

Information sheet

Environmental Protection Act 1994

Pyrolysis

This information sheet outlines the regulatory requirements and assessment considerations for pyrolysis and how the activity fits into the legislative framework under the Environmental Protection Act 1994

Introduction

The Department of Environment, Science and Innovation (the department) has received a number of applications for pre-lodgement meetings where the prospective customer is seeking direction and advice in relation to pyrolysis. The purpose of this information sheet is to provide a clear and consistent position to prospective customers on the regulatory requirements and assessment considerations for pyrolysis and how the activity fits into the legislative framework under the *Environmental Protection Act 1994* (EP Act).

What is pyrolysis

Pyrolysis is the chemical and physical decomposition of organic material that occurs at high temperatures in the absence of oxygen. The conditions created during pyrolysis cause complex organic molecules to break down into simpler molecules, fundamentally changing the properties of the organic material at a molecular level. Pyrolysis generates three main products; gas, oil and char or ash. The properties and ratio of these products vary depending on the composition of the feedstock used in the pyrolysis reactor and the process conditions.

A wide range of organic materials can be broken down by pyrolysis and the products used. For example, pyrolysis of waste tyres yields high energy gas, hydrocarbon oil, char and steel. The gas may be used as a source of energy to heat the pyrolysis reactor and the oil can be used as a fuel independently, mixed with diesel, or refined. The steel can be recycled while the char can be processed and used as a carbon black substitute or to produce activated carbon.

Legislative framework

An activity involving pyrolysis will require ERA 61 – thermal waste reprocessing and treatment – if the activity is conducted within a stated threshold for the activity as listed in the Environmental Protection Regulation 2019 (EP Regulation). The thresholds are for different types and quantities of waste.

The department understands that waste tyres may be used as a source of organic material for the pyrolysis process. Under the current legislative framework, tyres are category 2 regulated waste. Pyrolysis of tyres will require ERA 61(2) for the thermal waste reprocessing and treatment of category 2 regulated waste.

It is important to note that this information is limited to the application of pyrolysis only. It does not include circumstances where the products of pyrolysis are processed further. For example, if the oil or char was refined to produce diesel or carbon black respectively. Processing of the products of pyrolysis may require additional ERAs such as ERA 7 – chemical manufacturing.



Emissions and application requirements

The main environmental risk associated with pyrolysis is emissions to air. Pyrolysis generates a gas, which can be used as a fuel to heat the reactor or captured and treated prior to release to the atmosphere. The release can be through a stack or a flare. The characteristics of the emissions depend on the composition of the feedstock used and the process conditions. Emissions to air may include hydrocarbon gas, volatile organic carbon, oxides of nitrogen and odour.

Activities such as pyrolysis have potential impacts on a range of environmental values. To help you identify environmental values on or near to your site, search 'environmental maps and data online' on the department's [website](#) and refer to the following environmental policies for air, noise and water:

- [Environmental Protection \(Air\) Policy 2019](#)
- [Environmental Protection \(Noise\) Policy 2019](#)
- [Environmental Protection \(Water and wetland biodiversity\) Policy 2019](#).

It is important to note that your environmental authority application must include an assessment of the impact your operation may have on environmental values. When preparing your supporting information and impact assessment, you should refer to the:

- Application requirements for activities with impacts to air (Publication number ESR/2015/1840)¹
- Application requirements for activities with impacts to land (Publication number ESR/2015/1839)¹
- Application requirements for activities with noise impacts (Publication number ESR/2015/1838)¹
- Application requirements for activities with impacts to water (Publication number ESR/2015/1837)¹
- Application requirements for activities with waste impacts (Publication number ESR/2015/1836)¹

Disclaimer

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¹ Available at www.qld.gov.au using the publication number as a search term.

Version history

Version	Date	Description of changes
1.00	16 October 2015	Document first published.
1.01	16 August 2016	Added publication number ESR/2015/1682 and effective date. Updated publication number for referenced documents.
1.02	15 June 2018	Document rebranded to align with machinery of government changes.
2.00	01 July 2019	Updated for the Environmental Protection (Waste ERA Framework) Amendment Regulation 2018.
2.01	08 October 2019	Updated for the commencement of Environmental Protection Regulation 2019
2.02	25 March 2022	Removal of Fax numbers
2.03	16 February 2024	Document rebranded to align with machinery of government changes.