

Buckinghamshire Residual Waste Performance Report 2024/2025

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1.0 Introduction

Buckinghamshire Council Waste Management Project

Annual Service Report

Contract Year 9

1st April 2024 – 31st March 2025

Contract year 9 was much improved availability wise, though still challenging with respect to throughput as a result of the increases in calorific value of the waste feedstock. Whilst the plant did not meet the base case assumptions for waste burnt, it did still manage to exceed megawatts of electricity generated because the availability was above target.

Additionally, the sustained elevated price of electricity, coupled with a prudent hedging strategy, has resulted in over performance when compared to base case revenue generation.

There were 3 periods of forced-outage during this contract year; resulting in 7 days and 10 hours of lost availability (excluding the planned outage which was an additional 19 days). One period related to an inspection of the bottom ash conveyor (post rebuild during the Outage) losing 13hrs, one was related to significant fall of clinker onto the grate (6 days 11 hrs), and one due to the 2nd/3rd pass drag conveyor snapping as a result of casting defect (10hrs).

The losses seen in the previous contract year as a result of the unreliability of the Bottom Ash Extractor (BAE) did not re-occur as a result of a total rebuild to OEM (Original Equipment Manufacturer) standards using OEM parts & OEM support and by maintaining the vigorous operating regime developed during the previous issues.

As mentioned above, the only significant loss of availability during this contract year was as a result of an abnormally large build-up of slag/clinker within the first pass of the boiler which resulted in a large fall of material following a boiler pressure excursion (as a result of a gas bottle in the waste), which in turn damaged the grate where it landed. The resultant repair was relatively straightforward, but a significant amount of cleaning was required to strip the remaining slag and clinker off the boiler walls before workers could safely be allowed to enter the boiler.

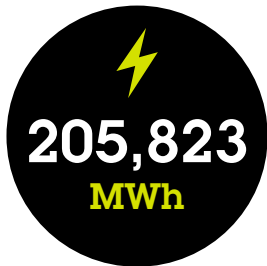
Map 1 – Location of FCC facilities



During the ninth contract year:



of residual waste were processed for energy recovery, with 116,232 tonnes of waste processed directly from BC.



of electrical power was exported to the National Grid system - over 30,000 MWh above the base case assumption.



were welcomed to the Visitor Centre as part of 48 separate tours.



The operation of High Heavens WTS saved an estimated 146,662 delivery miles to Greatmoor EfW.



3.4% below the base case model of 89.0%.



The average turnaround time at both sites was under 8 minutes (weighbridge to weighbridge).

2.0 Waste management

Total waste volumes handled

During this contract year, FCC Environment have processed 284,575 tonnes of residual waste across both facilities.

BC Contract Waste was delivered by all the Buckinghamshire Kerbside Teams and also from Household Recycling Centres (HRC). Bulky waste from the Kerbside collections, as well as HRCs, is shredded and delivered to Greatmoor EfW via High Heavens Waste Transfer Station (WTS), reducing waste that would otherwise be sent to landfill. In addition to BC Contract Waste, Greatmoor EfW also receives Third Party Residual waste. A full summary of the total waste inputs across both facilities is featured in Table 1.

Table 1 – Summary of waste inputs processed at High Heavens WTS and Greatmoor EfW in this contract year by supplier

Waste inputs	Tonnes
Aylesbury Vale Area	36,351
Household Recycling Centres	4,325
High Heavens WTS	70,671
Shredded Bulky Waste	4,884
Total BC Inputs	116,232
Third Party Residual Waste	168,343
Total inputs to Greatmoor EfW	284,575

3.0 High Heavens Waste Transfer Station

3.1 Background

High Heavens WTS is situated at the High Heavens Waste Treatment Complex in High Wycombe, located in the south of the county.

This BC waste treatment complex contains several waste operations and the WTS was developed specifically for residual waste.

The WTS was constructed and commissioned by FCC Environment and entered into commercial operation in November 2015, in advance of the original June 2016 handover. It is used as the local delivery point by the Southern kerbside teams and HRCs to transfer residual

waste to be processed at Greatmoor EfW. Waste is loaded onto articulated vehicles to transfer to Greatmoor EfW, reducing the number of transport miles required, compared with RCVs delivering directly to the EfW facility.

This also reduces the time, costs and associated environmental impacts of the service, allowing the waste services to operate more efficiently in the areas that are needed. As a condition of planning permission, there is a designated transport route (45.3 miles) between High Heavens WTS and Greatmoor EfW, which maximises the use of major roads and motorways whilst reducing the use of minor roads that are not suitable for larger vehicles.

Map 2 – High Heavens WTS and Greatmoor EfW, and transport route across Buckinghamshire



3.2 Waste inputs

During this contract year, High Heavens WTS processed over 70,671 tonnes of residual waste, demonstrating the benefits of bulking waste from a highly populated region.

Table 2 identifies the amount of waste delivered to High Heavens WTS by supplier.

Table 2 – Tonnes of waste delivered into High Heavens WTS during the contract year by supplier

Waste inputs	Tonnes
South Kerbside	61,391
Household Recycling Centre Residual	9,010
Contaminated IN ex HH GFBW FCC	47
Shredded Bulky Waste	223
Total	70,671

3.3 Waste outputs

The majority of waste from High Heavens WTS is bulked residual waste destined for Greatmoor EfW.

No ad-hoc waste was delivered into High Heavens in the contract year.



3.4 Waste transfer

Transport savings through bulk transfer of waste from High Heavens WTS.

FCC Environment transfers waste between High Heavens WTS and Greatmoor EfW using their own haulage vehicles.

Bulking operations of BC Contract Waste at High Heavens WTS successfully reduced transportation miles by 146,662 miles during this contract year. The breakdown of this is shown in Table 3 below.

Table 3 – Summary of vehicle movements and associated miles saved due to bulk waste transfer from High Heavens WTS

Waste transferred	Vehicle movements saved	Miles saved due to bulk transfer of waste from High Heavens WTS
South Kerbside	12,148	132,604
Household Recycling Centre Residual	866	13,727
Shredded bulky waste	8	331
Total	13,022	146,662

The transportation saving is calculated by analysing the delivery tonnes and mileage travelled from each location and adding the bulking transfer mileage to Greatmoor EfW. The transportation mileage saving takes into account a predetermined route (45.3 miles) from High Heavens WTS to Greatmoor EfW, as defined in the planning permission. We have used the theoretical vehicle mileage for direct deliveries into Greatmoor EfW, rather than the actual mileage to High Heavens WTS.



3.5 Environmental management

High Heavens WTS operates under a Pollution Prevention and Control permit (PPC number XP3091ER) issued by the Environment Agency.

There were no PPC permit breaches during this contract year.

Full details of the Environmental Permit (XP3091ER) can be found [here](#).

3.6 Complaints

No complaints were raised during the contract year at High Heavens WTS.

4.0 Greatmoor EfW

4.1 Background

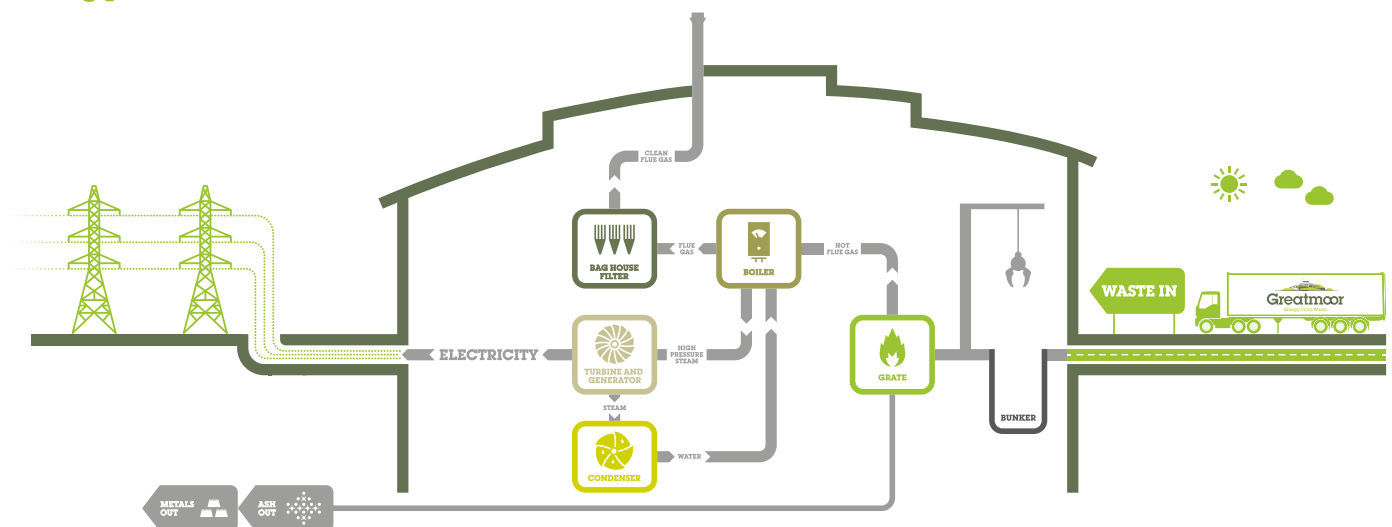
FCC Environment operate and maintain the Greatmoor EfW facility that is located to the north of Buckinghamshire County and adjacent to the FCC Environment Calvert Landfill site.

Construction of the EfW plant commenced in September 2013 and the plant became fully operational in June 2016.

Greatmoor EfW processes non-recyclable household residual waste that would have previously been sent to landfill for disposal. The process involves incinerating the waste to recover energy, which then heats a boiler to produce high pressure, high temperature steam. This steam is used to drive a Steam Turbine Generator to generate enough electricity to power over 68,000 homes¹.

The EfW process generates by-products (residues), such as ash and combustion exhaust gases. The Incinerator Bottom Ash (IBA) is removed after the combustion stage and is continually inspected, with all non-combustible materials separated and recycled, with the remaining ash used as landfill aggregate. The Air Pollution Control residues (APCr or Fly Ash) produced are removed from the combustion exhaust gases and sent to a facility to be neutralised before being landfilled. Combustion exhaust gases are treated through a complex Flue Gas Treatment (FGT) process that removes harmful emissions before being released to the atmosphere. All emissions to the atmosphere are rigorously controlled and managed by the onsite team and continually monitored by the Environment Agency.

The process of producing Energy from Waste



¹ Based on current OFGEM estimates that the 'average' home uses 2.7MWh of electricity per annum.

4.2 Waste inputs

A total of 284,575 tonnes of household residual waste were delivered and processed at Greatmoor EfW during this contract year.

The breakdown of waste inputs is presented in Table 4.

Table 4 – Tonnes of waste delivered into Greatmoor EfW during the contract year by supplier

Waste inputs	Tonnes
Aylesbury Vale Area	36,351
Household Recycling Centres	4,325
High Heavens Waste Transfer Station	70,671
Shredded Bulky Waste	4,884
Total BC inputs	116,232
Third Party Residual Waste	168,343
Total inputs to Greatmoor EfW	284,575

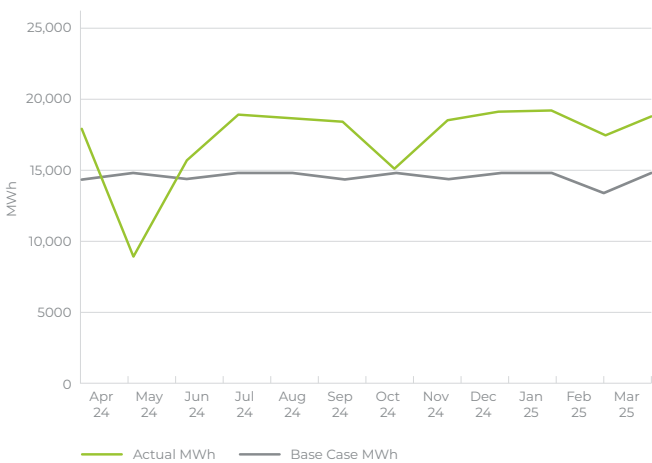
4.3 Waste outputs

Power generation

The Steam Turbine Generator is designed to generate up to 32.8 megawatts (MW) of electrical power. Although the boiler and feed system are not designed to be able to sustain this level of output for anything other than short periods.

The facility house load can be up to 6 MW (but is generally around 3 MW) and so, on average, a consistent 25 MW of power is exported to the National Grid system. The contract base case expected exports of 23 MWh of electrical power and the measurement of how many MW are generated over the specified amount of time is referred to as Megawatt hours (MWh). In this contract year Greatmoor EfW exported 204,690 MWh of electrical generation.

Figure 1 – Monthly electrical power exported from Greatmoor EfW versus the contract base case



The amount of electricity generated naturally varies over the contract year, as highlighted in Figure 1. This is due to changing ambient air temperature and wind direction (affecting the efficiency of the Air Cooled Condenser). More significant dips in amount of power exported are due to planned and unplanned outages (see Section 6, Table 9).

Residual outputs

From the 283,687 tonnes of residual waste treated at Greatmoor EfW, 77,967 tonnes of ash and residues were removed from the process, representing approximately 27.5% of all waste handled sent for landfill disposal. This compares favourably with CY8 which was 27.8% and is a reflection of increased lime use as a result of the new BREF limits on emissions to air. Table 5 provides a breakdown of residual waste outputs from Greatmoor EfW during the contract year.

Non-conforming waste materials are unsuitable for the EfW process and are removed during the pre- sorting and inspection stages. These materials are removed from the waste source to prevent impacting on the plant's combustion efficiency and emissions control. As highlighted above, the volume of non-conforming waste material received at Greatmoor EfW is very low and FCC Environment have waste inspection procedures to ensure the amount of non-conforming waste from Buckinghamshire Council and Third Party suppliers remains so.

Table 5 – Residual waste outputs from Greatmoor EfW

Waste outputs	Tonnes
APCr (Before treatment)	10,121
IBA (Before separation)	67,846
Non-conforming waste	0
Total outputs	77,967

4.4 Environmental management

Greatmoor EfW is regulated by the Environment Agency under the Environmental Permit reference **EPR/UP3734HT**.

On 16th March 2023 the Permit was varied by the Environment Agency to incorporate industry-wide changes as a result of Best Available Technique (BAT) conclusions. Three Improvement Conditions were added to the Permit and have been complied with as follows:

- Improvement Condition IC10 required a test of the DeNOx system and a report detailing performance parameters at lowed NOx emission levels. The trial was completed over three months, and a report submitted to the EA on 30th November.
- Improvement Condition IC11 and 12 required a report to be submitted to the EA on whether the waste feed can be shown to have low and stable Mercury content (IC11); and whether dioxin emissions to air are stable (IC12). Both were complied with and submitted on 24th August 2023, with a CAR response from the EA received on the 23rd of December 2024. The CAR documented the EA's satisfaction that Greatmoor had successfully demonstrated that the two improvement conditions could be met.
- The varied Permit also includes various changes to emission limit values that applied from 3rd December 2023. Greatmoor EfW remains compliant with all conditions in the (varied) Permit, with just two schedule 5 notifications submitted to the EA in the contract period.

EfW plants incorporate abatement technology to control the emissions to atmosphere. Greatmoor EfW has Continuous Emissions Monitoring (CEMS) equipment installed in the exhaust gas system to constantly monitor for harmful emissions. This real time data is recorded and presented to the Environment Agency as evidence that the facility complies with the PPC emissions limits. The Greatmoor EfW operations staff continually analyse the CEMS emissions data to ensure the plant is operated with PPC regulations. If there is any approach to these limits, the operator will take action to prevent an environmental incident ensuring the requirements of the Environmental Permit are maintained.

IBA and APCr residues are periodically inspected and tested by an independent UKAS accredited laboratory to ensure the residue characterisation has not changed and is being appropriately managed.

The PPC Permit UP3734HT requires FCC Environment to prepare and submit quarterly and annual reports detailing the facility's environmental performance. Regardless of this requirement, FCC Environment proactively manages the facility's environmental performance with the Environment Agency in real time.

Full details of the Environmental Permit (UP3734HT) can be found [here](#).

Permit monitoring requirements

The emission monitoring requirements are set out in Schedule 3 of the PPC Permit. There are two types of substance emissions monitoring, continuous (all the time) and periodic (bi-annually).

Continuously monitored emissions are measured using CEMs technology. Exhaust gas sample probes extract concentration samples that analyse and measure each emission parameter. This information automatically updates on the plant control system and is recorded in a dedicated read only data acquisition system. The facility operations team constantly monitor this CEMS data against the plant performance.

Periodic extractive sampling is carried out twice a year by a competent UKAS (United Kingdom Accreditation Service) accredited specialist contractor. Extractive exhaust gas samples are removed independently from the CEMS equipment and analysed in laboratory conditions.

Emissions limits

The Environmental Permit specifies Emission Limit Values (ELV) for all emission substance monitoring. The plant emissions must not exceed these limits to ensure compliance. In the event of plant abnormal operation affecting the emissions to atmosphere above the ELVs, the Environment Agency shall be formally notified. During this contract year no ELVs were exceeded.

The ELVs specified in the Permit refer to half hourly and 24-hour averages displayed in Table 7. As noted above, some of these ELV's changed on 4th December 2023, following an Environment Agency initiated variation of the Permit.

Table 6 – Emission monitoring requirements

Substance	Continuously	Periodically
Particulates	✓	
Total organic carbon	✓	
Hydrogen chloride	✓	
Carbon monoxide	✓	
Sulphur dioxide	✓	
Nitrogen oxides	✓	
Ammonia	✓	
Nitrous oxide		✓
Hydrogen fluoride		✓
Cadmium & Thallium		✓
Mercury		✓
Heavy metals		✓
Dioxins and furans		✓
Dioxin-like PCBs		✓

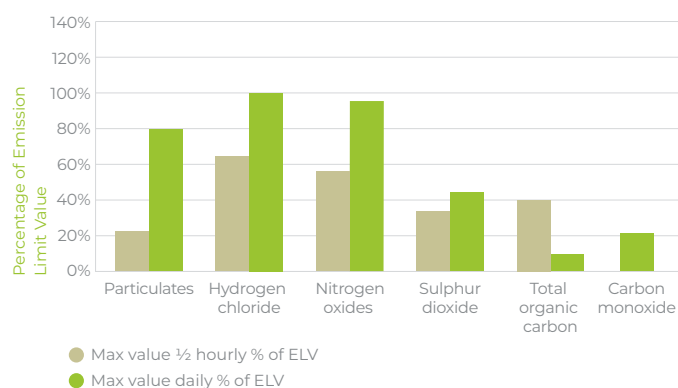
Table 7 – Half hourly average and daily average Emission Limit Values (ELV) by Substance

Substance	Half hour average (mg/m³)	Daily average (mg/m³)	
		until 3rd Dec 2023	until 4th Dec 2023
Particulates	30	10	5
Hydrogen chloride	60	10	8
Nitrogen oxides	400	200	180
Sulphur dioxide	200	50	40
Total organic carbon	20	10	10
Ammonia	n/a	n/a	15
Substance	10 min average (mg/m³)	Daily average (mg/m³)	
Carbon monoxide	150	50	

Continuous monitoring limits

Figure 2 maximum concentration percentage half hourly and daily emissions for the period of April 2024 to March 2025 (these are instantaneous values and not average percentage values). The graph takes account of the new (lower) Daily ELVs for particulates, Hydrogen Chloride, Nitrogen Oxides and Sulphur Dioxide. The graph further shows that there were no exceedances of the nominal half-hourly or daily ELVs during the reporting period. Ammonia readings, which have been low historically, have been at 0% (as a max % of ELVs) for the reporting period. HCL has been elevated for much of the reporting period due to higher C&I waste materials received, however it has remained within the permit limits.

Figure 2 – Maximum percentage of emission value during contract year



Permit Notification

In the period April 2024 to March 2025 there were two notifiable events at Greatmoor EFW.

The first occurred on the 4th of June 2024 where a failed daily zero calibration on both Duty and Standby MIR-FTIR instruments resulted in the unavailability of useable readings for CO, TOC, Nox, HCL, SO₂ and NH₃ between 12:01 and 12:39 and therefore one half hourly average and four 10-minute average of missing readings. This did not necessarily mean an exceedance of our permit ELVs as readings immediately before and after the missing periods were low and stable, and the daily averages compliant. The EA therefore scored Greatmoor the lowest possible score of C4.

On the 7th of October 2024 an elevated Dioxins and Furans reading of 0.2589ng/m³ was recorded during periodic monitoring of emissions against at permitted ELV of 0.06ng/m³. The reading was significantly higher than historical results and inconsistent with results recorded for cadmium and thallium, heavy metals and other metals tested, which remained very low. The Environment Agency was notified, and a full internal investigation completed with a report submitted to the EA.

The internal investigation was completed at Greatmoor without finding any apparent root cause to the elevated dioxins levels. Operational conditions were thoroughly assessed, and the contractors involved in monitoring and testing the stack gases were commissioned to conduct additional investigations into the reliability of the data and monitoring procedures; their findings confirmed the elevated dioxins/furans result.

We initiated all mitigation measures as soon as the results of the stack testing were submitted as a precautionary approach whilst undertaking the investigations. These included increased PAC dosing, changing the Carbon spec to one with a higher adsorption specification, and following the BREF PCDD-F Protocol for accelerated testing (six tests in three months). We have kept the EA abreast of all subsequent results from the accelerated dioxins re-testing programme – these have all been compliant and below our Emission Limit Values.

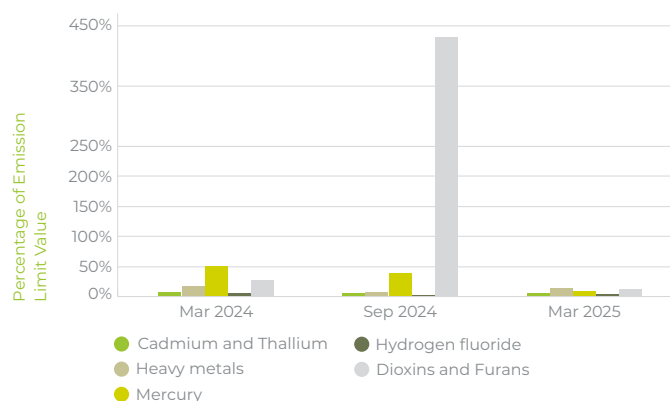
Additional testing has just been completed in the last month during our annual service outage shut down and start up dioxins monitoring with results awaited. Our routine bi-annual stack testing results from March were compliant and the next scheduled testing for dioxins/furans will be in September.

Periodic monitoring

A requirement of the PPC Permit is to complete independent stack emission testing for Dioxins, Furans, Cadmium and Thallium, Heavy Metals, Mercury and Hydrogen Fluoride.

Figure 3 below depicts the maximum concentration percentage levels of these substances for the period of April 2024 to March 2025 (instantaneous values and not average percentage values). As already highlighted in the preceding section, Greatmoor dioxins/furans stack samples resulted in elevated readings above the ELV of 0.06ng/m³ during the September 2024 periodic testing campaign. This is clearly evident in the graph. Following internal investigations and immediate operational intervention, subsequent accelerated testing (six tests as part of the PCDD-F protocol and two tests as part of bi-annual periodic monitoring) has resulted in compliant readings. This can be seen in the Mar-25 graph.

Figure 3 – Bi-annual emission values for Cadmium & Thallium, Heavy Metals, Mercury, Hydrogen Fluoride and Dioxins & Furans during the contract year



Summary of Environmental Compliance

In addition to monitoring and reporting emissions to air, FCC Environment has a responsibility to monitor the quality of IBA produced by the facility to ensure the characterisation remains non-hazardous. All data taken and analysed by a UKAS accredited research facility showed that the IBA remains non-hazardous; ensuring the waste fuel and combustion system is as per design.

Greatmoor EfW's environmental performance has consistently achieved the PPC Permit ELV levels throughout the contract year. Both continuous and periodic monitoring indicates that the EfW facility operates within Environment Agency regulations.

4.5 Complaints

Four complaints were received by FCC Environment during the contract year. None were at High Heavens, all four at Greatmoor, of which none were related to the operation of the plant.

All events related to HGV traffic passing through four separate villages, none of which were lorries on tasks related to Greatmoor. All communication was managed to the satisfaction of the complainants and, where issues were as a result of work parties not associated with Greatmoor, details on who to contact were passed onto complainants.

5.0 Integrated Management System

FCC Environment operates an Integrated Management System (IMS) to achieve and maintain ISO 9001, ISO 14001, ISO 45001 and ISO 50001 accreditations.

Greatmoor EfW and High Heavens WTS are operated and managed under the IMS requirements that have successfully achieved the British Standards Institution accreditations.

5.1 Internal auditing in this contract year

An IMS audit was conducted on 23 September 2024 at High Heavens WTS; zero NCRs (Non-Conformance Reports) were raised. The next biennial audit is planned for September 2026.

Greatmoor EfW received a BSI audit on 11th September 2024 and an internal IMS audit on the 1st July 2024. No NCRs were issued as a result of the BSI audit, and 12 minor IMS Observations were raised. All Audit actions were closed out within the contract year. A summary of all Observations received during the internal IMS audit during this contract year are provided in Table 8.

Table 8 – Summary of closed out non-conformances

Audit	Summary of NCR	Completed
IMS	Review the Management of Change Log and clearly identify which are still active and which are on hold.	09 Oct 2024
IMS	Ensure Staff involved in the MoC process are aware of their duties.	09 Oct 2024
IMS	All weighbridge staff to receive EFW Environmental Permit Compliance training.	09 Oct 2024
IMS	Revise the scope and frequency of Duty of Care documentation spot checks.	18 Oct 2024
IMS	Create an up to date asset list/s detailing all equipment that require LOLER, PUWER, or other statutory inspections, and the current list of operational ladders.	06 Jan 2025
IMS	Confirm how all instruments requiring calibrations are identified.	09 Oct 2024
IMS	Assign responsibility for the asset and calibration list/reports, review these periodically to ensure all statutory inspections are being managed and any new/obsolete equipment is updated.	09 Oct 2024
IMS	H&S team to communicate the procedure requirements for investigations to those on site who triage and investigate reported events.	30 Nov 2024
IMS	Remove temporary Outage gas bottle store.	01 Aug 2024
IMS	Review design of gas bottle store for 2025.	09 Oct 2024
IMS	Correct the Annual Season Ticket for Aston Clinton residual waste.	01 Jul 2024
IMS	Review completion notes on 9 (listed) event investigations.	09 Oct 2024

6.0 Maintenance Management

Maintenance management ensures the EfW plant remains reliable, safe to operate and demonstrates compliance with statutory legislation.

CMMS

The implementation of the Q4 Computerised Maintenance Management System (CMMS) continues to evolve at Greatmoor EFW. Planned work is now submitted in full a week in advance. This gives the Senior Authorised Person time to review the plan and associated safety documents, all reactive work orders are also reviewed and planned at this point dependent on labour and plant availability. Completed work orders are now signed off and placed in history & paper copies are archived. The daily maintenance activities are reviewed in a formal meeting by the Senior Authorised Person, the Mechanical Team Leader & EC&I Team Leader. Urgent plant issues can be added to the plan at this point dependent on the criticality.

Electrical

Electrical statutory work carried out this year, fixed wire testing, and portable appliance testing, lightning protection has been completed. Non-intrusive inspections have been carried out on HV and LV electrical board, partial discharge testing and thermographic testing has been carried out with no issues being identified. Intrusive testing is to be carried out on boards Comm 1, Comm 2 and Building Service board B during this year's outage. The first yearly inspection of the 33 KV circuit breakers and transformer have been completed.

Fire system

Fire detection and notification has been added to all buildings on site including temporary buildings, it has also been added to areas with integral fire suppression systems.

Inspections

Ongoing service visits continue as scheduled by Q4 for the following:

- Water Treatment Plant
- Dioxins and Furans testing
- Lift inspections & replacement ropes on passenger lift
- Fire suppression systems – gas cylinders requiring 10-year service
- CEM's annual service
- Fire alarm system routine checks
- UPS inspections
- Emergency Diesel Generator Inspections
- Legionella compliance
- Waste Cranes
- Lightning protection

...amongst other things.

Stores

The Engineering stores carry all our critical spares. In the past year we have totally removed all the spares in the stores and installed all new racking. We have then put all the spare parts in racking boxes and labelled so we can account for all the critical spares on site. We also intend going forward to use a bar code reader to do all our stock checks and book parts out. This will ensure that we have much better visibility stock holdings, age, where it is stored and (importantly) cost going forward. We also use a secure warehouse in Brackley for non-urgent spares, and spares used only during a prolonged shutdown (such as the annual planned maintenance outage). The spares there are all logged on an excel spreadsheet but will, in time, go onto the Q4 system. Again, this is aimed at improving visibility of available spares.

DCS and controls

2024 outage main task was the replacement of DCS processors AP01 and AP02. Further works were also carried out on Server backup, remote IO inspection and cleaning, controller redundancy checks on AP11 & AP12. A cyber security risk assessment has been carried out in 2025 and improvements to the OT network are scheduled for the 2025 outage with the replacement of a number of network switches to improve network traffic speeds. OEM continues to take regular backups as scheduled by Q4.

Access control

Greatmoor have implemented a new access control system to ensure the safety and security of everyone on site. The system works of individuals fingerprints and access to critical areas are limited to those who need access or have the correct level of competence to have access. In the event of an evacuation a printout of all those on site is provided by the system to ensure all operatives are accounted for.

Lifecycle maintenance

Greatmoor EfW carries out an annual shutdown to undertake lifecycle maintenance and overhaul to maintain plant performance, reliability and safe operation. During this year, the annual shutdown was carried out once again in May. The outage started on time and to plan in 2024, there was a large workload which was planned before and with many contractors on site. The Outage was well planned and controlled with all the work completed and the plant back on waste approximately 2 days early (against a target of 21 days).

During the 2024 outage the following works were carried out:

- Feed water pumps had new drains fitted on check valves on the suction side of the pumps.
 - Tipping bay doors replaced all ropes after 8 years.
 - Replaced the gulley sump pump with a more robust diaphragm design (more capable of dealing with silt and mud in the water).
 - Fitted access points for rope access to allow cleaning of the reactor using abseiling method to clean the sides of the reactor properly.
 - New safety lines installed under the APCR silos to allow safe access to the top of the tanker.
 - Installed a new hoist at 32metre level for 2024 outage superheater tube work.
 - Add additional isolation valves to the hydraulic system ring main line, so there can be great flexibility is isolations during outage work to allow work (ROMPS) to progress.
 - BAE stripped and rebuilt to OEM standards; Wear strips were replaced as were the deflector plates. Brand new chain was fitted and new sprockets. Brand new drive unit was installed. The new tensioners also installed and guide plates.
 - Replaced all the superheater drain valves (a known source of leaks in other EfWs).
 - Zurich PSSR examinations of boiler and other pressure plant.
 - Saacke Burners service.
 - Zenith carried out 4 yearly inspection survey of the stack including some remedial works to the liner.
 - Mines Rescue were employed to provide control and rescue for all confined space works.
- The boiler had many tubes replaced in the first, 2nd, 3rd and 4th passes, and there were over 2000 welds carried out and no leaks on startup. This was checked and verified by Zurich insurance (our nominated Pressure Systems Safety Regulations inspector).
 - Superheaters 2 & 3 (in the 4th or 'horizontal' pass) had their first 5 rows of tubes replaced (based on results from non-destructive testing conducted in 2023).

6.1 Maintenance issues

Plant Breakdowns

On occasion the EFW plant will breakdown due to mechanical and electrical faults, resulting in a full plant shut down. Table 9 identifies breakdown failures and downtime hours, with more details on each occurrence provided in the following section.

Table 9 - Summary of major availability losses during contract year

Date	Breakdown	Returned to service date	Total loss (hours)
26 Jun 24	Seized 2nd/3rd pass fly ash extractor conveyor belt	26 Jun 24	13hrs 20'
24 Oct 24	Blocked Bottom Ash Conveyor	30 Oct 24	155hrs 4'
18 Nov 24	Partial loss of Digital Control System (DCS)	18 Nov 24	10hrs 14'
Total			178hrs 38'

7.0 Community liaison

FCC employs a dedicated Waste Awareness and Education Manager with the aim to raise public awareness of waste issues, including waste prevention, reuse and recycling through educational initiatives. This position was vacant August 2024 to February 2025.

Greatmoor EfW has an on-site visitor centre which hosts site tours of the facility for local community groups and schools. Tours includes showing visitors the control room to demonstrate how the plant is operated, along with views of waste tipping into the bunker, and loading the system by the large grab crane. Visitors can also look inside the furnace inspection hatch to see waste being burnt.

As well as hosting on-site tours, FCC also carry out outreach visits to schools and other organisations within the county. The Waste Awareness and Education Manager attends school classes and assemblies to educate and raise awareness about recycling and waste management.

7.1 Greatmoor EfW Visitor Centre

The headline figures for 2024–25:

- 682 Visitors
- 48 Tours
- 1,353 attendees to Outreach Events
- 95.5% Excellent or Very Good feedback from visitors, across 6 key questions

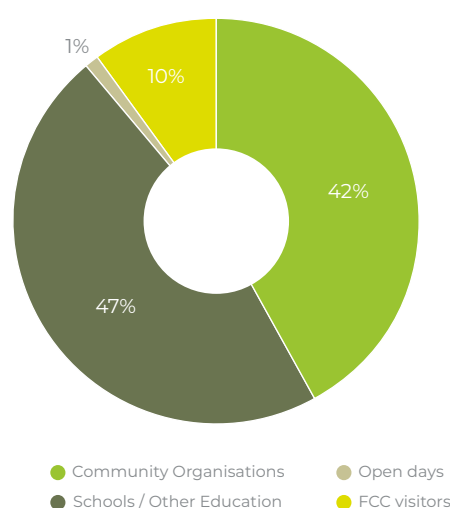
During the contract year there were a total of 682 people attended at the Visitor Centre over 48 tours.

During this contract period, the **10,000th** visitor attended a tour at Greatmoor.

Table 10 – Number of visitors over the contract year

	1st April 2024–31st March 2025
Adult Visitors	307
Under 16s	375
Total Visitors	682
No of Tours	48

Figure 4 – Breakdown of visitors by sector



7.2 Outreach Visits

Table 11 – Details of outreach visits

Type of Visit	No of Visits	No of Under 16s	No of Adults	No of Assemblies / Presentations	No of Activity Sessions
Primary Schools	5	869	32	2	3
Secondary Schools	1	156	6	0	6
Careers Events	1	26	44	0	0
Community Groups	4	0	125	4	0
Community Events	6	8	87	0	3
Total	17	1,059	294	6	12

7.3 Summary of visitor feedback

FCC encourages feedback from those visiting Greatmoor EfW by providing feedback forms after tours to highlight positive feedback and also identify areas for improvement to continuously focus on delivering the best service possible. Feedback from visitors has been excellent and shows a commitment to change behaviours towards recycling, reuse and waste minimisation.

Table 12 – Feedback Summary

Tour Section	% Excellent or Very Good 2024/25
Introduction	93.0
Guided Tour	100
Visitor Centre Facilities	96.5
Visitor Centre Staff	96.3
Information provided before visit	92.9
Greatmoor website	94.3

7.4 Local Employment

There are a total of 52 members of staff working on the Contract, 46 at Greatmoor EfW and 6 at High Heavens WTS. 67% of the staff employed on the contract live within Buckinghamshire itself, with others from the local surrounding areas of Oxfordshire, Northamptonshire and Berkshire. Currently, no staff travel from outside the local vicinity of the contract, so the majority are from the area demonstrating good levels of local employment. Contract staff required for the Outage continue to be recruited via a local agency and are mainly drawn from the contract area. Where possible supplies and stores are also drawn from the local area e.g. all catering is supplied from a company based in Waddesdon, the Outage village is supplied by a company with a site at the Wescott business park.

7.5 Liaison Group Meetings

Since April 2024 there have been four Greatmoor Community Liaison Group (CLG) meetings (7 July 2024, 14 October 2024, 16 January 2025 and 17 March 2025). The meetings occur regularly and from Service Commencement have been held in conjunction with the Calvert Landfill Community Liaison Group. These sessions are attended by local residents, parish councillors, interest groups, EA officers, councillors and FCC. The Greatmoor CLG is an opportunity for members to ask questions in relation to the EfW and raise issues of concern.

8.0 Conclusion

The ninth contract year, whilst ultimately very successful, has proven to be problematical for a number of commercial and engineering reasons.

Reliability and availability have improved over the year, in particular when compared to CY 8 & CY7, however the nature of the non-recyclates that are being presented as waste feedstock is constantly changing and this generally means that the calorific value (CV) of the feedstock is largely increasing. Higher CV equates to lower waste throughput and an increasing challenge to meet contracted targets for waste over the weighbridge. Additionally higher CV waste tends to contribute to increasing build up of clinker/slag on the boiler walls during combustion. In CY 9 this increased slag formation resulted in a particularly significant “slag-fall” that resulted in several tonnes of material landing on the grate resulting in damage that took 6.5 days to repair. On a positive note the remedial works on the Bottom Ash Extractor conducted by the OEM in the 2024 Maintenance Outage have resulted in a much improved performance with no breakdown loss of time or availability.

FCC Environment is proud to report that we have continued to operate and maintain the Greatmoor EfW and High Heavens WTS facilities safely and with the utmost respect for the environment.

High Heavens WTS operational availability has remained 100% for household residual waste deliveries. Greatmoor EfW operational availability achieved 92.4%, which was 3.4% above the base case.

Once again, both Greatmoor EfW and High Heavens WTS have met, or exceeded, all the requirements of their respective Environment PPC Permits throughout this contract year. This ongoing success further demonstrates FCC Environment's credibility as a responsible operator and commitment to operating all plant and facilities within national regulations and guidelines.

High Heavens WTS continues to provide a significant reduction in waste transport mileage by bulking waste to be delivered to Greatmoor EfW. Easing congestion on the Counties roads, improving RCV availability and smoothing the delivery schedule at Greatmoor (hence reducing waiting times for customers).

In 2024, FCC Environment carried out a successful EfW plant outage achieving all the required, mandated and elective maintenance work, without accident or environmental incident and returned the plant back to operations 20 hours ahead of schedule despite over 2000 welds being completed within the boiler alone.

Visitor numbers were not as high as previous years due to the gapping of the Waste Awareness and Education Manager's role (WAEM) which meant that we were only accepting very limited visits between August 2024 and February 2025. The delay in replacing the outgoing WAEM was due to the timing of their resignation and the desire to replace them with a candidate with a teaching qualification.

Yet again neither Greatmoor EfW nor High Heavens WTS have had a single Lost Time Accident for either FCC Environment employees or their contractor partners in this contract year. However, again and regrettably, there have been some minor accidents resulting in harm to workers on site. FCC Environment believe that all accidents are avoidable and are committed to protecting their staff, contractors and site visitors: as a result, all accidents (however minor) were investigated and there is a continuous overview looking for common causes or threads. The incumbent safety advisor was replaced in CY9 and their replacement is now fully trained and delivering continuous H&S oversight and advice.

For more information about FCC Greatmoor, please visit www.greatmoor.co.uk

For more information about FCC Environment, please visit www.fccenvironment.co.uk

For more information about Energy from Waste from Buckinghamshire Council, please visit www.buckinghamshire.gov.uk

9.0 Glossary

Air Pollution Control residue (APCr)

By products of the flue gas cleaning process and typically include ash, carbon and lime due to fly ash materials emitted from the combustion process and injection of neutralising agents to clean the gases before being released to the atmosphere. These materials are hazardous and are removed and disposed of by authorised licence holders for appropriate collection and disposal.

Automatic Number Plate Recognition (ANPR)

Automatic Number Plate Recognition (ANPR) is a technology that uses optical character recognition on images to read vehicle registration plates to create vehicle location data. It can use existing closed-circuit television, road-rule enforcement cameras, or cameras specifically designed for the task.

Buckinghamshire Council (BC)

BC is the administrative body governing the county of Buckinghamshire who are responsible for the collection and disposal of the county's residual waste and therefore act as both the Waste Disposal Authority and Waste Collection Authority. BC are in a 30 year contract with FCC for the treatment of this waste for energy recovery as a more sustainable alternative than landfill disposal.

Carbon monoxide (CO)

Carbon monoxide is a common naturally occurring chemical but can also be produced from human activity. It is a colourless, odourless, poisonous gas.

Community Liaison Group (CLG)

An organised group involving local community representatives, residents and other interest groups to facilitate communication, share information and encourage engagement for those who may be affected by the operation of the waste management facilities. These sessions are hosted by the council and operators to provide a transparent platform for attendees to ask questions.

Computerised Maintenance Management System (CMMs)

Computerised Maintenance Management System is software that helps manage and track maintenance activities.

Continuous Emissions Monitoring systems (CEMs)

Continuous Emissions Monitoring system (CEMs) technologies are used to constantly monitor emissions from the Energy from Waste process against the emission limit values specified within the Environmental Permit. Gas samples are extracted using a sample probe and analysers are used to measure concentrations of each parameter.

Contract waste

Waste materials that are included in the residual waste treatment contract between FCC and BC. This includes all residual household waste collected across the county by the district councils and residual wastes disposed of at the Household Recycling Centres.

Dioxins and Furans

Dioxins (polychlorinated dibenzodioxin, PCDD) and Furans (polychlorinated dibenzofuran, PCDF) are families of complex chemicals containing chlorine. There are several hundred dioxin substances. They are crystalline solids which dissolve in organic (carbon-containing) solvents, fats and oils – but not in water.

Emission Limit Value (ELV)

Emission Limit Values (ELV) are specified limits for various pollutant emissions from the Energy from Waste process and are set out as conditions of the Environmental Permit. Emissions must be monitored against the ELV for each pollutant and reported to the Environment Agency. Emissions must remain within the specified limits to maintain compliance with the Environmental Permit.

Energy from Waste (EfW)

Incineration process in which residual waste is converted into thermal energy to generate steam that drives turbines for electricity production. Energy from waste is a method of recovery and therefore preferable over landfill disposal.

Environment Agency (EA)

The Environment Agency (EA) is a non-departmental public body sponsored by the United Kingdom government's Department for Environment, Food and Rural Affairs (DEFRA), with responsibilities relating to the protection and enhancement of the environment.

Environmental Permit

The Environmental Permitting (England and Wales) Regulations 2016 requires waste management facilities to obtain an environmental permit before they are allowed to operate. Both Greatmoor EfW and High Heavens WTS are operated under Environmental Permits, which are regulated by the Environment Agency.

FCC

FCC Environment is one of the UK's leading waste and resource management companies who has been contracted by BC for the treatment of the county's residual waste.

Flue Gas Treatment (FGT)

FGT is the cleaning process to remove pollutants from flue gasses emitted during combustion. The treatment includes a series of chemical processes and filters to neutralise gasses and remove particulates before releasing to the atmosphere.

Heavy metals

A metal of relatively high density, or of high relative atomic weight and includes Arsenic, Antimony, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Thallium, Vanadium.

Household Recycling Centre (HRC)

A facility where members of the public can reuse, recycle and dispose of their household waste.

Hydrogen chloride (HCl)

Hydrogen chloride is a naturally occurring chemical, but can also occur in manufacturing processes. It is a colourless, reactive gas with a strong, pungent odour. In solution with water it forms hydrochloric acid.

Hydrogen fluoride (HF)

Under normal conditions, Hydrogen fluoride will be a colourless gas, which has a sharp, pungent smell. It is highly toxic and irritating, but non-flammable. Hydrogen fluoride is however usually found as a strong solution in water, whereby it is Hydrofluoric acid. Hydrofluoric acid is an extremely strong acid. It will severely corrode metals, glass, minerals and many organic (carbon-containing) substances – and will release highly flammable hydrogen in the process.

Incinerator Bottom Ash (IBA)

Incinerator Bottom Ash (IBA) is a form of ash produced as a residue from the incineration of waste in Energy from Waste (EfW) facilities. This material is discharged during combustion and is often processed to recover ferrous metals prior to onward treatment or disposal of the ash products.

Integrated Management Systems (IMS)

An Integrated Management System (IMS) combines related management systems of a business into one system for easier management and operations. Quality, Environmental, and Safety management systems are often combined and managed as an IMS through combined policies and procedures for more efficient and robust management processes.

Landfill disposal

A disposal site where residual waste is buried, spread into layers and compacted. Modern landfills are engineered to prevent any pollutants from leaking into the surrounding soil and water courses. Landfill is considered the least sustainable method of waste disposal and therefore other methods of recycling and energy recovery are sought before landfill.

Megawatt (MW)

A unit of electricity equal to 1 million watts, or 1,000 Kilowatts. This unit of electricity is the constant used to represent the power generated from energy from waste recovery. Greatmoor EfW is designed to generate 22MW of electricity which is sufficient to power 40,000 homes.

Nitrogen oxides (NOx)

The term 'nitrogen oxides' (NOx) usually covers two gases – nitric oxide (NO), which is a colourless, odourless gas and nitrogen dioxide (N₂O), which is a reddish-brown gas with a pungent odour. These contribute to acid rain, depletion of the ozone layer and have detrimental effects on health. They are also greenhouse gases.

OEM

Original Equipment Manufacturer.

Particulates

Particulates is the term used to describe tiny particles in the air, made up of a complex mixture of soot, organic and inorganic materials with a particle size less than or equal to 10 microns diameter (10 microns is equal to one hundredth part of a mm).

Refuse Collection Vehicle (RCV)

A vehicle commonly referred to as a dustcart specially designed to collect waste and/or recycling, and transport the collected materials to an onwards waste treatment facility.

Residual waste

Waste tonnages that remain after reuse, recycling and composting activities have taken place. This typically refers to everything that is disposed of in household black bin bags.

Sulphur dioxide (SO₂)

Sulphur dioxide is man-made and naturally occurring colourless gas with a penetrating odour. It dissolves in water to form an acidic solution. Sulphur dioxide gas is one of the main chemicals that causes acid rain, which can damage crops and forests and acidify sensitive soils and water bodies.

Third Party waste

Residual waste that is not included in the residual waste treatment contract between FCC and BC. Third party waste includes other municipal waste contracts that FCC have with nearby local authorities. Third party waste is processed at Greatmoor to fill the capacity of the plant, increase landfill diversion and maximise electricity generation for Buckinghamshire.

Total Organic Carbon (TOC)

Total Organic Carbon is a measurement of Volatile Organic Compounds (VOC). VOC is a term used to classify a large group of liquids and gases (containing carbon) that are gaseous or easily vaporize at room temperature.

Waste transfer station

A waste transfer station is a building used for the bulking of residual waste prior to onward transfer of waste to a treatment or disposal facility. The transfer station operating on the residual waste contract is High Heavens located in High Wycombe in the South of the County. This site services the southern district whose RCVs tip residual waste on site prior to bulk waste transfer to Greatmoor EfW.