

Buckinghamshire Residual Waste Performance Report 2020/2021

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1.0 Introduction

Buckinghamshire Council Waste Management Project

Annual Service Report

Contract Year 5

1st April 2020 – 31st March 2021

This contract year has been hugely challenging due to the impact of Covid-19. FCC have had to rethink and reorganise the way they operate day to day in order to protect their staff, and to maintain continuity of their operations.

With the implementation of new control measures FCC have achieved this with minimal disruption to the routine business. However, it did result in a delay in the annual maintenance Outage from May 2020 to August 2020 – effectively extending the period from 12 to 16 months. This had an impact on plant reliability (and consequently availability) during the summer and was the prime driver behind the failure to meet base case target for availability.

COVID also limited the ability to benchmark other sites and facilities and reduced the external oversight (both from within and without FCC and BC) that routinely contributes to maintaining good practice. Whilst this did not have an immediate impact within year, these activities are conducted for a variety of good reasons and their loss may be felt in numerous small ways in the future without careful mitigation.

Increased COVID precautions resulted in increased costs particularly during the Greatmoor Outage when extra facilities and services were required to ensure social distancing measures could be applied and enhanced hygiene maintained. These precautions undoubtedly contributed to the very low COVID infection rates seen at both sites.

Map 1 – Location of FCC facilities and district councils



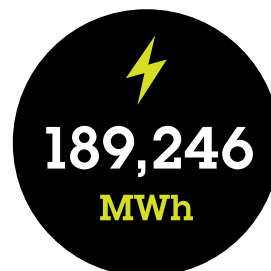
During the fifth contract year:



In April 2020, Buckinghamshire's County and District Councils came together to form one organisation and is now formally known and referred to in this report as Buckinghamshire Council (BC).



of residual waste were processed for energy recovery, with 114,658 tonnes of waste processed directly from BC.



of electrical power was exported to the National Grid system.



1.7% below the base case model of 89%.



The operation of High Heavens WTS saved an estimated 139,609 delivery miles to Greatmoor EfW.



Both Greatmoor EfW and High Heavens WTS have met, or exceeded, all the requirements of their respective Environmental Permits throughout this contract year.

2.0 Waste management

Total waste volumes handled

During this contract year, FCC Environment have processed 295,926 tonnes of residual waste across both facilities.

BCC 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	35,961
Chiltern & Wycombe Area	51,189
South Bucks Area	12,601
Household Recycling Centres Residual	10,594
Shredded Bulky Waste	4,777
Total Contract Waste Handled	115,122
Third Party Residual Waste	180,804
Total inputs to Greatmoor EfW	295,926

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 to 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, location of council districts and transport route across Buckinghamshire.



3.2 Waste inputs

During this contract year, High Heavens WTS processed over 75,579 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
Chiltern and Wycombe Area	51,188
South Bucks Area	12,601
Household Recycling Centre Residual	7,013
Shredded Bulky Waste	4,777
Total	75,579

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

On 1st June 2016, FCC Environment awarded a residual waste haulage contract to Fred Sherwood and Sons Limited to transport waste between High Heavens WTS and Greatmoor EfW, and has continued to develop a strong partnership and a successful service.

Bulking operations of BC Contract Waste at High Heavens WTS successfully reduced transportation miles by 139,609 miles during this contract year. The breakdown of this is shown in Table 3.

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.

Since year 3 of the contract (April 2018 to March 2019), the average residual waste payload collected from High Heavens WTS improved by 2%, from 23.93t to 24.38t per collection. The improved payload is part of High Heavens WTS commitment to continual improvement in the area of transport savings by reducing the number of deliveries required throughout the year.

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
Kerbside Residual	11,481	122,642
Household Recycling Centre Residual	739	13,143
Shredded bulky waste	91	3,824
Total	12,311	139,609



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 and the Environment Agency did not conduct a site inspection during this contract year.

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

3.6 Complaints

During the contract year, two complaints were raised at High Heavens WTS.

Both complaints were related to load security after the bulk hauliers left site. After investigation, one claim was substantiated which resulted in the driver receiving a strike/reprimand from site, and the haulier followed this up with the driver using their internal processes. A toolbox talk was also issued to all drivers.

No litter complaints were received during this contract year, which reflects the continued hard work by site staff to keep the site in good order.

4.0 Greatmoor EfW

4.1 Background

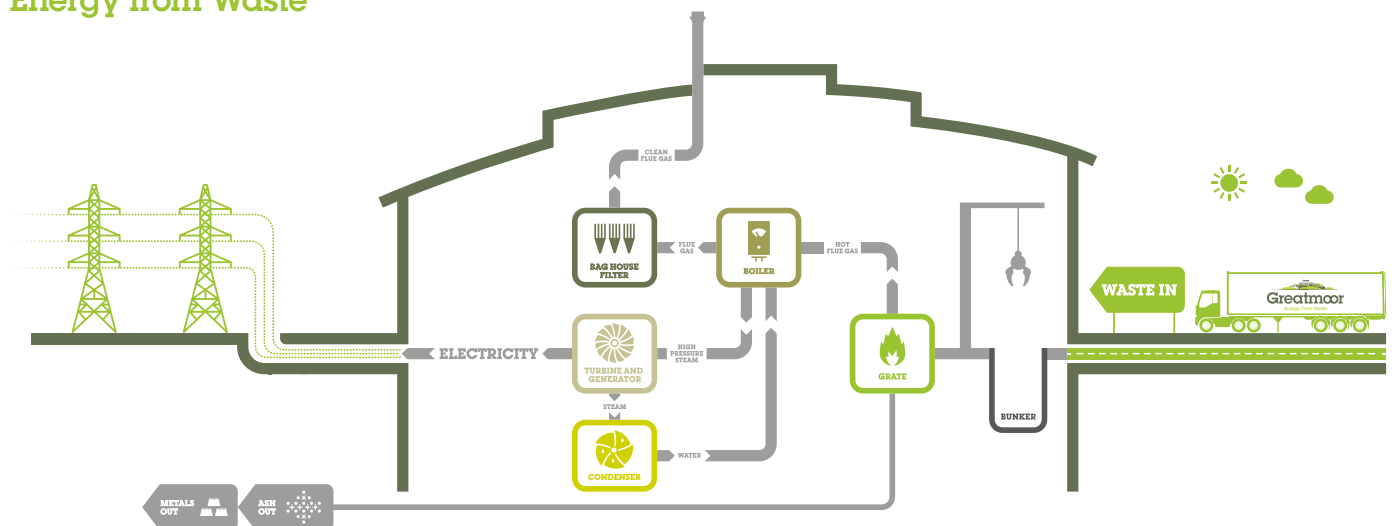
FCC Environment operate and maintain the Greatmoor EfW facility that is located to the north of Buckinghamshire County and adjacent to the FCC Environment Calvert Landfill site.

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 40,000 homes.

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



4.2 Waste inputs

A total of 295,462 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.

All of the residual waste received at High Heavens WTS was bulked to Greatmoor EfW. Greatmoor EfW has been able to process a large amount of Third Party waste due to plant efficiencies that allowed the site to handle more waste than originally estimated.

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

Waste inputs	Tonnes
Aylesbury Vale Area	35,961
Household Recycling Centres	3,581
Chiltern & Wycombe Area	2
High Heavens Waste Transfer Station	75,114
Total BCC inputs	114,658
Third Party Residual Waste	180,804
Total inputs to Greatmoor EfW	295,462

4.3 Waste outputs

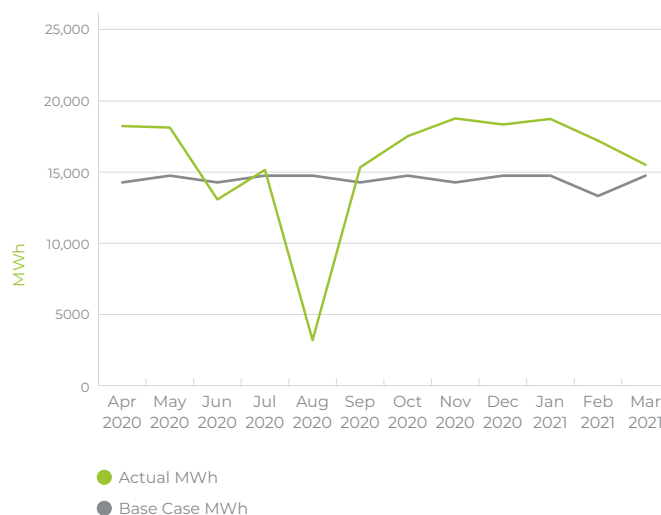
Power generation

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 26 MW of power is exported to the National Grid system. The contract base case expected exports of 23 MW 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 189,246 MWh of electrical generation.

As highlighted in Figure 1, the amount of electricity generated varied over the contract year. The reduction in the amount of power exported in September was due to the planned (though delayed) annual outage and the reduction in export power in June, July, (late) September, October and March were due to plant breakdowns.

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



Residual outputs

From the 295,462 tonnes of residual waste treated at Greatmoor EfW, 67,411 tonnes of ash and residues were removed from the process, representing approximately 22.8% of all waste handled sent for landfill disposal.

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 low and FCC Environment have waste inspection procedures to ensure the amount of non-conforming waste from Buckinghamshire Council and Third Party suppliers remains low.

Table 5 – Residual waste outputs from Greatmoor EfW

Waste outputs	Tonnes
APCr (Before treatment)	11,657
IBA (Before separation)	55,750
Non-conforming waste	4
Total outputs	67,411

4.4 Environmental management

Greatmoor EfW is regulated by the Environment Agency under the Pollution Prevention and Control Permit (PPC) that is issued to the facility.

The PPC integrates specific UK and European Environment and Waste Management directives to ensure the operator acts responsibly to prevent a failure to comply with these regulations.

A significant environmental risk for all EfW plants is 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. As demonstrated in the following section, there were no Permit breaches at Greatmoor EfW during the contract year.

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 (quarterly).

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 accredited specialist contractor. Extractive exhaust gas samples are removed independently from the CEMS equipment and analysed in laboratory conditions.

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		✓

Emissions limits

The PPC Permit specifies Emission Limit Values (ELV) for all emission substance monitoring. The plant emissions must not exceed these limits to ensure PPC 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 PPC Permit refers to half hourly and a 24 hour averages displayed in table 7.

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

Substance	Half hour average (mg/m ³)	Daily average (mg/m ³)
Particulates	30	10
Hydrogen chloride	60	10
Nitrogen oxides	400	200
Sulphur dioxide	200	50
Total organic carbon	20	10

Substance	10 min average (mg/m ³)	Daily average (mg/m ³)
Carbon monoxide	150	50

Continuous monitoring limits

Figure 2 depicts the maximum concentration percentage half hourly and full daily emission for the period of April 2020 to March 2021. The graph shows that at no point during the contract year did the facility emissions approach or exceed the ELVs. N.B these are instantaneous values and not average percentage values.

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 depicts the maximum concentration percentage levels of Dioxins and Furans for the period of April 2020 to March 2021. The graph shows that at no point during the contract year did the facility produce Dioxins and Furans that approached or exceeded the ELVs. N.B. these are instantaneous values and not average percentage values.

Figure 4 depicts the maximum concentration percentage levels of Cadmium & Thallium, Heavy Metals, Mercury and Hydrogen Fluoride for the period of April 2020 to March 2021. The graph shows that at no point during the contract year did the facility produce harmful emissions that approached or exceeded the ELVs.

N.B these are instantaneous values and not average percentage values.

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 well below Environment Agency regulations.

Figure 2 – Maximum percentage of emission value during contract year

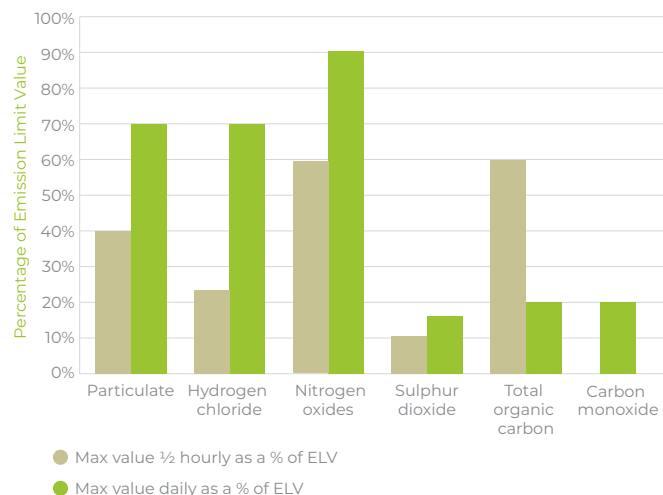


Figure 3 – Bi-annual emission values for Dioxins and Furans during the contract year

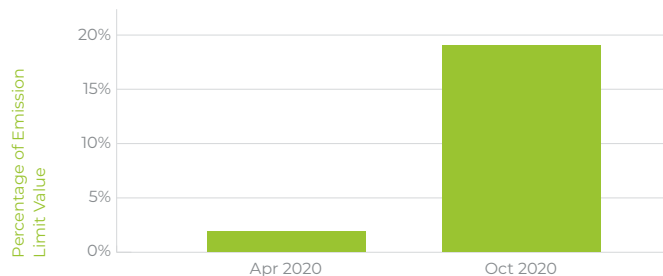
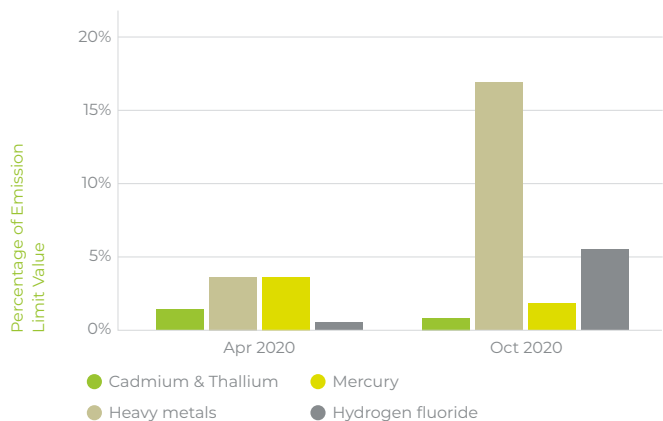


Figure 4 – Bi-annual emission values for Cadmium & Thallium, Heavy Metals, Mercury and Hydrogen fluoride during the contract year



4.5 Complaints

During the contract year there were three complaints raised at Greatmoor EfW.

The first complaint was received in December 2020. The complainant reported a continuous humming noise more noticeable at night. The incident was investigated and it was determined that no unusual or loud noises could be detected and the plant was running under normal operation. In the Community Liaison meeting the feedback from the complainant was very positive with how quickly this was dealt with by FCC. HS2 generators were reported to be the source of the noise.

The second complaint was also received in December 2020, raised by a member of public regarding a Haulage vehicle straying off route. The subsequent investigation revealed that the vehicle had a defective load sheet which required the driver to avoid the low bridges on the planned route.

The third complaint was received in March 2021, raised by a member of the public through the EA, due to a possible diesel spill in the river Ray. The EA investigated and found no diesel present but did find an increase in Ammonia levels in the river. Several samples were taken from the surrounding area and the EA are satisfied that the source is not the FCC facility, their investigation is still ongoing.

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

No IMS or BSI audits were conducted in the contract year at High Heavens WTS. Planned audits were scheduled for early 2020 but subsequently cancelled due to the outbreak of Covid 19.

Greatmoor EfW received a BSI audit on 26th October 2020 and IMS audits on 17th March 2021 and 19th September 2020. No NCRs were issued as a result of the BSI audit.

A summary of the NCRs (Non-Conformance Reports) received during internal IMS audits that were closed out during this contract year are provided in Table 8.

Table 8 - Summary of closed out non-conformances

Facility	Summary of NCR	Completed
Greatmoor	Update of the Business Risk and Opportunity register	February 2021
Greatmoor	Update of the fire risk assessment and Fire Prevention Plan	February 2021
Greatmoor	Update traffic survey, risk assessment and traffic management plan	January 2021
Greatmoor	Follow up of Legionella risk assessment and completion of routine legionella checks	January 2021
Greatmoor	Completion and update of PPE Assessment forms	January 2021
Greatmoor	Update of site responsibilities documents	November 2020

6.0 Maintenance management

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

Greatmoor EfW utilises AX Dynamics for the maintenance management system. This software package allows for detailed maintenance activity scheduling, tracking and recording of plant history to ensure successful maintenance management. During the contract year, all maintenance activities were carried out in the determined periodicity.

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 in August (postponed from May due to Covid 19).

Main works carried out include replacing missing or loose refractory tiles which was significantly more than planned. In 2019, it became evident there is a weak point with the first pass refractory tile fixings. This was further confirmed in 2020 with large amount of tiles having to be replaced. Lifecycle schedule has therefore been adjusted to accelerate tile replacement to a new fixing design. With exposed areas from missing tiles additional NDT work was carried out to determine water tube thickness losses. Repairs were made where required and detailed tube replacement plan for 2021 outage has been developed. All mechanical works for grate, fans and conveyors completed. Total refurbishment of Ash extractor was carried out following plant breakdowns in June, July and August.

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 breakdown provided in the following section. Note: delaying the outage from May to August due to COVID resulted in the delays to IBA ash extractor refurbishment between June – August.

Table 9 – Summary of major availability losses during contract year

Date	Breakdown	Returned to service date	Total loss (hours)
16/06/2020	IBA Extractor / Super heater drain tube	22/06/2020	126
29/06/2020	IBA Extractor	31/06/2020	53
01/07/2020	FGT Walking Floor cylinder traverse support	04/07/2020	53
29/07/2020	IBA Extractor blockage	30/07/2020	32
03/08/2020	IBA Extractor Blockage	05/08/2020	29
11/10/2020	IBA Extractor	14/07/2020	63
12/03/2021	Tree Trunk Blockage of Feed Hopper	15/03/2021	82
21/03/2021	Tree Trunk Blockage of Feed Hopper	23/03/2021	59
Total			497 Hours (21 Days)

IBA Extractor Forced Conveyor Repairs

Prior to the August outage there were four occasions where the Ash extractor tripped on overload due to blockages. This was caused by a combination of metal waste and equipment wear resulting in material blockage around drive sprockets and chain guides. Each occasion temporary repairs were carried out to run up to the outage. During the August outage a refurbishment of the Ash extractor was carried out where the chain, drive and non-drive sprockets were replaced complete with new sprockets guards to prevent scrap build up around the sprockets. New deflector plates were also welded in place along the internal section of each side of the chain guides to prevent build-up of waste between the side wall and chain guides.

An unplanned outage on 11th October was a precautionary inspection due to high drive motor currents. No significant findings, just minor alignment was carried out.

Tree Trunk Blockage of Feed Hopper

Two separate occasions where large tree trunks of approx. 1.0m Diameter and 2.5m in length was loaded into the waste bunkers by one of our waste supply contractors. Due to their size it was not possible to push the tree trunks onto the feeder table and burn on the grate. On both occasions the plant was shut down and cooled for access and the tree trunks were removed. The first occasion by lifting back out of the hopper with the crane and the second occasion by cutting up with a chainsaw on the grate. Investigations and discussions are currently ongoing on who offloaded the tree trunks.

Super heater drain leak

During the unplanned Ash extractor repair on 16th June, a leak on Super heater 3 drain pipework was found. Pressure systems contractor contacted and carried out a temporary patch repair. During the August outage the same contracting company replaced this and all other Super heater drain pipe sections.

FGT Walking Floor cylinder traverse support

Walking floor cylinder traverse fixings had become loose and fractured resulting in failure to traverse the walking floor. There were lessons learnt in fault finding as it was originally thought that the reasons for failure was blockage inside FGT and time was taken to open hatches to inspect internally. On further investigation fractured fixing bolts were found on the traverse cylinder support frame. During the August outage a support post was installed to remove any deflection on the traverse cylinder support frame.

7.0 Community liaison

FCC Environment 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.

Greatmoor EfW has an on-site visitor centre that hosts site tours of the facility for local community groups and schools. Tours include 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 Environment 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

In response to the UK Government's advice regarding the Coronavirus outbreak, the decision was made to postpone visits and outreach work until the Government advice changed. The Education Manager was placed on the furlough scheme until 1st September 2020.

From September, materials and presentations were revised for on-line sessions with schools, higher educational facilities and community organisations being offered the opportunity to take part.

During the contract year, 25 on-line sessions were undertaken to raise awareness on prevention, reuse and recycling. As highlighted in Table 10, a total of 423 people took part.

Table 10 - Detail of online sessions

Type of Visit	No of Session	No of Under 16s	No of Adults
Primary Schools	6	101	10
Secondary Schools	15	38	12
Higher Education	1	0	13
Community Groups	3	0	388
Total	25	139	423

7.2 Other highlights

Website

Not surprisingly visits to the website decreased this year, with a fall in visits of around 33%.

The main development in the website was the launch of a video graphic, showing the cumulative figures for waste processed and electricity generated, as well as incinerator bottom ash, air pollution control residue and visitors.

Liaison Group meetings

Community Liaison Group meetings have also taken place remotely, with 2 meetings taking place this year. The meetings have been held in conjunction with the Calvert Landfill Community Liaison Group (CLG). 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.

Local employment

There are a total of 51 members of staff working on the Contract, 44 at Greatmoor EfW and 7 at High Heavens WTS. A majority of the staff employed on the contract live within Buckinghamshire itself, with others from the local surrounding areas of Oxfordshire, Northamptonshire and Berkshire. There are a small number of staff who travel from outside of the local vicinity of the contract but the majority are from the area demonstrating good levels of local employment.

8.0 Conclusion

The fifth contract year has been successful for both BC and FCC Environment at Greatmoor EfW.

The plant has performed well, despite the challenges posed by COVID, and has built on the success of previous contract years.

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. The facilities continue to out-perform the expectations set out in the base case model.

High Heavens WTS operational availability has remained 100% for household residual waste deliveries. Greatmoor EfW operational availability achieved 87.3%, which, despite being 1.7% below the base case, still generated extra income for profit share and is a considerable achievement given the restrictions imposed by the pandemic, the unprecedented low electricity prices and the extended outage as a result of tile loss caused indirectly by the delay in performing the outage. Much of this loss was mitigated by the high level of throughput achieved at the beginning of the contract year and the improved availability (in excess of the base case) in the final 5 months.

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.

In 2020, 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 successfully. This outage contributed (along with high standards of operation and maintenance) to the sustained period of 100% availability seen post outage (the second longest waste to waste run in the plant's history so far at 143 days).

Despite the restrictions imposed by the COVID pandemic, the Greatmoor EfW website has continued to build on the strides made in previous years by the visitor centre. The Waste Education Officer has remained 'virtually active' in the local community providing online education resources and live video presentations to a wide variety of local community and educational groups. The opportunity has been taken to further develop the website with dynamic info-graphics detailing live plant operating parameters and cumulative plant statistics.

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 there have been some minor accidents resulting in harm to workers on site. FCC Environment believe all accidents are avoidable and are committed to protecting their staff, contractors and site visitors as a result all accidents were investigated and there is a continuous overview looking for common causes or threads.

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.buckscc.gov.uk/services/waste-and-recycling/energy-from-waste/

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.

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 BCC. 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 BCC 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 36,000 homes.

Nitrogen oxides (NO_x)

The term 'nitrogen oxides' (NO_x) 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.

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 BCC. 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 councils whose RCVs tip residual waste on site prior to bulk waste transfer to Greatmoor EfW.