



**TOUCAN ENVIRONMENT LIMITED**

# **NON-TECHNICAL SUMMARY**

Environmental Permit Application for a Bespoke Installation at

Carrington Generation Plant  
Manchester Road  
M31 4RQ



## Prepared for

Carrington Generation Limited  
Registered Company: 11529006

## Prepared by

Rachael Chambers CEnv MEnvSc PIEMA MSc BSc  
Toucan Environment Limited  
Registered Company: 13522900

## Version Control

Version	Date	Comments
1	13 <sup>th</sup> September 2021	Draft issued for client review.
2	23 <sup>rd</sup> September 2021	Updated sections 1, 2.6, 2.9, 3.3.
Final	7 <sup>th</sup> October 2021	Minor amendments to sections 1, 2.2, 2.6, 2.9.



## Contents

1. Introduction .....	4
2. Regulated Facility .....	5
2.1. Site Location.....	5
2.2. Equipment.....	5
2.3. Key technical standards .....	5
2.4. Environmental Management System .....	6
2.5. Key Control Measures.....	6
2.6. Raw Materials .....	6
2.7. Waste .....	7
2.8. Energy Efficiency .....	7
2.9. Best Available Techniques (BAT) Assessment.....	7
3. Environmental Impact Assessment and Monitoring .....	9
3.1. Receptors .....	9
3.2. Emissions to Land.....	9
3.3. Emissions to Air.....	10
3.4. Emissions to Water .....	10
3.5. Noise Emissions.....	11
3.6. Amenity and Accident Risk.....	11
4. Conclusion.....	12
Appendix H List of Directors .....	13
Appendix I Environmental Risk Assessment .....	14
I.1. Environmental Risk Assessment .....	14
I.2. Amenity and Accident Risk Assessment .....	16
Appendix J List of Combustion Plant.....	18



## 1. Introduction

This non-technical summary has been prepared by Toucan Environment Limited on behalf of Carrington Generation Limited (the Operator) in support of an environmental permit application for a bespoke installation at Carrington Generation Plant, Manchester Road, M31 4RQ (the Installation).

The purpose of this document is to explain the installation, a gas fired electricity generation facility peaking plant with an aggregated net thermal input of 90MWth and output of 40.5MWe.

Other documents submitted with this application are:

- Application Forms: Part A, Part B2, Part B3 and Part F1
- Appendix A Site Plan
- Appendix B BAT Assessment
- Appendix C1 Nature and Heritage Conservation Screening Report
- Appendix C2 MAGIC Map
- Appendix D Site Condition Report
- Appendix E1 Air Quality Assessment Part 1
- Appendix E2 Air Quality Assessment Part 2
- Appendix E3 AERMOD Files
- Appendix F Flood Risk Assessment and Drainage Strategy
- Appendix G Noise Impact Assessment
- Appendix H List of Directors
- Appendix I Environmental Risk Assessment
- Appendix J List of Combustion Plant



## 2. Regulated Facility

This section summaries the equipment and operations of the proposed Installation.

### 2.1. Site Location

The Installation is located at SJ 72369 92537 on brownfield land to the west of the Manchester Road, Carrington, M31 4RQ, within the former Peaksnook landfill site, previously operated by Viridor Waste Management.

The site is surrounded by commercial and industrial uses and the Manchester Ship Canal lies to the west of the boundary. The surrounding industrial estate houses some other regulated facilities nearby, including an electricity generation facility operated by UK Power Reserve Ltd (Permit reference JP3334QQ), the SAICA Paper Mill (ZP3736XH) and Carrington Power Station (RP3438GG).

### 2.2. Equipment

The Installation comprises 9 x Jenbacher JMS 624 GS-N.L engines and ancillary equipment. The engines will be powered by natural gas, each with 10MWth input and 4.5MWe output. Each engine will be housed inside a pre-fabricated concrete cell with a 14.0m high (from ground level) stack for exhaust emissions, forming 9 new emission points to air identified as A1-A9 in Appendix A Site Plan. The engines will use lean burn combustion principles to operate as a peaking plant for less than 1,500 hours per year as a rolling average over 5 years.

The purpose of the Installation is to provide security of electricity supply by operating at times when there is a peak demand for electricity. The site is connected to the National Grid via the local distribution network and will operate when called upon to fill the gap in capacity for supply and demand of electricity. The Installation will be operated remotely and remain relatively unmanned.

The Environmental Permitting (England and Wales) Regulations 2016 state that “Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts” is a Part A(1) activity that requires an Environmental Permit. The aggregated total rated thermal input of the 9 engines is 90MWth. This application is therefore being made to the Environment Agency (EA) for an Environmental Permit to cover that activity and directly associated activities.

The individual engines have a thermal input of 10MWth. As this is larger than 1MWth and less than 50MWth, the engines must comply with the Medium Combustion Plant Directive (MCPD). NOx emissions from the engines will be below the emission limit value of 95mg/Nm<sup>3</sup> and will be monitored in line with MCPD guidance. As the individual engine units are under 15MWth, they are exempt from Chapter III (Large Combustion Plant) of the Industrial Emissions Directive (IED).

### 2.3. Key technical standards

The following key technical standards have been used to design and operate the plant:

- Department for Environment Food & Rural Affairs (DEFRA) (February 2013): Industrial Emissions Directive EPR Guidance on Part A Installations
- EA (March 2021) Risk Assessments for your environmental permit
- EA (May 2021) Control and monitor emissions for your environmental permit
- EA (August 2021) Develop a management system: environmental permits
- European Commission JRC Science for Policy Report (2017): Best Available Techniques (BAT) Reference Document for Large Combustion Plant
- EA (August 2018) BAT guidance for >50MWth gas and liquid fuel combustion plant exporting electricity under commercial arrangements for <1500 hrs per annum (Working Draft)



- EA (August 2019) Medium Combustion Plant (MCP): Comply with emission limit values
- EA (August 2017) Technical Guidance Note (Monitoring) M1: Sampling requirements for stack emission monitoring.

#### 2.4. Environmental Management System

The Operator will develop an Environmental Management System (EMS) to the requirements of the ISO14001 standard that will be submitted to the EA prior to commencement of operations.

The EMS will:

- identify systems and procedures for all processes involved with operations of the Installation to minimise risk of environmental pollution and harm to human health. This will include start up, shut down, normal operation, maintenance, accidents, incidents and non-conformances.
- be kept on site and be available for inspection at all times.
- apply to all staff, visitors and contractors to the Installation.
- ensure compliance with the Environmental Permit and other legislative requirements.
- contain clear instructions for emergency situations including responsibilities, actions and communication channels.
- have systems and procedures audited externally with contingency plans prepared for unexpected complications.
- be audited internally annually at a minimum or in the event of a change in operations or processes on site.

The internal audit will ensure operations and processes comply with the management system and other legislative requirements. Any preventative and or corrective actions required to further minimise the risk of breach or non-compliance will be identified, recorded and communicated to all relevant persons.

#### 2.5. Key Control Measures

There are a number of key control measures used to operate the plant to ensure compliance, as listed below.

- Operated in accordance with an EMS designed in line with ISO14001 standards.
- Engines are remotely controlled allowing:
  - Performance to be constantly monitored.
  - air-fuel ratio can be controlled.
  - load to be actively and reactively controlled.
  - power to be metered.
  - engine speed managed.
  - voltage controlled.
- Implementation of a preventative maintenance schedule.
- Secondary containment will be installed on storage tanks for any potentially polluting substances.
- Waste will be managed in accordance with the waste hierarchy and only sent to appropriately licensed facilities.
- Emissions to air will be monitored periodically to ensure compliance with limits are achieved.
- Gas engines will be housed within sound mitigating containers.

#### 2.6. Raw Materials

Natural Gas will be the primary raw material used as fuel for the Installation, delivered to the engines from the local distribution network via a gas kiosk on site. There will be no storage of natural gas on site. It is anticipated that around 110,000kWh of natural gas will be required for one hour of operation.



This can be extrapolated to a maximum of 247.5GWh of natural gas used annually based on 2,250 operating hours.

Lubricating oil will be used in the engines and stored in an 8,000l double skinned tank sited within a concrete bund which will hold 110% of the capacity of the tank, constructed in accordance with CIRIA 736 guidance. Transfer of the oil from the tanks for use in the Installation will be carried out by trained operatives over hardstanding to minimise any potential environmental risk from spills in accordance with the procedure detailed in the Environmental Management System (EMS). Spill kits will be on site to provide a rapid response to any spillage via a procedure detailed in the EMS.

There will be no hazardous materials stored on site.

## 2.7. Waste

The Operator will aim to minimise waste as much as possible. The nature and quantity of all waste generated by the Installation will be recorded as per procedures detailed within the EMS.

Used lubricating oil will be the predominate waste stream generated on site and will be stored in a double skinned tank sited within a concrete bund, constructed in compliance with CIRIA 736 guidance.

There will also be a minimal amount of general waste produced by the operations and maintenance of the Installation. All waste will be managed in accordance with the waste hierarchy and only sent to appropriately licensed facilities.

## 2.8. Energy Efficiency

The electrical efficiency of the Installation will be measured using the gas meter to monitor gas input and the electrical meter to monitor electrical output.

The equipment has been chosen to represent the best available technology for the proposed operations of the Installation. Although the plant is not subject to Chapter III of the IED due to being less than 15MWth individually, the BREF for LCP is deemed appropriate guidance. The BREF for LCP states the BAT-Associated Energy Efficiency Levels (BAT-AEEL) for the combustion of natural gas for new engines is 39.5-44%. The electrical efficiency of the Jenbacher engines is 45.3%, which exceeds the BAT-AEEL.

General measures for improving energy efficiency can be summarised as:

- best practices for optimising efficiency will be utilised within the design.
- dry air cooling will be used instead of wet cooled condensers, minimising visual impact (minimal potential for visible plumes) whilst maximising efficiency.
- parasitic load will be reduced by using high efficiency motors and drives.
- components are the ideal size for the proposed operation to ensure they are optimally utilised.
- hot surfaces will be insulated.
- regular maintenance will ensure plant is operating correctly and therefore as efficient as possible.

## 2.9. Best Available Techniques (BAT) Assessment

A BAT Assessment has been completed and is presented in Appendix B BAT Assessment.

The report summarises the techniques utilised at the Installation against each of the applicable published BAT standards from the LCP BREF and the EA's working draft "BAT guidance for >50 MWth gas and liquid fuel combustion plant exporting electricity under commercial arrangements for <1500 hrs per annum".



The report finds the Installation to be compliant with all applicable LCP BREF BAT Conclusions and reasoning has been given for why this report considers any of the BAT Conclusions to be non-applicable.

Furthermore, the Installation exceeds the BAT requirements as detailed by the EA's working draft BAT guidance document. Through the use of primary abatement measures (advanced lean burn technology), the generators will meet the relevant ELV for NO<sub>x</sub> emissions set by the MCPD at 95mg/Nm<sup>3</sup> (15% O<sub>2</sub>). The nameplate efficiency of the Jenbacher engines is 45.3% which exceeds the efficiency threshold for new plant of 35.6%.

It is not considered that SCR would be an appropriate technology to utilise at the Installation due to the intended operational profile to provide balancing services for fewer than 1,500 hours per year on average.





### 3. Environmental Impact Assessment and Monitoring

This section summarises specialist reports commissioned to assess the environmental impact of the Installation and identifies ongoing monitoring requirements.

#### 3.1. Receptors

The site is situated within Natural England's National Character Area number 60: Mersey Valley which states:

*“Urban and industrial developments line the banks of the River Mersey. Industrial infrastructure is often prominent, with large-scale, highly visible development including chemical works and oil refineries. The Manchester Ship Canal links the estuary to the heart of Manchester, perpetuating the industrial development of the area. There is a dense communication network of major roads, railways, canals and transmission lines. The urban and suburban areas provide housing for those working in neighbouring conurbations, as well as in the industries of the Mersey Valley.”*

A Nature and Heritage Conservation Screening Report was requested at pre-application to identify any protected areas within screening distances for a habitats assessment and is presented in Appendix C1. The report identified:

Within 10km, there are 2 Special Area of Conservation (cSAC or SAC) and 1 Ramsar site:

- Rixton Clay Pits (SAC)
- Manchester Mosses (SAC)
- Rostherne Mere (Ramsar)

Within 2km, there are 6 Local Wildlife Sites (LWS):

- Broadoak Wood
- Carrington Power Station
- Flixton Sludge Beds
- Jack Lane
- Old River Irwell
- Partington Nature Reserve

Within 500m, there is 1 protected species record:

- European Eel migratory route

The MAGIC maps application<sup>1</sup> was used to identify any other protected areas, the results are presented in Appendix C2.

Within 5km, there are 4 Sites of Special Scientific Interest (SSSI):

- Holcroft Moss SSSI
- Risley Moss SSSI
- Rixton Clay Pits SSSI
- Brookeys Covert SSSI

A habitats assessment will therefore be required.

#### 3.2. Emissions to Land

There are no emissions to land from any of the regulated activities or DAAs.

---

<sup>1</sup> Published by DEFRA (Accessed via <https://magic.defra.gov.uk/>)



The current status of the land is outlined within the Appendix D Site Condition Report. In order to minimise any future contamination risk, all operational areas on site will be covered in hardstanding.

### 3.3. Emissions to Air

There will be 9 new release points of emissions to air, produced by combustion of natural gas, via the 14m stacks on top of each engine container. The largest emissions in volume are water vapour (H<sub>2</sub>O) and carbon dioxide (CO<sub>2</sub>), with smaller amounts of other compounds, carbon monoxide (CO), nitrogen oxide (NO) and nitrogen dioxide (NO<sub>2</sub>), expressed together as NO<sub>x</sub>.

An air quality assessment was carried out by Isopleth (Appendix E Air Quality Assessment) using the AERMOD 9 dispersion model (ref model files). As a worst-case, emissions from each of the stacks have been assumed to occur for 3000 hours per year when comparing against long term air quality limits and the entire year when comparing against short term limits. Actual operational hours are likely to be significantly lower.

All impacts, human and ecological, are predicted to be below limit values at locations where the Air Quality Directive states that they must be applied. When applying the theoretical worst case assumptions above (i.e. that each of the engines is operating for 3000 hours per year) it can be seen that there is no realistic potential for a breach of the air quality objectives at any location.

In summary, it can be concluded that the predicted short term and long term PECs at the sensitive human and ecological receptors are within acceptable limits. The site is therefore unlikely to be a significant contributor to or cause an exceedance of an EAL (or upper critical load / level).

Emissions to air will be monitored in line with the requirements for “New MCP” less than or equal to 20MWth. The sampling locations for monitoring will be accessed from the roof access via a port enabling measurements to be taken directly from the stack in line with M1 guidance. Monitoring to confirm initial compliance will be undertaken within 4 months of the permit being issued or the start date of operation, whichever is the latest. During the lifetime of the permit, periodic monitoring will be undertaken at least every 3 years. Monitoring will be undertaken by a UKAS accredited testing body in accordance with MCERTS.

### 3.4. Emissions to Water

There are no emissions to water from the regulated activity or DAAs. Uncontaminated surface water run-off from the site will be managed by the Operator. A flood risk and drainage strategy review has been carried out by Integra (Appendix F Flood Risk and Drainage Strategy).

Following review of the EA flood maps and data, the Installation lies almost wholly within Flood Zone 1. There are to be no off site site surface water flood risks generated by the development during an enhances 1 in 100 year storm. All surface water run-off will remain on site in the 1 in 100 year +35% climate change event.

Surface water runoff will be collected and discharged to the canal via an on-site surface water attenuation system, designed to provide detention of flows during low intensity rainfall events and enough storage (c.325 m<sup>3</sup>) during extreme rainfall events to prevent uncontrolled flooding of the site. The system will assist with the removal of sedimentation from rainwater runoff, and the downstream outlet of the pond will include a sump / catchpit for removal of silt and debris. Based on a 450 mm/ 0.45 m gravel depth and 30% void ratio the total storage required for 325 m<sup>2</sup> of storm water storage is 1,150 m<sup>3</sup> (including gravel back fill). A review against the site layout indicates that the storage would encapsulate a footprint of 2,555 m<sup>2</sup> or approximately 50.5 m by 50.5 m.



### 3.5. Noise Emissions

Noise emissions are produced from the engines during operation, so a noise impact assessment has been completed by Philip Dunbavin Acoustics (Appendix G Noise Impact Assessment) in accordance with BS4142:2014.

The assessment indicates that the Installation will not result in an adverse impact at the nearest noise sensitive receivers in accordance with the recommendation described within BS4142:2014.

### 3.6. Amenity and Accident Risk

An amenity and accident risk assessment is presented in Appendix I and will be managed by the Operator's EMS.



## 4. Conclusion

This information summarised within this report finds that Carrington Generation Plant is not predicted to significantly impact local receptors or the environment.



## Appendix H List of Directors

<b>Title</b>	Mr	Mr	Mr
<b>First Name</b>	Alessandro	Alan	Jonathan
<b>Last Name</b>	Boninsegna	Baker	Poley

## Appendix I Environmental Risk Assessment

### I.1. Environmental Risk Assessment

Hazard	Receptor	Pathways	Control Measures	Probability	Consequence	Overall Risk
Noise emissions from operations	Local residents or businesses*	Air	Engines are housed within individual prefabricated concrete cells to mitigate noise emissions. A noise impact assessment is included within Appendix G and concludes the Installation will have no adverse impact on the closest sensitive receptors. In the event of a complaint, the Operator will undertake appropriate monitoring and further action as necessary.	Low	High - Complaints made to Operator or local authority	Low – due to control measures and probability
Odour emissions (of VOCs) from operations	Local residents or businesses*	Air	All raw materials stored on site will be in appropriate containers. None of the raw materials stored on site are considered to be particularly odorous.	Very low	High - Complaints made to Operator or local authority	Very Low – due to probability
Vibration from operations	Local residents of businesses*	Land	The Installation is not expected to create significant vibration levels. In the event of a complaint, the Operator will undertake appropriate monitoring and further action as necessary.	Very low	High - Complaints made to Operator or local authority	Very Low – due to probability
Dust	Local residents of businesses*	Air	The Installation is not expected to create significant amounts of dust. In the event of a complaint, the Operator will undertake appropriate monitoring and further action as necessary.	Very Low	High - Complaints made to Operator or local authority	Very Low – due to probability
Visible plumes from stacks	Local residents of businesses*	Visual	The Installation is fuelled from natural gas so emissions from the stack should have no visual plumes.	Very Low	Low - Complaints made to Operator or local authority	Very Low – due to probability
Spills and/or leaks of lubricating oil	Land	Direct contact	Lubricating oil will be stored within a double skinned tank sited within a concrete bund which will hold 110% of the capacity of the tank, constructed in accordance with CIRIA 736 guidance.	Low	High - Localised pollution of land	Low – due to probability



	Site drainage system, local watercourses (surface water and/or groundwater)	Surface water drainage systems	Transfer of the oil from the tanks for use in the Installation will be carried out by trained operatives over hardstanding to minimise any potential environmental risk from spills in accordance with the procedure detailed in the Environmental Management System (EMS). Spill kits will be on site to provide a rapid response to any spillage via a procedure detailed in the EMS.	Low	High - Localised pollution of local watercourses (surface water and/or groundwater)	Low – due to probability
Pests	Local residents of businesses*	Land/Air	Unlikely that the Installation will attract any pests as all plant is mechanical and waste will be managed appropriately.	Very Low	Very Low	Very Low
Litter	Local residents of businesses*	Air (via Wind)	The Operator will ensure all staff working at the Installation will be trained in where to put their waste so that it doesn't become airborne and leave the Installation boundary. All waste will be managed in accordance with the waste hierarchy and only sent to appropriately licensed facilities.	Very Low	Low	Very Low

\*Closest business receptors are industrial and local residents are over 800m away.



I.2. Amenity and Accident Risk Assessment

Hazard	Receptor	Pathways	Control Measures	Probability	Consequence	Overall Risk
Fire	Local residents and businesses* Site staff Plant infrastructure	Air – gases released from combustion	Fire detection kit will cover all areas of the Installation allowing for an early detection of fire to minimise the risk of it spreading. Portable extinguishers will be placed around the Installation. Staff will be trained in fire procedures.	Low	Medium – Complaints of smoke or visual impact from local receptors.	Low
	Local watercourses, groundwater	Surface water drainage system	There will be an appropriately designed firewater containment system in place within the surface water drainage system, with dedicated firewater storage tanks.	Low	Medium – localised pollution of watercourses with firewater.	Low
Vandalism	Site staff Plant infrastructure	Air/water/land (depending on type of vandalism)	The Installation will be bounded by a 3m high paladin fence with secured access gates to provide a physical barrier to intruders. CCTV will be in place to enable a 24/7 feed to the Operator for monitoring.	Low	Low to High depending on nature of vandalism	Low
Flood waters releasing contaminants from the site.	Plant infrastructure Local watercourses	Surface water drainage system	The site is within Flood zone 1 so has a low probability of flooding. A flood risk assessment has been prepared for the site and is presented within Appendix F. All equipment is appropriately banded to contain any raw materials from entering flood water in the event of a flood.	Low	Medium – localised pollution of land watercourses with contaminants.	Low
Operator Error	Site staff Plant infrastructure	Air/water/land (depending on)	The Installation will be automatically controlled via the control room off site which minimises error for personnel on site.	Low	Low	Low





type of Alarms and warning lights will be installed in the control room to alert staff to potential operational issues.  
All staff will be suitably qualified and trained for the role they are carrying out within the Installation boundary.

\*Closest business receptors are industrial and local residents are over 800m away.

---



## Appendix J List of Combustion Plant

Emission Point		A1	A2	A3	A4	A5	A6	A7	A8	A9
<b>MCP specific identifier*</b>		To be submitted prior to operation commencing.								
<b>12-digit grid reference or latitude/longitude</b>	OS Xm	372345.90	372350.90	372355.90	372360.90	372365.90	372375.90	372381.00	372385.90	372390.90
	OS Ym	392536.80	392536.60	392536.40	392536.20	392536.10	392535.80	392535.60	392535.50	392535.30
<b>Rated thermal input (MW) of the MCP</b>		9.918	9.918	9.918	9.918	9.918	9.918	9.918	9.918	9.918
<b>Type of MCP (diesel engine, gas turbine, other engine or other MCP)</b>		gas turbine	gas turbine	gas turbine	gas turbine	gas turbine	gas turbine	gas turbine	gas turbine	gas turbine
<b>Type of fuels used: gas oil (diesel), natural gas, gaseous fuels other than natural gas</b>		natural gas	natural gas	natural gas	natural gas	natural gas	natural gas	natural gas	natural gas	natural gas
<b>Date when the new MCP was first put into operation**</b>		Dec 2022	Dec 2022	Dec 2022	Dec 2022	Dec 2022	Dec 2022	Dec 2022	Dec 2022	Dec 2022
<b>Sector of activity of the MCP or the facility in which it is applied (NACE code)</b>		D.35.11	D.35.11	D.35.11	D.35.11	D.35.11	D.35.11	D.35.11	D.35.11	D.35.11
<b>Expected number of annual operating hours of the MCP and average load in use</b>		1500	1500	1500	1500	1500	1500	1500	1500	1500
<b>Where the option of exemption under Article 6(8) is used the operator (as identified on Form A) should sign a declaration here that the MCP will not be operated more than the number of hours referred to in this paragraph</b>		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\* identifier – the MCP must be traceable via a serial number or other unique identifier, name plate, manufacturer and or model.

\*\* expected date of operation – will be confirmed prior to operation commencing.