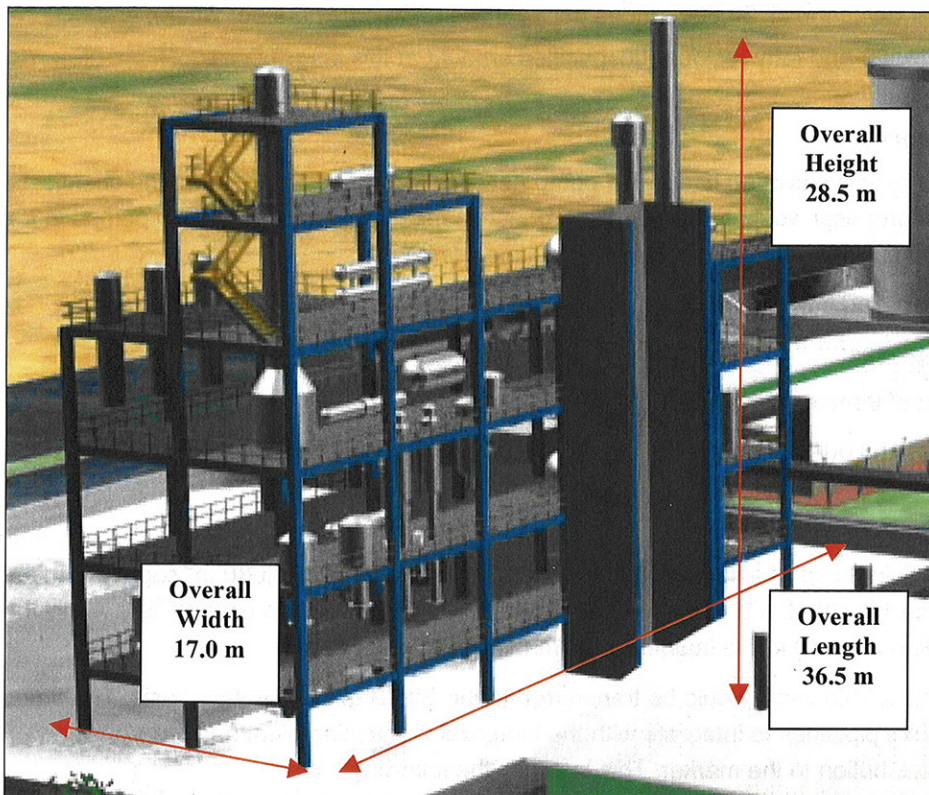


Figure 2 Lurgi Pacific designed biodiesel plant process train in Darwin, NT

1.4.7 Plant layout

The general layout includes defined areas and boundaries for storage tanks, pumps, transfer points and the biodiesel processing unit. The proposal also includes additional car parking, boom gate facilities, utility and control room facilities, workshop and staffroom.

The utility and control room, workshop, carpark and staff amenities would all be located along the



frontage of Friendship Road. The processing plant would be located on a cleared plot of land on the southwestern end of the Site A Terminal.

All storage tank areas also include bunded areas to contain spills in accordance with AS1940. This includes bunded areas for 100% of tank volume + 10% for any overspill. Bunds include common bund areas and separate bund areas depending on the product stored in the tanks.

1.4.8 Utility requirements

The utility building would house both the hot water generator and steam boiler. Cooling towers would be located adjacent to the utilities building. Natural gas would be used for fueling the boilers and the existing line would need to be upgraded to supply natural gas to the boiler.

The facility itself would be powered by electricity supplied by Energy Australia.

Other utility requirements and connections include the following:

- ▶ Potable water;
- ▶ Cooling water;
- ▶ Instrument air;
- ▶ Steam and hot water;
- ▶ Nitrogen;
- ▶ Stormwater;
- ▶ Wastewater;
- ▶ Fire water; and
- ▶ Fire foam.

No details have been provided at this stage for the effluent generated from the processing plant, however a treatment area has been set aside should treatment of the effluent is required prior to discharge with existing water treatment infrastructure. The current wastewater treatment plant on site is designed for collection and treatment of stormwater collected in bunded areas housing petroleum and chemical products.

No details have been provided in terms of annual electricity and water usage required for the proposal.

1.4.9 Fire protection

All the existing equipment to be used for the biodiesel processing plant does not require any additional fire protection systems. All new tanks and the biodiesel processing plant are located in a vacant plot. Existing fire water and fire foam headers are running around this plot with a number hydrants and monitors. Minor modifications are only required to connect this area to the existing water and foam headers.

1.4.10 Civil and structural works

The following works would be required as part of the proposal:

- ▶ Earthworks – including compaction, excavation of loose sand soils, removal of redundant pipe work and importation of fill materials;