
Project:	ARC21 Residual Waste Treatment Project		
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Subject:	WRATE update		

1 Context

This technical note serves as an Addendum to the WRATE Assessment previously undertaken in 2014 as part of the original Environmental Statement (ES). This assessment was prepared to calculate the environmental performance of the proposed waste management facility and enabled comparisons to be made with the existing practice of directing the majority of our waste to landfill.

This Addendum seeks to provide an updated assessment of the environmental performance of the proposed waste management facility based on the latest version 4 of the WRATE software.

The updated assessment has also considered the requirement to review and update any modelling assumptions where necessary. The only input that has changed from the original assessment is to reflect the scenario for Service Commencement in 2023 (previously this was anticipated for 2019/2020).

Whilst the Council structure has also changed since the original WRATE assessment was undertaken, the waste flow modelling figures and proposed collection and routing of waste remain applicable. Therefore all other modelling assumptions remain the same.

As before, the model calculates the impact to air, land and water, and assesses them against 6 default impacts:

- Global Warming Potential 100, measured in kg CO₂-Eq (kilograms of carbon dioxide equivalents);
- Acidification potential measured in kg SO₂ -Eq (kilograms of sulphur dioxide equivalents);
- Eutrophication potential measured in kg PO₄- Eq (kilograms of phosphate equivalents)
- Freshwater aquatic ecotoxicity measured in kg 1,4-dichlorobenzene-Eq; (kilograms dichlorobenzene equivalents)
- Human toxicity, kg 1,4 DCB-Eq, (kilograms dichlorobenzene equivalents) and
- Depletion of abiotic resources measured in kg antimony-Eq (kilograms of antimony equivalents).

WRATE also calculates two types of environmental burdens:

- Burdens that occur as a result of the operation of the waste management system (inputs and outputs that are represented by positive values), and
- Avoided burdens (offsets) that occur when materials and energy are recovered from the waste (i.e. recycled materials replacing virgin materials, recovered energy replacing mains electricity). These are represented by negative values.

In the following pages the baseline scenario for 2023 i.e. where all waste is directed to landfill is compared with the solution delivered by the residual waste management facility and the results are illustrated in a tabular and graphical manner.

2 Impact of the Proposed Solution

The impact of the proposed solution with respect to the WRATE default parameters is set out in Table 1 and Figure 1 below. The data has been presented as tonnages (the default setting in WRATE is kilograms). The result for each indicator is compared with the baseline scenario.

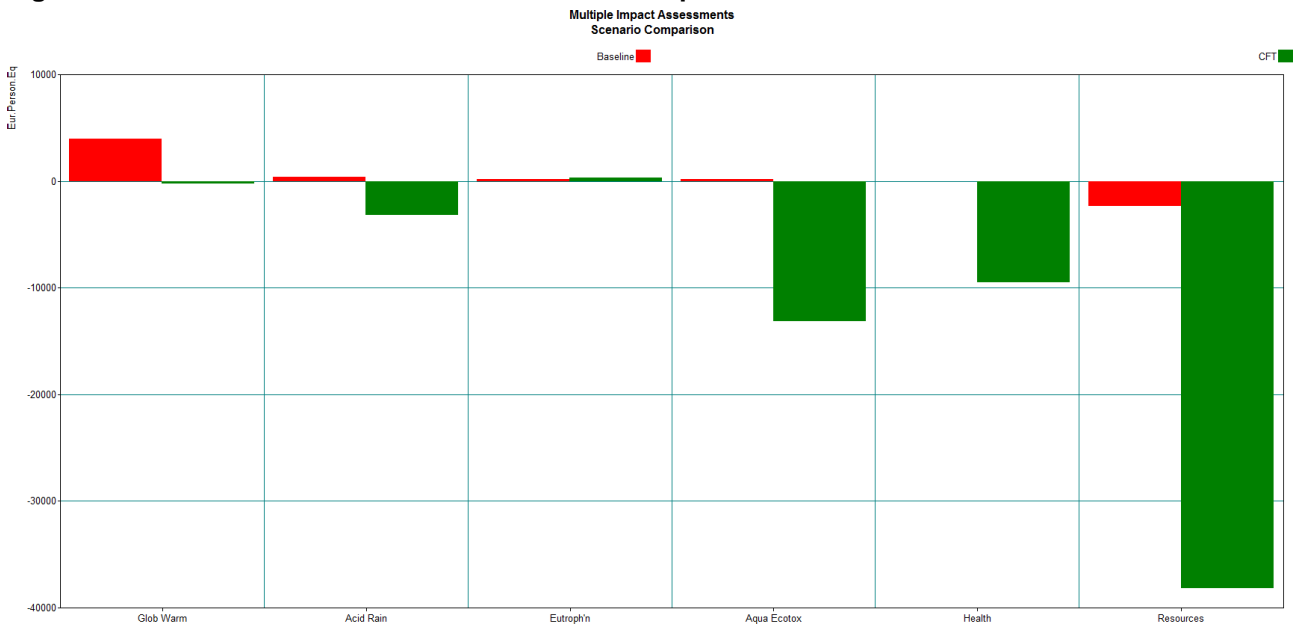
Table 1 shows a comparison of the default impacts of the proposed solution based upon the year 2023 which is the first of the years where the tonnage of materials treated is at a 'steady state' and is therefore representative of each of the contract years remaining to the end of the contract.

Table 1: Default Impacts of the Proposed Solution 2023 (tonnes)

Impact Assessments	Baseline	Project (2023)
climate change: GWP 100a tonne per annum	51,055	-2,978
acidification potential: average European	265	-230
eutrophication potential: generic	5.90	11.05
freshwater aquatic ecotoxicity: FAETP infinite	245	-17,369
human toxicity: HTP infinite	628	-187,793
resources: depletion of abiotic resources	-89	-1,474

Source: ARC21 CFT WRATE Model

Figure 1: The overall Results for All 6 Indicators Compared with the Baseline



The illustration provided by Table 1 and Figure 1 clearly indicate the solution offered by the residual waste treatment facility provides sustainable waste management with all the results generated having a negative number when compared to the Baseline Scenario with the exception of eutrophication as per the 2014 assessment.

The above results are compared for ease in Table 2 with those submitted with the ES in 2014 which were based on 2019/2020 as the starting point for the operations.

The proposed solution based on start of operations in 2023 offers considerable benefit to the environment especially in terms of climate change which is one the main indicators of importance to local authority in the United Kingdom. It is also noted there are improvement in parameters for Freshwater Aquatic Ecotoxicity and Human Toxicity.

Table 2: Default impacts of the proposed solution 2019/2020 vs 2023

Impact Assessments	Project (2019/2020)	Project (2023)
climate change: GWP 100a tonne per annum	-1,672	-2,978
acidification potential: average European	-279	-230
eutrophication potential: generic	8.18	11.05
freshwater aquatic ecotoxicity: FAETP infinite	-17,116	-17,369
human toxicity: HTP infinite	-187,074	-187,793

resources: depletion of abiotic resources	-1,617	-1,474
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Source: Volume 4 (Service), Part A (Overall Solution)

By undertaking the update WRATE modelling in Version 4 of the software the assessment confirms previous conclusions remain valid.

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