



Neutral Citation: [2023] UKFTT 619 (TC)

Case Number: TC08860

**FIRST-TIER TRIBUNAL
TAX CHAMBER**

Taylor House

Appeal reference: TC/2019/03806
TC/2019/04185

LANDFILL TAX – whether the non-hazardous waste arising as a result of mixing two hazardous wastes, air pollution control residues (“APCRs”) and ferrous chloride arising from the production of titanium dioxide production, qualifies for the lower rate of landfill tax by virtue of being entirely “calcium based reaction waste from titanium dioxide production” within the meaning of Note (9)(a) of the Schedule to the Landfill Tax (Qualifying Material) Order 2011 -no, because, taking into account the volume of the APCR’s involved in the process, the extent to which those APCR’s contained non-reactive compounds and the fact that the reactive compounds in those APCR’s were not limited to calcium compounds, the non-hazardous waste arising from the process was not entirely composed of calcium based reaction waste from titanium dioxide production – appeals dismissed

Heard on: 12, 13, 14, 15 and 16 JUNE 2023

Judgment date: 11 JULY 2023

Before

**TRIBUNAL JUDGE TONY BEARE
MR JULIAN SIMS**

Between

**SINGLETON BIRCH LIMITED
FCC RECYCLING (UK) LIMITED**

Appellants

and

**THE COMMISSIONERS FOR HIS MAJESTY’S REVENUE AND CUSTOMS
Respondents**

Representation:

For the Appellant: Mr Akash Nawbatt KC and Mr Colm Kelly of counsel, instructed by
Stewarts Law LLP

For the Respondents: Mr James Puzey and Mr Joseph Millington of counsel, instructed by
the General Counsel and Solicitor to HM Revenue and Customs

DECISION

INTRODUCTION

1. This decision relates to appeals against an assessment dated 6 December 2018, which assessed Singleton Birch Limited (the “First Appellant”) to landfill tax (“LFT”) in the amount of £8,726,716.70 for the period 1 July 2015 to 30 June 2018. The appeals relate to the rate at which LFT should be charged on waste (the “FCC waste”) which was disposed of at the First Appellant’s site at Camp Wood, Melton Ross, Barnetby, North Lincolnshire (the “SB Landfill Site”).

2. By way of background, LFT is payable at a much lower rate on waste that consists entirely of “qualifying material” for the purposes of Section 42 of the Finance Act 1996 (the “FA 1996”). The question at issue in these proceedings is whether the FCC waste consisted entirely of “qualifying material” for that purpose.

THE RELEVANT LFT LEGISLATION

3. Section 40 of the FA 1996 imposes LFT on a “taxable disposal”, which is a disposal of material as waste made by way of landfill at a landfill site on or after 1 October 1996.

4. Section 42 of the FA 1996 provides, inter alia, that:

(1) a lower rate of LFT is chargeable “[where] the material disposed of consists entirely of qualifying material” (see Section 42(2)); and

(2) qualifying material is material for the time being listed for the purposes of the section in an order (see Section 42(3)).

5. Section 42 of the FA 1996 goes on to provide as follows:

“(4) The Treasury must—

(a) set criteria to be considered in determining from time to time what material is to be listed ...,

(b) keep those criteria under review, and

(c) revise them whenever they consider they should be revised.

(5) The Commissioners must publish the criteria (and any revised criteria) set by the Treasury.

(6) In determining from time to time what material is to be listed, ... the Treasury must have regard to—

(a) the criteria (or revised criteria) published under subsection (5), and

(b) any other factors they consider relevant.”

6. Section 50 of the FA 1996 provides, inter alia, that:

“(1) Where— ...

(d) it appears to the Commissioners that returns required to be made by a registered person under this Part are incomplete or incorrect, the Commissioners may assess the amount of tax due from the person concerned to the best of their judgment and notify it to him.”

7. Section 54 of the FA 1996 provides that an appeal may be made to the First-tier Tribunal by any person “who is or will be affected by... a decision as to how much tax is chargeable”.

8. Section 63 of the FA 1996 provides, inter alia, as follows:

“(1) This section applies for the purposes of section 42 above.

(2) The Commissioners may direct that where material is disposed of it must be treated as qualifying material if it would in fact be such material but for a small quantity of non-qualifying material; and whether a quantity of non-qualifying material is small must be determined in accordance with the terms of the direction...

(5) An order may provide that material must not be treated as qualifying material unless prescribed conditions are met.

(6) A condition may relate to any matter the Treasury think fit (such as the production of a document which includes a statement of the nature of the material).”

9. The Landfill Tax (Qualifying Material) Order 2011 (the “QMO”) is an order which was made pursuant to Section 42(3) and 63(5) of the FA 1996. The preamble to the QMO:

(1) refers to the various provisions in Section 42 of the FA 1996 noted above;

(2) refers to the fact that the Treasury has now set the criteria to be considered in determining from time-to-time what material is to be listed as qualifying material; and

(3) then goes on say that:

“Accordingly, the Treasury, having regard to the criteria published by the Commissioners under section 42(5) of Finance Act 1996 and to the other factors they consider relevant, make the following Order in exercise of the powers conferred by sections 42(3) and 63(5) of the Finance Act 1996.”

10. Turning to the operative provisions of the QMO, Articles 3 to 8 of the QMO provide as follows:

“3. Subject to articles 4 to 6, the material listed in column 2 of the Schedule to this Order (“the Schedule”) is qualifying material for the purpose of section 42 of the Finance Act 1996.”

4. The Schedule shall be construed in accordance with the notes contained in it.

5. The material listed in column 2 of the Schedule must not be treated as qualifying material unless any condition set out alongside the description of the material in column 3 of the Schedule is met.

6. Where the owner of the material immediately prior to the disposal and the operator of the landfill site at which the disposal is made are not the same person, material must not be treated as qualifying material unless it meets the relevant condition.

7. The relevant condition is that a transfer note includes in relation to each type of material of which the disposal consists a description of the material which—

- (a) accords with its description in column 2 of the Schedule;
- (b) accords with a description listed in a note to the Schedule (other than by way of exclusion); or
- (c) is some other accurate description.

8. In article 7 above “transfer note” means a transfer note within the meaning of—
 (a) the Environmental Protection (Duty of Care) Regulations 1991 1 in relation to a disposal at a landfill site in Great Britain...”.

11. The Schedule to the QMO provides, inter alia, as follows:

Column 1	Column 2	Column 3
Group	Description of material	Conditions
6	Low activity inorganic compounds	

Notes

....(9) Group 6 comprises only—

(a) calcium based reaction wastes from titanium dioxide production; ...”

12. The explanatory notes to the QMO provide that, in making the QMO, the Treasury had regard to the criteria published by the Commissioners and to other factors that they considered relevant.

THE FACTS

13. The parties have agreed certain facts in connection with the appeals and those facts are as follows:

(1) the First Appellant is registered for LFT and carries on a business as a landfill site operator at the SB Landfill Site. The First Appellant accepts waste from two businesses, FCC Recycling (UK) Limited (the “Second Appellant”, together with the First Appellant, the “Appellants” and, each, an “Appellant”) and a company which is now known as Tronox Pigment UK Limited and was, during the period to which the appeals relate, known as Cristal Pigment UK Limited (“Cristal”) at the SB Landfill Site;

(2) the Second Appellant is a waste management company. The Second Appellant’s activities include the collection of household, commercial and industrial wastes, the sorting, treatment and recycling of these wastes, the operation of landfill sites and “Energy from Waste” facilities to deal with non-recyclable wastes. The Second Appellant also operates household waste recycling centres on behalf of local authorities;

(3) the Second Appellant's waste treatment division is based in Yorkshire, with the site which produces the FCC waste located in Leeds at Knostrop, Knostrop STW, Knowsthorpe Lane, LS9 0PJ ("FCC Knostrop"). FCC Knostrop deals with a wide range of industrial bulk wastes, which may be hazardous or non-hazardous. The purpose of the treatment of the wastes is to reduce the hazard associated with the waste received and/or to make the waste more suitable for final disposal by reducing their pollution potential;

(4) Cristal is the second largest producer of titanium dioxide in the world. It manufactures titanium dioxide at its works at Stallingborough in North East Lincolnshire, England. Cristal extracts titanium dioxide pigment from ores for sale to third parties. Titanium dioxide is used in a range of industrial and consumer products, including paints, coatings, adhesives, paper, plastics and rubber, printing inks, coated fabrics and textiles, as well as ceramics, floor coverings, roofing materials, cosmetics, toothpaste, soap, water treatment agents, pharmaceuticals, food colorants, automotive products, sunscreen and catalysts;

(5) a significant waste produced from the manufacture of titanium dioxide is an acidic ferrous chloride solution (i.e. an aqueous liquid) ("FC") which is a hazardous waste due to its acid content, heavy metals and naturally occurring radiation (from the ore material). Therefore, it must be treated before disposal. Cristal has its own on-site dedicated treatment facility for treatment of the FC. It is, however, unable to treat all of the FC at its Stallingborough site;

(6) the FC resulting from Cristal's titanium dioxide production process is transported by pipeline to a storage tank within its Stallingborough site. It is then ready for treatment by Cristal in a separate dedicated on-site treatment facility or for transportation to FCC Knostrop for treatment at the Second Appellant's own dedicated treatment facility;

(7) significant components of the FC are hydrochloric acid and iron ("ferrous") salts. The FC is commonly referred to as "ferrous chloride". The hydrochloric acid content derives from the use of chlorine in the titanium dioxide manufacturing process while the other constituents derive from the action of this chlorine on the ores containing the naturally-occurring titanium compounds (as well as other constituents including the iron) which form the feedstock for the manufacturing process. The FC, which is hazardous due to its acid content, presence of heavy metals and naturally occurring radiation (from the ore material), is not suitable for re-use or recovery and therefore needs to be disposed of as a waste. Due to its hazardous nature, separate treatment of the FC is necessary before disposal of the resulting waste at the SB Landfill Site;

(8) from the storage facility, the FC is transported by pipeline to Cristal's separate on-site treatment facility at Stallingborough. A neutralisation and filter pressing treatment is used to treat the FC;

(9) the FC is treated with hydrated (or "slaked") lime (a chemical reagent, containing calcium hydroxide), in the form of a powder, which is then mixed with water for treatment purposes to form a slurry of typically 10-20% calcium content (predominantly calcium hydroxide), and which is then mixed with the FC such that the alkalinity of the calcium reacts with the acidic components of the FC (effectively removing its acidity). This chemical reaction produces a non-hazardous, non-biodegradable, calcium based reaction waste. This is the first point in time that a calcium based reaction occurs. (To avoid confusion, in the rest of this decision, we will refer to the powder which is purchased by Cristal for the purposes of the process as the

“slaked lime”, the slurry which results from mixing that slaked lime with water as the “virgin calcium hydroxide slurry” and the slurry which results from the reaction between the virgin calcium hydroxide slurry and the FC as the “neutralised slurry”);

(10) at this stage, the neutralised slurry contains a mix of:

- (a) solids existing originally in the FC;
- (b) solids precipitated during the reaction; and
- (c) unreacted calcium hydroxide,

with water containing a wide range of dissolved salts (predominantly chlorides and those other components of the virgin calcium hydroxide slurry and the waste acid, which do not form solids in the neutralisation reaction;)

(11) before disposal at the SB Landfill Site, the neutralised slurry is de-watered (i.e. water is extracted out of it) by using filter presses, which use hydraulic pressure to separate as far as practicable the solids and the liquid portion of the neutralised slurry. A solid is produced (a “filter cake”) which incorporates the great majority of the solids but also retains some of the liquid and its associated dissolved contaminants. Around 40-50% by weight of the solid is associated with this liquid. The landfilling of liquids is not permitted and, hence, the waste must be in a solid form. The separated liquid is disposed of, with other wastewaters, to the Humber estuary;

(12) the resulting filter cake (the “Cristal waste”) is then transported to the SB Landfill Site for disposal;

(13) the Respondents accept that the Cristal waste is a calcium based reaction waste from titanium dioxide production within the meaning of Note (9)(a) of the QMO (“Note (9)(a)”), which, when disposed of at the SB Landfill Site, qualifies for the lower rate of LFT;

(14) wastes that are removed from a production site are required to be classified under the List of Waste Regulations 2005 (as amended) (the “Waste Regulations”) which enact the European Waste Catalogue (the “EWC”). This requires in the first instance consideration of the production source rather than the composition of a waste. Once the source is identified, the most appropriate waste classification, considering the source, properties and composition of the waste, is selected from the list provided in the regulations;

(15) to allow an industrial waste (such as the Cristal waste) to be disposed of at a landfill site, in addition to the waste classification (under the Waste Regulations), a waste description is required on documentation in the form of a Waste Transfer Note (a “WTN”) for non-hazardous wastes and a Consignment Note (a “CN”) for hazardous wastes, as described in the Waste Duty of Care Code of Practice. This typically includes a brief description of the production process, whether the waste is solid, sludge or in packages, confirmation whether the waste has been treated, is a treatment residue or cannot be treated and details of the chemical composition. The latter would generally identify those components present in the highest proportion, their typical concentration and their most likely chemical form – “likely” because wastes may be chemically complex and the actual chemical form may not be fully known. Where a waste is considered hazardous, those constituents responsible for this classification are also identified even though they may be only a very small portion of the waste. The waste producer is responsible for completing an appropriate WTN or CN to accompany the waste when it is transferred to the landfill site operator for disposal;

(16) this information, in particular the EWC code and waste description, is required so that the landfill site can confirm, via its waste acceptance procedures, that a waste is suitable for acceptance. The waste acceptance procedures reflect general regulatory requirements, incorporated into the permit to operate the site issued by the Environment Agency (the “EA”) and any specific requirements on the control of wastes to be disposed of which are relevant to the particular landfill site – these may be reflected in the permit or referenced in the permit as “operating techniques” agreed with the EA. As the Cristal waste is a non-hazardous waste, a WTN is used for the purposes of transporting it to the SB Landfill Site for disposal;

(17) using this approach, the Cristal waste is required to be classified as “calcium based reaction residues from titanium dioxide production” with the EWC reference 061101. The classification does not describe what form of calcium is used to produce the reaction residues or the actual composition of the waste. This is to be contrasted with the position for the Second Appellant and the FCC waste. As a waste treatment facility, the Second Appellant is required to classify waste from its processes using EWC codes beginning with 19 irrespective of the description and composition of the waste. EWC codes beginning with 19 represent waste treatment activities undertaken by companies of third parties’ (other companies’) wastes;

(18) Air pollution control residues (“APCRs”) are a hazardous waste produced at “Energy from Waste” facilities. Energy from Waste facilities incinerate suitable wastes and recover the energy generated to produce electricity with the ash resulting/produced used to manufacture aggregates for the construction industry. A consequence of incineration is the production of acid gases, heavy metals, toxic persistent organic pollutants (or “POPs”) such as dioxins and fine dusts which are required to be removed from the gases produced during incineration before discharge to the air. Hydrated lime (a chemical reagent, containing calcium hydroxide) is the most common chemical used to treat these gases, whilst activated carbon is used to remove heavy metals and POPs. The resulting waste is then collected at the Energy from Waste facility as a solid hazardous waste typically called air pollution control residues or “APCRs” (effectively a mixture of partially-used and unused calcium (lime), fine ash, and used activated carbon);

(19) not all of the FC produced by Cristal is treated in the manner described in paragraphs 13(8) to 13(17) above. Some of it is instead transported by road tanker from the storage facility at Cristal’s Stallingborough site to the Second Appellant’s dedicated waste treatment facility at FCC Knostrop and mixed with APCRs in the manner described below;

(20) APCRs are produced by the following processes: different waste materials are burned under controlled conditions to ensure organic material is destroyed so as to maximise the production of heat (and subsequently electricity) and to minimise the release of unburned or partly organic material, which may cause air pollution and/or be hazardous to health. This process releases, besides energy, also hot gases, which include the air used in the combustion process, gases released during combustion, heavy metals, POPs and some carry-over of fine dusts (or fly ash). The gases released during combustion include acid gases and may also contain some POPs and heavy metals – the quantities of which are determined by the waste being burned. The predominant acid gas is hydrogen chloride (although sulphur dioxide is also produced) which is also the main source of the acidity within the FC - i.e. the waste acid arising from Cristal’s manufacture of titanium dioxide. If not controlled, these gases are air pollutants. Control is predominantly achieved by the addition of hydrated (slaked) lime

(a chemical reagent, containing calcium hydroxide), and activated carbon into the gas stream to neutralise the acid gases and absorb the POPs and the heavy metals. Excess calcium hydroxide and activated carbon are used in the process to allow for a fast reaction and to ensure a buffer against what may be variable wastes being burned. The scrubbing residues and fly ash particles are captured together by a fabric filter or similar equipment, producing APCRs;

(21) at FCC Knostrop, two storage tanks of 50 tonnes capacity are provided for the receipt of the FC from Cristal. The two storage tanks are connected directly to mixers where the treatment reactions take place;

(22) three silos are provided for the receipt of suitable solid wastes that contain, inter alia, calcium hydroxide (i.e. APCRs). These wastes may vary in density but each silo allows for the storage of 100 cubic metres of waste, which equates to 40-110 tonnes. These silos are also connected directly to the mixers where the treatment reactions take place;

(23) control of the treatment process is by the addition of measured quantities of APCRs and the FC in a batch process into an intensive mixer. The quantities of materials mixed vary depending upon the actual composition of materials being processed in each batch. APCRs are sampled prior to processing and analysed. The Second Appellant operates its own laboratory at FCC Knostrop and uses independent laboratories to undertake analyses. The introduction of the APCRs causes a chemical reaction that produces a residue (or waste) – the FCC waste;

(24) following the treatment reaction, the resulting FCC waste is emptied from the relevant mixer into a storage area to await loading onto tipper trucks to be taken to the SB Landfill Site for disposal. This storage area is dedicated to this process plant and segregated from other storage areas at FCC Knostrop. Samples of the resulting treatment wastes are regularly obtained for testing the composition of the waste. The testing is carried out at the Second Appellant's on-site laboratory and off-site at independent laboratories;

(25) the FCC waste is loaded onto the tipper trucks by a loading shovel dedicated to this operation and, prior to leaving the site, the driver of the vehicle receives a WTN describing the waste, its composition, its waste classification (EWC) code, its origin and its destination. Once the driver arrives at the SB Landfill Site, he or she presents the WTN to the landfill operator (or a letterbox, if out of working hours). Such action generates a weighbridge ticket/conveyance note that proves that the FCC waste transported was deposited at the SB Landfill Site; and

(26) SB disposes of the FCC waste at the SB Landfill Site.

THE COURSE OF THE DISPUTE

14. The dispute between the parties has taken the following course:

(1) on 24 July 2017, the Respondents wrote to the First Appellant to inform it of an ongoing investigation into landfill sites. Correspondence concerning the FCC waste and whether it qualified for the lower rate of LFT on the basis it was a qualifying material within the meaning of Note (9)(a) followed;

(2) by notice dated 6 December 2018, the Respondents issued a notice of assessment to LFT at the standard rate pursuant to Section 50 of the FA 1996 in respect of the FCC waste. The notice assessed the First Appellant to LFT in the sum of £8,726,716.70. The interest due on the tax was said to be £368,101.64;

(3) on 18 January 2019, the First Appellant requested a statutory review of the assessment;

(4) the Respondents issued a review conclusion letter dated 24 April 2019, which upheld the assessment;

(5) the Appellants submitted their appeals to the First-tier Tribunal by notice of appeal dated 22 May 2019. In their grounds of appeal, the Appellants noted that each of them was a person entitled to appeal against the assessment by the terms of Section 54 of the FA 1996 because it was or would be affected by the Respondents' decision. That was the case for the First Appellant because it was the landfill operator to whom the assessment had been issued and it was the case for the Second Appellant because the assessment related to LFT on waste disposed of at the First Appellant's landfill site following treatment at the Second Appellant's site;

(6) on 20 June 2019, the First-tier Tribunal directed that the appeals of the First Appellant and the Second Appellant should be heard together; and

(7) the Respondents filed their statement of case in these proceedings on 12 August 2019.

15. It is fair to say that, in the period prior to filing their statement of case, the Respondents were not at all consistent in giving their reasons for objecting to the application of the lower rate of LFT to the FCC waste. Critically, no mention was made of what is now the main ground of engagement between the parties – namely, whether the FCC waste was “entirely” calcium based reaction waste from titanium dioxide production. Instead, the primary focus of the Respondents' objection was that the FCC waste did not derive from titanium dioxide production because it arose as a result of a process carried out by a person other than Cristal at a location other than Cristal's titanium dioxide production premises. On at least two occasions – once in an email of 12 January 2018 from Officer Ben Rob of the Respondents to Mr Mark Sacker of the First Appellant and then again in their review conclusion letter – the Respondents accepted that the FCC waste was calcium based reaction waste but said that it did not arise from titanium dioxide production. There was also a suggestion in the Respondents' pre-assessment letter of 8 October 2018 that the FCC waste fell outside Note (9)(a) because the treatment of the FC that gave rise to the FCC waste did not take place on-site at Cristal's premises.

16. Be that as it may, since the Respondents produced their statement of case on 12 August 2019, the Respondents have made it clear that their objection to the FCC waste's qualifying for the lower rate of LFT is based on their view that the FCC waste was not entirely calcium based reaction waste from titanium dioxide production but was instead the product of bringing together two wastes - the FC arising out of titanium dioxide production and the APCRs – and that the FCC waste was therefore as much, if not more, a waste deriving from the treatment of APCRs with the FC as it was a calcium based reaction waste from the treatment of FC with the APCRs.

THE ISSUE

17. There is a considerable amount of common ground between the parties.

18. For instance, it is common ground that:

(1) the FCC waste is a waste;

(2) if the FCC waste consists entirely of “qualifying material”, then the lower rate of LFT is payable whereas, if the FCC waste does not consist entirely of “qualifying material”, then the standard rate of LFT is payable; and

(3) the part of the definition of “qualifying material” which is relevant for this purpose is Group 6 (low activity inorganic compounds) in the Schedule to the QMO, as limited by paragraph (9) of the Notes to the Schedule.

19. It is also common ground that Section 63(2) of the FA 1996 – which makes provision for the Commissioners to direct that material must be treated as qualifying material if in fact it would be such material but for a small quantity of non-qualifying material – is not in point in the present case.

20. For completeness, we should observe that the parties reached this conclusion for slightly different reasons.

21. Mr Nawbatt submitted that Section 63(2) of the FA 1996 applied on its terms only to so-called “mixed loads” – which is to say loads comprising both standard-rated materials and lower-rated materials. He then said that, since the FCC waste was simply a single material, it was not a “mixed load” and therefore the section was not in point. Mr Puzey agreed that the FCC waste was not a “mixed load”. He also agreed that the section was not in point in the present case. However, he said that that was not because the section was confined by its language to applying to cases involving “mixed loads”. Instead, he said, it was merely because the only direction which had been made pursuant to the section was the direction in paragraph 7.3 of Excise Notice LFT1 (“LFT1”) and that direction was confined in its application to “mixed loads”.

22. In any event, for present purposes, it is merely necessary for us to note that it is common ground that:

- (1) the FCC waste was not a “mixed load”; and
- (2) Section 63(2) of the FA 1996 has no application in the present context.

23. Finally, it is also common ground that:

- (1) the Cristal waste consists entirely of a calcium based reaction waste from titanium dioxide production, within the meaning of Note (9)(a), and therefore consists entirely of material which is “qualifying material” for the purposes of Section 42(2) of the FA 1996; and
- (2) this outcome is not surprising given that the terms of Note (9)(a) were a direct response by the Government to the representations which had been made by Cristal during the consultation process leading to the enactment of the QMO.

24. Accordingly, the only issue for us to determine in this appeal is whether, like the Cristal waste, the FCC waste consisted entirely of a calcium based reaction waste from titanium dioxide production, within the meaning of Note (9)(a), and therefore consisted entirely of material which was “qualifying material” for the purposes of Section 42(2) of the FA 1996.

25. Inevitably, although both parties recognised that the status of the Cristal waste was technically not in issue before us, the nature of the process leading up to the production of that waste, the content of the slaked lime and the virgin calcium hydroxide slurry used in that process and the content of the waste resulting from that process loomed large in the course of the proceedings. The Appellants quite naturally sought to demonstrate the similarities between the Cristal waste and the FCC waste in those respects, whilst the Respondents equally naturally sought to emphasise the differences in each case. Moreover, the Respondents were (quite fairly) challenged by the Appellants to explain the implications of their submissions in relation to why the FCC waste did not qualify for the lower rate of LFT on the ability of the Cristal waste to be regarded as qualifying for that rate, given the

Respondents' acceptance that the Cristal waste did do that. We will return to this in due course.

THE EVIDENCE

Introduction

26. For the purposes of the hearing, we were provided with a number of documents and the evidence of five witnesses. Two of the witnesses were Officers of the Respondents who provided witness statements outlining the history of the dispute between the parties. Their evidence was not material to the outcome of the question which we had to decide. They were not called to attend the hearing and their evidence was not challenged by the Appellants. The three other witnesses did attend the hearing. They were Mr Ian Martin, the general manager of FCC Knostrop, and two expert witnesses, Ms Leslie Heasman for the Appellants and Dr Andrew Godley for the Respondents.

The documentary evidence

27. The documents to which our attention was drawn at the hearing included the following:

(1) a paper prepared by Ms Anna Bogush and others entitled "Element composition and mineralogical characterisation of air pollution control residue from UK energy-from-waste facilities" dated 29 May 2014 (the "Bogush paper"). This included:

(a) a conclusion that calcium hydroxide, sometimes only in trace amounts, was present in each of the 8 samples of APCRs which had been tested by the authors of the paper and that the calcium hydroxide content in each sample ranged from as little as 0.8% in one sample to as high as 14% in another;

(b) a table showing the dry mass composition of the samples, which revealed that, on average:

(i) the samples were composed of 26% calcium, 17% chlorine, 2.8% potassium, 2.2% sodium, 1.5% aluminium and 1.4% sulphur; and

(ii) no other element was present in the samples to an extent which was equal to or greater than 1%;

(2) test certificates setting out the breakdown of various samples of APCRs analysed by way of X-ray spectrometry. The certificates set out the constituent elements of each sample, with each element expressed as an oxide although it was common ground that that manner of expression was just convention and that the element in question might well have been present in the relevant sample in the form of a compound other than an oxide. Although we were provided with 16 certificates in all, a summary of 5 of the certificates suffices to demonstrate the extent of the variation in the content of the samples. For example:

(a) for the first sample, received on 30 May 2014, 21.60% of the elements had been lost in the course of incineration and, of what remained:

(i) 46.7% were calcium compounds, 10.60% were silicon compounds, 9.40% were sulphur compounds, 3.20% were potassium compounds, 2.60% were magnesium compounds, 2.10% were titanium compounds, 2.10% were iron compounds and 1.20% were aluminium compounds; and

(ii) no other element was present in a compound to an extent which was equal to or greater than 1%;

(b) for the second sample, received on 26 July 2017, 23.80% of the elements had been lost in the course of incineration and, of what remained:

(i) 26.20% were calcium compounds, 19.70% were chlorine compounds, 5.75% were sodium compounds, 5.60% were silicon compounds, 5.50% were sulphur compounds, 5.44% were magnesium compounds, 4.10% were aluminium compounds and 1.41% were potassium compounds; and

(ii) no other element was present in a compound to an extent which was equal to or greater than 1%;

(c) for the third sample, received on 8 August 2017, 12.70% of the elements had been lost in the course of incineration and, of what remained:

(i) 51.50% were silicon compounds, 13.70% were calcium compounds, 5.42% were magnesium compounds, 4.94% were chlorine compounds, 3.66% were aluminium compounds, 3.23% were sulphur compounds, 1.32% were iron compounds and 1.19% were titanium compounds; and

(ii) no other element was present in a compound to an extent which was equal to or greater than 1%;

(d) for the fourth sample, received on 15 March 2018, 16.40% of the elements had been lost in the course of incineration and, of what remained:

(i) 42.50% were calcium compounds, 19.30% were chlorine compounds, 5.70% were sulphur compounds, 4.63% were magnesium compounds, 3.30% were potassium compounds, 2.43% were silicon compounds, 1.84% were sodium compounds and 1.66% were aluminium compounds; and

(ii) no other element was present in a compound to an extent which was equal to or greater than 1%; and

(e) for the fifth sample, also received on 15 March 2018, 22.80% of the elements had been lost in the course of incineration and, of what remained:

(i) 25.10% were calcium compounds, 12.8% were sulphur compounds, 12% were chlorine compounds, 11.40% were potassium compounds, 10.10% were silicon compounds and 4.09% were magnesium compounds; and

(ii) no other element was present in a compound to an extent which was equal to or greater than 1%;

(3) a table prepared by Dr Godley in which he converted the figures for the various compounds mentioned in the test certificates referred to in paragraph 27(2) above into the individual elements forming part of those compounds - by taking out the value which was attributable to the oxide component in the case of each element - and then compared the resulting figures to the comparable figures in the Bogush paper. This table, the basis of calculation of which was not challenged by Ms Heasman, showed that the average amount lost in the course of incineration in the samples was 22.12% and, of what remained:

(a) the average amount of calcium was 23.67%, the average amount of chlorine was 15.16%, the average amount of aluminium was 4.36%, the average amount of magnesium was 4.20%, the average amount of silicon was 4.16%, the average amount of potassium was 2.80%, the average amount of sulphur was 2.56% and the average amount of zinc was 1.03%; and

(b) no other element was present to an extent which was equal to or greater than 1%;

- (4) a log headed “Ash Plant 3 – Shift log” (the “ash plant log”) which contained the details of three separate neutralisation processes that took place at FCC Knostrop on a single day falling outside the period to which the appeals relate (3 July 2019). The ash plant log revealed that, on average in the three neutralisation processes which took place on that day, 3.9 tonnes of APCRs were reacting with 1 tonne of FC and that the quality of the end product of the process was described as the “Treated Ash Quality”;
- (5) a table showing the chemical composition of each of the Cristal waste and the FCC waste which showed that:
 - (a) the FCC waste was composed of calcium compounds as to 33% and the Cristal waste was composed of calcium compounds as to 25.30%;
 - (b) each category of waste contained other compounds in common, such as compounds of silicon, iron, aluminium and titanium; and
 - (c) each form of waste was composed as to over 40% of unidentified elements, which were classified as “Other”;
- (6) a safety data sheet prepared by the First Appellant for the slaked lime which was mixed with water to create the virgin calcium hydroxide slurry that was used by Cristal to neutralise the FC in the course of creating the Cristal waste. This showed that more than 90% of the slaked lime was composed of calcium hydroxide; and
- (7) a breakdown of a product called “Aqualime”, which was a virgin calcium hydroxide slurry supplied by the First Appellant to Cristal at times when Cristal’s own plant for mixing slaked lime with water to create virgin calcium hydroxide slurry was out of action. The breakdown of the product showed that:
 - (a) Aqualime was a slurry composed of slaked lime as to 20% and water as to 80%; and
 - (b) less than 1% of the slaked lime which had been used to create the Aqualime was composed of compounds other than calcium hydroxide.

The witness evidence

Mr Martin

28. Mr Martin testified that:

- (1) APCRs were a hazardous alkaline waste which would need to be treated with acid before they could be landfilled in a non-hazardous landfill site;
- (2) the reactive compounds within APCRs were predominantly calcium-based. The calcium-based reactive compounds were primarily calcium oxide and calcium hydroxide but they also included other compounds such as calcium carbonate and calcium chloride hydroxide;
- (3) the reactive compounds within APCRs also included non-calcium metal compounds, such as sodium and, possibly, aluminium compounds, but they were present to only a small extent;
- (4) APCRs also included non-reactive calcium compounds such as calcium chloride and calcium sulphate;
- (5) the breakdown of elements in the Bogush paper did not distinguish between reactive calcium based compounds and non-reactive calcium based ones within APCRs;

- (6) in his experience, based on the testing of the APCRs received by the Second Appellant, the usual range of reactive compounds within APCRs was typically 10% to 30% although it could be higher if the relevant Energy from Waste facility from which the APCRs derived was not working efficiently; and
- (7) for each sample of APCRs, the extent to which the relevant APCRs were reactive was determined by adding clean acid to the relevant sample and seeing how much of the acid was used up.
29. Mr Martin accepted that:
- (1) both the terminology used in describing the plant and the language used in the ash plant log did not “do ourselves any favours” as they suggested that the process carried out by the Second Appellant involved the treatment of the APCRs with FC, as opposed to the treatment of the FC with APCRs;
- (2) the volumes suggested by the ash plant log of approximately 3.9 tonnes of APCRs to neutralise 1 tonne of FC was typical;
- (3) a large proportion of the APCRs did not undergo a calcium based reaction with the FC; and
- (4) it was fair to say that the FCC waste was as much the treatment residue of the APCRs as it was the treatment residue of the FC.
30. Finally, as regards the Cristal waste, Mr Martin said that:
- (1) although Cristal did not use such products in the course of producing the Cristal waste, there were slaked lime products in the market which contained only 60% to 70% calcium hydroxide, instead of the greater than 90% calcium hydroxide which was to be found in the slaked lime purchased by Cristal; and
- (2) the Cristal waste would include:
- (a) elements such as carbon and silicon which were present in the FC and which did not react with the alkaline contents of the virgin calcium hydroxide slurry; and
- (b) non-reactive calcium compounds which were present in the rock out of which the slaked lime was quarried.

The expert witnesses

Introduction

31. The two expert witnesses provided their evidence concurrently. This was helpful to us as we were able to see each of them respond to points made by the other on an interactive basis.
32. There was a considerable degree of common ground between the two experts. For instance, in relation to the APCRs, both of them were agreed on the following:
- (1) because of their provenance as a waste product, the composition of APCRs was highly variable from sample to sample – as shown in the various breakdowns of APCRs described in paragraph 27 above – and therefore the components of APCRs varied considerably from sample to sample;
- (2) APCRs were not composed entirely of reactive alkaline compounds;

- (3) the reactive alkaline compounds within APCRs included various calcium based compounds such as calcium hydroxide, calcium oxide, calcium chloride hydroxide and calcium carbonate;
- (4) the calcium hydroxide in APCRs was the amount left over from the calcium hydroxide which was introduced in the course of the air pollution control process that gave rise to the APCRs – in other words, it was the excess calcium hydroxide which had not reacted with the acid gases that the calcium hydroxide had been introduced to neutralise as part of that process;
- (5) the reactive alkaline compounds within APCRs also included non-calcium metal compounds, such as oxides or hydroxides of sodium, potassium, magnesium, iron and aluminium and, according to Dr Godley but not Ms Heasman, copper, nickel, manganese and zinc;
- (6) the calcium based reactive compounds within the APCRs tended to be more reactive than the non-calcium based ones although there were some non-calcium based reactive compounds such as sodium hydroxide which could be just as reactive as the calcium based compounds; and
- (7) the non-reactive compounds in APCRs included:
 - (a) activated carbon – which was added during the air pollution control process to remove some volatile metals that were in the incinerator, gas and some organic pollutants;
 - (b) calcium chloride and calcium sulphate – which were the result of the reaction which occurred in the course of the air pollution control process between the calcium hydroxide which had been introduced as part of that process and the acid gases which the calcium hydroxide was intended to neutralise, such as hydrogen chloride and sulphur dioxide; and
 - (c) certain metal compounds within the fly ash – which arose from the burning that occurred as part of the air pollution control process.

33. Similarly, both experts were agreed that, in relation to the process giving rise to the Cristal waste:

- (1) the slaked lime originates from the excavation of calcium carbonate from quarries and the addition of water to the calcium oxide which results from heating that calcium carbonate to a very high temperature in a kiln;
- (2) more than 90% of the slaked lime is calcium hydroxide and the balance could include small amounts of other alkaline metal compounds which would react with the FC such as oxides or hydroxides of manganese, iron and aluminium, as was shown in the Aqualime breakdown, or, according to Ms Heasman but not Dr Godley, hydroxides of sodium or potassium;
- (3) the virgin calcium hydroxide slurry is produced by adding water to the slaked lime, roughly in the proportions of 80% to 20% or 90% to 10%; and
- (4) it is unclear whether:
 - (a) the water which is so used is tap water or water from Cristal's site; or
 - (b) the water has been neutralised or contains within it some alkaline elements which would react with the FC,

but it is most likely to have come from the site.

34. However, there was a difference between the experts in relation to the following issues:
- (1) the amount of APCRs which would have been required to neutralise one tonne of FC in the course of producing the FCC waste;
 - (2) the extent to which APCRs consisted of reactive alkaline compounds;
 - (3) the extent to which the reactive alkaline compounds in APCRs were calcium based; and
 - (4) the amount of slaked lime which would be required to neutralise one tonne of FC in the course of producing the Cristal waste.

The amount of APCRs which would have been required to neutralise 1 tonne of FC in the course of producing the FCC waste

35. In relation to the first issue, Ms Heasman accepted that the ratio of APCRs to FC (in producing the FCC waste) was always going to be greater than the ratio of slaked lime to FC (in producing the Cristal waste) but she suspected that the ratio was likely to be between 2 to 3 tonnes of APCRs to 1 tonne of FC (and closer to 2 tonnes than 3 tonnes, at that) whereas Dr Godley said that ratio was much higher than that.

36. Dr Godley explained that he had carried out two calculations in relation to the amount of APCRs required to neutralise 1 tonne of FC. The first calculation was based on the figures for the FC received and the treated FCC waste landfilled in each of 2016 and 2017. That gave rise to a figure of 2.37 tonnes of APCRs for 1 tonne of FC in 2016 and 3.2 tonnes of APCRs for 1 tonne of FC in 2017, an average for the two years in question of 2.9 tonnes for 1 tonne of FC. The second calculation was based on the figures which appeared in the ash plant log. That gave rise to a figure of 3.9 tonnes of APCRs for 1 tonne of FC. Both figures were more than 10 times the amount of slaked lime which was required to treat the FC at Stallingborough.

37. Ms Heasman said that both of Dr Godley's calculations were flawed.

38. The first calculation did not take into account, inter alia, the fact that:

- (1) not all of the APCRs which had been received at FCC Knostrup had been used in neutralising the FC to produce the FCC waste. Consequently, this methodology required batch by batch information to be accurate; and
- (2) in the course of carrying out the process leading to the FCC waste, water was added into the mix and not discharged as effluent. Consequently, that added water needed to be taken into account when comparing the figures for the FC received and the treated FCC waste landfilled.

39. The second calculation was flawed in that it was simply based on three samples, all of which were processed on the same day, and it was common ground that the amount of variables in APCRs meant that there was a considerable fluctuation in the constituent elements of APCRs from time to time.

40. Ms Heasman accepted that the ratio of APCRs to FC (in producing the FCC waste) was always going to be greater than the ratio of slaked lime to FC (in producing the Cristal waste) but she suspected that the true figure was somewhere in the middle of the figures produced by Dr Godley's two calculations, a figure closer to 2 tonnes of APCRs to 1 tonne of FC than 3 tonnes.

41. Ms Heasman said that, although the Cristal waste contained only a small contribution from the slaked lime and the APCRs made a somewhat larger contribution to the FCC waste, the table described at paragraph 27(5) above demonstrated that the chemical composition of

each of the FCC waste and the Cristal waste was similar. However, she accepted that, since that table showed that over 40% of each category of waste was composed of unidentified elements, they might well be more chemically diverse than the breakdown in that table suggested.

The extent to which APCRs consisted of reactive alkaline compounds

42. In relation to the second issue, Ms Heasman accepted that a significant portion of the APCRs was not reactive but said that her view (in common with that of Mr Martin) was that the usual range of reactive alkaline compounds within APCRs was between 10% and 30% whereas Dr Godley expressed the view that that figure was only between 3% to 4%.

43. Dr Godley reached his figures by comparing the amount of APCRs which was required to neutralise the FC in the course of producing the FCC waste to the amount of slaked lime which was required to neutralise the FC in the course of producing the Cristal waste. He said that, on the assumption that:

- (1) virtually all of the slaked lime used in the course of producing the Cristal waste was fully reactive;
- (2) it required, say, 140 kilograms of slaked lime to neutralise 1 tonne of FC in that case (the 140 kilograms' being in fact slightly greater than his final estimate of the actual amount of slaked lime of 119.3 kilograms which was so required, as to which see paragraph 48 below); and
- (3) it required 3.9 tonnes of APCRs to neutralise 1 tonne of FC (for the reasons he had already explained (see paragraph 36 above)),

only between 3% and 4% of the APCRs ($140/3,900 \times 100$) could be seen to be reactive. (In fact, on the basis of Dr Godley's final estimate for the amount of slaked lime that was required to neutralise the FC in the course of producing the Cristal waste, which was 119.3 kilograms per 1 tonne of FC, only a little over 3% of the APCRs ($119.3/3,900 \times 100$) would be said to be reactive).

44. Ms Heasman said that she based her figures on the measurements of total alkalinity within each batch of APCRs which the Second Appellant had made before carrying out the process in each case and the evidence of Mr Martin to that effect.

The extent to which the reactive alkaline compounds in APCRs were calcium based

45. In relation to the third issue, Ms Heasman was of the view that the reactive alkaline compounds were predominantly calcium-based and that only a negligible proportion of the reactive compounds was non-calcium based whereas Dr Godley, whilst accepting that the majority of the reactive alkaline compounds was calcium based, was of the view that that was only a slight majority and that a meaningful proportion of the reactive alkaline compounds was non-calcium based.

46. In support of his conclusion, Dr Godley pointed out that:

- (1) the amounts of calcium hydroxide in the samples of APCRs referred to in the Bogush paper varied between 0.8% and 14% and that the majority of the samples had calcium hydroxide levels of between only 1% and 2%;
- (2) the sum of the alkaline metal elements other than calcium present in the samples of APCRs in the Bogush paper amounted to 4% to 5%; and
- (3) in his view, most of the calcium which was present in the APCRs was attributable to non-reactive calcium compounds.

It was therefore unlikely that the majority was very significant, even taking into account the fact that the APCRs would have contained some calcium compounds other than calcium hydroxide which were reactive with the FC.

47. In contrast, Ms Heasman was of the view that:

- (1) the volume of calcium, relative to the volume of other elements, in the APCRs - as shown in the Bogush paper and the X-ray spectrometry test certificates referred to in paragraph 27(2) above;
- (2) the fact that many of the non-calcium metal compounds in the APCRS were less reactive than the calcium compounds; and
- (3) the volume of calcium compounds which were left in the FCC waste following the reaction,

all suggested that, even after taking into account the fact that some of the calcium compounds within the APCRs were non-reactive, by far the greater part of the reaction between the APCRs and the FC was calcium based.

The amount of slaked lime which would be required to neutralise 1 tonne of FC in the course of producing the Cristal waste

48. In relation to the fourth issue, Dr Godley said that, on the basis of a stoichiometric calculation, it required only 119.3 kilograms of calcium hydroxide to neutralise 1 tonne of FC whereas Ms Heasman said that there were a number of issues with Dr Godley's calculation. Those were as follows:

- (1) first, it was a stoichiometric calculation – in other words, a theoretical calculation in accordance with a formula. That was all very well when one was doing a theoretical chemical equation in a laboratory with no side reactions and consistent material but it had a limited role to play in industrial chemistry, where there were many more variables to take into account;
- (2) secondly, the figure produced by the calculation was inconsistent with (and too low to explain) the level of calcium which was contained in the Cristal waste after the neutralisation of the FC had occurred in the course of producing the Cristal waste;
- (3) thirdly, even the level of calcium contained in the Cristal waste was not the correct way to measure the calcium content of the slaked lime because that level of calcium did not take into account the fact that a significant amount of calcium would have been lost in the effluent from the filter press when the water was squeezed out after the reaction to create the Cristal waste. Thus, the figure produced by the calculation was an even greater understatement of the level of calcium hydroxide than was suggested by the level of calcium contained in the Cristal waste; and
- (4) finally, the calculation had been based on an assumption that the process giving rise to the Cristal waste was aimed at producing neutralised waste with a pH level of 7, whereas the process might have been aimed at producing neutralised waste with a different pH level – say between 4 and 10 or between 5 and 8. The figures were very sensitive – each unit in the pH scale was a factor of 10 – so that solving towards a pH level in excess of 7 would require a greater amount of calcium hydroxide.

49. For the above reasons, Ms Heasman was of the view that Dr Godley had understated the amount of calcium hydroxide which was needed to produce the Cristal waste. She declined to provide a precise figure herself but said that, based on an earlier calculation made by Dr Godley (by reference to the level of calcium contained in the Cristal waste) of between 187 kilograms and 260 kilograms of calcium hydroxide per 1 tonne of FC, and recognising

that that earlier calculation also did not take into account the calcium which had been lost in the effluent, she would expect the amount of calcium hydroxide required to neutralise 1 tonne of FC in the course of producing the Cristal waste to be more than 260 kilograms.

THE PARTIES' SUBMISSIONS

Introduction

50. At the hearing, Mr Nawbatt sought to advance the Appellants' case in the first instance by advancing three propositions in relation to the manner in which Section 42(2) of the FA 1996 and the QMO should be construed. Those were as follows:

- (1) first, he said that, although LFT was an entirely domestic initiative, it had been introduced as part of the steps taken by the UK to comply with EU environmental legislation and should therefore be seen as intimately linked with the EU and UK environmental legislation. It followed that, when construing the provisions of the LFT legislation purposively, the principles and aims of the environmental legislation should be borne in mind;
- (2) secondly, he said that:
 - (a) all legislation needed to be construed in the light of the background to its enactment and therefore the provision of the QMO with which we were concerned needed to be construed in the light of the consultation which preceded its enactment; and
 - (b) that consultation again revealed the intimate link between the basis on which the LFT was to be applied and the principles and aims of the overall environmental code; and
- (3) thirdly, and consistent with the first two propositions set out above, he said that the QMO needed to be construed in accordance with the Treasury criteria which had emerged from the consultation process preceding the enactment of the QMO.

The environmental legislation

51. In support of his first proposition, Mr Nawbatt referred us to the judgment of Aldous J in *Customs and Excise Commissioners v Parkwood Landfill Limited* [2002] EWCA Civ 1707 at paragraphs [9], [10], [20] and [28]. In paragraphs [9] and [10], Aldous LJ described LFT as a creature of a domestic statute which was not itself required by any provision of EU law but was a separate domestic initiative aimed at protecting the environment and enabling the UK to meet its obligations under the EU legislation dealing with environmental protection.

52. In paragraph [20], Aldous LJ noted that the FA 1996 needed to “be construed against the background of its purpose” and that there was no dispute that “one of the purposes of the Act was to promote recycling and to reduce the amount of waste going to landfill”. It followed that there would need to be a clear indication in the language of a particular provision of the Act before one could conclude that that provision produced a result that was contrary to that purpose.

53. Mr Nawbatt said that a similar point was made by the Upper Tribunal for Scotland in *Barr Environmental Limited v Revenue Scotland* [2022] UT 11 (“*Barr*”). In that case, the Upper Tribunal for Scotland had pointed out that the purpose of the LFT was to change behaviour and not just raise revenue so that there was nothing wrong with a landfill operator's seeking to reduce its LFT liability by recycling waste (see *Barr* at paragraphs [43] and [45]).

54. Mr Nawbatt then took us in some detail through various documents which revealed that the principles and aims of the environmental legislation included the fact that:

- (1) a waste hierarchy existed, pursuant to which the disposal of waste in landfill sites was at the bottom of the hierarchy and there were steps which were to be taken in relation to waste before doing so, such re-use, recycling and other recovery of waste;
- (2) the environmental impact of waste was more important than the constituent elements within waste – waste could be hazardous, non-hazardous or inert and inert waste was the most preferable of those three categories and the one at which the provisions of the QMO were aimed; and
- (3) the use of raw materials was to be discouraged. Where possible, waste should be used as a reagent in changing the pH of other waste ahead of raw materials.

55. Mr Nawbatt said that the documents which demonstrated this included:

- (1) The Waste (England and Wales) Regulations 2011 (the “Waste Regulations”), which:
 - (a) at Regulation 12 set out a “waste hierarchy” to be applied to waste which showed that the disposal of waste should be the last resort and that waste should always be re-used, recycled or otherwise recovered before disposing of it unless departing from the order of priority would achieve the best overall environmental outcome; and
 - (b) at Schedule 1, stipulated that the overall objective of waste prevention programmes and waste management plans was to protect the environment and human health by, inter alia, reducing the overall impacts of resource use and improving the efficiency of such use;
- (2) LFT1 – a general guide to LFT – which stipulated that the lower rate applied to less polluting wastes;
- (3) EU Council Directive 1999/31/EC on the landfill of waste (the “Landfill Directive”), which referred to encouraging the recovery and recycling of waste and the safeguarding of natural resources (see recitals (3) and (8) in the Landfill Directive);
- (4) the EA guidance on waste acceptance at landfills published in November 2010, which:
 - (a) explained that the objectives of the Landfill Directive included applying the waste hierarchy in the management of waste, re-using waste wherever possible and minimising landfill; and
 - (b) stated that, whilst the dilution or mixing of wastes solely in order to meet waste acceptance criteria was prohibited, “it is acceptable to mix wastes, or wastes with other materials, in order to achieve a chemical or physico-chemical change where the treatment is permitted. For example, mixing acids and alkalis to adjust pH is an acceptable treatment – provided that it does not result in a waste which is prohibited because, for example, it is liquid or corrosive”;
- (5) the Guidance on applying the Waste Hierarchy produced by the Department for Environment Food and Rural Affairs (“DEFRA”) in June 2011, which:
 - (a) demonstrated, by means of an inverted triangle, that disposal was at the bottom of the hierarchy and was to be allowed only where none of the previous levels of the hierarchy applied, those being (in order) prevention, preparing for re-use, recycling or other recovery; and
 - (b) stipulated that good environmental practice included the protection of natural resources;

(6) the Guidance on applying the Waste Hierarchy to Hazardous Waste produced by DEFRA in November 2011, which:

(a) set out certain principles, one of which was that, in applying the hierarchy, hazardous waste producers and managers should take into account the resource value of hazardous waste, the need to maintain health and safety and delivering the best environmental outcome and another of which was that hazardous waste should be landfilled only “where, overall, there is no better recovery or disposal option”; and

(b) contained an appendix describing APCRs, which included a reference to their being recovered by being used as a replacement for raw material and gave as an example of that the use of lime-based APCRs as a replacement for raw lime;

(7) the Commission Implementing Decision (EU) 2018/1147 establishing best available techniques (“BAT”) conclusions for waste treatment under Directive 2010/75/EU on industrial emissions, which stated that, in order to use materials efficiently, BAT was to use waste instead of other materials for the treatment of waste and gave as an example the use of waste alkalis for pH adjustment; and

(8) the permit granted to each Appellant and Cristal by the EA, each of which contained a condition requiring the relevant operator, in relation to the permitted activities, to take appropriate measures to ensure that raw materials and water were used efficiently and to review at least every four years whether there were suitable alternative materials that could reduce the environmental impact or there were opportunities to improve the efficiency of raw material and water use.

56. In relation to Mr Nawbatt’s first proposition, Mr Puzey did not deny that the general environmental principles and aims could be helpful in construing the LFT legislation but merely noted that that approach had its limits. He drew our attention to the judgement of Lady Rose JSC in *Devon Waste Management Limited and others v The Commissioners for Her Majesty’s Revenue and Customs; Biffa Waste Services Limited v The Commissioners for Her Majesty’s Revenue and Customs* [2021] 4 WLR 89 at paragraph [68] in which Lady Rose JSC observed that “such broad brush policy goals are not usually helpful in determining where more precisely the line was intended to be drawn by Parliament between what is a taxable disposal and what is not.” Whilst he accepted that Lady Rose JSC was addressing a different generic question in that case – namely the question of whether there had been a taxable disposal at all, as opposed to the question of what rate to be applied to a disposal – he said that the same caveat was pertinent in relation to whether or not the lower rate of LFT applied.

57. Similarly, the decision in *Barr* was of limited relevance in the present case. Not only was it a decision of the Scottish courts in relation to Scottish landfill tax – and therefore not binding in the present proceedings. It was also that the case related to the use of recycled materials for infrastructure at landfill sites, as opposed to the disposal of material as waste at landfill sites. For all its qualities as non-hazardous waste, the FCC waste was still waste.

58. In this case, whether or not it was good environmental practice to extend the lower rate of LFT to a product combining FC and APCRs was irrelevant in light of the fact that the statute required material to be entirely qualifying material in order to fall within the ambit of the lower rate.

59. Mr Puzey added that, in any event, the Appellants had failed to demonstrate that the use of waste in this way did meet the environmental objectives of the LFT. The LFT was a landfilling tax and the result of combining the two wastes was to increase the amount going to landfill. Moreover, the Appellants had produced no analysis to make good their

proposition that the FCC waste was better for the environment than the Cristal waste. It was not sufficient to say that because a waste product was being used instead of a virgin product to neutralise the FC, that made it more environmentally friendly. That did not take into account the amount of APCRs which were being used to produce the FCC waste or the environmental costs of doing so and of transporting the APCRs, the FC and the FCC waste.

60. Mr Nawbatt pointed out that the unchallenged evidence of Ms Heasman had been that the use of APCRs to neutralise the FC was environmental BAT.

The consultation

61. In support of his second proposition, Mr Nawbatt referred us to the recent Supreme Court Decision in *R (Project for the Registration of Children as British Citizens) v Secretary of State for the Home Department; R (O) v Secretary of State for the Home Department* [2022] UKSC 3 (“*R(O)*”) at paragraphs [29] to [31] and [58] to [63]. He said that the judgments in that case made it clear that, in construing a statute, it was necessary to consider the context in which the legislation was enacted. That included primarily other provisions in the same section, group of sections or statute but also included, as secondary aids to interpretation, external material such as explanatory notes and consultation documents preceding the enactment of the legislation in question. Those materials disclosed the context in which the legislation had been enacted. Thus, whilst the external aids could not displace the meanings conveyed by the words of the statute which, after consideration of that context, were clear and unambiguous and did not produce absurdity, they were relevant in assisting the court to establish the meaning of the legislation, whether or not there was ambiguity or uncertainty in the wording. Indeed, that context might well reveal ambiguity and uncertainty which would otherwise not be perceived.

62. Mr Nawbatt then took us in some detail through the consultation which preceded the enactment of the QMO. He said that that consultation demonstrated that:

- (1) the stated purpose of the consultation process was to review the legislation governing, inter alia, wastes that qualified for the lower rate of LFT and the way in which the legislation reflected environmental protection legislation and waste industry practice; and
- (2) the consultation document made it clear that LFT had a central role in supporting waste policy.

63. Mr Nawbatt said that the documents which demonstrated this included:

- (1) the consultation document itself, which, at paragraph 2.17, encouraged the use of waste as a substitute for virgin material;
- (2) the impact assessment, which made it clear that the lower rate was to be confined to those wastes which qualified as inert under the Landfill Directive and that the reduction of the use of natural resources remained at the top of the policy agenda;
- (3) the representations made by Cristal in the course of the consultation as to why the Cristal waste ought to qualify for the lower rate, which said that:
 - (a) the reasons why the Cristal waste ought to qualify for the lower rate were that the Cristal waste was not bio-degradable, did not produce landfill gas, was deemed to present a low risk to ground and surface water and was subject to a short after-care period; and
 - (b) 88.2% of the overall carbon footprint of the process giving rise to the Cristal waste was attributable to the use of the slaked lime.

Mr Nawbatt said that, since it was common ground that the terms of Note (9)(a) had been drafted to accommodate the Cristal waste, these points were significant. The FCC waste also met all of the conditions set out in paragraph 63(3)(a) above and the use of APCRs instead of slaked lime to create the FCC waste gave rise to a significantly reduced carbon footprint);

(4) the Government's response to the consultation responses, in which it again reiterated that a central purpose of LFT was to encourage the greater re-use of waste materials as an alternative to disposal and to make the lower rate available for less polluting material such as inert waste; and

(5) Brief 08/11, which was published following the consultation, in which the Respondents explained that the changes that were about to be made would improve the LFT's environmental effectiveness and align the wastes which would be subject to the lower rate with the new criteria for lower rating to be published by the Treasury.

64. In relation to Mr Nawbatt's second proposition, Mr Puzey noted that *R(O)* had made it plain that, where the words of the legislation were unambiguous and clear, and did not produce absurdity, there was no need to resort to secondary material such as consultation documents. In this case, he said, the word "entirely" was unambiguous and clear and did not give rise to any absurdity. There was therefore no need to resort to the terms of the documents which were part of the consultation process in order to construe the legislation.

65. In response, Mr Nawbatt said that Mr Puzey had not taken into account the fact that Lady Rose JSC had said that looking at the secondary materials might well reveal an ambiguity or uncertainty which was not apparent simply by looking at the words of the legislation themselves. As such, secondary materials should always be considered when construing legislation even though he accepted that, if, having done so, the words of the legislation were unambiguous and clear and did not give rise to absurdity, they could not be displaced by anything contained in the secondary materials.

The Treasury criteria

66. In relation to his third proposition, Mr Nawbatt sought to rely on the decision of the First-tier Tribunal in *Augean North Limited and Augean South Limited v The Commissioners for Her Majesty's Revenue and Customs* [2021] UKFTT 0230 (TC) ("*Augean*"). In that case, the First-tier Tribunal had rejected the Respondents' submission to the effect that the LFT "tertiary legislation" in LFT1 should be construed in the light of the Treasury criteria. Mr Nawbatt said that, in the course of doing so, the First-tier Tribunal had, in paragraph [57] of its decision, reiterated the importance of applying the Treasury criteria in construing the secondary legislation in the QMO.

67. Mr Nawbatt also placed reliance on the fact that the terms of the QMO itself made reference to the criteria and the role which the criteria had played in determining the materials which qualified for the lower rate. He explained that the Treasury criteria had been published on 21 December 2010 as a result of the consultation process and they were that waste:

- (1) should be non-hazardous;
- (2) should be low carbon-emitting (for example, inert waste and waste with little or no organic content such as inorganic residues); and
- (3) should have a low polluting potential in the landfill environment and have significantly less stringent after-care requirements.

68. Mr Nawbatt said that the link between the criteria and the terms of the QMO could be seen both in the language of the QMO itself and in the document of 21 December 2010 in which the criteria were published. The reason why Group 6 included low activity inorganic compounds such as calcium based reaction waste from titanium dioxide production was that those compounds met all three of the criteria. It followed that the provisions of Note (9)(a) must necessarily be construed in the light of the criteria.

69. Mr Nawbatt stopped short of saying that waste which clearly fell outside the language in the Schedule to the QMO could nevertheless be treated as falling within that language simply because it met the Treasury criteria. However, he said that the criteria should be used as an aid to construing the language and should be a factor which was taken into account in considering whether a particular category of waste fell within the scope of the Schedule.

70. In relation to Mr Nawbatt's third proposition, Mr Puzey agreed that the Treasury criteria had a role to play in construing the language used in the Schedule but said that that was not the same as saying that simply satisfying the criteria should be sufficient to bring material within the scope of the Schedule. There were items within the Schedule which did not satisfy the criteria – such as bottom ash and fly ash in Note (7) to the Schedule - and similarly there would be items satisfying the criteria which did not fall within the language of the Schedule. That was because, in drafting the QMO, the Treasury were required to take into account not only the criteria but also “other factors they consider relevant”.

The substantive question

Introduction

71. As for the application of the legislation, when construed as described above, in the light of the evidence, it was common ground that:

- (1) the language of Section 42(2) of the FA 1996 and Note (9)(a) did not require that, in order to qualify for the lower rate, a waste needed to be composed entirely of calcium reacted compounds;
- (2) the language was not focused on the elements which were the components of the waste but rather on the reactions which had led to the waste; and
- (3) the reactions giving rise to the creation of the FCC waste were primarily between calcium compounds within the APCRs and the FC.

72. However, there was a disagreement between the parties in relation to the extent to which waste needed to be the product of a reaction between calcium compounds and the FC in order to satisfy the statutory language.

73. Mr Nawbatt said that, since:

- (1) the reactions giving rise to the creation of the FCC waste were primarily between calcium compounds within the APCRs and the FC; and
- (2) the FC was a by-product of the production of titanium dioxide,

it followed that the FCC waste was entirely a calcium based reaction waste from titanium dioxide production and therefore fell within the ambit of Note (9)(a). The fact that the same reaction also involved the neutralisation of the alkaline content of the APCRs with FC was neither here nor there.

74. In response, Mr Puzey submitted that the FCC waste was as much, if not more, a product of neutralising the APCRs with the FC as it was the other way around. The mere fact that the reactions giving rise to the creation of the FCC waste were primarily between calcium compounds within the APCRs and the FC arising from titanium dioxide production

did not mean that the resulting waste was entirely calcium based reaction waste from titanium dioxide production given the presence of substantial non-reactive material within the APCRs and the amount of APCRs that was required to be used in the course of the process giving rise to the FCC waste.

The reactive portion of the APCRs

75. In terms of the detailed submissions, Mr Nawbatt said that the evidence of Mr Martin and Ms Heasman was that approximately 10% to 30% of the APCRs was composed of alkaline compounds which reacted with the FC and that those reactive compounds were predominantly calcium based compounds. The reactive calcium compounds included not only calcium hydroxide but also other calcium compounds such as calcium carbonate, calcium oxide and calcium chloride hydroxide. In addition, the Bogush paper revealed that an average of 26% of the APCRs samples analysed was composed of calcium and that, on average, calcium was the predominant element in those samples.

76. In response, Mr Puzey said that, even if we were to accept the evidence of Mr Martin and Ms Heasman to the effect that only 10% to 30% of the APCRs was reactive, that still meant that between 70% and 90% of the APCRs was non-reactive. He added that:

(1) some of the calcium which was present in the FCC waste was the result of the fact that the APCRs themselves were the product of a reaction between calcium hydroxide and other waste material, producing non-reactive calcium compounds such as calcium sulphate and calcium chloride. To the extent that the calcium present in the FCC waste was referable to those compounds, that calcium was not the result of a calcium based reaction with the FC resulting from titanium dioxide production; and

(2) not all of the reactive compounds in the APCRs were calcium-based. For example, one of the X ray spectrometry test certificates for the APCRs -see paragraph 27(2)(e) above - showed that some 11.40% of that particular sample consisted of potassium, another potentially reactive compound.

The amount of the APCRs

77. Mr Puzey said that, in addition to the high proportion of the APCRs which was non-reactive, the process required a significant amount of APCRs to be used to neutralise the FC at FCC Knostrop in comparison to the amount of slaked lime which was used to neutralise the FC at Stallingborough. The evidence of both Mr Martin and Dr Godley was that it typically required around 3.9 tonnes of APCRs to neutralise 1 tonne of FC at FCC Knostrop whereas the evidence of Dr Godley was that it required only 119.3 kilograms of slaked lime to neutralise 1 tonne of FC at Stallingborough.

78. Mr Nawbatt accepted that the amount of APCRs which were used to treat the FC at FCC Knostrop was greater than the amount of the slaked lime which was used to treat the FC at Stallingborough. However:

(1) relying on this comparison failed to take into account the fact that using one waste product to neutralise another (instead of using virgin raw materials) was consistent with BAT and higher up the waste hierarchy;

(2) the comparison was misleading because the slaked lime was only 20% of the virgin calcium hydroxide slurry which was applied to the FC at Stallingborough. The amount of the slurry was therefore five times greater than the amount of the slaked lime which was being used there; and

(3) insofar as Mr Puzey was relying on the evidence of Dr Godley to establish both sets of figures, Dr Godley's calculations were faulty, for the reasons given by Ms Heasman.

79. Mr Puzey said that he was not relying solely on the evidence of Dr Godley in relation to establishing the proportion of APCRs to FC. The ratio of 3.9 tonnes to 1 tonne was the ratio revealed by the ash plant log and Mr Martin, in giving his evidence, had said that that ratio was typical. It was true that Dr Godley had also come to the same ratio but, in any event, Mr Martin was the most reliable witness in this context because he was responsible for actually carrying out the process.

80. Mr Puzey went on to say that, taking the proportion of the APCRs which were non-reactive along with the ratio of APCRs to FC, it could be seen that, necessarily, a significant proportion of the FCC waste – somewhere between 57% (assuming that 70% of the APCRs was non-reactive) to 72% (assuming that 90% of the APCRs was non-reactive) - of the FCC waste did not result from a reaction between the alkaline compounds within the APCRs and the acidic FC. Moreover, that was before taking into account the fact that not all of the reactive compounds in the APCRs were calcium-based (as noted in paragraph 76(2) above).

Comparison with the Cristal waste

81. Mr Nawbatt submitted that the experts had agreed that the virgin calcium hydroxide slurry which was used by Cristal to neutralise the FC contained elements which were not calcium compounds and that some of those elements were alkaline and therefore reacted with the FC when the slurry and the FC were mixed. Those elements were attributable to certain impurities in the quarries from which the calcium carbonate which gave rise to the slaked lime derived and to the water in which the slaked lime was diluted to create the slurry which was then mixed with the FC. It followed that there was no meaningful difference between the FCC waste and the Cristal waste in this respect. Both wastes were the product of applying an alkaline solution which included calcium hydroxide to the FC arising from titanium dioxide production in circumstances where elements other than calcium were present in that alkaline solution and where some of those elements were themselves reactive with the FC.

82. Moreover:

(1) since only 20% of the virgin calcium hydroxide slurry which was used in the process at Stallingborough consisted of slaked lime (as a result of the dilution which occurred prior to the reaction), the proportion of the slurry which consisted of calcium hydroxide was similar to the proportion of the APCRs which was reactive; and

(2) the calcium compound content of the FCC waste following the treatment of the FC with APCRs at FCC Knostrop was 33% whereas the calcium compound content of the Cristal waste following the treatment of the FC with virgin calcium hydroxide slurry at Stallingborough was 25.3%.

Consequently, if we were to accept Mr Puzey's submission that the FCC waste did not consist entirely of calcium based reaction waste from titanium dioxide production, then we would necessarily have to conclude that the same was true of the Cristal waste and that was both contrary to the position agreed between the parties and hard to reconcile with the fact that the language in Note (9)(a) was a direct response to the representations made by Cristal in the course of the consultation which had led to the enactment of Note (9)(a).

83. In response, Mr Puzey said that it was incorrect to liken the impurities in the APCRs to the impurities in the virgin calcium hydroxide slurry which was used to treat the FC at Stallingborough. That was because:

(1) first, the fact that the specification of the slaked lime used at Stallingborough was that it was at least 90% calcium hydroxide did not mean that 10% of the slaked lime consisted of compounds other than calcium hydroxide. It was merely an assurance that those compounds would not exceed 10% of the slaked lime. That was an assurance on which customers would rely and therefore it was highly likely to be a conservative estimate. The experts were agreed that the slaked lime which was used at Stallingborough had a high degree of purity. The breakdown of the Aqualime which had been supplied to Cristal showed that 99.4% of the slaked lime which was dissolved in that solution was pure calcium hydroxide so that there were very few reactive alkaline elements in the slaked lime other than calcium hydroxide. This was very different from the level of non-calcium based compounds in the APCRs; and

(2) secondly, the water used in the slurry at Stallingborough was necessary in order for the neutralisation of the FC to proceed. The water was an essential part of the process as the calcium hydroxide had to be diluted for the purposes of the calcium based chemical reaction with the FC to occur. It was therefore very different from the non-calcium based compounds in the APCRs, whose existence was not necessary for the reaction with the FC to take place.

84. He added that the experts were agreed that it would be impossible for an industrial reaction to proceed on the basis of a single reaction with no side reactions taking place. It would therefore be unreasonable and impracticable for the waste classification in Note (9)(a) to be limited to a waste that was wholly or solely referable to a single element. Since Note (9)(a) had been introduced specifically to cover the Cristal waste, it necessarily followed that the presence of minute quantities of contaminants in the virgin calcium hydroxide slurry should not prevent the resultant waste from being regarded as entirely qualifying waste. To adopt any other approach would be absurd given the origins of the drafting. However, the FCC waste was not the Cristal waste. The level of the non-calcium based compounds in the APCRs was significant.

85. Mr Nawbatt said that:

(1) no evidence had been provided as to the precise level of contaminants in the slaked lime which was the basis of the virgin calcium hydroxide slurry used by Cristal in the course of neutralising the FC to give rise to the Cristal waste. The 99.4% figure cited by Mr Puzey was a dry weight analysis of Aqualime - a product which was supplied to Cristal but which was not used in the production of the Cristal waste; and

(2) the word “entirely” in Section 42(2) of the FA 1996 was concerned with quantity and not quality and, since between 40% and 50% of the Cristal waste was comprised of water, its presence could not simply be disregarded in determining whether the Cristal waste was entirely composed of calcium based reaction waste. Even if quality was the significant issue, the water used to dilute the slaked lime would inevitably contain some contaminants. That would be the case even if the water was tap water. Moreover, there was no evidence that the water which was used to dilute the slaked lime in preparing the slurry was tap water. The experts were of the view that it was more likely to have been water from Cristal’s titanium dioxide production plant, in which case the level of contaminants in the water would be even greater.

The nature of the process

86. Mr Puzey said that the process whereby the FCC waste was created could just as easily (if not more accurately) be described as the treatment of the APCRs with FC as it could the treatment of the FC with APCRs. The purpose of the process at FCC Knostrop was very different from the purpose of the process at Stallingborough. In that regard:

(1) it was instructive to see how Mr Martin had described the origins of the process at FCC Knothrop in his witness statement. Mr Martin had said that, in the early 2000s, the Second Appellant had recognised that the UK municipal and commercial waste market was changing away from landfilling towards the construction of Energy from Waste facilities, the result of which was likely to be a significant growth in the level of calcium hydroxide wastes and that those wastes would require an appropriate treatment prior to disposal; and

(2) the true nature of the process was also implicit in the language used by the Second Appellant in relation to the process. The plant where the APCRs and the FC were processed was called the “Ash Plant”, the log which the Second Appellant used to record the process was called the “Ash Plant Log” and that log contained a column headed ‘Treated Ash Quality’. In each case, the “Ash” in question was the APCRs and not the FC, thereby revealing that the Second Appellant saw the process as involving the neutralisation of the APCRs with FC, and not vice versa.

87. In response, Mr Nawbatt said that the fact that the process was most appropriately described as the neutralisation of the FC, instead of the neutralisation of the APCRs, could be seen in the fact that not all of the APCRs received by the Second Appellant were used to treat the FC from Cristal. APCRs were tested, both by third parties before being brought to FCC Knothrop and on-site by the Second Appellant itself, to ensure that they were appropriate for neutralising the FC. The above features demonstrated that the process whereby the FCC waste was created should properly be regarded as involving a calcium based reaction and therefore that the entirety of the FCC waste should properly be regarded as a calcium based reaction waste from titanium dioxide production within the meaning of Note (9)(a).

Statutory construction

88. In conclusion, Mr Nawbatt noted that:

(1) the use of a hazardous waste (the APCRs), instead of virgin raw materials (the slaked lime which was used in the process at Stallingborough) was consistent with the principles and aims of the environmental legislation and, in particular, the waste hierarchy and BAT;

(2) treating the FCC waste as falling within the ambit of Note (9)(a) was consistent with the purpose of that provision, as determined from the consultation process which gave rise to the provision; and

(3) the FCC waste satisfied all three of the Treasury criteria set out in paragraph 67 above.

Treating the FCC waste as falling within the ambit of Note (9)(a) was therefore entirely consistent with the principles of statutory construction he had described in his three propositions set out in paragraph 50 above.

89. Mr Puzey said that none of the above-mentioned aids to construction could override the fact that, on the plain meaning of the language in the legislation, the FCC waste did not consist entirely of calcium based reaction waste from titanium dioxide production and therefore the FCC waste did not fall within the ambit of Note (9)(a). The FCC waste was simply a combination of two wastes, some parts of which reflected a calcium based reaction. Moreover, a majority of the FCC waste consisted of elements which had not reacted. Even if one assumed that 30% of the APCRs was reactive, which was the top of the range provided by Mr Martin and Ms Heasman, that still meant that more than half of the FCC waste did not consist of a reaction waste deriving from titanium dioxide production.

The WTN

90. As an aside, both parties agreed that the question of whether the description of the FCC waste in the WTN - as “sludge consisting of calcium based residues from the treatment of acid from titanium oxide” – complied with Articles 6 and 7 of the QMO was ultimately redundant in terms of resolving the appeals. Mr Nawbatt maintained that the description was accurate whilst Mr Puzey maintained that it was not. However, since each party’s position on this question accorded with its position in relation to whether or not the FCC waste fell within the ambit of Note (9)(a), it was recognised that the answer to the question would have no bearing on the outcome of the appeals. If Mr Nawbatt was right to say that the FCC waste fell within the ambit of the language in Note (9)(a), then, by definition, the language used by the Second Appellant in the WTN would be correct. Conversely, if Mr Puzey was right to say that the FCC waste fell outside the ambit of the language in Note (9)(a), then, by definition, the language used by the Second Appellant in the WTN would be incorrect. It followed that, in either case, the answer to the WTN question would not be determinative of the appeals.

FINDINGS OF FACT

Introduction

91. We have set out in paragraphs 32 and 33 above a number of points on which both of the expert witnesses were agreed. We find each of those statements to be a fact for the purposes of the appeal.

92. However, there are various other findings of fact to be made in the light of the evidence, particularly because, as noted in paragraphs 34 to 49 above, there were a number of points on which the expert witnesses did not agree.

93. Before setting out our conclusions in relation to the issues on which the experts did not agree, we will make some general observations about the witnesses.

94. We considered Mr Martin to be an open and frank witness. Moreover, although he was not an expert witness, his qualifications included a degree in Environmental Science and Occupational Hygiene, an MSC in Public Health Engineering, Certificates of Technical Competence in Hazardous Waste Treatment and Transfer and various relevant professional memberships. Most importantly, as the general manager of FCC Knostrop throughout the relevant period, he had had first-hand experience of the workings of the site and the process involved in converting the FC and APCRs into the FCC waste and he had also been provided with information about the content of the Cristal waste by SLR, the consultants to Cristal. We have therefore placed considerable weight on his evidence in reaching our conclusions of fact.

95. Both of the expert witnesses were eminently well qualified to address the matters at hand. However, that is not to say that we did not find certain aspects of their evidence troubling.

96. In our view, Dr Godley was a little more enthusiastic about advancing his client’s case than we would have liked, given that his role was to assist us in providing independent and objective factual information about the nature of the chemical processes which gave rise to the FCC waste and the contents of the materials which were used in those processes and not to provide us with his view on why the FCC waste was not entirely calcium based reaction waste from titanium dioxide production. For instance, in giving his evidence:

- (1) he provided inconsistent responses to questions about the relative reactivity of the various reactive compounds in the APCRs. Initially, he said that there was no meaningful difference in reactivity between the calcium based reactive compounds and

the non-calcium based reactive compounds within the APCRs (such as iron and aluminium compounds) but he later accepted that the calcium based reactive compounds might be more reactive than those non-calcium based reactive compounds, and that one would therefore need a greater amount of the latter to achieve the same level of reaction;

(2) he provided inconsistent responses to questions about whether or not the majority of the reactive compounds in the APCRs were calcium based. At various points, he maintained that, because the level of calcium hydroxide in the ACPRs was very low and most of the calcium which was present in the APCRs was in the form of non-reactive compounds, the majority of the reactive compounds within the APCRs were not calcium-based. However, he eventually accepted that that was not the case and that the majority (albeit only a small majority) of the reactive compounds in the APCRs were calcium-based;

(3) he declined to answer questions about the relative proportions of non-calcium based reactive compounds to calcium based reactive compounds within APCRs without reference to the volume of APCRs which was required to neutralise the FC, even though the latter self-evidently had no impact on the proportion of the reactive compounds within the APCRs which was calcium based;

(4) he insisted that, despite:

(a) his own initial calculation of the amount of calcium hydroxide which was needed in the process leading to the Cristal waste, based on the calcium left in that waste, as being between 187 and 260 kilograms of calcium hydroxide to 1 tonne of FC; and

(b) his acceptance that the calcium left in the Cristal waste did not take into account any calcium which was inevitably lost in the effluent arising out of the process,

the correct figure for the calcium hydroxide used in the process at Stallingborough was not materially different from 119.3 kilograms per 1 tonne of FC, based on the stoichiometric calculation, a much lower figure than his own initial calculation; and

(5) when asked about the level of the impurities in the water content of the virgin calcium hydroxide slurry, he was anxious to point out that, if that water stemmed from the Cristal site, then the relevant impurities were derived from titanium dioxide production.

97. Ms Heasman appeared to us to be more independent and objective and less partisan in the evidence she provided and we have therefore preferred to accept her evidence over that of Dr Godley where the two were in conflict and there was no other evidence available. However, we were perplexed by Ms Heasman's failure to ask the Appellants (and, through the Appellants, Cristal) for information in relation to the amounts of APCRs and FC required to produce the FCC waste or the amounts of slaked lime and FC required to produce the Cristal waste and, on the basis of that information, to come up with her own calculations in relation to those matters.

98. That information was readily available. In giving his evidence, Mr Martin said that the Second Appellant had maintained batch-by-batch records of the amounts of APCRs and FC which had been used in the course of giving rise to the FCC waste - as exemplified by the ash plant log - and that he had access to information in relation to the composition of the Cristal waste from Cristal's consultants, SLR, who were also consultants to the First Appellant.

99. Ms Heasman could therefore reasonably have asked Mr Martin to provide batch-by-batch records of the amounts of APCRs and FC which were used on each occasion that the process leading to the production of the FCC waste was carried out and to obtain information from SLR in relation to the amounts of slaked lime and FC which were used by Cristal on each occasion that the process leading to the production of the Cristal waste was carried out.

100. In relation to the former information, although it is possible that the batch-by-batch records for the period to which the appeals relate were no longer available, neither Ms Heasman nor Mr Martin appears to have checked whether or not that was the case and, in any event, the batch-by-batch records in relation to more recent periods would have given considerable insight into the answer to the question. Thus, Ms Heasman had ready access to information which would have enabled her to make an informed calculation of the amounts of APCRs and FC which were used in the course of creating the FCC waste and she had the opportunity to ask Mr Martin to ascertain from SLR information in relation to the amounts of slaked lime and FC which were used by Cristal on each occasion that the process leading to the production of the Cristal waste was carried out.

101. Ms Heasman did not ask for any of that information. Instead, she confined herself to commenting on the deficiencies in the methodologies used by Dr Godley in attempting to answer the questions despite the fact that Dr Godley did not have access to the same level of information as she did. This meant that Ms Heasman was not as helpful to us as she could have been.

102. The matters to which we have referred above have made it very difficult for us to reach conclusions of fact beyond those which are set out in paragraphs 32 and 33 above. All that can be said with any certainty, because all three witnesses agreed on this, is that:

- (1) a significant part - at least 70%, if not more - of the material comprising the APCRs was not reactive with the FC; and
- (2) most of the reactive material in the APCRs – more than 50%, if not more - was calcium based.

103. We accordingly find the matters set out in paragraph 102 above to be additional facts for the purposes of this decision, although they are subject to our more detailed findings of fact on those questions in paragraphs 107 to 111 below.

The four areas of disagreement

104. The findings of fact set out in paragraphs 32, 33 and 102 above are, in our view, sufficient to dispose of this appeal, for reasons which will become apparent in the section of the decision which follows. Nevertheless, in case the appeal should go further, we set out below our conclusions in relation to the matters which were in dispute between the experts and our reasons for those findings.

The amount of APCRs which would have been required to neutralise 1 tonne of FC in the course of producing the FCC waste

105. As regards the first issue, we consider that, Dr Godley's second calculation of 3.9 tonnes of APCRs for 1 tonne of FC is likely to be more accurate than either Dr Godley's first calculation or Ms Heasman's calculation. We say that because:

- (1) 3.9 tonnes of APCRs for 1 tonne of FC are the figures suggested by the ash plant log; and
- (2) Mr Martin said that, in his view, that ratio was "typical" and Mr Martin was responsible for running FCC Knostrop.

106. Therefore, to the extent that it is relevant, we find as a fact that the amount of APCRs which would have been required to neutralise 1 tonne of FC in the course of producing the FCC waste was 3.9 tonnes.

The extent to which APCRs consisted of reactive alkaline compounds

107. As regards the second issue, we again consider the evidence of Mr Martin to be determinative.

108. Mr Martin said that each batch of APCRs was tested for alkalinity with clean acid before it was used in the neutralisation process and that, on the basis of that testing, the usual range of reactive compounds within the APCRs was 10% to 30%. We have already said that we considered Mr Martin to be a reliable and credible witness and that, as the person with responsibility for the process, his evidence is compelling. On that basis, we prefer his estimation of the degree of reactivity of the APCRs over the more theoretical estimation of Dr Godley.

109. It follows that, to the extent that it is relevant, we find as a fact that the usual range of reactivity of the APCRs was 10% to 30% and our finding of fact in paragraph 102(1) above is modified to that effect.

The extent to which the reactive compounds in APCRs were calcium based

110. As regards the third issue, we again rely on the view of Mr Martin in concluding that the reactive alkaline compounds within the APCRs were predominantly calcium based. That view is supported by the breakdowns of the elements within the APCRs with which we were provided. Whilst we accept that those breakdowns are not determinative, because of the presence of significant unidentified elements within the APCRs (described as ‘Other’ in the breakdowns) and because the calcium content in the APCRs included non-reactive calcium as well as reactive calcium, the significance of the calcium content relative to the other identified elements suggests to us that a significant part of the reactive compounds within the APCRs were calcium based.

111. Therefore, to the extent that it is relevant, we find as a fact that a significant majority, and not merely a slight majority, of the reactive compounds within the APCRs were calcium based and our finding of fact in paragraph 102(2) above is modified to that effect.

The amount of slaked lime which would have been required to neutralise 1 tonne of FC in the course of producing the Cristal waste

112. As regards the fourth issue, the critical point, on which both experts were agreed, is that the amount of APCRs required to neutralise the FC in the course of producing the FCC waste was considerably in excess of the amount of slaked lime which is required to neutralise the FC in the course of producing the Cristal waste. Even on Ms Heasman’s view on both questions, the amount of APCRs required for the former purpose was almost 10 times the amount of slaked lime required for the latter purpose.

113. Having said that, we think that Dr Godley’s conclusion - based on his stoichiometric calculation – that it requires 119.3 kilograms of calcium hydroxide to neutralise 1 tonne of FC in producing the Cristal waste is flawed, for the reasons given by Ms Heasman and set out in paragraph 48 above. In particular, Dr Godley’s analysis did not take into account either the amount of calcium which was left in the Cristal waste following the process or the fact that a considerable amount of calcium would have been discharged in the effluent before the Cristal waste was formed. However, in the absence of any definitive suggestion by either of Ms Heasman or Mr Martin, we can say no more than that we are inclined to accept that the relevant figure is somewhere in excess of 260 kilograms of slaked lime to 1 tonne of FC.

114. It follows that, to the extent that it is relevant, we find as a fact that the amount of slaked lime which is required to neutralise 1 tonne of FC in the course of producing the Cristal waste is somewhere in excess of 260 kilograms.

DISCUSSION

Introduction

115. It may be seen that, with the exception of our conclusion that the amount of APCRs which was required to neutralise 1 tonne of FC in the course of producing the FCC waste was 3.9 tonnes, our findings of fact are entirely consistent with the submissions of Ms Heasman and that the one conclusion which is not consistent with those submissions reflects the view of Mr Martin as well as that of Dr Godley. Thus, to all intents and purposes, our findings of fact in this case are consistent with the position adopted by the Appellants.

116. Even though that is the case, we have reached the conclusion that the FCC waste does not consist entirely of calcium based reaction waste from titanium dioxide production. Indeed, we think that that conclusion is self-evident, essentially for the reasons given by Mr Puzey and summarised in paragraphs 71 to 89 above.

Our conclusion

117. Starting first with the issues relating to statutory construction, we did not detect a meaningful difference between the parties in relation to Mr Nawbatt's three propositions, as set out in paragraph 50 above.

118. Mr Nawbatt did not go so far as saying that the clear words which were used in the legislation could be overridden by any of:

- (1) the environmental qualities of the FCC waste;
- (2) the nature of the consultation which preceded the legislation; or
- (3) the terms of the Treasury criteria

and Mr Puzey did not go so far as saying that those matters could simply be disregarded in construing the legislation.

119. In our view, the correct approach lies between the two extremes referred to in paragraph 118 above, which is also where we believe that both Mr Nawbatt and Mr Puzey were.

120. The context in which the LFT legislation in general, and the QMO in particular, were enacted is plainly relevant in construing the language in Note (9)(a). We have therefore taken into account in answering the question at issue in this appeal the fact that:

- (1) the LFT legislation must be interpreted as far as possible by taking into account the overall landscape in which it exists - namely, the UK environmental legislation as a whole;
- (2) the nature of the consultation which preceded the enactment of the QMO informs the purpose underlying the enactment of Note (9)(a); and
- (3) the Treasury were required to take the criteria into account in determining the items which appear in the Schedule to the QMO (as well as certain other, unspecified, factors) and therefore the Schedule should be construed with the criteria in mind.

121. However, none of the above matters can override the clear language which is used in Section 42(2) of the FA 1996 and the QMO. They can provide some context but they are not a substitute for examining the language actually used and, when one turns to considering whether the FCC waste can be said to "consist entirely of...calcium based reaction waste

from titanium dioxide production”, we think that it is self-evident that it does not. As Mr Puzey succinctly pointed out, more than half of the FCC waste was neither reaction waste nor derived from titanium dioxide production. It is therefore clear that the FCC waste does not consist entirely of calcium-based reaction waste from titanium dioxide production.

122. We agree with Mr Puzey that:

- (1) the relatively low level of reactive material within the APCRs;
- (2) the presence of non-calcium based reactive materials within the APCRs; and
- (3) the amount of APCRs required to neutralise the FC,

mean that, although the process at FCC Knostrop undoubtedly included a reaction between the calcium hydroxide (and certain other calcium based reactive compounds) within the APCRs and the FC, somewhere between 57% and 72% of the FCC waste consisted of material which was not the result of a calcium based reaction at all. To a very significant extent, the FCC waste simply consisted of elements which were part of the APCRs and which did not react with the FC.

123. We also agree with Mr Puzey that the process which took place at FCC Knostrop is more accurately described as the neutralisation of the APCRs using FC than the neutralisation of the FC using APCRs. The Second Appellant recognised this in:

- (1) referring to the plant where the APCRs and the FC were processed as the “Ash Plant”;
- (2) calling the log in which it recorded the process the “Ash Plant Log”; and
- (3) including a column in that log headed “Treated Ash Quality”.

As Mr Martin readily admitted at the hearing, the “Ash” referred to in each of those contexts was the APCRs and not the FC. Thus, those references all support the conclusion that the process which was going on at FCC Knostrop is more properly described as the treatment of the APCRs with FC than as the treatment of the FC with APCRs and that the majority of the FCC waste was simply the treated APCRs waste and not the treated FC waste derived from the production of titanium dioxide.

124. We should make it clear that we do not base our conclusion on the mere fact that the process at FCC Knostrop happened to involve the neutralisation of the APCRs at the same time as the FC was neutralised. We recognise that that is no different from the fact that the process at Stallingborough involves the neutralisation of the virgin calcium hydroxide slurry at the same time as the FC is neutralised. Instead, our conclusion is based on:

- (1) the extent of the non-reactive material and the non-calcium based reactive material within the APCRs and the amount of the APCRs which were required for the process – see paragraph 122 above; and
- (2) our view, supported by the view of those conducting the process, that the essence of the process involved the neutralisation of the APCRs with FC and not vice versa – see paragraph 123 above.

125. For the reasons set out above, notwithstanding the principles of statutory construction which we were urged by Mr Nawbatt to apply, we cannot see how the FCC waste can properly be said to satisfy the statutory language. Quite simply, the FCC waste did not consist entirely of calcium based reaction waste from titanium dioxide production and the fact that the use of APCRs instead of slaked lime to neutralise the FC may fit better with the UK environmental legislation, may be consistent with the process of consultation leading to

the enactment of the QMO and may be consistent with the Treasury criteria is not sufficient to make it so.

The Cristal waste

126. Mr Nawbatt sought to make much of the fact that the word “entirely” in this context could not mean what it purported to say given that the Cristal waste also contains some impurities and there is no dispute that Note (9)(a) was inserted precisely in order to include the Cristal waste within its ambit.

127. One possible answer to that submission is that this appeal does not relate to the Cristal waste. Were it to transpire that, contrary to the parties’ common understanding, the Cristal waste also fell outside the language in Section 42(2) of the FA 1996 and the Schedule to the QMO, that would simply mean that the Parliamentary draftsman had failed to achieve his or her objective in drafting the relevant legislation. It would be irrelevant to the matter which we are required to address in this decision.

128. However, we think that that is not the correct answer to the submission. Instead, we think that, for the reasons which follow, in contrast to the FCC waste, the Cristal waste can properly be described as consisting entirely of calcium based reaction waste from titanium dioxide production.

129. In our view, the starting point in determining whether or not a particular waste product consists entirely of calcium based reaction waste from titanium dioxide production is not to ask whether all of that waste product is the result of a reaction between alkaline calcium compounds and the acid arising from titanium dioxide production. Instead, one should instead consider whether the essence of the process by which the relevant waste product has been produced involves a reaction between alkaline calcium compounds and the acid arising from titanium dioxide production. As long as the latter is the case, then the waste product resulting from the process in question consists entirely of calcium based reaction waste from titanium dioxide production. Moreover, that is the case regardless of whether:

- (1) the alkaline solution which is used to neutralise the acid contains reactive elements other than calcium; or
- (2) some of the end waste product is not the result of a reaction between a calcium compound in the alkaline solution and the acid.

130. Applying that test in the present case, it is plain that the essence of the process which takes place at Stallingborough is exactly as described in paragraph 129 above. In other words, the only purpose of the process is to neutralise the FC that has arisen from titanium dioxide production. That remains the case despite the fact that:

- (1) the virgin calcium hydroxide slurry which gives rise to the reaction contains a small amount of reactive elements other than calcium; and
- (2) some of the constituent elements of the resulting Cristal waste are not the result of a reaction between a calcium compound and the FC.

131. The Cristal waste displays both of the features described in paragraphs 130(1) and 130(2) above because:

- (1) there are some de minimis impurities in the slaked lime which is the basis of the virgin calcium hydroxide slurry that is applied to the FC; and
- (2) that slurry contains water, which could be tap water or water arising from the titanium dioxide production at Cristal’s plant, and that water itself contains impurities.

132. However, the crucial point is that those impurities are simply unavoidable features of the calcium based reaction which is the essence of the process giving rise to the Cristal waste or, to put it another way, unavoidable features of the alkaline which is required to be applied in order to achieve the end objective of neutralising the FC with calcium hydroxide. They do not change that end objective and thus they do not change the essence of the process which is occurring at the site. Instead, that essence remains the neutralisation of the FC arising from titanium dioxide production by way of a reaction between a reactive alkaline which is calcium-based and that FC.

133. We say that because:

(1) the minimal impurities in the slaked lime are not there by design – they are there simply because the slaked lime originates from the excavation of calcium carbonate from quarries and then the addition of water to the calcium oxide which results from heating that calcium carbonate to a very high temperature in a kiln. They are thus an inevitable feature of the steps which need to be taken to produce the slaked lime in the first place. The material which is excavated from the quarries inevitably contains traces of elements other than calcium carbonate and so too does the water which is added to convert the calcium oxide into calcium hydroxide; and

(2) the elements contained in the water which is used to create the slurry are there because the slaked lime is highly reactive and therefore needs to be diluted in order properly to carry out the calcium-based reaction.

The fact that those impurities are simply unavoidable features of the process leading to the end objective of neutralising the FC arising from titanium dioxide production with a reactive alkaline solution that is largely calcium based and are not there for any other reason means they do not change the essence of the process, which is to do just that. Moreover, prior to its dilution in the water, at least 90%, and very likely a considerably greater percentage, of the slaked lime consists of pure calcium hydroxide. (We agree with Mr Puzey's observation that the 90% figure is likely to be a very conservative estimate as the supplier of the slaked lime, the First Appellant, was effectively warranting that the calcium hydroxide content of the slaked lime would not be below the cited figure.)

134. So, when one asks whether the Cristal waste can accurately be described as consisting entirely of a calcium based reaction waste from titanium dioxide production, the answer is demonstrably that it is.

135. The same cannot be said of the FCC waste. On the contrary, as we have said in paragraph 123 above, the essence of the process giving rise to the FCC waste was the neutralisation of the APCRs using the FC. In addition:

(1) a significant part of the APCRs consisted of material which was not calcium based; and

(2) the presence of that material was not attributable to the purpose of neutralising the FC arising from titanium dioxide production.

Thus, whilst a calcium based reaction did occur in the course of the process which led to the FCC waste, it would be a misnomer to describe that calcium based reaction as amounting to the essence of the process. Consequently, the waste which arose as a result of the process did not consist entirely of a calcium based reaction waste from titanium dioxide production and the Cristal waste is readily distinguishable from the FCC waste.

136. It may be seen from the above that we emphatically reject the proposition that, because:

(1) the slaked lime used in the course of the process at Stallingborough is diluted in water so that only 20% of the virgin calcium hydroxide slurry consists of calcium hydroxide; and

(2) between 10% and 30% of the APCRs was reactive and most of the reactive compounds were calcium based,

the Cristal waste and the FCC waste must inevitably stand or fall together when it comes to determining whether or not they come within the ambit of Note (9)(a). The percentage of calcium hydroxide which is in the virgin calcium hydroxide slurry at Stallingborough is simply the result of the need to dilute the slaked lime appropriately so that the calcium based reaction which occurs in the process at Stallingborough neutralises the FC from the titanium dioxide production without giving rise to a waste which is itself hazardous by virtue of its alkalinity. In contrast, the percentage of calcium hydroxide which is in the APCRs at FCC Knostrop was a function of the substantial other material of which the APCRs consisted, whose presence in the APCRs had nothing whatsoever to do with the calcium based reaction which occurred at FCC Knostrop.

DISPOSITION

137. It follows from the above that, in our view:

(1) the FCC waste did not consist entirely of calcium based reaction waste from titanium dioxide production; and

(2) thus, the FCC waste does not satisfy the conditions set out in Section 42(2) of the FA 1996 and the QMO for the lower rate of LFT to apply.

138. The appeals are therefore dismissed.

RIGHT TO APPLY FOR PERMISSION TO APPEAL

139. This document contains full findings of fact and reasons for the decision. Any party dissatisfied with this decision has a right to apply for permission to appeal against it pursuant to Rule 39 of The Tribunal Procedure (First-tier Tribunal)(Tax Chamber) Rules 2009. The application must be received by this Tribunal not later than 56 days after this decision is sent to that party. The parties are referred to “Guidance to accompany a Decision from the First-tier Tribunal (Tax Chamber)” which accompanies and forms part of this decision notice.

**TONY BEARE
TRIBUNAL JUDGE**

Release Date: 11th JULY 2023

