Standard Environmental Permit Variation Application

EPR/EP3830GH
Liberty Steelworks, Newport

Liberty Steel Newport Limited

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	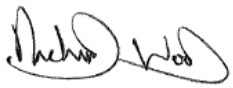	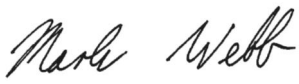
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Revision History

Revision	Revision date	Details	Authorized	Name	Position

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Non - Technical Summary

This document describes the proposed changes to the Liberty Steel Newport Installation (Environmental Permit reference EPR/EP3830GH), to cover the installation of nine biofuel electricity generators, to provide a standby power source for the installation in the event of power failure at the site, or during times of peak demand on the National Grid.

Nine 4.59 MWth Mitsubishi M1900 units, each capable of generating up to 1.65MWe electricity, will be installed at the site. The units will have associated transformers, a substation and three 50m^3 fuel tanks. The units and ancillary equipment will be installed on concrete laid in accordance with BS8500. The fuel tanks are integrally bunded and will also be located within a 55m^3 concrete bund.

The units will provide standby power, with the capability to supply the National Grid to provide additional capacity during peak periods if required. The units are expected to operate for up to 500 hours a year.

Emissions to air are not expected to exceed 400mg/m^3 NO_2. Impacts at local receptors (with the exception of the River Usk and Local Nature Reserves) have been assessed as insignificant. However, these assessments are based upon a conservative assessment using worst-case habitat Critical Loads, and are also include significant contributions from background loads. It is therefore considered that due to the worst case assumptions used in the assessment, and given the location and limited running times of the facility, that the predicted impacts are considered to be acceptable.

The generator units are held within soundproof containers which attenuate noise levels to a maximum 75dBA at 7m, with noise levels at the nearest residential receptors reduced to less than half of the original level.

The potential for pollution of surface waters is minimised through the use of bunding on the fuel storage tanks and the connection of the drainage to the existing site drainage system, which includes interceptors to capture any potential oil spills. Rainwater filtration systems will also be installed within the drainage system in the immediate vicinity of the development.

A specific management system for the generators has been developed to supplement the existing environmental management system in place at the installation.

The proposed changes have been reviewed and are considered to represent a Standard Variation to the Environmental Permit.

1. Introduction

This document supports the application submitted by Liberty Steel Newport Limited ("LSN") under the Environmental Permitting (England and Wales) Regulations 2016 ("the EPR Regulations") for a Standard Variation to the Environmental Permit (reference EPR/EP3830GH) for the LSN steelworks site located at Corporation Road, Newport, South Wales, NP19 4XE ("the site"), National Grid Reference (NGR) ST 33278 85123 (refer to Figure 1 (Appendix A) for the site location).

The Variation will add a biofuel fired electrical generation plant (peaking plant) having a maximum rated net thermal input of 41.3MWth and a rated electrical output of 14.9MWe , comprising 9 containerised biofuel fired generators and ancillary facilities, on land within the current installation boundary.

1.1 Background

LSN currently operates an engineering steel works on the site, in addition to waste storage activities, and is authorised to operate in accordance with an Environmental Permit (reference EP3830GH). The site is permitted to make and refine steel in an electric arc furnace (EAF) having a capacity of more than 7 tonnes per hour (tph), process ferrous metal and their alloys by hot-rolling having a processing capacity of >20 tph, combusting fuel in appliances having a rated thermal input >50MWth, and store up to 10,000t of SRF and 50,000t of other waste derived fuel, automobile shredder residue (ASR), waste plastic and waste tyres.

LSN now intends to install 9 containerised biofuel operated generators each with a rated net thermal input of 4.59MWth i.e. a total net thermal Input of 41.3 MWth, These units can each generate up to 1.65MWe of electrical output i.e. a total electrical output of 14.9MWe. These units will be operated as a peaking plant supporting the continuous operation of the LSN Steelworks, with the additional capability to provide electricity to the electricity grid at peak load times. The peaking plant will supplement the base load generation provided by other sources in the area, which include the adjacent Uskmouth B Power Station, and the Severn Power Combined Cycle Gas Turbine (CCGT), as well as other renewable generation sources. The peaking plant is expected to operate for up to 500 hours annually.

The peaking plant will include the main generation plant itself, and associated infrastructure comprising bunded areas for fuel storage tanks, drainage and electrical transformers.

The proposed development will cover an area of approximately 0.41 hectares (ha). LSN intends to construct the proposed facilities on existing hardstanding located within the eastern boundary of the site. There are no changes to the installation boundary. The location of the peaking plant within the installation boundary is shown in Figure 2.

1.2 Peaking Plant

The peaking plant will consist of separate containerised liquid fuel generators, along with ancillary equipment such as transformers and fuel storage tanks. The purpose of the peaking plant will be to provide a back-up power supply to the LSN plant, with the potential to export electricity to the National Grid at times of peak electricity demand to supplement base load generation provided by other sources (such as the adjacent larger Uskmouth B Power Station) and the Severn Power Combined Cycle Gas Turbine (CCGT) Power Station as well as renewable generation sources). The peaking plant will have a total generation capacity of 14.9 MWe. It will operate for approximately 500 hours per year.

The proposed units are Mitsubishi M1900 units, each with a rated net thermal input of 4.59MWth and an electrical generation capacity of up to 1.65MWe at peak load.

1.3 Proposed Changes to the Environmental Permit

The proposed variations to the site's Environmental Permit (EPR/EP3830GH) include the installation of 9 containerised engines which will be fired with biofuel ("peaking plant"), and associated ancillary

equipment. Associated infrastructure will include bunded storage facilities for the fuel storage tanks, and electrical transformers.

The application covers the changes to existing site operations as shown in Table 1-1 and Table 1-2.

Table 1-1: Schedule 1 Listed Activities

Schedule 1 – Part 2 Reference	Description of Activity	Activity Capacity	Proposed change
Section 1.1 Part A(1)(a)	Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts	Combustion of fuel in appliances with a rated thermal input >50MWth	None – remains to cover natural gas-fired furnace use

Table 1-2: Directly Associated Activities (DAAs)

Name of DAA	Description	Proposed Changes
Steam and electrical power supply	18MWe gas-fired CHP and 2x8MWth gas/gas-oil fired boilers.	
Peaking electrical power supply	9x1.65MWe biofuel-fired generator units for the purpose of power provision support	Addition of biofuel generator units as described

1.4 Is the Variation a Substantial Change?

The definition of a substantial change is stated within the Natural Resources Wales' (NRW's) "Regulatory Guidance Series EPR 8 – Substantial changes in operation at installations, mining waste facilities and other facilities involving solvents and combustion"[1] (RGN -8) as:

"a change in operation which in the Agency's opinion "may have significant negative effects on human beings or the environment".

This application for a variation is not considered to represent a substantial change and consequently is submitted as a Standard Variation to the existing permit, for the reasons set out below:

- The installation is currently permitted to operate combustion activities, both as a Part A(1) activity and as a directly associated activity (see Table 1-1); combustion of biofuel in the Peaking plant will not add any new listed activities to the permit. Therefore, it is concluded that the proposed change does not involve significant changes to the primary processes currently conducted on site;
- The generator set includes a fuel storage area of 3x50m^3 integrally bunded plastic tanks to store fuel used to operate the existing combustion activities. The tanks will be located in additional bunding to 110% tank capacity (55m^3) to prevent release to environment. It is therefore considered that the additional storage area proposed to be built for the storage of biodiesel which will fuel the Peaking plant will not substantially increase the pollution risks at the site.

The existing management procedures and associated documents for the site will be amended and expanded to include the operations proposed in this variation application. This will include management techniques, preventative maintenance, waste handling, accident management, and decommissioning and installation issues, supported by the sites' Environmental Management System (EMS).

Additionally, the practical tests outlined in RGN-8 have been applied to assess if the proposed change in operation is substantial or not, and have indicated that the proposed variation does not represent a Substantial Change. Consequently this application is made as a Normal / Standard Variation.

[1] Regulatory Guidance Series EPR 8 – Substantial changes in operation at installations, mining waste facilities and other facilities involving solvents and combustion Version 5.0, Natural Resources Wales, October 2014

The results of the practical tests are summarised in

Table 1-3.

Table 1-3: Determining Substantial Change

Test Criteria	Result and Comments
A.1 Release of Polluting Substances	This variation will add nine new emission sources to the site, which will lead to additional releases of polluting substances associated with the main process activities at the installation. The proposed changes incorporate nine containerised generators fuelled by biofuel (compliant with BS EN quality requirements). Each generator container will be situated on a concrete hardstanding with sealed drains. Each container will have its' own individual emission point. However, the generators are predicted to operate for less than 500 hours annually; therefore limiting the emissions from the site. The emissions from the generators in conjunction with the emissions from the other permitted activities on site have been modelled and reviewed using the H1 assessment tool and have been found to have no significant impacts on the local environment (see Section 3.1).
A.2 Changes To Ambient Pollutant Concentrations	The potential impacts on local air quality associated with the emissions from the proposed generators (41.3MWth) have been modelled and reviewed using the H1 assessment tool and have been found to have no significant impacts (refer to Section 3.1).
A.3 Releases of Substances to Groundwater	There are no point source releases of substances to groundwater. The proposed operation will not introduce any point source emissions to groundwater.
A.4 Accumulation of Released Substances in the Environment	The proposed changes will not lead to the release of any substances which will accumulate in the environment.
A.5 Releases of "Special Substances" – The Precautionary Principle	The proposed changes will not lead to the release of "Special Substances".
A.6 Energy Efficiency and Releases of Greenhouse Gases	The proposed changes will result in energy use from the operation of the generators. The proposed plant has been designed with energy efficiency in mind, therefore only energy efficient equipment is used.
A.7 Releases of Substances that Deplete the Ozone Layer	The proposed facility will not lead to the release of any ozone layer depleting substances. As such, the limited operational period for the plant will ensure that the release of polluting substances is reduced.
A.8 Releases of Substances Causing Low Level Ozone Formation	The proposed changes to the site will not lead to the release of any substances which can cause low level ozone formation.
A.9 Effects of Releases on Visual Amenity	It is not anticipated that the proposed changes will result in the appearance of any visual plumes or visual impacts of concern.
A.10 Odour Effects of Releases	The proposed changes are not expected to cause any additional odours from the site.
A.11 Increased Likelihood or Consequences of Accidents	The proposed changes are not anticipated to lead to any significant additional accident risk. The existing containment measures and emergency procedures currently applied to the site will be extended to include the proposed additions to the facility, and are considered to be adequate. Containment provision for firewater and process spills is incorporated within the design of the infrastructure.
A.12 Increases in Production of	The proposed changes are not anticipated to lead to any significant alteration in the waste arisings at the site.

Test Criteria	Result and Comments
Waste	
A.13 Heat	There are no anticipated changes to the level of waste heat arising from the installation as a result of the proposed changes.
A.14 Noise and Vibration	The installation of new equipment is not considered to have an impact on emissions of noise or vibration. The peaking plant operation may lead to an increase in the number of vehicles travelling to and from the site for delivering fuel; however considering the limited operational period for the plant, it is considered that the increased vehicle movements will not lead to a significant increase in noise emissions from the site. All proposed generators will be enclosed within containers thereby minimising noise and vibration emissions.
A.15 Effects on Sensitive Receptors	The proposed addition of the generators will not cause significant impacts on sensitive receptors. As such, the peaking plant will be in operation for a limited period of time annually (≤500 hours), thereby minimising the emissions from the site. There will be no direct discharges to controlled water from the peaking plant. Any emissions to water will be managed in line with existing site procedures. The key new emissions from the site will be to air, which have been assessed using the H1 tool and are also considered to be insignificant (see Section 3.1).
A.16 Environmental Impact Assessment (EIA)	The site is not required to submit an Environmental Impact Assessment (EIA) to the Local Planning Authority for the proposed changes.
A.11 Increased Likelihood or Consequences of Accidents	The proposed changes are not anticipated to lead to any significant additional accident risk. The existing containment measures and emergency procedures currently applied to the site will be extended to include the proposed additions to the facility, and are considered to be adequate. Containment provision for firewater and process spills is incorporated within the design of the installation.

2. Operating Techniques

2.1 Technical Standards

The installation will continue to operate in accordance with the conditions of the site environmental permit and also applicable NRW Sector Guidance:

- How to comply with your environmental permit[2];
- EPR 1.01: How to comply with your environmental permit Additional guidance for: Combustion Activities[3];
- EPR 2.04: How to comply with your environmental permit Additional guidance for: hot rolling of ferrous metals[4].

Electricity generation is already covered within the existing permit as a directly associated activity. This variation therefore does not introduce any new processes to which new technical standards may be applicable; and the installation will continue to operate in accordance with the above guidance.

Plant operating for less than 500 hours a year, averaged over 5 years, are currently exempt from the requirements of the Medium Combustion Plant Directive ((EU) 2015/2193) and the Energy Efficiency Directive (2012/27/EU).

2.2 Site Condition Report

The proposed peaking plant will be situated on existing concrete hardstanding, with the inclusion of bunding for the proposed fuel storage. The drainage on the hardstanding will connect with the existing site drainage system, incorporating interceptors. The existing site condition report already includes assessment of the potential for oil contamination of the ground and control measures in place to minimise this. This approach is considered to be applicable to the proposed peaking plant development. As a consequence, no significant update of the Site Condition Report is proposed, although LSN will update their environmental management procedures to incorporate the generator units and fuel storage.

2.3 Process Description

LSN intends to install nine containerised generators with a combined net thermal input of 41.3MWth and an electrical generation capacity of 14.9MWe, as a standby electrical generation plant to support the continuous operation of the LSN Steelworks. The generators will operate on biofuel which contains a small proportion of diesel, and is compliant with the requirements of EN 15940:2016 ,. The proposed development will cover an area of approximately 0.41ha within the existing site boundary; the current installation boundary therefore does not require to be extended for the purpose of this variation. LSN intends to construct the proposed facilities on existing hardstanding located in the south-eastern corner of the installation. The location of the peaking plant within the installation boundary is shown in Figure 2.

Installation of the peaking plant will also be used to feed in to the national grid at times of peak electrical demand to supplement the base load generation provided by other sources in the area, including the adjacent Uskmouth B Power Station, and the Severn Power Combined Cycle Gas Turbine (CCGT), as well as other renewable generation sources.

Both National Grid and Ofgem have predicted that the requirement for back-up generation, to manage changes in demand will need to increase over the next eight years for the following three key reasons.

[2] How to comply with your environmental permit, Version 8.0, NRW, October 2014
[3] EPR 1.01: How to comply with your environmental permit Additional guidance for: Combustion Activities, V2.0, NRW, September 2014
[4] EPR 2.04: How to comply with your environmental permit Additional guidance for: Hot Rolling of Ferrous Metals, V2.0, NRW, September 2014

1. With the advent of large proportion of supply being delivered by intermittent renewable generation such as solar and wind, the supply margin has decreased significantly over the last two years. The consequence of this is that National Grid urgently requires more reserve services, of standby electricity generating plant are a main contributor.

2. The proposed increase in size of the next generation of nuclear power plants from 1.2GW to 1.8GW each has a similar demand increase. In the event of one of these new generation stations coming offline, a larger amount of power is lost that must be covered by emergency generation.

3. There is also a large interim demand to be covered as many of the existing coal and nuclear power plants are due to come off line in the next decade before the full benefits of the forthcoming renewable generation sources have time to be developed. The 2010 to 2015 government policy: UK energy security states that a total of 22.5 GW of generating capacity will be gone by 2020. By 2025 there will be further coal plant closures and just one of the existing nuclear stations will be working. This represents almost 50% of the UK's existing capacity.

National Grid has estimated that the electricity distribution network needs to double its stand-by capacity by 2020 to avoid rolling blackouts. When called upon, this stand-by peaking capacity needs to quickly begin to generate power and rebalance the system. It is the speed of response in turning the power on and off that is critical in maintaining supply. The requirement is well suited to a diesel fuelled standby electricity generating facility, which can be fully operational within minutes. Such facilities operate for up to a few hours a day over the winter months, and are not suitable for continual or base load operation. This approach can also be applied to allow the Newport site to maintain the required level of electrical use whilst minimising the draw on the National Grid in such times of high demand on the Grid.

To ensure that there is reliability of supply, it is government policy that the electricity generation mix needs to incorporate a balance of technologies that continuously and reliably produce stable and controllable power.

Given the above there is therefore a clear need for further capacity to meet the projected need for peaking and standby generation. A dedicated emergency standby electricity generating facility at the site will allow for start-up and connection to the plant within minutes of being called up, thus helping minimise the plant's draw upon the national and regional grid and providing some of this necessary additional capacity.

The generators selected for the peaking plant are Mitsubishi Generators (model: M1900).

The peaking plant will comprise the main containerised generators and associated infrastructure comprising bunded areas for fuel storage tanks, drainage and electrical transformers.

The proposed layout of the development is set out in Drawing no. 140 (Appendix A). The drawing shows up to six fuel storage tanks located on concrete bases (B2) – this has been revised to three $50m^3$ tanks as described within this application. The tanks are located on a 12m x 12m concrete base with a 0.4m concrete bund wall proposed to provide containment to over $55m^3$ capacity. Drainage around the fuel delivery and transfer locations is directed to the main installation surface water system, which incorporates oil-water interceptors and a containment lagoon, provided tertiary containment for any spills and leaks during the delivery and transfer of the biofuel, which is delivered by tanker to integrally bunded plastic (HDPE) fuel storage tanks before transferring to the generator units via overground pipeline.

The fuel consists of a bioliquid fuel generated through hydrotreatment of vegetable oils and animal fats, and blended with a small proportion of diesel, to a specification compliant with BS EN 15940.

Small power plants comprising of reciprocating engines are more efficient than gas turbine based plants in situations where considerable load variations are possible, and are considered cost-efficient solutions for peaking electricity supplies for energy-intensive industries. The nature of the process at Liberty Steel leads to large variations in electricity demand, both on a daily and seasonal basis, and accessibility to electricity may be compromised during periods of peak demand on the Grid. In order

to maintain satisfactory efficiency, smaller engines with the capability of quick start-up and shutdown are necessary, such that individual engines can be run at optimum loading and hence optimum efficiency.

Reciprocating engines are able to maintain good performance at part load, with typically only a 10% increase in Specific Fuel Consumption (SFC) at half-load. Thermal performance below half-load deteriorates whilst pollutant emissions in exhaust gas increases.

As a consequence, the use of the proposed engine plant is considered to represent BAT for the purpose of providing a rapid-start, short-term power supply during periods of peak demand, both on- and off-site.

2.4 Management Systems

The site is operated under an existing management system, which is applicable to all current permitted site activities, which will be amended as appropriate to reflect the proposed additions to the facility at Newport.

In summary, the management system seeks to identify and minimise the risk of pollution and harm to human health which may arise from operation, maintenance, accidents, incidents and non-conformances specific to the proposed peaking plant.

The management system and procedures is available for inspection at the facility and applicable to all staff, contractors and visitors to the facility. The management system has been developed to enable compliance with the environmental permit and other legislative requirements for the protection of the environment and human health.

The management system and procedures contained therein are subject to regular review and amendment. Internal review of the management system (or relevant parts therein) will continue to be undertaken at least on an annual basis or in the event of change in operations / site processes. Internal audits will be undertaken to ensure compliance with the management system, relevant legal requirements, environmental and management performance and to identify preventative / corrective actions to minimise the risk of breach / non-compliance. The findings of any such review and audits are communicated to all staff and relevant external contractors and where appropriate improvement works / corrective actions implemented. All internal reviews, audits, amendments to the management system and improvement measures implemented will continue to be recorded for reference and inspection purposes, and be available for review by the NRW if requested.

2.5 General Maintenance

LSN's existing Operations and Maintenance (O&M) Manuals will be amended to include the proposed peaking plant and the biofuel storage area. The development will be incorporated as a supplementary set of procedures covering the plant and storage facility.

The site operates an infrastructure monitoring programme for the existing activities, this programme implements the monitoring and maintenance requirements as defined in the site protection and monitoring program (SPMP). The SPMP will be updated to include the new infrastructure, which will also be monitored and maintained by LSN.

This system will cover the inspection and maintenance of fuel storage area, and concrete hardstanding surfacing, the generators, and the containers holding them; and will consist of a combination of weekly, monthly and quarterly inspections, alongside more infrequent activities such as bund integrity tests for the fuel storage area.

Monitoring and maintenance will be recorded on the planned preventative maintenance system. Where infrastructure inspections identify non-conformity, this will be raised on an incident report form and an appropriate corrective action initiated. Where a defect is identified via an informal inspection method, e.g. by operators undertaking routine day-to-day tasks, records will be kept through an ccident / Incident and Near Miss Reporting Procedure.

Records of all non-conformities, along with corrective actions to be taken, will be collated on the Accidents and Incidents spreadsheet for monitoring of environmental performance.

Clear operational procedures will be applied to the management of fluid spills under existing EMS procedures.

2.6 Raw Materials

The only new raw material introduced to the installation by the proposed peaking plant will be the biofuel to fuel the peaking plant. It is anticipated that based on the limited operational period of the peaking plant, the installation will use up to 1,750 tonnes of biofuel annually, with 150m^3 stored on site at any one time.

The biofuel used on site will be a bioliquid produced through the hydrotreatment of vegetable oils and/or animal fats, and blended with a small quantity of diesel, to a specification compliant with BS EN 15940 requirements. The characteristics of the fuel to be used at the peaking plant are shown in Appendix B.

Due to the presence of diesel in the biofuel, there is a small potential for it to contaminate the underlying ground, if it is not contained appropriately, or is spilled. The fuel storage facilities have therefore been designed with this aspect taken in to consideration.

Fuel storage tanks are 3x50m^3 HDPE integrally bunded tanks, located within a 55m^3 bunded area and with delivery connection points located within the bund. Drainage in the area is directed to the existing site drainage system with oil-water interceptors. Deliveries are expected to be around three tanker loads every two weeks to cover the annual demand. On this basis of the control measures applied on site, it is considered that the chance for the fuel to cause accidental damage to the underlying soils is negligible.

2.7 Waste

It is anticipated that there will be no significant increase or change in the waste generated from the site due to the peaking plant.

Minor quantities of waste may be generated from maintenance works, which will be stored in the existing waste storage facilities on site. The waste storage area has appropriate signage to mark containers of hazardous and non-hazardous waste.

All waste produced on site will be managed appropriately in line with the waste hierarchy and the Waste Framework Directive.

2.8 Energy Use

The units are anticipated to operate at approximately 36% efficiency, with up to 1.65MWe generated from a maximum input of 4.59MWth for each generator unit. Over a 500 hour operation period, this would result in a consumption level equivalent to approximately 20,000MWth through the consumption of approximately 1,750 tonnes of biofuel.

2.9 Energy Efficiency

The equipment selected for use in the proposed peaking plant and associated amenities are considered to represent energy efficient units for the proposed duties. It is anticipated that the installed generator units will consume up to 1,750 tonnes of biofuel a year. As the proposed fuel (a bioliquid derived from vegetable oils and animal fats) is from a sustainable source, the generation of electricity through this approach produces 50-90% less carbon dioxide than the fossil-fuel equivalent.

As the plant will be operating as peaking plant with a run time of less than 500 hours a year, it is exempt from the key requirements of the Energy Efficiency Directive.

2.10 Accidents

An Accident Management Plan is already in place for the installation. In conjunction with the existing Accident Management Plan for the site, a plan specific to the peaking plant and biofuel storage operations will be produced to prevent and manage any potential accidents from the proposed activities. This will focus primarily on fire prevention and control alongside firewater and spill control.

3. Emissions to Air, Water and Land

3.1 Emissions to Air

LSN intends to install nine Mitsubishi M1900 generators, each housed within its own individual container. Each generator will be housed within a container having dimensions 12192mm (length) x 2438mm (width) x 2591mm (height). The technical specifications of the generators are shown in Appendix B, along with a description of the containers.

The emission points from the generators are not proposed to be connected to a single flue stack; therefore each of the containerised generators installed as part of the Peaking Plant at the site will have a separate dedicated emission point. The containers housing the generators are all equipped with exhaust vents located on the roof at a height of approximately 2.6m. The proposed variation will introduce 9 new emission points to the site (reference: A14 – A23).The emissions points are located in close proximity to each other as described in Appendix C, with each point having the parameters outlined in Table 3-1.

Table 3-1. Point Source Emissions to Air

Parameter	Value
Stack Height	2.6m
Stack Diameter	0.406m
Flue temperature	539^{o}C
Actual Volumetric Flow	5.15 m^3/sec
Reference Volumetric Flow (dry, 0°C, 1 atm, 5% O_2)	1.58 Nm^3/sec
NO_2	400 mg/Nm^3
CO	650 mg/Nm^3
Particulate matter	130 mg/Nm^3

In addition to the above, there will be fuel storage tanks on site which will have breathing vents to allow vapours to escape when the tanks are being filled. However, emissions from these vents are expected to be insignificant in comparison with the emissions from the generator, due to the low volatility of the biofuel; as such they have been discounted from assessment.

An assessment of the potential impacts of emissions to air from the proposed process is presented in Section 6, with a detailed air quality assessment of the peaking plant in Appendix C.

3.2 Emissions to Water / Sewer

There will be no direct emissions to controlled waters from the new facilities.

Surface water run-off from the container area will be directed to the existing surface water drainage. Drainage in the vicinity of the development will be fitted with Filtrelec Ecodesign stormwater filters, which are high-efficiency, oleophilic hydrophobic polymer filters, designed to capture hydrocarbons to a discharge concentration of 5ppm in flows of up to 40l/sec. These filters also seal instantly in the

event of a loss of containment resulting in high levels of hydrocarbons within the system. The use of these filters will provide protection in the event of loss of containment of biofuel during delivery or of transformer oil.

All wastewater produced from the peaking plant and associated infrastructure (such as fuel storage bunds), will be managed in line with existing site procedures.

It is therefore considered that additional assessment for wastewater management is not required.

The generators on site will be enclosed within containers therefore minimising any fuel spills into the site drainage. The proposed biofuel storage area will be a concrete slab of 12m x 12m contained within concrete bunding to a height of 0.4m, providing containment to 57m^3. The bund will incorporate a collection sump and level alarms to allow for pumping out of water collected within the bund. Bund water will be visually inspected and either discharged through the existing interceptors or transported off-site for appropriate treatment.

Offloading of biofuel will be carried out adjacent to the biofuel storage area, with connection points located within the bunded area. Drainage from the delivery area is connected to the main site drainage system which includes oil-water separators, and the local drainage will also be fitted with oil filters as described above, to provide additional protection including the ability to seal the drain in the event of a spill.

3.3 Emissions to Land

The new generators will be containerised and be located on concrete hardstanding. The proposed biofuel storage area will be contained within impermeable bunds, whilst the delivery area is on impermeable hardstanding with controlled drainage to the site interceptors. Therefore, no direct emissions to land are predicted to occur as a result of the operation of the new facility.

3.4 Fugitive Releases

Fugitive releases to air are expected to be minimal, restricted to potential losses to air during refilling of the fuel tanks. As the biofuel has a low volatility, the potential impact is negligible.

The risk of accidental releases to land and controlled water from the Peaking plant during operation is considered to be low. The generators are sat within specifically designed generator containers and their location on impermeable concrete hardstanding is expected to provide sufficient containment for potential fuel spills from the generators. Similarly, the bunded fuel storage area with impermeable floor and sealed drains is anticipated to provide sufficient containment to the stored fuel, and prevent any potential impacts on the underlying ground and groundwater.

Concrete bases for the generator units and fuel storage tanks are constructed to BS 8500-1, and containment for the fuel storage tanks will meet the requirements of CIRIA C736.

3.5 Odour

The operation of the peaking plant will not introduce the use of any odorous materials to the site, as the fuel delivered to the site has been produced to a high standard (EN 15940), minimising the potential for odour generation. Fuel on site will be contained within integrally bunded tanks. The potential for odour emissions from the site as a result of the peaking plant operation is considered to be insignificant.

3.6 Noise

It is anticipated that the vehicle movements required to deliver biofuel for the peaking plant operation will increase the overall number of vehicles accessing and leaving the site, leading to an increase in noise generation from the site. However, due to the limited operational period of the plant, it is the expected that the increase in vehicle movement will not lead to a significant increase in the noise level from the site.

Noise generation from the plant itself is not anticipated to be an issue at the site as all equipment being installed is new and designed to generate low levels of noise. Additionally all generators will be enclosed within containers with sound insulation reducing sound levels to between 65dBA and 75dBA at 7m, and are therefore not expected to lead to significant noise impacts off-site. A brief assessment of noise impacts is provided in Section 6.

4. Monitoring

4.1 Emissions to Air

There are 9 emission points to air associated with this variation to the Permit, with each generator vent representing one emission point.

Due to the infrequent nature of the operation, no ongoing monitoring of the emissions is proposed. Emissions from the generator sets will be minimised through a maintenance regime in line with the manufacturer's requirements.

4.2 Emissions to Water

Surface water from the area in the vicinity of the generator sets will be directed through the existing surface water system, which incorporates oil interceptors. Discharges from the site surface water system will continue to be monitored through the existing processes.

4.3 Emissions to Sewer

No discharges to sewer will occur from the proposed generator sets.

4.4 Site Protection and Monitoring Plan (SPMP)

A Site Protection and Monitoring Plan (SPMP) is in operation at the site. The SPMP will be amended to incorporate the infrastructure improvements associated with the generator set, including the plant and equipment, concrete hardstanding, the fuel storage area and the associated drainage. The SPMP will consist of a combination of weekly, monthly and quarterly inspections.

No additional environmental monitoring is proposed as the risk to the environment is minimised through the containment infrastructure.

5. Environmental Risk Assessment

5.1 Introduction

This section discusses the potential impact on sensitive receptors and the surrounding area and shows how the emissions from the peaking plant have been assessed and minimised. Guidance contained in the Environment Agency Horizontal Guidance Note H1 Overview document and supporting Annexes[5] (as guided by the NRW), has been used to scope and assess the emissions from the site.

5.2 Site Location and Sensitive Receptors

5.2.1 Human Receptors

The site is located along the eastern bank of River Usk, in an area generally occupied by commercial and industrial uses. The site is bordered by a small water stream (Julian's Reen) along its southern boundary. To the east of the site lies a railway track, beyond which lie four lagoons and agricultural land. Disused land lies immediately to the north of the site boundary beyond which other commercial facilities are located.

The closest receptor is the sailing club, 450m to the south-west. The closest residential property is a farm located along West Nash Road approximately 600m to the south east of the site. The farm is located adjacent to the southern boundary of the Nash Waste Water Treatment Works.

A full list of human health receptors is presented in Table

Table 5-1: Designated Sites Near the Site

Receptor	Description	National Grid Reference	
		Eastings	Northings
R1	Hart Farm	334283	185087
R2	Property on Nash Road	334481	185070
R3	Pye Corner Farm	334524	185156
R4	Fair Orchard	334540	184816
R5	Campsite	334714	184969
R6	Ty Du Farm	334686	184579
R7	Property on Nash Road	334666	184507
R8	Old Farm House	334695	184415
R9	Property on Nash Road	334795	184095
R10	Property on West Nash Road	334719	183925
R11	Nash Hall/School	334326	183771
R12	Property on West Nash Road	334420	183754
R13	Farm North of Nash	334187	183989
R14	Ty-Porta	333920	183710
R15	Great House	333701	183431
R16	Sailing Club	333039	184187

[5] Risk assessments for specific activities: environmental permits, EA, February 2016, available on https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits, accessed on 17/11/2016

Receptor	Description	National Grid Reference	
		Eastings	Northings
R17	Property on Watch House Parade	331490	186201
R18	Property on Alexandra Road	331563	186239
R19	Property on Stephenson Street	332018	186114

5.2.2 Sensitive Habitats

There are a number of ecologically sensitive sites in the vicinity of the site, which are identified in Table 5-2 below. All statutory designated sites within 10km of the site including Ramsar Sites, Special Protection Area (SPAs), Special Areas of Conservation (SACs) National Nature Reserves (NNRs) and Sites of Special Scientific Interest (SSSI) and have been identified.

Table 5-2: Designated Sites Near the Site

Designated Site	Designation	Area (ha)	Distance from site (km)
River Usk (Lower Usk)	SAC SSSI	1011.46 539.18	0.12W
Severn Estuary	Ramsar SSSI SAC SPA	6889.19 6853.77 26693.12	1.32SW
Newport Wetlands	NNR SSSI	865.72 374.16	0.65S
Gwent Levels - Nash And Goldcliff	SSSI	760.65	1.09NW
Gwent Levels - St. Brides	SSSI	1305.89	2.82E
Gwent Levels - Rumney And Peterstone	SSSI	976.77	3.57E
Langstone-Llanmartin Meadows	SSSI	8.96	4.23NE
Gwent Levels – Whitson	SSSI	891.30	5.87NE
Gwent Levels - Redwick And Llandevenny	SSSI	941.01	6.50NE
Magor Marsh	SSSI	22.57	9.06NE
Penhow Woodlands	NNR SSSI	24.02 42.99	9.43NE
Plas Machen Wood	SSSI	3.76	9.70NW

The site is outside of any Air Quality Management Areas (AQMAs) declared by Newport City Council (NCC) which regulates the area.

5.2.3 Hydrology

The nearest surface watercourse / feature to the site is the River Usk which flows along the western boundary. Julian's Reen, which is a small brook, runs along the southern boundary of the site before its confluence with the River Usk. There are four lagoons situated outside the eastern boundary of the site.

The indicative flood risk map for the area, published by the NRW, shows that most of the installation (including the proposed area for the generator sets) is at risk of flooding from rivers and sea, whilst

some parts of the installation are at risk of surface water flooding. The installation is identified to be within Flood Zone 2. NRW provides the following definitions for this flood zone:

- Flood Zone 2 is land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.

The installation is further assessed by NCC as being in zone C1, indicating that it is served by significant infrastructure, including flood defences, which provides protection against flooding events.

5.2.4 Geology

The site is located on superficial deposits of tidal flat deposits of clay, silt and sand, which is underlain by a bedrock of Mercia Mudstone Group.

Review of borehole records for the nearest boreholes to the site boundary, located approximately 0.5km to the north east of the site (BGS reference: ST38NW235, ST38NW236 and ST38NW237) showed that the area comprises shallow made ground (up to 1m below ground level (bgl)), which is underlain by layers of silty clay with some organic content.

The tidal flat deposits typically comprise normally consolidated, soft silty clay, with layers of sand, gravel and peat.

5.2.5 Hydrogeology

The British Geological Survey (BGS) hydrogeological maps[6] show that the hydrogeology of the site comprises Triassic Rocks, which are designated as an “Undifferentiated” aquifer. The aquifer is defined by BGS as a low productivity aquifer, which constitutes a largely argillaceous sequence with occasional sandstones yielding less than 0.5l/s of water that can be highly mineralised. The rocks confine the underlying Sherwood Sandstone aquifer.

The anticipated depth to the water table in the aquifers is unknown. However, the borehole scans for three boreholes – BH ST38NW235, BH ST38NW236 and BH ST38NW237, located to the north-east of the site, show that groundwater levels vary between 0.80m below ground level (bgl) to 6m bgl. The regional direction of groundwater flow is expected to be to the west due to the location of the River Usk. It is possible that localised perched water may also be present in the Tidal Flat Deposits.

5.3 Pathways for Pollution

Without proper management there is potential for pollution from the generator sets. Pathways to sensitive receptors include, but are not limited, to the following:

- Spillage of biodiesel on to unmade ground during delivery or whilst being filled into the generators, which might leach into the ground and be washed into surface water or groundwater through the underlying soils; and/or
- Combustion gases from the generators might be carried by wind to sensitive receptors.

In order to prevent and minimise the risk of pollution, the fuel storage facilities and the generators themselves will be designed and managed to isolate these pathways, preventing and/or minimising contaminants from migrating off site other than through properly managed abatement systems. The detailed description provided in Section 0 of this supporting document demonstrates how best available techniques have been applied to prevent pollution from the site.

5.4 Impact Assessment

The following sections provide an assessment of the impact of releases from the facility and provide justification for the measures that will be put in place for their control and that will adequately protect the environment. The approach to risk assessment has been based on the following four stages:

[6] http://mapapps2.bgs.ac.uk/geoindex/home.html?layer=BGSHydroMap, accessed on 29/11/2016

- Identify risks from the activity;
- Assess the risks and check that they are acceptable;
- Justify appropriate measures to control the risks, if necessary; and
- Present the assessment as detailed in the Environment Agency's (EA's) Horizontal Guidance Note H1[7].

Activities with the potential to impact on the surrounding environment have been identified in line with guidance provided in Table 1 of Horizontal Guidance Note H1 and include the following assessment annexes for installations:

- Emissions to air;
- Emissions to surface water;
- Emissions to groundwater.
- Amenity and accidents;
- Site waste; and
- Global warming potential.

5.4.1 Emissions to Air

5.4.1.1 H1 Assessment

An H1 assessment has been carried out for the proposed peaking plant, and the associated nine emission points. It should be noted that the assessment only considered emissions from the peaking plant in isolation and not in conjunction with the other combustion emissions from the site. This is considered appropriate as the generator units are isolated from the existing combustion sources on site and will be operated infrequently, based upon demand and Grid capacity. The inputs used for the H1 assessment and its results are summarised in this section.

An air dispersion modelling exercise has been undertaken to assess the impact on local air quality as a result of the anticipated emission levels identified in Table 3.1 above.

A copy of the air quality assessment is included in Appendix C.

Horizontal Guidance from the NRW states that the H1 software tool developed by the Environment Agency (EA) to assess impacts from emissions from industrial activities should be used for assessing proposed industrial activities in Wales. According to the EA's H1 methodology, it is possible to identify emissions that result in "insignificant" impacts and those emissions where further assessment is not required, based on the contribution to the appropriate Air Quality Standard (AQS) objective or Environmental Assessment Limits (EAL) for each pollutant. Screening of the emissions is achieved using the simplified dispersion factors contained within the H1 methodology, which are applied through the effective stack height of the emission source and are used to estimate the ground level concentration per unit release of pollutant.

The tool applies two stages of tests for identifying significant emissions; which are described below:

- Stage 1 Screening: At this stage, the H1 tool calculates the PC of each emission based on the total exhaust flow rate, stack diameter, stack height and emission concentration. Following PC calculation, the test screens out emissions of significance as follows:
  - If an emission PC is >1% of the EAL, then it is considered to be significant for long term impacts;
  - If an emission PC is >10% of the EAL, then it is considered to be significant for short term impacts;

[7] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit, accessed on 29/11/2016

- Stage 2 Screening: The emissions identified to be significant in the Stage 1 screening are then carried forward to this test, where the tool then calculates the PEC for these emissions which takes the local background concentrations (BCs) of the identified substances; following which emissions are screened on the following basis:
  - If an emission PEC is ≥70% of the EAL adjusted for BC (referred to as EAL-Background, or Headroom), then it is considered to be significant for long term impacts;
  - If an emission PC is ≥20% of the EAL adjusted for BC (referred to as EAL-Background, or Headroom), then it is considered to be significant for short term impacts;

During normal operation there will be emissions from all proposed generators. The specifications provided by the manufacturer show that the vents are located on the roofs of the containers housing the generators. Each vent is an individual dedicated emission point on the roof of the generator container. The containers housing the generators will be located on ground level; the vents are therefore going to be at an approximate height of 2.6m above ground level, which is at a much lower level than the surrounding buildings/structures on site. The effective height of the emission points (defined as the stack height above the surrounding structures) has been assumed to be 0m for the purpose of this assessment.

The specifications of the peaking plant used for the assessment are shown below in Table 5-2.

Table 5-3: Specification of the Peaking Plant

Parameter	Value
Number of emission points	9
Thermal rating of each unit (KWth (NET)	4590
Output capacity for each generator (KWe)	1652
Number of operational hours annually	500
Proportion of year when the Peaking Plant is in operation (%)	6
Exhaust stack diameter (m)	0.406
Effective stack height (m)	0
Exhaust stack temperature (°C)	539
Fuel flow rate (l/hour)	444
Wet exhaust flow rate (at stack temperature) (m^3/sec)	5.15
Dry exhaust flow rate (at 0°C and 101.2 KPa) (m^3/sec)	1.58
Emission Levels (Rated Speed at Nominal rate)	
Total NOx (as NO_2) (mg/normalised m^3 @ 5% O_2)	400.0
Total CO (mg/normalised m^3@ 5% O_2)	650
Total Particulate Matter (PM) (mg/normalised m^3@ 5% O_2)	130

Source: Gen Set Package Performance Data, SDMO, 21 December 2016

Notes:
The H1 assessment tool calculates the Process Concentration (PC) and subsequently the Process Emissions Concentration (PEC) of each emission and compares it against the appropriate EALs; which are then used to screen the emissions. The H1 assessment takes in to consideration both long term and short term impacts of emissions. Short-term impacts are likely to be of greater relevance, particularly with regard to human health receptors, however long-term impacts are also presented to provide a complete picture of potential impacts.

A summary of the H1 screening using the outputs from the dispersion modelling are presented in Tables 5-3 (for the worst-case human health receptor) and 5-4 (for the worst-case ecological receptor).

Both short-term and long-term impacts at human health receptors are screened as insignificant (<1% and <10% of the long- and short-term EALs respectively). The highest long-term impacts occur at receptors R4, R6, R7 and R16 (Fair orchard, Ty Du Farm, Property on Nash Road and the Sailing Club), whilst the highest short-term impact is at R13 (Farm North of Nash).

The worst case results for ecological receptors are based upon adjacent Local Nature Reserves, with impacts at the more distant SAC/SPA/RAMSAR sites being significantly lower.

The process contributions of nutrient nitrogen is less than 1% of the lower range critical loads at the Severn Estuary SAC, and therefore can be considered to be insignificant. At the two closest local nature reserves, the PC is well below the H1 screening criteria for impacts on sites of local importance. It is therefore considered that there will be no significant air quality effects from nitrogen deposition on ecological receptors.

Deposition effects were also assessed. Nutrient deposition rates were considered to be insignificant for the Severn Estuary SAC and were also below the screening criteria for the local nature reserves.. Acid deposition was 1.4% of the Minimum Critical Load function for the River Usk, and is therefore marginally over the insignificance threshold. This is based upon the most sensitive habitats present within the River Usk SSSI (marsh grassland) which does not appear as a specific habitat in the vicinity of the installation. The primary habitat in the vicinity is mudflats, which do not have a sensitivity to acid deposition.

5.4.2 Emissions to Surface Water

The proposed peaking plant will not lead to any emissions of process water or foul water into the surface water bodies in the vicinity of the site.

There will be rain water run-off from the peaking plant, which will be captured within the existing site drainage system and directed through oil-water interceptors, which are managed in line with existing site procedures,.

5.4.3 Amenity and Accidents

5.4.3.1 Odour

Given the nature of the operations to be undertaken at the facility, it is anticipated that there will only be minor odour emissions from the storage of biodiesel on site. The combustion of biodiesel is not expected to generate any significant odour emissions.

Additionally, the site is located in an industrial area with no sensitive receptors in the immediate vicinity (the nearest residential receptor is approximately 600m away). Therefore, it is considered that the site does not require an Odour Management Plan for the proposed activity.

In the event of odour being detected on the site boundary by a regulatory inspector or any substantiated complaints being made with regards to odour from the proposed operations, it is proposed that an Odour Management Plan be prepared by the operator in agreement with the NRW.

5.4.3.2 Noise and Vibration

The generator sets are enclosed within soundproofed containers and the exhaust vents equipped with silencers, resulting in maximum sound levels of 75dBA at 7m. Using the Environment Agency's H3 guidance for noise, and assuming no further attenuation, noise levels at the nearest receptor (farm at West Nash Road) are predicted to be 36.4dBA. These levels would be intermittent due to the standby nature of the generator sets. The short-term nature of the noise generated will also minimise any potential effects on the nearby ecological receptors.

There will be no perceptible vibration associated with the plant and equipment outside of the site boundary, with anti-vibration measures incorporated into concrete bases for the generator units. Given the distance to the nearest sensitive receptor, off-site vibration has not been considered further in this application.

5.4.3.3 Fugitive Emissions

The potential for fugitive emissions is primarily limited to spills associated with delivery and transfer of the biofuel, which will be managed through the application of containment around the storage tanks and use of interceptors on the surface water system. Fuel delivery procedures in place at LSN will be extended to cover deliveries to the fuel storage area.

5.4.3.4 Visible Plumes

Visible plumes are anticipated to be minimal, with no steam generation or cooling systems involved with the generator sets.

5.4.3.5 Accidents

A qualitative assessment of accident risks in relation to the production facility that may have environmental consequences, for example: fire, vandalism, flooding, etc. is included in Appendix D.

Based on this risk assessment and consideration of the mitigation measures included in the design it is considered that the overall risk of impact from vandalism and fire risks will be low. The effective implementation of management techniques and actions will also help prevent and/or minimise the risk of emissions from accidents.

5.4.3.6 Flood Risk Assessment

The site is identified to be located within a high flood risk zone. However, the proposed peaking plant will comprise fully contained generators, and bunded fuel storage. The containers will be bolted onto the concrete hardstanding, and the bunding will protect the fuel tanks from the effects of flooding. The likelihood of spillage on to ground or into floodwaters from the generators and the fuel tanks is therefore considered to be very low.

As such, as the site is an existing operation, it has flood management procedures in place, which will be applied to the peaking plant and all associated infrastructure. Additional flood risk assessment for the peaking plant is therefore not considered to be required.

5.4.4 Site Waste

The peaking plant is only expected to produce minimal quantities of waste, primarily from maintenance activities. All waste produced from maintenance activities will be similar to that already produced on site, and will therefore be managed in line with existing site procedures.

As a consequence, no further assessment of waste has been applied.

5.4.5 Global Warming Potential

The site intends to use liquid biofuel for firing the generators, which generates between 50-90% less carbon dioxide than conventional diesel, with an average of 65% reported by the producer, Neste. Using the Environment Agency's H2 Horizontal Guidance on Energy Efficiency, the emissions of carbon dioxide from the combustion of gas oil (diesel) are 250kg/MWh. As up to 20,000MWh could be consumed annually, emissions using conventional diesel could be up to 5000 tonnes. Using the biofuel as a fuel would generate just 1,750 tonnes a year, a reduction of 3,250 tonnes. It is therefore considered that the global warming potential of the peaking plant will be negligible in comparison to a conventional diesel generator.

5.4.6 Emissions to Groundwater

There will not be any discharges to ground / groundwater from the additional activities proposed by this variation application.

Table 5-3: H1 Screening Predicted Ground Level Concentrations – Human Receptors (Worst Case)

Pollutant	EAL		Stage 1 Screening				Stage 2 Screening					
					Insignificant?						Insignificant?	
	Long Term	Short Term	PC mg/m^3	PC/EAL%	Long Term	Short Term	BC[(1)] mg/m3	%PC of Headroom[(2)]	PEC mg/m3	PEC/ EAL%	Long Term	Short Term
NO_2	40	-	0.1	0.3	Yes	-	14.3	-	14.4	36.1	Yes	-
	-	200	10	5.0	-	Yes	28.6	5.3	-	-	-	Yes
CO	-	10,000	56.4	0.6	-	Yes	504	0.6	-	-	-	Yes
Particulates (PM10)	40	-	0.1	0.2	Yes	-	14.2	-	14.3	35.7	Yes	-
	-	50	0.3	0.6	-	Yes	28.4	1.4	-	-	-	Yes

Table 5-4: H1 Screening Predicted Ground Level Concentrations – Ecological Receptors (Worst Case)

Pollutant	EAL		Stage 1 Screening				Stage 2 Screening					
					Insignificant?						Insignificant?	
	Long Term	Short Term	PC mg/m^3	PC/EAL%	Long Term	Short Term	BC[(1)] mg/m3	%PC of Headroom[(2)]	PEC mg/m3	PEC/ EAL%	Long Term	Short Term
NO_x	30	-	2.4	8.1	No	-	19.4	-	21.8	73	No	-
	-	75	75	100	-	No	29.1	-	-	-	-	No

Notes:

(1) Background concentrations for the pollutants was obtained from Welsh Air Quality website (http://www.welshairquality.co.uk/, accessed on 29 November 2016)

(2) The Headroom i.e. EAL adjusted for BC is calculated by H1 tool itself and is not displayed.

6. Conclusions

LSN intends to install 9 containerised biofuel operated generators with an output of 14.9MWe (41.3MWth), to provide standby electricity generation to support the continuous operation of the LSN Steelworks, with the additional capability to provide electricity to the electricity grid at peak load times. The peaking plant is expected to operate for up to 500 hours annually.

The amendments also include consideration of the activities to be undertaken in association with the peaking plant including delivery and storage of fuel.

Environmental impacts associated with the proposed changes, reviewed utilising the Environment Agency EPR - H1 methodology, have been reviewed and are considered to be insignificant with the exception of potential nitrogen oxides and acid deposition effects on two local nature reserves and the River Usk SSSI. However, these assessments are based upon a conservative assessment using worst-case habitat Critical Loads, and are also include significant contributions from background loads. It is therefore considered that due to the worst case assumptions used in the assessment, and given the location and limited running times of the facility, that the predicted impacts are considered to be acceptable.

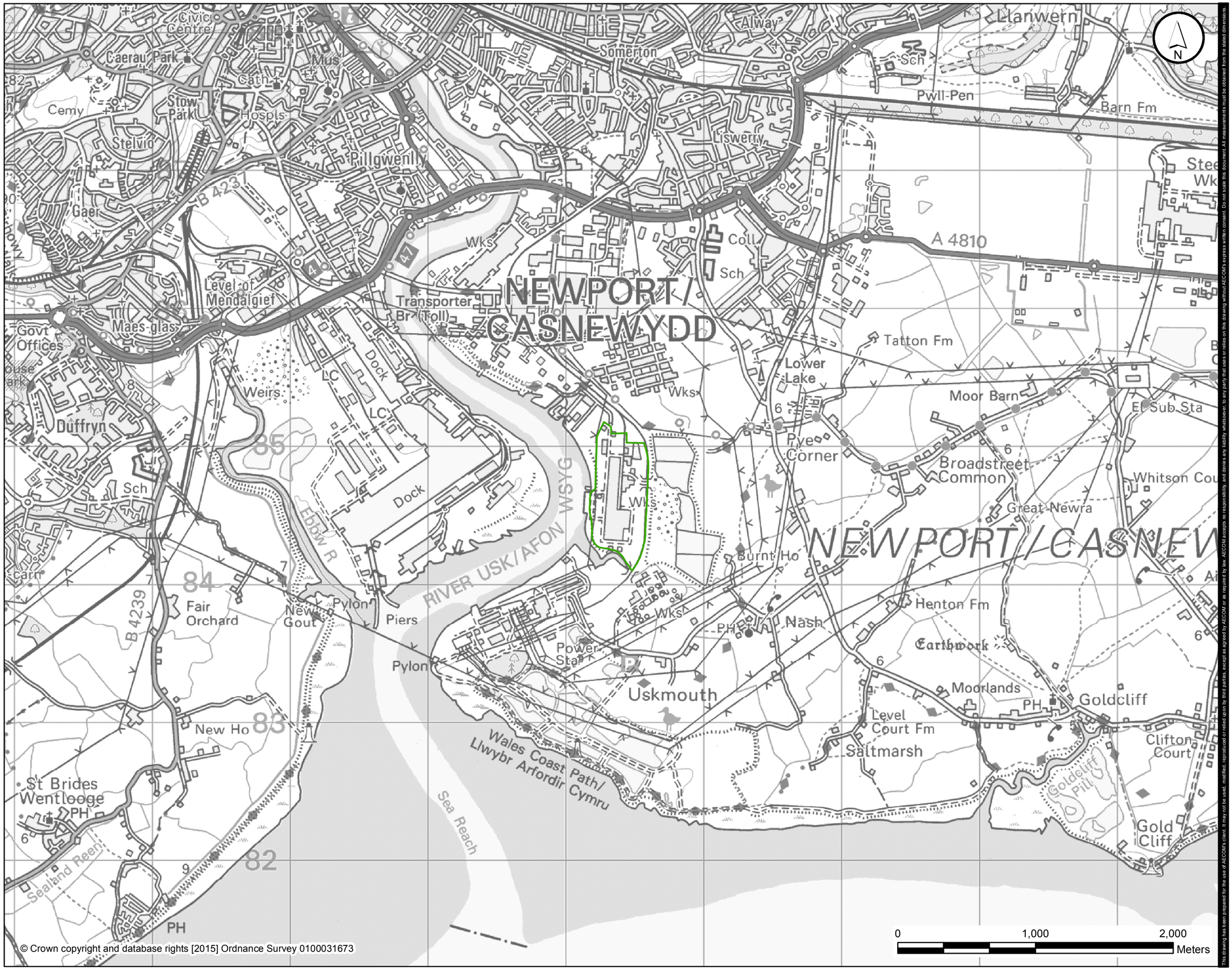
Appendices

Appendix A Drawings

Figure 1 – Site Location

Figure 2 – Site layout

Figure 3 - Drawing 140 – Newport Compound – Preliminary Layout



AECOM

PROJECT

Liberty Steel
Newport Steelworks
EP Variation

CLIENT

LIBERTY STEEL
NEWPORT LTD

CONSULTANT

AECOM Limited
1 Callaghan Square
Cardiff, CF10 5BT
+44 (0)29 2067 4600 tel
www.aecom.com

LEGEND

Instalation Boundary

ISSUE/REVISION

A	10/12/2015	ISSUED FOR INFORMATION
I/R	DATE	DESCRIPTION

KEY PLAN

CONTRACT NUMBER

60443992

SHEET TITLE

Figure 1
Site Location Plan
Scale at A3: 1:25,000

SHEET NUMBER

L_Figure1_Site_Location_LSN_v1

AECOM

PROJECT

LSN -
Request for Scoping Opinion

CLIENT

LIBERTY STEEL NEWPORT LTD

CONSULTANT

AECOM Limited
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+44 (0)29 2067 4600 tel
www.aecom.com

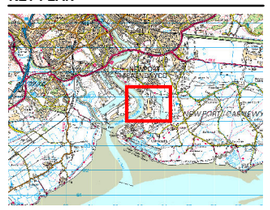
LEGEND

- Installation Boundary
- Generator units and fuel storage

ISSUE/REVISION

A	04/01/2017	ISSUED FOR INFORMATION
I/R	DATE	DESCRIPTION

KEY PLAN



CONTRACT NUMBER

60443992

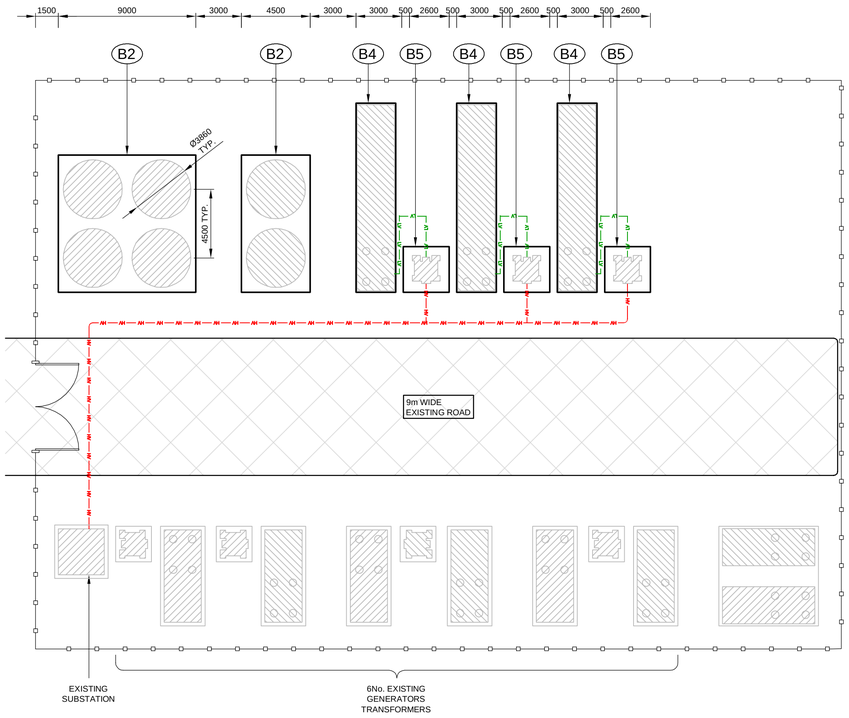
SHEET TITLE

Figure 2
Site Boundary

Scale at A3: 1:5,000

SHEET NUMBER

Figure2_SiteBoundary



NEWPORT SITE PLAN

(SCALE 1:200)

0m 4m 8m 12m 16m 20m

Scale: 1:200

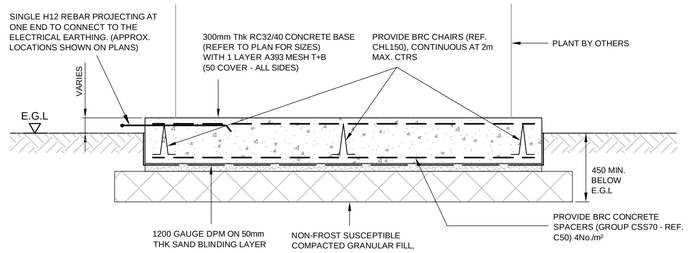
0m 1m 2m 3m 4m 5m

Scale: 1:50

KEY:

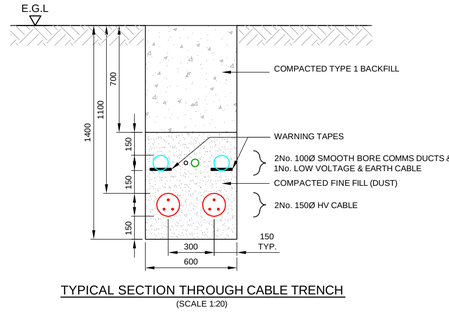
- B2 — FUEL STORE AND DISTRIBUTION BASES (9000x9000 AND 4500x9000)
- B4 — GENERATOR BASE (2600x12390) TO BE PROVIDED WITH ANTI VIBRATION MOUNTS. (3 No. TOTAL)
- B5 — TRANSFORMER BASE (3000x3000) WITH CUT OUT FOR HV CABLES (3 No. TOTAL)
- HV HV — HIGH VOLTAGE CABLE TRENCH 1200 DEEP
- LV LV — LOW VOLTAGE CABLE TRENCH
- 2400mm HIGH GALVANISED PALISADE FENCE

COMMS CABLES BETWEEN THE SUBSTATION AND GENERATORS TO FOLLOW THE SAME ROUTE AS THE HV & LV CABLES.



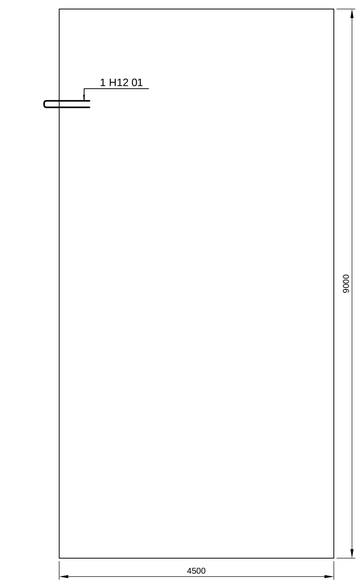
TYPICAL SECTION THROUGH BASE

(SCALE 1:20)



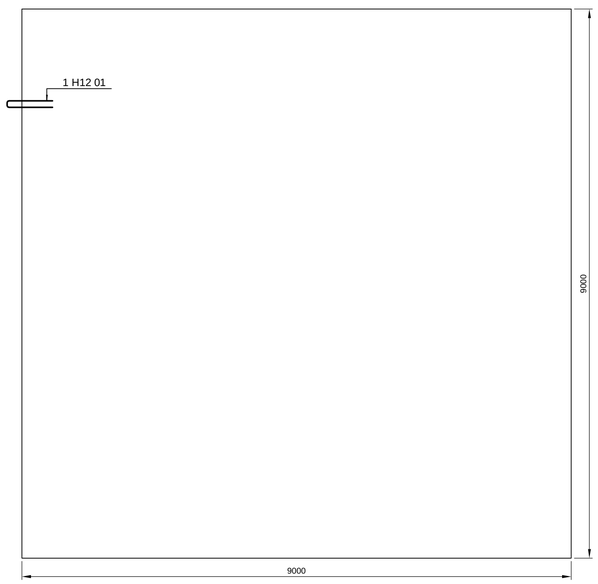
TYPICAL SECTION THROUGH CABLE TRENCH

(SCALE 1:20)



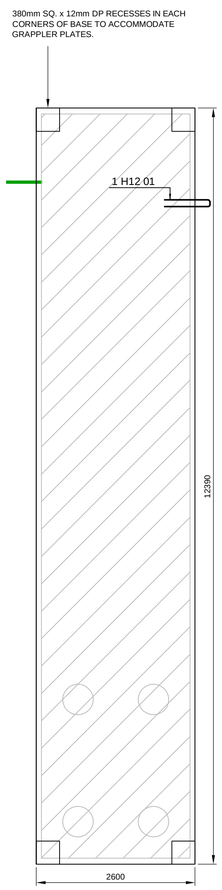
PLAN ON BASE TYPE B2 TYPE 1 (1No. TOTAL)

(SCALE 1:50)



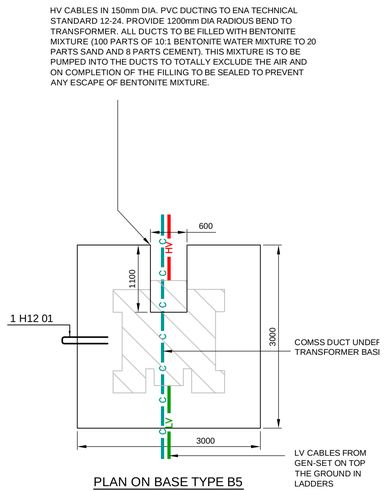
PLAN ON BASE TYPE B2 TYPE 2 (1No. TOTAL)

(SCALE 1:50)



PLAN ON BASE TYPE B4 (3No. TOTAL)

(SCALE 1:50)



PLAN ON BASE TYPE B5 (3No. TOTAL)

(SCALE 1:50)

GENERAL NOTES

1. This drawing is to be read in conjunction with all relevant Engineers drawings, Architects drawings and specifications.
2. Refer to Architects drawings for levels and setting out information.
3. Dimensions are in mm and levels in m unless otherwise stated.
4. DO NOT SCALE FROM THIS DRAWING.
5. Refer to electrical/power engineers for all electrical details.
6. Marker tape to be provided over burried cables in accordance with ENA technical specification 12-23. Tapes to be 150mm directly above cables and ducts.

Foundation Notes

1. All foundation works to conform to bs 8004 code of practice for foundations
2. Assumed bearing pressure is 100 kn/m2 at subgrade to be confirmed by clients site investigation.
3. Foundation depths noted are minimum and shall be extended downwards if applicable until a satisfactory bearing strata is found.

CONCRETE WORKS

4. Structural concrete to be in accordance with BS 8500 part 1 & 2 and the specification for building construction.
5. Concrete to be RC32/40 to BS 8500-1
6. Maximum aggregate size 20mm.
7. Cover to all reinforcement 50 mm.
8. All concrete to be fully compacted by means of poker vibrators and workmanship to be inaccordance with BS EN 1992.
9. Concrete strength to be verified by identity testing in accordance with BS EN 206-1:2000.
10. Reinforcement:
    Ribbed bars to BS 4449 - grade 500b
    Fabric bar to BS 4483 - grade 500b
11. Slump - contractors choice
12. All reinforcement and mesh to be securely fixed with concrete spacer blocks and tying wire to the correct position. all reinforcement to be clean before the concrete is poured without mud, loose rust or other contamination.

Rev	Detail	By	Chk	Date
P3	Base & cable trench details added	PD	DH	25/11/16
P2	General layout changes.	PD	DH	22/11/16
P1	Preliminary Issue	PD	DH	04/11/16

DHDSTRUCTURES

The Hive
6 Beaufighter
Weston Super Mare
N Somerset
BS4 8EE

01934 411270
07933 739147
www.DHDStuctures.co.uk

Client: SIMEC

Project: LIBERTY STEELGENERATION SITES

Drawing Title: NEWPORT COMPOUND

Drawing Status: PRELIMINARY

Project No.	Discipline	Drawing No.
1092	S	140

Scale	Date	Revision
1:200 @ A1	Nov 16	P3

Drawn	Checked	Sheet Size
PD	DH	A1

Appendix B – Plant and Fuel Specifications

T1900

Engine ref.	S16R-PTA
Alternator ref.	KH04402T
Performance class	G3

GENERAL CHARACTERISTICS

Frequency (Hz)	50 Hz
Voltage (V)	400/230
Standard Control Panel	
Optional control panel	M80
Optional Control Panel	TELYS
Optional control panel	APM802

POWER

Voltage	ESP		PRP		DCC (*)		Standby Amps
	kWe	kVA	kWe	kVA	kWe	kVA	
415/240	1520	1900	1382	1727	1382	1727	2643
400/230	1520	1900	1382	1727	1382	1727	2742
380/220	1520	1900	1382	1727	1382	1727	2887

DIMENSIONS COMPACT VERSION

Length (mm)	12192
Width (mm)	2438
Height (mm)	2896
Dry weight (kg)	22760
Tank capacity (L)	500

DIMENSIONS SOUNDPROOFED VERSION

Type soundproofing	
Length (mm)	5520
Width (mm)	2286
Height (mm)	2479
Dry weight (kg)	12979
Tank capacity (L)	
Acoustic pressure level @1m in dB(A)	
Sound power level guaranteed (Lwa)	
Acoustic pressure level @7m in dB(A)	

DESCRIPTIVE

- Electronic governor
- Mechanically welded chassis with antivibration suspension
- Radiator for core temperature of 48/50°C max with mechanical fan
- Protective grille for fan and rotating parts (CE option)
- Exhaust compensators with flanges
- 24 V charge alternator and starter
- Delivered with oil and coolant -30°C
- Manual for use and installation

POWER DEFINITION

PRP : Prime Power is available for an unlimited number of annual operating hours in variable load applications, in accordance with ISO 8528-1. ESP : The standby power rating is applicable for supplying emergency power in variable load applications in accordance with ISO 8528-1. Overload is not allowed.
*DCC : Data Center Continuous Power ratings apply to Data Center installations where a reliable utility power is available and comply with Uptime institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Average load factor : ≤ 100%.

TERMS OF USE

According to the standard, the nominal power assigned by the genset is given for 25°C Air Intlet Temperature, of a barometric pressure of 100 kPA (100 m A.S.L), and 30 % relative humidity. For particular conditions in your installation, refer to the derating table.

ASSOCIATED UNCERTAINTY

For the generating sets used indoor, where the acoustic pressure levels depends on the installation conditions, it is not possible to specify the ambient noise level in the exploitation and maintenance instructions . You will also find in our exploitation and maintenance instructions a warning concerning the air noise dangers and the need to implement appropriated preventive measures.

T1900

ENGINE CHARACTERISTICS

GENERAL ENGINE DATA

Engine brand	MITSUBISHI
Engine ref.	S16R-PTA
Air inlet system	Turbo
Cylinders configuration	V
Number of cylinders	16
Displacement (L)	65,37
Charge Air coolant	Air/Water DC
Bore (mm) x Stroke (mm)	170 x 180
Compression ratio	14 : 1
Speed (RPM)	1500
Pistons speed (m/s)	9
Maximum stand-by power at rated RPM (kW)	1620
Frequency regulation, steady state (%)	+/- 0.5%
BMEP (bar)	18
Governor type	Electronic

COOLING SYSTEM

Radiator & Engine capacity (L)	420
Fan power (kW)	43
Fan air flow w/o restriction (m3/s)	33,50
Available restriction on air flow (mm H2O)	20
Type of coolant	Glycol-Ethylene

EMISSIONS

Emission PM (mg/Nm3) 5% O2	110
Emission CO (mg/Nm3) 5% O2	560
Emission HC+NOx (g/kWh)	14,47
Emission HC (mg/Nm3) 5% O2	100

EXHAUST

Exhaust gas temperature @ ESP 50Hz (°C)	539
Exhaust gas flow @ ESP 50 Hz (L/s)	5150
Max. exhaust back pressure (mm H2O)	600

FUEL

Consumption @ 110% load (L/h)	388
Consumption @ 100% load (L/h)	353
Consumption @ 75% load (L/h)	266
Consumption @ 50% load (L/h)	188
Maximum fuel pump flow (L/h)	588

OIL

Oil capacity (L)	230
Min. oil pressure (bar)	2,50
Max. oil pressure (bar)	5,80
Oil consumption 100% ESP (L/h)	1,30
Oil sump capacity (L)	140

HEAT BALANCE

Heat rejection to exhaust (kW)	977
Radiated heat to ambiant (kW)	102
Haet rejection to coolant HT (kW)	852

AIR INTAKE

Max. intake restriction (mm H2O)	400
Intake air flow (L/s)	1950

T1900

ALTERNATOR CHARACTERISTICS

GENERAL DATA

Alternator ref.	KH04402T
Number of Phase	Three phase
Power factor (Cos Phi)	0,80
Altitude (m)	0 à 1000
Overspeed (rpm)	2250
Number of pole	4
Capacity for maintaining short circuit at 3 In for 10 s	Yes
Insulation class	H
T° class (H/125°), continuous 40°C	H / 125°K
T° class (H/163°C), standby 27°C	H / 163°K
AVR Regulation	Yes
Total Harmonic Distortion in no-load DHT (%)	<3.5
Total Harmonic Distortion, on load DHT (%)	<3.5
Wave form : NEMA=TIF	<50
Wave form : CEI=FHT	<2
Number of bearing	1
Coupling	Direct
Voltage regulation at established rating (+/- %)	0,50
Recovery time (Delta U = 20% transcient) (ms)	500
Indication of protection	IP 23
Technology	Without collar or brush

OTHER DATA

Continuous Nominal Rating 40°C (kVA)	1860
Standby Rating 27°C (kVA)	2046
Efficiencies 100% of load (%)	96
Air flow (m3/s)	2,50
Short circuit ratio (Kcc)	0,3540
Direct axis synchro reactance unsaturated (Xd) (%)	366,90
Quadra axis synchro reactance unsaturated (Xq) (%)	195,40
Open circuit time constant (T'do) (ms)	2390,73
Direct axis transcient reactance saturated (X'd) (%)	29,50
Short circuit transcient time constant (T'd) (ms)	220,69
Direct axis subtranscient reactance saturated (X"d) (%)	15,60
Subtranscient time constant (T"d) (ms)	13,7180
Quadra axis subtranscient reactance saturated (X"q) (%)	16,11
Subtranscient time constant (T"q) (ms)	15,90
Zero sequence reactance unsaturated (Xo) (%)	2,33
Negative sequence reactance saturated (X2) (%)	15,86
Armature time constant (Ta) (ms)	28,9330
No load excitation current (io) (A)	1,16
Full load excitation current (ic) (A)	4,22
Full load excitation voltage (uc) (V)	44,70
Engine start (Delta U = 20% perm. or 50% trans.) (kVA)	1556,79
Transcient dip (4/4 load) - PF : 0,8 AR (%)	20,16
No load losses (W)	15090,75
Heat rejection (W)	62292,09
Unbalanced load acceptance ratio (%)	8

DIMENSIONS

Dimensions compact version

Type soundproofing	
Length (mm)	5520
Width (mm)	2286
Height (mm)	2479
Dry weight (kg)	12979
Tank capacity (L)	
Acoustic pressure level @1m in dB(A)	
Sound power level guaranteed (Lwa)	
Acoustic pressure level @7m in dB(A)	

T1900

CONTROL PANEL

Basic terminal block

The control unit can be used as a basic terminal block for connecting a control box.

Offers the following functions:

emergency stop button, customer connection terminal block, CE.

M80, transfer of information

The M80 is a dual-function control unit. It can be used as a basic terminal block for connecting a control box and as an instrument panel with a direct read facility, with displays giving a global view of your generating set's basic parameters.

Offers the following functions:

Engine parameters: tachometer, working hours counter, coolant temperature indicator, oil pressure indicator, emergency stop button, customer connection terminal block, CE.

TELYS, ergonomic and user-friendly

The highly versatile TELYS control unit is complex yet accessible, thanks to the particular attention paid to optimising its ergonomics and ease of use. With its large display screen, buttons and scroll wheel, it places the accent on simplicity and communication.

The TELYS offers the following functions:

Electrical measurements: voltmeter, frequency meter, ammeter.

Engine parameters: working hours counter, oil pressure, coolant temperature, fuel level, engine speed, battery voltage.

Alarms and faults: oil pressure, coolant temperature, failure to start, overspeed, alternator min./max., battery voltage min./max., emergency stop, fuel level.

Ergonomics: wheel for navigating around the various menus.

Communication: remote control and operation software, USB connections, PC connection.

For more information on the product and its options, please refer to the sales documentation.

APM802 dedicated to power plant management

The new APM802 command/control system is specifically designed for operating and monitoring power plants for markets including hospitals, data centres, banks, the oil and gas sector, industries, IPP, rental and mining.
This unit is available as standard on all generating sets from 275 Kva designed for coupling. It is optional on the rest of our range.
The Human Machine Interface, designed in collaboration with a company specialising in interface design, facilitates operations with a large 100% touch screen. The pre-configured system for power plant applications features a brand new customisation function which complies with the international standard IEC 61131-3. New communication functions (PLC and regulation), improve the high level of equipment availability in the installation.

Advantages:
Dedicated to power plant management.
Specially researched ergonomics.
High level of equipment availability.
Modularity and long service life guaranteed.
Making it easy to extend the installation

For more information, please refer to the sales documentation.

"HD" SOUND-PROOF CONTAINERS

MAIN FEATURES

This document aims at defining the features of VISA sound-proof containers intended for the installation of generating sets complete with any accessories (e.g. electrical panel, tank, etc.). Thanks to the structural features that make them particularly sturdy, the containers from the HD series represent the right choice for demanding applications that require frequent handling of the units and/or are located in particularly hostile climatic conditions.\nNB: These containers do not have the same structural specifications and certifications as transportation containers, such as: Rina and stackability tests (these two features must be agreed upon beforehand, when placing an order, and generate an extra cost in addition to that of the container itself).

DESCRIPTION

PICTURE

STRONG POINTS: Among the many advantages that this solution has to offer, the following are of utmost relevance: - extreme solidity; -easy to handle thanks to the twist lock corner castings and the removable flanged silencers; -easy access to the unit thanks to the presence of large doors at the sides and on both ends; -ample possibility of customising the internal technical installations such as: sand filters, large capacity fuel tanks, customised control panels; -possibility of installing combined systems on the exhaust to reduce polluting emissions thanks to its large internal space and the sturdiness of the structure; -possibility of being equipped with board radiator installed on the roof.

BASEFRAME AND FLOOR: The base is built with cold-pressed steel sheet metal profiles and stands on a perimeter of longitudinal beams plus a series of crossbeams and reinforcing bars. The floor is made with sheet metal that is welded above the structure, along the edge of the perimetral longitudinal beams and in some sections, on the crossbeams. The floor set up in this way contains the generating set, complete with its base, plus all the required accessories. Near the corners of the baseframe there are 4 corner castings that allow the container to be used on a lorry equipped with a standard twist-lock fastening system.
ROOF AND SUPPORTING STRUCTURES: The external profile of the roof is comprised of a main cold-pressed steel sheet metal beam with castings on its 4 corners. The roofing is made with corrugated sheet metal.

WALLS: The walls are comprised of the assembly of corrugated steel sheet metal panels. The four corner joints (corners) are made with pressed sheet metal, welded on the corner castings as well as along the longitudinal beams.
DOORS: The number and position of the doors depends on the container model and/or specific customer requirements. In any case, standard VISA containers are equipped with: -double doors on the sides when work must be carried out on the unit (unless agreed otherwise with the customer, when the available space allows for it, at least one panel is fitted with a panic bar; the remaining doors close with a rod); - a service door positioned at the end of the container; a double door for access to the silencer compartment. The doors are secured to the walls of the container with bolted hinges, in galvanised steel, which allow them to be opened outwards. Impermeability and acoustic tightness are guaranteed by the application of suitable gaskets.

RADIATOR SIDE END: In standard models, a space for the cooling air outlet is made here. In some versions the exhaust silencers can be housed in this compartment, or alternatively, above the roof of the container. The exhaust gas silencer housing. In applications where exhaust silencers are housed in the cooling compartment, they can be accessed from the outside by a double door. In non-standard containers the position of the exhaust gas silencers is designed according to the required overall dimensions. In any case, whenever it is possible, maintaining the position of the silencers inside the container and on the radiator end is deemed to be the preferable solution.
ALTERNATOR SIDE END: Usually space is made on this end to house the electrical panel, if included. If necessary, the panel can be segregated from the rest of the container by applying an insulated separating wall between the alternator and the panel. This solution is defined as a box for the electrical panel. When no separating wall is envisioned, it is simply referred to as space for the electrical panel. It is possible to access the panel from outside the container through a door with a sight glass.

N.A.= not available; O.R. = on request. Reference conditions standard ISO8528-1: temperature 25 °C, altitude 1-1000 m. A.M.S.L., 30% relative humidity, 100 kPa atmospheric pressure (1 bar), 0.8 delayed power factor, load applied balanced not distorting. The data provided is subject to variation without prior notice.

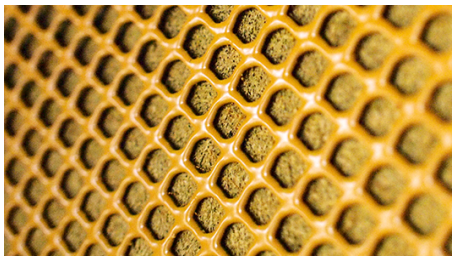
MEASUREMENTS

The external measurements of ISO series 1 containers:
20" standard: width 2438mm length.6058mm hgt.2591mm
25" standard: width 2438mm length.7620mm hgt.2591mm
30" standard: width 2438mm length.9125mm hgt.2591mm
40" standard: width 2438mm length.12192mm hgt.2591mm
NB: the HC containers are the most common, varying in height between 2591 in the standard version and 2896 (without silencers).

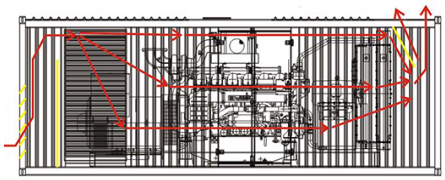
DESCRIPTION

PICTURE

WALL AND ROOF INSULATION:the walls and roof are insulated through the application of: -rock wool; -fibrous and metal protections (stretched galvanised sheet metal). The thicknesses are defined according to the required residual noise level, the materials used are fire-reaction Euroclass A1.
SOUND INSULATION: the sound insulation is able to satisfy the residual noise threshold defined by our standards according to the generating set type and model that is housed in the container. The standard sound pressure values that VISA refers to range from 65 dBA = at 7 m up to 75 dBA at 7 m (the measurements are carried out on request, in compliance with ISO 3744 and using a class 1 sound level meter. The measurements are carried out in open field - 3 dBA tolerance. The results of the readings are recorded on a specific form, also indicating the environmental conditions at the time that the measurements are taken. Versions with sound pressure levels defined by the Customer can be built on request.
PAINTING:on the internal and exposed external surfaces: -Thorough degreasing -Application of an epoxy base layer, 50-60 micron thick -Application of polyurethane glaze (RAL to be defined), 60 micron thick.



COOLING SYSTEM:the generating sets are cooled by a silent system of air intakes/outlets which is set up according to the type of engine that will be installed, the residual noise level that the customer wishes to achieve or other variables. In simple cases the units are cooled through the following air ventilation system: - cool air is drawn in through openings made on one or more doors per side, equipped with relative silencers and protected by grilles with fixed fins; - air is extracted upwards through a hole made in the roof of the container. In complex cases, when the useful space inside the container does not allow for the afore-mentioned air ventilation system, or the required noise reduction level cannot be achieved by adopting this system, and in agreement with the Customer, different solutions are assessed, which usually involve the use of silencing panels positioned and sized according to the various requirements.



OPTIONAL ACCESSORIES:internal lighting system, fire prevention system, gas detection system, ventilation system, conditioning system, sand and/or dust filters, motorised dampers. The following documentation can be supplied upon specific request made when placing the order: documentation from the suppliers of product accessory parts, RINA, UIC, CSC certification, other certificates, phonometric tests.

N.A.= not available; O.R. = on request. Reference conditions standard ISO8528-1: temperature 25 °C, altitude 1-1000 m. A.M.S.L., 30% relative humidity, 100 kPa atmospheric pressure (1 bar), 0.8 delayed power factor, load applied balanced not distorting. The data provided is subject to variation without prior notice.

Visa S.p.A. via I° Maggio, 55 31043 Fontanelle (TV) Italy Tel: +39 0422 5091 Fax: +39 0422 509350
Mail: visa@visa.it Web: www.visa.it SAP 109000000043-001-00 19-03-2015

GREEN BIOFUELS
cleaner & healthier air

GREEN D+ Product Specification: EN 15940/ASTM D975 2D

CHARACTERISTICS	UNITS	LIMITS	TEST METHODS
Appearance at 25°C		Clear & Bright	ASTM 4176-1
Colour		max 70	ISO 6271-2
Cetane Number (DCN)		min 70	EN 15195
Density at 15°C	kg/ m³	770 - 790	EN ISO 12185
Total Aromatics Content	wt-%	max 1,0	EN 12916
Polyaromatic Content	wt-%	max 0,1	EN 12916
Sulphur	mg/kg	max 5	EN ISO 20846
Flash Point	°C	min 61	EN ISO 2719
Carbon Residue on 10% distillation	wt-%	max 0,1	EN ISO 10370
Ash Content	wt-%	max 0,001	EN ISO 6245
Water Content	mg/kg	max 200	EN ISO 12937
Sediment (Total Contamination)	mg/kg	max 10	EN 12662
Copper Strip Corrosion 3h/50°C		Class 1	EN ISO 2160
Oxidation Stability	g/m³	max 25	EN ISO 12205
Acid Number	mgKOH/g	max 0,01	ASTM D 3242
Viscosity at 40°C	mm^2/s	2,0 - 4,0	EN ISO 3104
Distillation 95 vol-%	°C	max 320	EN ISO 3405
Distillation FBP	°C	max 330	EN ISO 3405
Lubricity*	µm	max 460	EN ISO 12156-1
Cloud Point	°C	max -34	EN 23015
CFPP	°C	-22 to -42	EN 116
Electrical Conductivity	pS/m	min 100	ISO6297
Conductivity Measuring	Temp. °C	To be reported	ISO6297
Calorific value	Mj/l	34	

To be stated on the Certificate of Quality: Incl. Conductivity Additive STADIS 450

* Lubricity Additive Tolad 9121 is added

SAFETY DATA SHEET
Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Product number ID 13865

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Distribution of substance, Use as a fuel, Use as an intermediate

1.3. Details of the supplier of the safety data sheet

Supplier Neste Oyj
Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND
Tel. +358 10 45811
SDS@neste.com (chemical safety)

1.4. Emergency telephone number

National emergency telephone number +358-9-471 977, +358-9-4711, Poison Information Centre/HUS, P.O.B 340 (Tukholmankatu 17) 00029 HUS (Helsinki, Finland)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC/1272/2008)

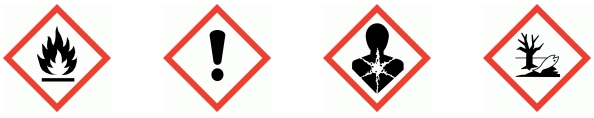
Physical hazards Flam. Liq. 3 - H226

Health hazards Acute Tox. 4 - H332 Skin Irrit. 2 - H315 Carc. 2 - H351 STOT RE 2 - H373 Asp. Tox. 1 - H304

Environmental hazards Aquatic Chronic 2 - H411

2.2. Label elements

Pictogram



Signal word Danger

Hazard statements H226 Flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H332 Harmful if inhaled.
H351 Suspected of causing cancer.
H373 May cause damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Precautionary statements P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273 Avoid release to the environment.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P302+P352 IF ON SKIN: Wash with plenty of water.
P331 Do NOT induce vomiting.
P261 Avoid breathing vapours.

2.3. Other hazards

Other hazards Evaporates slowly., Risk of soil and ground water contamination.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Fuels, diesel **0 - 100 %**

CAS number: 68334-30-5 | EC number: 269-822-7 | REACH registration number: 01-2119484664-27-0012

Classification
Flam. Liq. 3 - H226
Acute Tox. 4 - H332
Skin Irrit. 2 - H315
Carc. 2 - H351
STOT RE 2 - H373
Asp. Tox. 1 - H304
Aquatic Chronic 2 - H411

Distillates (petroleum), hydrotreated light **0 - 100 %**

CAS number: 64742-47-8 | EC number: 265-149-8 | REACH registration number: 01-2119484819-18-0004

Classification
Skin Irrit. 2 - H315
STOT SE 3 - H336
Asp. Tox. 1 - H304
Aquatic Chronic 2 - H411

Distillates (Fischer-Tropsch), C8-26 - branched and linear **0 - 100 %**

CAS number: 848301-67-7 | EC number: 481-740-5 | REACH registration number: 01-0000020119-75-XXXX

Classification
Asp. Tox. 1 - H304

Renewable hydrocarbons (diesel type fraction) **0 - 80 %**

CAS number: — | REACH registration number: 01-2119450077-42-0000

Classification
Asp. Tox. 1 - H304

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Petroleum diesel/gas oil fraction, co-processed with renewable hydrocarbons of plant or animal origin	**0 - 5 %**
CAS number: —	REACH registration number: 01-2120091562-55-0001

Classification
Flam. Liq. 3 - H226
Acute Tox. 4 - H332
Skin Irrit. 2 - H315
Carc. 2 - H351
STOT RE 2 - H373
Asp. Tox. 1 - H304
Aquatic Chronic 2 - H411

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition comments Mixture of renewable raw material fuel, petroleum product and additives. Contains kerosine streams and straight-run and hydrocracked gas oil streams.

Other information Renewable hydrocarbons (diesel type fraction):, Identity outside the EU (CAS number and name of the substance):, Alkanes, C10-C20 -branched and linear, CAS 928771-01-1.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation Remove person to fresh air and keep comfortable for breathing. Get medical attention if symptoms are severe or persist.

Ingestion Do not induce vomiting. Get medical attention immediately.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if irritation persists after washing.

Eye contact Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.

4.2. Most important symptoms and effects, both acute and delayed

General information Irritating to skin. May irritate eyes. Harmful by inhalation. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards Flammable liquid and vapour. Containers can burst violently or explode when heated, due to excessive pressure build-up.

Hazardous combustion products Carbon dioxide (CO2). Carbon monoxide (CO).

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

5.3. Advice for firefighters

Protective actions during firefighting Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Prevent fire extinguishing water from contaminating surface water or the ground water system.

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Avoid inhalation of vapours and contact with skin and eyes. Wear adequate protective equipment at all operations.

For emergency responders Prevent unauthorized access. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Eliminate all ignition sources if safe to do so. Take precautionary measures against static discharge.

6.2. Environmental precautions

Environmental precautions Avoid release to the environment. Stop leak if safe to do so. Avoid the spillage or runoff entering drains, sewers or watercourses. Contain spillage with sand, earth or other suitable non-combustible material. Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air). Risk of soil and ground water contamination.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Immediately start clean-up of the liquid and contaminated soil. Small Spillages: Absorb spillage with sand or other inert absorbent. Pay attention to the fire and health hazards caused by the product.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions The product contains volatile substances which may spread in the atmosphere. Avoid heat, flames and other sources of ignition. Take precautionary measures against static discharges. All handling should only take place in well-ventilated areas. Avoid inhalation of vapours and contact with skin and eyes. Use personal protective equipment and/or local ventilation when needed. Do not eat, drink or smoke when using this product. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Flammable liquid storage. Store in accordance with local regulations. Store in a demarcated bunded area to prevent release to drains and/or watercourses. Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations. Only store in correctly labelled containers. Use containers made of the following materials: Carbon steel. Stainless steel.

7.3. Specific end use(s)

Specific end use(s) Not known.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Ingredient comments The individual limit values can be applied for the hydrocarbons. Diesel fuel as total hydrocarbons; ACGIH TLV®-TWA (8h) 100 mg/m3 (IFV).

PNEC Not available.

Fuels, diesel (CAS: 68334-30-5)

DNEL
Workers - Inhalation; Short term systemic effects: 4300 mg/m³, (15 min), Aerosol
Workers - Inhalation; Long term systemic effects: 68 mg/m³, (8h), Aerosol
Workers - Dermal; Long term systemic effects: 2,9 mg/kg/day, (8h)
Consumer - Inhalation; Short term systemic effects: 2600 mg/m³, (15 min), Aerosol
Consumer - Inhalation; Long term systemic effects: 20 mg/m³, (24h), Aerosol
Consumer - Dermal; Long term systemic effects: 1,3 mg/kg/day, (24h)

Renewable hydrocarbons (diesel type fraction)

DNEL
Workers - Inhalation; Long term systemic effects: 147 mg/m³
Workers - Dermal; Long term systemic effects: 42 mg/kg/day
Consumer - Inhalation; Long term systemic effects: 94 mg/m³
Consumer - Dermal; Long term systemic effects: 18 mg/kg/day

8.2. Exposure controls

Appropriate engineering controls All handling should only take place in well-ventilated areas. Use personal protective equipment and/or local ventilation when needed. Handle in accordance with good industrial hygiene and safety practice. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).

Eye/face protection Tight-fitting safety glasses. Face shield when needed.

Hand protection Wear protective gloves. It is recommended that gloves are made of the following material: Nitrile rubber. Neoprene. Polyvinyl chloride (PVC). Viton rubber (fluoro rubber). The selected gloves should have a breakthrough time of at least 8 hours. Protection class 6. Protective gloves according to standards EN 420 and EN 374. Change protective gloves regularly.

Other skin and body protection Wear suitable protective clothing as protection against splashing or contamination. Wear anti-static protective clothing if there is a risk of ignition from static electricity.

Respiratory protection Filter device/half mask Combination filter, type A2/P3. Filter device could be used maximum 2 hours at a time. Filter devices must not be used in conditions where the oxygen level is low (< 19 vol.-%). At high concentrations a breathing apparatus must be used (self-contained or fresh air hose breathing apparatus). Filter must be changed often enough. Respirators according to standards EN 140 and EN 141.

Environmental exposure controls Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance Liquid.

Colour Clear. Yellowish.

Odour Hydrocarbons. Mild.

Odour threshold -

pH -

Melting point Cloud point ≤ 0°C

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Initial boiling point and range	150...370°C (EN ISO 4305)
Flash point	≥ 55°C (EN ISO 2719)
Upper/lower flammability or explosive limits	Upper flammable/explosive limit: 1 % Estimated value. Lower flammable/explosive limit: 6 % Estimated value.
Vapour pressure	< 1 kPa @ 40°C
Vapour density	-
Relative density	~ 0,8...0,85 @ 15/4°C (EN ISO 12185)
Solubility(ies)	The product has poor water-solubility. < 50 mg/l @ 20°C
Partition coefficient	log Kow: > 3
Auto-ignition temperature	~ 220°C Estimated value.
Decomposition Temperature	-
Viscosity	Kinematic viscosity ≤ 4,5 mm2/s @ 40°C (EN ISO 3104).
Explosive properties	Not considered to be explosive.
Oxidising properties	Does not meet the criteria for classification as oxidising.

9.2. Other information

Other information Not known.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stability Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions No potentially hazardous reactions known.

10.4. Conditions to avoid

Conditions to avoid Keep away from heat, sparks and open flame.

10.5. Incompatible materials

Materials to avoid Oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products Does not decompose when used and stored as recommended.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological effects Harmful if inhaled.

Acute toxicity - inhalation

ATE inhalation (vapours mg/l) 20.0

Skin corrosion/irritation

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Skin corrosion/irritation	Fuels, diesel:, Irritating to skin., (OECD 404), Renewable hydrocarbons (diesel type fraction):, Not classified., (EC B4), The product irritates mucous membranes and may cause abdominal discomfort if swallowed., May cause respiratory irritation.

Serious eye damage/irritation

Serious eye damage/irritation	Based on available data the classification criteria are not met. (OECD 405, EC B5)

Skin sensitisation

Skin sensitisation	Based on available data the classification criteria are not met. (OECD 406, EC B6)

Germ cell mutagenicity

Genotoxicity - in vitro	Based on available data the classification criteria are not met. (OECD 471, EC B10, B13/14, B17)
Genotoxicity - in vivo	Based on available data the classification criteria are not met. Fuels, diesel: (OECD 475)

Carcinogenicity

Carcinogenicity	Suspected of causing cancer. Fuels, diesel: Product may contain cracked gas oil streams. Contains a substance/a group of substances which may cause cancer.

Reproductive toxicity

Reproductive toxicity - fertility	Based on available data the classification criteria are not met. Renewable hydrocarbons (diesel type fraction): (OECD 416)
Reproductive toxicity - development	Based on available data the classification criteria are not met. Fuels, diesel: (OECD 414)

Specific target organ toxicity - single exposure

STOT - single exposure	Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure	Fuels, diesel: May cause damage to organs through prolonged or repeated exposure. (OECD 410, 411, 413) Renewable hydrocarbons (diesel type fraction): Not classified. (OECD 408)

Aspiration hazard

Aspiration hazard	May be fatal if swallowed and enters airways. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

Toxicological information on ingredients.

Fuels, diesel

Toxicological effects	Harmful if inhaled.

Acute toxicity - oral

Notes (oral LD_{50})	LD_{50} > 5000 mg/kg, Oral, Rat (OECD 401, 420)

Acute toxicity - dermal

Notes (dermal LD_{50})	LD_{50} > 4300 mg/kg, Dermal, Rabbit (OECD 434)

Acute toxicity - inhalation

Notes (inhalation LC_{50})	LC_{50} 3,6 - 5,4 mg/l, Inhalation, (4h), Rat (OECD 403)
ATE inhalation (vapours mg/l)	11.0

Distillates (petroleum), hydrotreated light

Acute toxicity - oral

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Notes (oral LD_{50})	LD_{50} > 5000 mg/kg, Oral, Rat (EPA OTS 798.1175 / OECD 420)
Acute toxicity - dermal	
Notes (dermal LD_{50})	LD_{50} > 2000 mg/kg, Dermal, Rabbit (EPA OTS 798.1100 / OECD 402)
Acute toxicity - inhalation	
Notes (inhalation LC_{50})	LC_{50} > 5,3 mg/l, Inhalation, Rat (4h) (OECD 403)

Renewable hydrocarbons (diesel type fraction)

Acute toxicity - oral	
Notes (oral LD_{50})	LD_{50} >2000 mg/kg, Oral, Rat (EC B1 tris)
Acute toxicity - dermal	
Notes (dermal LD_{50})	LD_{50} > 2000 mg/kg, Dermal, Rat (EC B3)

SECTION 12: Ecological Information

12.1. Toxicity

Toxicity Toxic to aquatic life with long lasting effects.

Ecological information on ingredients.

Fuels, diesel

Toxicity	Toxic to aquatic life with long lasting effects.
Acute toxicity - fish	LL_{50}, 96 hours: 21 mg/l, Fish NOEL, 96 hours: 10 mg/l, Fish WAF (OECD 203, EC C.1)
Acute toxicity - aquatic invertebrates	EL50, 48 hours: 68 mg/l, NOEL, 48 hours: 47 mg/l, WAF (OECD 202, EC C.2)
Acute toxicity - aquatic plants	EbL50, 72 hours: 10 mg/l, Algae NOEL, 72 hours: 1 mg/l, Algae WAF (OECD 201, EC C.3)
Acute toxicity - microorganisms	EL50, 40 hours: > 1000 mg/l, Micro-organisms (wastewater sludge) NOEL, 40 hours: 3,22 mg/l, Micro-organisms (wastewater sludge) (QSAR)
Chronic toxicity - fish early life stage	NOEL, 14 days: 0,08 mg/l, Fish (QSAR)
Chronic toxicity - aquatic invertebrates	NOEL, 21 days: 0,2 mg/l, (QSAR)

Distillates (petroleum), hydrotreated light

Toxicity	Toxic to aquatic life with long lasting effects.
Acute toxicity - fish	LL_{50}, 48-96 hours: 2-5 mg/l, Fish NOEL, 96 hours: 2 mg/l, Fish WAF (OECD 203)

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Acute toxicity - aquatic invertebrates	EL50, 48 hours: 1,4 mg/l, NOEL, 48 hours: 0,3 mg/l, WAF (OECD 202)
Acute toxicity - aquatic plants	EL50, 24-72 hours: 1-3 mg/l, Algae NOEL, 48 hours: 1 mg/l, Algae (OECD 201)
Chronic toxicity - fish early life stage	NOEL, 28 days: 0,10 mg/l, Fish (QSAR)
Chronic toxicity - aquatic invertebrates	EL50, 21 days: 0,89 mg/l, NOEL, 21 days: 0,48 mg/l, LOEL, 21 days: 1,2 mg/l, WAF, (OECD 211)

Renewable hydrocarbons (diesel type fraction)

Acute toxicity - fish	LL_{50}, 96 hours: > 1000 mg/l, WAF (OECD 203)
Acute toxicity - aquatic invertebrates	EL50, 48 hours: > 100 mg/l, WAF (OECD 202)
Acute toxicity - aquatic plants	EL50, 72 hours: > 100 mg/l, Algae WAF (OECD 201)
Acute toxicity - microorganisms	EC_{50}, 30-180 minutes: > 1000 mg/l, Micro-organisms (wastewater sludge) (OECD 209)
Chronic toxicity - aquatic invertebrates	NOEC, 21 days: 1 mg/l, LOEC, 21 days: 3,2 mg/l, WAF (OECD 211) Sediment organisms NOEC, 10 days: 373 mg/kg, LOEC, 10 days: 1165 mg/kg, LC_{50}, 10 days: 1200 mg/kg, (OSPAR Protocols, Part A: Sediment Bioassay, 2005)

12.2. Persistence and degradability

Persistence and degradability	The product contains volatile substances which may spread in the atmosphere. Can be photodegraded in the atmosphere.
Stability (hydrolysis)	No significant reaction in water.

Ecological information on ingredients.

Fuels, diesel

Biodegradation	Inherently biodegradable. (OECD 301F)

Distillates (petroleum), hydrotreated light

Biodegradation	Inherently biodegradable. (OECD 301F)

Renewable hydrocarbons (diesel type fraction)

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Biodegradation	Rapidly degradable (OECD 301B)

12.3. Bioaccumulative potential

Bioaccumulative potential	Possibly bioaccumulative.
Partition coefficient	log Kow: > 3

12.4. Mobility in soil

Mobility	Evaporates slowly. The product has poor water-solubility. Product can penetrate soil until reaching the surface of ground water. The product contains substances which are bound to particulate matter and are retained in soil.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects	Product causes fouling, and direct contact produces harmful effects e.g. to birds and vegetation. Adsorbed hydrocarbon residues can be harmful to sediment organisms.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal methods	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out.

SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID)	1202

14.2. UN proper shipping name

Proper shipping name (ADR/RID)	UN 1202 DIESEL FUEL

14.3. Transport hazard class(es)

ADR/RID class	3

14.4. Packing group

ADR/RID packing group	III

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
MARINE POLLUTANT

14.6. Special precautions for user

Tunnel restriction code	(D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Diesel fuel, sulphur free; Neste Pro Diesel; Neste Futura Diesel

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	When containing more than 1% but less than 75% of petroleum oil, the bio-fuel blend is subject to Annex II of MARPOL. (MEPC.1/Circ.761) - - - - When a flashpoint is > 60 °C, product name: Bio-fuel blends Diesel/ gas oil and Alkanes (C10-C26), linear and branched with a flash point > 60 °C (> 25% but < 99% by volume). Pollution category: Cat X Ship type: 2 - - - - When a flashpoint is ≤ 60 °C, product name: Bio-fuel blends Diesel/ gas oil and Alkanes (C10-C26), linear and branched with a flash point ≤ 60 °C (> 25% but < 99% by volume). Pollution category: Cat X Ship type: 2

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU legislation	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended). Commission Regulation (EU) No 453/2010 of 20 May 2010. Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet	DNEL = Derived No-Effect Level PNEC = Predicted No-Effect Concentration WAF = Water Accommodated Fraction
Key literature references and sources for data	Regulations, databases, literature, own research. CONCAWE Report 10/14: Hazard classification and labelling of petroleum substances in the EEA - 2014. Chemical Safety Report Vacuum Gas Oils, Hydrocracked Gas Oils and Distillate Fuels, 2016. Chemical Safety Report Renewable hydrocarbons (diesel type fraction), 2013. Chemical Safety Report Kerosines, 2016.
Training advice	DO NOT SIPHON PRODUCT BY MOUTH SUCTION.
Revision comments	Updated, sections: 1.1.
Revision date	12/05/2016
Supersedes date	24/03/2016
SDS number	5634
Hazard statements in full	H226 Flammable liquid and vapour. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. H332 Harmful if inhaled. H336 May cause drowsiness or dizziness. H351 Suspected of causing cancer. H373 May cause damage to organs through prolonged or repeated exposure. H411 Toxic to aquatic life with long lasting effects.

Exposure scenario
Distribution of Substance - Industrial

Identification

Product name Vacuum Gas Oils, Hydrocracked Gas Oils, and Distillate Fuels

Supplier Neste Oyj
Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND
Tel. +358 10 45811
SDS@neste.com (chemical safety)

1. Title of exposure scenario

Main title Distribution of Substance - Industrial

Process scope Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

Environment

Environmental release category
ERC4 Industrial use of processing aids in processes and products, not becoming part of articles.
ERC5 Industrial use resulting in inclusion into or onto a matrix.
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates).
ERC6b Industrial use of reactive processing aids.
ERC6c Industrial use of monomers for manufacture of thermoplastics.
ERC6d Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers.
ERC7 Industrial use of substances in closed systems.

SPERC ESVOC SpERC 1.1b.v1

Worker

Process category
PROC1 Use in closed process, no likelihood of exposure.
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC3 Use in closed batch process (synthesis or formulation).
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Distribution of Substance - Industrial

Amounts used

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 3.4E7 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 6.7E4 tonnes
Maximum daily site tonnage: 220 tonne/day

Frequency and duration of use

Continuous release.
Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (initial release prior to RMM): 0.001

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 1.0E-6

Emission factor - soil Release fraction to soil from process (initial release prior to RMM): 0.0001

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice Common practices vary across sites, thus conservative process release estimates used.

Risk from environmental exposure is driven by freshwater sediment.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 94.5%
Removal efficiency (total): 94.5%%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 1000 tonne/day
Assumed domestic sewage treatment plant flow (m³/day):
2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air Treat air emission to provide a typical removal efficiency of 90%.

Water Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 75,3. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Soil Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery method External recovery and recycling of waste should comply with applicable local and/or national regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid With potential for aerosol generation

Distribution of Substance - Industrial

Vapour pressure Vapour pressure < 0.5 kPa at STP.

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Assumes a good basic standard of occupational hygiene is implemented.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures General measures applicable to all activities Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. . General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

Risk management measures

Distribution of Substance - Industrial

General exposures (closed systems)
Handle substance within a closed system.
.
General exposures (open systems)
Wear suitable gloves tested to EN374.
.
Process sampling
No other specific measures identified.
.
Laboratory activities
No other specific measures identified.
.
Bulk closed loading and unloading
Handle substance within a closed system.
Wear suitable gloves tested to EN374.
.
Bulk open loading and unloading
Wear suitable gloves tested to EN374.
.
Drum and small package filling
Wear suitable gloves tested to EN374.
.
Equipment cleaning and maintenance
Drain down and flush system prior to equipment break-in or maintenance.
Wear chemically-resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
.
Storage
Handle substance within a closed system.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

3. Exposure estimation (Health 1)

Assessment method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Qualitative approach used to conclude safe use.

4. Guidance to check compliance with the exposure scenario (Health 1)

Distribution of Substance - Industrial

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario
Use as a fuel - Industrial

Identification

Product name Vacuum Gas Oils, Hydrocracked Gas Oils, and Distillate Fuels

Supplier Neste Oyj
Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND
Tel. +358 10 45811
SDS@neste.com (chemical safety)

1. Title of exposure scenario

Main title Use as a fuel - Industrial

Process scope Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Environment

Environmental release category ERC7 Industrial use of substances in closed systems.

SPERC ESVOC SpERC 7.12a.v1

Worker

Process category
PROC1 Use in closed process, no likelihood of exposure.
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC3 Use in closed batch process (synthesis or formulation).
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
PROC16 Using material as fuel sources, limited exposure to unburned product to be expected.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 4.3E6 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 1.5E6 tonnes
Maximum daily site tonnage: 5,000 tonne/day

Frequency and duration of use

Continuous release.
Emission days: 300 days/year

Use as a fuel - Industrial

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (initial release prior to RMM): 0.005

Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 1.0E-5

Emission factor - soil Release fraction to soil from process (initial release prior to RMM): 0

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice Common practices vary across sites, thus conservative process release estimates used.

Risk from environmental exposure is driven by freshwater sediment.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 94.5%
Removal efficiency (total): 94,5%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 34,000 tonne/day
Assumed domestic sewage treatment plant flow (m^3/day):
2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air Treat air emission to provide a typical removal efficiency of 95%.

Water Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 62,4. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Soil Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery method This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid With potential for aerosol generation

Vapour pressure Vapour pressure < 0.5 kPa at STP.

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Assumes a good basic standard of occupational hygiene is implemented.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Use as a fuel - Industrial

Organisational measures

General measures applicable to all activities Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. . General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

Risk management measures

Bulk transfers
Wear suitable gloves tested to EN374.
.
Drum/batch transfers
Wear suitable gloves tested to EN374.
.
Use as a fuel
(closed systems)
No other specific measures identified.
.
Equipment cleaning and maintenance
Drain down and flush system prior to equipment break-in or maintenance.
Wear chemically-resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
.
Storage
Handle substance within a closed system.

3. Exposure estimation (Environment 1)

Assessment method

Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Qualitative approach used to conclude safe use.

Use as a fuel - Industrial

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario
Use as a fuel - Professional

Identification

Product name Vacuum Gas Oils, Hydrocracked Gas Oils, and Distillate Fuels

Supplier

Neste Oyj
Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND
Tel. +358 10 45811
SDS@neste.com (chemical safety)

1. Title of exposure scenario

Main title Use as a fuel - Professional

Process scope Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Environment

Environmental release category
ERC9a Wide dispersive indoor use of substances in closed systems.
ERC9b Wide dispersive outdoor use of substances in closed systems.

SPERC ESVOC SpERC 9.12b.v1

Worker

Process category
PROC1 Use in closed process, no likelihood of exposure.
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC3 Use in closed batch process (synthesis or formulation).
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
PROC16 Using material as fuel sources, limited exposure to unburned product to be expected.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 7.2E6 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 3600 tonnes
Maximum daily site tonnage: 9.9 tonne/day

Frequency and duration of use

Continuous release.
Emission days: 365 days/year

Use as a fuel - Professional

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from wide dispersive use (regional only): 0.0001
Emission factor - water	Release fraction to wastewater from wide dispersive use: 0.00001
Emission factor - soil	Release fraction to soil from wide dispersive use (regional only): 0.00001

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Risk management measures

Good practice	Common practices vary across sites, thus conservative process release estimates used. Risk from environmental exposure is driven by freshwater sediment.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 94.5% Removal efficiency (total): 94.5% Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 59 tonne/day Assumed domestic sewage treatment plant flow (m^3/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air	Not determined.
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 67.2 %. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Soil	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery method	This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid With potential for aerosol generation
Vapour pressure	Vapour pressure < 0.5 kPa at STP.
Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Assumes a good basic standard of occupational hygiene is implemented.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Use as a fuel - Professional

Organisational measures

General measures applicable to all activities Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. . General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

Risk management measures

Bulk transfers
Wear suitable gloves tested to EN374.
.
Drum/batch transfers
Use drum pumps or carefully pour from container.
Wear suitable gloves tested to EN374.
.
Refuelling
Wear suitable gloves tested to EN374.
.
Use as a fuel
(closed systems)
Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
, or:
Ensure operation is undertaken outdoors.
.
Equipment cleaning and maintenance
Drain down and flush system prior to equipment break-in or maintenance.
Wear chemically-resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
.
Storage
Handle substance within a closed system.

3. Exposure estimation (Environment 1)

Assessment method

Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

Use as a fuel - Professional

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Qualitative approach used to conclude safe use.

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario
Use as a fuel - Consumer

Identification

Product name	Vacuum Gas Oils, Hydrocracked Gas Oils, and Distillate Fuels
Supplier	Neste Oyj Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND Tel. +358 10 45811 SDS@neste.com (chemical safety)

1. Title of exposure scenario

Main title	Use as a fuel - Consumer
Process scope	Covers consumer uses in liquid fuels.
Product category	PC13 Fuels.

Environment

Environmental release category	ERC9a Wide dispersive indoor use of substances in closed systems. ERC9b Wide dispersive outdoor use of substances in closed systems.
SPERC	ESVOC SpERC 9.12c.v1

Non-industrial

Product sub-category	PC13_1 Liquid: automotive refuelling PC13_3 Liquid: garden equipment - use PC13_4 Liquid: garden equipment - refuelling

2. Conditions of use affecting exposure (Non-industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 1.9E7 tonnes/year
Fraction of Regional tonnage used locally: 0.0005
Annual site tonnage: 9700 tonnes
Maximum daily site tonnage: 27 tonne/day

Frequency and duration of use

Continuous release.
Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from wide dispersive use (regional only): 1.0E-4
Emission factor - water	Release fraction to wastewater from wide dispersive use: 1.0E-5

Use as a fuel - Consumer

Emission factor - soil Release fraction to soil from wide dispersive use (regional only): 1.0E-5

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

STP details Estimated substance removal from wastewater via domestic sewage treatment: 94.5%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 110 tonne/day
Assumed domestic sewage treatment plant flow (m³/day):
2000.

Conditions and measures related to external treatment of waste for disposal

Waste treatment Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery method This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Non-industrial - Health 1)

Control of Non-industrial exposure

PC13_1 Liquid: automotive refuelling

Product characteristics

Physical state Liquid

Vapour pressure Liquid, vapour pressure > 10 Pa (STP)

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

For each use event, covers use amounts up to 37.5 kg.

Frequency and duration of use

Covers use up to 52 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.05 hours per event.

Human factors not influenced by risk management

Potentially exposed body parts Covers skin contact area up to 210.00 cm².

Other given operational conditions affecting Non-industrial exposure

Room size Covers outdoor use. Covers use in room size of 100 m³.

Other given operational conditions affecting Non-industrial exposure

No specific risk management measure identified beyond those operational conditions stated.

2. Conditions of use affecting exposure (Non-industrial - Health 2)

Control of Non-industrial exposure

PC13_3 Liquid: garden equipment - use

Use as a fuel - Consumer

Product characteristics

Physical state Liquid

Vapour pressure Vapour pressure > 10 kPa at STP.

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

For each use event, covers use amounts up to 750 g.

Frequency and duration of use

Covers use up to 26 day(s)/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 2 hours per event.

Other given operational conditions affecting Non-industrial exposure

Room size Covers outdoor use. Covers use in room size of 100 m³.

Other given operational conditions affecting Non-industrial exposure

No specific risk management measure identified beyond those operational conditions stated.

2. Conditions of use affecting exposure (Non-industrial - Health 3)

Control of Non-industrial exposure

PC13_4 Liquid: garden equipment - refuelling

Product characteristics

Physical state Liquid

Vapour pressure Vapour pressure > 10 kPa at STP.

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

For each use event, covers use amounts up to 750 g.

Frequency and duration of use

Covers use up to 26 day(s)/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.03 hours per event.

Human factors not influenced by risk management

Potentially exposed body parts Covers skin contact area up to 420 cm².

Other given operational conditions affecting Non-industrial exposure

Room size Covers use in room size of 34 m³. Covers use in a one car garage (34 m³) under typical ventilation.

Other given operational conditions affecting Non-industrial exposure

No specific risk management measure identified beyond those operational conditions stated.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model. (Hydrocarbon Block Method)

Use as a fuel - Consumer

4. Guidance to check compliance with the exposure scenario (Environment 1)

Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate consumer exposures, unless otherwise indicated.

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario
Use as Intermediate - Industrial

Identification

Product name Vacuum Gas Oils, Hydrocracked Gas Oils, and Distillate Fuels

Supplier Neste Oyj
Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND
Tel. +358 10 45811
SDS@neste.com (chemical safety)

1. Title of exposure scenario

Main title Use as Intermediate - Industrial

Process scope Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Environment

Environmental release category ERC6a Industrial use resulting in manufacture of another substance (use of intermediates).

SPERC ESVOC SpERC 6.1a.v1

Worker

Process category
PROC1 Use in closed process, no likelihood of exposure.
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC3 Use in closed batch process (synthesis or formulation).
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises.
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 1.7E6 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 1.5E4 tonnes
Maximum daily site tonnage: 50 tonne/day

Frequency and duration of use

Use as Intermediate - Industrial

Continuous release.
Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (initial release prior to RMM): 0.001
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 3.0E-5
Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 0.001

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100

Risk management measures

Good practice	Common practices vary across sites, thus conservative process release estimates used. Risk from environmental exposure is driven by freshwater sediment.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 94.5% Removal efficiency (total): 94.5% Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 64 tonne/day Assumed domestic sewage treatment plant flow (m^3/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air	Treat air emission to provide a typical removal efficiency of 80%.
Water	Prevent leaks and prevent soil/water pollution caused by leaks. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): ≥ 93,0 If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Soil	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	This substance is consumed during use and no waste of the substance is generated.

Conditions and measures related to external recovery of waste

Recovery method	This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid With potential for aerosol generation
Vapour pressure	Vapour pressure < 0.5 kPa at STP.
Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Assumes a good basic standard of occupational hygiene is implemented.
Temperature	Operation is carried out at elevated temperature (> 20°C above ambient temperature).

Use as Intermediate - Industrial

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures

General measures applicable to all activities Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. . General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

Risk management measures

General exposures (closed systems)
Handle substance within a closed system.
.
General exposures (open systems)
Wear suitable gloves tested to EN374.
.
Process sampling
No other specific measures identified.
.
Bulk closed loading and unloading
Handle substance within a closed system.
Wear suitable gloves tested to EN374.
.
Bulk open loading and unloading
Wear suitable gloves tested to EN374.
.
Equipment cleaning and maintenance
Drain down and flush system prior to equipment break-in or maintenance.
Wear chemically-resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
.
Laboratory activities
No other specific measures identified.
.
Bulk product storage
Handle substance within a closed system.

3. Exposure estimation (Environment 1)

Assessment method

Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

Use as Intermediate - Industrial

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Qualitative approach used to conclude safe use.

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Appendix C – Air Quality Assessment

Appendix D – Qualitative Environmental Impact Assessment

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Escape of VOCs / odour	Local residents / businesses beyond the installation boundary	Vapours carried on wind	Use of enclosed reception area for fuel; contained tanks and pipework systems; adequate dispersion of emissions from storage containers; and inspection and maintenance at regular intervals.	Fugitive vapours could reach sensitive receptors but appropriate design and management actions should prevent this from happening.	Complaints of odours / smells in vicinity of local receptors	Low if design and management techniques are applied.
Escape of biodiesel	Local surface water and/or groundwater	Flow by gravity / drainage systems / unsurfaced areas	Use of: storage arrangements appropriate to materials being stored; impermeable surfacing across site; bunded storage; high and low level tank alarm systems; drainage systems for offloading areas linked to interceptors and isolation points; and inspection and maintenance at regular intervals.	Fugitive releases could reach surface water and/or groundwater but appropriate design and management actions should prevent this from happening. The storage area is bunded to provide sufficient containment in the event of a tank failure. Any fuel spilled during filling the generators will be contained within the associated bunds. The containers will provide containment for any biodiesel spilled inside the containers, with tertiary containment available through the site's system of interceptors.	Localised pollution of surface water and groundwater.	Low if design and management techniques are applied.
Visible plume from regular small impact from operation of generators	Closest sensitive receptors >0.5km to the south-east of the site.	Dispersion by wind	The receptor is located along the southern boundary of the sewage treatment works. As such the taller structures on site, and limited operational period are expected to limit the impact from visible plumes from the generator. The site is located within a heavily industrial area, which includes power stations.	Low given location relative to sensitive receptors. Appropriate design and management actions should reduce occurrence.	Nuisance – reduced visibility.	Low given location and if design techniques and management are applied.
Fire	Local residents / businesses beyond the installation boundary Air, land and water. Site staff and Infrastructure.	Emissions of smoke and fire suppression materials including firewater, foam, etc.	Fire control systems applied as for the existing installation. Ability to contain firefighting agents and spillages within the site drainage system, which is designed to be capable of containing firewater from the installation as a whole.	Appropriate design and management actions should allow the early detection of / minimise the risk of fire spreading.	Complaints of smoke / smells in vicinity of local receptors. Localised pollution of surface water and groundwater.	Low if design and management techniques are applied.

Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	Overall Risk
Flooding	Local surface water and/or groundwater	Flow by gravity / drainage systems / unsurfaced areas	Plant (generators) are protected within containers and are bolted to their concrete bases. Fuel storage tanks located within bunds, providing protection from external flooding.	Medium. The NRW Flood Map shows the entirety of the site to be within Flood Zone 2, which has a 'medium' probability of flooding. However, appropriate design and management actions should prevent significant impact from flooding.	Potential pollution of surface water and groundwater from escape of biodiesel.	Low if design and management techniques are applied.
Vandalism to plant, equipment and infrastructure	Local residents / businesses beyond the installation boundary Air, land and water. Site staff and Infrastructure.	Emissions resulting from failure / reduced performance of vandalised plant, equipment and infrastructure	Use of: 24 hour on-site staff presence; a 2.4 metre high anti-climb perimeter security fence; sliding security control gates at site entrance; relevant signage.	Appropriate design and management actions should prevent vandalism happening.	Complaints of odours / smells in vicinity of local receptors Localised pollution of surface water and groundwater. Potential for injury, damage to plant / equipment.	Low if design and management techniques are applied.