

Environmental Review: Proposed Development Of A Biofuel Power Generation Plant

Hargreaves Services plc.

Whaley Road, Barnsley, S75 1HQ

Prepared for:

Hargreaves Services plc.

Prepared by:
ENVIRON
Leeds, UK

Date:
1st June 2009

Project Number:
UK16 14636

Contract/Proposal No:	UK16 14636
Issue:	1
Author:	Michael Sylvester
(signature):	
Project Manager/Director:	Jeremy Cork
(signature):	
Date:	1st June 2009

This report has been prepared by ENVIRON with all reasonable skill, care and diligence, and taking account of the Services and the Terms agreed between ENVIRON and the Client.

This report is confidential to the client, and ENVIRON accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by ENVIRON beforehand. Any such party relies upon the report at their own risk.

ENVIRON disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the Services.

VERSION CONTROL RECORD				
Issue	Description of Status	Date	Reviewer Initials	Authors Initials
A	Internal draft	29/05/09	JPC	MJS
1	Client Issue	1/06/09	JPC	MJS

Contents

		Page
1	Introduction	3
1.1	Background	3
1.2	Installed Capacity	3
2	Environmental Permitting	5
2.1	Permitting Assessment	5
3	Environmental Impact Assessment (EIA)	7
3.1	Schedule 1 Projects	7
3.2	Schedule 2 Projects	7
4	Hazardous Substances Storage	9
4.1	Hazardous Substances Consent	9
4.2	Control of Major Accident Hazards (COMAH)	9

Annexes

Annex A – Figures
Annex B – Manufacturers Safety Data Sheets (MSDS)

1 Introduction

1.1 Background

Hargreaves Services plc and Rocpower Ltd (joint venture) proposes to develop a biofuel power generation plant at:

- Whaley Road, Barnsley, S75 1HQ (Figure 1, Annex A)

In-light of the proposed development ENVIRON UK Limited (ENVIRON) was contracted to undertake an environmental review to determine the applicability of the following regulations:

- *The Environmental Permitting (England and Wales) Regulations 2007*
- *Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (as amended)*
- *Planning (Hazardous Substances) Regulations 1992 (as amended)*
- *The Control of Major Accident Hazards (Amendment) Regulations 2005*

It is important to note that this report relates to the named site only.

1.2 Installed Capacity

Hargreaves Services plc/Rocpower Ltd proposes to install the following generator sets at the site identified in *Section 1* (*Table 1.1*).

Table 1.1: Proposed Installed Capacity

Unit	Output (MW)	Net rated Thermal Input (MW) (@ 37% efficiency)
1	1.4MW	3.8 MW
2	1.4MW	3.8 MW
3	1.4MW	3.8 MW
4	1.4MW	3.8 MW
5	1.4MW	3.8 MW
6	(Stand by only)	-
7	-	-
Total (MW)		**19.0 MW**

Bay 6 will house a ‘stand-by’ generating set (1.4W output), that will only be operational when one of the others (1 to 5 sets) are taken off line for servicing. However bays 6 and 7 may become available for installation of additional units to feed into the grid once initial trails have been conducted (current YEDL capacity is 8 MW). Hargreaves Services plc/Rocpower Ltd will assess any further proposed installations to feed into the grid and the potential to impact statutory permitting thresholds prior to operation of any further units.

2 Environmental Permitting

2.1 Permitting Assessment

An Environmental Permit (EPR) is required where an operator carries out certain prescribed activities, namely installations that undertake a Schedule 1 activity as outlined within *The Environmental Permitting (England and Wales) Regulations 2007*, a waste operation or a mobile plant (carrying out either a Schedule 1 activity or a waste operation).

Hargreaves Services plc/Rocpower Ltd proposes to develop and install a number of compression ignition engines (generator sets) on the site identified in *Section 1*. As a result there is potential for the installation to be caught under Section 1.1 (Combustion Activities).

A discussion of the potential permitting requirements is outlined in *Table 2.1*.

Table 2.1: EPR Permitting Assessment

Type	Description	Discussion
Part A(1)	(a) Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts.	The site will not burn fuel in one or more appliances with a rated thermal input of 50 or more megawatts. **NOT APPLICABLE**
	(b) Unless carried on as part of a Part A(2) or Part B activity, burning any: (i) waste oil; (ii) recovered oil; or (iii) fuel manufactured from, or comprising, any other waste, in an appliance with a rated thermal input of 3 or more megawatts, but less than 50 megawatts.	The site combustion appliances will operate in the range 3 – 50 MW. The site will make use of various types of fuel sources *e.g.* Tall Oil (a by-product from the pulping of pine trees), palm oil *etc.* that are commercially available on the market. The initial start-up of the engines will be achieved through the use of bio-diesel. The choice of fuel will be largely dependent on availability and prevailing financial conditions. The Manufacturers Safety Data Sheets (MSDS) for the types of materials that could be used within the combustion plants are provided in *Annex B*. None of the materials that will be used at the site are classified as a waste. **NOT APPLICABLE**
Part A(2)	None	None

Table 2.1: EPR Permitting Assessment

Type	Description	Discussion
Part B	(a) Burning any fuel (other than a fuel mentioned in Part A(1)(b)) in— (i) a boiler; (ii) a furnace; (iii) a gas turbine; or (iv) a compression ignition engine, with a net rated thermal input of 20 or more megawatts, but a rated thermal input of less than 50 megawatts.	The fuels will be burnt within a compression ignition engine. The total installed net rated thermal capacity will be maintained at less than 20 MW. Hargreaves Services plc/Rocpower Ltd are aware that if the 20 MW threshold is exceeded a Part B permit would be required prior to exceedence of the 20 MW threshold. **NOT APPLICABLE**
	(b) Burning any (i) waste oil; (ii) recovered oil; (iii) solid fuel which has been manufactured from waste by an activity involving the application of heat, in an appliance with a rated thermal input of less than 3 megawatts.	No waste oils, recovered oils or solid fuels derived from waste will be burnt within the generator sets. **NOT APPLICABLE**
	(c) Burning fuel manufactured from or including waste (other than a fuel mentioned in paragraph (b)) in any appliance with a net rated thermal input of 0.4 or more megawatts, but a rated thermal input of less than 3 megawatts— (i) which is used together with other appliances which each have a rated thermal input of less than 3 megawatts; and (ii) where the aggregate net rated thermal input of all the appliances is at least 0.4 megawatts.	No fuels manufactured from waste will be burnt within the generator sets. **NOT APPLICABLE**
Notes: Net rated thermal input is the rate at which fuel can be burned at the maximum continuous rating of the appliance multiplied by the net calorific value of the fuel and expressed as megawatts thermal.		

Based on the proposed net rated thermal input (19.0 MW) and the fuel types that are planned no permit requirements have been identified.

3 Environmental Impact Assessment (EIA)

EIA is a procedure that must be followed for certain types of development before they are granted development consent. The requirement for EIA comes from a European Directive (85/33/EEC as amended by 97/11/EC). The procedure requires the developer to compile an Environmental Statement (ES) describing the likely significant effects of the development on the environment and proposed mitigation measures. The ES must be circulated to statutory consultation bodies and made available to the public for comment. Its contents, together with any comments, must be taken into account by the competent authority (*e.g.* local planning authority) before it may grant consent.

3.1 Schedule 1 Projects

Projects of the types listed in Schedule1 of the *Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999* (as amended) must always be subject to EIA. The Regulations specify:

- (a) Thermal power stations and other combustion installations with a heat output of 300 megawatts or more.

EIA will normally be required for power stations which require approval from the Secretary of State at the Department of Trade and Industry (*i.e.* those with a thermal output of more than 50 MW).

This is not applicable to this project.

3.2 Schedule 2 Projects

Projects of the types listed in Schedule 2 of the *Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999* (as amended) must be subject to EIA whenever they are likely to have significant effects on the environment. The characteristics that need to be considered are:

Characteristics of development

The characteristics of development must be considered having regard in particular, to:

- the size of the development;
- the cumulation with other development;
- the use of natural resources;
- the production of waste;
- pollution and nuisances;

- the risk of accidents, having regard in particular to substances or technologies used.

Location of development

The environmental sensitivity of geographical areas likely to be affected by development must be considered, having regard in particular, to.

- the existing land use;
- the relative abundance, quality and regenerative capacity of natural resources in the area;
- the absorption capacity of the natural environment, paying particular attention to the following areas -
    - i. wetlands;
    - ii. coastal zones;
    - iii. mountain and forest areas;
    - iv. nature reserves and parks;
    - v. areas classified or protected under Member States' legislation; areas designated by Member States pursuant to Council Directive 79/409/EEC on the conservation of wild birds (see endnote 36) and Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora;
    - vi. areas in which the environmental quality standards laid down in Community legislation have already been exceeded;
    - vii. densely populated areas;
    - viii. landscapes of historical, cultural or archaeological significance.

The Regulations specify indicative threshold criteria:

- (a) Industrial installations for the production of electricity, steam and hot water (unless included in Schedule 1) where the area of the development exceeds 0.5 hectare.

EIA is unlikely to be required for smaller new conventional power stations. Small stations using novel forms of generation should be considered carefully in line with the guidance in PPG 22 (Renewable Energy). The main considerations are likely to be the level of emissions to air, arrangements for the transport of fuel and any visual impact.

As the site is 0.13 hectares it is considered unlikely that an ES would be required.

4 Hazardous Substances Storage

The facility plans to install:

- two 100,000 litre tanks for the storage of virgin vegetable oils (Flash point: >66° C, typical >100° C); and
- one 12,000 litre tank of bio-diesel.

The tanks will be designed and constructed to comply with the requirements of *The Control of Pollution (Oil Storage) (England) Regulations 2001*.

4.1 Hazardous Substances Consent

Hazardous substances are subject to controls at amounts at or above which hazardous substances consent is required (known as the controlled quantities) as set out in Schedule 1 to the *Planning (Hazardous Substances) Regulations 1992* (as amended).

The site does not plan to store any materials on site that would exceed any of the statutory thresholds outlined within the *Planning (Hazardous Substances) Regulations 1992* (as amended).

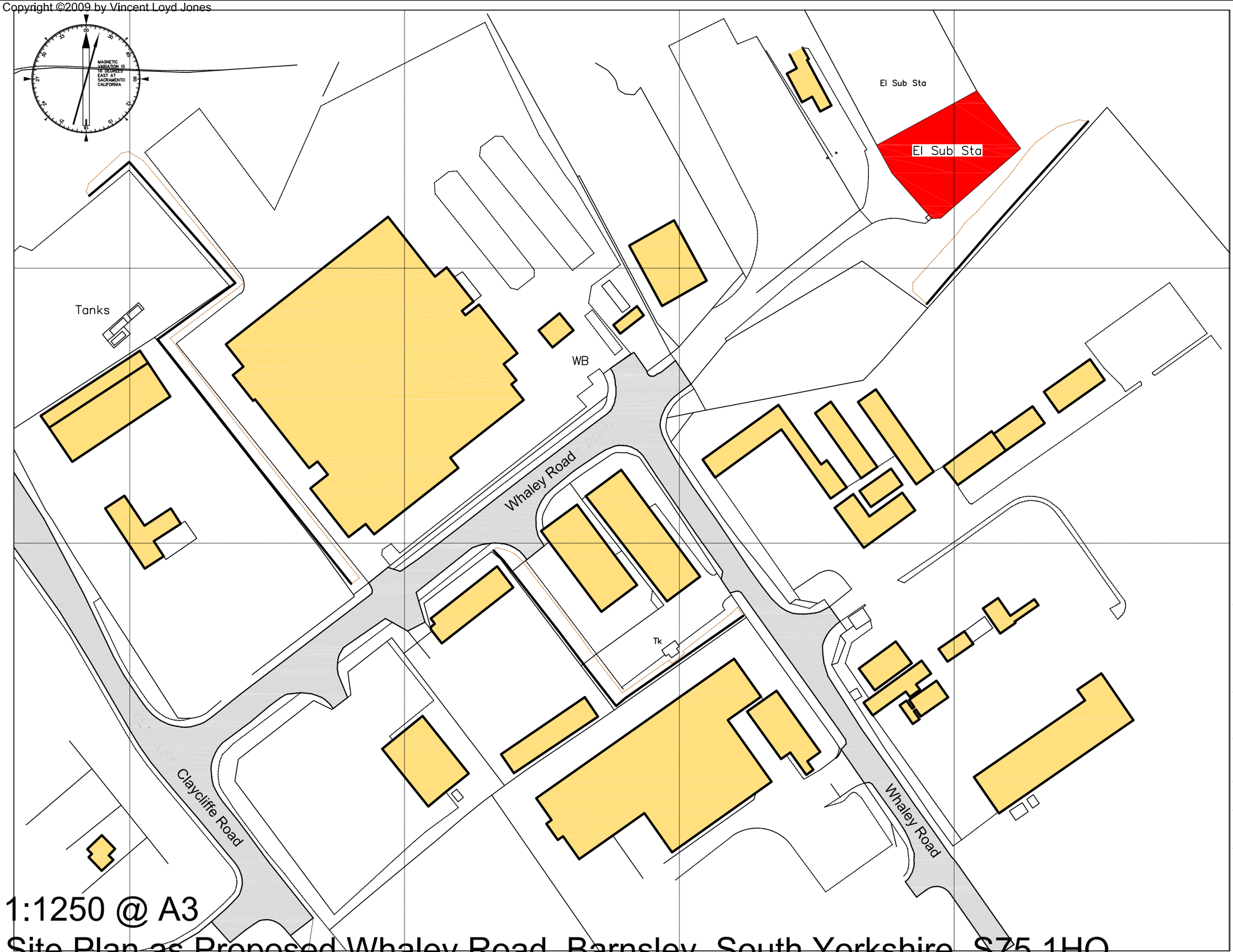
4.2 Control of Major Accident Hazards (COMAH)

If a facility manufactures, stores or uses any dangerous substances in amounts that exceed thresholds defined in Schedule 1 (Part 2 and 3) of *The Control of Major Accident Hazards (Amendment) Regulations 2005* (COMAH) a COMAH registration may be required. There are two thresholds for dangerous substances, which vary depending on the substances involved. If a site stores or uses more than the lower threshold for a substance it is classed as a lower tier site. If the site stores or uses more than the higher threshold the site is a top tier site.

No materials or substances within the proposed facility will exceed either the lower or upper tier thresholds stated in the COMAH regulations.

Annex A: Figure

Copyright ©2009 by Vincent Loyd Jones



GEMINI STEEL BUILDINGS LTD

Client

Rocpower

PROJECT NUMBER / DRAWING NUMBER	1st Publication.
BAR / 001 / P	

DRAWING TITLE

1:1250 Locatlon Plan

FIRST PUBLICATION DATE	DRAWN BY
22/05/2009	VIN JONES

SCALE :-

Use Dimensions Only
Do Not Scale 1:1250

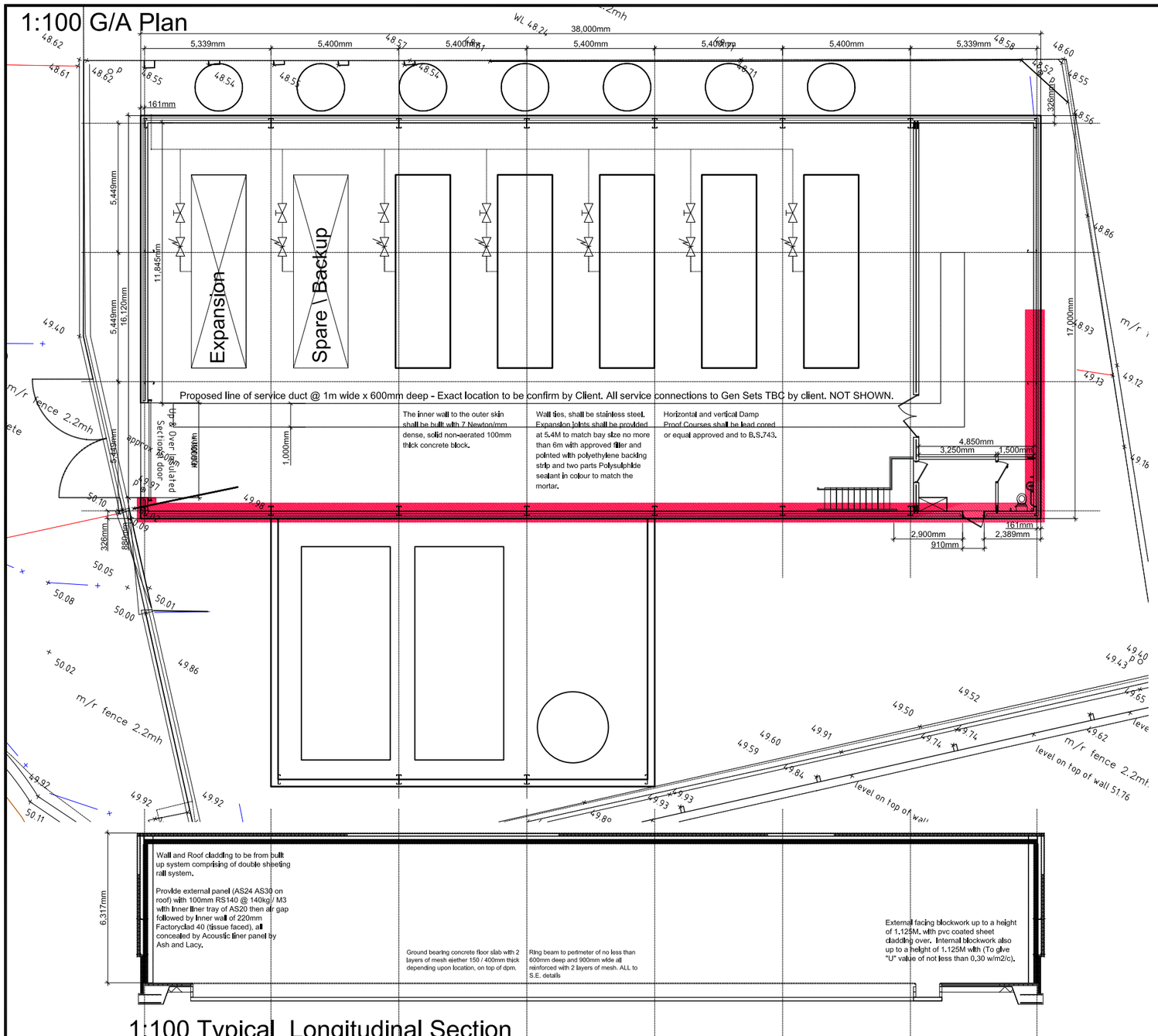
PROJECT

Proposed New Housings and associated civil engineering works for BIOMASS generators.
Whaley Road, Barnsley,
South Yorkshire.
S75 1HQ.

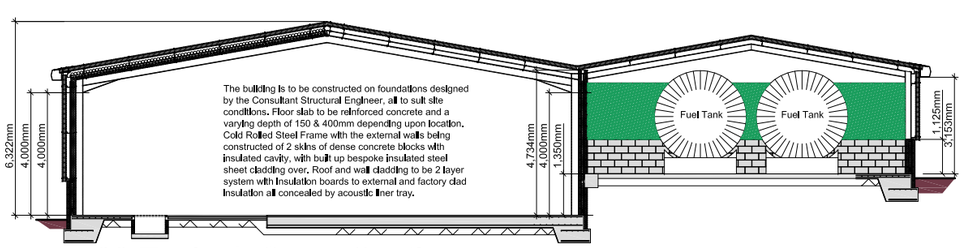
1:1250 @ A3

Site Plan as Proposed Whaley Road, Barnsley, South Yorkshire. S75 1HQ.

1:100 G/A Plan



1:100 Typical Longitudinal Section



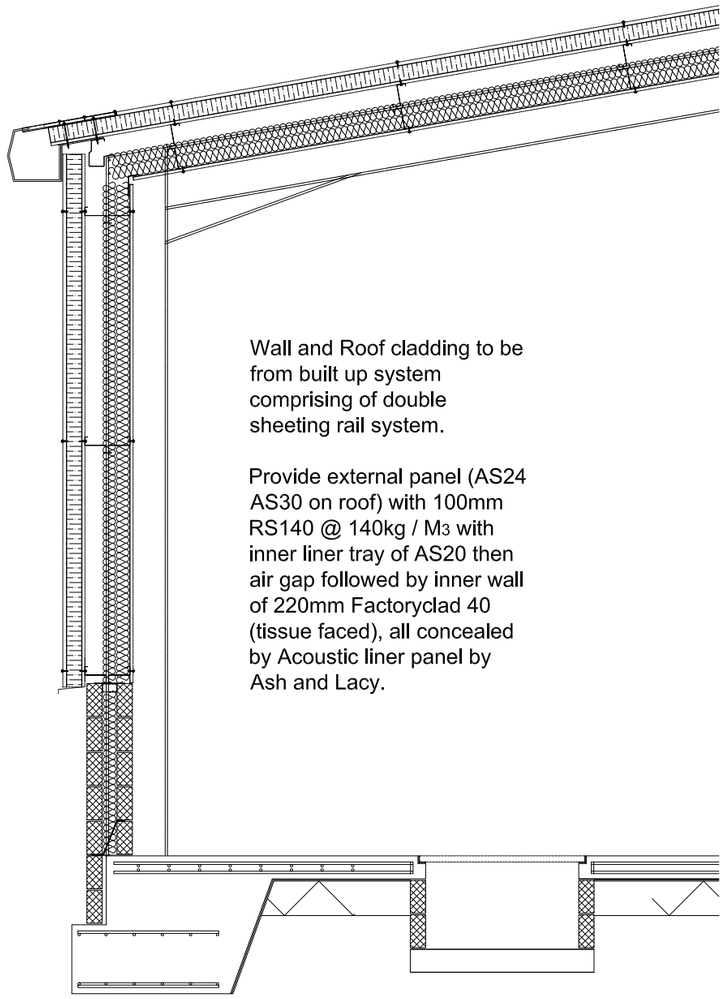
Bunded fuel area to be surrounded by 1.2M high wall with Cold Rolled steel sections over with composite roof panels to match profile of main building.

Side wall to have composite panels also to match main building.

Gable Ends to have "GaleBreaker" screening on dlpback fixings to enable retention of ambient temperature to fuel storage area.

2 skins of block work, Insulated, to party wall between main and fuel areas

1:100 Typical Cross Section



1:20 Typical Section

1:20 / 100 @ A1 General Arrangements

Copyright ©2009 by Vincent Loyd Jones

GSB
GEMINI STEEL BUILDINGS LTD

REVISIONS & PUBLICATION DATES

? ?

Design and Quality Standards

All designs are compliant with relevant British Standards and Building Control: Approved Documents.

Rocpower

PROJECT NUMBER / DRAWING NUMBER
BAR / 004 / P
1st Publication

DRAWING TITLE
GA's Plans and Sections

FIRST PUBLICATION DATE
25/04/2009

DRAWN BY
VIN JONES

SCALE :-
Use Dimensions Only
Do Not Scale
as noted

PROJECT
Proposed New Housings and associated civil engineering works for BIOMASS generators.
Whaley Road, Barnsley,
South Yorkshire.
S75 1HQ.

TENDER ISSUE DRAWING ONLY

Annex B: Manufacturers Safety Data Sheets (MSDS)

ROCFUEL BIOFUEL – FUEL SPECIFICATION SHEET

Chemical name:	A mixture of wood pitch blended with high & low fractions
CAS number:	8016-81-7
EINECS number:	2324144

Typical values:

Acid number:	120 max mg KOH/g (typical 80-100)
Water %:	1.50 % max (typical 0.5 %)
Ash:	0.80 % max (typical 0.35 %)
Sulphur:	0.30 % max (typical 0.17 %)
Nitrogen:	0.05 % typical
Calorific value:	17000 – 18000 BTU/lb. 37-42 GJ/Tonne (typical 39 mj/kg)
Viscosity:	100-600 cSt @ 50° C (typical 150-200) 2-30 cSt @ 140° C (typical 3-15)
Density:	0.930 – 0.998 (typical 0.970 @ 50° C)
Flash point:	>66° C (typical >100° C
Pour point:	-10 to +15° C (typical +1° C)
Asphaltenes:	4.0 % max (typical figure 1.0-1.5 % but false figure as Asphaltenes not present In tall oil)
Particulate emissions:	< 20 % opacity (measured at chimney)
Miscibility with HFO:	complete

Heavy metals

Cadmium:	0.2 ppm max (typical <1 ppm)
Vanadium:	<10 ppm (typical <1 ppm)
Chromium:	<20 ppm (typical <1 ppm)
Copper:	<30 ppm (typical <1 ppm)
Nickel:	<20 ppm (typical <1 ppm)
Lead:	<10 ppm (typical <1 ppm)
Zinc:	<50 ppm (typical 1 ppm)
Arsenic:	<3 ppm (typical <1 ppm)

Chlorine:	<2000 ppm (typical <2 ppm)
Flourine:	<2 ppm
Mercury:	<0.04 ppm (typical 20 ppb)

O ring seal compatibility Biofuel 5:

Acrylonitrile-Butadiene
Hydrogenated Nitrile
Fluorocarbon (Viton)
Highly fluorinated elastomer (Hifluor)
Perfluorinated elastomer (Parofluor)
Fluorosilicone

O ring seal compatibility Biofuel 5/HFO: as above (do not use with SBR which is only compatible with HFO)

PALM BIO FUEL

DESCRIPTION : Palm Bio Fuel is a blend of Crude Palm Oil (minimum 70%) and fatty acid distillate of vegetable oil origin.

CHEMICAL / PHYSICAL CHARACTERISTICS

			Analysis method
Free Fatty Acid (% as Palmitic)	:	30 (typical)	IUPAC 2.201
Moisture (%)	:	0.5 max.	Karl Fischer
Flash Point (°C)	:	200 min	IP 34
Pour Point (°C)	:	28 (typical)	IP 15
Ash Content (950°C)	:	0.2% max	ISO 6884
Calorific Value (mj/kg)	:	39 (typical)	IP 12
pH	:	4.1 (typical)	
Acid Value (mg KOH / g)	:	60 (typical)	ASTM D 130

TRACE METALS (mg / kg)

Sulphur (%)	:	< 0.05	Atomic Absoption
Chlorine (%)	:	< 0.05	
Cadmium (%)	:	< 0.05	
Mercury (mg/kg)	:	< 0.10	
Arsenic (mg/kg)	:	< 1.0	
Chromium (mg/kg)	:	< 1.0	
Copper (mg/kg)	:	< 1.0	
Lead (mg/kg)	:	< 1.0	
Nickel (mg/kg)	:	< 1.0	
Vanadium (mg/kg)	:	< 1.0	
Zinc (mg/kg)	:	< 1.0	
Sodium (mg/kg)	:	< 4.0	
Aluminium (mg/kg)	:	< 5.0	
Potassium (mg/kg)	:	< 10.0	
Manganese (mg/kg)	:	< 10.0	
Phosphorous (mg/kg)	:	< 20.0	

DELIVERY

In approved bulk tankers at 50°C min.

MATERIAL SAFETY DATA SHEET – CRUDE PALM OIL (CPO)

1. IDENTIFICATION

Trade name	:	Crude Palm Oil
Chemical type	:	Mixed triglycerides
Classification	:	Vegetable Oil

2. PHYSICAL DATA

Melting point (C)	:	33 - 39
Density	:	0.880 - 0.940
Appearance	:	Reddish-yellow liquid
Solubility	:	Insoluble in water, soluble in hydrocarbons
Odour	:	Raw palm odour

3. FIRE & EXPLOSION DATA

Flammability	:	Not flammable
Extinguishing media	:	Dry powder, foam, carbon dioxide
Flash point	:	>250 F
Hazardous combustion products	:	Carbon monoxide, soot, smoke.

4. REACTIVITY DATA

Stability	:	Biodegradable
Hazardous decomposition products	:	None known

5. HEALTH HAZARDS & FIRST AID PROCEDURES

Health hazards (acute & chronic)	:	None known
Effects of exposure	:	None known
Emergency & first aid	:	Eyes - Flush thoroughly with water Skin - Wash with soap & water If necessary, seek medical treatment

6. SPILL & LEAK PROCEDURES

Steps to be taken in case of spill or leak	:	Soak up with sand or other absorbent Wash with soap and water
Waste disposal methods	:	Observe all local, state & federal regulations

7. SPECIAL PROTECTION INFORMATION

Product is readily biodegradable.

Respiratory protection	:	Not required
Protective gloves & clothing	:	Not required
Eye protection	:	Not required

8. STORAGE & HANDLING PROCEDURES

Precautions to be taken in storage & handling	:	Store away from heat sources and flame Do not contaminate drains & sewage system