

Neutral Citation Number: [2009] EWHC 1944 (TCC)

Case No: HT-09-63

**IN THE HIGH COURT OF JUSTICE**  
**QUEEN'S BENCH DIVISION**  
**TECHNOLOGY AND CONSTRUCTION COURT**  
**THE CORBY GROUP LITIGATION**

Royal Courts of Justice  
Strand, London, WC2A 2LL

Date: 29 July 2009

**Before :**

**THE HONOURABLE MR JUSTICE AKENHEAD**

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**Between :**

|  |                                                                                  |                         |
|--|----------------------------------------------------------------------------------|-------------------------|
|  | <b>THE CLAIMANTS appearing on the Register<br/>of the Corby Group Litigation</b> | <b><u>Claimant</u></b>  |
|  | <b>- and -</b>                                                                   |                         |
|  | <b>CORBY DISTRICT COUNCIL</b>                                                    | <b><u>Defendant</u></b> |

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**David Wilby QC (instructed by Collins) for the Claimants**  
**Stephen Grime QC and Charles Utley (instructed by Berrymans Lace Mawer) for the**  
**Defendant**

Hearing dates: 16-19,23-26 February, 2-5, 9-12, 16-18, 23-26, 30-1 March, 1-2, 6-8, 21-3, 27-8  
April, 6-7 May, 29 July 2009  
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**JUDGEMENT**

**Mr Justice Akenhead :**

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## **Introduction**

1. This claim relates to birth defects said to have been caused to a group of children born between 1986 and 1999 as a result of negligence, breach of statutory duty and public nuisance on the part of Corby Borough Council and its statutory predecessor Corby District Council (collectively “CBC”) in connection with the reclamation of the extensive British Steel (“BSC”) site to the east of the town of Corby. The birth defects are shortened or missing arms, legs and fingers in the main and are said to have been caused as a result of ingestion or inhalation of harmful substances generated by the reclamation works and spread in various ways through many parts of Corby. The harmful substances are said to be Cadmium, Chromium, Nickel, Dioxins and PAHs on their own or in combination.
2. It must be borne in mind that this trial has not as such been an open-ended inquiry in which the Court in an inquisitorial manner seeks to determine unilaterally what happened and what caused the birth defects. The Claimants have pleaded what their case is and it is that case which they have to establish broadly upon a balance of probabilities and which CBC has to meet. Thus, the Court is restricted to the evidence put before it. For instance, neither party has provided evidence to demonstrate whether there was statistically an increase in miscarriages or stillbirths during the period over which the Claimants were conceived and there has been no comparison with what had occurred over the previous years in Corby or since so far as the incidence of birth defects, miscarriages and still births were concerned; that might have been of assistance to support either side’s position. I suggested at an earlier procedural meeting that the parties might consider whether such evidence might be adduced. Further examples are Messrs Cropley and Palmer who were senior engineers and who were dismissed by CBC in early 1997; they were heavily involved in many of

the projects about which criticism is made in these proceedings; neither party saw fit to call either of these people. Furthermore, although many thousands of pages of contemporary documents have been produced, many documents have not been; for instance, CBC has had a large number of documents destroyed accidentally; consequently, there are large gaps in the documentation. It would be wrong to speculate as to evidence which was not put before the Court. I must decide this case based on the evidence adduced by the parties.

3. This is currently “Group” litigation in which a group of 18 Claimants have joined. The Group Litigation Order requires this Court to consider and address specific issues which are generic and common to the Claimants. The Court is not required at this stage to find that CBC is liable for damages to any individual Claimant but the issues which are now decided are to a large extent pre-requisite issues in any determination of liability. There are five specific issues which are expressly the subject of the Group Litigation Order which largely by agreement have been amplified by the addition of a further 25 sub-issues.

### **Corby and its history**

4. Corby was a small Northamptonshire village until it grew as a result of steelmaking. The area was known for a long time, indeed from Roman times, as one which contained ironstone deposits; indeed, the Domesday Book records the “manor of Corbei” as an iron producing centre. By 1910, Corby had its own ironstone works which were taken over by Stewarts and Lloyds. By the 1930s, a large integrated steelworks was in place on the east and north-east of what was now becoming a town. There was a large influx of steelworkers, particularly from Scotland. The town prospered and it was designated a new town in 1950. The population grew to some 50,000. Other industries and businesses were attracted to the area, such as Golden Wonder Crisps, Sealed Beam and Weetabix, and were also located on the east side and north sides of Corby.
5. Following steel nationalisation in 1967, BSC took over. However, by late 1979, it had been decided that BSC would shut down which it did shortly thereafter, although the tube making facility was retained (now operated by Corus/Tata). Some thousands of people were made redundant from BSC and associated businesses from 1980 onwards. The BSC site as a whole extended historically to the south and north as well as the east of the town. Thus, ironstone quarries had been excavated at what is now the Earlstrees Industrial site to the north north east of the old town centre and at Cowthwick to the south east.
6. CBC, then the District Council, with some grant funding, decided to acquire the bulk of the BSC sites, some 680 acres broadly in the north to east quadrant of the centre of Corby and initiated extensive reclamation of that whole area over a 15 year period from about 1983 to 1997. That area appears to have represented about 50-60% of what had been historically owned by BSC and its predecessors. Broadly the sites acquired represented on plan a parallelogram shape of about 2.6 by 2 kilometres, bounded on the South by the Weldon Road, to the East by Bransgrave and Gretton Roads, to the North by Gretton Park Road

and to the West by the (north-south railway line). Over the years which followed the reclamation, a large number of businesses relocated to Corby so that employment levels are high.

7.I have prepared a Location Plan (not to scale and purely for illustrative purposes) which broadly identifies where the principal sites and roads were.

### **The Steelworks Site-before the Reclamation**

8.The Court was provided with a book “Corby Iron and Steel Works” by S. Purcell (2002, Tempus) which provides some useful background. Key features of the site were:

(a) There was an extensive railway network on the site which connected to the national railway line.

(b) The Blast Furnace building was a massive agglomeration with a number of multi-storey vessels stretching above it; it was on the west side of the site broadly where new Asda and Matalan stores were to be built in the 1980s. The Blast Furnace superstructure was dismantled by BSC after CBC purchased the site.

(c) Immediately to the east of the Blast Furnace was the Ore Preparation Plant and to the east of that the Glebe Coke Ovens over which some four very tall chimneys stretched. These were fired by gas and a coal mixture kept in a massive concrete bunker. To the north of the Blast Furnace were the Lime Kilns, lime being part of the steel making process. To the north east of the Blast Furnace was the Sinter Plant, which was also topped by a tall chimney. The Sinter Plant and the Blast Furnace area was known as the “Heavy End”, although sometimes this expression extended to other operations to the east.

(d) Along the south side of the site broadly along the Weldon Road was, and indeed remains the Tube Works which was a series of massive industrial sheds; this was not acquired by CBC and was retained by BSC.

(e) To the north of the Tube Works and the east of the Ore Preparation Plant were the various Rolling and Strip Mills, the BOS Plant and the Deene Coke Oven, together with an associated By-Products Plant. The Mills were sometimes included in the expression “the Heavy Rolling Mills” There was a galvanising plant. This area encompassed Willowbrook North and South.

(f) The northern part of the site was by 1980 not particularly built upon albeit it can best be described as being waste land in all senses of the expression. There were

sludge beds and 6 or 7 of what were called “Toxic Ponds” in the northern part of the site. To the east and south of the Toxic Ponds were the Candy Filter ponds. At the north east boundary there was a pond which came to be called the “Valley of the Drums” because some thousands of oil or other chemical drums had been dumped there. There were also a number of other dumps for a variety of other waste products. Part of this site to the south of the Toxic Ponds was retained by BSC.

(g) The whole area to the north and north east was or became known as the Deene Quarry. Over many years, it had been mined primarily for iron ore. Topographically, this had produced a hill and dale formation and appearance. Some of the quarry excavations had been filled either with the previously excavated overburden which could not be used in the iron making process or with wastes from the iron and steel making process. The vast bulk of it was contaminated to a greater or lesser degree.

The iron making process involved the admixture into pellet form in a sinter plant of ironstone, coke and limestone which was then transferred and fed through hoppers into a blast furnace; the furnace contents were heated up to an extremely high temperature with air blasted through jets near the bottom of the furnace. The exhaust gases were taken away in piping from the top of the furnace. The coke was made on the site in the two coke ovens from coal which was brought to the site by train. At the height of iron and steelmaking, some 1.3m tonnes of iron and steel were made annually. Although estimates vary, for every tonne of iron and steel produced, well over 2 tonnes of base material (iron ore, limestone and coke) was needed. There were necessarily substantial quantities of waste.

## Words and acronyms

9. The parties, experts and Counsel have all used a large number of words and acronyms which, to many, would be meaningless. I prepared and showed the following lists to the parties.

## Words

|                   |                                                                                             |
|-------------------|---------------------------------------------------------------------------------------------|
| Aerosols.....     | airborne fine particles                                                                     |
| Aetiology.....    | the science or study of causation                                                           |
| Amniotic.....     | relating to foetal membrane                                                                 |
| Benzo-pyria.....  | cancer inducing hydrocarbon                                                                 |
| Bessemer.....     | relating to steel making                                                                    |
| Carcinogens.....  | cancer inducing substances                                                                  |
| Dysplia.....      | abnormal growth of cell/tissue/organ                                                        |
| Ectrodactyly..... | congenital absence of all or part of 1 or more<br>fingers/toes                              |
| Endocrine.....    | secreting internally                                                                        |
| Epidemiology..... | science of occurrence/severity/distribution of<br>diseases which travel from place to place |

|                         |                                                                             |
|-------------------------|-----------------------------------------------------------------------------|
| Epiphysial.....         | to do with finger joints                                                    |
| Ehlers-Danlos Type..... | connective tissue disorder                                                  |
| Haematopoietic.....     | formation of blood                                                          |
| Hypoxic,hypoxia.....    | deficiency of oxygen to the tissues                                         |
| Leukocytosis.....       | presence of excessive no. of white blood corpuscles<br>in blood             |
| Mesne.....              | intermediate                                                                |
| Micromelia.....         | condition of having disproportionately short or<br>small limbs              |
| Mutagens.....           | substances or agents producing mutations                                    |
| Mytotic.....            | related to cell division                                                    |
| Neoplasm.....           | a morbid new growth of tissue                                               |
| Organogenesis.....      | developing of living organs; the period of<br>embryological differentiation |
| Parietal.....           | bones part of sides and top of skull                                        |
| Particulate.....        | relating to particles                                                       |
| Phytotoxicity.....      | the prevention or inhibition of plant growth                                |
| Poland Syndrome.....    | a condition affecting the muscles of the chest                              |
| Polycyclic.....         | having many circles/rings—more than one ring of<br>atoms                    |
| Somatic.....            | of the body or body cells                                                   |
| Syndactyly.....         | having fused digits                                                         |
| Synergistically.....    | combined, coordinated or acting additively                                  |
| Talipes.....            | club foot                                                                   |
| Teratogenic.....        | causing abnormal growth in foetuses                                         |
| Teratogenesis.....      | induced congenital abnormalities                                            |
| Toluene.....            | aromatic chemical compound related to benzene                               |
| Toxicilogy.....         | study of poisonous substances                                               |
| Trisomy.....            | a chromosome appearing three times in a cell<br>(rather than twice)         |
| ug.....                 | microgram                                                                   |
| Um.....                 | micrometres                                                                 |

### **Acronyms**

|              |                                                                               |
|--------------|-------------------------------------------------------------------------------|
| BOS.....     | Basic Oxygen Steel                                                            |
| BSC.....     | British Steel Corporation                                                     |
| CNT.....     | Commission for New Towns                                                      |
| CLEA.....    | Contaminated Land Exposure Model                                              |
| DLG.....     | Derelict Land Grant                                                           |
| DoE.....     | Department of the Environment                                                 |
| EFP.....     | Electric Furnace Plant                                                        |
| EMSYCAR..... | E Midlands and S Yorkshire Congenital Abnormalities<br>Register               |
| EUROCAT..... | European Congenital Anomalies                                                 |
| IRCRL.....   | Interdepartmental Committee on Reclamation of<br>Contaminated Land Guidelines |

ICD..... International Classification of Diseases  
 KHA..... Kettering Health Authority  
 LOEL..... Lowest observed effect level  
 LRCG..... Land Reclamation Co-Ordination Group  
 LRD..... Limb Reduction Defects  
 NCC..... Northamptonshire County Council  
 NRA..... National Rivers Authority  
 O&M..... Operation and Maintenance  
 PAH..... Polycyclic aromatic hydrocarbons  
 PCDD..... Polychromate Dibenzo-p-dioxins  
 PDDF..... Polychromate Dibenzo furans  
 RR..... Relative risk  
 SGV..... Soil Guideline Values  
 TEM..... Toluene Extractable Matter  
 ULR..... Upper limb reduction  
 ULRD..... Upper limb reduction defect  
 WDA..... Waste Disposal Authority

**The witnesses**

10. A. Without exception I found the parents of the 18 Claimants on the register to be wholly honest and to have done their best to recall what had been happening in Corby at the time that the mothers became pregnant with the Claimants. They all gave their evidence in what I can properly call a dignified way. I set out below in a table some of the more enlightening evidence which they gave and which I found convincing.

| NAME OF CLAIMANT/<br>DATE OF BIRTH/<br>PARENT or<br>OTHER<br>GIVING<br>EVID-<br>ENCE | DESCRIP-<br>TION OF<br>BIRTH<br>DEFECT | ADDRESS<br>AT CONC-<br>EPTION/<br>1st TRIM-<br>ESTER | EVIDENCE |
|--------------------------------------------------------------------------------------|----------------------------------------|------------------------------------------------------|----------|
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| <p>KYNAN<br/>FAULKNER<br/>- 22.6.86<br/>LYDIA SHORT-<br/>sensible and<br/>straight-<br/>Day 3</p>                                                                        | <p>No thumb on<br/>either hand/<br/>Ehler Danlos<br/>Syndrome</p>                                                              | <p>Hatton<br/>Drive,<br/>Gretton<br/>Jan 1985 to<br/>early 1988</p>                                                              | <p>Worked at Tarmac, Geddington<br/>Road, Corby until 7<sup>th</sup> month of<br/>pregnancy. Used to drop off<br/>husband at work at Weldon<br/>Industrial estate. Remembers, near<br/>enough every day, dirty big lorries/<br/>dust in air, lot of red dust, “very<br/>muddy and dusty”/lot of lorries-<br/>could see mud and slush- a kind of<br/>red mud-lorries not covered-<br/>wheels always muddy-car needed<br/>washing every week as it was<br/>covered with mud and dust-<br/>metallic coppery smell in the air.</p>                                                         |
| <p>DAWN MALLIN<br/>-31.5.87<br/>BARBARA<br/>MALLIN/<br/>Nervous but<br/>patently honest<br/>ANTHONY<br/>MALLIN<br/>Day 3-not<br/>nervous-clear-firm<br/>recollection</p> | <p>Under-<br/>developed left<br/>hand, wrist and<br/>forearm;<br/>fingers and<br/>thumb less than<br/>half normal<br/>size</p> | <p>Halifax<br/>Square/<br/>Stuart Road,<br/>Corby<br/>July-<br/>September<br/>1986-Mrs<br/>Mallin’s<br/>brother’s<br/>houses</p> | <p>Visited local Sunday market near<br/>Asda-couldn’t remember where it<br/>was-Recall dust and dirt and big<br/>earth moving lorries-dust on road-<br/>car covered in dust (horrible<br/>orangey colour)-had to keep car<br/>windows shut-<br/>3 weeks stint in Corby towards the<br/>end of the year/autumn 1986 but<br/>made many visits (every other<br/>weekend)-dust where they parked<br/>the car-on a dry day dust blowing<br/>about all over the place-dust made<br/>us cough-lorries uncovered-awful<br/>sulphurous smell<br/>Dust at Stuart Road and Halifax<br/>Square</p> |
| <p>SIMONE<br/>ATKINSON<br/>-27.6.89<br/>LISA-MARIE<br/>ATKINSON-<br/>Straight-forward,<br/>decent-<br/>Day 4</p>                                                         | <p>Missing<br/>fingers and<br/>joints on both<br/>hands-feet:<br/>short tendons<br/>from her toes<br/>and ankles</p>           | <p>Culross<br/>Walk<br/>Corby</p>                                                                                                | <p>Corby roads thick with mud-dust<br/>and dirt on cars-shopped at<br/>Sunday markets-security guard at<br/>RS Components (at three sites<br/>around BSC site)-travelled<br/>between sites at east and north<br/>west of site-quite a lot of work<br/>outside-lorries (like Tonka trucks)-<br/>unsheeted-mountains of muck on<br/>the back-lorries coming off old<br/>BSC site-noticed muck on clothes-<br/>mud on roads and cars-had to clear<br/>away dust on cars to see permits-<br/>just very dusty</p>                                                                           |

|                                                                                                                     |                                                                                                                                      |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| SARAH JANE CROFT -13.7.91<br>CAROLYN CROFT-straight-forward,<br>VIVIENNE SINGH-straight, lively<br>Day 4            | Missing three middle fingers and part of palm on left hand and other digits deformed + weakness in left arm                          | 6 Falmer Walk, Corby                     | Lived in Cambridgeshire but visited sister once a week on average in late 1990-used to go with sister in car to Earlstrees Industrial estate-Corby very dirty, dusty and muddy.<br>Air rank - trucks dripping loads everywhere-leaking horrible gooey stuff-unsheeted / threw off dust-would have to use windscreen wipers to clean off dust-very dusty all the time                                                                                                                                       |
| ANTHONY MCGRATH -23.9.91<br>CATHERINE PADILLA (mother)-<br>Good recollection<br>Day 4                               | Club foot (right), Trisomy 9p, delayed speech and development -short hands and palms; small (shortened) fingers and thumbs turned in | Scot Road Corby, later Glastonbury Road  | Worked McGregor Cory, Hunters Road, Weldon until 4 months pregnant<br>Area in and around Corby dusty, dirty. Car always dirty-Saw unsheeted lorries coming out of Shelton Road onto Steel Road-dirt would fall onto road from lorries-Shopped at Sunday market at Bangrave Road<br>Smell                                                                                                                                                                                                                   |
| GEORGE ANGUS TAYLOR -11.3.92<br>FIONA TAYLOR/- decent and straight<br>BRIAN TAYLOR-reasonable recollection<br>Day 4 | No free movement of smaller right finger and thumb-curvature of right arm-bone in right arm shorter                                  | York Road, Corby/<br>King's Arms, Weldon | Trucks in Corby-mud and dust-workers from steel site (Noone & McGowan and Weldon Plant) in pub in work clothes, covered in dust and debris; left dusty residues-Mrs Taylor had to clean up after them-very dirty open top lorries parked in car park around pub-car park always full of debris from lorries-went to Sunday markets. After steelworks closed, it was just dusty and muddy-a lot of lorries<br>Mr Taylor worked at BSC for 13 years- acrid metallic smell-trucks always covered in thick mud |
|                                                                                                                     |                                                                                                                                      |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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| <p>LEWIS WATER-FIELD-9.7.94<br/>SARAH PEARSON/<br/>decent, bright, sense of humour<br/>MICHAEL WATER-FIELD-<br/>straight-forward</p> <p>Day 5</p> | <p>Deformed thumbs (Parts of bones missing)-<br/>missing muscle in right hand near thumb</p>               | <p>Burton Latimer, Kettering</p> | <p>Mr Waterfield a roofer in Corby-worked to West of Phoenix Parkway with view over reclamation area-saw constant loads of un-sheeted lorries coming out of Mitchell Road turning up to Gretton Brook Road-roads in Corby covered in mud in winter and dust in summer-very dusty and dirty-never saw road sweepers-shopped at Asda and Sunday markets-Sarah would come up on odd days for lunch-Lewis 4 weeks premature-Corby very dirty-clothes dustier, grimmer than usual after working in Corby-Ms Pearson would wash partner's clothes</p> |
| <p>JORDAN SCOTT -24.10.94<br/>NICHOLA SCOTT-straight-forward<br/>-Day 5</p>                                                                       | <p>Webbed fingers to right hand-reduced right hand-Poland syndrome (missing muscle on pectoral muscle)</p> | <p>25, Cecil Close Corby</p>     | <p>Town dirty and muddy and smell-greasy dust on the car-always washing car-saw lots of lorries on Phoenix Parkway could see wet drips coming off-went to Sunday market by Asda-did smoke (10 a day)</p>                                                                                                                                                                                                                                                                                                                                        |
| <p>DYLAN SOUTH -4.2.96<br/>AUDREY BARFIELD-reliable and sensible<br/>-Day 5</p>                                                                   | <p>Club foot (right)-no muscle and shorter</p>                                                             | <p>18 Cromarty House, Corby</p>  | <p>Constant lorries on Oakley Road, mud and muck slopped over sides-unsheeted lorries-cars would have to be washed more often</p>                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p>CURTIS THORPE -27.3.96<br/>MANDY</p>                                                                                                           | <p>5 digits on right hand not fully formed-right hand and</p>                                              | <p>24 Strathay Walk, Corby</p>   | <p>Dust on cars -did smoke (9 a day)/ anti-depressant during pregnancy – worked at Rockingham Arms where dusty and dirty workers</p>                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>THORPE (now WRIGHT)-down to earth, good recollection<br/>-Day 5</p>                                                                            | <p>palnm smaller-small thin arm</p>                                                                        |                                  | <p>(from reclamation (the worst) and elsewhere)went-bar became filthy-dirty, dusty and horrible-shopped at Asda (husband was a manager there) and Sunday markets-car really filthy-visited mother and sister on Exeter Estate</p>                                                                                                                                                                                                                                                                                                               |

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| <p>SHELBY-<br/>ANN TAYLOR<br/>-19.4.96<br/>d. 22.4.96<br/>TRACY ANN<br/>TAYLOR-calm<br/>and impressive<br/>*Not a Claimant</p>                      | <p>Died after 3<br/>days<br/>Possible<br/>missing toe on<br/>right foot<br/>[no positive<br/>case advanced<br/>by Claimants in<br/>respect of this]</p> | <p>Kettering</p>                                                                      | <p>Worked at Euromax, Brunel<br/>Road'89-'97-Gretton Brook Road<br/>mucky and muddy-dust-saw<br/>tankers leaking sludge and un-<br/>sheeted muck-carrying lorries<br/>[some Shanks &amp; McEwans<br/>lorries-others so dirty couldn't see<br/>names]-like following a sand<br/>storm. Couldn't have your<br/>windows open. Lorry wheels very<br/>muddy and mud dropping off.<br/>Worse over 18 months before<br/>pregnancy-Never saw any road<br/>cleaning lorries. Went to Sunday<br/>markets.</p>                                                          |
| <p>CONNOR FORD<br/>-6.8.96<br/>SUSAN<br/>McINTYRE-<br/>down to earth,<br/>Day 6</p>                                                                 | <p>No fingers,<br/>thumb or<br/>knuckles on<br/>left hand-<br/>thinner arm-</p>                                                                         | <p>90, Dumble<br/>Close, Corby</p>                                                    | <p>Husband worked at Euromax<br/>during pregnancy-mud and sludge<br/>on roads-dirt and dust on clothes-<br/>foul smell (rotten eggs)-very dusty<br/>and mucky after reclamation work<br/>started-later when pregnant saw<br/>lorries on Oakley Road-sludge<br/>onto road-Corby full of lorries-she<br/>had to scrub dust off the pram</p>                                                                                                                                                                                                                    |
| <p>DANIEL<br/>SHATFORD<br/>-3.12.96<br/>JOY<br/>SHATFORD/<br/>clear, firm<br/>recollection-<br/>DARREN<br/>SHATFORD-ring<br/>of truth<br/>Day 6</p> | <p>No fingers and<br/>thumb on his<br/>left hand-palm<br/>smaller</p>                                                                                   | <p>54,<br/>Moorfield<br/>Road,<br/>Rothwell<br/>(8 miles<br/>away from<br/>Corby)</p> | <p>Mr Shatford worked in<br/>Corporation Street, Corby1995-9-<br/>Mrs Shatford drove him [along<br/>Oakley Road] to work-shopped at<br/>Sunday markets-mud falling off<br/>lorries (you would have to dodge<br/>them)-lorry wheels dirty and<br/>muddy, as were roads-dust when<br/>dry-lorries not sheeted-forever<br/>(twice a week) washing the car<br/>(red dust)-Weldon Road always<br/>full of lorries (often Shanks &amp;<br/>McEwans) but building down the<br/>Oakley Road also- not sure where<br/>lorries came from-metallic taste in<br/>air</p> |
|                                                                                                                                                     |                                                                                                                                                         |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|                                                                                                           |                                                                                                                         |                                                         |                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KERRY-<br>LEIGH<br>NATHWANI<br>-14.3.97<br>ANITA<br>NATHWANI-<br>gave evidence<br>clearly-bright<br>Day 6 | Left hand -1 <sup>st</sup><br>2 fingers<br>webbed-fingers<br>short and<br>deformed-<br>possible<br>Poland<br>Syndrome   | 18, Brigford<br>Place,<br>Beanfield<br>Avenue,<br>Corby | Worked at Matalan on Phoenix<br>Parkway during pregnancy-went<br>to Sunday Market-dust and mud in<br>market-roads always orange-<br>brown colour from mud from<br>lorry wheels-vast quantities of<br>lorries-dust led to having to wash<br>car at least once to three times a<br>week-water coming from lorry<br>falling onto road                                          |
| JAKE MURPHY<br>-20.3.97<br>LORRAINE<br>MURPHY-<br>straight<br>Day 7                                       | Proximal<br>femoral focal<br>deficiency-<br>unstable hip,<br>knee too high<br>up-club foot<br>(left-since<br>amputated) | 46,York<br>Road, Corby                                  | Used to walk often with pram-<br>Shopped in town centre and<br>Sunday market by Asda. Huge<br>lorries moving mud and sludge-<br>her daughter's first word was<br>"lorry"-mud on road and lorry<br>spills-pram wheels got dirty-had to<br>take them off to wash them                                                                                                         |
| SAMUEL<br>MAHON<br>-10.7.97<br>MARGARET<br>MAHON-<br>sensible-sense of<br>humour                          | Club foot<br>(right)-smaller<br>than left but<br>wider                                                                  | 40, Rowlett<br>Road, Corby                              | Husband worked for Weldon<br>Plant at Deene Quarry and other<br>BSC sites (couldn't remember if<br>he was during the 1 <sup>st</sup> trimester)-he<br>would come home covered in mud<br>and dust-had to hand wash his<br>clothes first-used to shop at local<br>supermarkets (including Asda)<br>and Sunday market-roads quite<br>muddy-lot of lorries-roads were<br>dusty- |
|                                                                                                           |                                                                                                                         |                                                         |                                                                                                                                                                                                                                                                                                                                                                             |

|                                                                                                                                                             |                                                                                                                                                                                 |                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>BEN VISSIAN<br/>-23.12.97<br/>REBECCA<br/>VISSIAN-<br/>straightforward /<br/>DAVID<br/>VISSIAN-<br/>knowledgeable<br/>about lorries and<br/>straight</p> | <p>Left hand two<br/>fingers missing<br/>(like half a<br/>hand) and<br/>smaller than<br/>right-bones<br/>missing in his<br/>right hand little<br/>finger-slight<br/>webbing</p> | <p>Raunds,<br/>Northants<br/>(10-15 miles<br/>from Corby)</p>     | <p>Visited Corby whilst pregnant<br/>(worked for Jobcentre). Roads<br/>covered in orange mud and muck<br/>and un-sheeted lorries. Husband<br/>serviced lorries run by Shanks &amp;<br/>McEwan and Weldon Plant.<br/>Washed husband's clothes, which<br/>were filthy-car dusty (she<br/>hoovered inside)-shopped at Asda<br/>every week on Fridays.<br/>Mr Vissian went on to BSC site<br/>sometimes to service and repair-<br/>The lorries (8 wheel-20/25<br/>tons-13/4 feet high) would not be<br/>clean when serviced-muddy and<br/>dusty-wheel- washes not being<br/>used effectively- lorries not built<br/>for sheeting</p> |
| <p>INDIA<br/>HARRISON<br/>-2.9.99<br/>JOHANN<br/>HARRISON-<br/>decent</p>                                                                                   | <p>Left hand and<br/>arm- shorter<br/>and thinner<br/>than right-<br/>missing<br/>muscles or<br/>tendons-two<br/>fingers welded<br/>Together-no<br/>small finger</p>            | <p>Scotland but<br/>visited 28<br/>Shakespeare<br/>Way, Corby</p> | <p>India born 3 weeks early-in Corby<br/>at Christmas, 1998, next half term<br/>and sister's birthday in February<br/>1999-Open backed un-sheeted<br/>lorries, load spills-metallic taste in<br/>the air-would go to Asda and<br/>Matalan-Corby had been a dirty<br/>place since she was little-it was the<br/>mud on the road-father was<br/>always cleaning his car-reddish<br/>mud or film of dust</p>                                                                                                                                                                                                                        |
| <p>ASHLEIGH<br/>JANE<br/>CUSTANCE<br/>-13.4.99<br/>LOUISE<br/>CARLEY<br/>Honest and<br/>straightforward</p>                                                 | <p>Right hand-<br/>middle and ring<br/>finger-swollen<br/>and huge</p>                                                                                                          | <p>25 Dickens<br/>Drive,<br/>Kettering</p>                        | <p>Visited Corby 4 times a week-<br/>Shopped at Market by Asda-<br/>constant film of dust on car-father<br/>and I washed car 3 times a week-<br/>air gassy-lots of dirty tipper type<br/>open lorries but don't know where<br/>they were going to or coming<br/>from-building rather than clearing<br/>going on-dusty and mud on the<br/>roads</p>                                                                                                                                                                                                                                                                               |

I do not make any findings as to whether the various syndromes, Ehler Danlos, Trisomy, Poland and proximal femoral deficiency, referred to above are actually present, since the mothers have simply passed on in evidence what others have told them about their children. My other findings as to the birth defects are not intended to be exclusive or exhaustive.

B. As to the other witnesses called by the Claimants, my views are as follows:

(i) Mark Bosence: he started to work for CBC in 1990 as a senior engineering technician and continued working until 2000-1. Mr Palmer was his line manager. He was involved in the Toxic Ponds 5 and 6, Candy Filter pond and Soothills reclamations. He was removed from Toxic Ponds 5 and 6 when he stated to complain about what was happening. He was conscientious and a straightforward witness, albeit subpoenaed, who had a reasonably good recollection of what happened. He reported initially anonymously to Mr Hagen in 1996 about some unacceptable practices on the Willowbrook and Soothills contracts which led to Messrs Palmer and Cropley being dismissed and the police being called in. I have no difficulty in accepting his evidence which was largely corroborated by contemporaneous documents.

(ii) Stephen Warren: he was an independent auditor from the Audit Commission who gave a report in October 2002 about what had gone wrong on several projects. He was very succinct and precise and obviously honest. His report of 3/10/02 was based on a consideration of the procedures, processes and controls of CBC. It was not an investigation into the physical control of the sites and as to whether there were adequate controls such as to prevent the discharge of particles into the air or onto the road.

(iii) Sam Hagen: he worked for CBC for 30 years from 1962 albeit not on any material part of the reclamation with which this case is concerned. He was a CBC Councillor from 1995 to 2003. His material involvement was as the Councillor to whom Mr Bosence went with his complaints in about March 1996; he then passed them on and in effect campaigned to have the matters investigated. Much of what he addressed at the time and in evidence was not directly relevant to the issues in the case. For instance, he was concerned about possible corruption between CBC Councillors and Officers and contractors in the early 1990s but in the result there was no prosecution and no evidence was put before the Court as to whether there was corruption; I can make no findings about this aspect of the history. I found him to be a wholly honest and principled person as far as his evidence went.

(iv) Keith Watson: a qualified barrister, he was Head of Legal Services for CBC from 1990 to 1997 and answerable to the Chief Executive. He was heavily involved in the disciplinary proceedings against Messrs Palmer and Cropley and in the related Police investigation. He worked with Mr Bosence in this regard. He was patently honest. Following his involvement in 1997, he was strongly of the view that Messrs Palmer and Cropley were unqualified to run reclamation projects and that, once they took over, "chaos reigned".

(v) John McGenaghan: he did not in the result give evidence but there was a statement from him dated 1 March 2009 and a statement to the police in September 1997. He was the Principal Auditor who particularly in 1996 and 1997 considered the extent to which certain complaints mostly about Messrs Cropley and Palmer were made out. The statements do not go further than a chronology and a commentary. Such contemporaneous documents as he did produce contained commentary upon other people's behaviour and they and the statements contain little first hand evidence which is relevant other than from a chronological standpoint.

11. As for the Defendant's witnesses, my impressions were as follows:

(a) Keith Phillips: he was the Head of Estates and Valuation from 1990 to 2001. His job was concerned with the management of non-housing land owned by CBC, including the purchase and sale of development land. He was a member of the LRCG but he was not an engineer and had no technical knowledge as to what needed to be done to achieve an effective reclamation. The letting of the Sunday Market sites was part of his job. He does not recall if a site investigation was done after the Sinter Area was selected as the place for the Sunday Market. There were dust and flood problems on this site-these were known by late 1994. Some work was done to reduce puddles by April 1995 but he could not remember whether any other works were done until 2001. He was honest enough but much of his knowledge was based on what he was told. He did not seem to recall much about recorded problems. I found his evidence of little direct use.

(b) Glenn Clarke: from 1989 to 2000, he was Assistant Director of Industrial Development for CBC, having been a Technical Engineer from 1974. His main task was to promote and sell the reclaimed land; he also assisted in the applications for funding. Thereafter he went to work for Rockingham Speedway. He arranged for trial pits to be excavated into the Soothills waste cell in July 2008. He was more involved in marketing the various sites. Deene Quarry was to be a site to be used as a repository for material from other remediated sites. Again, he was honest but much of his knowledge also was based on what he was told. He did not seem to recall much about recorded problems. He was very defensive when recalled on Day 16 in relation to the evidence about taking samples in July 2008; this gives rise to doubts about the reliability of this evidence. I found his evidence to be of little direct use.

(c) Mark Poucher: In 1995, he was an engineering assistant with CBC. He had no experience of reclamation or contaminated land. He was only involved in the reclamation for the first few months first on a remedial scheme for the Sunday Market drainage near Asda and then for 3-4 weeks on design and site work at Willowbrook North; afterwards he went on to Estate work. He had limited involvement and inexperienced at the relevant time. Again, his evidence was of little use.

(d) Ray Bird: from 1989 to 1998, he was a Clerk of Works for CBC. His area of expertise was highways and sewers/drains. He relied on others with regard to contaminated material. He did not understand the reclamation terminology. He was answerable to Mr Palmer. He was not involved much in the Willowbrook North site, Deene Quarry or Soothills (apart from a week deputising for Mr Bosence). His recall was limited. There were some clear inaccuracies in his witness statement such as the assertion that lorries coming loaded from the Toxic Ponds were covered which he accepted in evidence was not correct. Whilst I did not find him dishonest, his evidence, save where corroborated by other reliable evidence, was unconvincing.

(e) Keith Webster: He was the Director of Developmental Services CBC from 1987 or 1988 to 1997. His background beforehand was as a Planning Officer; he was not an engineer. He chaired the LRCG and was the superior to Messrs Palmer and Copley. His

witness statements were unhelpful and sometimes incorrect recitations of letters sent and received. He was defensive perhaps not surprisingly. He was inappropriately flippant on occasions e.g. Day 11/111-2, Day 12/53/16-18 when he said he was not joking about children not swimming in the Toxic Ponds but laughed as he said it. He said that he was reliant upon others. He accepted that it was a misjudgement on his part to rely upon Mr Copley. He seemed to think that a desk study should be done after the site investigation; he did not know that a desk study is usually the first step in determining what investigation needs to be done on site and involves a detailed consideration of what is already known about a site. He was more concerned about financial matters than the need for proper investigation. His direct recollection was poor. He gave the strong impression that Corby's main criterion was to provide land quickly to get businesses on to it (Day 12/ is 45). He said, surprisingly, that he would not have read the waste deposit licences (Day 12/64). He tended to speculate. He did not seem to know much about how to deal with contaminated sites. It was accepted by CBC's Counsel that he was not an attractive witness in the witness box; his manner was not commended by Counsel. He was an unsatisfactory witness, in my view. I formed the clear view that, whatever his perceived merits as a planner, he was not qualified to head up the reclamation team. He seemed to have no idea until the time that Mr Copley and Mr Palmer were being disciplined in late 1996 and 1997 that the two key men he had working under him on the engineering and technical aspects of the reclamation were not qualified, sufficiently or at all, to be involved in the reclamation. He seemed to have no real understanding of the need to protect the public.

- (f) Dr Rick Smith: He was a consultant geologist and proprietor of FWS Consultants, which was in effect the subcontractor or sub consultant to Mr Ibbotson. It is doubtful if he had much relevant experience of reclamation and contaminated site work before 1981, although he obviously learnt as he went along. He was bright and alert in giving evidence. He visited site irregularly and had only rare contact with CBC. His role was, he said, looking after the site investigations and it was usually only when the site works were being planned or were in progress that he would visit the site. He was not involved in any detail or at all on a large number of the projects, including the Heavy End works in 1983 to 1987, the Toxic Ponds work (albeit he liaised with Ove Arup who had been retained by a power station company which purchased a site covering two of the ponds) or in relation to much of the Willowbrook work. That, of course, was not Dr Smith's fault. His main involvement other than looking after site investigations was with the design of the containment tip facility (which accommodated some of the slurry from some of the Toxic Ponds) and his own firm investigated the Soothills reclamation site in 1996. He was engaged in monitoring the after effects (gas and water) of the containment tip facility. I have very much formed the view that his was an optimistic approach to reclamation and he tended to see the bright side; sub-consciously at least he tended to underestimate problems for instance at Willowbrook North and Soothills.

(g) Roderick Ibbotson: he was the Land Reclamation Engineer retained by CBC 1981-1997. He was effectively unqualified but had experience. His recollection of events was very hazy indeed. His detailed statement was clearly largely prepared by solicitors and contained errors such as placing him at meetings which he did not attend. Paras 205-6 are good examples of inaccuracies in his statement: he had not controlled the Deene Quarry

since 1985. Similarly, he does not qualify what he is recorded as saying, such as Paragraph 217 of his statement and F36/5/44. Much of his work, such as it was, was to provide the documentation for derelict land grant funding for the works. His involvement was not full time and he was working for other employers at the time. He seemed honest and had some broad recollection. Clearly from time to time, he became concerned if not exasperated with CBC; for instance, in his letter of 9 March 1993 he complained about a number of deficiencies in the working practices on the Toxic Ponds 5 & 6 reclamation; he received no response to that letter. I did not find much of his witness statement helpful and, after cross examination, nor did he. He made it clear in evidence that, left to his own devices, he would have prepared a witness statement of some 10 pages and not the very long witness statement prepared for him by CBC's solicitors.

(h) Benson Downey: a chemist by background, he was the Environmental Safety Officer retained by CBC from 1983-1990. He had no experience of contaminated land before; he had worked as an industrial chemist for a truck seating company. His role and focus was mainly the safety of workers. He was not familiar with regulations. He seems to have spent time visiting the various sites being worked for a short time each day seeing what was going on. His witness statement was drafted by the solicitors and is not always accurate (para. 122 of 1<sup>st</sup> statement and F22/41/187) and, in so far as it summarises documents it refers to documents with which he was not involved. His recollection in reality was not good.

(i) David Barry: Senior Environmental Consultant of WS Atkin & Partners ("WSA") 1983-1988-9. He was a qualified, experienced and competent engineer. He was open and confident in giving evidence. WSA was not retained to design and supervise any actual reclamation work. WSA did do some chemical investigations and other work. From time to time his advice as to what to do and what not to do was not followed by CBC.

(j) Adrian Lack: he was the Anglian Water Chemist from 1980 to 1987, Senior Inspector with Northampton County Council Waste Regulation Authority from 1987 to 1994, then Principal Licensing Officer for the WRA thereafter for the Environment Agency from 1994 to 1997 and Environment Protection Team Leader 1997-2002. He gave some second hand evidence. He gave evidence to a large extent as a representative of the Environment Agency. His organisations' remits were somewhat limited, primarily to do with licensing of Deene Quarry and seeing by inspection that, so far as obvious, the licenses were complied with. He had a limited personal involvement in the site. There was an element of "see no evil" about the WRA's involvement; if the inspectors actually saw something which did not seem right, they would record it but they would not be pro-active in looking for non-compliance with the licences or the legislation. For instance they would not sample material going into the contaminated tip facility or elsewhere unless they had reason to believe that non compliant material was being deposited. There were clearly matters of which he knew nothing which if he had known about would have led to action against CBC. Whilst I have no qualms about his honesty, I am not satisfied that much of what he gave evidence about, insofar as it was not corroborated by contemporaneous documents, was useful.

(k) John Sweeney: he was the District then Senior then Principal Quality Officer for the National Rivers Authority from 1990 to 1995, then Water Resources Manager in 1995-6 and Area Waste Regulation Manager for the Environment Agency in 1996-7. He relies in his evidence to a large extent on other people's inspections; he only visited some four times in 6 years. His evidence again, insofar as unsupported by contemporaneous documents, was not particularly helpful.

(l) Dr Susan Price: since 1998 she has been a consultant in clinical genetics for Northamptonshire. She had some involvement in collating and surveying medical records of a number of patients (including some of the Claimants). She accepted that the work of reviewing the medical records was "no more than a brief survey" to see if there were any common features. She was not able to carry out any full examinations of the patients or to review their genetic and family backgrounds. Other than the fact that she was involved historically in the Olivier and Morgan investigation and report in this limited context, her evidence in this is not particularly illuminating although she was a helpful witness as far as she could go.

(m) Dr Judith Budd: she had a degree and a Ph.D. in geography. From 1993 she joined the Department of Epidemiology and Public Health at Leicester University. In mid-1996 she was appointed to organise the collection, collation and reporting of data for the newly established Trent Congenital Anomalies Register. This became or became part of the East Midlands and South Yorkshire Congenital Anomalies Register ("EMSYPAR"), based at the University of Leicester. She was not called as an expert but to explain how the EMSYPAR register was collated. She was competent but ultimately the epidemiological evidence depends upon the expert epidemiology evidence.

(n) Dr Patrick Morgan: he was the consultant in communicable disease control with Northampton Primary Care Trust. He prepared the Report on the Investigation into an Alleged Cluster of Congenital Limb Reduction Defects in Northamptonshire at in 2000. Not a medical statistician, he had no experience in any epidemiological study of the nature which he and his trainee colleague undertook in 1999/2000. He considered that he was working with other agencies with a view to protect the public. I am unconvinced that it was or was intended to be an independent enquiry as such. He went to meetings such as on 14 April 1999 with CBC at which there was for instance an agreement to put out a press statement. Although his case identification was not challenged, it was very surprising that he did not focus on the possible cause and location of the alleged birth defects; if he was concerned to see what risk there was to the people of Corby, it would have been better if he had focussed on the possibility that the reclamation and/or landfill sites were a cause.

(o) John Buckland: a statement was obtained from him but unfortunately he died before he could sign his statement which had been prepared by the Solicitors for CBC; the statement was admitted in evidence. He was a former BSC employee who was taken on by Mr Ibbotson to manage the contaminated tip facility first built to accommodate wastes from Toxic Ponds 3-6 and later the extension to accommodate the Soothills wastes. He was part time as he had various other jobs elsewhere. His suggestion that he worked and walked

over the entire site was not borne out by other witnesses. His statement (page 5) that no large scale tipping was carried on at Deene Quarry from outside the CBC site was contradicted by his police statement at page 6. His assertion that the Toxic Pond works were carried out “meticulously” is gainsaid by almost all the other evidence and in particular the contemporaneous evidence. He said in a statement to police in November 1997 that neither he nor Mr Ibbotson was responsible for the control of Deene Quarry; that remained with CBC. Mr Bosence believed with some justification that he was not qualified to manage that tip. He also said that Mr Buckland had a nervous breakdown during the operation of Deene Quarry.

Most of the CBC's witness statements were prepared primarily by reference to contemporaneous documents. This was done by CBC's solicitors following interviews with the various witnesses. There is nothing wrong in practice for solicitors to prepare witness statements in this way, particularly where a substantial period of time has gone by between the events to which the witnesses attest before the preparation of those statements. However, there were numerous examples, particularly in relation to Mr Ibbotson and Mr Webster, where they were unable directly to support what the witness statements had been drafted to say. That said, those witnesses had been prepared not only to sign those statements but also confirm on oath that the statements were true. There were several witness statements from witnesses who had either died or who were otherwise unable to attend. Save in so far as those statements were corroborated by contemporaneous and reliable documentation, I attach little weight to them.

### **General History**

12. This Chapter of the judgment addresses the general history relating to the site and to the involvement of CBC and the emergence of the suggestion that there was a cluster of birth defects amongst children of Corby mothers. The documentation is incomplete and so necessarily I have had to do the best that I can on the written and other evidence available.
13. Over the 19 years with which this claim is specifically concerned, CBC entered into over 100 formal contracts for civil engineering works with contractors. The works included wholesale demolition of superstructures and substructures, ground, the construction of new roads and sewers, service diversions, finishing works such as footpaths, topsoiling, landscaping and re-seeding, the creation of tip containment facilities for contaminated materials and the construction of balancing reservoirs. Apart from material moved off site, I assess that some 1,500,000 to 2,000,000 cubic metres of contaminated material was excavated and transported to parts of the old BSC site acquired by CBC, much of it by and across public roads and the large bulk of it in un-sheeted lorries. Some of that material was double handled, for instance placed in stockpiles and then moved again to as with the Toxic Ponds reclamation sludge moved on from one pond to another and then moved to elsewhere. The whole exercise was described as being the largest reclamation operation in Europe at the time.

14. Corby District Council, the predecessor to CBC, had dealt with numerous planning applications by BSC over the years prior to CBC's direct involvement in the site. For instance the Council dealt with an application by BSC for planning permission for a steel framed building and lime powder storage silo at the site in July 1974. It is clear that CBC and its predecessor council had a reasonable general knowledge of the processes and the location of the various buildings, structures and facilities on the BSC site prior to its purchase of it.
15. By the 1970s, BSC had a well established effluent disposal piped system over the whole site. In 1978, BSC's Works Chemist and others carried out an apparently comprehensive survey of "Tanker Services for Effluent Disposal within the Corby Works". This related primarily to a number of effluent and settling ponds into which toxic materials had been pumped or deposited. The Western Effluent Ponds became known as the Toxic Ponds, seven in number, and various other Ponds such as the North, South and Central Settling Ponds and the East Effluent Ponds are also described. BSC had a drainage system by which waste materials in water or slurry form were eventually taken off site. The Toxic Ponds were also filled with liquid and slurry wastes brought by road tankers from various parts of the BSC site. I will return to consider the detailed history relating to some of these Ponds later in this judgement. These Ponds were said to have a capacity of 20,000,000 gallons or some 91,000m<sup>3</sup>. The contents were described as having very high toxicity ranging from "acid with no oil to alkaline with much oil". There were also what was described separately as the 5 Northern Settling Ponds and an Eastern Effluent Pond. From this and other evidence, it is clear that the area north of the northern arm of the Willow Brook, which later is referred to as Deene Quarry, was a dumping ground for industrial effluents and by-products of the iron, steel and coke making process, many of which were toxic.
16. As Dr Smith attested, the site was as one might expect after so much heavy industry carried on there. The buildings were massive constructions with very heavy foundations and the ground around them was built up with wastes such as slag and ash. The outlying areas were equally contaminated. The disposal of waste had been unregulated for most of the time from the 1930s to the 1970s. It had been deposited on the nearest available land, mostly in the area that was later described as Deene Quarry. The precise history of waste disposal practices by the steel works, since its opening, had never been recorded, even by BSC to whose records Dr Smith and CBC had access albeit that from the 1970s, when waste disposal had started to be regulated, there was more information, but it was still not very detailed.
17. By March 1980, BSC had decided to close down the bulk of its operation in Corby. It commissioned engineers, White Young, to consider the feasibility of establishing a serviced industrial development site; in broad terms, this related to some 200 acres in the Willowbrook area. The authors concluded that this area was a suitable and appropriate site industrial development and it was capable of rapid development. This report seems to have concentrated more on whether the underlying ground could take appropriate foundations

rather than upon any complications raised by the presence of soil contamination. A relatively limited borehole survey was done.

18. On 4 June 1980, Northampton County Council as the Waste Disposal Authority under Section 5 of the Control of Pollution Act 1974 granted to BSC a licence valid until 31 May 1982 to deposit "controlled waste" on the Toxic, Candy Filter and the Blast Furnace Settling Ponds. A "Draft Operational Statement" records that:

"Periodically each settling pond is taken out of stream, the settled sludge excavated and taken to a sludge tip by dump truck. Grid references of the sludge tips are respectively... In each case the sludge is tipped in to worked out areas and allowed to dry out. After drying the material is levelled off; the areas will eventually be reclaimed."

19. By this time, CBC was actively considering the purchase of at least parts of the BSC site. It retained Mr Ibbotson to do a number of studies relating to the possible reclamation of derelict land at the Blast Furnace, Willowbrook, Deene Quarry, Corby Sidings, Earlstrees and Weldon Industrial Estate sites. This related to some 800 acres. Mr Ibbotson did these studies in September 1980 pursuant to an appointment from CBC; the terms of reference are recorded in a letter dated the 23 September 1980 from the Council on behalf of itself and the Commission for New Towns:

"The terms of reference of your appointment are as follows:

(1) To identify areas of land within the Corby District which potentially are capable of being the subject of an application to reclamation grant by the local authority.

(2) Pursuant to 1) above to take all necessary consultations with officers of the District Council and Commission for New Towns to determine such sites.

(3) to prepare for submission within the time-scale of your appointment and application for reclamation funding arrangements with the Department of the Environment..."

CBC, before retaining him, had obtained a reference from Derbyshire County Council which had retained him initially for four years in 1970 as a Senior Assistant in Reclamation and later in 1975 he was a Senior and then Principal Engineer rising to Group leader in its Reclamation department. It spoke highly of him and indicated that he had been involved in colliery reclamations

20. In October 1980, CBC granted planning permission to the CNT to develop land for industrial use and land adjoining the Weldon industrial estate phase 1, to the east of the Willowbrook site.

21. By letter dated 18 November 1980, CBC asked Mr Ibbotson for comments in respect of the following:

“a) the ability of you and/or your partnership (if a partnership please supply details) to undertake possibly a five-year contract renewable annually for the reclamation works in Corby.

b) the ability of your partnership to provide:

i) detailed site investigations

ii) production of documentation in all forms

iii) general supervision as the works to be undertaken

c) your proposals in respect of the proposed charges and fees

d) your availability in respect of discussion outside immediate contractual responsibilities following commencement of the works, e.g. Discussions with the Department of Environment, Council etc”

It is clear that by this stage CBC had resolved in principle to proceed with a substantial programme of reclamation, subject to funding.

22. Mr Ibbotson replied on 28 November 1980. His letterhead describes him as "Consultant Engineer"; although he neither was nor became a qualified or chartered engineer, he did not ever describe himself as such. The material parts of his letter are:

“(a) I wish to inform you that apart from myself, engaged on the project, Dr F.W. Smith, Ph.D., M.I.M.M., C.Eng., will also be joining me together with other staff, e.g. Tracers, Draughtsmen and Engineers, etc. as and when the work proceeds.

...As the person heading the project I have had 20 years experience in civil engineering and the last 10 years with the Derbyshire County Council engaged on the reclamation of derelict land for various after uses... During my employment with the

County Council I have had experience in all aspects of reclamation works from the design stage through to the supervision of the work on site, and in the latter years the overall responsibility for the running of the reclamation team.

(b) Over a number of years I have had considerable experience in the formation of contract documents to this type of work... An important part of the work is in the field of Soil Mechanics as most of the sites are for an industrial after use, and consequently I have employed an expert in this area, Dr Smith...”

23. By early 1981, CBC was actively negotiating to purchase at least part of the BSC site. Initially CBC was looking to purchase some 255 acres of the former steelworks complex, namely the Blast Furnace site, the ore preparation and handling areas, the Glebe and Deene Coke Oven sites and associated chemical plants, sinter plants, railway sidings, expansion land, settling ponds, ancillary buildings and access roads thereto. By April 1981, this had been purchased.

24. No complete set of site purchase documents were put before the Court. However, it is common ground that as part of the purchase arrangements BSC undertook the demolition of the superstructures of a number of buildings or structures, including the blast furnace and the main sinter plant. BSC employed at least two contractors, Ward and Bird, to carry out this demolition work in 1981 and 1982. This work was done pursuant to four main demolition contracts which apparently incorporated a draft specification (F61/1). Part of the reason at least why BSC wished to carry out the demolition was to recover the more valuable metal materials.

25. A formal agreement was drawn up between CBC and Messrs Ibbotson and Smith (described as “the Consulting Engineers”) on 20 May 1981. This agreement wrongly describes them as “Partners” who practised together. In effect the relationship between them was that Mr Ibbotson in effect retained Dr Smith who had no share in the profits generated by Mr Ibbotson or any responsibility for any of his liabilities. The agreement was retrospective to 23 March 1981 and in its preamble confirmed that CBC proposed to carry out a programme of restoration works. The duties were described as follows:

“1. The Consulting Engineers shall make or be responsible for obtaining all necessary surveys, levels, soundings and borings and shall make such investigations and enquiries as may be necessary or may be required by the Council for the purpose of and in connection with the Works...

2 After such consultation as may be necessary with any authorities having rights or powers in connection with the construction or site of the works the consulting engineers shall submit for the Council's consideration a report on the works together with preliminary plans, designs and an estimate of cost.

3. The consulting engineers shall upon receipt of the direction in writing to that effect by the Council prepare all such detailed designs, drawings, working drawings, dimensions, sections, plans, specifications, bills of quantities and a revised estimate of cost, together with all other documents, matters or things that may be necessary or may be required by the Council for the purpose of inviting and obtaining tenders for the carrying out of the Works. The duties... shall include the preparation of the draft contract documents... the Consulting Engineers shall be responsible for liaising with British Steel Corporation and their contractors and advising on the most expeditious and economic method of working.

4. The Consulting Engineers shall aid and advise the council in the consideration of any tenders obtained and the selection of the tender or tenders for acceptance...

5. The designs, drawings, dimensions, sections, plans, specifications, bills of quantities and other documents, matters or things prepared as aforesaid shall be subject to approval by the Council but no such approval shall affect the responsibility of the Consulting Engineers in connection with the duties undertaken by them under this Agreement...

6. The Consulting Engineers shall consult all authorities, including British Steel Corporation and the commission for new towns, having rights or powers in connection with the construction or site of the Works...

8. The Consulting Engineers shall if reasonably possible attend or be represented at all meetings convened by the council to which they may be summoned and shall advise and assist the Council on all matters relating to the duties they have assumed under the Agreement.

9. The Consulting Engineers shall subject to the approval of the Council... appoint such resident site staff as the consulting engineers consider necessary for the efficient supervision of the work on site. The Consulting Engineers shall also make such inspections as may be necessary and shall keep the Council informed of the progress of the works. The supervision and direction before mentioned shall include the inspection and testing of work and materials and the supervision of works processes."

26. In addition to the cost of site, soil and other special investigations and the cost of site staff, Mr Ibbotson was entitled to a reducing percentage fee depending on the cost of the works in question.

27. Mr Ibbotson by August 1981 had lined up John Buckland as a resident engineer to supervise demolition works on site which were to be undertaken by CBC. Mr Buckland who had

some involvement over the following years as a resident engineer for a number of different projects at the BSC site had formerly worked in BSC's civil engineering department, albeit that he was not a qualified or chartered engineer.

28. The White Young report had been made available to CBC. This is referred to in a letter from Mr Ibbotson to CBC on 15 September 1981; he referred to it as a "thorough site investigation". He endorsed the development of that site as suitable for industrial development "with a limited amount of engineering works".

29. By letter dated the 20 October 1981, CBC applied to the Departments of Environment and Transport for 100% grant aid for the cost of "Reclamation of Derelict Land at Blast Furnace Industrial Estate Corby". This letter highlights the Council's thinking at the time:

"... I wish to formally submit draft proposals for the basic infrastructure necessary to develop the reclaimed land at the former iron and steel making site in Corby.

The application is made under the Local Employment Act 1972 for 100% grant aid to cover the costs of basic infrastructure...

The District Council in reaching a decision to develop the land in question has had regard to the critical unemployment levels in the town and the immediate need to make available land for incoming industry...

Following our recent meeting with yourself... please find enclosed as requested, a plan indicating the basic layout of the industrial estate together with estimates of the total cost involved...

The estimated total cost of the basic infrastructure amounts to £10,017,550.

Sections of the site will be released by the contractors undertaking the present demolition and site clearance works thus enabling the early commencement of the earthworks and engineering contracts.

It is intended to commence the industrial access road from Lloyds Road and extend in a north easterly direction as indicated in phase 1 of the plan...

Also included in the overall proposals is the construction of a link to Gretton Brook Road..."

The attached estimate allowed £30,000 for a soils survey and £1,050,000 for "poor ground conditions". 10% was included for contingencies and 10% for fees.

30. A document was prepared by CBC at this time which may or may not have accompanied that letter. It is headed "Industrial Land BSC Site and Willowbrook". The "Aim" was described as follows:

"To achieve the maximum industrial development of the site of 255 acres to meet the unemployment situation in Corby with the best possible commercial basis"

Apart from "Aim", the other headings were "Objective", "Requirement", "Infrastructure", "Reclamation", "Marketing", "Finance", "Factory Development" and "Wider Issues". It is clear that what was driving CBC at this stage was the need to increase employment, redevelop the site, establish a new infrastructure, secure funding and market the site all within as short a timeframe as possible. A Technical Group and Working Party had been established. It was recorded that:

"Whilst the Working Party is determining the necessary site layout it is essential that these soil and site surveys are instigated to avoid any future delays."

The Working Party was to report by 30 December 1981 on basic considerations for the site development and site layout.

31. It was obviously known by CBC that the BSC site was or was likely to be seriously contaminated. CBC had not carried out any soil analysis or indeed any survey of the BSC site or sites before they purchased them. Unsurprisingly, there came a time when CBC appreciated that it was necessary actively to consider how contaminated soil was to be disposed. Mr Sharnock, who was the CBC Environmental Health and Enforcement officer, wrote a memo to the Planning and Design Officer, on 8 March 1982:

#### "DISPOSAL OF CONTAMINATED SOIL"

It is understood that as yet no soil analysis has been carried out on the land recently purchased from BSC.

When such samples are taken I would be grateful to know of any such results before soil is re-sited should they contain the following:-...

4. Carcinogen Mutagenic or Teratogenic compounds

5. Mercury and compounds
6. Cadmium and compounds
7. Mineral oils and hydrocarbons
8. Cyanides

Metalloids and Metals and their compounds in his

1. Zinc...
3. Nickel
4. Chrome
5. Lead..."

Although this memo was passed to Mr Ibbotson, it does not appear to have received any particularly careful consideration thereafter. It is an important document because it shows that CBC was aware that there might be teratogenic elements or materials and was aware of the danger of cadmium, nickel, chromium and oil and hydrocarbon-based materials.

32. Through 1982 discussions and negotiations continued between CBC and the Departments of Environment and Transport about funding albeit in principle they were satisfied that the application made was justified in principle.
33. Throughout the early 1980s, BSC continued to use parts of the old site to deposit waste materials from the processes which they continued to run in the buildings and structures which they had retained. Thus it was on 26 May 1982 BSC requested the extension and renewal of their three licences, 002, 003 and 004, from Northamptonshire County Council. The letter confirmed as was the case that Toxic Pond 7 had been backfilled and was no longer being used. On 14 June 1982, the County Council extended the validity of the three licences until 31 May 1984.
34. By early August 1982, Mr Ibbotson was compiling a list of potential contractors to undertake general reclamation contracts at the BSC site. During July and August and September 1982, CBC let a contract for ground investigation to Norwest Holst Soil Engineering Ltd ("Norwest Holst") in relation to the sites of the Glebe and Deene Coke ovens which had

by that stage already been cleared.

35.A letter dated 28 February 1983 from the Departments of Environment and Transport gives some insight on what was being done or planned at about that time but it also demonstrates that a substantial amount of documents are missing. The letter clearly is intended to address funding and grants. It confirms that the Blast Furnace and BOS sites had been purchased for £495,000 and £190,000 respectively. It shows that substantial demolition and other works were about to commence at the Iron Making Plant, the Deene Coke Ovens, the By-products and Glebe Ovens areas with tender prices being set out. It also indicated substantial infrastructure works including what was then termed the Weldon-Earlstrees Link Road Phases 1 and 2.

36.By March 1983 BSC and CBC had agreed subject to contract that the Longhills site, comprising some 22.5 acres, should be sold to CBC. At that stage the Departments of Environment and Transport allocated to CBC £3.5m for derelict land reclamation for 1983/4.

37.It was clearly intended by CBC that materials arising from the demolition operations being undertaken by it through contractors should be deposited on the BSC site which it was buying. By letter dated 25 March 1983, BSC's property manager wrote to Mr Ibbotson in these terms:

“...I now confirm that it is the Corporation's wish that forthwith you cease depositing the reinforced concrete and other clean materials arising from the demolition area in the present tips and commence the filling of the final Deene gullet which is marked in red on the enclosed plan. The transfer of this tipping facility will require a certain amount of upgrading works to be done to the existing track system...

I appreciate that there are still large quantities of contaminated materials arising from, in particular, the Glebe Coke Oven area, and these you will continue to deposit in your existing tipping facility.

We also require at the end of each month a written return certifying the amount and type of material taken to the tip, so that this can be added to our statutory return...”

The Deene gullet was in the North Eastern part of the site and was an old gully which had been excavated historically by BSC or its predecessors to recover iron ore. It does not appear that Mr Ibbotson ever prepared any written documentation indicating what quantities and type of materials were taken to the tip either in terms of contaminated or other material.

38. It is clear that CBC was committed to developing for industrial or warehousing purposes substantial parts of the site which it had purchased. Thus, CBC jointly with the Commission for New Towns commissioned studies from Rodney Environmental Consultants in April 1983 in relation to flood protection prior to further urbanisation of the site and to provide flood storage proposals up stream of the Willowbrook East area development.
39. From 1983 or before Mr Palmer was working for CBC on reclamation contracts. As appeared later, he had no relevant experience on reclamation work or on dealing with contaminated wastes as CBC must have known. He was concerned with supervising or monitoring works on site albeit at above the level of foreman. Throughout 1983, CBC's contractors were working at the site engaged on substantial demolition and materials movement works.
40. That CBC was committed to the development of the site is demonstrated, for instance, by its retention of Soils Engineering Ltd in May 1983 to carry out a ground investigation at the Western or "Heavy" end of the site in the area formerly occupied by the blast furnaces, car park, railway sidings, pig casting plant and gas holder. The expressed object of that investigation was "to establish the ground conditions on the site and the geotechnical properties of the soils in relation to the design of different types of foundations". It was also asking that an indication be given as to "the existence of any hazardous or toxic chemicals". 28 boreholes were done which revealed, mostly "made ground [which] consisted largely of backfilled ironstone workings with ash, furnace slag, brick, metal and timber". Flue dusts were also found. The report gave advice about the installation of sewers and roads design, together with the consideration of potential earthworks.
41. It does not appear that at any time CBC paid any or much heed to the advice given and request made in Mr Sharnock's memo of 8 March 1982.
42. There is evidence that when CBC and its contractors came to demolish some of the structures left at the site, particularly the heavy substructures left in the ground, they had to use explosives. Mr Buckland's draft statement indicates these would cause dust albeit he said that the dust would settle within minutes. He accepted that there was "quite a lot of dust from the wheels as they drove over haul roads".
43. As early as 1983, CBC was interested in the Soothills and Sootbank areas to the south of Weldon Road. It asked consulting engineers, Pick Everard, in May 1983 to quote for providing various survey works at the site.
44. On 7 September 1983, CBC granted to itself planning permission to construct a public highway and carry out and associated works of land north-west of the tube works site which BSC had retained. This road was to become Steel Road leading into Phoenix

Parkway and was part of the link between Weldon and Earlstrees. These roads had the effect, once constructed, of opening up the old BSC site so that more developments could be done close to public roads.

45. It does not appear that any or any particularly effective measures were taken to exclude the public, albeit probably as trespassers, from the sites which CBC had purchased. At a meeting attended by various CBC representatives and Mr Ibbotson on 13 September 1983, it was reported that people had been swimming in some of the contaminated ponds. There was a discussion of this meeting about the Willowbrook Central and West sites, it being recorded that about one third would be expensive to develop because it consisted of old sludge lagoons with the depth of slurry ranging from 4 to 10 metres. Mr Hinest of the CNT which was proposing to develop its site to the east of CBC's Willowbrook site and on the basis of work done for the Commission, said that the BSC tipping operations had been very haphazard without records having been kept.
46. By October 1983, it was being reported that the contractor was removing screened slag from the various stockpiles of material on the Longhills site and that numerous lorries were crossing the site to gain access to an adjoining quarry and fly tipping was taking place on the site. BSC, having sold its land to CBC, had given up its rights to remove slag from it.
47. Mr Ibbotson reported to CBC in December 1983 about the proposed reclamation of derelict land at the Willowbrook site, in particular the buried slurry lagoon. His report illustrates what had become probably by then, but definitely thereafter, became, the "Dig and dump" policy. This policy, which was not in fact adopted for absolutely all materials excavated (only for the very large part thereof), involved the transporting of materials excavated on CBC's sites for deposit in the North Eastern quadrant of the site. The 33 acres of buried slurry lagoon, for example, was, Mr Ibbotson recommended, to be excavated and "deposited in a void in Deene Quarry or an area to the east adjoining Gretton Brook Road".
48. CBC knew at all times of the potential dangers to workmen and other personnel working in or on ground that was chemically contaminated. For instance at a special meeting between representatives of CBC, WS Atkins (including Mr Barry) and the contractor Noone and McGowan working on the "Heavy End Phase 1" project, held on 9 January 1984, there was a discussion about how trial pits were to be excavated and other safety procedures relating to excavations and backfilling of one sort or another.
49. By this time Mr Downey had begun work for CBC and the first of his logs is dated 10 January 1984. He apparently visited the Sinter Plant, the Lloyds Road Intersection, Phoenix Parkway, Toxic Ponds, Deene Quarry and Scrap Area, the Earlstrees to Weldon Link Road, the Willowbrook area and the BOS plant during the day. He seems to have visited six of these sites on a number of occasions throughout the day whilst for two of them he visited only once. He does not seem to have been supervising work as such or

controlling or monitoring safety as such. If anything he seems to have been recording progress, limited though it was on that particular day.

50. On 17 January 1984, CBC let a contract to contractors, Kottler & Heron Construction Ltd, for Phase IIa of the Earlstrees-Weldon Link Road. In this contract which seems to have incorporated the standard ICE conditions of contract there was as in other civil engineering contracts let by CBC a requirement on the contractor to keep the highway in the facility of the works and any other highways used by the contractors vehicles clear of mud and other debris falling from vehicles connected with the works or spread on the highways as a result of the works.

51. It seems to have been common on many of the projects on CBC's sites that chemical deposits of one sort or another were found at varying depths. An example is on the Heavy End Phase 1 project where an area of significant tar and fuel oil deposits was found at a depth of 3.5 metres in January 1984. It was reported on 31 January 1984 that "the appearance of coal tars and associated organic compounds is almost a daily occurrence". Similarly in February 1984 naphthalene or coal naphtha vapours were encountered on that project together with old slag waste which when broken into released acid gases.

52. WS Atkins and Mr Barry, who gave evidence, were "on board" by this time. As appears later in this judgement they made a number of recommendations and produced a number of reports, some of which were followed by CBC and some of which were not. For instance in February 1984, Mr Barry made "Recommendations for Chemical Investigation" in relation to the iron making and BOS plant areas in the following terms:

"Based on the knowledge of the previous uses of the areas in question, there is a fundamental need for properly investigating the existing chemical regimes on the site. There are likely to be a range of toxic and hazardous substances in the ground that are a legacy from the previous industrial processes and activities and wedge can affect a number of different ' targets ' in different ways:

-site workers can be affected by liquids, and dusts, solids, and gases;

-future site uses could also be at risk albeit to a more modest degree...

-plant life can be adversely affected"

He reported, in relation to the site history that the iron making plant and area would be contaminated by amongst other things, heavy metals and mineral oils.

53. On 6 February 1984, CBC gave planning permission for the erection of a superstore, retail

shop units, retail warehouses and a petrol filling station together with roads and car parks at land at Phoenix Parkway. This was to become the site of the Asda supermarket.

54. By March 1984, BSC had made it clear that they were willing to sell some 280 acres of further land, mainly Deene Quarry, and what had been formerly a contractor's yard. In principle, CBC was interested in purchasing and, indeed, this went through some time later.

55. Although Noone and McGowan had been working on the Heavy End Phase 1 project for some time, it was only on 26 April 1984 that the formal contract under seal was entered into. The specification as for many of the future specifications contained the "Mud on Highway" clause and also a clause relating to "Vehicles":

"The Contractor shall take all reasonable precautions to prevent contamination of public roads by vehicles leaving the site. These should include wheel-washing in the event of contact with toxic materials."

It is unlikely that any effective wheel washing facility of any sort was provided for this project or indeed most of the projects undertaken by CBC.

56. Dust as a site problem at least was known about. For instance, CBC's safety officer reported "windblown dust" in a memorandum of one of May 1984, albeit at a time when no significant contaminants were found during excavation.

57. By May 1984 it was anticipated that reclamation vehicles carrying excavation materials would have to cross at least public highways. In a letter to the Department of Environment and Transport of 3 May 1984, CBC referred to the fact that these vehicles could be up to 80 tonnes laden.

58. On 29 May 1984, Mr Ibbotson was writing to CBC in relation to the Deene Quarry as follows:

"It should be noted that the quarry is being used as a tip for the deposition of the slurry and contaminated ground and a condition of the sale of the land from B.S.C. is that the quarry site is fully restored. As an additional precaution it would be sensible to include a clause in the heads of terms for the sale of the land stating that the quarry has to be fully restored."

This demonstrates that CBC was aware that BSC was continuing to deposit slurry at Deene Quarry.

59. On 31 May 1984, Northamptonshire County Council extended BSC's Waste Disposal Licences to 31 May 1985. CBC did not have any such licences at this stage. They were

nonetheless allowing both BSC and their own contractors to deposit excavated material on the site.

60. By June 1984, CBC was interested in purchasing the Candy Filter, Toxic and Oil ponds and with that in mind it commissioned WS Atkins and Partners to carry out a preliminary investigation into those ponds and the Blast Furnace Slurry ponds which at that stage BSC was intending to retain. CBC was aware, and was made aware further, that the Toxic Ponds contained a variety of contaminants, and that they should be considered as "highly toxic".

61. There is in CBC's documents a note of a visit probably by the Department of the Environment to the BSC site on 28 June 1984. I infer that CBC was aware of its contents at the time. The note records as follows:

"1. Though not an active disposal facility, these works were worth visiting as an example of what can happen when industry disposes of waste within the factory cartilage. While the company [BSC] was licensed to dispose of waste it did so with minimal supervision.

2. British Steel, with the exception of a pipe-making plant, have left this site. Negotiations are underway with Corby District Council, for the district to purchase the site with a view to developing its light industry. The district appeared to be aware that the site is contaminated, but feel they have the expertise to deal with it. They have not been in formal contact with the county, and the county have no locus here, as this is a derelict land problem. It is also worth noting that the BSC Foreman who [ran] the waste disposal is currently the chairman of Corby District Council.

3. We visited three areas within the site: a drum disposal area, and asbestos disposal area and some tar lagoons.

#### DRUM DISPOSAL

4. The area we visited consisted of a cutting full of water and drums. The drums appeared to be floating in the water, though equally it could be that the drums were in greater quantities and had been partly covered with water. No attempt had been made to crush the drums or otherwise deal with them.

5. The drum area has also been used to take asbestos, and currently is used for general factory rubbish and some foundry sand. No attempt is made to cover,

crush or generally deal with this waste.

## ASBESTOS AREA

6. A considerable area is designated as an asbestos tip. It has to be a large area as no one knows how much asbestos has been tipped or where. While no asbestos was visible, it does appear that up till recently asbestos was frequently found uncovered.

## TAR LAGOONS

7. A number of lagoons have been used to dispose of the line, benzole and cast lodges. These lagoons still remain, and will have to be drained and the contents probably removed from the site.”

62. In March and April 1984 Exploration Associates undertook for CBC a geotechnical investigation of the "Iron making" and "BOS" sites to enable the design of foundations for new structures and the road pavements to take place. Additionally some investigation of the level of chemical contamination and the nature and distribution of slag deposits was carried out.

63. In July 1984, Anglian Water, which was responsible for water provision in the Corby area set up a working party to consider the redevelopment of the BSC site. Its report was given to CBC. The summary stated:

“Very few records of the type, quantity and composition of waste products were kept prior to the 1972 Deposit of Poisonous Wastes Act.

The areas where these wastes were dumped were not properly recorded and controlled prior to 1972.

When steelmaking ceased in 1979 the prime concern of Anglian Water was the quality of the groundwater.

Analysis of soil samples in 1983 showed that area is to be developed at very high levels of contamination...

Areas of heavily contaminated land have had the topsoil removed and replaced with uncontaminated soil.

Soil surveys are now being complicated on all development site[s] to identify possible areas of contamination.

Sites of unknown contamination have been identified...”

64. By August 1984, negotiations between CBC and BSC were advanced relating to the proposed purchase of Deene Quarry and agreement had been reached in principle. Provisional agreement was reached whereby CBC would be granted tipping facilities for the disposal of materials arising from the reclamation works, in return for which CBC would amongst other things “ pump out and dispose of liquid waste materials from various lagoons and ponds prior to infilling with tipped material” (as recorded in Mr Ibbotson's letter to CBC of 8 August 1984). CBC was also to "reclaim areas of land at present used for the Toxic Ponds" and provide new tipping and lagoon facilities for BSC in the former contractor's yard area to be purchased by CBC.

65. On 14 September 1984, CBC granted planning permission for the erection of a factory warehouse and offices at the former BOS site.

66. By September 1984, probably prior to its formal opening, Phoenix Parkway was being used by the public. For instance on 28 September 1984, Mr Downey's site patrol log records that public traffic was "quite heavy". A week or so later, barriers were erected to prevent the public having access

67. A number of the ponds had waste oil dumped in them. CBC from time to time arranged with various contractors to remove the waste oil, in effect floating on the surface. An example of this is highlighted in Mr Ibbotson's letter of 29 September 1984 to CBC which related to the removal of waste oil from the Candy Ponds by a contractor with whose technical director Mr Ibbotson “was not too impressed”.

68. Mr Downey's log for 3 October 1984 records that BSC was tipping “Orange Gunge” at the Deene Quarry and scrap area; this was noted to be "effluent from the galvanising plant”.

69. There appears at least in 1984 to have been little or no control by CBC or BSC over access to the site. Reports were made of motor bike scramblers and men with shotguns being present, for instance. On 26 October 1984, Mr Downey reported that such fencing as their was on Phoenix Parkway was “holed [therefore] area not secure”.

70. In November 1984, WS Atkins presented their chemical investigation report relating to Willowbrook Central and West areas, which was a 30 hectare site which covered part of the former Deene Coke Oven and By-Products Plant, the slurry deposit area and other areas to the east. The report split site into three areas: the slurry deposit area being

contaminated down to some 3 m, the coking plant area extensively contaminated to 0.75m and other areas which in part were contaminated with slurries.

71.By November 1984, the Department of Environment had accepted in principle that CBC could purchase the Heavy Rolling Mills Area from BSC for £190,000.

72.Throughout 1984, BSC continued to deposit and discharge waste into the Toxic Ponds and elsewhere. This is illustrated by Mr Downey's log of 6 November 1984 in which he records that toxic waste was being discharged into Toxic Pond No 2 by BSC. On 7 November 1984 he records that BSC was "dumping galvanising waste (orange muck)" at the Deene Quarry and scrap area.

73.In November 1984, CBC invited and received tenders for the excavation at the BOS site of the old foundations. This involved the excavation of some 90,000 cu m of material, it's carting away and depositing at a tip on the Deene Quarry site. The work also included the backfilling and compaction of the site to an industrial after use.

74.By late 1984, Mr Downey was recording that a company called "Bennies" was grading slag at the Deene Quarry and scrap area. This company appears to have been permitted by BSC and CBC to grade slag and then remove it for use or sale.

75.On 4 December 1984 Northamptonshire County Council granted waste deposit licenses, C17 and C18, to BSC to permit the deposit of "controlled waste" on the north bank of North Brook, just to the north of the Willowbrook site.

76.By 6 December 1984, CBC had placed a contract with T W Ward for the excavation works at the BOS area, albeit that, as BSC commented in its letter on that date, the sale of the area by BSC to CBC had not been completed. Pending that, BSC was prepared to license CBC to deposit and tip excavated materials in the Deene Quarry area.

77.Representatives of the DoE visited the site from time to time. Such a visit took place on 28 February 1985. Mr Beckett of the DoE recorded the following in a memo which was probably copied to CBC:

"2. Although some work is well underway, other areas still have to be cleared and handed over by [BSC] to [CBC] for reclamation. A brief inspection of some of these latter areas indicated that there will be considerable difficulties in reclaiming them. They included:

(i) 5 lagoons containing tarry sludges and oily or phenolic liquids from the coke oven plant. These were all of considerable extent and in my

view represented a physical hazard in their present state.

(ii) a large flooded quarry which is still in use by BSC for disposal of solid waste resulting from demolition and site clearance, but most notable for its remarkably close approximation to a waterborne equivalent of the "Valley of the Drums".

3. BSC have (generously?) offered to release these areas for reclamation at DoE expense in exchange for "new" land which they can use as a waste disposal facility for the smaller quantities of liquid and solid wastes arising from the rolling mill. I advised Corby DC and the DoE Regional Office to delay accepting these proposals until the feasibility of reclamation had been assessed.

4. It seems to me that if these facilities are to continue in use, they should be operated in a way consistent with the practices that would be required for sites subject to COPA I. This cannot be the case at present, unless the waste disposal authority have granted unusually liberal conditions to BSC. It is more likely that they are quite unaware of or unable to deal with these lagoons and with the quarry. Their continuation outside the provisions of COPA I, together with the lack of any semblance of good practice, is bad enough: the possibility that the department's funds may have to be used to restore the damage being caused to the environment by bad practices of this kind is worse..."

78. This DoE visit was attended by Mr Downey who was particularly concerned by the Valley of the Drums area. He recorded in a memorandum of 6 March 1985 about the state of that area:

"Thousands of drums (45 gallons/200 litres) of floating in the Deene quarry pond exposed to the elements and therefore in a rotting condition, drifting east and west according to the wind. Dumping of assorted rubbish, steel and galvanising plant waste (BSC's) takes place predominantly at the eastern end of the pond, and it is assumed that drums are periodically becoming trapped here causing stability problems..."

He was concerned about what the drums contained; he considered that some drums contained "the more exotic additive chemicals". He recommended that the drums should be removed and disposed of properly with the pond of being neutralised to Anglian Water requirements.

79. A further visit to the site by Mr Beckett and others took place on 16 April 1985; Mr Downey accompanied them. The note of that visit records as follows:

“1...the site is still actively used by British Steel. Although most of the works are close there is still a tube rolling mill and the galvanising plant in operation and waste from both of these are still deposited on the site.

2. British Steel and its predecessors have been using the site for over 50 years. The site was always an in-house facility and has been allowed to operate with minimal supervision from the WDA [“Waste Disposal Authority].

3. British Steel (obviously a firm believer in the 3Ps ie Pontius Pilate Principle rather than the Polluter Pays Principle) have skilfully off loaded the site on to Corby District Council. Corbett were desperate for the land (the whole area including ex-works, landfill, lagoons etc.) In order to create industrial estates to boost employment, British Steel offered it, as it stood, for £10 an acre...

4. Also as part of the deal Corby have to provide BS with an alternative site. This they are doing on part of the derelict site and this new disposal area should be ready soon. It is being newly licensed by the WDA.

## RESTORATION

5. The primary reason for the visit was to discuss ways and means by which the cleanup of the site could be effected prior to reclamation. Corby DC appeared very naive about means of doing so and about the likely costs involved. They have little knowledge of what has gone into the site or the present make up the site in the seven lagoons. British Steel did apparently carry out a sampling exercise on these but Corby do not have the results...

## DRUM DISPOSAL

6. The old flooded quarry (Deene Quarry) is in a similar state as when the site was last visited brackets although as the wind was in the opposite direction the drums were all at the other end of the lake brackets with one notable exception. Whilst travelling to this section of the site with Corby's Safety Officer Martin Beckett said he'd heard a rumour that a scrap merchant was fishing the drums out of the lake, crushing them and selling them for scrap. This was a vigorously denied by the safety officer as it would be a very dangerous and unsafe practice-nobody knows what the contents are. As we approached the western end of the "Valley of the Drums" lo and behold; two men fishing drums out, running over them with a bulldozer and throwing them into a skip!

7. Clearly embarrassed the safety officer rushed into action, stopping the men,

pointing out the hazards of what they were doing and informing them that as safety officer he was forbidding them to continue. He then asked on whose authority they were operating: back came the answer "Corby District Council"! Apparently Corby had employed a scrap merchant to clear the site of waste metal brackets (with which it abounds, from bits of wire to 7 tonne steel ingots); having seen the drums gaily floating on the lake and scrap man had enquired of someone in the district's technical department whether these should go to. He was then told to clear them!

8. The Safety Officer engaged in extensive discussions with his colleagues over lunch and it was agreed that the removal of the drums should cease until a proper and safe method of extraction, emptying and disposal had been arranged.

## LAGOONS

9. There are two areas of lagoons on the site. One in the NW corner of the site contains five lagoons which have taken a range of liquid wastes from coke ovens, sulphate plant, benzole plant, waste liquor ponds etc for many years. These lagoons are still in use for wastes from the galvanising and tube rolling plants. Only one of the lagoons has a oil separator and most have an obvious layer of oil across the surface. The level of at least one had dropped from previous visits. The site licence calls for the periodic cleaning out of the lagoons and for the sludge to be deposited in the area of the site taking solid waste.

10. There are two further lagoons (the "candy lagoons") further east on the site containing an oil/water emulsion floating on water. The surface material is very deep. British Steel have recently put strings across all lagoons fescue and with bits of coloured plastic to deter waterbirds from landing on them. This followed the untimely demise of several Canada geese in the candy lagoons.

## SOLID WASTE AREA

11. This area lies to the west of [Deene] Quarry and constitutes the infilling of the flooded area. The licence specifically requires that solid wastes be tipped into the flooded area to recover land. This means that an indeterminate number of drums have been covered and incorporated into the solid area. The dry area is still being used and we observed vehicles carrying sludge type wastes to this area brackets (or what was left in the vehicle after it had bounced over the appalling site roads).

The area also takes asbestos. This area is bounded by a public road and there was evidence of fly tipping at the boundary.

## ASSESSMENT

13. An appalling site which apparently has received little or no attention from the WDA. Hopefully the newly licensed area will be more stringently policed."

The remark about CBC being "naïve" about the ways and means of cleaning up the site was not only apt but prescient. The remark about CBC not knowing what had gone into the site was correct and must have been known to CBC who did not challenge these observations.

80. On 9 May 1985 BSC conveyed to CBC the 33 acres of land which contained the Toxic Ponds. On 24 May 1985 Northamptonshire County Council extended BSC's waste disposal licences, 002, 003 and 004, to 30 November 1985. On 6 June 1985, the Council gave notice to BSC that the drums should be removed from the Valley of the Drums. CBC was advised by WS Atkins and Partners on 19 June 1985 to seek to convince the Council to delay this operation until it was properly organised. As Mr Downey reported in his log of 16 July 1985, some drum removal had started by then.
81. Phoenix Parkway and Steel Road were open to the public officially in July 1985. It is likely that BSC and CBC used these roads on numerous occasions to transport contaminated material. Part of the reason at least for this is that CBC was contractually required to provide access to BSC across land which had been conveyed to them in Willowbrook but had failed to do so. Another reason probably was that BSC had let CBC use a road across part of land retained by BSC and CBC's contractors had severely damaged it.
82. By a written contract under seal dated 17 July 1985 CBC employed Shanks and McEwan (England) Ltd to dismantle and demolish the Heavy Rolling Mill.
83. On 23 July 1985 BSC wrote to CBC about youths riding scrambling motorbikes on disused slag tips in the Weldon area bought by CBC in March 1983. BSC suggested that CBC provided proper fencing to prevent this.
84. In August 1985, WS Atkins submitted to CBC a site investigation and assessment report relating to the Deene Quarry reclamation and in particular the liquid environments and asbestos tipping areas.
85. By late August 1985, all or most of the drums which had been floating on the water in the Valley of the Drums had been removed. Drum contents were reported by Mr Downey on 22 August 1985 to have been "dropped in the pond" and "residues have been spilled in the adjoining area of Calcium Sulphate backfill".

86. On 16 August 1985, CBC wrote to the local police saying that CBC had "an agreement with BSC" that they should use parts of the new industrial roads, Phoenix Parkway and Steel Road, to haul waste materials to their tip. Because the vehicles which BSC used were untaxed and the roads were private or at least not at that stage formally adopted, CBC wanted police confirmation that the drivers would not be prosecuted using such roads. It thus seems to have been the case that both roads had been completed by this stage and were being used by the public, albeit that the roads had not been formally adopted.
87. On 19 August 1985, Mr Downey submitted his "Safety Officers Report" in respect of the period April to July 1985. He reported that naphthalene, mainly, had been encountered in the construction of the BOS plant foul sewer; an empty pipe containing 1000 gallons of water creosote and Benzole was found, which was pumped out and "bowsered" off-site. He reported that the investigation by WS Atkins of the ponds at the north side of the site was "smelly, dirty and dangerous work"; he described it as an "awful task". Notwithstanding this he reported throughout much of August 1985 that liquid dumping was still in progress at the Toxic Ponds.
88. On 26 September 1985 Mr Downey reported that red oxide, flue dust, was being removed from the Deene Quarry and scrap area. This continued over the next few working days. In early October 2008, he reported that tankers were removing oil from toxic ponds and from the candy filter ponds.
89. On 17 October 1985 CBC granted a planning approval of reserved matters relating to the construction of what was to become the Asda superstore.
90. Only 15 November 1985 BSC wrote to CBC relating to CBC's possible plan to commence filling the Valley of the Drums. BSC was concerned that tipping would cause water displacement into its workings. It appears that this plan was to be implemented, without the consent of and contrary to the advice of WS Atkins, by CBC on its own initiative. Mr Downey records in his log of 19 November 1985 that Wards were now tipping in that area.
91. The minutes of CBC's policy and planning committee meeting of 19 November 1985 give some insight into what had happened and what was planned to happen over the preceding and following five and three year periods:

"... the major proportion of superstructure has been removed from the site, main roads, sewers and services have been or are being provided and the first developers are now on site... Currently the DoE have approved approximately £14 million of expenditure. The original purchase from BSC was 255 acres in 1981 and the council now owns approximately 700 acres including such areas as Deene Quarry, the Slag Banks and the Soot Hills.

The original programme was estimated at about five years and with the additional purchases of land the team is working on a more extended timescale and this has necessitated a review of staff level requirements...

The scheme has been tackled successfully to date using a mixture of consultants (for specialist work) and an Industrial Development Project Team comprising up to 12 staff on fixed term contracts (the staff originally seconded from the Commission for the New Towns having returned to CNT), all fees and staff costs being reimbursed by 100% grant from the Department of the Environment...

The principal consultant used has been R.C. Ibbotson Consultant Engineers and his work has involved in negotiations with the DoE as well as engineering design of reclamation and earthworks. W.S. Atkins have also been used for specialist advice in matters to do with contamination and specialist soil advice has been sought where necessary...

In the light of the above it is RECOMMENDED that the committee extended contracts of the industrial development team until December 1988 with a further review in June 1988 and engage R. C. Ibbotson Consultant Engineers, to deal with the initial reclamation on the following sites:-

- 1) Land adjoining the Heavy End
- 2) Land adjoining the former Northern Tip area
- 3) Land adjoining the former BOS Plant
- 4) Heavy Rolling Mills

and engage specialist consultants to advise where appropriate..."

It is a matter of some regret that very few minutes of such meetings or of the meetings of the Corby Joint Industrial Development Committee, which clearly did exist, have been put before the Court.

92. Mr Barry of WS Atkins' letter to CBC on 22 November 1985 illustrates what had been and was to continue to be a continuing exercise which CBC was engaged on, namely the transport and transfer of substantial quantities of contaminated material for deposit in the Deene Quarry area and in particular in the North Eastern part of the site:

“During my visit to the steelworks redevelopment site on 20.11.85 I noted that considerable quantities of subsoil are currently being transported from the old “Heavy End” up to the dry tipping area east of the drum pond...”

Mr Barry was concerned to protect various items of monitoring equipment which were in that area. This particular operation of depositing “muck” from the “Heavy End” continued until December 1985 if not until later, as recorded by Mr Downey on 12 December 1985.

93. By November 1985, BSC had been allowing CBC and its contractors to use various haul roads over its land to transport material from the various demolition, excavation and reclamation activities which they were carrying out. BSC, for instance, wrote to CBC on 15 November 1985 complaining that a tarmac road had been seriously damaged by heavy haulage vehicles in this regard. Some accommodation was reached following a meeting between Mr Ibbotson and a BSC representative shortly thereafter and it appears that CBC was to provide a site access gate from Phoenix Parkway and to provide access roads to the Deene Quarry tips with CBC to re-grade them and provide additional slag on such roads wherever required.

94. On 9 December 1985, Northamptonshire County Council extended BSC’s waste disposal licences, 002, 003 and 004, to 28 February 1986. It was not until 1987 that CBC had any waste disposal licences on the site.

95. BSC also wanted to ensure that it had access to deposit waste materials of one sort or another either in the Toxic Ponds or in the dry tipping facility at Deene Quarry. Its letter of 16 January 1986 to CBC talked about access through a southern gate from Phoenix Parkway as well as access from a northern gate. This latter access was to become an access to Deene Quarry from about this time.

96. It was only on 7 February 1986 that CBC applied, for the first time, to Northamptonshire County Council for a waste disposal licence for Deene Quarry. It must have known that it did not have such a licence before and that it had been depositing material on its land without any such licence. The application identified that it would be “clean topsoil, subsoil clay or some other, clean hard-core, concrete, brickwork or stone” which would be accepted at the site, although unparticularised “other” material was also referred to on the application. In its accompanying letter, CBC wrote as follows:

“Enclosed please find completed forms and plans in respect of the District Council's application for a Disposal Licence for the Deene Quarry which is presently being used for the deposition of excavation material from reclamation contracts at the former Steelworks site.

Since recently acquiring the site from the Corporation, the Council has commenced

its programme for the restoration of the former quarry and the infilling of the various voids is the first stage of the reclamation proposals. Upon completion of the various tipping operations, the site will be covered by a capping material, topsoil, cultivated and seeded, together with the erection of protective fencing and the installation of site drainage...

The site licence is to cover the whole of the site because materials will be deposited in various locations, dependent upon the time of year and site conditions, however, the prime objective is to infill the "drum pond" as quickly as possible. The material used for infilling voids etc. is from the former steelworks complex and is mainly reinforced concrete foundations, brickwork, slag and general excavated materials which is arising from the various reclamation schemes. The material will be transported to the tip in on-site dump trucks utilising existing internal haul roads. Material on the tip will be spread into position by a D8 or D6 dozer. The partial restoration of Deene Quarry is therefore a by-product of the reclamation works in the former steelworks site..."

This confirms that this is exactly what had been going on and was to continue to go on, namely that almost all excavated material from the various sites which CBC and its contractors were working on was simply taken on to Deene Quarry and deposited with a view to filling the area. Indeed it was such excavated material that was dumped into the Valley of the Drums pond in January and February 1986.

97.Perhaps unsurprisingly, the placing of material into the Valley of the Drums pond led to a substantial overflow of the water from the pond, so much so that BSC complained to CBC about this on 12 March 1986.

98.A letter dated 22 April 1986 from BSC to Bennies, which it had retained to recover special slag and furnace bricks from the Deene Quarry area, obliquely, confirms the licensing arrangements which BSC had secured from CBC:

"The land in question is now included in a contract of sale to Corby District Council and dated 20<sup>th</sup> March 1985, with completion to take place by 31<sup>st</sup> March 1989 or sooner if restoration work is completed. Under the terms of the contract there is a right in favour of BSC, its Agents or Licensees to enter the land until the 31<sup>st</sup> December 1989 for the purpose of recovering, treating, screening and stockpiling the slag and furnace bricks lying to the south and east of the effluent ponds... the materials in question lie within the final gullet of the former Deene Quarry..."

99.In July 1986, Norwest Holst produced a report on a ground investigation at Soothills and Sootbanks, initiated by CBC presumably as a result of its wish to develop that area. It was

the case however that no work was done there for some ten years. It was Trial Pit No 5 of this investigation which revealed serious contamination in terms of heavy metals.

100. Mr Ibbotson reported to CBC on 12 July 1986 as follows:

“Following the request to approach the D.O.E. regarding the proposed reclamation scheme of the former Deene Coke Ovens Site to accommodate recent potential industrial development enquiries, I am pleased to inform you that the Department has approved the scheme in principle.

Basically the proposals involve the removal of the mounds of material, the excavation and removal of contaminated ground, the backfilling of the site with stone, and the dynamic compaction of the ground afterwards...”

101. On 11 September 1986, Mr Barry of W S Atkins reported to CBC that “extensive tarry wastes” had been found adjacent to three of the Toxic Ponds. The unexpected presence of tarry wastes proved to be not uncommon over the whole site. The quantity later found by W S Atkins was reported in May 1987 as 50,000 cubic metres of “buried coal tar waste”.

102. On 15 September 1986, CBC signed a contract with Shanks & McEwan Ltd for the reclamation of BSC’s tipping facilities. The Works were described as:

“the formation of new tipping facilities for the British Steel Corporation and includes the excavation of settling lagoons, screening mounds, general earthworks, site roads and the erection of protective security fencing.”

This identifies that CBC had agreed to assume responsibility to BSC to remediate much of the old BSC tipping facilities.

103. Mr Downey wrote a log on 20 October 1986 which he described as a “recent history” of the site. He mentions:

“Sinter Plant...Some work muckshifting...during Spring-area used by trials bikes and public still cross it...

Phoenix Parkway...suffering from construction traffic use...

Deene Quarry and Scrap Area...Bennie’s grading slag...public regularly traverse site...BSC’s new disposal site not secure children have been spotted...playing in new ponds...

Willowbrook Area...fencegates torn down on northern perimeter allowing access to BSC’s wet and dry tipping area...public shoot & scramble & walk dogs in area.

Phytotoxicity low.”

This demonstrates a lack of concern on the part of CBC as to the contaminated parts of the site.

104. One of WS Atkins' main functions was in connection with the possible effect of contaminants and the various operations on the water tables and aquifers, which might then feed into Anglian Water's sphere of responsibility. Thus, WS Atkins monitored, investigated and reported on this to CBC. An example is contained in its 4 page letter dated 17 December 1986.

105. In late February 1987, Mr Downey reports in his log that “muckshifting” continued at the Sinter Plant and blasting of foundations was due to take place. A contractor is reported to be “muckshifting” east of Deene Quarry. Work is proceeding on “infrastructure work on the BOS plant area.

106. On 16 March 1987, CBC signed a contract with contractors to carry out the following works:

- “a) Transfer of contaminated water from Candy Filter Pond South to Candy Filter Pond North.
- b) Collection of floating oily waste material from Toxic Waste Pond No.-5 and transfer to Candy Filter Pond South.
- c) Transfer of contaminated water from Toxic Waste Pond Nos. 1, 2, 3, 4 and 5 into Toxic Waste Pond Nos. 6 and 7.”

107. On 30 March 1987, WS Atkins reported that an additional 15,000-20,000 cubic metres of excavated spoil had been deposited in the Drum pond clearly without WS Atkins' knowledge or consent. Its letter of that day stated:

“As predicted, the recent backfilling activities have caused a considerable increase in water level in the drum pond (AOD now greater than 100.0m compared to 97.0m towards the end of 1985), and additionally, a new pond has formed to the west of the 'retaining' bund, due to the intimate hydraulic continuity through the soda slag which underlies the bund.

Concern was expressed both as to the effect on the ground water or on streams but also as to the general hazard. It was recommended that tipping should cease.

108. It was only on 9 April 1987 that CBC for the first time obtained a licence to deposit controlled waste at Deene Quarry. The Licence Conditions stated:

“WORKING PLAN

1.01 Working Plan: No deposit of waste shall take place unless at least one month previously a working plan, giving details of the proposed conduct of operations at the site, has been submitted to the Waste Disposal Authority. The Licence Holder shall

notify the Waste Disposal Authority of any proposed change in the actual conduct of operations from the proposals shown in the plan, as altered by any previously notified changes, at least one month before the proposed change is implemented...

1.02 Types of Waste: The types and quantities of wastes deposited at the site shall not exceed those given in Schedule 2.

3.23 Deposit on highway: All necessary action shall be taken to prevent the deposit of mud on the highway by vehicles leaving the site. Any deposit of mud or other material on the highway or other land caused by tipping operations shall be removed immediately.

3.27 Unauthorised Deposit: All reasonable steps shall be taken to ensure that no material is deposited except in accordance with the conditions of this licence. If any material is deposited on or near to the site, either by the licence holder or by any other person, in contravention of the conditions of this licence, that material shall be dealt with as directed by the Waste Disposal Authority, at the expense of the licence holder.”

Schedule 2 identified the material to be deposited should be:

“SCHEDULE 2: TYPES OF WASTE

The types of waste deposited at the site shall consist solely of-

Waste Category A – Inert Waste (arising from the steel works’ area only edged in red on plan C/20A and from no other source whatsoever)

For waste categories see Appendix”

The Appendix listed the material which could be deposited as:

“WASTE CATEGORY A

“Inert Waste”

Material which either does not decompose or decomposes only very slowly.

It consists of clean, dry materials from the following list which are not mixed with other materials.

Subsoil

Topsoil

Hardcore

Brickwork

Stone

Concrete

Clay

Plaster

Ash, Clinker

Coal, Coke

Sand (including clean foundry and moulding sand)

Silica

Cement  
Builder's Rubble  
Excavated Road Metal (well weathered)

Excluded from Category A  
Any material listed in Category B or C"

109. Material in Categories B and C included slag, boiler scale and iron oxides and domestic waste and asbestos. These materials thus could not legitimately be deposited in Deene Quarry.

110. Other material parts of the Licence were:

"The licence holder shall keep a record of the quantities of waste deposited at the site. The licence holder is required to submit to the Waste Disposal Authority a return showing the total quantity deposited each year. The return to be submitted within 14 days of the end of each calendar year."

No such records were kept and certainly none have been retained for the period 1987 to 1995.

111. In May 1987, Exploration Associates (Warwick) Ltd reported to CBC on a geotechnical site investigation carried out at the site of the Electric Furnace Plant. By the time of the investigation, the superstructure has been demolished and the site comprised "a flat expanse with mounds of rubble, in situ concrete footings and floor slabs associated with the original furnace buildings". 34 boreholes were done and a number of trial pits. These revealed a substantial quantity and depth of "made ground" as opposed to undisturbed natural material. There was ash, slag and various chemicals, including petrochemicals, within the made ground. This was not untypical of large parts of the site purchased by CBC. It is not surprising that this is the case given that iron and steel had been intensively produced at the site for 60 years or more. The primary purpose of this investigation, again not untypically, was to determine what type of foundations would be suitable for buildings, pavements and the like. The materials found were not tested for many of the types of material referred to in Mr Sharnock's memorandum of 8 March 1982.

112. On the 13 May 1987, Mr Ibbotson reported to CBC that the Sinter Plant Area Phase 1 works were nearing completion, the Longhills work was proceeding satisfactorily and that the second phase demolition of the Heavy Rolling Mills was nearing completion. Works in the pipeline included the Electric Furnace Plant, Morgan Mill, Sinter Plant Area Phase 2 works and the Deene Coke Ovens area. In relation to Deene Quarry, he said:

"The reclamation of the Deene Quarry has generally been executed to date as a by-product of the reclamation of the main steelworks site. The exception being the

provision of the new BSC tipping facilities, which is now complete.

The eastern section of the quarry has been tipped to final contours ready for sub-soiling and topsoiling. The "Valley of the Drums" pond partially filled together with other voids, with material from the Sinter Plant Scheme. Additional filling of the voids is still required and may be undertaken as part of the current financial year's works..."

113. CBC wrote to Mr Ibbotson on 29 May 1987 expressing concern that:

"...during the reclamation of the Electric Furnace Building area, and later of the Heavy Rolling Mills area, large quantities of mud and debris will be deposited on the steel road reclamation vehicle crossing.

During the Sinter Plant contract conditions of Phoenix Parkway in North were frequently extremely bad, and the risk of an accident is much higher on steel road because of the greater vehicle speeds.

You must therefore incorporate wheel washing facilities on both sides of steel road in your contract documentation; this is essential both for public safety and to avoid silting of the gullies and sewers. Please advise me of the type and position of the washing facilities you propose..."

This was recognition that a significant and noticeable amount of mud and debris had already been deposited on Phoenix Parkway by CBC's contractors, that CBC knew about it and had done nothing about it at least until this stage and that no wheel washing facilities had been incorporated beforehand. As the history shows after this time, no effective wheel washing facilities were ever provided by CBC or its contractors.

114. In June 1987, WS Atkins produced a report containing proposals for the de-watering of the Candy Filter Pond North. This involved removing the water from that pond (approximately 5000 m<sup>3</sup>) and spraying it onto some 80,000 m<sup>2</sup> to the South East. This was necessary to make room for the removal of some 4700 m<sup>3</sup> of sludge from Toxic Pond No 1 which was to go into the Candy Pond. This was part of an overall strategy proposed by these engineers to CBC and to address the Toxic and Candy Filter Ponds and the Valley of the Drums.
115. On 11 and 12 June 1987, it was noted in a council officer's diary that there was "lots of mud on road" and "roads still very dirty".
116. On 4 August 1987, the Chairman of CBC circulated a letter from the Institute of Waste

Management. In the files before the court attached to this was a note from Mr Downey of the "History of effluent disposal in former steelworks area south of Gretton Brook Road-Deene Gullet":

"Deene Gullet was the closest mined and quarried area to the former BSC steelwork and as such was the most convenient "hole" which was used for waste materials; in addition the area has also been used to accommodate debris from the steelworks demolition. Solid and liquid waste has been extensively deposited in the area over a period of 30 years and is still being used for this purpose.

Solid waste deposited during steelworks operations includes soda slag and hard-core, electrostatically precipitated flu dusts, hot blast furnace residues, waste iron and skulls (high iron content slag plugs from steelmaking). Liquid wastes include contaminated water, waste oil and high oil bearing sludge and tars.

The site has 10 reception ponds for these wastes, that is effluent ponds numbered 1 to 7, an oil pond and two "Candy" Filter Ponds. In addition the unfilled portion of the Deene Gullet received highly contaminated water, washed through soda slag, galvanising plant sludge, and low-grade waste (metal, wood, rags etc). A quantity of 45 gallon drums, mostly empty, was also dropped in this area, which consequently gained the nickname "Valley of the Drums"; these have now been removed. Effluent treatment ponds seven has been in filled, the liquid fraction has been largely removed from effluent ponds 1-6 inclusive, and plans are in hand to deal with other existing liquid wastes...

Various areas on the site had been subject to fly tipping of such things as gas line condensates (Blue Billy), and indiscriminate dumping of one sort or another. The whole former steelworks site constitutes a hazard in that workers constructing roads and sewers may any time come across an unforeseen contaminant, of which there is no record. This was graphically demonstrated in October 1984 when 200 kg of fuming white phosphorus was exposed during the construction of a French drain at the junction of Steel Road and Curver Way..."

117. The first note (in the files before the Court) of a meeting of what CBC called its Land Reclamation and Coordination Group is dated 21 January 1988. This was attended by Messrs Webster, Hussey, Clarke and Ibbotson. The note is prefaced with this:

"KW (Mr Webster) commenced the meeting by expressing the need for formalisation of procedures and relationships. In the past the informal approach had allowed a more flexible and rapid response to frequently changing development pressures. However with a tighter financial climate and more specific and rigid new DoE rules for DLG, there must be accurate and justifiable programmes for

expenditure. Given the amount of reclaimed but as of yet undeveloped land the DoE or their auditors may well require evidence that the programme is tailored to specific market demand of the sites.”

118. In February 1988, Mr Ibbotson presented a short report to CBC which addressed the proposed ground treatment works for the Deene Coke Ovens site to produce a site capable of future development. He recommended that "dynamic compaction" was the most cost-effective method of treatment.
119. The LRCG met initially every fortnight. Thus its second meeting was on 4 February 1988 and discussion ranged from the Deene Coke Ovens work to the Willowbrook West, Heavy Rolling Mills and Electric Furnace sites as well as the programme for 1987/8 and 1988/9.
120. BSC had been transferring its own wastes in part on Phoenix Parkway, partly because CBC had not provided an access to BSC's land to the east of Phoenix Parkway and north of Steel Road. A CBC draft report prepared in February 1988 addressing the "Transfer of BSC waste to tip in the Deene Area" states:

“At present, BSC vehicles transfer wastes of various kinds to their Tipping facility in the Deene area along a route which incorporates part of Phoenix Parkway; this route is shown on the attached drawing.

The Police have now ruled that Phoenix Parkway is a Road Traffic Act highway. This means that the BSC waste transfer vehicles, which are unlicensed and uninsured, can no longer legally use their current route; the Police are however tolerating the situation further short time until a suitable alternative can be found.

As a condition of one of the land purchases from BSC...this authority is committed to provide BSC with a private route to tip so that their unroadworthy vehicles can continue to function. The best route to this private road is shown on the drawing...”

121. On 20 February 1988, CBC signed a contract with Noone and McGowan Ltd for the removal of sludge from Toxic Ponds 3 and 4. This was to involve the pumping of the water from those ponds to ponds 2 and 5, the removal of sludge by dragline onto dump trucks and its carting to the on site tip. The bills of quantities identified some 2500 m<sup>3</sup> of sludge.
122. Mr Barry of WS Atkins reported to CBC on 9 March 1988 that the backfilling of the Drums pond on had caused "the release of oils, probably from disturbed drums on the

base of the ponds."

123. In August 1988, discussions continued between CBC and BSC about the construction of a road suitable for unlicensed vehicles from BSC to transfer waste material from their works to the tipping facility. A draft report to the DoE was prepared on 5 August 1988 which identified historically what the arrangements had been over the previous few years between CBC and BSC:

"1.1 Since 1982 Corby District Council has purchased various areas of land...these purchases severed the Tubeworks from the BSE effluent disposal ponds dry tipping areas in the Deene Quarry...

1.2 During 1984/5 negotiations were opened with BSC for the purchase of the Deene Quarry, principally because of its great value as a tipping void for the enormous amounts of material being excavated under the reclamation contracts. Tipping in this area has subsequently saved tipping charges and additional haulage costs on the 750,000 m<sup>3</sup> of material placed there to date.

1.3 The Deene Quarry eventually purchased by CDC included the areas used by BSC for wet and dry tipping...a new facility had to be provided... BSC were also realising that their route to tip was becoming prejudiced by the construction of the new highways Phoenix Parkway and Steel Road, and therefore insisted on the construction of a new Private Road to ensure that their waste disposal operations would not be prejudiced any further.

1.4 The new tipping facility, together with the Private Road and other Covenants, were accepted by BSC in lieu of all the tipping charges which they would have obtained from CDC's disposal of material in the Deene Quarry. The purchase price of the area was therefore set at only £10 per acre..."

Later in the draft, it is stated:

"The volume of material tipped in the Deene Quarry has however already exceeded that planned for disposal under the "Buried Slurry Lagoons" contract, and currently totals in excess of 750,000 m<sup>3</sup>"

I can and do safely conclude that up to August 1988 alone CBC had procured the transport and deposition of over three quarters of a million cubic metres of material from sites which it had purchased and remediated. .

124. On 18 August 1988, Mr Downey reported to CBC as follows:

“Sludge extracted from the Heavy End Balancing Reservoir excavation has been giving rise to concern about its contamination. This has been complicated by the proximity of an old oil/tar interceptor which ran water to this area of the stream and was demolished some time ago. Initial sludge sampling indicated significant coal tar contamination in the sludge downstream of the interceptor on the sludge’s surface. However it was not regarded as a special waste.

Subsequent sampling up and down stream of the organic contamination site has shown the cold tars to be localised to the proximity of the interceptor, and that this is small (negligible) in comparison to the bulk of the sludge.

The sludge itself is not organic but appears to be mainly blast furnace dust high in insoluble zinc. In-house tests on distilled water leachate from the sludge indicate only low soluble contamination. Communications with G Cook, WS Atkins confirmed that this is a low risk waste, and the land filling the concrete and iron area to the east of the former Deene Gulley Drum pond is appropriate.”

125. On 23 August 1988, a CBC diary entry records that there was some mud on the roads from the “Drum ponds – Tip” area.

126. Mr Hussey's letter to Mr Ibbotson of 7 October 1988 is illuminating:

“As discussed when we met on 6 October, please arrange for 5000 m<sup>3</sup> of the material from Bell's Yard to be deposited in the area of Davey Road...

I confirm that a contract is being that the removal of silt from toxic Ponds 3&4 which will be placed on the area of rubble east of the former "Drum Ponds"; the volume is approximately 2500 m<sup>3</sup>”

This is illuminating for two reasons, the first being that CBC was quite willing to permit the deposition of material from Bell's Yard which was part of an area of the site which was contaminated. Secondly, it seemed willing to permit the spreading and deposition of the sludges from the Toxic Ponds onto Deene Quarry in breach of its licence which did not permit the contaminated type of material represented by the sludges to be deposited there. Mr Webster did tell Northamptonshire County Council about this in a letter dated 7 October 1988, however.

127. At the LRCG meeting of 1 December 1988, it was reported that the material from Bell's Yard works had been stockpiled on Willowbrook; the quantity was 25,000 m<sup>3</sup> including

5000 m<sup>3</sup> for Davey Road. The Bells Yard contract bills of quantities showed some 50,000 cubic metres of material to be excavated and removed.

128. In 9 December 1988, it was recorded that Noone and McGowan, retained as contractors on the Willowbrook Sewers and Stormwater Balancing Lake contract had deposited "unacceptably large quantities of material" on to Steel and Birchington Roads.
129. Whilst Bennies were removing slag from Deene Quarry, they were permitted to use a site entrance from Gretton Brook Road; that entrance had gates which were within the control of CBC, albeit they were very rarely if ever closed.
130. On 26 January 1989, CBC complained to Noone and McGowan about what they had been doing in Deene Quarry:

“I refer to our meeting on 24 January when we inspected part of the Deene Quarry together. We agreed that the tipping which has taken place is very unsatisfactory in the way it has been left, and also that there has been some unauthorised tipping by your company.

I understand that you had intended in any event to tidy up some of the areas, however the tipped material is holding water and need[s] immediate action.

I therefore require you at your own expense to carry out the following works to remedy the situation...

(1) Immediately cease tipping in the Deene Quarry...

(3) Area C- slurry arising from Willowbrook Lakes scheme which is being tipped in unauthorised manner.

I will write to regain about the treatment needed in this area...

(4) Remove heaps of lake slurry tipped short of their destination by drivers in a hurry to get home. This material should not in any event had been taken to the Deene Quarry...”

131. On the following day Mr Hussey apologised internally for the CBC’s “lack of proper control over the tipping operations carried out by Noone and McGowan in the Deene Quarry”. There can be little doubt that this apology was justified.

132. On 2 February 1989, CBC wrote to WS Atkins asking for an explanation why the quantities for sludges originally estimated by WS Atkins to be some 2500 m<sup>3</sup> for Toxic Ponds 3 and 4 had increased in fact to some 14,700 m<sup>3</sup>.

133. On 13 February 1989 Mr Ibbotson wrote to Mr Webster at CBC as follows:

“Progressive restoration of the Deene Quarry has been achieved by the planned tipping over many years of excavated material from the main reclamation site into the various voids in the Quarry. Substantial areas of the site were ready for the final treatment and the spreading of top soil prior to cultivation and seeding. However, this may not now be undertaken until such time as the considerable deposits of slurry have been removed. It is estimated that some 60,000 to 70,000 m<sup>3</sup> of material had been deposited on the site without prior consent, and the majority of the slurry being in the incorrect location. Substantial areas of the quarry are now sterilised through a long period until such time as the site conditions improve and permit the repositioning exercise”

This confirmed what had been going on over the previous few months, namely transport and deposition of substantial quantities of slurry in an uncontrolled and unapproved manner. Much of this work of slurry deposition seems to have been carried out by Noone and McGowan with nobody from CBC either noticing or preventing it.

134. The LRCG meeting of 9 March 1989 recorded that the Davey Road works were progressing well, the Bell's Yard works were substantially completed, and that the "filling of the Toxic Ponds [was] continuing sporadically".

135. In April 1989, Mr Hussey prepared a paper relating to the "Tipping of sludges and slurries in the Deene Quarry during October and November 1988". Materially, he states as follows:

“1.1 As part of the ongoing restoration of the Deene Quarry area, in October 1988 a contract was led by competitive tender to Noone and McGowan... for the removal of sludges from Toxic Ponds 3 & 4; the tender sum was £20,509.04.

1.2 The sludges are classified as ‘difficult waste’, and the Waste Disposal Authority quoted between £7.50 and £15.00 per cu m tipping cool charges to take the material to a licensed tip, dependent upon the exact nature of the material.

1.3 After consulting the relevant bodies, however, a location was identified on the Deene Quarry where the sludges could safely be tipped and covered without danger of leachate entering the aquifer below and contaminating groundwater. The area was

a large shallow void with reinforced concrete having been deposited in the bottom.

## 2.1 Sludge volumes

2.1.1 Following a survey by WS Atkins...a report was received suggesting sludge quantities of a little over 2000 m<sup>3</sup> for Ponds 3 and 4 together.

2.1.2 In practice, the volume excavated to reach a good firm surface were in excess of 14,000 m<sup>3</sup> between the two ponds, a vast increase on Atkins estimated quantities. A letter was written to Atkins asking them to explain this gross error.

## 2.2 Nature of the sludges

2.2.2 Considerable difficulty was encountered when trying to place the sludges in the selected area of the Deene Quarry; because of their nature it proved almost impossible to grade them out effectively and to track across them.

2.2.3 To ease this situation, the Contractor was instructed to take dry slurry from the Willowbrook Lake and Sewers Contract to the Deene Quarry to mix with the difficult waste from the Toxic Ponds Sludge Removal contract. This improved the position substantially, however because of the weather and the difficulty in tracking across the wastes the tipping area was left in a very chaotic state...

## 2.3 Financial Implications

2.3.4 The Bill of Quantities for the Willowbrook Lake and Sewers contract instructed the Contractor to take the excavated dry slurry to his own tip. Thus by instructing him to take the slurry to the Deene Quarry to mix with other materials a saving was made at 60 p per cu metre tipping charges.

2.3.5 The contractor was however involved in the longer round trip to deposit this dry slurry, and this is offset against any gains in 2.3.4...

## 4. Tipping-summary

4.1 Proper tipping control was not exercised by staff responsible for site supervision. This, combined with the difficulty in handling the materials and the poor weather conditions, resulted in the chosen area of the Deene Quarry being left in a chaotic state without proper compaction and grading.

4.2 The contractor tipped slurry materials from the Willowbrook Lake contract, without the authorisation or knowledge of site staff, on a different area of the Deene Quarry. This was not noticed quickly as site staff had no reason to visit the area in question frequently...

## 6. Quantities tipped without authorisation

6.1 It is extremely difficult to make an exact assessment of the quantity tipped... without authorisation...

6.3 The quantity tipped without authorisation then is not greater than the difference between 75,000 and 64,000 m<sup>3</sup>, i.e. 11,000 m<sup>3</sup>...

## 8. Summary

8.1 The contractor, Noone & McGowan, practised unauthorised tipping and also failed to carry out their authorised tipping in a controlled manner.

8.2 They have expressed apologies for both these occurrences, and have agreed to remedial action at their own expense and the payment of tipping charges to CDC.

8.3 Tipping control by CDC staff was bad, however valuable lessons have been learned; tipping control is now much better and the level of general vigilance in the Deene Quarry is higher..."

What Mr Hussey however did not report was that CBC decided of its own volition and without any advice from independent consultants to permit the deposit of the slurries as set out in Paragraph 1.3.

136. By mid-1989, a power station company, Hawker Siddeley Power Engineering Ltd, was interested in purchasing a site in the North West of CBC's site to establish a gas-fired power station. This was to be located beside Toxic Ponds 1 and 2. To that end it retained Ove Arup and Partners initially to carry out a ground contamination assessment and later to carry out the detailed design. Its preliminary chemical site investigation report was dated May 1989.
137. On 25 May 1989, the LRCG meeting minutes record that the Davey Road contract was complete, the Willowbrook sewers project was progressing well and the Electric Furnace area Phase 2 works were due to start within a few days. The Longhills earthworks were substantially completed and the Sinter Plant earthworks were due to commence in July of

that year.

138. Mr Barry of WS Atkins belatedly replied on 9 June 1989 to the earlier letter from CBC asking for an explanation for the increase in quantities of sludge volumes in Toxic Ponds 3 and 4:

“... No obvious reason for the large discrepancies is apparent but the following observations are relevant.

Firstly, our July 1986 report gave estimated volumes of 1450 cu m and 810 cu m for TWP3 and 4. Our subsequent work showed a revision in these estimates as 1700 cu m and 2400 cu m (Ref. May 1987 report...)...

I wonder if a possible explanation for the large discrepancies was the use of an old sludge type material lining the base of the ponds...

We acknowledge the embarrassment that the additional excavation volumes created but we believed that the data collected was suitable for the purposes intended. However, your findings may have more significant implications namely, the actual depths of wastes in the ponds and not yet excavated might be greater than the S. I. suggested. Therefore, perhaps it is an ‘ill wind’ and the need to reassess the more critical wastes in TWP5 has been established in advance of rehabilitation works...”

139. On 28 June 1989, Mr Hussey of CBC sent to WS Atkins soil analysis results for "five random surface samples" from the Deene tip. He wanted to see if there were any potential phytotoxicity implications. He was concerned that some of the results were well above the ICRCL “trigger values”. Analysis was done on the cadmium, nickel, chromium and toluene extractable material, amongst others. Notwithstanding the deposit of hundreds of thousands of tonnes of material on the Deene tip by CBC or its contractors, this was the first time any such sampling had been done. Little if any was done in the future. WS Atkins replied on 7 July 1989 indicating that the arsenic and lead content was at a potentially toxic level but it would not pose a real toxic hazard given the proposed end use. It was recommended that at least a further 10 samples were taken of surface materials, so as to equate to a 50 m grid spacing.
140. On 4 August 1989, the Electric Furnace reclamation works were certified to be substantially complete.
141. On 16 August 1989, Mr Webster of CBC, following a meeting between Mr Buckland and Mr Palmer, wrote to Mr Ibbotson in the context of the Phase 2 Sinter Plant works recently started that "means of dealing with dust are now available and can be utilised as

necessary". This did not, obviously or at all, deal with wheel washes. The demolition and excavation material from those works was to be taken to Deene Quarry across and partly on Phoenix Parkway.

142. In October 1989, CBC published its "Derelict Land Rolling Programme Review", which had been prepared by Mr Hussey in September. Material parts of that document are as follows:

### I Strategy of Rolling Programme

#### Summary of Original Strategy.

(i) Closure of the BSC iron and steel making plants in Corby was effected in the spring of 1980 with the immediate loss of 5000 jobs; a further 4000 jobs in the steelworks have been lost in the years 1980-1989...

After closure, Corby District Council set a target of the creation of 12,000 jobs in the town in as short a time as possible; one of the major strategies for achieving this was the purchase and reclamation of the iron and steel making areas using Derelict Land Grant...

The land acquired consisted of the bulk of the steelworks, comprising blast furnaces, sinter plants, by-products plants, coke ovens, and numerous other structures together with railway sidings, yards and tipping areas.

The extent of the dereliction was colossal, with all the rusting obsolete buildings, vast heavy foundations, and an enormous area heavily contaminated from chaotic tipping of by-products of the steelwork processes...

The reclamation strategy was in four parts:

- a) demolition and clearance of above ground structures
- b) bulk earth moving and removal of heavy foundations
- c) provision of roads, drainage and services
- d) development by the private sector.

The intention was to promote industrial or commercial development over as much of the site as possible, with an emphasis on soft end uses only for highway verge of landscaping or on difficult areas.

### Organisational Structures

(ii) During 1981 a Reclamation Consultant was engaged, assisted by site staff, and during 1982 a special Project Team was established by the Council to provide the necessary roads, sewers and services to the reclaimed sites. The Joint Industrial Development Committee had been set up by the Council to pursue economic regeneration, and this Committee took responsibility for overseeing the reclamation programme.

In 1983, as the District Council became more aware of the potential problems caused by chemical contamination, a firm of Consultants experienced in this field was also retained.

### Reformulation of Objectives

(iii) The District Council's prime objectives are still the same as those formulated in 1981, however the situation in 1989 is very different:

- a) unemployment is greatly reduced
- b) demand for land has increased
- c) the initial target of 12,000 jobs has been achieved
- d) there is a very different economic climate generally.

The original objective for DLG was to provide as much land for industrial and commercial development as possible, however because of the above factors that District Council can now be more selective about proposed land use...

## II Performance so far

### Achievements so far

(i) A vigorous start on the reclamation was made in 1981, and to date 92 Ha (228 acres) of dereliction has been cleared with the benefit of DLG, and 9 Ha (22 acres) without DLG...

A further 35 Ha (87 acres) will be sold after only minimal reclamation, and in addition 48.5 Ha (120 acres) could be classified as 'difficult' land with potentially very high reclamation costs of unit area.

Highway and sewer corridors account for an area of 21.5(53 acres), and an area of 68.5 (170 acres) is planned for an amenity use...

### Main Features of Scheme

#### (ii) Reclamation

Reclamation schemes have consisted of the following elements:

- a) Demolition of the enormous structures remaining from the steel making processes
- b) Removal of foundations, many of them extremely heavy as they supported buildings like the Blast Furnaces
- c) Bulk earthworks to rationalise the very variable ground levels on the site
- d) Backfilling the numerous voids and underground chambers which had been discovered with clay or stone
- e) Dealing with widespread chemical contamination from the BSC processes

The aim has been to provide a bearing capacity equivalent to that of surrounding natural ground.

### Infrastructure

Infrastructure schemes followed hot on the heels of the reclamation contracts, and these have consisted of:

- a) Provision of highways to adoptable standards to release areas for development
- b) Surface and Foul water sewers to adoptable standards
- c) Gas, water, telephone and electricity services along the highways...

#### Problems and constraints encountered

(v) Corby District Council, although being one of the smallest District Councils, decided to take on one of the largest reclamation schemes in Britain. There were considerable problems and constraints to be overcome, including:

- a) Until 1980, Corby was very reliant upon one major industry and had the public image of being a 'steel town'...
- c) The physical problems associated with reclamation were diverse, including demolition, bulk earth moving, contaminated land and extensive underground obstructions. The Council had to acquire the skills to deal with these problems...

#### IV Future Strategy

##### Remaining problems...

- c) 'Difficult land'

Approximately 127 acres of 'difficult' land is in the Council's ownership; no reclamation has been carried out in these areas, which are described below.

i Willowbrook Buried Slurry Lagoons (33 acres) - when the Willowbrook area was worked for ironstone the overburden was left in the characteristic 'hill and dale' formation. During the 1950s, the slurry consisting largely of soot washed from the Blast Furnace chimneys were deposited in the dales, and then the whole area was levelled with 2 metres of clay and other materials. The result was undulating and buried slurry in pockets up to 9 metres deep.

Many options had been considered for treating the Buried Slurry Lagoons, and Consultant's reports are available. If the area is reclaimed, costs will be in the

region of £200,000 per acre.

ii The Toxic Ponds and other Lagoons - these ponds and lagoons were used by BSC up to 1985 to deposit liquid wastes from the Steelworks and Tubeworks.

They are contaminated to varying degrees with heavy metals, tars, ammonia and other compounds. The difficulty in reclaiming the ponds depends upon the levels of contamination and the quantities of sludges present; Consultant's reports describing the reclamation options are available.

The reclamation of all the ponds would cost between £1 million and £2 million but would help to release approximately 18 acres of land for development.

ii The Soot Banks (69 acres)- the Soot Banks is an extremely undulating site where large quantities of blast furnace sort and other materials have been deposited by BSC over many years.

There is a railway line adjacent to the area, however there is no road access. To provide road access and reclaim the land to a standard suitable for development would cost in the region of £100,000 per acre...

The Toxic Ponds have severe surface contamination, and it is imperative to reclaim them in a manner which does not merely involve the removal of the contaminated material to another location; the release of land for development in this case is a secondary reason..."

There were some inaccuracies in this report. For instance, BSC had continued to deposit slurry materials in the Toxic Ponds after 1985.

143. On 16 October 1989, CBC signed a contract with Weldon Plant Ltd for the Sinter Plant Phase 2 Earthworks. The contract Bill of Quantities identified an estimated 154,000 m<sup>3</sup> of material to be excavated, carted away and deposited in the Deene Quarry tip. This material is described as including "reinforced concrete, mass concrete, brickwork, grillage foundations, piles, slag and original ground depth varying between 0M and 5M".
144. In November 1989, CBC had substantially dispensed with the services of WS Atkins. It retained Haiste and Partners, consulting engineers, to undertake a feasibility study for the creation of a central disposal facility in the Deene area to contain all solid wastes from the ponds in perpetuity. In practice, this was the genesis of what became known as the "tip containment facility". Haiste's report, updated in December, confirmed that the sludges excavated from Ponds 3 and 4 were "still exposed on the surface" in the eastern part of the

Deene Quarry. The report concluded that the tip containment facility was technically viable and the cost for it was reasonable. This approach was endorsed by Mr Ibbotson in an "Appraisal of Reclamation Proposals" sent to CBC in November 1989.

145. On 2 November 1989, Mr Downey reported in relation to the Deene area that scrap men were scouring the area. Extraordinarily, he noticed "a hunt with pack hounds-horses by the Candy Filter Ponds".
146. On 13 November 1989, Mr Webster invited a number of consultants, including WS Atkins, to submit a bid for consulting services in relation to the Deene Quarry slurry disposal facility. WS Atkins' response on 20 November 1989 was to express some misgivings. They wrote:

"As you appreciate, we have carried out an evaluation of a number of options for the removal of wastes from the various ponds and surrounding areas, but due to changing economic factors, these studies were not always taken to a full conclusion.

The most critical factor in our view concerns the disposal of the highly organic wastes from Toxic Waste Pond No 5; the landfilling of such wastes is generally not favoured by DOE, notwithstanding the fact that they are currently 'landfilled' on this site. Also their physical nature could present significant practical difficulties..."

WS Atkins did not succeed in securing the requisite appointment.

147. On 15 December 1989, Mr Downey wrote to Mr Palmer and Mr Webster. This is an important document as it throws considerable light on what was or was not being done by CBC:

"Following a site visit by Mr Webb of the Northamptonshire Waste Disposal Authority to the Deene Quarry Borrow Pit earlier this year a request was made for analysis results concerning 2400 m<sup>3</sup> of tip waste found on the Willowbrook Roads Contract. This generated a letter from Mr M Ward suggesting we take greater care to deposit only INERT wastes in the Deene tip. The letter also contained a copy of our License C20 for tipping in the area.

This is the first time I've seen this document. Hitherto I understood that wastes generated on former steelworks area could be tipped in the Deene Tip so long as they were not "special wastes" which could only be tipped off site, under the Special Waste Regulations.

Where as I am sure no special wastes had been tipped into the Deene (we have not

come across any), we have tipped waste outside the INERT category. Furthermore we are not operating the Deene tip to anything like the requirements of the License C20.

Clearly we could be in danger of having this licence revoked and this could endanger future development/reclamation strategies.

It must also be said that the WDA in the form of Mr Webb regularly visit the site, over the past five years, and no communication from them has come to the LRPT offices concerning the operation of the tip to my knowledge, so presumably they are not over concerned.

The following questions need to be addressed.

(i) Waste we generate/find. Do we need to stockpile and analyse more than we currently do? Instead of simply moving poor site material straight to tip. This obviously has cost implications, not least of which would mean a designated tipping area for wastes between the INERT & SPECIAL WASTE categories.

(ii) Deene site security and operations. We are inadequate in both these areas and possibly in record-keeping. Do we need to improve fencing, manning and compaction practices?

(iii) Is this our problem at all, or is it being dealt with by the IBBOTSON/BUCKLAND axis?

(iv) I look at wastes primarily from a safety point of view the contractors' personnel. I am not a waste disposal officer-have I exceeded my brief?"

148. In the summer of 1989, CBC published a booklet "Corby Works - A Town in Action". It contains a useful if flowery insight as to CBC's thought processes and approaches from 1979 onwards:

"If ever there was a 'tide in the affairs of men', then such a tide came to Corby in 1979...

Corby's reaction was one of both courage and realism. It was based on the conviction that unless the town set about helping itself, it was extremely unlikely that anyone else would. That meant an unconventional approach to local decision-making and need to cut through red tape, a willingness to push open doors in the corridors

of power, to argue a case with those who control the purse strings, regardless of their political complexion and that it was a town with its back to the wall and the right to expect from its elected local representatives.

An early and, as it turned out, far-sighted decision by the District Council, acting jointly with the Development Corporation and Northamptonshire County Council, had been to commission a report... on the likely effects of steel closure...published in January, 1979. Whilst the Council rejected its less optimistic prognosis, it did accept two of its major recommendations: the establishment of a Joint Industrial Development Committee to coordinate future strategy and the creation of a single agency to spearhead Corby's industrial promotion....

Duncan Hall, Chief Executive of the District Council from 1979-1987, viewed the formation of the JIDC as one of the key decisions on putting the town on the road to success. He said:

‘The combination of the District Council, County Council and Commission New Towns provided the format to create an overall strategy for the economic regeneration of Corby. It also enabled the strategy to be maintained, sustained, and ultimately refined to meet the changing needs and circumstances of the town’.

An equally important move by Corby Council was to reorganise itself. There had been seven chief officers. They were replaced by three. And, in addition to the creation of the JIDC as a policy-making body, the Council effectively placed executive powers in the hands of their own leadership in order to secure or new industry. In other words, the local authority would be run and controlled as a business in which a strong element of ‘crisis management’ was called for....

Tom Simmons, who moved to Corby as Chief Executive in 1987, makes this comment on the earlier decisions to restructure the local authority and delegate powers: ‘local authorities generally are places with great intricacy of political machinery, a whole edifice that tends to stand in the way of actually achieving results.

‘Coming here has been a remarkable experience. The purpose of the Council is absolutely clear. They are not interested in structure, or organisation, or things like that. They are interested in results. You don't get intellectual debates concerning high principle. It is very much plain speaking; straightforward argument.

‘I think it was a very bold move by the Council to cut away the bureaucracy and cut away the structure of the party organisation.

‘Their principal purpose was to increase employment, and that was not subjugated to anything else. I couldn't imagine many other politicians doing that.’

And so responsibility for the drive towards industrial recovery was uniquely vested in the hands of what Deputy Leader, Councillor William Mawdsley, has described as ‘a complex mixture of democracy and autocracy’...

...Buying British Steel Corporation land, 270 hectares of it, and reclaiming it has cost £21 millions, but the cost to Corby has been nothing. 90% of the money came from a Derelict Land Grant and the rest from Europe...

... The granting of assisted area status opened the way for Corby to apply for European Community aid, and in eight years would receive some £130 million from the Community's regional, social and energy funds-a record for any British town”

It was not mentioned that very large quantities of contaminated material had been moved from their existing locations to another part of the site. It reflects CBC's concentrated determination on achieving its aims but less concentration on how to achieve its ends safely.

149. Mr Downey had arranged for a further 10 samples to be obtained from the Deene tip and they were sent to WS Atkins who commented on them in a letter to him of 8 January 1990. WS Atkins wrote:

“The combined data show that although some of the phytotoxic determinands are in excess of ICRL TTVs, there is no evidence of any real risk to human health, if the area is to be developed for some form of public open space.

The main concern is the potential phytotoxic contamination mainly in the form of high zinc levels (both total and available). The further boron results are also very high for water-soluble values, and as discussed with you I'm doubtful of their validity. Other potentially phytotoxic parameters (copper, nickel and total cyanide) are within acceptable levels...”

150. In February 1990, Mr Ibbotson made arrangements on behalf of CBC with contractors to demolish the old BSC locomotive sheds. The LRCG meeting of 22 March 1990 recorded that this work was proceeding as were the Deene Quarry earthworks. The Electric Furnace Phase 2 works were progressing well. Works at Morgan Mill and Longhills were expected to commence shortly. The meeting minutes also makes mention of the property recession and its effect on land prices.

151. On 20 April 1990, in the files put before the Court, there is the first record of an inspection of the Deene Quarry carried out by NCC, as the Waste Disposal Authority. It records that unauthorised types of waste were at the site ("non inert waste, mainly in the Borrow Pits area, lots of rubber tyres, 45 gallon drums, wood and plastic"), but there was 24-hour access at the Gretton Brook Road and Toxic Ponds gates and that there were "heavy mud deposits on Gretton Brook Rd (by Weldon Plant tippers)".
152. The Deene Quarry Earthworks Phase 2 works contract between CBC and C A Blackwell (Contracts) Ltd was signed on 3 May 1990. The scope of works involved "the scrub clearance, general earthworks, excavation and spreading of overburden, etc and site grading". So far as can be ascertained, this involved the spreading of the slurries and other contaminated and otherwise excavated materials which had been deposited towards the eastern end of the Deene Quarry site. At the LRCG meeting of 24 May 1990, it was recorded that the fencing to Deene Quarry was complete and that the site was "now secure". The Locomotive Shed demolition and Deene Quarry earthworks were said to be complete. The Morgan Mill works had started.
153. At the LRCG meeting of 5 July 1990, the name of Mr Copley first appears. I infer that it was in the first half of 1990 that he was first employed by CBC. He was appointed as the Head of Engineering Services and directly responsible for the reclamation works. As appeared later, although he was a Chartered Engineer, he was not qualified or experienced in reclamation work or in dealing with contaminated materials. He had previously worked for a London Borough.
154. On 30 July 1990, there was a discussion between various council officers in the Chief Executive's office about complaints from parties who had bought or were buying the land along Steel Road about contamination or poor ground conditions that restricted their ability to build and which increased their building costs. CBC had been disposing of land which had been reclaimed on a caveat emptor or "buyer beware" basis. It was resolved that absolute guarantees on sites could not be given. The policy of "buyer beware" continued.
155. Dr Smith was instructed by CBC and Mr Ibbotson to and did investigate details for the contaminated tip facility proposed, and in particular the lining. What was being considered in broad terms was the lining of a substantial hole in the ground to enable material to be placed in it in such a way that it could not or would not escape. Dr Smith wrote to Mr Ibbotson on 2 August 1990 about the proposed lining and what steps were necessary to be taken. Tenders were invited from seven contractors in August 1990 also. The tender invitation indicated that the contaminated tip facility was to have a volume of approximately 130,000 to 140,000m<sup>3</sup>. What was undoubtedly envisaged was that material from the remaining Toxic Ponds as well as material from other sites would be placed in the facility.
156. On 3 September 1990, Ove Arup on behalf of Corby Power prepared a "Statement of

Intended Works to Undertake the Partial Reclamation" of Toxic Ponds 1 and 2; it was intended as a consultation report to inform the Waste Authority, National Rivers Authority and CBC. The proposed reclamation works were summarised as:

- “1. The removal of oils to a licensed incinerator.
2. The disposal of polluted water to Anglian Water Ltd's Corby Reclamation Works.
3. The excavation of approximately 100,000 m<sup>3</sup> of contaminated ground to a prepared storage facility.
4. The backfilling and compaction of material in the void formed by removal of contaminants.
5. The importation of about 90,000 m<sup>3</sup> of fill materials to make up site ground levels.”

It was indicated that the ground had been found to be contaminated by a number of substances with ammonia, cyanide, phenol, sulphate, sulphide, toluene extractable matter and zinc levels being particularly high.

157. CBC discussed these proposals with NCC (the WDA). It made clear that CBC would monitor the infilling operation. CBC would also be responsible for the design and construction of the tip containment facility. In September 1990, CBC applied to NCC to modify the C20 licence which it already had. This involved the addition (in plan) of a large triangular area for the new facility; this triangular area occupied in part an existing tipping area on which there was an existing void. The wastes to be permitted in this area were to be those from the Toxic Ponds and the Deene By-Products Plant.
158. On 24 September 1990, CBC signed another contract with Weldon Plant Ltd for further work on Deene Quarry, namely the "scrub clearance of the site, general earthworks to form void for future infilling and the importation and stockpiling of fill from adjoining site"; this was to relate to the triangular area for the tip containment facility.
159. On 29 September 1990, Mr Ibbotson wrote to Mr Webster about the contaminated tip facility:

“I enclose for your information a schedule of items which I would consider to be of use to protect the Council's interest when drawing up the agreement with Corby Power. The suggested specification is for the backfilling of the void with the

contaminated material from the Toxic Ponds, and it is my recommendation that the Contract Documents to be prepared by Ove Arup should include such works.

Because it is Ove Arup's intention to use only the main Civil Engineering companies to tender for the works, the earthmoving aspect of the operation will more than likely be sub-let, and it is important that the quality of the earthmoving contractor be approved by the District Council.

The District Council is to supervise the works for the backfilling of the void and hence the decisions of the Resident Engineer must be final with regard to this operation."

The attached Specification indicated that Corby Power's contract was also to maintain the haul road between the Toxic Ponds and the Tip Facility in a suitable condition and standard and upon completion of the operation to reinstate the same to the requirements of CBC.

160. In October 1990, CBC placed a contract for the supply and installation of the membrane lining for the contaminated tip facility. There were some delays in the commencement of this work which gave rise to some concerns in November 1990, being recorded in letters exchanged between the membrane contractor and CBC on 20 November 1990; these related to the nature of the fill material and the combination of bad weather making it impossible to prepare the site to a standard acceptable for the installation of the liner.
161. On 25 October 1990, NCC issued an amended Disposal Licence C20 as applied for by CBC. The types of waste which could be accepted at the site were defined as consisting of:

“...that described in the existing licence and contaminated material from the area of the Toxic Ponds and the Deene By-Products Plant as defined by previously submitted analysis. Should waste entering the site appear to fall outside these permitted wastes it should be isolated and the Waste Disposal Authority informed. No free oil or aqueous waste shall be deposited at the site.”
162. CBC obtained a list of approved potential subcontractors for the earthmoving and backfilling operation relating to the materials from Toxic Ponds 1 and 2.
163. It seems clear from letters which Mr Webster wrote to WS Atkins and Geotechnics on 4 December 1990 that CBC had mislaid many original documents and plans containing geological environmental data and reports relating to Deene Quarry. He asked them to provide further copies of various reports, exercises surveys and logs.

164. On 15 November 1990, CBC granted a licence to Midlands Markets Ltd to use a site on the western side of Bangrave Road as a Sunday market. The evidence suggests that there was at least one Sunday market in the years prior to this somewhere around the old BSC site.
165. CBC procured tenders for the backfilling operation for the contaminated tip facility and told Corby Power's holding company by letter dated 31 December 1990 that it was Weldon Plant Ltd whose tender was the lowest and was recommended for acceptance. By letter dated 16 January 1991, Corby Power accepted the recommendation and also CBC's proposal to construct a second access to the contaminated tip facility.
166. At the LRCG meeting of 24 January 1991, it was recorded that the Morgan Mill demolition works, first phase, were going well. The membrane at the bottom of the contaminated tip facility was expected to be finished within the next two days.
167. In February 1991, the Environmental Advisory Unit of Liverpool University submitted its draft report in relation to Toxic Pond 5 on its "contamination investigation". It described the surface of the pond as consisting of open water, oil mousse and solidified sludge; the sloping banks were covered with a layer of oil and tar rich sludge. Several unlabelled, empty drums were evident on the surface of the pond. Some of the samples had to be obtained from a boat using a sediment grab. Total plan area was found to be some 2707 m<sup>2</sup> and the water volume estimated at 2815 m<sup>3</sup>. The volume of sludge was calculated to be 5415 m<sup>3</sup>, albeit only on a best estimate basis. The waters were found to be highly contaminated by organic material as determined by the cyclohexane extract. Heavy metals concentrations did not indicate any significant contamination by those elements. PAHs were found as were other hydrocarbons. Amongst other things the hydrocarbons were considered to be of importance in terms of a potential hazard to health. At paragraph 6.10, it wrote:

“Coal tars include a wide range of compounds which characteristically include a number of benzene rings in their structure. Many of these compounds have known or inferred effects upon human health. Certain polynuclear aromatic hydrocarbons which form a substantial proportion of coal tar compounds are known carcinogens from either occupational exposure records or from experimental studies on laboratory animals. Other health effects have been recorded. Napthalene, which may be inhaled, ingested or absorbed can cause nausea, vomiting, and headaches or in cases of severe exposure, convulsions, coma and death. Phenanthrene is known to cause photo sensitising of the skin.”

CBC knew of the existence of PAHs in the sludges from a fairly early stage.

168. On 7 February 1991 Dr Smith sent to Weldon Plant's safety officer some "Safety

Guidance" in relation to the Deene Quarry tip. It was primarily related to the protection of workers but certain hazards were identified including long-term health problems from skin contact and fumes.

169. On the following day, he also wrote to CBC with an update of what had been happening at the Deene tip. He confirmed that the new waste tip had been designed and lined to the complete satisfaction of the NRA and WDA. The volume of the facility was at least 120,000 m<sup>3</sup> and plans had been approved extending it in the future. Five monitoring boreholes and piezometers had been installed together with a pre-existing hole. He referred to the hazards from the sludges including coal tars as arising from ingestion, vapour release and soil contamination around the haul road (amongst others). He assumed that any problems of odour or dust arising from the earthworks at Corby Power or from the haul road were the responsibility of Balfour Beattie, the contractors employed by Corby Power. He said that, if the haul road was pinpointed as a source of problems, the contractors should be stopped from using it until the problem was solved. He referred to the fact that Mr Buckland was CBC's resident engineer at the facility. He said there was no requirement on CBC to analyse the materials or to provide a detailed report on the materials tipped about it was obliged to ensure that each load was checked visually for its suitability. Should any waste fall outside the permitted descriptions it should be returned.
170. On 13 February 1991, WS Atkins replied to the letter of 4 December 1990 seeking further information and documents. A number of borehole records were enclosed.
171. A demarcation dispute appears to have arisen between CBC, Mr Ibbotson and Dr Smith on the one hand and Ove Arup and Corby Power on the other concerning the provision of soils information from the latter relating to the content of Toxic Ponds 1 and 2. On 18 February 1991, Ove Arup provided summaries of chemical testing undertaken in its various site investigations. Dr Smith estimated on 23rd February 1991 that some 63,500 m<sup>3</sup> of chemically affected material would be removed from Toxic Ponds 1 and 2.
172. In March 1991, Deene Raceway (Corby) Ltd together with CBC applied for planning permission to develop the eastern end of the Deene Quarry as a motor vehicle testing circuit. This was in the area which was eventually to become the Rockingham Motor Speedway.
173. On 20 March 1991, Mr Ibbotson reported to Ove Arup that contaminated material and slurry were being deposited at various locations along the haul road from the dump trucks transporting the excavated material from Toxic Ponds 1 and 2 to the contaminated tip facility. He asked that action be taken promptly.
174. At the LRCG meeting of 20 March 1991, it was reported that the Morgan Mill works were progressing, albeit very slowly. On 25 March 1991, CBC signed a contract with PL

Construction Ltd for the construction of the BSC haul road, comprising 620 m of 5.5 m wide road north and south of Steel Road.

175. Following complaints to and by police, it was clear that, up to and beyond April 1991 there was no effective fencing at Soothills. This was to continue with numerous examples of unauthorised access.
176. In April and May 1991, demolition works were being carried out at the old BSC workshops by CBC using contractors.
177. On 17 May 1991 Dr Smith wrote to Mr Ibbotson referring to the fact that there had been substantial spillage from the trucks used by Weldon Plant as subcontractors to Balfour Beatty on the Toxic Ponds 1 and 2 contract. Because from time to time the haul road had been bladed off, the material spilt and lying at the side of the road was contaminated. Dr Smith had had some samples carried out. He recommended that the material was bladed off should be disposed of in the containment facility. On the same day he also wrote to Mr Ibbotson about the material being deposited in the containment facility. Some PAHs and coal tar along with other contaminants were noticed. Mr Ibbotson replied on 20 May 1991 confirming that the bladed material on the haul road had been placed in the facility.
178. At the LRCG meeting of 6 June 1991, it was reported that the Morgan Mill and Workshops demolition works were completed, as well as the Railway Sidings work.
179. On 3 July 1991, Mr Webster reported to Northamptonshire County Council that the contaminated tip facility had now been substantially infilled. It had been decided, he said, to increase its capacity by extending the size to accommodate contaminated material from the remaining Toxic Ponds and the two Candy Ponds. On 20 September 1991, the reply came back that this proposal was acceptable subject to the production of an acceptable scheme before any further work was done.
180. On 31 July 1991, East Northamptonshire District Council gave outline planning permission for the motor vehicle testing circuit in the north-east corner of the site.
181. In September 1991, Dr Smith produced a Summary Report on Reclamation of Toxic Waste Ponds and the Construction of the Contaminated Tip Facility. He referred to the fact that the Candy Ponds had not yet been treated and went into the history to date of the Toxic Ponds, the Oil Ponds and the Valley of the Drums. He referred to the fact that sludges from Toxic Pond 3 and slurry from the Willowbrook balancing reservoir had been tipped into the Gretton Road gullet. He recorded that wastes from the Glebe Coke Works had been tipped over much of the site from the Candy Filter Ponds towards the North Brook.

182. On 4 September 1991 CBC wrote to NCC stating that the extension to the contaminated tip facility would have to accommodate some 60,000 m<sup>3</sup> of material from the Toxic Ponds and 25,000 m<sup>3</sup> from the Candy Filter Ponds. Some general details were provided of the proposed works.
183. In September 1991, CBC began again to consider what to do with the Willowbrook North site and in particular the buried slurry lagoons. Mr Palmer produced a report which was discussed shortly before 20 September 1991 which divided the sides into two halves, eastern and western. The provisional view formed was that the western half might be treated and reclaimed whilst the eastern half would remain untreated for the time being apart from some minor works.
184. It seems clear from various clerks of works report sheets in September and October 1991 that demolition work was still continuing at the BSC Workshops with two contractors involved. At the LRCG meeting of 10 October 1991, it was recorded that considerable amounts of material were being found underground in excess of that originally billed.
185. On 27 November 1991, CBC (Mr Webster) wrote to Northamptonshire County Council to address an objection from Mr Sweeney of the NRA about the proposed tip extension at Deene Quarry. Mr Webster accepted that the ideal solution would be to remove the material to an off site tip but that was too expensive. He urged Northamptonshire to accept that the encapsulation of the material in a sealed tip facility on the site was an appropriate course of action. He wrote:
- “The Candy Lagoons and the Toxic Ponds contain liquids and slurries in addition to contaminated ground around and under the ponds. The liquids will be removed from the Ponds in the usual way, the slurries will be transported to the tip, placed in the cells and blended with other materials in order to make them more workable. The other deposits of contaminated ground will also be blended with the materials of high moisture content, to produce a tip which will be manageable and of sufficient bearing pressure to enable machines to traverse the site to place the final layer of capping material prior to the roof membrane.”
186. On 1 December 1991, CBC signed its contract with contractors for the demolition of the Morgan Mill.
187. On 28 November 1991, NCC in its WDA capacity wrote complaining that there was "unrestricted access of vehicles to Deene Quarry at the new Power Station end of the site." It recorded that the original fencing and gates no longer afforded any control of tipping. It was concerned that:

“This situation may have contributed to the influx of waste consignments containing

wood, plastics, bitumen, etc recently taken on to site and tipped nearby, whether this is tipping by unauthorised people or not, the consent for tipping inert waste only is being ignored and also the indiscriminate disposal of tangled reinforced concrete may give restoration difficulties.”

188. In December 1991, Dr Smith produced reports about the Soothhills and Willowbrook areas.

189. On 10 January 1992, NCC wrote to CBC as follows:

“With reference to the above site [Deene Quarry], it was brought to my attention, just prior to the Christmas break, that inert waste materials arising from the Kingswood area of Corby were being disposed of at this site. I have since been advised that this activity has ceased.

I am writing to remind you that the planning permission and site licence allow only the disposal at the sight of materials arising from within the former steel works area and from no other sources whatsoever. The recent importation of materials from elsewhere is unauthorised and should therefore not be recommenced”

Details were sought of what quantities and over what area this material was deposited.

190. Mr Webster responded to this letter on 23 January 1992, albeit that the letter was drafted by Mr Croyley:

“The unauthorised importation of material has been suspended until such time as the matter can be regularised.

I am sorry that permission for this work was not sought in advance, this was unfortunately due to a misunderstanding of the situation between officers of this Council...”

191. As confirmed at the LRCG meeting of 20 February 1992 no further security fencing had been provided to prevent unauthorised access in the northern part of the site although gates, mounds and ditches were acknowledged to be required to secure the site and prevent further fly tipping. The WDA Inspector however recorded on his inspection sheet for 24 April 1992 that fly tipping was still continuing and it follows that inadequate measures had been taken so far as fencing and the like were concerned. Similar inspection sheets of 8 May and 12 June 1992 record that unauthorised waste continued to be dumped at Deene Quarry.

192. On 19 May 1992, Dr Smith wrote to CBC about what had been going on at Willowbrook. Motorcycling and go-karting had been permitted and had:

“...disturbed the surface capping quite significantly in places, digging up mounds of slurry. When these dry they will generate a lot of dust. As far as we know the slurry comprises fine grained coke, iron ore and limestone-but also has high levels of some other metals, particularly lead and zinc. We've not averaged all the data, but guess around 0.2% lead and 0.3% zinc. There is also ca. 0.05% coal tars and a few ppm cyanide. It is not acutely toxic. Given the use of the track, though, conditions could get very dusty and drivers and spectators may get high exposures. We are not occupational hygienists and you would need someone experienced to calculate out the "risk"-which I expect is low and cumulative effect. It is, however, clearly not a good idea to allow them to plough up more slurry...”

One would have thought that it was obviously dangerous that scrambling and go-carting would or at least could cause the creation of harmful dusts; Willowbrook North was known to be a highly contaminated site.

193. By June 1992, tender documentation had been prepared in connection with the reclamation of Toxic Ponds 5 and 6 and the Candy Filter Ponds. The scope of the works was described as comprising the removal of water and sludges from the Ponds with the disposal of sludges at the tip containment facility at Deene Quarry. The proposed work also included the pumping out of water from the Ponds to sewers. Some 38,000 m<sup>3</sup> of sludge was estimated as requiring excavation.
194. On 1 June 1992, CBC gave planning permission for a temporary change of use at land at Bangrave Road, Weldon. This was to be the site of one of the Sunday markets which many of the parents of the Claimants visited.
195. At the LRCG meeting of 24 June 1992, it was recorded that the Mills Road Earthworks Phase 2 works were proceeding although some concrete and galvanising sludge tipped by BSC had caused difficulties.
196. On 9 July 1992 the WDA Inspector noted that unauthorised material was still being brought onto Deene Quarry and that there was random tipping of soil consignments with no compaction and that concrete lumps from demolition sites were being brought in exchange for soil. It was noted that there were mud deposits on Gretton Brook Road.
197. Mr Palmer was reprimanded for attending a function with Noone & McGowan. Mr Webster wrote to him on 6 August 1992 as follows:

“I believe you realise that your attendance at the function on 29th was unfortunate as it

left yourself open to accusations of an improper relationship with the contractor concerned. This is especially so in this case where the contractor, Noone & McGowan, is one where you have frequent contact at work and are in a position of influencing the award of contracts, the approval of works, or the payment of monies. I trust you will endeavour in future to maintain a prudent 'distance' between yourself and the contractor concerned. Should you require clarification of whether or not the receipt of hospitality by this or any other contractor is acceptable, you should, in future, always discuss the precise example with either the Head of Engineering Services or myself."

198. In a letter dated 6 October 1992, Mr Ibbotson reported to CBC:

"As you are aware, work has resumed on the earthworks operation to the contaminated tip facility after terminating the contract last December due to adverse weather conditions making the site impossible to work.

However, in order to be able to progress the operation the tip void has been pumped out on three occasions, this being as a result of the recent prolonged periods of heavy rain. In order to maintain the site free of water to permit work to proceed a 24 hour pumping operation is in progress. When the void is sufficiently dewatered it may be possible to revert to one pump only from the present two pumps.

As you can imagine, the weather and site conditions at the moment are not conducive to the efficient completion of the earthworks contract and, in addition, the laying of the membrane. However, I am pleased to be able to report that during the last three days steady progress has been maintained and I will keep you informed of any further developments.

I refer to our recent discussions with your Engineer, Mr Cropley, regarding the probable overspend to this contract and, as promised, I detail below the various headings in which I consider the potential overspend to be :-...

- 3) Repositioning sand to bank sides damaged by heavy rainfall.
- 4) Drainage problems resulting from egress of water from Candy Ponds...
- 6) Re-mobilisation on site on three occasions
- 7) Removal of additional contaminated slag from road around the original tip void which was not allowed for in the original B of Q..."

199. By November 1992 CBC had let to Weldon Plant the contract for the reclamation of Toxic Ponds No 5 and 6 and Candy Filter Ponds. Site meeting No 1 took place on 4 November 1992 attended by Mr Palmer, Mr Bosence and Mr Bird for CBC. Mr Bosence was to be the resident engineer for the project until he was removed in about March 1993 and re-assigned elsewhere. On the same day CBC signed a contract with Weldon Plant Ltd for the execution of general earthworks at the site of the tip containment facility. This was to enable the expansion of that facility to take place. Those earthworks must have involved the moving of contaminated materials. Some concern was raised at the second site meeting as to whether the contaminated tip facility would be ready to receive sludge from Toxic

Ponds 5 and 6 in time.

200. Site meeting No 2 of this contract took place on 26 November 1992. Relevant parts of the minutes (set out in a legal officer's report of 22 January 1997) are:

“2.23 LM suggested pumping out Candy Filter Ponds North and South which was included in the contract, haul the sludge from ponds 5 and 6 to the Candy Filter ponds, then double handle the sludge into the contaminated tip when it is completed. This would allow the regrade area to continue if the contaminated tip was not completed.

2.24 Following a consideration of the volumes this was considered feasible, MP to consider.

2.25 PG enquired as to the tipping method of the toxic sludge into the Candy Filter ponds.

2.26 MP stated that the sludge had a high moisture content and that it was possible that it could be tipped into the candy filter ponds from the dump trucks without additional handling.

2.27 ...If the contaminated tip was not completed, investigate the possibility of excavating toxic ponds 5 and 6 and placing the sludge into the candy filter ponds which will be dewatered under the existing contract.

Finally double handle sludge from ponds 5 and 6 into the contaminated tip when completed. A rate of £0.86 for double handling of the sludge was further agreed...

3.01 LM confirmed receipt of NCC waste disposal notices relating to tipping restrictions and the letter of consent from AWA to discharge water from the toxic ponds into the existing FWS.

5.01 LM confirmed all slag areas had now been located on site and were being dealt with as contaminated materials and then taken to the contaminated tip as mixing materials with the toxic sludge.

12.10 MP requested details of the modified dump trucks carrying toxic sludge.

12.11 LM stated that previous modifications were unsuccessful and it was WP's intention to part fill the dump trucks with toxic sludge and bund off the sludge within the dump truck with cohesive material.

12.12 MP confirmed that this proposal was acceptable.”

201. The WDA inspection sheet for 27 November 1992 refers to the Deene Quarry site being very busy with some mud fouling Gretton Brook Road.
202. On 1 December 1992, Mr Webster wrote a memorandum referring to various stockpiles of material around the Deene Quarry site. One was “mainly concrete” from the Heavy Rolling Mills, another stockpile “of muck” from Longhills and the third from Universal Salvage.
203. On 4 December 1992 Mr Bird or Mr Palmer instructed Weldon Plant to dewater the Candy Filter Ponds and fill them with the sludge from Toxic Ponds 5 and 6 until the contaminated tip facility was ready. The formal contract (Contract 70) between CBC and

Weldon Plant was signed on 4 December 1992. The water from the Toxic Ponds and the Candy Filter ponds was discharged by agreement into the Anglian Water sewers.

204. On 7 December 1992 Mr Bird's site log recorded as follows for the Contract 70 work that he was:

"...not happy with filling of site, basically filling inside as if it was a landfill site not compacting incorrectly...Ray and I visited p.m. and both agreed it was not been compacted adequately..."

205. There had been for some time complaints about mud on the roads; some of these are referred to above. Another example is that of 9 December 1992 when Noone & McGowan employed by CBC involved in works at Longhills were criticised for not keeping the roads approaching Longhills and Deene Quarry cleaner. That was reflected in a WDA inspection sheet of 11 December 1992 referring to mud fouling Gretton Brook Road.

206. In a letter dated 11 December 1992 and set out in a legal officer's report of 22 January 1997, Mr Ibbotson reported further problems at Deene Quarry to CBC:

"I refer to recent discussions and site meetings with your Assistants, Messrs Copley and Palmer, when it was pointed out the problems which exist and have to be overcome to enable the completion of the membrane contract.

With the recent prolonged adverse weather conditions a considerable quantity of water is being pumped from the tip void over the site to a former borrow pit site to the south. With the water emanating from the tip void, it may be slightly contaminated, however, I can see no alternative to the continuation of this operation until the works are complete, irrespective of its quality.

It is my opinion that the pumping operation will have to continue whilst the void is being filled by Weldon Plant's activities and I should be grateful if you would advise if you wish me to action this matter in due course.

The materials being stockpiled along the northern boundary of the tip facility by Weldon Plant is surcharging the bank and may be causing the issue of water along this bank under the membrane. It should be noted that this area was a former tip void and subsequently filled in by Noone, and hence the stability of the embankment may be at risk if this operation continues..."

It was an optimistic view that the water from the contaminated tip was only slightly contaminated as the material already tipped was highly contaminated.

207. On 17 December 1992, Mr Bird recorded as follows:

“Hose line has been washed out in wheel wash, Mick [Palmer] has confirmed that this water is now contaminated.”

This ties in with evidence given by Mr Bosence, which I accept, that some sort of wheel wash facility was provided near the entrance to Gretton Brook Road but it was nothing more than a hole in the ground into which lorries could drive; it was frequently contaminated and lorries could and did just drive around it. Certainly, the lorries were never washed before they went on to the public roads from the Deene Quarry site.

208. On 22 December 1992, Anglian Water wrote to CBC, Mr Webster, reporting that oil had been discharged with the toxic pond effluent on two successive days. Mr Palmer blamed this on Weldon Plant leaving pumps on unattended contrary to instructions. Mr Webster formally replied on 11 January 1993, regretting the illegal discharge of the oil, in effect blaming the contractor.

209. On 4 January 1993, NCC wrote to CBC about the impact of the Environmental Protection Act 1990 parts of which were to come into effect:

“ENVIRONMENTAL PROTECTION ACT 1990, PART II WASTE MANAGEMENT LICENSING

At present you are the holder of a disposal licence issued under the Control of Pollution Act 1974 which authorises you to deposit, store or process waste, depending on the nature of your business. The above legislation proposed a stricter waste management licensing system and the Department of the Environment is carrying out consultations on draft regulations to enact this legislation. The proposed date for these regulations to come into force is 1st April 1993. In view of the tight timescale I am writing to inform you, if you are not already aware, of the implications of the legislation.

Your disposal licence will automatically become a waste management licence on 1st April 1993. The consequences of this are:-

(1) Fees and Charges for Waste Management Licensing

You will be charged an annual subsistence fee by the Waste Regulation Authority in order to cover the cost of supervising the site. This fee will depend on the type of activity undertaken at the facility, the types of waste accepted and the quantity of waste accepted...

(2) Technical Competence

A licence holder must show that he is a fit and proper person in order to hold that licence. From the point of view of existing licence holders it will be necessary to

demonstrate technical competence. The manager of a site must, within 5 years, obtain a qualification which enables him to gain a certificate of technical competence awarded by the Waste Management Training and Advisory Board (WAMITAB) in conjunction with the National Council for Vocational Qualifications and City and Guilds. The person who is to obtain these qualifications must apply to WAMITAB before 1st April 1993. This does not apply to a person over 55 on 1st April 1993. These qualifications do not apply to scrap yards or inert waste landfill sites with a void space of less than 50,000 m<sup>3</sup>. However, the WRA must still assess the competence of the operator at these sites.”

This was not an inaccurate description of these provisions of the Act and Mr Buckland was to acquire a WAMITAB certificate.

210. Following further complaints about mud on Gretton Brook Road in particular from a CBC councillor, Mr Bianchi, Mr Webster wrote to him on 15 January 1993:

“Thank you for your letter dated 22 December 1992. The mud on the road at the site is a problem that has been exacerbated by the recent adverse weather conditions.

The site at Deene Quarry is being restored and fill material is required to complete the works. The majority of spoil importation is now complete, and the works are due to be complete in April 1993. Other material importation will be required from time to time.

The contractor is brushing the road throughout the day and using labour to remove any large lumps and unblock gullies, these operations will continue whenever necessary.

The approaches to the affected area are fully signed; driver awareness is a significant factor in reducing accidents and it is clear that drivers are not paying sufficient attention to the signs. I will investigate the signing to see if further warnings can be given.

The problem of mud on the road at construction sites during the winter months is an old chestnut and it is extremely difficult to balance the need for keeping the roads clean with maintaining the construction programme.

My officers will be monitoring the road conditions daily and taking any action necessary.

Once the scheme is complete and the access removed the problem in this area will be eliminated.”

The letter to which this is replying is not in the files before the Court. This is a fairly “political” response. There is no mention of there being no or no effective wheel washing facility. There is no indication given that mud on roads will not continue to be a problem. There is and was no reliable evidence that any or any effective brushing of the roads ever

took place.

211. By deed dated 18 January 1993, CBC granted BSC a right of way north and south of Steel Road in effect for access from the Tubeworks through the old BOS site over Steel Road and across Willowbrook to the land retained by BSC.
212. A row broke out in January 1993 between Weldon Plant and CBC about work activities at the tip containment facility. Weldon Plant wrote on 22 January 1993 to CBC:

“TOXIC PONDS RECLAMATION CONTRACT NO. 70 / DEENE QUARRY  
PHASE II

Further to your letter of the 21st January 1993 In respect of the above Contract.

We were both somewhat surprised and disappointed to receive correspondence as at our on site meeting of the 20th January 1993, the order of procedure and method sequence for constructing the cell bund wall placing the sand, tyres and inert fills were extensively discussed.

The history of events that surrounds these Contracts can only be described as a catalogue of disasters. Time for construction defined within the Deene Quarry Contract should have meant that the work, at present being carried out by ourselves, should have been completed in Spring 1992 not January 1993.

The Inert materials stored by ourselves at the toe of the batter for placing has been destroyed by the actions of other Contractors in your direct employ.

We cannot accept any responsibility for damage to the membrane as we were not given the opportunity to price for what is a risk item arising from the design of the works at a time not foreseen.

We consider that we have acted wholly in the best interests of both Contracts with due consideration for minimising expenditure to yourselves...”

This paints a picture that the operations at Deene Quarry and at the containment tip facility were being carried out in a chaotic manner, which was similar to the view which Mr Bosence had at the time also.

213. Site Meeting No 4 relating to Contract 70 took place on 27 January 1993. The works were some 6 weeks behind programme. The progress was summarised in the minutes:

“Pumping of Candy Filter Ponds was complete  
Excavation of sludge was 7 weeks behind programme  
Toxic Ponds 5 & 6 2.5 weeks behind programme  
Disposal of sludge 7 weeks behind programme  
Grading of site 4 weeks behind programme

Placing of cohesive material 4 weeks behind programme  
Crushing of concrete stockpile 2 weeks ahead of programme.”

The minutes went on to say:

“3.14 AM stated that Candy Filter Ponds North and South would not be excavated until Ponds 5 & 6 were empty.

3.15 MP [Mr Palmer] enquired as to the method of excavating the Candy Filter Ponds

3.16 LM stated that it was Weldon Plant's intention to drag line the ponds.

3.17 MP expressed concern over toxic sludge spillages when excavating the Candy Filter Ponds and the possibility of vehicles tracking the toxic sludges outside the site.

3.18 AM confirmed that should spillages occur, these will be removed before vehicles tracked passed the drag line.

3.19 JB stated that due to the toxic sludge viscosity it was not advisable to place the material against the eastern bund wall, as it had on previous occasions when mixing with fill material overspilled previous bund walls.

3.20 MP would advise on the placing of toxic sludges against the eastern wall.”

This is of interest because it demonstrates an understanding on the part of CBC that it was not desirable to track contaminated materials on to the public roads.

214. The haul road between the Toxic Ponds and the contaminated tip facility became as before extremely contaminated. This was because the sludge was wet and when placed in the back of the dump trucks being it washed over the tail and side boards on to the road. This was referred to by Mr Bosence and this is corroborated by his site records such as that of 2 February 1993. He again reported mud on the external roads.
215. In February 1993, Contest Melbourne Weeks Ltd, consulting engineers, reported to CBC on its site investigation of the Willowbrook North site in particular the slurry ponds areas. The history of that part of the site is summarised, broadly accurately, in Paragraph 2:

“The site was originally an opencast ironstone mine that was operated until 1948. The traditional method of extraction of the ironstone was to excavate the overburden using a walking dragline, the limestone first requiring blasting. The underlying ironstone was then dug out with a face shovel and the extracted overburden dumped directly into that part of the mine from which the ironstone has already been removed. The resulting ground surface is left as a hill and dale formation.

Latterly part of the site was used as lagoons for settling waste slurries from the blast furnaces associated with the nearby steelworks. A chemical analysis of the slurries carried out by the British Steel Corporation described it as a "non-toxic inert fine dust made up of ore/sinter, coke, lime/limestone particles and blast furnace volatilisation product such as zinc and lead". These slurries were contained along the eastern part of the site by a bund and allowed to find their own level over the backfilled opencast waste.

In the late 1950's, the whole site was levelled off to 106.70m A.O.D. and the slurry buried beneath backfill. Part of the site was later used for the Deene coke ovens and a slurry pond was constructed to hold waste from the blast furnaces. Slurry was discharged into the site until 1979. Following closure of the steelworks in 1980, the Deene coke ovens were demolished and some of the more contaminated surface clay fill has since been removed and replaced with clean fill.

At the time of the investigation the eastern half of the site was in use as an off road vehicle track and large areas of the site were under shallow water. The central area is relatively flat at an approximate elevation of 106.50m A.O.D. The ground has been raised to approximately 110.00m A.O.D. on the east and north east sides of the site with the entire north boundary forming the top of an embankment at the base of which lies Willow Brook at a level of approximately 100.00m A.O.D. The east and south sides of the site are bounded by roads whilst the west of the site is bounded by as yet undeveloped land."

216. Mr Webster wrote to Mr Lack of NCC on 11 February 1993 about the waste licence:

**"WASTE MANAGEMENT LICENCE - DEENE QUARRY**

Thank you for attending a meeting at my office to discuss the implications of the Environmental Protection Act 1990 Pt II with my Head of Engineering Services, Richard Cropley.

I would be most pleased if you would amend the Licence to take account of the following items:-

1. Deene Quarry currently has an unlimited amount of waste entering the site. As my major works will be completed at this site by the end of March 1993 I would be most pleased if a restriction on input could be arranged. I propose category (ii) between 25,000 and 75,000 tonnes. This would be sufficient for me to conclude the restoration work at Deene Quarry over the next two years.

2. Technically competent persons at this tip are:-

|                 |                                       |
|-----------------|---------------------------------------|
| Richard Cropley | Head of Engineering Services          |
| Mike Palmer     | Principal Engineer - Land Reclamation |
| Dr. Rik Smith   | Consultant Geologist                  |
| Laurence Brown  | "                                     |
| John Buckland   | Consultant Clerk of Works             |
| Ray Bird        | CDC Clerk of Works                    |

217. On 22 February 1993, NCC wrote asking for a return from CBC showing the total quantity of waste deposited in 1992.

218. The minutes of Site Meeting No 5 for Contract 70, held on 24 February 1993, referred to what had been going on at the contaminated tip facility which was that, because the sludges being delivered from the Toxic Ponds were wet, they had to be mixed with other material so that they could be rolled and compacted within the facility. Mr Bosence is recorded as confirming that all spillages on the haul road had been cleaned up but that the

road should be monitored for spillages.

219. The picture painted by Mr Bosence as to the way in which the Toxic Ponds 5 and 6 works proceeded was convincing and borne out by contemporaneous documents. His observations were that the sludge material went into the lorries “50% water/50% sludge”, the sludge was excavated without proper prior full dewatering of the ponds, wet sludges were being spilt all over the haul road, wet sludges were being placed in the contaminated tip, there was no effective wheelwash and what there was was simply full of contaminated material and lorries were leaving the site and going on to the public roads contaminated with mud. He was aware that Mr Palmer was permitting clinical waste from a site in Northampton to be deposited at the Deene Quarry at the time. The wheel wash arrangement, such as it was, was a ditch dug in the ground with some sort of grillage on it which had water in it. As Mr Bosence said in evidence which I accept, it was not used in fact as the contractor thought that the water would damage the disc brakes of its lorries; it was by-passed. Mr Bosence raised this with Mr Palmer who simply ignored his concerns.

220. On 2 March 1993, BSC wrote to Weldon Plant about the wheel wash:

“Results of analysis of the sample of water collected on 5th February 1993 from your vehicle wheel wash facility at the former iron and steel works waste disposal site near Gretton Brook Road, Corby are attached. With the exception of a small amount of cyanide the water is relatively unpolluted. The levels of phenols, ammonia, oil and toxic metals are all very low and pose no significant pollution risk. The Biochemical Oxygen Demand (BOD) level at 8.3mg/l is below the limit normally set for industrial discharges to river (20mg/l approx) and is similar to that found in many "general amenity" surface water streams and water courses. The slightly high pH is probably the result of contamination of the wheel wash water by lime or slag materials while the high conductivity and chloride contents are almost certainly due to contamination by road salt used for de-icing the public roads. Semi-quantitative analysis of the solids recovered from the sample shows these to consist of a mixture of clay, sand and iron oxides with no significant levels of toxic metals present.”

221. On 3 March 1993, Mr Bosence wrote a note which recorded as follows:

“1. Started excavating pond 6 without dewatering on approval of Mick [Palmer]/Pete Webb...

4....haul road is completely awash with sludge spillages. Mick is aware of this although this procedure is illegal as the contaminated tip is for dry use only.

5. Mick informed me that contaminated muck is coming in from Northampton-

illegal.”

222. Mr Bosence also gave evidence which I accept that throughout the Toxic Ponds 5 and 6 reclamation, the Gretton Brook Road was filthy. He recalled driving along that road in his Landrover following other cars and “your screen was completely sprayed from the spray that was coming off the roads”. This is entirely consistent with the evidence given by a number of the parents of various Claimants. He added that the contractor’s road sweeper was inadequate and kept breaking down.

223. A CBC site report from Mr Bosence for 9 March 1993 sets out misgivings about contamination:

“1) Visited site and noted that Gordon Lacey had started to set out hoses near wheel wash. Mick [Mr Palmer] confirmed this was OK. I instructed Roy Larter to visit site due to extensive contamination. Roy stated that if site had been inspected by Health & Safety it would be closed down and Mick was totally responsible for site conditions and not me & Ray [Bird]...

2) Pond 6 has increased dramatically due to ingress of water, Mick aware of this but seemed unconcerned...”

Mr Bosence was in effect taken off the Toxic Ponds work after writing this report and expressing these views; this was probably in late March 1993, although he attended several meetings thereafter. This must have been because Mr Palmer and possibly others thought that he was being too critical of his superiors.

224. Mr Ibbotson wrote to CBC, Mr Webster, on 9 March 1993 expressing various concerns:

“Deene Quarry - Contaminated Tip Facility

I refer to my previous discussions with your Chief Engineer, Mr R. Cropley, regarding the infilling of the contaminated tip facility in Deene Quarry and as promised I note below the various aspects of the scheme which give rise for concern:-

a) Extensive damage to chain link fence adjoining Corby Power's entrance. This has been observed since the removal of the spoil heap to infill the lagoons. This damage may have been caused by contractors placing fill in the stockpile.

b) Damage to Palisade Security Fence to northern boundary of BS Tip. This fence has deteriorated in recent weeks as a result of dump trucks passing too close to the fence whilst transporting material to the tip facility. Ground in places tending to heave under fence plus damage to the fence itself.

c) Dump trucks depositing contaminated liquids and sludges over the entire length of the haul road to the tip, including the security fence and BS side of the boundary. This area will require de-contaminating.

- d) Contaminated liquids which have spilled from dump trucks have been deposited into the pond of water adjoining the Candy Ponds. The contaminated water now requires removal to a suitable licenced tip,
- e) Damage to various lengths of the barbed wire fence to the tip facility as a result of Weldon Plant's activities. This requires reinstatement on completion.
- f) Damage to tip internal access road plus contaminated materials being deposited in this area outside tip lining. Road requires reinstatement upon completion of the present contract and contaminated material placed inside the tip membrane area.
- g) Considerable volumes of contaminated liquids are being deposited in the tip facility and these liquids are not being blended and may escape in the future causing contamination outside the tip area. The tip facility is in no way designed as a water retaining structure. In my opinion this requires urgent attention to improve the quality of the blend of the liquid and solids. If the cap is placed on the tip without the necessary blending being undertaken, then the contents will remain as a liquid, which once again may give rise for concern in the future. If more money is required for this work then the necessary application should be made to the DOE to fund the blending operation as it is essential to deal with the problem now and not in the future when grant would not be available to the Borough Council...
- j) Lack of safety equipment on the site to ensure safe working practices of the men in the facility together with machine operatives. Records kept of gas levels etc during the backfilling operation may be of use to the Council to counter any future claims from employees etc.
- k) Contaminated material placed in the facility is well above the level of the lining and in places this material is on the lining. Slag deposits are also falling onto the lining. Both the above require removal.
- l) It is recommended that the new bund to be constructed in the facility should be at a maximum height of, say, 2 metres and the contaminated materials placed inside the cell and blended prior to the next lift of the retaining mound. This will ensure that the correct mix of solids to liquids is being achieved, i.e. blending, as the fill increases in the tip. Smaller capacity cells will ensure that the filling operation becomes more manageable. The site supervision provided by John Buckland is restricted to looking after the sanding, tyreing and covering of the membrane to the floor and walls of the facility.

I trust that the above comments are of assistance to you.”

This paints a picture of a chaotic site at the Deene Quarry end of the CBC site which is adequately reflected in other documents, some of which are set out above. Mr Bosence said in evidence which I accept that from 1992 to the end of the Soothills project in 1996 “there was no ownership of responsibility as to what went on and what went in and what went out”; it was muddy in winter and very dry and dusty in summer. However, Mr Ibbotson’s letter was not replied to and that implies an acceptance that his criticisms were valid.

225. On 11 March 1993 NCC sent to CBC a modified licence:

“CONTROL OF POLLUTION ACT 1974. SECTION 7 NOTICE OF MODIFICATION OF DISPOSAL LICENCE

Notice is hereby given under the Control of Pollution Act 1974 Section 7(1), that Disposal Licence C/20 held by yourselves for the operation of the site at Deene Quarry shall be modified with effect from 1st April 1993, with the following condition:-

1.02. Types of Waste

The quantity of waste accepted at the site shall not exceed 75,000 tonnes per annum.

Please note that this modification applies to the whole Licensed area of Deene Quarry and is in addition to the modification to this condition dated 30th October 1992.

All other conditions shall continue to apply to the site.”

226. On 17 March 1993, CBC replied to Northamptonshire County Council’s letter of 22 February 1993:

“...I detail below the volume of material imported onto the Deene Quarry Site, and this quantity excludes top soil brought onto the site for restoration purposes.

a) The volume of material imported onto the site in 1992 is 113,212 cubic metres.

b) The volume of material moved internally in Deene Quarry from the Toxic Ponds to the Contaminated Tip Facility in 1992 is 19,500 cubic metres.”

227. By Site Meeting No 6 on Contract 70 on 24 March 1993, it was reported that the excavation and backfilling of Toxic Ponds 5 and 6 were complete. Mr Palmer is minuted as follows:

“4.01 MP requested analysis of soil on the line of the haul route to the contaminated tip to ensure spillages of toxic sludges which occurred had not caused contamination of the surrounding ground.

4.02 MP requested an analysis of the pond water adjacent to the stockpile of mixing material as this could have been contaminated by spillages of toxic sludges.”

228. At the LRCG meeting of 1 April 1993, the following was noted:

“Toxic Ponds Reclamation - progressing extremely well at present. Now digging out Candy Filter Pond North - this material is much more stable. 4 - 6 weeks to complete. Spot of contamination found under road and being dug out and a small tip found east of Toxic Pond 6. MP proposing to take down 1m to see what’s there and then fill. RI thought this may be an old toxic pond previously infilled by BSC.”

Mr Bosence recalled that a sludge or tar lagoon close by Toxic Ponds 5 and 6 was excavated and the contaminated material wrongly used at least in part to backfill one of these ponds.

229. On 1 July 1993, at the LRCG meeting it was stated that Contract 70 was completed and

that the Morgan Mills work was progressing.

230. In July 1993, consideration was being given to moving the Sunday Market from Longhills. It is a measure of how popular that market had been that the Chief Executive was looking for another site which could accommodate 300 stalls and 1000 parking places.
231. At the LRCG meeting of 9 September 1993, the following was stated about the status of Deene Quarry:
- “Discussions took place with regard to the suspect ammonia discharge. The meeting was reminded that Deene Quarry has not been restored, it is a tip with on-going liability not just for the contaminated tip but for the whole site.”
232. After the completion of the tip reclamation works, the groundwater was and indeed continues to be monitored to see what if any impact there has been on the groundwater and in particular to see if the membrane was and is working to contain the contaminants. Dr Smith produced a report on this in December 1993.
233. Contest Melbourne Weeks produced a ground investigation report for CBC in January 1994 relating to the Exchange Sidings, which were to the east of the BOS plant, and comprised some 14 acres. The primary purposes appear to have been to assist in determining foundation design and in assessing the fill for the presence of slag. It is of some interest that a relatively extensive series of chemical tests were carried out but neither chromium, PAHs nor dioxins were tested for. Cadmium results ranged from very small to 18.6 mg/kg. The engineering report was produced in February 1994 and indicated at paragraph 4.1.1:

“Sampling from previous work at adjacent sites indicated elevated levels of certain pollutants and analysis of these and other selected parameters was specified within the remit of the investigation. Analytical testing of the oversite fill materials and groundwater was scheduled in order to give a broad real assessment of the specified determinants. However, a decision to remove all the oversite fill, made at an early stage of the investigation by the Council’s Consultants, obviated the need for extensive consideration of the possible constraints any contamination may place on future development. However, the purposes of waste disposal, the results are discussed below.”

This illustrates CBC’s approach which was focused on making as much land available for development as possible. It is surprising, to say the least, that CBC permitted the removal of contaminated material before receipt of the very ground investigation which it had initiated to determine amongst other things the level of chemical contamination. Contest Melbourne Weeks then went on to review the levels of contamination found in their

samples.

234. Contract No 90 was let by CBC to Weldon Plant Ltd on 28 January 1994, relating to works described as Deene Quarry Restoration Earthworks Phase 1, which comprised the excavation and removal of contaminated material, concrete, steel and existing non-contaminated material, placing in the contaminated tip facility and the importation and spreading of clay material. A warning was given to the tenderers (Clause 122 of the Specification):

“Owing to the previous use of the site, any of the solids, liquids or gases listed below could be encountered which may be hazardous to site workers...[coal tars, heavy metals, toluene amongst others]”

235. On 16 February 1994, a CBC law officer, Mr Watson, wrote a memorandum to the Chief Executive relating to licensing and legal matters raised by contamination of Deene Quarry, the relevant parts of which are as follows:

“1. The Council is the holder of a disposal licence issued under the Control of Pollution Act 1974 which authorises it to deposit waste, under certain conditions, in Deene Quarry. It also allows toxic materials to be deposited in the contaminated tip.

2. Deene Quarry has not been decontaminated, save in the worst areas, e.g., toxic ponds and candy filter ponds, and contains numerous deposits of buried contamination remains a potential liability...”

This indicates a general knowledge with in CBC about the extensive contamination which continued to be present on Deene Quarry. Mr Watson in a memorandum went on to explain the statutory requirements under the 1974 Act and the possibility of criminal proceedings. He explained that there was a potential liability under the law of nuisance, and negligence and under the rule in *Rylands v Fletcher*.

236. On 16 February 1994, Mr Phillips of CBC asked the legal officer to prepare a new licence for two licensees in relation to the removal of furnace soot from the Soot Hills and Soot Banks site. Furnace soot had been used historically for colouring certain building materials and had been removed from time to time from various of the BSC sites. CBC continued this, doubtless to secure some income. Other evidence reveals that a substantial quantity of materials was removed by licensees of CBC from the Soot Hills site in 1994 and 1995. There is no suggestion that this was in any way done under the supervision of CBC or subject to any safety restrictions imposed by CBC.

237. The LRCG meeting minutes for 17 February 1994 reveal that work on the Sinter Plant

Landscape Park was due to start imminently, and that work on the Deene Quarry balancing lake and restoration projects were proceeding. Sewer work on the Heavy Rolling Mills was proceeding. On 22 February 1994, an inspection by Northamptonshire County Council noted that there was mud staining of the highway across the site access at Deene Quarry.

238. On 23 February 1994, CBC informed Barton Plant Ltd that it had secured the contract for the construction of the new Sunday market on the site of the old Sinter building north of the Asda Superstore and to the east of Phoenix Parkway.
239. On 28 February 1994 there was an internal CBC meeting attended by the legal officers, Mr Webster and Mr Copley. The discussion related to the sale of land on Deene Quarry to Deene Raceway Ltd. Since the contaminated tip of facility was on or at least close to the land to be sold, the meeting agreed that the contaminated tip had to be a continuing liability of CBC is to be retained in its ownership and monitored by it. So far as the remainder of the site to be sold, the meeting then went on to discuss whether CBC would have any continuing liability. It was reported to the meeting that ammonia and tar were widespread all over the site "as generally speaking they were part of the foundations of the Steel Works buildings".
240. Mud continued to be reported on Gretton Brook Road in March 1994.
241. The formal contract with Barton Plant Ltd for the Sunday Market works was signed on 5 April 1994. The scope of works was defined as follows:

"The site forms part of the redundant British Steel Sinter Plant site situated on the Phoenix Parkway industrial estate. The site has been reclaimed with soft to firm clay, on which, after grading and compaction, it is intended to provide a platform by covering the site with various grades of geo-textile together with a layer of Type I sub-base material 250 mm - 400 mm thick. The initial crossover off Cockerell Road, which will form part of the adoptable highway, is to be constructive in concrete. A 20 mm dia water service is to be provided within the site and a 150 mm dia foul water connection is to be constructive to the existing foul water manhole..."

There is no reason to doubt that this description of the site at that stage is reasonably accurate.

242. On 14 April 1994, a memo was written which went to Mr Ibbotson and the Land Reclamation Team relating to continued problems with mud on the roads:

"I confirm that on numerous occasions over the last few weeks Gretton Brook Road

has been extremely hazardous due to the amount of mud carried onto the road. The mud continued from the site entrance to the Deene Quarry through the junction with Phoenix Parkway, along to Earlstrees Road and down Brunel Road

It has been extremely hazardous and I would ask that you therefore ensure any contractors working in the area clean the lorry wheels before driving onto the highway.

The situation created has been extremely delicate as with this quantity of mud carried onto the highway, if it had involved the developer or another contractor then there is the possibility that legal action would have been necessary."

243. The mud on roads problem continued with a member of the public, a Mr Kane, writing on 20 April 1994 to the Chief Constable:

"I write with reference to the Gretton Brook Road in Corby. I would like to stress my concern to the condition the road is in due to heavy vehicles transporting earth. The road has at least 2 inches of mud on it, and as I use this road every day to travel to and from work my car ends up covered in mud and I am continually having to wash it. This also creates in my opinion dangerous driving conditions, as apart from the mud, the top surface of the road has been broken up by the heavy lorries causing stones to fly up from the road which could cause a broken windscreen or worse. Attempts have been made by the contractors to try and clean the road but whatever they do only seems to make matters worse.

I feel very strongly about this matter and feel that what used to be a pleasant country lane has now become a blot on the landscape. I would appreciate any comments you may have on the above and would also like to know what actions will be taken to rectify this problem."

This was copied to CBC which was undoubtedly aware of the continuing problem.

244. Mr Ibbotson wrote to Mr Webster on 28 April 1994 addressing amongst other things the mud problem, but in the context of the Mills Road Earthworks Phase III works:

"We are at present experiencing a number of problems in connection with the above contract which may give rise to potential claims from Weldon Plant. I briefly detail below the various headings which I consider require attention by the Council:

- 1) There has been a new haul road constructed across the Deene Quarry Site from the gated entrance on Gretton Brook Road to the contaminated tip facility. The

standard of the haul road is now causing problems during wet weather conditions due to its construction, and this is now resulting in additional maintenance to enable dump trucks to cross the site. The haul road has been constructed after the tendering exercise for the Mills Road Earthworks contract and hence circumstances are now different.

2) Noone & McGowan are also using the haul road, adding to the problems, and to date without making any contribution towards the maintenance costs...

3) Mud is being distributed along Gretton Brook Road during adverse weather conditions. Both contractors are contributing towards this, with the biggest problem caused by the road lorries used by Noones. Weldon Plant are having to clean up the road surface on behalf of Noones as well as themselves. I am receiving complaints from the Borough Council regarding the state of the road.

4) Noones have been importing considerable quantities of material onto the quarry site and this operation has been going on for number of weeks and at times, seven days a week.

I am experiencing difficulty in establishing if Noones had in fact obtained permission to do the material on the site. In addition, is the Council receiving any tipping fee from this operation?

Until the Earthworks contract is completed with Weldon I would recommend that Noones terminate their activities for the time being..."

245. The LRCG meeting minutes of 5 May 1994 records that the Mills Road Earthworks Phase III, Deene Quarry Balancing Lake, Sinter Plant Landscaping and Sunday Market works were progressing.

246. The mud on roads problem continued throughout this period. A local resident, a Mrs Paluise, wrote in May 1994 as follows:

"I am writing to express my concern regarding the large amounts of rubble which are being conveyed in open trucks to the Weldon's site in Gretton Brook Road. As I use the road several times a day, and generally have young children in my car when being behind these trucks or alongside them – this... was not enough to avoid my car being hit by a large piece of rubble as one of these trucks thundered past -- fortunately for me and my children, the rock hit the lower part of my car and no damage was done... The general state of that piece of road is usually appallingly filthy... but I feel strongly that there should be some safety measures taken to ensure

rubble is safely secured, or is loaded at a level that does not pose a risk..."

247. On 7 June 1994 Mr Ibbotson wrote to Mr Webster of CBC informing him that Weldon Plant was now importing material from an excavation in the Corby area and depositing it in the contaminated tip facility. He presumed that the contractor had obtained CBC's permission. He referred to the fact that Noone & McGowan were still bringing material onto the Deene Quarry site.
248. On 9 June 1994, the NRA placed a (criminal) caution on CBC with regard to a discharge of effluent into the Gretton Brook from the Deene Quarry Reservoir work area. On the same day Mr Webster described this incident as "most regrettable".
249. At the LRCG meeting of 16 June 1994, it was reported that the Deene Quarry Balancing Lake, Sunday Market and Heavy Rolling Mills Sewers works were effectively complete and that the Mills Road Earthworks Phase III works were progressing.
250. Work had been proceeding prior to September 1994 at the Longhills site on a foul water pumping station for some months.
251. In November 1994, Dr Smith's firm produced what was termed a "Validation Report" in relation to the Rolling Mills Phase III works. Such a report does not seem to have been provided for any other part of CBC's site. Its purpose seems to have been to demonstrate that a full and effective reclamation and de-contamination had taken place. It contains a material inaccuracy in that it says that it was "following the recommendations of Contest Melbourne Weeks" that the over site fill was removed. That fill had been removed before that firm's reports were received. The report excludes references to contaminants found in that fill.
252. On 6 December 1994, CBC granted Midlands Markets Ltd a licence to use the site north of Asda as a Sunday market. It seems that the site had already been used beforehand after completion of the works for several months.
253. Following the completion of the Sunday Market work, there were many complaints regarding flooding of the site. These are referred to in a CBC memo dated 8 November 1994. Red dust at that site was also reported as a problem at the LRCG meeting of 23 November 1994. The new Sunday market was up and running by this time. Ponding continued to be a problem in December 1994. Dust continued to be a problem at the Sunday Market site over the months and years that followed as has been attested to convincingly by a number of the parents of the Claimants.
254. In 11 January 1995 Mr Webster of CBC wrote to Mr Lack of NCC discussing the

"deemed technically competent" regulations as applicable to the contaminated tip facility. He effectively put forward Mr Buckland as the "deemed person" and attached an outline of the "Management Structure". He identified himself as being at the top of that structure with Mr Cropley as the head of Engineering Services "directly responsible for all Engineering works, including use and restoration of tip facilities at Deene Quarry for five years". Under them was Mr Palmer, the "Principal Engineer" said to have been "responsible for restoration works at Deene Quarry, reporting to H. E. S. Has undertaken these work since 1980." Mr Ibbotson was, wrongly, described as having the qualification M.I.C.E (Member of the Institute of Civil Engineers); he was said to be a "Consulting Engineer responsible for design, construction and use of Contaminated Tip Facility at Deene Quarry. Employed by Corby Council on these works since 1982". Under Mr Ibbotson, Mr Buckland appears as "responsible for day-to-day management of the facility including tipping. Is on-site at all times when tip is in use. Employed at the tip since its original conception".

255. Midland Markets who were the tenant of the new Sunday Markets site wrote to CBC on 23 January 1995 complaining that there were still "dreadful problems with the surface at" the market site. It wrote:

"The areas where they [the traders] have to stand is even worse now because the water also runs off the public walkways. The red dust which was a problem in the summer is now red mud. Traders or customers have only to drop something off the store or have the wind blow a rail of clothing over and that's their profit gone.

I cannot understand who suggested this surface for a market site, they certainly did not do much homework. The road shavings would be ideal, it's clean it rolls down and most times contractors have a problem getting rid of it. At least on the other market site traders were only stood in puddles not mud up to their armpits.

Even the exit road which was supposed to be a much stronger surface is collapsed with just the use of cars, there are potholes so deep we had hard-core delivered to repair than, but we are just fighting a losing battle...

Something has got to be done or else we shall have no traders left to worry about..."

256. By February 1995, CBC had subdivided their Willowbrook site into three Areas, A, B and C. Tender documentation was drawn up with regard to work of "decontamination" for Area A which was the westernmost area. The tender documents describe the works as being carried out :

"in an area of open land, formerly used as a quarry for ironstone extraction,

subsequently backfilled in a loose hill and dale formation. Slurry residue from steel making processes was then placed within this formation and generally overlain layer of locally occurring clay."

The specification called for a wheel wash facility to be provided (Clause 112). The Bill of Quantities identified 63,000 m<sup>3</sup> of material to be excavated. 36,000 m<sup>3</sup> was to be disposed of to a temporary stockpile on-site whilst 27,000 m<sup>3</sup> of contaminated material was to be taken to a "licensed landfill site". Various contractors tended for this project, including Noone and McGowan, Weldon Plant and Barton Plant. Area A originally contained the old lime plant. It was known that the eastern end contained part of the slurry lagoon and there were other pockets of slurry. What was intended at this stage for Areas B and C was for open storage vehicles. Tenders were also invited in February 1995 for the works to these areas.

257. As referred to in the LRCG meeting of 2 March 1995, further drainage works were done at the new Sunday Market site; by that stage these works were described as "almost complete.
258. On 10 March 1995, Mr Webster informed Weldon that its tender for the Area A decontamination works had been accepted. Weldon's tendered rate for excavation of contaminated material was £10.92 per cubic metre. No separate rate was included for disposing of that material to a licensed landfill site: the rate for that was said to be included elsewhere in the tender rates and prices. Some 63,000 cubic metres of contaminated material was billed to be excavated. Weldon's tenders for Areas B and C and for Bank Stabilisation were also accepted, there being some 25,000 and 46,000m<sup>3</sup> respectively billed to be excavated. The pre-contract meeting for all these works was held on 28 March 1995, attended by Mr Cropley and Mr Palmer for CBC.
259. A wheel wash facility was installed in early April 1995 at the entrance to Deene Quarry off Gretton Brook Road. This was inspected by Northamptonshire County Council whose inspector was concerned that it was very close to the side entrance and might "not be totally effective in terms of preventing mud being deposited on Gretton Brook Road", as set out in its letter dated the 27 April 1995 to Mr Cropley.
260. At the first Site Meeting for the Willowbrook works, it was reported that approximately 22,000 m<sup>3</sup> had been excavated at Area A.
261. On 28 April 1995 the Deene Quarry Restoration Landscaping and Leachate Control works were substantially completed by Weldon Plant. This was work which comprised excavation and removal of contaminated material, concrete, steel and existing non-contaminated material, placing them in a stockpile on-site importing cohesive material and placing in layers to provide capping to site. This was Contract No 98.

262. The NCC inspection of 21 April 1995 identified that "some non-inert materials have appeared on-site[and] are stockpiled near to the containment cell" on the Deene Quarry site.
263. At the LRCG meeting of 27 April 1995, Mr Palmer reported that Area A of Willowbrook site "had been found to be more contaminated than expected-full extent of contamination not yet known". It is clear that Weldon was being permitted to deposit the excavated contaminants at the Deene Quarry contaminated tip facility or in that area.
264. On 10 May 1995, Mr Ibbotson reported to CBC that barrels and trees were being deposited in the Deene Quarry tip, there was no supervision of the tipping operation and considerable quantities of inert fill were being imported from other sites and being deposited in the tip facility.

265. The NCC inspection report of 12 May 1995 records:

"Mud Stain on the highway at Gretton Brook Road Entrance to site-wheel wash too close to highway to be effective."

266. At Site Meeting No 2 held on 16 May 1995 for the Willowbrook work, it was reported that for Area A 40,000 m<sup>3</sup> had been disposed of, for Area B excavation and disposal was 80% complete and for Area C excavation and disposal was 50% complete.
267. At the LRCG meeting of 25 May 1995, it was reported that at Area A the excavation had already reached 8 m in depth: dry contaminants (i.e. slag) were to be left in whilst "wet contamination will be removed completely". It was reported that the contaminated tip facility at Deene Quarry was nearly full and would be completely full when Area A was a decontaminated. On the same day it was recorded in an inspection report that there was a "muddy film on Gretton Brook Road". The following week on 31 May 1995, a similar inspection report from Northamptonshire County Council reported:

"Mud on the road is causing slippery surface to highway and problems with dust. The wheel wash is probably contributing to this problem rather than helping- Road sweeper being used is totally inadequate for job required."

268. By 12 May 1995, the NCC inspection records indicated that the containment facility was full but material was still being imported and was now far exceeding that necessary to restore the containment area. Notwithstanding this the LRCG meeting of 12 June 1995 recorded that the filling of the contaminated tip was "to be targeted to be completed by end

July”.

269. On 23 June 1995, there clearly was a problem with dust on the Willowbrook sites. Weldon Plant was instructed for Area A to "cease import of materials as at 9 am this morning until all access roads are damped down sufficiently well to inhibit flying dust". This continued to be a problem as the NCC inspection record of 7 July 1995 recorded:

“Tipping lorries causing large clouds of dust to cross site on breeze. Whilst there are no residences or businesses very close to site some effort should be employed to suppress dust.”

270. By July 1995, Mr Hagen, a CBC Councillor, had raised concerns with CBC which had been referred to the principal auditor, Mr McGrenaghan relating to the Willowbrook tender process. This related to issues concerning the opening of tenders. Mr McGrenaghan had reported on these matters on 13 July 1995. There would be later complaints from Mr Hagan.
271. On 11 August 1995, NCC modified CBC's Waste Management License C20 by adding a requirement that CBC was to "keep a record of the quantities of waste deposited at the site" and submit a quarterly return of quantities of waste deposited at the site each month.
272. On 22 August 1995, NCC referred to three earlier letters relating to the inadequacy of the wheel cleaning facilities at the Deene Quarry site:

“... I ... am writing firstly to express concern that I have not received reply to the matters raised.

Secondly, I wish to reiterate my previous concerns about the effectiveness of the wheel cleaning facilities on site and attach a copy of photographs taken in many of this year illustrate this point.

I should be grateful for your comments in reply to the above as soon as possible and would suggest that if the wheel cleaning facilities are to be improved and present weather conditions would appear ideal.”

273. On 18 September 1995, NCC reported to CBC on a problem which had been continuing for a number of months, fly tipping at Deene Quarry:

“I write further to my letter of 24 August 1995 and must report that fly tipping, as predicted, has continued and is increasing the above site. The situation is very

disappointing and I would request that you consider blocking-off the gap in the hedgerow and removing the fly-tipped materials just inside this gap as a matter of urgency.

I will also highlight that the large quantity of tyres and tree roots, which had been on-site for many months now, also constitute unauthorised deposit and I would request that you inform me of your intentions regarding the removal of these 'stockpiles' from the site. There is also evidence that fly-tipping has occurred between the tyres and tree roots where offenders can deposit unauthorised materials and be sheltered from sight.

As today I have not received any word from either yourself or Mr Cropley regarding any of the above, I must request that you inform me later than 14 days from receipt of this letter of your intentions, otherwise enforcement proceedings may be initially. Alternatively, if you should wish to arrange for a site meeting to discuss the above, this can also be arranged."

The County Council inspection report of 22 September 1995 recorded that the hedge gap was now closed but that the site was busy again with the importation of contaminated soils.

274. On 7 September 1995, the Certificate of Completion for Areas B and C, Willowbrook, was issued certifying a date of 28 May 95, although this may have been inaccurate.

275. On 22 September 1995, Mr Palmer answered NCC's letter of 22 August 1995 relating to wheel washing:

"Thank you for your letter dated 22 August 1995. Please accept my apologies for the delay in replying.

No action has been taken in respect of the wheel wash facility as negotiations for the disposal of sites are well advanced.

The sale will make the entrance of Gretton Brook Road redundant and it would be sensible to defer any action until such time as the land sale issue is determined

My assistant, Mr Palmer, will be pleased to discuss any problems you may have in this area."

This was in effect an acknowledgement that the wheel wash facility was inadequate and

that nothing had been done to overcome the inadequacy or make any alternative arrangements. NCC's response on 26 September 1995 was to be asked to be advised "of the final outcome relating to the possible sale of the site, in order that it can be determined whether any further action is necessary on my behalf"

276. At the LRCG meeting of 28 September 1995, it was reported that "all de- contamination had been carried out" at Site A and filling was still required. This was not true as the contractor had simply ceased digging having found substantially more contaminated material than had been billed. The contaminated tip was said now to be full and a contract for capping it was due to be returned on 11 October 1995.
277. CBC had some concerns about the activities of Weldon Plant Ltd, some of which were referred to in its letter at to Weldon on 24 November 1995:

"The Council is now attempting to undertake the restoration of the Deene Quarry Tip as soon as is practical. In this respect a number of points require clarification:

...3) Tree trunks and roots-It is proposed to burn and dispose of the tree roots etc, which you imported onto the site, as part of the current tip restoration contract. This element of the contract has a cost implication of £200. Please indicate your intention to either remove the roots, or cover the Council's costs.

4) Contaminated Material-Earlier this year some 50-55 loads of chemically contaminated material were imported onto the site and deposited in the tipped facility. You were subsequently requested to remove the same from the site, but instead proceeded to bury the material in the tip. Following a site inspection by the Council you were subsequently requested to undertake further grading worked on the site in the vicinity of where the material has been buried. A number of issues arise as a result of your action:

a) The Council requires to know the chemical compound of the material deposited in the facility to ascertain if it is compatible with the deposits already in the tip.

b) The chemical nature of the material is required to check if the membrane lining in the tip is capable of containing the same.

c) The source of the material.

An early response to the above points would be most helpful."

278. NCC's inspection sheet of 12 December 1995 records that a mud film had been deposited on the highway due to a recent busy period. It was said that "a brush-type sweeper in

operation is not sufficient” and that not all the vehicles were using the wheel wash when leaving the site.

279. NCC’s inspection report of 17 January 1996 states that:

“Site roads in poor condition.. At present importation to site very busy with Weldon Plant haul from Geddington Road Corby. Mud on road very prevalent, muddy puddle forming by turn into access. Tractor brush type sweeper on-site but wholly inadequate during busy times. Sweeper/extractor tanker should be employed. At present the mud situation is very poor and continuous some distance on Gretton Brook Road. Action required urgently.”

280. On 2 February 1996, Mr Palmer under Mr Webster's name wrote to English Partnerships, who taken over from the DoE, under the Derelict Land Act 1982. He sought funding for the filling of the substantial excavation which had been left unfilled on Area A of Willowbrook. Effectively, Weldon Plant had simply left a hole in the contaminated ground at that site, with the knowledge and consent of CBC.

281. Mud continued to be a problem with the County Council reporting to Mr Palmer on 12 February 1996 in relation to "wheel cleaning":

“I refer to your letter dated 22 September 1995...

It has recently been brought to my attention that the site entrance to Gretton Brook Road is still in use and this is causing problems in terms of mud on the road.

I should therefore be grateful if you could advise the latest situation relating to the sale of the site, together with any measures to address the mud on the road this year.”

Thus, it is clear that no effective wheel wash facility had ever been provided and as a result substantial quantities of mud, earth and other materials had been tracked onto the roads in and around the site.

282. By early 1996, CBC had resolved to carry out extensive works at Soothills with funding from English Partnerships. NCC had formed the view that material from Soothills could go into Deene Quarry but certain material from Soothills identified in Trial Pit No 5 dug by Norwest Holst in 1986 was to be excluded from what could go into Deene Quarry; Mr Palmer was told of this by Mr Downey who by this stage had been working for NCC for some years on 22 February 1996. On the same day, Mr Palmer asked NCC for a modification in that context of its tip licence.

283. On 23 February 1996, NCC wrote to Mr Palmer saying that, in order for the wheel washing arrangements to be more successful, it would be desirable to have at least 50 metres of hard surfaced road between the wheel cleaner and exit out onto Gretton Brook Road. He even sent details of wheel cleaning facilities. On 29 February 1996, the NCC inspection report stated:

“Approach to wheel wash 12" deep in mud from side to side, as result the wheel wash water is very muddy and has limited effect despite good weather and low traffic movements. Mud being deposited on road. Internally site very muddy due to thaw. Significant improvements to Gretton Brook Road site entrance will be needed when the site is busy again.”

Matters had not improved in any way when the inspector visited a week later as was pointed out by NCC's letter to CBC on 11 March 1996. Matters still did not improve as the weeks went by.

284. In February 1996, CBC prepared tender documentation for the Soothills reclamation. The scope of works was described as comprising:

“...major earthworks including excavation and removal of contaminated material, imports include use of material, re-alignment of existing watercourse using box culverts, land drainage works and services diversions”

The Health and Safety Plan stated that the works were to be carried out in "in an area of open land, containing large deposits of contaminated materials". The Specification stated materially:

“Mud on the Highway

The Contractor shall ensure that the highway in the vicinity of the Works and any other highways used by the Contractor's vehicles are kept clear of mud and other debris falling from vehicles connected with Works or spreading on highways as a result of the Works in any way and shall comply with Northants County Council Bylaws in this respect. Corby Borough Council is agent for Northants County Council. A wheel wash facility is to be installed to the Engineer's approval and a suction road sweeper is to be permanently in use when the access is being used by construction vehicles. This requirement is for the Soothills site and the Deene Quarry tip facility. [Clause 124AR]....

Transportation

1. All materials shall be transported to and from the site in vehicles that fully comply with the provisions of the Road Traffic Act and shall exclude all vehicles contained within Section 9 of the Schedules of Dayworks carried out incidental to Contract Work 1990.

2. All vehicles removing contaminated materials must be sheeted in an approved manner". [Clause 642AR]

Tenders were invited for this project, Contract No 108, on 6 March 1996.

285. It was in March 1996 that Mr Hagen was contacted by a "whistleblower" with concerns about how various contracts had been procured. In fact that whistleblower was Mr Bosence. The allegation was that there were "corrupt practices" carried on for some years between CBC officers (in particular, Messrs. Webster, Cropley and Palmer) and Weldon Plant. I emphasise that these were allegations and, as appears elsewhere in this judgement, I do not need to make any findings as to whether the allegations were made out. Certainly no police prosecutions ensued. Mr Hagen wrote a three-page letter to the Leader of CBC setting out the allegations on 17 March 1996.

286. A Mr Wood (possibly a borough councillor) wrote to CBC on 20 March 1996 with concerns about the Soothills Reclamation:

"I have some concerns as to the possible levels of contamination that may be present in the soot deposits at this site, therefore I would expect an up-to-date survey of the site to be carried out to determine if the material is contaminated with substances which may be potentially harmful. Also, that the contractor submit a method statement outlining what action will be taken to prevent as far as possible, particulate discharge into atmosphere during the removal of the sootbanks.

There is great potential for dust nuisance on this site and therefore you may wish to consider the following to help mitigate dust emissions:

1. A wheel wash be provided on site.
2. That facilities are provided for damping down during dry weather conditions.
3. That proper sheeting be provided for vehicles and equipment on-site.

4. A designated vehicle route away from domestic and dust sensitive areas.

5. That the same facilities be provided at the destination site, should that be in Corby Borough.

In order to determine if any atmospheric pollution may occur during the reclamation of the Corby subfields, I contacted the Land Reclamation Team to discuss reports of "heavy metals" and other contaminants which may be on-site. Information was that the latest survey carried out was in 1986 by Norwest Holst. I then contacted Northamptonshire County Council Waste Regulation Officer, Mr Benson Downey, who informed me that he was very familiar with the site. He is satisfied that the material is classified as category F non-special waste. This means that the material has a level of toxicity and should be disposed of in a prescribed manner.

Information from alternative sources indicate that the level of toxicity is being "played down". I consider that an immediate survey of the area should be undertaken to determine the levels of contamination and a method statement submitted by the contractor outlining the disposal of materials and harassment of particulars into atmosphere."

This was a sensible and informed letter. It was surprising that no new site investigation had been done at Soothills before tenders had been invited. However, a further investigation was initiated, to be done by Dr Smith's firm.

287. Weldon Plant's tender was the lowest for Contract No 108 but the second lowest tenderer, Noone & McGowan's, tender was actually accepted. Weldon Plant wrote complaining about this on 29 March 1996.
288. Mr Bosence was involved in Contract No 108 and attended the first meeting between CBC and Noone & McGowan on 19 April 1996. There was a detailed discussion about access to the sites. There was a possibility that access (entry and exit) could be obtained via Geddington Road but that would have to be negotiated with BSC. The Contractor asked for access to Deene Quarry tip via Shelton Road, which was off Steel Road. Mr Palmer said that CBC would not object to this latter request provided all permits and wheel wash facilities were in place. He said that CBC would appoint a chemist to test material at the Soothills site to determine its suitability as fill material at Deene Quarry.
289. Meanwhile, matters were not improving in terms of wheel washing facilities at the Gretton Brook Road access to Deene Quarry. NCC wrote on 22 April 1996 that on 18 April 1996 a "concentrated number of vehicles" were utilising that access. It asked what works were being undertaken and what was the latest situation regarding any improvements to access and wheel cleaning facilities. NCC's inspection sheet for 25 April 1996 revealed that the

internal haul road was very muddy and mud was being deposited on the highway in the form of a muddy film which was drying and causing dust on the road. The inspector wrote that because the wheel wash was not working properly it should not be used; arrangements should be made for the road to be kept dust free.

290. Mr Hagen wrote to the Leader of CBC again on 29 April 1996 referring to a meeting which he had with Mr Webb, the Managing Director of Weldon Plant. Mr Webb rebutted all the allegations which Mr Hagen had earlier passed on. Weldon Plant later threatened to sue CBC and Mr Hagen.

291. Mr McGrenaghan produced his Principal Auditor report in May 1996 relating to the alleged contract irregularities raised by Mr Hagen. His "Summary of Findings" is as follows:

- “1. Insufficient evidence to support allegations of corruption
2. Level of supervision needs improving and enhancing.
3. Improvements in financial controls and obtaining value of the money required.
4. Levels of documentation are not satisfactory.
5. Lack of management information reports on projects will stop.
6. Inadequacies in the level of audit trails maintained.
7. Grave oversight that details of facts of 12 March 1996 not known about by those involved in tendering opening.
8. Levels of technical expertise is [sic] called into question.
9. The position concerning variations in quantities and steel shuttering in the Willowbrook North Area "A" contract is unsatisfactory.”

Mr Bosence was interviewed for this report but it was not known that he was the whistleblower. Indeed the note of his interview suggests that he was somewhat reticent.

292. Dr Smith was asked by Mr Palmer to help formulate a strategy for advanced sampling "to

obtain sufficient information to guide excavation and determine the most suitable tip (either the Deene Quarry, in the proposed new cell; or else in a contaminant site as requested by the WRA)." He wrote on 2 May 1996:

"...Norwest Holst tested only a relatively small number of samples in the 1986 investigation and, I believe, tended to choose samples that were typical of different materials. The high metal results obtained from samples at TP5 should not, therefore, be considered as applicable only to TP5 and its vicinity, rather they should be considered as probably typical of the very fine-grained variety of brown soot wherever it occurs.

Walking around the heaps, now that they had been dug open and spread around, the amount of white efflorescence is startling. I'm fairly sure that this is all sodium sulphate. This is very soluble, but not particularly toxic...

The Soot Banks are now so spread out and so patchy that I think the best way of planning it out would be to spend two days trial pitting a.s.a.p to try to obtain as many representative samples of different mounds/terraces/materials as possible. These would be tested for the main contaminants of concern and are selected suite, say ten samples, will be subjected to the NRA leaching test to determine the pollution potential of the main types of materials..."

Dr Smith was retained to carry out the site investigation which he suggested in that letter and his firm commenced trial pitting in early May.

293. Mr Bosence and NCC had a meeting on 14 May 1996 to discuss the wheel cleaning facilities at the Gretton Brook Road entrance. NCC wanted the wheel cleaning facility to be more than 50m from the public highway and for there to be a surfaced road between it and the highway edge. Mr Bosence thought that this was not possible because that would involve excavating into contaminated waste. Some accommodation however was reached between them and was set out in NCC's letter dated 16 May 1996 to Mr Bosence:

"...the Council as Waste Planning Authority is reluctantly prepared to accept the wheel cleaning proposals detailed on your plan reference CBC542 but only subject to conditions:

1. That wheel cleaner is located as far back into the site as possible before entering the contaminated area.
2. The surface between the facility and the public highway is surfaced with concrete.

3. A road sweeper is kept permanently on site and the stretch of concreted area is kept totally clear of debris. I must stress the importance of this final point and I would advise that any sweeping of the highway should be seen as a very last resort and every attempt should be made to ensure mud is not deposited beyond the site boundary in the first instance...”

Even this accommodation was not realised by CBC.

294. By late May 1996, the Environment Agency, which was now responsible for waste licensing decided to approve amendments to the C20 licence which as amended read:

“This licence permits the deposit of waste on land other than burning by an incinerator.

Other types of waste accepted at the site shall consist only of:

1.02.1 Waste Category A-Solid Inert Waste

1.02.2 Contaminated material as defined by previously submitted analysis:

a) from the area of the Toxic Ponds and the Deene By Products Plant to be deposited only in the area marked A on plan C/20.

b) from the area of Soothills (as marked on plan C/20A) to be deposited only in the area marked B on plan C/20.

Under no circumstances shall any of the Soothills waste from Trial Pit 5 of the original analysis (refer to appendix 2) or any other Soothill waste found at or above these levels be deposited at the site, but shall be disposed of appropriately at a site that will accept category F non-special in accordance with the Working Plan.

For waste categories see appendix 1.

The total annual quantity of waste to be accepted at the site shall be less than 75,000 tonnes.”

The new area was a triangular (approximately) area to the South of the old tip containment

facility.

295. There continued to be little or no control over what was happening at Deene Quarry. NCC's inspection record of 23 May 1996 refers to the fact that a full load of tarmac had been deposited at the tipping face notwithstanding that it was not a suitable material for depositing at an inert only site.

296. In June 1996 Dr Smith's firm produced its report on its investigation of the Soothills Area. He referred to the fact that the site "had been severely altered by the excavations of the soot contractor". His examination reveals that none of the samples had heavy metal levels remotely similar to those identified in Trial Pit 5 dug in 1986. He said that if more spots of heavy metals, such as those originally seen at Trial Pit 5 were encountered, the levels of lead and cadmium would present a mild health hazard from long-term exposure via ingestion and via inhalation of dust. At paragraph 7.5 he wrote:

"The key to safe excavation and transport of the material, then, will be dust control and dust suppression, to reduce the risk of exposure of the workforce and public. Appropriate protective clothing, including eye protection, should be worn where ever exposure to dust is likely."

297. The report concluded:

"9.1 The configuration and nature of the Soot Banks has altered significantly since the 1986 survey was carried out. Large volumes of soot have been removed from site. The materials that remain include remnants of the original banks that were considered to contain too little soot to be workable, and heaps of other fines and of large boulders that were abandoned by the soot contractor.

9.2 The 1986 survey had located and sampled at pit five a deposit of 0.55m thickness of very fine grained, brown, slightly clayey silt, believed to have been from blast furnace secondary dust catchers. This silt had particularly high concentrations of zinc, high cyanides, elevated lead and cadmium. The site of pit 5 was excavated by the soot contractor and that material removed and sold, along with the rest of the soot. The former site of pit 5 is now approximately 5m lower than in 1986. No other material exactly similar in either appearance or chemistry to that brown fine grained silt has been found and it now appears likely to have been an isolated occurrence, although further probing will still take place around the former site of pit 5.

9.3 The bulk of the material remaining on-site is slag intermixed with coarse grained sand to gravel-sized 'soot', or flue dust from the blast furnace primary dust catchers, which consists of varying proportions of iron ore, Coke, limestone, and slag. The deposits include soda slag, or similar wastes from the soda ash process for

desulphurization of steel. It has been on the site at least 45 years and has leached and weathered to liberate sodium sulphate that has re-crystallised in massive blocks, at depths of 3m or more below the original tip surface...”

298. On 3 June 1996, CBC granted itself planning permission for the reclamation, regrading and removal of industrial waste at Soothills. Following representations from the Environment Agency, CBC imposed a number of conditions on this planning permission including:

“2. No development approved by this permission shall be commenced before a detailed scheme for investigation and recording of contamination at the site has been completed and detailed proposals in line with current best practice for removal, containment or other treatment of such contamination... have been submitted to and approved by [CBC]...”

5. Before commencement of works for reclamation measures, facilities for prevention of dust nuisance and transfer of contaminants or materials to the public highway including wheel wash and damping down facilities shall be installed at the site in accordance with details approved by [CBC]...

6. Before commencement of removal of any material from the site details of traffic management measures to ensure that lorry movements in connection with the transfer of contaminated materials between the application site and the receiving site are restricted to specified routes shall be submitted to [CBC] for approval and approved management measures implemented for so long as reclamation continues...”

Effectively CBC was to police this reclamation operation.

299. Mr Webster of CBC replied to NCC's letter of 16 May 1996 in relation to wheel cleaning facilities at Deene Quarry on 7 June 1996:

“... I confirm the following points raised... at the site meeting of 14 May 1996.

1. A concrete surface roadway exists between the present wheel wash and Gretton Brook Road. This was considered adequate.

2. A suction road sweeper is to be permanently in use when the access is being used by construction vehicles.

3. An additional wheel wash is to be constructed as indicated on Drg CBC 542, this is to be placed before the existing wheel wash providing a 50m run-off to the site gates.

4. The existing wheel wash is to be cleaned out and remain a dry run in/out area.

With regard to Mr Bosence' telephone conversation with your Mr Cattell on 31 May 1996 regarding proposed to wheel wash facilities at the Geddington Road entrance to the Soothills site, it was agreed that, as an existing surfaced road runs into the site for approx 100m, temporary wheel wash facilities will only be required at times of inclement weather."

300. By mid-June 1996 there were discussions between NCC and CBC about how lorry loads of material from Soothills should be analysed; this was with a view to avoiding a breach of the licence and to preventing unauthorised material from being placed in the tip at Deene Quarry. NCC wanted analysis on at least one in 20 loads. Dr Smith on 10 June 1996 advised against any analysis of loads because by the time that the results came back (6-10 working days), it would be too late; he preferred identifying unsuitable wastes at source.
301. At the LRCG meeting of 13 June 1996, it was reported that £100,000 had been approved for filling the void left at Area A at Willowbrook. It was said that preparation of the tip site at Deene Quarry (for the Soothills material) had hit a problem, which was that a previously buried tar lagoon was leaking out into the pit. Noone & McGowan notified a potential claim in relation to this which they described as a "potential hazardous material" on 13 June 1996.
302. The NCC inspection sheet for 13 June 1996 recorded that unacceptable material (similar to ditch dredgings or from a pond, containing tyres) had been deposited at Deene Quarry.
303. Mr Buckland, employed to supervise the Deene Quarry end of the Soothills work, kept notes in a notebook (F63/242-341), which records for instance that Noone & McGowan started work on Soothills on 4 June 1996 and that they used Soothills material as a sort of hardcore for the haul road and for site access; Mr Buckland assumed that this was acceptable. He noted that later in July the contractor was tipping the soot and slag off a "high face". He describes there being dust on numerous occasions.
304. Over the first few weeks of the Soothills work, Noone & McGowan loaded substantial quantities of excavated material onto un-sheeted lorries which were then driven on public roads, including Phoenix Parkway and the material deposited in a stockpile in Deene Quarry close to the Gretton Brook Road entrance. Some 3000 m<sup>3</sup> was involved, which would have involved up to 300 lorry loads. No wheel wash was provided at the Soothills site and no effective wheel wash was in operation at the Gretton Brook Road entrance.

These lorries' contents were not tested.

305. At the Pre-Contract Meeting for the Soothills contract works on 3 June 1996, it was noted that Mr Buckland was to be responsible for the supervision of cell lining and the filling of Deene Quarry with the Soothills material. Work was to commence that day. The first Site Meeting took place on 18 June 1996. Mr Palmer told the contractor that a material sample was required from every 20th lorry load with a chemical test every 60th load. Mr Buckland was away on holiday at the time and it was said later that Mr Ibbotson was overseeing operations at Deene Quarry.

306. By June 1996, it was apparent to CBC that the annual quantity of waste for 1996/7 would exceed the 75,000 tonnes permitted by the licence. To that end, it wrote to the Environment Agency on 19 June 1996 asking for a variation to that licence condition and, additionally, asking:

“(4.02) The requirement for testing every 20 loads of Soothills waste appears unnecessary and prescriptive giving the Council's strategy of identifying, in advance of excavation, any deposits of wastes unsuitable for Deene Quarry, with excavation taking place under the guidance of an independent consultant.

The rationale behind this strategy is to, firstly, identify and categorise all wastes on the site and, secondly, to ensure that deposition of unsuitable wastes at Deene Quarry is prevented.

It is accepted that testing of loads to the site is a further check to the off- site testing regime previously mentioned. Can a frequency of every 200 loads be agreed as an acceptable alternative?”

This letter was misleading; there was no “strategy” for identifying in advance unsuitable wastes and the excavation was not taking place under the guidance of an independent consultant. Dr Smith was not supervising and tests on the material were not being done in advance.

307. On 19 June 1996, Dr Smith wrote to Mr Palmer and CBC quoting figures for supervision costs for the Soothills contract. This quote was not accepted.

308. On 24 June 1996 Noone & McGowan provided a method statement for, amongst other things, "dust suppression and control". The document in the Court papers is incomplete and distorted in photocopying. The statement appears to suggest that on site dust would be suppressed using a vacuum and a bowser would saturate with water roads and washing areas. It proposed that all vehicles removing contaminated materials off the Soothills site

would be sheeted "to minimise risk to the general public". It said that a "suction sweeper" would be available at all times to keep clean Gretton Brook Road and Geddington Road.

309. The Environment Agency, who had taken over from the County Council waste regulation responsibilities, recorded as follows on its inspection sheet of 27 June 1996 in relation to Deene Quarry:

“Site relatively busy this morning as hard-core being imported to construct internal haul road for Soothills Hall. Considerable dust problem with vehicles ‘kicking up’ dust and creating dusty access onto Gretton Brook Road. When Soothills haul commences dust suppression measures will [illegible] be permanently on the site to prevent considerable problems with dust”.

By this stage excavation and transporting of material from Soothills had started and was being taken to the Gretton Brook Road entrance, where there remained no effective wheelwashing facility and there was none at the Soothills site.

310. The Environment Agency responded on 27 June 1996 to Mr Palmer's letter of 19 June 1996. It was willing to permit more than 75,000 tonnes of waste to be deposited at Deene Quarry. Claire Poole for the Agency wrote:

“Waste Input Analysis I believe this issue was discussed at a meeting recently with my colleague Mr Benson Downey. I appreciate that Corby Borough Council has proposed and is undertaking a monitoring program to analyse the materials source and therefore should prevent all unsuitable material from being taken to Deene Quarry. However the reason for the analysis of waste entering the site is to achieve an accurate indication of the waste that is actually deposited at the site. This is vital information if a certificate of completion is to be contemplated in the future.

The licence actually requires 1 in 20 loads to be sampled and analysed. However it was agreed that as long as one in 20 loads were sampled and retained, 1 in 60 could be analysed and submitted to the Environment Agency. If any of the submitted analysis caused concern than the other samples could be analysed as a check...”

311. The formal construction contract between CBC and Noone & McGowan was signed on 1 July 1996. As Mr Webster said in a draft report of 13 December 1996, consultants were not retained to design or supervise either the Soothills or the Willowbrook North contract, albeit that Dr Smith and others had provided some advice and investigative services mostly beforehand.

312. On 2 July 1996, Dr Smith presented his findings in relation to the tar which had been

found at Deene Quarry. He considered that the tar deposit was at most 10 x 20 metres. He reported that the old Ordnance Survey maps showed a long "slurry pond" at this point in the Quarry, with a rail link to the main line. He said that there was no doubt "that there was a lot of tarry waste... tipped in this general area". He found that there were benzenes and PAHs present and that these were hazardous to health.

313. Site Meeting No 2 for the Soothills works was held on 2 July 1996. It was recorded that no roadsweeper had attended the entrances to Deene Quarry and Soothills during inclement weather; this was said to be unacceptable. Although signs had been erected at the entrance of the site informing all drivers that lorries were to be sheeted, it was reported that present sheeting operations were unsatisfactory as areas of excavated material were exposed on the backs of lorries. The contractor said that larger sheets would be used with the sheets being tied over the back of lorry tailgates to prevent material being exposed. At this stage material continued to be transported to the Gretton Brook Road entrance to Deene Quarry over public roads as access arrangements at the Shelton Road entrance had not been finalised. Other material being imported into Soothills contained a high proportion of unacceptable fill such as plastic bags, paving flags and wood.
314. On 10 July 1996 the Environment Agency inspection report commented that there was "some evidence of dust suppression on site".
315. Meanwhile, there was intensive discussion proceeding at and within CBC relating to the tender process for yet another project, the Mills Road Earthworks Phase IV works. Mr Bosence had, secretly, told Mr Hagen about certain acts which were said to have taken place which were said to be irregular. Because Mr Cropley and Mr Palmer were implicated in this and in the earlier matters investigated, their union, Unison, raised their concerns with the Chief Executive of CBC. Mr Hagen's activities, justified or not, gave rise to some political turmoil within the controlling Labour group at CBC with complaints being made about him.
316. As at 25 July 1996, when Mr Webster wrote to a Councillor who had raised some queries, material continued to be transported from the Soothills site onto Geddington Road, across the roundabout with Weldon Road and up Phoenix Parkway and into Deene Quarry via that route.
317. On 8 August 1996, the Environment Agency modified CBC's Waste Management License C20:

“1.02 Types of Waste/Permitted Operations

This license permits the deposit of waste on land other than burning by an

incinerator.

Other types of waste excepted at the site shall consist solely of:

1.02.1) Waste Category A-Solid Inert Waste

1.02.2) Contaminated material as defined by previously submitted analysis:

a) from the area of the Toxic Ponds and the Deene By Products Plant to be deposited only in the area marked A on plan C/20.

b) from the area of Soothills (as marked on plan C 20/A) to be deposited only in the area marked B on plan C/20.

Under no circumstances shall any of the Soothills waste from Trial Pit 5 of the original analysis (referred to appendix 2) or any other of the Soothills waste found at or above these levels be deposited at the site, but shall be disposed of appropriately at a site that will accept category F non-special in accordance with the Working Plan.

For waste categories see appendix 1.

Please note that this modification removes the previous annual quantity limit of less than 75,000 tonnes from the licence."

318. On 8 August 1996, Dr Smith submitted to Mr Palmer at CBC the first batch of chemical results received from the laboratory of the samples taken off lorries transporting slag and soot to Deene Quarry. Those samples had been taken on 23 July 1996.
319. On 9 August 1996, the Environment Agency inspection report records that mud and debris were being deposited on road due to wet weather and suggests that roadsweepers were not being deployed.
320. Mr Buckland's notes continue to record dusts. They reveal that the first time that the Shelton Road entrance was used was probably 16 August 1996. It is unclear when the contractually required wheel wash facility was installed and effective. He recorded on 6 August 1996 that it was not complete and usable. There is no entry as to when it was completed or used. Mr Bosence recalled that one was eventually installed at the Gretton Brook Road entrance and used but that must have been after 6 August 1996; he said that it did not have water in when he saw it. He also said that hand fixed sheeting was used for

the lorries but I am satisfied that this did not happen for several months after commencement. He gave evidence that only an inadequate sweeper was used by the contractor on the road; it was a JCB with a brush on the front. There clearly was a serious dust problem at the Soothills site. Drivers and other workers were offered respirators but most declined them. Numerous complaints were made about the dust. Mr Bosence talked about "plumes of dust", "you used to get covered in the stuff", that "you were black at the end of the day" and that the dust was going over the adjacent Exeter Estate to the west of the Soothills site. The use of bowsers and sweepers were used as a "token effort to try and suppress the dust", as Mr Bosence said in evidence. A significant part of the dust problem arose from the breaking up with mechanical plant of large amounts of fused contaminated material. Limited dust sampling was arranged in September 1996.

321. By August 1996, Mr McGrenaghen as Principal Auditor was furthering his enquiries into the activities of a number of people including Mr Crolepy and Mr Palmer. To that end he prepared a number of questions to be answered in interview. They were interviewed in relation at least to Area A Willowbrook North in August. Their answers to some of the questions were and are illuminating:

(a) In answer to Question 2.3, "was all the excavated material taken to the contaminated tip?" both answered "yes".

(b) In answer to Question 2.4, "was there permanent and constant supervision of the works and, if so, by who?", Mr Crolepy replied: " Had temporary Clerk of Works who supervised the job and would say that he was there on site the majority of the time. Can't remember his name but it was a chap with a beard." Mr Palmer replied "yes by the Clerk of Works, Brian Clarke."

(c) In answer to Question 3.1, "what do you understand the requirements of the [Environmental Protection Act 1990] to be in relation to the movement and transport of contaminated material?", Mr Palmer replied: "don't really know" whilst Mr Crolepy replied: " Depends on category of what contamination is-falls into two categories: Special wastes which is cleared by N.C.C. through the approved license for tipping at our own tip at Deene Quarry and because it is not the really nasty stuff and Toxic wastes which is dangerous stuff requiring disposal at a special licence tip."

(d) In answer to Question 3.2 "do you accept that the Act covers contaminated material taken to and on Deene Quarry?", Mr Palmer replied: "without looking at Act wouldn't know" and Mr Crolepy said:

"Yes it applies to Deene Quarry and is covered by: (i) Planning permissions approved by N.C.C. (ii) Waste licence approved formerly by N.C.C but now

covered by the Waste Regulation Authority. The rules vary depending on whether special waste or toxic waste.”

(e) Question 3.3 was:

“Is it not a requirement of the Act that when contaminated material is transported off a site that specific conditions have to be met:

(i) The load has to be covered.

(ii) A written record of the material, weight and volume has to be maintained by the contractor.

(iii) The information has to be provided to the licensed tip owner.

(iv) The licence tip owner signs for what he has received and issues an appropriate certificate which has to be retained by the contractor.”

Mr Cropley replied:

"Applies to toxic waste-regulations don't apply to the special waste we were excavating. The tipping of the excavations in the contaminated tip enabled it to be filled so that it can be capped off. An outline of the material to be taken to the tip would have been set out in the planning permission covering the anticipated works and works would have been carried out in line with this planning permission. In addition an annual return is completed the Waste Disposal Authority outlining the volume of material taken to Deene Quarry”.

Mr Palmer replied: "Not the way we do it-think Richard certifies to N.C.C each year what goes into Deene Quarry-used existing approved tipping licence."

(f) Question 3.4 was: "what checks did you make to ensure that the contractor was complying with the requirements of the [Environmental Protection] Act?". Mr Cropley's answer was: "It can just be transported and tipped like it was any ordinary earth that had been excavated" whilst Mr Palmer's answer was: "No checks made of documentation maintained by contractor. Since this contract done, Contract and Design Method Regulations have come into force."

Road entrance to Deene Quarry, that is from the south, was "now in use". The inspector stated that:

“If this is to continue to be the case then the same [concern] relating to dust and mud on the highway will apply as with their Gretton Brook Rd entrance.”

Mr Bosence told the Environment Agency on 20 August 1996 that the new route for Soothills material to be transported to Deene Quarry through the Shelton Road entrance would be to Geddington Road as before, turning right onto Weldon Road following that through onto Steel Road before turning right onto Shelton Road.

323. The Environment Agency report of 3 September 1996 revealed that yet again fly tipping had occurred on the Deene Quarry site, in this case a sofa and bags of rubbish on the haul road and the Gretton Brook Road entrance.
324. Belatedly, on 5 September 1996, Mr Webster for CBC informed the Environment Agency that 205,000 m<sup>3</sup> of material (all from designated sites) was taken into Deene Quarry in 1995. For the first six months of 1996, he said that none had been imported. That was not strictly accurate as Soothills material had already been taken into Deene Quarry through the Gretton Brook Road entrance by Noone & McGowan, albeit stockpiled and not actually placed in the tip.
325. On 11 September 1996, the Environment Agency reported in relation to Deene Quarry that "dust suppression [was] non-existent and vehicles kicking clouds of dust with every journey". Given the dust problems which were undoubtedly occurring at the Soothills site and which were giving rise to some complaints from the public, consideration was given to set up dust monitoring in September 1996. A quote was obtained on 17 September 1996 from MIS Ltd to take samples for amongst other things nickel, chromium and cadmium. Dust monitoring equipment was used to carry out sampling initially over five days, 19, 20, 23, 24 and 25 September 1996. Dust was certainly being generated on this site. The contractors had to use machinery known as an Ackerman to break up large boulders or agglomerations of material.
326. Dr Smith's firm did a further trial pit investigation on 19 September 1996 at Soothills. In two pits, W and Y, a very fine grained sludge, described as "cheesy", was found. In one pit oily material was found with a marked coal tar odour.
327. A disciplinary hearing for Mr Palmer took place on 25 October 1996 in which Mr Webster made his statement of case against Mr Palmer, the main points of criticism being failure to carry out duties on job description, lack of supervision of staff, poor preparation of drawings, inadequate supervision, failure to file satisfactory minutes relating to contract

status and monthly progress meetings and lack of liaison.

328. On 31 October 96, the Environment Agency's report highlights some inadequacies in mud control which were corroborated in the evidence of Mr Bosence:

“Although roadsweeper on site it is barely enough in today's muddy conditions and although there are no ‘clods’ of mud on road there is a thick film. Each passing vehicle along Gretton Brook Rd is causing a mud spray to be thrown up. The wheel wash is not doing a great deal to help and I commented on its inadequacy last year and subsequent [illegible] on site to improve its performance have not really seen improvement. I am extremely disappointed by the situation.”

329. On 1 November 1996 there was a disciplinary hearing with regard to charges against Mr Cropley. Mr Webster presented the case against him under two main headings relating to alleged poor management judgement in awarding work to a personal friend said to be at favourable rates and what was said to be ineffective management of the section. The Chief Executive following this hearing issued Mr Cropley with a final warning for employment purposes.
330. From September 1996 onwards, the Mills Road Phase IV Scheme was progressing which involved the excavation of contaminated material and its deposition at Deene Quarry.
331. On 18 November 1996, Dr Smith advised Mr Bosence that the material identified in trial pits W and Y should be taken to a properly licensed facility (as opposed to Deene Quarry which could not accept contaminated material of that type).
332. On 24 November 1996, Mr Ibbotson wrote to Mr Webster in relation to these stockpiles of material which still remained in the Deene Quarry somewhere near the Gretton Brook Road entrance. He wrote:

“...it is my opinion that a number of matters require attention regarding the Council's activities. In making the following observations I also referred to the site licence as issued for the tip by Northamptonshire County Council:

1) Stockpiling of graded material in the Quarry, originating from the Banks Site, would appear to be in breach of the Planning Permission. The recycling of materials on the site appears to be in breach of the site licence conditions.

These matters require resolving with the Planning Department of the County Council and Claire Pool of the Environment Agency.

2) Waste from the Soothills Site should be deposited in containment cells in the Quarry. The design of the containment cells is detailed in the licence conditions for the tip. It would appear that modifications have been made to the design, agreed verbally with EA, and subsequently implemented on site. Such modifications should be confirmed in writing and a working plan of the licence altered accordingly...

4) Haul roads on the site should be constructed of inert fill...

7) The Council's interest, in my opinion, would be best served by the provision of a full time supervising officer in the quarry to ensure that the various records are being kept and that the tipping operation is being undertaken in a professional manner and to the correct specification. The supervising officer should be WAMITAB approved.

8) The site licence specifies that a notice board should be located at the entrance to the tip with the operator's emergency telephone numbers displayed, together with EA's emergency number. This matter requires attention.

9) The contaminated tip requires fencing and the site licence specifies that the fence should be of a security type, 1.8m high surmounted with barbed wire. It is my opinion that the restored tip only requires a token fence, ie. Wood post and barbed wire type. This should be resolved with EA and the necessary modification to the licence made if they are in agreement. Otherwise the full specification fence as stated in the licence should be erected.”

This suggests that the supervision being provided by Messrs Ibbotson and Buckland between them did not amount to the full time supervision recommended by him. In any event, the advice was not followed.

333. The Environment Agency inspection report of 27 November 1996 again records that site roads were very muddy and that some mud was getting on to Shelton Road which suggests that this entrance was now being used.
334. On 28 November 1996, the Environment Agency informed CBC that it was willing to extend the area within licence C 20 on which the approved Soothills waste could be deposited. That was an Area C to the north of the earlier area permitted for the deposit of Soothills waste.
335. In December 1996, Dr Smith's firm produced a "Validation Survey" of the Rolling Mills Earthworks Phase IV works. It described the work which had been done:

“2.2 Two site investigations were carried out prior to reclamation... they established that the site was mantled by a deposit of ‘oversite fill’ ranging generally from 1.5 to 2 m in thickness and consisting of ash, slag, refractories, rubble, ballast etc. The

oversite fill overlay natural ground in the north-eastern corner of the site, and quarry backfill (chiefly quarry overburden-sand & clay) over the rest of the site. The report recommended that the oversite fill should be removed prior to redevelopment and that the void should be backfilled with suitable imported materials.

2.3 A contract was let by [CBC] ... to break out old foundations and underground chambers, where practical; to remove the contaminated oversite fill; and to backfill compact imported stone. The contaminated soils were landfilled at the Council's own site at Deene Quarry..."

336. At the same time, the firm produced a Summary of Contamination results for this particular site, which does not seem to have been done for any of the other sites to date. It usefully described its former uses:

"1.3 The particular operations carried out on our particular portion of the mills appear to have been associated to a large extent with "soaking". This is the process whereby large ingots are reheated, prior to rolling, in very large pits (the "soaking pits"), lined with refractories and heated by burning waste gas - probably blast furnace gas. Once the ingots had attained the required temperature, they would be lifted out by massive cranes onto the rolls. The soaking pits were associated with underground flues that carried the hot blast from gas burners, and there was also a substantial chimney to carry off the exhaust. The northern part of our site, outside the mill building, was occupied by rail sidings.

1.4 During demolition of many of the works structures in the 1980s, overhead blast furnace gas mains were dismantled by scrap contractors on the open sidings, and gas main deposits and condensates, including ferricyanide wastes and organo-sulphur compounds-some of which smouldered on exposure to air-were spread around. Similarly, the removal and break-up of the mill machinery from inside the buildings resulted in the release of large amounts of oil, adding to the already widespread oil contamination that had resulted from some 45 years of continuous heavy engineering."

337. Under the heading "Site Investigations", the Summary report provides useful information not only about the particular site but also about the approach adopted by CBC and its consultants to many of the sites:

"2.1 The area was included within the boundary of an investigation entitled 'Electric Furnace Plant', that we supervised on behalf of Corby District Council in 1986... This report concluded that:-

- a) "The random deposits of waste contain sludges from the lime neutralization of steel pickling acids. Oily gas-line condensates are also present in smaller quantities. All the deposits should be removed prior to redevelopment".
- b) Soil analyses ranged from acidic to highly alkaline (pH 11.1), soluble sulphates were high, and Class 4 concrete (sulphate resistant), was recommended.

c) High concentrations of zinc, in particular, were found in the soils and ranged up to 1,558 mg/kg.

2.2 A more detailed investigation was carried out in 1994, as part of the Exchange Sidings project (Ref 2), although the mill itself was still not included.

The report states that the site was blanketed by a mantle of iron & steelworks wastes consisting of ash, slag, refractories, ballast, rubble etc. of variable thickness and visibly oily in places, overlying natural ground to the north of the old quarry face, or opencast backfill to the south of the face. The opencast backfill and the natural soils were judged to be relatively inert.

The oversite fill was found to be chemically contaminated with arsenic (up to 262 mg/kg), cadmium (up to 23 mg/kg), lead (up to 2,655 mg/kg), zinc (up to 6,742 mg/kg), and toluene extractable matter (eg. oils and tars) which ranged up to 1.5%. The pH value of the oversite soils ranged from 2.3 to 11.1. Acidic conditions, where encountered, generally extended down from the oversite fill into the underlying strata. Significant amounts of free calcium oxide and magnesium oxide was found, associated with the presence of steel slag and possibly from basic refractories. A particular feature of the results was their extreme variability across the site, from pit to pit, reflecting the inhomogeneous nature of the oversite fill and the presence of many localized point sources of contamination (eg. isolated spillages and dumping of wastes during the works history).

Groundwater was found to be contaminated with ammonia, chloride, and cyanide, with traces of phenols.

The report concluded that the oversite fill could be unstable in the long term as a result of the presence of free lime and magnesia in the slags/refractories; and that contamination-unless remediated-would place constraints on the development of the site. Not stated, but implied, was that the contamination of groundwater was resulting from downward percolation of leachate from the oversite fill. The report recommended removal of the oversite fill prior to development...

2.3 Examination of the derelict remains of the mills buildings themselves, here and on the adjoining Phase III site, revealed that very deep machine pits and the soaking pits had been loosely backfilled with demolition rubble; directly on top of thick deposits of oily residues and sludges in the case of the machine pits. Experience from reclamation of the remainder of the mills indicated the likelihood of some asbestos contamination within this backfill. The council has reclaimed a huge area of the former steelworks over the last 15 years. Based upon the experience gained from that programme, and on the requirements of the various regulators, and of potential developers, it was agreed that the most appropriate strategy was - as recommended in the s.i. reports-to remove the contaminated oversite fill; then excavate the contaminated backfilled debris and sludges from the various pits; break out any voids etc; and remove the contaminated materials to the Council's own licensed landfill at Deene Quarry; then to backfill the site with clean imported fill to an appropriate geotechnical specification."

338. The Summary concluded that some 48,000 m<sup>3</sup> had been removed and that there had been extensive contamination. Of some interest is that high toluene extractable material, nickel and other materials were found on this remediation contract whilst only low cadmium was

found at this stage (up to 2.5 mg/kg) although significantly higher levels (up to 23 mg/kg) had been found than in the earlier investigation.

339. On 2 December 1996, Mr Webster belatedly submitted to the Environment Agency CBC's volume of material returns for July, August and September 1996 respectively 22,440, 36,522, and 45,800 cubic metres being deposited.
340. On 6 December 1996, the Environment Agency extended the C20 licence to cover the further Area C at Deene Quarry. Once filled it was to be capped with a geotextile membrane.
341. An internal CBC council document dated 18 December 1996 states that at Soothills:
- “During excavation of the 15m high hills of soot a solid mass of cemented silica slag, amounting to approximately 13,000m<sup>3</sup> was encountered. Previous boreholes in the area had indicated obstructions encountered at 6m depth which were assumed to be isolated steel ingots and small nodules of hardened slag. The breaking out of this solid mound has proved to be a major task, hard dig with pneumatic heavy breakers.”
342. There was discussion in December 1996 about the continued engagement of Mr Ibbotson. A “Pre-meeting” paper on this subject was dated 20 December 1996:

“Background

Since 1980, the Consultant Engineers, R C Ibbotson Ltd., have been employed by the Council to assist in designing and implementing schemes for the reclamation of the former steel works area. The design and administering of individual schemes has generally been handled by Mr Ibbotson himself, with his site representative being a Mr J Buckland. A detailed contract was drawn up between the Consultant and the Council, specifying the terms and conditions of appointment.

The costs of employing the Consultant have been met through Derelict Land Grant administration allowances.

Present Position

The most recent reclamation scheme undertaken by the Consultant is Mills Road Phase IV, which has now been completed on site.

The Consultant was not employed on the two reclamation schemes Willowbrook North and Soothills, the Head of Engineering and Construction Services being the supervising engineer for both. These two schemes have yet to be completed.

The final major reclamation scheme that is likely to be pursued by the Council is the restoration of Deene Quarry, after completion of all the tipping activity.

Under the terms of the Waste Management Tip Licence for Deene Quarry, issued by the Environment Agency, it is a requirement to employ a qualified tip inspector with a WAMITAB certificate. The inspector supervises tipping operations and keeps the necessary records required under relevant legislation. These duties have been added to

by the introduction of Landfill Tax, from 1 October 1996, which requires further records to be kept, and returns made to the Government. Mr Ibbotson's assistant, Mr Buckland, has been fulfilling the role as tip inspector and is accepted by the Environment Agency.”

At some stage in the Autumn of 1996, Messrs Cropley and Palmer had been suspended and so it was recommended that Mr Ibbotson be kept on.

343. On 8 January 1997, HM Customs & Excise decided that CBC had secured an exemption for landfill tax. In its letter to CBC, it refers to the fact that CBC had claimed that 300,000 and 40,000 tonnes had been deposited on Deene Quarry from the Soothills and Heavy Rolling Mills sites respectively.
344. Mr Larter who was a senior CBC employee involved from time to time in the reclamation works provided a statement (probably to Mr McGrenaghan) on 16 January 1997 which sheds some light on what happened on Toxic Ponds 5 and 6:

“My recollection regarding my involvement with the Toxic ponds Contract No.70 is of discussions with the Principal Project Engineer M. Palmer in late 1992 regarding the health and safety requirements of the specification and a final agreed set of paragraphs regarding health and safety of employees placed in the Contract 70 Instructions to Tenderers, item 122 Safety requirements due to chemical hazard (1-39).

I visited the site of operations at Gretton Brook Road in November 1992 with Mark Boscence Engineer to view operations at commencement of Contract and recall raising issues with the Engineer in charge M. Palmer about standards of safety for CBC employees and the fact that certain requirements of the safety method statement provided by the contractors were not being met. These issues were addressed.

During the Spring of 1993 I received complaints from employees of CBC concerning operations at the Toxic pond site not complying with the requirements of the method Statement. I visited the site at Gretton Brook road and was concerned the safety [sic] of various operations and requested the attendance of the Contractors (Weldon Plant's) Safety officer.

I raised complaints regarding welfare facilities for employees and site workers and in particular regarding the emergency shower, washing, drinking and eating facilities. I also raised concerns regarding:

- Site vehicles leaving the site without proper wheel washing and the possible contamination of the Gretton Brook watercourse.
- The site boundary fencing
- The on site haul road was affected by spillage.

These complaints were given as a verbal report

My normal approach to deal with on site safety issues is to make clear to the responsible person (The Principal Engineer M. Palmer) the standards required (which at that time was compliance with the safety method statement provided by the Contractor) and this would be followed up with a further site visit to identify compliance. Failures to comply with the Method Statement at this point would be followed by a written report to the person responsible with a copy to the Director responsible for the Department concerned. No written report was sent which leads me to the conclusion that I considered that adequate action was taken at the time.”

345. On 21 January 1997, CBC replied to HM Customs & Excise to the effect that some 33,000 and 244,500 tonnes of material had been deposited at Deene Quarry from Mills Road and Soothills which had been rounded up to 40,000 to 300,000 tonnes respectively.
346. An Environmental Agency inspection report of 22 January 1997 describes the state of the site roads internally at Deene Quarry as “appalling” and refers to the fact that stockpiled materials at the Deene Quarry were being taken away and transported elsewhere. Mr Bosence said in evidence that he agreed that the public roads were covered in mud and sludge and dust throughout his time on the Soothills project.
347. The Legal Officer of CBC produced a report as to what had been going on at Deene Quarry over the years in January 1997. He set out details of the contracts with Mr Ibbotson (20 May 1981 (General agreement), 1 November 1983 (Soothills, Sootbanks and BOS), and 31 December 1985 (Tipping areas and Heavy Rolling Mills). The report recorded the contracts entered into relating to Deene Quarry in which Mr Ibbotson was involved:

- “1. Agreement made with Pipeline Constructors Limited dated 16 March, 1987,... Reclamation Toxic Waste Pond Water Disposal "Engineer" Community and Technical Services Officer
2. Agreement with Weldon Plant dated 24 September, 1990, Contaminated Tip Facility "Engineer" R.C. Ibbotson and F.W. Smith
3. Agreement with Weldon Plant dated 3 December, 1990, Contaminated Tip Facility - Backfilling Operation -( Plant Hire
4. Agreement made with AGRU Environmental Technology Limited dated 9 January, 1991 ...- Contaminated Tip Facility Membrane "Engineer" R.C. Ibbotson and F.W. Smith
5. Agreement with AGRU Environmental Technology Limited dated 12 May, 1991 ...Contaminated Tip Facility Membrane Extension "Engineer" R.C. Ibbotson and F.W. Smith
6. Agreement with Weldon Plant dated 4 November, 1992, Contaminated Tip Facility - Earthworks Phase II "Engineer" R.C.Ibbotson and F.W. Smith
7. Agreement with Weldon Plant dated 4 December, 1992, Toxic Ponds Reclamation (5 and 6) "Engineer" Head of Engineering Services
8. Agreement with Noone and McGowan dated 23 December, 1993 ...Drainage "Engineer" Head of Engineering Services

9. Agreement with Weldon Plant dated 28 January, 1994 ... Restoration Earthworks Phase I "Engineer" Head of Engineering Services
10. Agreement with Noone and McGowan 18 March, 1994 ... Contaminated Tip Restoration - Phase I "Engineer" R.C. Ibbotson and F.W. Smith
11. Agreement made with Geotechnics Limited dated 10 April, 1995 ... Gas and Groundwater monitoring Boreholes "Engineer" R.C. Ibbotson and F. W. Smith
12. Agreement with Weldon Plant dated 21 April, 1995 ... Restoration and Leachate Control "Engineer" Head of Engineering Services
13. Agreement with Weldon Plant dated 6 February, 1996,... contaminated Tip Restoration "Engineer" Head of Engineering Services.”

348. The report went on to identify what work, which was to have been done by Mr Ibbotson, had been done by CBC:

“Comments

1. It is indubitable that by the Supplemental Agreement dated 31 December, 1985, R.C. Ibbotson and F.W. Smith "the Consultant Engineers" were to prepare the schedule of drawings, conditions of contract, specification, bill of quantities and supervise for the Toxic Ponds Reclamation works in accordance with that Agreement and the Principal Agreement dated 20 May, 1981. The area of 33 acres of land referred to in the Supplemental Agreement corresponds to the area of 33 acres acquired from the British Steel Corporation.
2. It is indubitable that the Council, in breach of its contractual obligations to the Consultant Engineer prepared the schedule of drawings, conditions of contract, specification, bill of quantities and supervised the contract.
3. On Monday, 13 January, 1997, I had a meeting with Rod Ibbotson. He came to see me in response to my letter to discuss with him his letter of 9 March, 1993:

“...The site supervision provided by John Buckland is restricted to looking after the sanding, tyreing and covering of the membrane to the floor and walls of the facility.”

4. Rod Ibbotson confirmed the accuracy of the penultimate paragraph of that letter..
6. Rod Ibbotson confirmed that he received no response to the letter from any Council Officer...”

349. In January 1997, CBC commissioned Aspen Burrow Crocker Ltd, consulting engineers to review events on a number of the reclamation contracts. They attended with Mr McGrenaghan a meeting about the Willowbrook contract with Weldon Plant on 23 January 1997 to this end.
350. Mr McGrenaghan conducted a site visit on 24 January 1997 and recorded what he saw in a memorandum of 27 January 1997:

“Arising from your memorandum of 22 January 1997 I conducted a site visit on Friday 24 January 1997 and would inform you of the following:-

1. The access gate at Mitchell Road is closed and padlocked.
2. The access on Gretton Brook Road is open and accessible.
3. As I approached the junction of Phoenix Parkway and Steel Road I spotted a lorry loaded with "muck" travelling along Phoenix Parkway towards the Power Station. I followed the lorry which had no company name and it turned into Gretton Brook Road and then through the access onto Deene Quarry no doubt to tip its load.
4. I then inspected the Ashbury site and can confirm that Noone & McGowan are obviously performing a contract for Ashbury part of which is the excavation and disposal of muck. I followed a Noone & McGowan lorry loaded with "muck" as it left the site and this lorry also entered onto Deene Quarry, again no doubt to tip its load.

Following the site visit I spoke to the Senior Engineering Technician who advised that under the Sootbanks contract being carried out by Noone & McGowan there is a requirement to provide cohesive clay for capping works at Deene Quarry...

I have also spoken to the Consultant Engineer, Rod Ibbotson who confirms the requirement for capping material on Deene Quarry. He further advises that the Resident Engineer makes periodic visits each day to check what is going onto Deene Quarry and obtain from drivers details of what has been brought on. He also stated that as of Monday 27 January 1997 the Resident Engineer will be permanently on the Deene Quarry site and check all loads in.

Further details on this matter will be provided by the Director of Development Services."

351. On 28 January 1997, Mr Palmer was dismissed by CBC following a further hearing on 22 January 1997. The letter from the Chief Executive sent a copy of a report about this and the dismissal was expressed to be on the grounds of "gross misconduct and irredeemable incapability". There was no challenge or reference to any employment tribunal. The report findings were:

"Findings

I shall deal first of all with the matters deferred from the previous disciplinary hearing pending further investigations.

1. The omission of the interlocking steel shutters.

*...On balance I have to conclude that the matter was very poorly handled, both in relation to tender evaluation and contract management. The absence of adequate records does not lead to confidence that matters were handled as they should have been and makes it impossible to eliminate suspicion as to the motives of the people involved...*

2. Unlawful payment

Clear evidence was produced that the Council had been charged and had paid for works to the 2 acre site reserved for Newteam through the contract for Sites B and C.

Consequently the story related to me at the previous hearing, namely that the overpayment for fill on contract A was to reimburse the contractor for works to the 2 acres, was untrue.

This is a very serious matter. Either MP, when he related the story, knew it was untrue and deliberately tried to mislead me and subvert the proceedings, or he negligently gave me a story without knowing whether or not it was true. Either way this is a very serious failing.

I specifically asked him whether he had intended to mislead me, which he said he hadn't.

I also put it to him that he must have been negligent in not even bothering to find out whether or not the story he was giving me was substantiated, and he agreed.

*I find that Mr Palmer authorised an unlawful payment, and led the Council into making a double payment for work, and further that he made statements to me at the previous disciplinary hearing which were seriously misleading.*

### 3. Bill Rates

Mr Palmer was unable to explain why it is that the rates for ostensibly similar work in the bank stabilisation contract were considerably lower than the rates in the contract for site A. Neither could he explain why throughout the conduct of the works valuations are based on the lower rates, but at draft final account stage there is a sudden switch to the much higher rate. Worse still, that higher rate went unchallenged and has in fact been ticked. That tick apparently was made by the Head of Engineering and Construction Services, however MP acknowledged that he was in agreement. He explained that, in going through the draft final account with the Head of Engineering Services he was not examining the validity of the rates used, but was really only verifying the nature of the item and the arithmetical correctness.

*Again I can only conclude that this represents a serious shortcoming on the part of an officer who is responsible for contract works to allow such a significant and obvious change to go apparently unchallenged.*

### 4. Additional Drainage

Keith Webster accepted MP's explanation that the drainage was omitted from the contract for sites B and C simply because details were not available of the works to be carried out on Eurofleets part of the site. However, he maintained his case that the matter should have been properly recorded in the contract documentation and procedures when the variation was made, which it was not.

*I agree with that. There was once again a disregard of the need to document events on the contract to set up the proper audit trail and to provide reassurance that all was as it should be.*

## 5. Practical Completion Certificates

It was clearly established that only one certificate was issued, namely for the purpose of enabling the Head of Estates to conclude the land transaction he was negotiating with Eurofleet. It was not at all clear as to why the others hadn't been issued, although there was a suggestion that this was in order to enable cross funding of contracts with a view to getting the best outcome for the Council. That is not a satisfactory explanation.

*I find that there was a failure to issue certificates as required by the contract and I heard no satisfactory explanation for this.*

## 6. Computer Equipment

Keith Webster expresses his serious concern that these items, having been brought into the contracts as variations, are likely to be picked up and rejected by English Partnerships. He cites a recent example in relation to the Soothills contract as evidence of this.

Mick Palmer on the other hand said that English Partnerships do accept necessary computer equipment as a legitimate item in a contract.

Having regard to the requirements of grant conditions, it seems to me that it would be an elementary precaution to ensure that the items being purchased were going to meet English Partnerships approval. Furthermore it does seem an extraordinary arrangement whereby the contractor makes the running on the items, and apparently earns a "profit" element based on the cost of the equipment.

Furthermore, DODS pointed out that this way of proceeding was contrary to his standing instructions with regard to the purchase of IT equipment.

*I therefore find that the handling of this item fell short of the standards appropriate for an officer in MPs position.*

## 7. Roadworks

The complaint here is that to divide the total cost of making good damage to roads equally between three contracts is inappropriate.

It is also of concern to DODS that the total cost of such works was £9,000 in excess of the £30,000 aggregate total for the provisional item, and is therefore likely to be heavily scrutinised by English Partnerships.

*I do not necessarily subscribe to the view it is inappropriate to split an item of this nature equally between three concurrent contracts. That may well be a convenient approach, although obviously the funding agency will need to be satisfied if they have not already been notified.*

*However of more concern is the overspend, apparently not previously authorised,*

*which may lead to closer scrutiny and disallowance. That points to a fundamental lack of management control of the contract. I note from condition D attached to grant approvals that changes to costs outside certain specified areas are required to be identified and justified when claims are submitted, and that changes may be accepted against the total contingency allowance of 5% on the contract. I was not given any detailed evidence on our ability or otherwise to justify the additional costs, and draw no conclusion on this aspect.*

#### 8. Outstanding balances

The significant differences referred to between the practical completion stage and final account points again to slack contract management procedures.

The wide variations in contract figures as compared with grant approval figures, although in aggregate remaining within the global grant offer, were very poorly handled.

*There seems to have been a total disregard for English Partnerships requirements, and a consequential risk to the Council.*

#### Conclusions

...The only defence he was able to advance was his stress condition at the time when these contracts were current as a result of domestic and marital problems. I accept that he would undoubtedly have been under considerable stress as a result of these matters. I have previously accepted that he was working in extremely difficult circumstances in carrying out these and other contracts. It is regrettable, however, that he apparently made no reference to these matters to his Manager in order to receive either practical help in relation to workload, or counselling advice in relation to his stress condition...

...I have reached a number of findings against Mr Palmer. For the most part these relate to a failure to follow proper contract procedures and internal Council procedures and failure to maintain essential contract records. There were also failures to observe English Partnership requirements. Pressure of work and the need for speed are doubtless relevant considerations. However, I cannot see how they can excuse such fundamental deficiencies as those identified in this case. The Council has been placed in a very vulnerable position and may have suffered financial detriment. In some instances Mr Palmer's motives are placed under suspicion. In essence his lack of attention to such crucial matters amounts to negligence.

However by far the most serious item against Mr Palmer relates to the excess payment for fill material on two grounds:

- a. it was unlawful in that it was not payment for value received and
- b. I was given seriously misleading information at the previous disciplinary hearing in an attempt to explain it.

Regrettably I have no alternative but to conclude that the matter in relation to the double payment, and the unlawful payment, is such that whatever the mitigating circumstances may have been, and regardless of whether it was made with an intention to deceive or negligently there is no realistic conclusion that I am able to reach other than that Mr Palmer's employment as Principal Projects Engineer must be terminated. He simply cannot continue in that job."

352. This report coupled with my views of the evidence in numerous other respects leads me to the conclusions that Mr Palmer simply was not qualified or experienced enough to be involved in a senior engineer role on any material part of the reclamations carried out by CBC at the old BSC site.
353. The Environment Agency inspection report for 28 January 1997 reveals that the large stockpiles of contaminated material which had been left at Deene Quarry were now being removed "in large quantities". The inspector recorded that it would be "highly unsuitable" for this to be deposited elsewhere. He recorded that this removal was a breach of the licence and caused him concern for "potential pollution" elsewhere. Removal continued as reported by the inspector on 5 February 1997. This removal was done with the knowledge and concurrence of CBC and it involved putting back in lorries contaminated material for carriage on the public roads. This work was not obviously supervised by CBC.
354. It is clear from a letter dated 30 January 1997 from the Environment Agency to Noone & McGowan that the latter had taken some material from Soothills to another site altogether.
355. Throughout the period of the Soothills contract lorries were sampled broadly on the basis agreed with the Environment Agency. Dr Smith reported for example on this in a letter dated 4 February 1997. Mr Buckland who was supposed to be supervising the work had his site hut at the Gretton Brook Road entrance although since about September or October 1996 most of the Soothills load were coming in from the Shelton Road entrance.
356. On 7 February 1997, CBC dismissed Mr Copley on grounds of "gross misconduct". He did not challenge his dismissal. The disciplinary report findings dated 6 February 1997 were:

"For ease of reference I will incorporate here where appropriate findings arising from the October hearing in addition to my findings based on the evidence before me in this hearing...

a) Failure to provide effective management of the contract in accordance with the conditions of contract and in contravention of the job description.

b) Failure to exercise supervision of staff in accordance with the requirements of the job description.

*In the previous hearing I found that management was inadequate when judged*

*against what would normally be expected. However there were mitigating factors. At that time I also found that there was no evidence that the Council had been disadvantaged as a result of the shortcomings. That no longer remains the case. The Council has clearly been disadvantaged in having paid for materials which were not received on site A. Whilst it may be true that this can be rectified through negotiations on the final account there is no getting away from the fact that the payment has already been made and it should not have been. Having regard to the general state of records and management of the contract there must, in my view, be a risk that this matter would not have been picked up at the final account stage had it not been for these proceedings.*

c) Failure to ensure adequate levels of documentation maintained.

*I previously found that there was an absence of detailed site minutes which was a cause for concern, and no variation order for the omission of steel shuttering - a major item...*

h) Approved payment of valuation number 6 in contravention of Financial Regulation 14 (iii) a in the sum of £22,508.37 plus VAT which included for 64046 cubic metres of imported back fill material whereas only 40,000 cubic metres was brought in, resulting in an overpayment in excess of £9 0,000 thus resulting in potential financial loss to the Council.

*I previously found that this charge had been established. Subsequent enquiries have revealed that the claimed basis of this overpayment - allegedly to provide the means of paying the contractor for works on 2 acres of land within site B, did not stand up to scrutiny. Payment for that*

*work had already been made on a valuation on the site B contract. The evidence adduced at this hearing showed very clearly that the story I was told at the first hearing was either a complete fabrication, or had been put forward negligently without Mr Cropley having taken the trouble to examine whether it stood up to scrutiny.*

2. The situation in relation to the duplicate payment for either back fill to site A or reclamation of the 2 acres on site B/C has not been satisfactorily explained and remains a serious breach of Financial Regulations 7 (iii) and (iv) . The purchase of the computer equipment is in breach of Standing Order 48 and Financial Regulation 14 (iii).

*I have already commented on the duplicate payment. This is a very serious matter. The purchase of the computer equipment was not in accordance with the Council's procedures, and if the scenario described by Mr Cropley to justify this had any substance, I would have expected there to be some record on the file to explain why procedures were not being followed in this instance, and to indicate that English Partnerships were satisfied and would fund the actual cost. There remains a risk that they will not cover the cost, at least the element that represents the contractors profit.*

3. It is clear from the fluctuations in the contract valuations from April 1995 through

to October 1995 that there was little attempt made to catch up and subsequently regularise matters in relation to contract documentation/ Council approvals, and English Partnerships approvals this shows continual negligent contract management by Mr Cropley as the Engineer.

*I understood from what Mr Cropley told me that he acknowledged that these matters had not been satisfactorily followed through. He remained reliant upon the pressure of work as the explanation for this.*

4. Mr Cropley's statements that senior management were fully aware of all matters and had instructed him in relation to the 2 acre scam is not supported by the evidence.

*There remained a difference of opinion between the Director and Mr Cropley as to whether or not the device of inflating the fill costs on site A to pay for work on site B had been specifically discussed and agreed with the Director. What did appear to be beyond dispute was that all parties were aware that work to the 2 acre site would be paid for by the Council, and no doubt all parties expected that that payment would be recovered from English Partnerships. I am unable to draw a clear conclusion on this although having regard to the fact that the work to the 2 acres had already been paid for within contract B, the evidence suggests that the Director's view of matters is to be preferred.*

5. The Director's conclusion therefore is that Mr Cropley is guilty of gross misconduct and irredeemable incapability in relation to contract management issues, and he could therefore not see how the Council could have any trust or confidence in him to continue carrying out his duties as a senior officer of the Council.”

This confirms the view which I have formed which is that Mr Cropley was and indeed had never been up to the job for which he was employed.

357. On 12 February 1997, the Environment Agency inspector recorded that contaminated material was being used to repair a haul road at Deene Quarry and as a base for a site office. That led to Noone & McGowan being written to by Mr Ibbotson on 13 February 1997:

“I have been requested by Corby Borough Council to point out that the stockpiles of slag material located in Deene Quarry, originating from the Soot Hill Site, must not be used without the prior permission of the Environment Agency. Hence this material should not be used on the site or removed from Deene Quarry Tip without obtaining such permissions.

This matter has been the subject of previous correspondence with yourselves and Corby Borough Council and supplemented by telephone conversations.

It is my understanding that the Agency has now undertaken some tests on the material and from the results have concluded that the slag must be defined as a classified waste from henceforth.

I would respectfully point out that contrary to previous instructions some slag material has been used for haul road maintenance within the quarry complex on 12 February 1997. This occurrence must not be repeated without obtaining the necessary consents from the Agency.

Your co-operation in complying with the Agency's request is sought..."

Slags and other waste materials had been used as hardcore for access roads from the start on the Soothills project.

358. In this context, after contacting the Environment Agency, Mr Ibbotson wrote to Mr Webster at CBC on 17 February 1997:

"Following our recent meeting last week and our telephone conversation on Thursday 13 February 1997, I wish to confirm a number of points, and also inform you of my discussions with the Officers from the Environment Agency.

- 1) The Agency has now received the results of the tests on the various samples of stockpiled slag on the Deene Quarry Site. From the information gained the material is well above threshold levels with regard to arsenic and sulphate, hence the material is to be defined as a "Difficult Waste" Category F None Special, and must not therefore be used on the site or removed from the site.
- 2) The degree of contamination is much greater than the information previously given to me by Noones based on their own test results.
- 3) The Environment Agency is of the opinion that the stockpiles of material should be deposited in the Contaminated Tip Facility and covered over with the cap. This also includes the uplifting of the haul road across the site and depositing this material also in the facility. This will be subject to a formal decision by the EA, however, it is my opinion that the necessary steps may be taken to obtain prices from Noones for repositioning of the slag deposits. English Partnerships may also be contacted regarding the funding implications.
- 4) The Environment Agency is also requesting a validation survey to be undertaken in the stockpile area when the deposits have been removed. This is to prove to them that there is no contamination left in the area. The validation survey will also apply to the haul road route. This procedure will be an important part of the surrender of the tip licence.
- 5) In connection with the use of the slag on the haul road maintenance last week by Noones, I enclose for your file copies of the two letters which are self explanatory.
- 6) At the present time Noones are importing subsoil material from the Kettering site for restoration purposes.
- 7) The Environment Agency is certainly looking closely at the various sites where Noones have used the slag and it may come to pass that the slag will have to be removed from these sites. The EA is in discussions with Noones at the present time on the subject.

If the material has to be taken to a licensed tip for disposal, should Deene Quarry be considered?

8) I have made the necessary arrangements for the additional cover to be on site to accommodate the hours working by Noones, including Saturdays.”

359. On 20 February 1997, the work at Soothills was described as 90% complete at a LRCG meeting on that date. Mr Bosence described Deene Quarry as a “free-for-all that anyone could come and tip from wherever”; he said that the gates were always wide open and there was no control over that aspect of access to the quarry areas. He described the haul road from the Shelton Road as having lots of dust everywhere, so much so that he would stay in his Landrover when visiting. As the wheel wash had been placed at the Gretton Brook Road entrance to Deene Quarry, and as the large bulk of the Soothills material had entered Deene Quarry by the Shelton Road entrance, it is clear that for the large amount of lorries carrying contaminated material from Soothills were not subject to effective wheelwashing and thus contaminated material from Soothills will have found itself deposited on to public roads.

360. Noone & McGowan wrote on 23 February to the Environment Agency:

“With regard to material removed from Deene Quarry, location purpose and quantities as follows

- 1) Darwin Road, Maxim Logistix development, approx 500 tonnes used to make up levels beneath lorry park areas.
- 2) Kettering Leisure park complex, approx 600 tonnes used to form haul roads for access to site.
- 3) In addition to this some 2000 tonnes was taken from Soothills and used to form haul roads within the Deene Quarry facility.
- 4) A further 200 tonnes was taken directly from Soothills site as used to make up levels below subbase to parking areas on various parking schemes for Corby Borough Council.”

It is inconceivable that this occurred without the knowledge of CBC officers.

361. In March 1997, Aspen Burrow Crocker submitted its report. It had been appointed by the Principal Auditor, Mr McGrenaghan who was undertaking a final audit of the various contracts carried out by Weldon Plant at Willowbrook. Its conclusions are contained in Paragraph 13:

(1) The proposals to provide an encapsulated site, together with stabilisation of the existing bank Willowbrook, have been effective in providing the intended area suitable for use as a car storage compound by Eurofleet Ltd. The adequacy of the contract documentation in defining the actual work to be carried out is however questionable and the lack of site records limit any assessment of the long-term suitability of the site.

(2) The reasons and justification for inclusion of an additional 2 acre site within the Area B/C Encapsulation Contract remain unclear and it is recommended that CBC instigates further discussion with Eurofleet Ltd. In the absence of any information to

the contrary it can only be assumed that Weldon Plant acted on the instructions of CBC to carry out work in this area.

(3) The ground investigations carried out at Area A between 1984 and 1992 were inadequate to assess the nature, spatial extent and depth of any ground and groundwater contamination prevalent at the site and thus provide the information necessary to address the question of whether remedial action was required, and if it was the design parameters necessary.

(4) The apparent absence of a comprehensive desk study, produced by either the Council's Engineers or their advisers, and the inadequate specification of the ground investigation has been identified. This appears to have resulted in an inadequate knowledge of the site conditions and the extent of contamination within Area A time that tender documents were prepared. In these circumstances there is a significant possibility that the methods of decontamination carried out were inappropriate to provide a site fit for the proposed end-use at an economic cost.

(5) The Contract documents were generally inadequate to define the extent of work to be carried out and specify the quality of workmanship and materials used.

(6) The limited availability of site instructions and total lack of variation orders is indicative of an almost total breakdown of adequate site supervision and management. The lack of site instructions and variations... to define the changes in the scope and extent of the work carried out, and the total absence of records to verify the contractor's measurement documents, makes it almost impossible to carry out an adequate audit of the measured quantities claimed the payment in the final account.

(7) There is no evidence of a Tender Evaluation Report for the tenders submitted for the three contracts. The extensive, and often inappropriate use of 'included' rates in the tender submitted by Weldon Plant should have been questioned and clarified prior to award of the contract.

(8) With regard to Area A it is clearly evident that the decontamination proposals were not based on adequate ground information and consideration of the long-term suitability of the site of the proposed end use. This has resulted in a considerable overspend (£120,000) without completion to the required standard. Furthermore, it is estimated that additional work, to the value of £175,000-£240,000 is required to complete the site required by Eurofleet for a proposed office development. The work carried out at Area A is clearly not provided value for money..."

This is undoubtedly a highly condemnatory indictment of CBC's design and management

of the Willowbrook contracts.

362. Up to early March 1997, Noone & McGowan had imported to Deene Quarry some 15,000 m<sup>3</sup> of material, probably of a clay nature to provide capping and cover at the quarry.
363. On 5 March 1997 are the first "Advice and Waste Transfer Notes" to appear in the documents put before the court. They record the loads and quantities of wastes being transferred; they are signed by the driver and by the person at the gate of the requisite landfill site. Those in the court bundle at 5 March appear to relate to another landfill site in Wellingborough. As Mr Bosence effectively said in evidence, no waste transfer notes were used for the Soothills operation; if there had been any he would have known about them.
364. On 10 March 1997, Mr Ibbotson wrote to Mr Webster at CBC concerning the fact that CBC had, apparently without his knowledge, arranged for the tipping of volumes of material into the old Candy Filter Ponds; this material he thought had come from two other sites. There seem to have been no records kept about this arrangement.
365. On 12 March 1997, Mr Ibbotson wrote again to Mr Webster about the need to excavate and transport to a suitable tip 4020 m<sup>3</sup> " of a dry slurry based product". This advice seems to have been ignored.
366. On 13 March 1997, the Environment Agency inspection report recorded that the Soothills stockpiles were still on the Deene Quarry site. By late March 1997 at least some of this material was being taken to the tip to which the Soothills material continued to be taken. The inspection report of 1 April 1997 records that "on-site movement of Soothills slag material using dump [trucks] is generating a serious and dust problem". Another inspection report of 29 April 1997 indicates that there was still a large stockpile which should have been "gone" by then.
367. On 14 March 1997 Mr Larter of CBC, the Safety Advisor, signed a statement relating to Contract 70 (Toxic Ponds 5 and 6) in which he said that he had raised concerns regarding site vehicles leaving the site without proper wheel washing and the possible contamination of the Gretton Brook watercourse, the site boundary fencing and the on-site haul road being affected by spillage.
368. Mr W. Wood, a Senior Technical Assistant working for CBC, signed a statement dated 2 April 1997. He said:

“...Early in 1996 I was aware of the decision to remove the material deposits at the

site known as the 'Soothills'...

...On 20 March 1996 I reported to my supervisor my concerns at the possible high levels of chemical contamination of the material and discussed methods of abatement of particulate matter entering the atmosphere following removal..."

369. On 8 April 1997, Mr Watson, the CBC Legal Officer, wrote to the Chief Executive passing on information that Mr Palmer had informed Mr Bosence that contaminated material from a site in Northampton was to be deposited in the contaminated tip at Deene Quarry. It was believed that this contaminated material was from the Sixfields site.
370. The LRCG meeting of 29 April 1997 reported that the Soothills project was still proceeding. As Mr Ibbotson's letter of 15 May 1997 to Mr Webster indicates, Soothills material was still being delivered at that time.
371. On 30 April 1997, in a memorandum to the Director of Development Services, Mr Watson expressed the view that "the manner in which Messrs Copley and Palmer administered [the Willowbrook contracts] can only be described as a complete and utter shambles".
372. Mr Buckland's notes indicate that Noone & McGowan continued work at Deene Quarry until about June 1997.
373. Mr McGrenaghan, Mr Bosence and Mr Watson attended a meeting on 9 June 1997 with the North Lincolnshire Council arising out of concerns about Mr Ibbotson and Mr Buckland. That Council was not happy about Mr Ibbotson's standard of work, amongst other matters. Another concern was that Mr Buckland during this period, so far as salaries were concerned, appeared to have been working full-time for both councils.
374. By June 1997, the police were investigating the activities of a number of people involved with the reclamation sites at Corby.
375. Unilaterally, and without any warning, on 26 June 1997 CBC gave Mr Ibbotson notice terminating his May 1981 agreement. No reasons were given. Mr Ibbotson was clearly extremely upset by this action. He did go and see the acting Chief Executive and Mr Watson to be given the letter; the former said to him words to the effect "you are not qualified in land reclamation" and his answer was "no, my forte is highways". This evidence was given by Mr Watson and I accept it; Mr Watson had contacted the Institution of Civil Engineers to be told that Mr Ibbotson was not a qualified engineer.
376. Capping and restoration works proceeded into July 1997 and, at a meeting attended by

various Environment Agency and CBC representatives, it was pointed out that material from the stockpile which had come from Soothills was being used for the restoration layer above the cap at Deene Quarry. A screen was required because there were rocks in it. On 6 August 1997, the Environment Agency inspection report states that the Deene Quarry site was secure and works were complete.

377. On 8 October 1997, the Environment Agency inspection report records that "fly-tipping to Shelton Road now worse than ever", albeit that one week later it was reported that this was being addressed.

378. CBC had called in Ove Arup to investigate and report upon a number of sites including Willowbrook, the Toxic Ponds and Deene Quarry. On 3 March 1998 Ove Arup produced a document entitled "Responses to Outline Brief" which confirmed that Willowbrook Area A was "still contaminated". They advised CBC in May 1998 that additional works were required at the Area A site. They went on to say:

“We are therefore duty bound to inform you that the area of exposed steelworks slurry on the site should at the very least be securely fenced off to ensure that the risk to human health from contact with the slurry is minimise.”

379. By March 1999, some people in and around Corby were becoming concerned about the planning implications of the application for planning permission for a new motor speedway, to be called the Rockingham Speedway, in the North East quarter of the Deene Quarry site which had been sold by CBC sometime earlier to a private organisation. Local people were concerned about reports of the deposit of toxic waste onto this site over the years. The directors of Rockingham Speedway emphasised in a press statement of 12 March 1999 that the former tip area was not a part of its racing circuit or on land owned by it.

380. Mr Larter seems to have been very active in writing letters at a time, albeit from his private address in Peterborough. For instance on 16 March 1999, he wrote to the HSE in these terms:

“During the period 1992 to 1997 this site was subject to Corby Borough Council contract 70 to clear the Toxic Ponds and place the contents in the containment cell. The work carried out over this period was extremely badly managed both by CBC its Consultant Engineer and the Contractors carrying out the process.

The Contractor carried waste materials from the toxic ponds to the new containment cell as a wet sludge/slurry made worse by an influx of water into the Ponds from a breached wall in one of the Ponds. It was carried in open backed vehicles across the site. Contaminated water and sludge was slopped onto the path and temporary

roadways. The temporary roadways became so wet that vehicles began taking alternative route across the site to avoid being bogged down. This caused the contaminated waste to be spread even further around the site. Initially there was no proper vehicle wash on leaving the site and the Contractors vehicles would travel through Corby and Earlstree estate spilling waste from wheels etc...”

He confirmed that he had been employed by CBC as safety advisor from December 1987 to February 1998.

381. On 11 April 1999, the Sunday Times published a story about birth defects and a possible connection to waste sites in Corby. The article reported that it had "uncovered four instances of limb deformities close to the dump in Corby" said elsewhere in the article to be "one of Britain's most notorious toxic waste dumps." At least three of the current claimants were referred to. This led to a number of other articles in other newspapers.
382. CBC liaised with the Northants Health Authority, in particular Dr Morgan. A meeting was held on 14 April 1999 to share information and to adopt a way forward by agreement. They agreed to issue jointly a press statement at the end of the meeting which they did.
383. Thus it was that the Health Authority arranged for its epidemiological study issued in 2000 by Drs Olivier and Morgan. This considered the comparable birth defects between children born to mothers in Corby in the period 1989 to 1998 and those born to mothers elsewhere in the Kettering Health Authority area. There continued to be close liaison between CBC and the Health Authority over the following 12 months.
384. Dr Smith's firm was retained by Rockingham Motor Speedway to investigate the landfill repository containing the Soothills Material at Deene Quarry. The requisite report is dated August 1999. A substantial amount of slag was found in many of the trial pits. It was clear that the Speedway development would lead to the need to relocate some of the contaminated material. This work seems to have taken place at least in part in the last few months of 1999; it was completed by about July 2000. Dr Smith reported in October 2000 to his commercial client that 8000 m<sup>3</sup> of Soothills wastes and 9000 m<sup>3</sup> of pre-1996 materials had been excavated from the track area and relocated.
385. In February 2000, the Health Authority issued the Olivier and Morgan report which concluded that they had found “no evidence of a cluster of deformities”
386. The Rockingham Speedway development proceeded from 2000 onwards. It was regularly monitored by Dr Smith's firm for gas and water pollution.
387. A number of other developers considered the Soothills site for development purposes but

concluded that it was not viable.

388. In January 2002 Mr Warren issue a draft "Report in the Public Interest" as part of his District Audit function. It recorded that the Crown Prosecution Service had decided in late 2000 not to prosecute anybody in connection with the management of reclamation contracts entered into by CBC. Paragraph 7 indicated that he had identified "widespread and systematic weaknesses in the arrangements which the Council put in place to award and manage the contracts for the decontamination of derelict land." He refers to CBC's "cavalier attitude to the administration of contracts".

389. In October 2002 he issued his final report. His overall conclusion at Paragraph 7 was:

"I have identified widespread and systemic weaknesses in the arrangements which the Council put in place to award and manage the contracts for the decontamination of derelict land. Whilst I am unable to prove any specific loss to public funds, the Council's arrangements were not such that it could demonstrate that best value for money was secured. Moreover, the arrangements were not such as to demonstrate adherence to the highest standards of probity and governance which is to be expected in the application of public funds. The Council has subsequently taken action to improve the management of contracts that much work remains to be done."

Elsewhere, at Paragraph 21 onwards in relation to the "Specification of Works", he says:

"21. In order to comply with the terms of the grant funding, a detailed specification was required from which the budget could be established and against which the scheme could be appraised and monitored. The Council required specialist skills, not only for drawing up the necessary specifications but also in assessing the method statements to ensure safe working practices. None of the engineering staff had professional experience in toxic waste disposal. The Council commissioned reports from specialist consultants to identify the nature of the contaminants at particular sites. The Council also employed a consultant engineer on a contract basis. However, in most cases, it appears that specialist professional advice was not thought in drawing up the specifications.

22. The reclamation programme at Corby was unique in the size and scale of works proposed. While the Council established a Reclamation Group within the Engineering Department, the Group was not appropriately staffed and was under pressure from both the Council and the Department of Environment to progress the programme within the planned financial years.

23. The failure to specify reclamation works to be done accurately was widespread...

24. As a result of the failure to specify works to be done either accurately or comprehensively, there is little confidence that works included in the specifications actually needed to be done. Moreover, there was limited control over additional works which had been omitted from the specifications, the need which became apparent after work commenced”

390. At least one of the Claimants commenced proceedings against CBC in the early 2004. In February 2006, the Group Litigation Order was made. In November 2007, the case was transferred to the Technology and Construction Court. As a case which undoubtedly involves exceptionally complex and detailed issues, many of which needed expert evidence, and issues relating to a reclamation which took place over some 19 years, this court was thought to be the proper forum for the Group issues trial.

### **The Specific Sites and Contracts**

391. In this part of the judgement, I will consider those projects undertaken by CBC on the site which they acquired from BSC and the contracts relating to them. So far as contracts are concerned, the parties have been unable to provide the Court with some of the contracts. So far as can be ascertained, only incomplete copies of contract documentation had been provided. For instance, very few of the civil engineering construction Contract Drawings have been provided; generally either no or incomplete copies of the Bills of Quantities have been provided. Only a few extracts of final accounts were provided. I say that not by way of criticism given the lapse of time and the loss of numerous documents but what this means is that the Court must do the best it can on the evidence available to it. There is no doubt, I infer, given the CBC Standing Orders and what was at least it is common practice in relation to the reclamation, that contracts and usually formal contracts were entered into between CBC and the various civil engineering and demolition contractors which it engaged between about 1982 or 1983 and 1997.
392. In the preceding part of this judgement, a substantial number of the projects have been referred to, sometimes in some detail. I will seek not unnecessarily to repeat the detail in this part of the judgement. There will be some overlap as several site investigations covered different areas to those which I have grouped together.
393. Some of the engineering reports in the Court papers are incomplete; very few show locations where boreholes and trial pits or trenches were drilled or dug. It seems clear that CBC had access not only to the reports which they commissioned but also to reports prepared by CNT and other actual or potential purchasers of sites being sold or developed by CBC. CBC and its independent engineers were also provided with copies of geotechnical and chemical information from BSC, much of which is no longer available albeit referred to in some of the reports.

### **The Heavy End, the Roads and Willowbrook South**

394. CBC acquired the site which included the Heavy End in the spring of 1981. The site acquired was some 254 acres and comprised the Blast Furnace site, Ore preparation and handling areas, Glebe and Deene Coke Oven sites and associated chemical plants, plants, railway sidings, expansion land, settling ponds, ancillary buildings and access roads thereto. The Willowbrook South area comprised the area to the south of what became Steel Road and included the BOS plant, the Heavy Rolling Mills, Bessemer and Electric Furnace areas, Bells Yard and Morgan Mill. This site was acquired by CBC in about 1985, although elements of it may have been acquired before..
395. Over 1981 and 1982, BSC used demolition contractors to demolish the superstructures of some of these buildings, including the Blast Furnaces.
396. By July 1982 the Glebe and Deene Coke Oven superstructures had been cleared (the latter being on the Willowbrook North area) so that Norwest Holst Soil Engineering Ltd was able on CBC's instructions to carry out a site investigation of those areas between July and September 1982. 83 boreholes supplemented by 45 trial pits and trenches were carried out over a site which one can estimate to be some 150 acres approximately. Heavily contaminated ground was found at the Coke Oven areas and various "settlement" lagoons were found. BSC carried out in September 1982 some analysis of samples from the two Oven sites and it reported that the zinc, lead and cadmium levels in soil samples were low. Water samples were however said to be "heavily polluted with products of the former Coke oven by product operations". The Norwest Holst report dated 8 November 1982 was primarily related to determining the suitability of the sites for development.
397. Apart from one fencing contract, the first important contract was dated 28 January 1983 between CBC and Noone and McGowan Ltd which related to the construction of the Earlstrees to Weldon Link Road Phase 1. This was in effect the first part of the connection between the village of Weldon and the Earlstrees area and comprised eventually Steel Road and Phoenix Parkway. No site investigation was done by CBC. There can be no doubt that this will have involved excavation and removal of material from sites which must have been contaminated generally by BSC and its predecessors over the years. Phase 1 appears from a letter dated 28 February 1983 to CBC from the Departments of the Environment and Transport to have involved some £500,000-600,000. Phase 2 involved some £200,000 and this was the subject of a contract between CBC and Braithwaite Contracting Ltd on 23 March 1983. The same letter identifies demolition tenders in the Iron Making Plant, Deene Coke Ovens and Coke Ovens and By-product areas totalling some £1.45m. The letter indicated also that the material from the demolition would be taken to Deene Quarry with the haulage, haul road and tip maintenance estimated to cost some of £150,000. The tendered cost of the proposed Glebe Coke Ovens and By-products plant area was £1.159m, and most of which was demolition and earthworks.

398. It is clear that by March 1983 substantial demolition works were proceeding pursuant to various contracts with CBC and contractors. BSC wrote to Mr Ibbotson on 25 March 1983 about the placing of excavated materials in Deene Quarry; the text is set out above.
399. Soils Engineering Ltd's site investigation in early 1983 for CBC related to the Western end of the Heavy End, mostly to the Blast Furnaces area of some 30 acres and 28 boreholes were sunk. Boreholes revealed ground consisting largely of backfilled ironstone workings, furnace slag, brick, metal and timber. Sub- grades were said in the May 1983 report to be likely to comprise extensive areas of this material which would include flue dusts. Limited chemical tests were done and the primary purpose was to consider the suitability of the ground for foundations and the like. This report, which was the first commissioned by CBC, was produced after reclamation works had started at the Heavy End.
400. A Special Meeting took place on 9 January 1994 between CBC, W S Atkins (including Mr Barry) and Noone and McGowan in connection with the Heavy End Phase 1 which was about to be let to the contractor for a contract sum of over £500,000. This involved substantial earthworks. The meeting had been called "to discuss safe working practices in ground that is probably chemically contaminated." Work started very shortly thereafter and the formal contracts were signed in April 1994.
401. In February 1984 Mr Barry of WS Atkins produced for CBC a report entitled "Recommendations for Chemical Investigation of Iron Making and BOS Plants Areas":

"1...Based on the knowledge of the previous uses of the areas in question, there is a fundamental need for properly investigating the existing chemical regimes on the site. There are likely to be a range of toxic and hazardous substances in the ground that are a legacy from the previous industrial processes and activities and which can affect a number of different targets in different ways:

-site workers can be affected by liquids, dusts, solids and gases;

-future site users could also be at risk albeit to a more modest degree;

-construction materials can be adversely affected;

-plant life can be adversely affected...

## 2.1 Site History

The Iron Making Plant comprised a number of features that are likely to have

contaminated the ground to one degree or another, whether by virtue of the normal process activities or through demolition and site clearance operations. The principal items of plant or areas and their most likely associated contaminants are as follows:

Blast Furnace: Cyanide; heavy metals; Ammonia; Asbestos Sulphates and Chlorides

Sinter Plant: Chlorides (resulting from coke quenched by high chloride effluents)

Gas Cleaning Plant: Cyanides; Heavy Metals; Phenols; Ammonia;

Dorr Thickeners: Thiocyanate

Ore Crushing: Mineral oils

Ore beds: Heavy Metals

Power plant: Acids and alkalis

In the BOS plant area under investigation, there are relatively few major sources of contamination. However, the following are likely to be relevant:

B.O.S Plant: Sulphates, Sulphides, Chlorides; Heavy Metals ;

Acid storage area; Acids

Tar Tanks: Tars

Dorr Thickeners: Heavy Metals, Fluoride

Scrap metal storage: Heavy Metals

Refractory Linings: Heavy Metals

Slag: Sulphides, Sulphates

## INVESTIGATION STRATEGY

### 3.1 Introduction

The recommended strategy for investigating chemical contamination has been developed by taking into account both of the previous uses of the site and also the proposed uses where identified. Thus the likelihood of finding particular contaminants and their potential significance with respect to different targets was in the first instance a major factor in the positioning of sampling locations and the associated range of analysis. Overall the most significant influence on these analyses was that of safety with respect to construction workers

### 3.2 Sampling Strategy

The proposed system of sampling is by the use of trial pits rather than boreholes. Trial pits are profoundly the better mode of chemical exploration since they allow a visible and all factory evidence to be noted more meaningfully...

### 3.3 Chemical Analysis

The range of recommended chemical tests is listed below. These have been selected on the basis of their likelihood of being present and their potential contact with critical targets..... In addition to those listed, some other tests may be needed to be added selectively to match the visual or other evidence in each trial pits, e. g. coal tars, oils... [Then listed are amongst others soil tests for Toluene Extractable, Cadmium and Nickel]”

402. Earlier in this judgement is reference to CBC engaging Exploration Associates to carry out a site investigation at the Iron Making Plant and the BOS plant areas in the spring of 1984. Part of their report involved a chemical investigation carried out by PPC Consultant Services. PPC analysed samples provided for amongst other elements Cadmium, Nickel and Toluene Extractable. PPC reported as follows:

#### “Total Cadmium

Little of ingested Cadmium enters the bloodstream, and once in the bloodstream it tends to accumulate in the liver and kidneys. Absorption of cadmium via the skin is negligible. Some cadmium salts are carcinogenic. Research at this stage is, however, inadequate to give a definite answer.

The main problem associated with cadmium is likely to be as a result of the inhalation

of cadmium metal or oxide as fumes or dust...

The highest level of Cadmium was 2.03 mg/kg in samples numbered 52 and 53...

For general handling purposes associated with building work on the site, cadmium is not likely to be a problem, assuming adequate dust control measures are taken and there is no excessive dust arising...

#### Total Nickel

... The main problem results from the inhalation of certain nickel fumes and dusts, and some of which are carcinogenic...

The highest value of nickel was 64.68 mg/kg in sample number 49...

There is not likely to be any major problem in handling nickel contaminated soil (on the basis of the analyses carried out) during building operations at the site, assuming adequate dust control measures are taken...

4.1 The main problem which is likely to arise at the site will probably be as a result of dust or fumes. We recommend that the following precautions are taken (in addition to H&SE or other Regulations that may need to be complied with):

1) Operators on site must wash their hands before eating food, to prevent the accidental ingestion of contaminated material...

(3) Adequate dust control measures should be implemented to prevent inhalation of dust by site workers. Certain areas of the site have high concentrations of heavy metals and long-term inhalation of dust may result in heavy metal poisoning of site workers.

4) Adequate dust control measures may be taken by spraying work areas, and other areas which are likely to produce dust, with water as required. Internal roads should be swept and sprayed frequently.

5) Vehicles leaving the site may give rise to dust and may in addition carry material off-site. Adequate measures to be taken to prevent dust off site and contaminated soil being carried on to adjacent roads of site..."

There is nothing in the documentation which suggests that this advice was consciously heeded by CBC either for the works on these sites or later projects in connection with the reclamation. The advice, however reflects the very minimum which CBC should have been following from 1984 onwards and possibly even before.

403. Throughout 1984 contractors employed by CBC worked on the Sinter Plant and Blast Furnace demolition works, the road works (Phoenix Parkway and Steel Road) and on the old BOS Plant site. The reports of Mr Downey corroborate that amongst other documents.

404. Mr Ibbotson reported to CBC about the proposed purchase of the Heavy Rolling Mills and other associated areas in November 1984:

“The site of the land reclamation scheme is as shown on the attached plan and covers an area of 15.4 HA 38 Acres, and consists of the former Heavy Rolling Mills, Strip Mills, Bessemer and Electric Furnace Area and Morgan Mill, all of which form part of the now disused British Steel Corporation's Corby Steel Works. The site is located to the north of the Tube Works and is bounded to the north by the former B.O.S. Plant, and to the west by the former Iron Making Plant and the Glebe Coke Ovens. Since the closure of this section of the Steel Works the site has become derelict and consequently meets the requirements of the D.O.E. Definition of Derelict Land, i.e. "Land so damaged by industrial or other development that it is incapable of beneficial use without treatment.

The reclamation of this part of the former plant would not only remove a major eyesore as viewed from the new industrial complex to the north, but would also provide valuable industrial land.

The proposed reclamation scheme will be carried out in two stages:-

(a) The Engineering Works which consist of the demolition of all derelict buildings and structures, the grubbing up of mass concrete and reinforced concrete foundations, the demolition of tunnels and other structures below ground level, the infilling of voids, service diversion, construction of a new gable end to the Loco Shed, the erection of protective fencing and the installation of site drainage.

(b) The Landscaping Works which will cover only a small part of the site and involve the cultivation and seeding of mounds to form a screen between the Tube Works and the proposed industrial areas.”

405. The BOS Phase 2 works contract was formally let in the late autumn of 1984 with the tender from TW Ward dated 21 November 1984 being accepted by early December; Phase 1 work had been proceeding earlier and included some road and service work. The Phase 2 work involved the excavation of the old foundations and the excavation and removal to within Deene Quarry of some 120,000 cubic metres of material. The contract price was over £900,000.

406. WS Atkins was asked to comment on the Exploration Associates Report referred to above. In a report dated January 1985, they reported their conclusion that the area was not

“grossly contaminated and the greatest risks are likely to relate to isolated hotspots.” There was however to be no particular care taken in the future to ascertain and deal with “hotspots”.

407. There was either included a separate contract for some further works which were referred to in correspondence as the "BOS Plant Outfall Sewer-Phase II" for instance in a letter dated 10 June 1985 from CBC to Mr Ibbotson; the works were due to start on 24 June. The same letter refers to Ward being instructed to complete excavation and removal of the electric furnace building foundations. It is unclear whether that work was part of the BOS Phase 2 works contract or a variation to it or by way of a new contract. The BOS Phase 1 works contract was also under way at this time because there was a site meeting on 20 June 1985 attended by CBC and that the contractors, Noone and McGowan.

408. Mr Downey reported chemical contamination on 28 March 1985 in the Glebe Coke Oven area which had already been partly cleared:

“Chemical Contamination

Trenching up the railway cutting (F19 - F14) has shown signs of chemical contamination, gaseous, liquid or solids, however trenching for the laying of concrete storm pipes parallel to this line is showing slag hard cores and rudimentary precautions should be taken here, (overalls and gloves).

As expected progress towards the site of the former Glebe Coke Works is leading to areas of chemical concern. On Monday 25th March 1985 a deep and heavily polluted area was crossed which looks to be along the line of the old Willowbrook Central Stream - No gases were detected but considerable solid/liquid pollution in the former stream bed was observed, 5 x 3m approximately in cross-section and it must be assumed that this extends for some length down stream from the site of the old Oil Interceptor.(Samples sent for expeditious analysis to Bostock, Hill and Rigby).”

409. On 17 July 1985, CBC entered in to a contract with Shanks and McEwan (England) Ltd for the dismantling and demolition of the Heavy Rolling Mills Phase 1 works. This involved the demolition of the Mills buildings and structures. These works were started by 12 September 1985 when Mr Downey reported that the contractor was setting up the site office for “muck” shifting operations in the Deene Quarry area. Works were still proceeding on the BOS Plant Outfall Sewer Phase 2 works. On 18 September 1985, CBC entered into another contract with Shanks and McEwan for the "Reclamation Vehicle Crossing" works to take place at the southern end of Phoenix Parkway. In early October 1985 Mr Downey recorded Ward as "putting muckshifters onto heavy end and Poclain 300's prior to muck shifting operations". Earthmoving and other works continue to take place during October 1985 with the Phase 2 BOS sewer work proceeding throughout. Shanks and McEwan spent time also doing work at what was described as the "wet tipping area" in Deene Quarry. Mr Downey in his report for 15 November 1985 describes that contractor as "illegally tipping in Deene from BOS plant site, working wet tipping area" whilst on 19 November 1985 he records Ward as tipping in the eastern extremity of

Deene Quarry.

410. There is no doubt that substantial earthmoving operations took place throughout 1985 in connection with the reclamation which involved not only excavating contaminated materials but transporting them partly on public roads and partly on private haul roads to Deene Quarry, more particularly the north-eastern sector of the site. For instance, WS Atkins wrote to CBC on 22 November 1985 noting that "considerable quantities of subsoil are currently being transported from the old Heavy End up to the dry tipping area east of the drum pond."
411. In February 1986, earthmoving was proceeding at the Sinter Plant, the Lloyds Road Intersection, the Phoenix Parkway area, the Heavy End and at the BOS Plant. Shanks and McEwan had also been engaged by CBC on what was referred to as the BSC Tipping Facilities Contract, which was formally signed on 15 September 1986; the work involved the formation of new tipping facilities for BSC on the part of Deene Quarry which BSC; the work included the excavation of settling lagoons, screening mounds and general earthworks. This also involved moving to elsewhere in Deene Quarry over 50,000 m<sup>3</sup> of contaminated material. This proceeded through late 1985 until well into 1986 and involved a substantial earthmoving operation on the Deene Quarry site. No site investigation was done in this area. On 18 March 1986, CBC again retained Ward to carry out excavations of foundations at the Iron Making Plant.
412. Other road works contracts were let in 1986. For instance on 7 May 1996, CBC engaged Shanks and McEwan to carry out such work in the Sidings Area of the Heavy End. As from about this time, CBC employed contractors to construct a number of the lesser roads off Phoenix Parkway and Steel Road such as Darwin Road, Arkwright Road, Shelton Road and Culver Way. It is not easy from the statements and the documents to determine precisely when these roads went in; that may be because the names of the roads were not given until later.
413. In mid-1986, the Sinter Earthworks Phase 1 contract was let to Weldon Plant; that involved the excavation of some 350,000 m<sup>3</sup> of material including concrete and disposing of it in Deene Quarry. This work was, I infer done over the following nine months. It was certainly proceeding in February 1987 when a complaint was made to them that they were pumping water from the excavations directly into the Phoenix Parkway sewer system
414. Contract 35 dated 27 October 1986 was between CBC and D Willettt and Company Ltd and involved the construction of another reclamation vehicle crossing, across Steel Road. Curver Way was constructed by this stage.
415. On Thursday, April 1987, the Heavy End Rolling Mills Phase 2 contract was let by CBC to Shanks and McEwan. There is no doubt that 1986 and 1987 were "heavy" years in the

CBC reclamation history.

416. By January 1987 the Electric Furnace Plant had been demolished by CBC's contractors. At that time Exploration Associates were instructed by CBC to undertake a geotechnical site investigation there, which was said to be approximately 20 acres. The report of May 1987 described at that stage a generally flat expanse with mounds of rubble and floor slabs associated with the original furnace buildings; in the north-eastern sector were existing railway sidings and underlying the majority of the site was a labyrinth of deep drains and cable ducts up to 7 metres below existing ground level. A chemical analysis was done and showed a maximum cadmium level of 13 mg/kg. This report is interesting because, so far as chemical contamination is concerned, its concentration was on the end use of the site:

“Given that the site will be developed for industrial warehouse units and is not intended to be used for gardens or allotments, the concentrations of all parameters analysed appear acceptable and not regarded as a hazard with regard to toxicity. The data has been assessed according to the guidelines set out by the ICRCL...”

There was no particular thought given to the need to protect the public during the actual demolition, excavation and haulage operation. This was not untypical of many of these site investigations.

417. Blasting at the Sinter Plant site took place in late February or early March 1987 as referred to by Mr Downey.
418. A letter from Mr Ibbotson dated 13 May 1987 to CBC establishes that the Sinter Plant Phase 1 and the Heavy Rolling Mills Phase 2 works were nearing completion. Works involving the moving of material on or across public roads continued in June as recorded in the site diary entries of 11 and 12 June 1987.
419. On 25 July 1987, CBC entered into a contract with Noone and McGowan for the BOS Plant Infrastructure Phase 1 works which involved the construction of some 1160 m of carriageway with some 17,384 m<sup>3</sup> of excavation required. On 20 August 1987 the same parties entered into a further contract No 29 for the Glebe Roads work, which involved the construction of two culs de sac in the Heavy End area.
420. At a meeting on 22 October 1987 between Messrs Ibbotson, Buckland, Palmer and Downey, it was clear that contaminated material from the South Willowbrook area was still being taken from there to Deene Quarry. This is borne out by a record on 25 November 1987; there was mud on the public roads.
421. By early 1988, work was proceeding, albeit delayed, on a project between CBC and

Noone and McGowan on Sinter Plant Outfall Sewers, the formal contract for which was signed on 11 February 1988. The works involved the construction of some 1700 m of sewers.

422. At the LRCG meeting of 5 May 1988 progress was reported on the Sinter Plant Roads Phase 1, Rockingham Triangle Drainage, the BSC Link Road and the Deene Coke Oven work. Most of these works were reported to be complete or nearing completion in late June 1988. By late July 1988 work on the balancing lake at the Heavy End was proceeding; it is not wholly clear where this was but it was either on Willowbrook South or North. Sludge extracted from the excavations gave rise to concern about its contamination as reported by Mr Downey to Mr Hussey of CBC on 18 August 1988. This related to blast furnace dust and some coal tar. The contract for this with Willetts was dated 2 September 1988 and involved the excavation of some 14,700 m<sup>3</sup>; it was reported in October 1988 as nearing completion in November.
423. Other projects proceeding in October and November 1988 were the Willow Brook Balancing Lake and sewers contract (let to Noone & McGowan for over £1.1m) and substantial works at Bells Yard to the east of the Heavy Rolling Mills. By 1 December 1988 some 25,000 m<sup>3</sup> of material had been excavated from Bells Yard and was stockpiled on Willowbrook; some 36,000 m<sup>3</sup> was billed to be excavated and removed to Deene Quarry. These various works were to proceed until well into 1989. Bells Yard work was substantially completed by March 1989 at which time work was reported to be proceeding on Davey Road on South Willowbrook.
424. By June 1989, the LRCG meeting was being told that further works were proceeding, involving excavation, on the Electric Furnace Area Lorry Park and the Sinter Plant Phase 2 earthworks were about to commence, which they did in late July, the formal contract being signed on 16 October 1989 between CBC and Weldon Plant. This work involved the excavation of over 130,000 cubic metres of material from the former Sinter Plant Area and its deposition at Deene Quarry
425. On 8 November 1989 it was reported that as a result of heavy rain the southern end of Cockerill Road was flooded because a run off from the nearby Sinter Plant area came direct onto the road. This was attributed to the absence of any properly designed cut-off drains. It was agreed that such drains should be put in as soon as possible.
426. Willowbrook road schemes were proceeding until well into 1990, being reported as continuing at the LRCG meeting of 22 March 2000. One of the road construction contracts was let on 1 June 1990 to Noone and McGowan; this related to Genner Road and/or Arkwright Road on the north of Steel Road. It involved the removal of some 13,000 m<sup>3</sup> of excavated material. By way of example, Clause 118 of the Specification stated that serious chemical contamination of the soils to be excavated was not expected. It was said that "however owing to the previous use of the site, any of the following solids, liquids or

gases and maybe encountered which could be hazardous to site workers"; amongst the items mentioned were coal tars, heavy metals, and Toluene and Mineral oils. This was surprising as the nearby Willowbrook North area was known to be seriously contaminated.

427. The LRCG meeting of 24 May 1990 was told that the Electric Furnace Infrastructure works were proceeding and that the Morgan Mill services diversion works had started. The Morgan Mill demolition works started shortly thereafter and were said to be progressing well at the LRCG meeting of 13 November 1990. There was discussion about making the demolition of the water tower at Morgan Mill into a fund raising event for Children in Need.
428. The Morgan Mill demolition was nearing completion in February or March 1991. In 1990 and 1991, CBC had embarked on fulfilling its obligations to BSC by constructing a haul road for them in four phases which were still proceeding well into 1991. Phases three and four were let by CBC to PL Construction by contract dated 25 March 1991. That must have involved the excavation and removal of contaminated material.
429. Contract No 59 was let by CBC to Barton Plant in May 1991; this related to the demolition of the BSC workshops and buildings which included electrical workshops, works garage, a canteen, an old loco shed and an air raid shelter. This work was said to have been completed by early June 1991 but records indicate that work continued for some months thereafter with another contractor, Fitzpatrick.
430. At the LRCG meeting of 10 October 1991, it was reported that works were proceeding on the Mills Road Earthworks Phase 1 project and that the Workshops Redevelopment project was also proceeding.
431. In January 1992 the Mills Road Earthworks Phase 1 works and the Rail Sidings works were proceeding. The Mills Road Earthworks Phase 2 works would commence in the Spring. By mid July 1992 excavated materials from the phase 2 contract were being transported to Deene Quarry, partly on public roads. In late August 1992 the contractor was still breaking out concrete foundations.
432. The Mills Roads were in and around the Heavy Rolling Mills. Dr Smith inspected these in August 1992 and reported that foundations were being removed and taken to tips at Deene Quarry; galvanising sludges had been taken there also. He sampled what was left and did not find any great contamination. Work in this area is continuing until late November and into December 1992.
433. On 24 September 1992, CBC entered into a contract with Noone & McGowan for the construction of an access road to BSC's locomotive shed to the south of where the Heavy

Rolling Mills had been.

434. On 27 November 1992, CBC entered into a contract with Grant Lyon for the relocation of Exchange Sidings. This work was largely completed by the Spring of 1993. In late May or early June 1993, works had started on earthworks for the Morgan Mills site; Morgan Mill was a mill for rolling the steel ingots into product. These works were complete in August 1993.
435. In August 1993, the Exchange Sidings and Loco Shed area were looked at by Mr Cropley who reported on 23 August 1993 as follows:

“EXCHANGE SIDINGS LAND

3.79 Acres

A Visual inspection of this land shows:

1. Scrap and other materials dumped on the surface, some of which appear to be contaminants.
2. Surface concrete (it is not known whether these are ground slabs or the top of underground voids).
3. Concrete bases and small derelict concrete structures.
4. Uneven areas of grassland etc.
5. Railway tracks.
6. Deep sewers of unknown line and usage.

0.71 Acres

A visual inspection of this land shows:

1. Semi-derelict loco shed with shallow pits etc. components thought to contain asbestos.”

436. CBC retained Contest Melbourne Weeks to carry out a site investigation of the Exchange Sidings area; that firm duly reported in January 1994. As CBC’s Counsel accepted in closing, some work had already been done at this site beforehand. The fill was described as:

“OVERSITE FILL

Compact ash with variable amounts of slag, together with concrete, sandstone, limestone fragments and rarely rubber, metal sheets and pipes, refractory bricks. Occasionally soft clay with ash and ironstone fragments”.

Over 90 chemical tests were done for amongst other elements cadmium (highest reading 23.2 mg/kg) and toluene extract (highest 0.89%). It is perhaps of interest that 59 boreholes, 14 trial trenches and 23 trial pits were done on a 580 square metres site. That represented by far the most extensive site investigation on a per acre basis ever done by CBC. Slag and refractory material was found in the trial pits

437. In early 1994 the Mills Road Phase 3 earthworks contract was let by CBC to Weldon Plant for some £750,000; these works were started in March and completed by the end of

July. Sinter Plant landscaping started at that time also and involved some 500m<sup>3</sup> of excavation. In February 1994, contractors engaged by CBC were working on a sewer contract at the Heavy Rolling Mills site; these were reported as complete by the end of July. In about March 1994, the Sunday market project on the old Sinter Plant area started and was finished in about July 1994. By the end of the year, the LRCG meeting was told that there were then no current schemes on site.

438. There was however some work going on in January and February 1995; it is recorded in diary entries that the site haul road was wet and muddy and Noone & McGowan had equipment stolen from the site and that material from footpath reconstruction was being hauled. The new Sunday Market remedial drainage work was being carried out in February and March 1995.
439. After what was described as a “saga” in the tendering exercise, Mills Road Phase IV was formally let in September 1996 at a contract price exceeding £500,000 after a re-tendering exercise in July 1996. This had been one of the contracts in which Mr Hagen and others thought that there might have been irregularities in the contractor selection process. Mr Ibbotson wrote to CBC on 25 September 1996 as follows:

“RECLAMATION OF CORBY STEELWORKS MILLS ROAD  
EARTHWORKS PHASE IV

It is my understanding that the majority of the fill to be removed from the Soot Banks Site into Deene Quarry will be via the Gretton Brook Road entrance, and not Shelton Road. From past experience this will cause problems when a second contractor is also using the same haul roads in the quarry, ie. Claims for haul road maintenance, cleaning Gretton Brook Road and delays to contract etc.

It is proposed to commence the Mills Road IV contract as from Monday 30 September 1996, and to start infilling the designated voids in the quarry. Both Webfell and Noones will be using the same haul roads to the tip.”

440. Dr Smith was asked to and did produce a report entitled Summary of Contamination Results for this site. Relevant parts of the report are:

“1.1 FWS Consultants has been instructed by Corby Borough Council to compile a summary report on the contamination that existed formerly on the Rolling Mills Phase IV site, how it determined the reclamation strategy, and how that strategy has been implemented...

1.3 The particular operations carried out on our particular portion of the mills appear to have been associated to a large extent with "soaking". This is the process whereby large ingots are reheated, prior to rolling, in very large pits (the "soaking pits"), lined with refractories and heated by burning waste gas - probably blast furnace gas. Once the ingots had attained the required temperature, they would be lifted out by massive cranes onto the rolls. The soaking pits were associated with underground flues that carried the hot blast from gas burners, and there was also a substantial chimney to

carry off the exhaust The northern part of our site, outside the mill building, was occupied by rail sidings.

1.4 During demolition of many of the works structures in the 1980s, overhead blast furnace gas mains were dismantled by scrap contractors on the open sidings, and gas main deposits and condensates, including ferricyanide wastes and organo-sulphur compounds - some of which smouldered on exposure to air - were spread around. Similarly, the removal and break-up of the mill machinery from inside the buildings resulted in the release of large amounts of oil, adding to the already widespread oil contamination that had resulted from some 45 years of continuous heavy engineering”

He had examined the site himself at some stage and taken samples during the excavations; having reviewed earlier relevant site investigation reports, he said:

“2.3 Examination of the derelict remains of the mills buildings themselves, here and on the adjoining Phase III site, revealed that very deep machine pits and the soaking pits had been loosely backfilled with demolition rubble; directly on top of thick deposits of oily residues and sludges in the case of the machine pits. Experience from reclamation of the remainder of the mills indicated the likelihood of some asbestos contamination within this backfill. The council has reclaimed a huge area of the former steelworks over the last 15 years. Based upon the experience gained from that programme, and on the requirements of the various regulators, and of potential developers, it was agreed that the most appropriate strategy was - as recommended in the s.i. reports - to remove the contaminated oversite fill; then excavate the contaminated backfilled debris and sludges from the various pits; break out any voids etc; and remove the contaminated materials to the Council's own licensed landfill at Deene Quarry; then to backfill the site with clean imported fill to an appropriate geotechnical specification.”

441. Based on sampling he said amongst other things:

“4.7 Cadmium and lead were relatively low, ranging up to 2.5 mg/kg and 1,724 mg/kg respectively, neither of which exceeds their relevant ICRCL TTVs for landscaping.

4.8 Copper, nickel and zinc commonly exceed their ICRCL TTVs for phytotoxicity, although the effects would be mitigated by the alkaline pH values. Copper ranged up to 296 mg/kg (9 out of 12 results exceeded the TTV), nickel ranged up to 713 mg/kg (9 out of 12 results exceeded the TTV of 70 mg/kg); and zinc ranged up to 1,103 mg/kg (6 of 12 results exceeded the TTV of 300 mg/kg).

4.9 Toluene extractable matter (TEM), which is used as a screening method for tars and oils, ranged from 0.088 to 3.95%. There are no formal U.K. guidelines for the interpretation of TEM results, but a threshold of 0.5% is commonly used to trigger further testwork. Eight of our samples fell into this category and were tested by thin layer chromatography. The major organic component was determined as mineral oil.

The Dutch Intervention level for mineral oil contamination of soil is 0.5%. While this has no legitimacy in the U.K., we have no alternative guidelines - other than an old Department of Environment publication (Derivation of Trigger Values for

Hydrocarbons in Contaminated Soils, publ. February 1987) that recommends 0.2% total hydrocarbons as a threshold trigger. Views upon hydrocarbon contamination have hardened significantly since 1987, and the most recent regulations - The Special Waste Regulations 1996, which came into force on 1.9.96 - regard used mineral oils as Special Wastes. Soils containing in excess of 0.1% of used mineral oils are classed by the waste regulators as Special Wastes, once uplifted.

He concluded:

“5.1 The Rolling Mills Phase IV site has been remediated by removal, to landfill, of contaminated materials with unacceptable levels of oils, high levels of metals and sulphates, asbestos, and with free lime and magnesia (the presence of which would have rendered the site unstable and precluded development). Reclamation of the site has also removed the threat to local groundwater, posed by the presence of the oversite fill.

5.2 We understand from the Consulting Engineer that the total volume removed, prior to validation sampling and backfilling, amounted to 23,629 m<sup>3</sup>. The mean of 12 determinations of bulk density (in-situ), made by Exploration Associates on the Exchange Sidings site as a whole, is 2.06 t/m. Applying this to the volume excavated, we calculate that approximately 48,676 tonnes have been removed to landfill.

442. Thus these Mills Road Phase IV works were largely carried out by the time of this report and involved the excavation and removal to Deene Quarry of some 23,600 m<sup>3</sup> of contaminated which or some of which could be described as Special Waste under the legislation. The samples taken by Dr Smith were taken from a site which had already had the over site fill and some foundations removed in an earlier contract, as referred to in a Validation Survey of December 1996 prepared by Dr Smith.
443. After 1996, no work of any relevance to this claim on or at the old Heavy End and the Willowbrook South sites was done by or commissioned by CBC.
444. Some of the conclusions which I can and do draw from the general history and this specific history of events in relation to this area are:
- (i) Little by way of site, ground or chemical investigation was done or commissioned by CBC on the bulk of this heavily contaminated area; for instance, none was done before the Mills Road and Heavy Rolling Mills works were started or the Morgan Mill work. Essentially, the approach of CBC was “dig and dump”, that is demolish and excavate and remove the material to Deene Quarry. Where an extensive chemical investigation was done, there was heavy contamination.
  - (ii) The vast amount of the excavated and demolition material was transferred by lorry, much of it on or over public roads; the lorries were not sheeted and there were no

effective wheel washing facilities.

(iii) there can be no doubt that the work of excavation, demolition and transport gave rise to substantial quantities of dust and to large quantities of mud being dropped on the public roads.

### **Deene Quarry**

445. I bring together all the sites to the north and north east of North Willowbrook under this heading. This Chapter relates to the Toxic Ponds, The Valley of the Drums, the Candy Filter Ponds, the Tip Containment facility and its extensions and the other areas. I have set out much of the history in the General History chapter above.

446. Deene Quarry was acquired by CBC in 1985. However, there is no doubt that as from 1983 when CBC began its demolition and reclamation work itself, CBC used Deene Quarry to deposit vast quantities of demolition and excavated material from those mostly Heavy End, Willowbrook South and Longhills sites they were working on. As Mr Ibbotson was recorded as saying in at a LRCG meeting on 10 October 1991:

“JM [Mr McGrenaghan] asked why CDC got landed with the poor area of toxic ponds land. RI explained that Deene Quarry was bought for tipping purposes and BSC insisted on us taking toxic ponds with it. The tipping facility we have gained has been of great value as the nearest contaminated tip would have been Bedfordshire.”

447. WS Atkins was retained in June 1984 to do initially a preliminary investigation into Deene Quarry as it had been decided that CBC would purchase it from BSC. The following was said by them in relation to the Candy Filter Ponds:

#### **2.1 General Description**

These two ponds are shown on Figure 1 and photographs 1-5. They generally contain a low grade waste from the Rolling Mills and have not been used since 1979. The waste was treated in the Patterson Candy plant which removed the majority of mill scale and suspended solids, with the remaining waste waters going to the Candy Ponds and the cleaned water going back to the plant as cooling water. Oils from leaks or spills were collected in the ponds and were later removed. On the north pond there remains a layer of oil confined to a small area (depending on wind direction). On the south pond, however, a thick (estimated at 80-100mm) layer of oil emulsion has collected, forming a light brown 'mousse' on the water surface (see photographs). The carcasses of several unidentified birds can be found in the oil. There is also an odour of hydrocarbons from the ponds.”

#### **2.2 Toxicity**

Oil in small amounts is lethal to birds as it destroys the water repellent and insulant properties of feathers and causes birds to freeze or drown. This undoubtedly was

the cause of death for those birds found in the oil. The oily layer will also hamper or smother plant growth or cause injury to animal life. However, the oil is probably of such an age that its innate toxicity is low. BSC have carried out analyses for waters under the oily layers, and these are shown in Appendix 1. These suggest that the water quality is poor, but not toxic. Parameters measured are within the water authority consent conditions and so difficult or expensive disposal or treatment is not necessary for these waters. However, these tests may require further verification before water discharge is permitted particularly if fly tipping is likely to have occurred.

### 2.3 Treatment options

The essential problem associated with oil emulsion is in respect of wild life and plant life, and engineering stability. Since the ponds are on private land, the public cannot be considered to be at risk if access is difficult and suitable notices are displayed. On the basis that Corby District Council wish to utilise the ponds for spoil disposal, the initial questions that must be addressed are a) can the oil be left in position (having removed the underlying water) b) can it be disposed of in another 'hole' on the Council's land, or c) must it be taken off site for disposal at a suitable landfill for example. Leaving aside the question of cost, it should be reasonably practical to remove the underlying water and thus allow the oil to lay on the base of the pond.

#### Option A Insitu treatment

Leaving aside the question of cost, it should be reasonably practical to remove the underlying water and thus allow the oil to lay on the base of the pond. Since the base of the pond is narrower than the surface (by an unknown amount), the ultimate thickness of the base layer could be at least double that of the present thickness, say, 200mm. Placing 'normal' fill on this layer would merely displace the oil upwards...

Overall, therefore, burying the oil is possible and should not have any significant environmental risks since it would be contained. However, it is most likely that because of factors such as construction quality, ground settlement and physical interference with the barrier layer, this option might at best be described as a 'time bomb'. It is fair to say, however, that a suitably robust and durable solution could be designed but, obviously, at considerable cost. Moreover, improvements to the basic solution would most likely reduce the net volume available for tipping, thus partly defeating one of the objects of the exercise.

#### Option B: Disposal to another Council 'hole'

This option is similar in principle to Option A but has the following principal differences: i) the oil would have to be 'cleaned' off the existing site and transported to the proposed disposal location. This has obvious cost penalties and could only be carried out by an experienced operator ii) the oil is not likely to be contained underneath or laterally and so the implications of water ingress are different. The oil, which would have to be encapsulated in a manner similar to Option A, could

escape laterally through the movement of groundwater and/or merely by moving along the 'surface' of the groundwater. Indeed the groundwater level would determine the depth at which the oil should be buried. In essence this option cannot be considered at all desirable notwithstanding that it would almost certainly be in contravention of the Control of Pollution Act. Therefore, we recommend that no further consideration be given this option.

Option C: Biological treatment

Based on our recent discussions with Bio Technica it is reasonable to assume that biological treatment of the oil in-situ is practicable. However, taking the time scale for both culture development and treatment, it seems that it could take about 2 years to effect a full solution to that particular aspect.

Option D: Off-site disposal

On the face of it, and particularly if time is of the essence, the only real option is to remove the oil and dispose of it at a special landfill. The cost of this option can only be established after consultation with suitable waste disposal contractors, the water authority and BSC. We consider that these ponds should now be examined in closer detail and a strategy developed that will satisfy all parties.”

The substance of this advice was not followed by CBC.

448. On the Toxic Ponds, WS Atkins said:

“3.1 General Description

This group of 6 (originally 7) ponds is shown on Figure 1 and photographs 6-9. The ponds are still in use. Ponds 1 and 2 primarily received coke oven effluent, and contain ammonia, thiocyanates, and phenols. Ponds 3 and 4 contain various contaminated waters. Ponds 5 and 6 received alkalis, degreasants and phosphates. Other wastes dumped in the ponds included pickling liquors, chromium oxides, oils, galvanising spent liquors, acids, various metals, cyanides and organics. In general, two ponds were used for treatment and two for holding difficult wastes for disposal when unsure of what to do with them.

3.2. Toxicity

The ponds must all be considered highly toxic.

3.3 Disposal and treatment

No analyses were available of liquors or sediments within the ponds. However, it is most likely that some form of water treatment would be required, and sediments or solids would require disposal to licensed sites.”

449. On 10 August 1984 arrangements had been made between CBC and BSC as to Deene Quarry, although it had been agreed well beforehand that CBC could deposit (and indeed had deposited) excavation and demolition material from the other parts of the BSC site which it had purchased. A letter to the Departments of Environment and Transport summarised the agreement:

“With reference to our meeting on 9th August 1984 regarding the Deene Quarry site,

I should like to confirm the following arrangements regarding the proposed purchase and licence agreement with BSC.

BSC to grant tipping facilities to Corby District Council for the disposal of materials arising from the reclamation works in the form of a licence. The area of Deene Quarry involved is to the east of the green line on the enclosed plan and is situated within the East Northants District. In lieu of tipping charges the Corporation are insisting on the following works being undertaken:-

1. Overburden to be excavated from various deposits in the quarry and to be re-spread over the site to a minimum depth of 600MM on completion of all tipping operations.
2. Pump out and dispose of liquid waste materials from various lagoons and ponds prior to infilling with tipped material.
3. Provide basic drainage necessary to ensure the free passage of surface water across the site.
4. Provide any necessary perimeter fencing to the site.
5. Site to be topsoiled, cultivated and seeded upon completion of tipping operations and the spreading of overburden.
6. Corby District Council to provide an alternative void for BSC in the former Shanks & McEwan area, including screening mounds, access roads, drainage, security fencing, new lagoon layout, etc., all in accordance with the Heads of Terms for the sale of land to Corby District Council, and the tipping licence to be granted by Northamptonshire County Council.
7. Corby District Council to reclaim areas of land at present used for the toxic ponds.
8. Corby District Council to provide new lagoon facilities for BSC in the former Shanks & McEwan area.
9. Corby District Council to provide new tipping facilities in the former Shanks & McEwan area and such facilities to be maintained during this initial transitional period of reclamation works. BSC to grant access to existing ponds for the purpose of emptying and infilling prior to completion of legal formalities.

In conclusion, it is proposed to utilise the whole of Deene Quarry for the purpose of reclamation and under the Buried Slurry Lagoon Contract to undertake the first stage of the restoration of the site. The site to the west of the green line to be purchased by Corby District Council and the land to the east be the subject of a licence with BSC.

It should be noted that the alternative method of disposal of the slurry and contaminated ground if the void in Deene Quarry is not used, is to dispose of the material off site. The nearest void available would be in former BSC workings, and involve road transport to move the material. Apart from increasing the cost of the operation, estimated at approximately £1,400,000, there is also a danger of haulage traffic passing through the town. The slurry material is not the most suitable material to be transported by road lorries and undoubtedly the conditions imposed by BSC on any tipping area would be similar to those for Deene Quarry.

As pointed out in a previous report, the disposal of slurry and associated works in the Deene Quarry would commence the initial reclamation of the site and remove an area of dereliction and considerable danger to obvious overall environmental improvement.

It is hoped that the arrangements now reached with BSC meet you're your approval

and that you are now in a position to approve the preferred tender.”

This demonstrates at least some understanding on the part of CBC that it was not desirable to transport contaminated material through the town.

450. The formal written agreement for the sale of the Deene Quarry site by BSC to CBC was dated 20 March 1985 and related to some 188 acres. It is clear from this time if not before CBC was in charge of the land which it had purchased. Mr Downey reported on all activities which he noticed taking place there which were many and various. He did not supervise the deposition operations on Deene Quarry.

451. It was in the February to April 1985 period that the DoE visited Deene Quarry and the Valley of the Drums in particular. It is clear that CBC decided that it was necessary to do something about this particular problem.

452. WS Atkins with CBC approval were meanwhile considering what might be done to the various sludges which were present in the various waste ponds. To this end, they considered a waste solidification process offered by a German Company and reported on this to CBC on April 1985:

“The stabilisation of a particularly difficult waste has recently been demonstrated by GFS using one of their solidification processes for sewage sludges modified so as to contain acid tars. These arise, for example, from the distillation of crude benzole where sulphur compounds and unsaturated hydrocarbons are removed by a concentrated sulphuric acid wash. In this assessment, 25 kg samples of an oil refinery acid tar waste were mixed with 50 kg of dried, powdery red mud whose high cation exchange capacity and metal oxide content react so as to stabilise the polluting components of the waste. Subsequently, 75 kg of fly ash from a coal-burning power station and 90 kg of a special hydraulic binder were incorporated in addition to 15 kg of hydrated lime and 375 kg of centrifuged sewage sludge (70-80% water). The process yielded a reddish-brown material of a clay-type consistency which lost its aromatic' odour over a few days and showed a crumbly soil like structure upon lengthy exposure to air...

Following discussions...it would seem that the steelworks redevelopment site offers considerable potential for the application of this waste treatment technique, the toxic, oil and candy filter ponds and, perhaps, the Deene Quarry area being of particular interest.”

453. There is no doubt that, by this stage and for a long time before, CBC was aware that the Deene Quarry area including the Toxic and Candy Ponds and the Valley of the Drums was likely to be highly contaminated and would need treatment. This awareness is clear from a memorandum of Mr Beckett of the DoE dated June 1985 of which CBC had a copy.

454. At this time W S Atkins was asked by CBC to give advice again on what to do with

Deene Quarry, although their brief was somewhat wider than before. Their draft report of August 1985 summarised their views.

“A physical and chemical investigation was carried out of the major liquid environments, and asbestos tipping area, in the Deene Quarry. Samples were taken from the various oil, water and sludge media and analysed for potentially critical parameters. The principal physical factor that emerged was the scale of water volumes involved, while the principal chemical factor was in respect of the degree to which these water bodies were contaminated. By far the greatest single issue encountered was the 'Valley of Drums' and its surrounds. The scale of the problem is very great and will require considerable additional resources before the full extent of the problem is defined and an appropriate solution designed. Ironically, the problem is unrelated to the visually bad situation of thousands of drums floating upon the pond surface.”

Although this is a draft report, no final report was served, and there is no suggestion that the advice was withdrawn or modified.

455. They described what they were considering:

“1.1 Background

The Deene Quarry is an area along the northern boundary of the former British Steelworks Corporation's site, which is some 2.5km. in length and of varying width. Currently the area under consideration has the following visible principal features...

A. 7 no. toxic effluent ponds (one largely filled with demolition waste)

2 no. candy filter ponds

1 no. oil pond

1 no. 'drum pond'

B. Iron making slag deposits (mostly containing soda slag)

Iron Oxide flue dust deposits (3 areas)

Iron oxide slurry deposits

Refractory wastes (weathered dolomitic)

Refractory spoil

Waste disposal site (encompassing asbestos tipping area and acid neutralisation wastes)”

They were not asked to report on the areas referred to in B above. They described their objectives as:

“a) establish the principal physical and chemical parameters of the relevant waste areas.

b) establish the most suitable methods for abating the identified problems so that the areas could be reclaimed for redevelopment.

c) prepare a specification, vis a vis methods and precautions, for the execution of the selected treatment measures.”

456. In Chapter 4 WS Atkins described the principal problems. At Paragraph 4.3, they

reported:

“Other Features

Various areas outside of those explicitly described in our brief warrant closer investigation before reclamation works proceed. Many of these areas were listed earlier [see B above]. In addition, the following are pertinent: (i) a number of large water bodies have been formed in excavations which appear to be contaminated by leaching or surface water run-off, (ii) tarry wastes were noted at the southern edge of the waste disposal area (adjacent the asbestos tipping area), (iii) tarry wastes are emanating from the (hard core) tip face at the south-eastern corner of the Deene Quarry area.”

457. Their remedial proposals were addressed later in the report:

“The water bodies on the site fall into the following four categories:

(i) those not requiring treatment prior to discharge to sewer, viz. TWP Nos. 1,2\*,3,4 and-Candy Filter Pond South

\*to be mixed with other water prior to discharge

(ii) those requiring some treatment prior to discharge to sewer, viz. TWP Nos. 5 and 6, Candy Filter Pond North and Oil Pond;

(iii) those requiring treatment or control (vis a vis migration) but which would remain in place viz. Valley of Drums and surrounds;

(iv) those requiring no treatment and which could be left in place, viz. TWP No. 7.”

In relation to the Valley of the Drums, they wrote:

“It is not possible to displace the pond water by careful backfilling since, even with reasonably large graded rock, the amount of water to be displaced (assuming no more than a 1m. rise in the area's ground water level) would amount to about 40,000 cu.m. This volume would in turn need some 270,000 sq.m.(27 ha) of surrounding area for its absorption if a 15% void ratio was assumed in the 1m. above the existing water table. Considering other permutations of a) permissible rise in water level and b) permeability value of surrounding ground, would not remove the fundamental problem, namely that this very large body of polluted water would undoubtedly migrate through the surrounding ground with possible long term consequences for local groundwater quality. In effect, therefore, it is most likely that the only practical solution is to limit and contain the already affected water.”

458. So far as the sludges were concerned, they advised as follows:

“5.4.1. Introduction

The general nature of the sludges is such that they would probably all be classified as 'Special' under the terms of the Control of Pollution (Special Waste) Regulations, 1980. As with all controlled wastes, if removed, they would have to be disposed of to a site licensed to receive them. The practical options for dealing with the sludges are:

(i) dispose of all materials to a suitably licensed site;

- (ii) create a suitable facility on site for their disposal;
- (iii) a combination of (i) and (ii).

It is not considered prudent to leave any sludges in deep ponds which would be many metres beneath any future development. Although it might be argued that, with a carefully selected backfill material, the sludge would not rise greatly (e.g. 150mm of sludge could rise to about 1 metre with a material with 17% voids) any oils for example could be raised subsequently by groundwater contained by the pond. This situation could have undesirable effects although some provision could be made to prevent it happening, e.g. by introducing low permeability layers in the backfill. Overall, for the quantities that might be left in place, the savings would be very small, if any. Thus, total removal is the most sensible option.

#### 5.4.3 . Create an on-site facility

Creating a suitable on-site facility for the sludges has many environmental attractions that need not be in conflict with the ultimate development of the site , e.g. the waste disposal area used by BSC, which include asbestos and other special wastes, is to remain and be suitably reclaimed. Adding a further, suitably designed facility in a suitable location can be considered at least acceptable, though not desirable.”

459. In August and earlier in July, before, CBC permitted contractors to extract drums from the Valley of the Drums. It is quite clear that the work was not supervised by CBC as is apparent from Mr Downey’s memo of 22 August 1985:

#### “Deene Quarry Pond - Drum Extraction

This operation has been continuing for the past six weeks and appears to be coming to an end, casual conversation with Contractors operatives indicate drum breakage during extraction. Drum contents have been dropped in the pond and residues have been spilled in the adjoining area of Calcium Sulphate backfill. It is also thought that the Northants Waste Disposal Authorities may have observed the operation and results. Consideration of the following may be required:-

1. Will the pond require further analysis to determine whether its chemical content has radically changed?
2. Do spilled residues constitute an area of special waste?
3. Has the operation been carried out in accordance with Occupational Safety Standards?”

460. In September 1985, CBC allowed contractors on to the site to remove the oil from the surface of the Candy Filter Ponds.
461. It seems that CBC engaged Noone & McGowan in 1985 or 1986 to fill in Toxic Pond 7. There is little detail about this but it is referred to in a Report of Dr Smith of September 1991.
462. At some stage in 1985 or possible 1986, CBC employed contractors to provide a new tipping area or areas for BSC as part of the agreement. This comprised the excavation for what were said to be butyl lined ponds for BSC to tip their wastes. So far as can be

ascertained, this was work done by Shanks & McKewan in the latter half of 1985 but little documentation has been provided about this. It is probable that the material from the excavations which itself was probably contaminated was deposited elsewhere in Deene Quarry. Mr Downey records muck shifting by that contractor in September 1985 for this work. Throughout much of 1985, CBC permitted Bennies to remove slags and they or others to remove red flue dusts. Scrap metals were removed as well with the knowledge and consent of CBC.

463. There was little or no security at the site; there were no gates at the Gretton Brook entrance which was the main entrance and apart from Mr Downey happening to see what was going on, Deene Quarry in effect was an open site.
464. Although it was something which Mr Barry had and had expressed misgivings about (see above), WS Atkins were nonetheless asked to report on a pilot exercise for filling part of the Valley of the Drums, which they did in October 1985. The Introduction summarises the issues:

“Reclamation Proposal: Fill 'Drum Pond' and area to the east with 'Inert' material from elsewhere on site.

Issue: Potential impact of displacing some 50,000m<sup>3</sup> of highly contaminated water causing it, through having a greater hydrostatic head, to enter the underlying aquifer at an unacceptable rate.

Objective: Design monitoring system for a pilot backfilling test

a) to determine the probable rate of extra over influx into the aquifer and b) to measure some of the physical and chemical characteristics of the underlying aquifer.”

There were some handwritten changes but as nobody has suggested they were made by WS Atkins I will ignore them. The “Potential Problem” was addressed as follows:

“2.1. General Description of Water and Ground Conditions

The valley to the east of the Drum Pond has been filled with miscellaneous wastes, including sludges, asbestos, oils, scrap metal, building materials, and some degradable materials. To the west, the gulley has been filled mainly with soda slags, refractory spoil and flue dusts. These wastes generally appear to be highly permeable. The 'waste' to the south of the gulley consists of the overburden from the mined area. This latter material appears from preliminary borehole work adjacent the pond, to be of low permeability. The area immediately to the north of the gulley is virgin ground and, if the general pattern of geological features applies, the ironstone is overlain by Lower Estuarine Series, Lincolnshire Limestone and Boulder Clay.

During mining, water was pumped from the ironstone aquifer at the eastern end of the quarry. After cessation of pumping the water in the gulley has returned to a level slightly higher than the original pre-pumping level.

The sources of water in the gulley are likely to be the underlying ironstone (confined) aquifer, the adjacent limestone (local) aquifer, and surface water. The existing water along the gulley is, based on data acquired to date, extensively contaminated, e.g. it is highly alkaline, and high in sodium and in sulphate in particular. The AWA have

already detected the high sodium and sulphate concentrations in waters external to the site.

## 2.2. Hypothesis to be Tested

It is our view that the existing water level in the pond is a manifestation of the ground water along the full length of the gulley that was left after completion of BSC's ironstone mining. That mining operation, according to BSC, extended to a depth generally corresponding to half way into the Ironstone aquifer. This aquifer was fissured by blasting operations and this greatly facilitated surface water control.

We consider that the effects of backfilling the pond will primarily result in a lateral displacement along the gulley, at a rate corresponding to the permeability of the ground mass. This permeability is considered to be very much higher than that of the adjacent or underlying ground. Therefore, the water level along the valley is likely to rise generally corresponding to the water displacement in the pond. As the hydrostatic head rises there will, by definition, be a greater net downward movement of contaminated water into the aquifer.

If this hydrostatic head is built up in a relatively short time scale, then the volume of contaminated plume entering the aquifer might be undesirably high. At worst, an 'extra' 50,000cu.m. of contaminated water will have entered the aquifer, possibly at a greatly accelerated rate due to the increased hydrostatic head. By carefully controlling the rate and location of backfilling, the water table in the valley could be allowed to rise in the region of 3 metres without creating any long-term engineering problems, i.e. the ultimate finished ground level could be some 4m higher than the pond water level.

Currently, the amount of contaminated water entering the aquifer could be a simple function of the net water volume entering the gulley, mainly through surface water ingress. If this is so, the net surface water volume, based on 85% of 635-765mm rainfall per annum, is  $0.85 \times 0.7\text{m} \times \text{catchment area}$ . This area is likely to be at least 1600m (i.e. length of gulley)  $\times$  50m (width of gulley at top). Thus, some  $0.85 \times 0.7 \times 1600 \times 50 = 47,600 \text{ cu.m.}$ , may be entering the underlying aquifer annually. Thus, at worst, the displacement of the pond water in one year could double the contamination loading during that period."

465. It was clear to all that a careful backfilling exercise was required. It stood (and stands) to reason that if the water in the Valley of the Drums pond was displaced too quickly, it would, on the most basic Archimedean principle, flow over the sides and into the surrounding area. WS Atkins suggested monitoring backfilling to see if their hypothesis was right.
466. Mr Downey's log for 21 October 1985 shows that Mr Buckland had arranged for an old railway line to be converted into a haul road for wastes to be taken to the eastern edge of the site.
467. CBC, was independently of consultants, taking decisions as to what was to happen. An

example of this is CBC's letter of 7 November 1985 to Mr Ibbotson:

- “1. Could you please let Peter Hussey have as soon as possible plans of the fencing around the toxic ponds and a plan of the haul route which you have specified from the Erostin site to the Deene Quarry.
2. Please also let Peter Hussey know whereabouts in the Deene Quarry you intend that Wards should tip, so that he can ensure no conflict with the positions of the monitoring system for the Drum Ponds”

CBC arranged for contractors to deposit material into the Valley of the Drums Pond. WS Atkins arranged for monitoring to be put in place in November 1985.

468. Although nothing seems to have been done about it, Mr Downey records that a contractor, Shanks & McEwan was tipping material from the BOS plant “illegally” into Deene Quarry on 15 November 1985.
469. On 15 November 1985, BSC, aware that backfilling of the Drums pond was soon to begin, wrote to CBC calling for care to be taken:

“Deene Quarry, North Bank, Corby

I understand that your Council wish to commence filling the above quarry area which is on Corporation land occupied by your Council under Licence by Agreement dated 20th March 1985. As you are no doubt aware the quarry is partially flooded, the water level being recorded on the 31st October 1985 at a level of 96.86 metres above ordnance datum.

Your Council have agreed under Clause 4-(d) (ii) of the Agreement, not to impede or hamper our adjoining recovery operation and I am obviously concerned that any tipping into the quarry will cause water displacement into our workings. In an attempt to prevent this from occurring I suggest that your tipping operation commences at the western end of the quarry with the tipping along the whole of the width of the same, initially with a clay like material in order to attempt to seal this particular section. It will be necessary to build up a bank at this point to prevent the water from surcharging over into our working areas.

Your vehicular access to this point should be along the line approximately marked in brown on the enclosed plan and I would suggest that once tipped vehicles then proceed along the green route before returning to your clearance area. This will ensure that your vehicles will cause minimum disturbance to our working areas.

In the event that the above does not successfully contain the water and our workings are flooded then I shall have no alternative but to insist that your tipping operations cease until such time as a satisfactory method of containing or dispersing the water is evolved...”

470. The contractor, Wards, commenced tipping of excavation and demolition material to the east of the Drums pond on or about 19 November 1985. As noted as occurring by Mr Downey on that day, he was not supervising them. WS Atkins noted this in their letter of 22 November 1985 to CBC because they were concerned that the monitoring for the

Drums pond was not disrupted. The proposed time for the backfilling to start was 2 December 1985.

471. By early December 1985, CBC by its contractors had finished much of their work of providing new tipping areas for BSC, but some lining of lagoons remained to be completed. Handover was expected shortly after mid December 1985.
472. In January 1986, WS Atkins produced a progress report about what they were doing on various aspects of the Deene Quarry works:

“Summary

This report details the progress made, as at 17th January 1986, in the preparation of recommendations for an integrated approach to the reclamation of the Deene Quarry.

The outline design is now completed and the preparation of appropriate contract documentation for the discharge of water from the toxic ponds to foul sewer is well advanced. The problems experienced in analysing the cyanide/thiocyanate content of these waters have been resolved and a draft application for a trade effluent consent has been made to the Anglian Water Authority. Oil reclamation companies have already commenced removal of the bulk of the oils on two of the water bodies.

An assessment of the potential odour problems associated with the exposure and removal of sludges from the toxic waste ponds has been completed, with the conclusion that the potential odour problems can be overcome if the works are carried out in a strictly controlled fashion. Modest delays could result from unfavourable wind directions.

Discussions are still proceeding with a number of waste disposal/ treatment companies regarding the sludge deposits in the ponds.

Recommendations and costings will be made when the most appropriate economic and environmental strategy has been identified. Preparations for the monitoring programme associated with the pilot back-filling exercise in the Valley of the Drums are now complete. The back-filling operations are scheduled to commence at the end of January.”

473. The report adverted to the fact that the Toxic Ponds contained some 23,000 m<sup>3</sup>, the Candy Filter and Oil Ponds some 5,500 m<sup>3</sup> and the Drums Pond some 49,000m<sup>3</sup>. In relation to the sludges, WS Atkins said:

“The large volumes of settled sludges underlying the water and oil in the Toxic Waste Ponds, Oil Pond and Candy Filter Ponds pose considerable problems to the design of a successful reclamation programme. The sludges are very odorous, have relatively high moisture contents and a substantial organic fraction, except for Toxic Pond 1 which is largely calcium sulphate containing large quantities of ammonia.

A range of options exist for dealing with these materials which may be applied either singly or in combination:

High level incineration

Reclamation of oil content  
Biological treatment  
Solidification/polymerisation  
Landfill (on or off site)

In our early discussions with the Water Authority we gauged their reactions to the creation of an on-site landfill facility. It was clear that such an option would meet with resistance, i.e. AWA feel that there are enough potential problems on the site already.”

They reviewed treatment options and identified the closest landfill site as being in Bedfordshire. They reported on possible odour problems to a flour mill to the north west.

474. By 17 January 1986, WS Atkins told CBC that the monitoring equipment for the Drums Pond was in and running so that the backfilling could commence. On 28 January 1986, the first loads of “muck” were deposited by Wards in the Drums Pond as noted by Mr Downey.

475. In a letter of 10 February 1986 to the County Surveyor, CBC wrote of what its intentions had been and remained for Deene Quarry:

“Since recently acquiring the site from the Corporation, the Council has commenced its programme for the restoration of the former quarry and the infilling of the various voids is the first stage of the reclamation proposals. Upon completion of the various tipping operations, the site will be covered by a capping material, top soiled, cultivated and seeded, together with the erection of protective fencing and the installation of site drainage. The site will ultimately be restored to an agricultural/ forestry/amenity after use. The removal of the various toxic lagoons will be undertaken under a separate scheme, however, in the meantime protective fencing has been erected to some six lagoons and the other lagoons will be made safe as soon as possible. It is envisaged that the restoration proposals will take approximately three years to complete.

The site licence is to cover the whole of the site because materials will be deposited in various locations, dependent upon the time of year and site conditions, however, the prime objective is to infill the “drum pond” as quickly as possible. The material used for infilling voids etc. is from the former steelworks complex and is mainly reinforced concrete foundations, brickwork, slag and general excavated materials which is arising from the various reclamation schemes. The material will be transported to the tip in on-site dump trucks utilising existing internal haul roads. Material on the tip will be spread into position by a CAT D8 or D6 Dozer. The partial restoration of Deene Quarry is therefore a by-product of the reclamation works in the former steelworks site.”

This, in broad terms, remained CBC’s policy and strategy for Deene Quarry.

476. By 20 February 1986, Mr Downey estimated that 15,000-20,000m<sup>3</sup> had been deposited in the Drums Pond. It is more than possible that Weldon Plant, working on another project,

had dumped material there as well as Wards. The work of depositing material was not monitored or supervised although Mr Downey recorded briefly what was going on. The work of deposition at the Drums Pond was not done carefully. The result was that the water was inevitably displaced by the material which was being deposited in the water and it spilt over the sides. On 12 March 1986 BSC wrote complaining:

“Our contractor has reported that water from the Deene Quarry is now entering the area from which they are recovering materials. This inundation is due to a rise in the water level from 96.86 metres as originally reported to 98.39 metres, giving a rise of 1.53 metres.

We are very concerned about the water displacement that has taken place as this is adding substantially to the cost of recovery as the material has to be raised above water level and allowed to drain before being marketed. You stated that your Consultant, W S Atkins, was monitoring the situation and what has happened is now impeding our operations, which is contrary to Clause 4(d) (ii).

Would you please arrange to cease depositing tip material into the water filled quarry forthwith.

In your letter dated 20th January 1986, your Council undertook to construct a bank along the western end; this work has not been carried out. You stated that your Council would limit the deposit of demolition material in the quarry to the equivalent that the BSC had been depositing and there is no doubt that this is being exceeded by a vast amount.

In our opinion your Council is in breach of the covenants they entered into and we shall be pleased to receive your assurance that no further action will be taken which will be detrimental to the Corporation's interest.”

The reference to “the material” in the second paragraph of this letter is to the slag and flue dusts materials in the north east part of Deene Quarry which BSC and CBC had agreed could be removed by BSC for sale; it was on this material that amongst other Bennies had been working. Ward started to work on constructing the bank referred to at about this time but used material from the surrounding area which was permeable as noted in WS Atkins’ letter to CBC of 12 March 1986.

477. On 19 March 1986, there was a visit to the Drums Pond by Northamptonshire County Council attended by Mr Downey. A note of the meeting states:

“This visit was to assess the current situation with the Valley of the Drums. This former tipping area has been taken over by Corby DC with a view to its eventual reinstatement. Consultants have been examining the degree of contamination on the site and a number of boreholes have been drilled to allow sampling of the ground water. This was being carried out by Mr Downey when we arrived on site. He is a chemist and regularly checks the boreholes for migration. They are especially interested in cyanide and thiocyanate. In an attempt to discover any migration route from the main pond several thousand tonnes of inert waste was tipped into the pond to raise the water level and increase the head.

There is still some tipping of contaminated spoil from local building projects e.g. ASDA, going on in the area and a firm is working over the rubble heaps for hardcore.

The pond still has about a hundred drums floating on the surface together with an amount of oily flotsam. Material is still leaking into the pond probably from corroding full drums on the bottom as an oil smear was being formed on one area of the surface. At one end of the pond I found a torn bag containing asbestos on the surface of the site.

The removal of the floating drums would appear to be the easy start of clearing this large area of polluted land.”

This was inaccurate at least with regard to the quantity of material which had been deposited.

478. In July 1986, WS Atkins produced a Recommended Strategy for Deene Quarry for CBC. The Summary states:

“It is considered that the sludges in the Toxic Waste, and other Ponds within the Deene Quarry cannot be left in-situ owing to their unacceptable chemical and physical natures. The sludges vary considerably in chemical composition but the major common factor is their coal tar and general oil content, apart from one pond (TWPI) which has a very high ammoniacal content. The aggregate volume of sludges has been estimated at around 15,000m<sup>3</sup> and four different strategies have been examined for their effective disposal, (Also included in the review was a provisional estimate of 1,000 m<sup>3</sup> of cyanide rich and organic wastes near the Toxic Waste and Oil Ponds.). The four options to be considered seriously have been a) off- site landfill, b) a chemical fixation process (GFS), c) a lime stabilisation process (OCR) and d) on-site landfill using a combination of the above techniques. Biological treatment and incineration were also considered initially. A further factor included in the assessment has been the need to improve the effectiveness of the ground cover to the disposed Glebe wastes, i.e., the area south east of the Candy Filter Ponds.”

479. The contents of the Ponds were described:

“Toxic Waste Pond No. 1

2.9 This pond acted as a holding reservoir for limed coke oven liquor. The suspicion that the sludges comprised tar contaminated lime sludge was confirmed by chemical analyses which showed the bulk phase of the material to be hydrated lime with a minor calcium sulphate component. As would be expected, this material is highly alkaline (pH 8.3 - 11.4) and contains large quantities of ammonia (NH<sub>4</sub><sup>+</sup>-N approx. 5,000 ppm). The sulphate content is explained by the reported disposal of waste sulphuric acid to this pond. The sludge has a stiff consistency and could present an occupational hygiene problem during excavation due to the elevated ammonia content. (This can be overcome by ensuring that the excavator driver is suitably equipped with breathing apparatus and, as far as possible, he works upwind).

Toxic Waste Pond Nos. 2 to 6

2.10 Although heterogeneous in nature, the sludges in Pond Nos. 2 to 6 can in general be considered as quite similar, due to the presence of mobile tarry deposits arising

from coal carbonisation. The 'coal tar' parameter evaluated in the laboratory is semi-quantitative and should be considered in conjunction with visual and olfactory evidence obtained in the field. The highly elevated toluene extractable figures are indicative of extensive hydrocarbon contamination broadly associated with a range of mineral oils, but also encompassing a range of aromatics and certain vegetable oils used by BSC...

2.11 Heavy metal concentrations (zinc in particular) are highly elevated in many of the sludges. These concentrations are of concern as potential water pollutants if inappropriately disposed of, and have wide ranging microbial toxicity.

#### Candy Filter Ponds

2.12 The sludges in the two Candy Filter Ponds essentially comprise millscale contaminated with mineral oils, which are slowly being released into the overlying water body. The result is an oil in water emulsion known as 'chocolate mousse'. The mineral oil content is confirmed by the very elevated toluene extractable value of the sludge.

#### Area Adjacent to the Oil Pond

2.13 The recent trial pit investigation near the Oil Pond revealed odorous wastes with a significant organic content, and also surface deposits of spent oxide wastes with elevated cyanide levels. In one case a very elevated toluene extractable measurement associated with elemental sulphur in the gas cleaning waste was noted.

#### Area to the South and East of Candy Filter Ponds

2.14 The extensive waste deposits to the south east of the two Candy Filter Ponds originate from the demolition of the Glebe coke oven battery, and these are grossly contaminated with tarry materials. Large metallic structures, together with concrete and bricks, are disseminated throughout the waste mass."

480. The report reviewed the options for on and off site disposal and treatment of the sludges. The Introduction to their Chapter on Recommended Strategy was as follows:

"4.1 Organic wastes have been deposited in a number of areas within or near to the Deene Gulley. In developing a recommendation for the removal of one such group of wastes (i.e. the Toxic Waste Ponds et al). It is appropriate to review the situation that prevails, or would prevail, at the other waste deposit locations.

4.2 In addition to the more formalised disposal into the Toxic Waste Ponds, Candy Filter Ponds and Oil Pond, extensive wastes have been deposited in the eastern end of the Deene Gulley. Organic slurry and spent oxide waste deposits have also been found to the west of the Oil Pond in an area which former site maps show as a lagoon. Further deposits of organic wastes lie to the south east of the Candy Filter Ponds, where the excavated ground mass from the Glebe Coking Plant has been placed. This material has been shown by recently excavated trial pits to include large amounts of coal tar, together with inert solid and metal wastes."

The Reclamation Proposals were:

“Introduction

4.9 The recommended strategy essentially involves the disposal of all sludges on-site in a suitably prepared facility. The strategy takes account of the need, on the one hand, to remove sludges from the various ponds and, on the other, to enhance the ground cover (vis-à-vis permeability) in the area of the Glebe Coking Plant wastes.

Principal Features

4.10 The proposals consist of the following principal elements:

- i) Construction of low permeability lining to (cleared) Candy Filter Ponds North (CFPN).
- ii) Treatment of sludges from TWP2 by GFS process using TWPI sludge (part of) as a filler.
- iii) Co-disposal of sludges from TWP's 3, 4 and 5 with GFS treated sludges in an integrated manner, together with cyanide rich (i.e. spent oxide) and other wastes near the Oil Pond.
- iv) Covering redeposited sludges with suitable low permeability cover system.”
- v) Treatment of sludges from Candy Filter Ponds by DCR process and land farm over 'Glebe' waste area.”

As will be seen, these recommendations were not followed by CBC, which next considered simply leaving the sludges in situ and covering them up.

481. That the Deene Quarry site was open to all is indicated by Mr Downey's log for 20 October 1986 where he records the public as regularly traversing the site.

482. On 16 March 1987, CBC let a contract to Pipeline Construction Ltd to carry out the following:

- “a) Transfer of contaminated water from Candy Filter Pond South to Candy Filter Pond North.
- b) Collection of floating oily waste material from Toxic Waste Pond No.5 and transfer to Candy Filter Pond South.
- c) Transfer of contaminated water from Toxic Waste Pond Nos. 1, 2, 3, 4 and 5 into Toxic Waste Pond Nos. 6 and 7.”

This contract did not involve the removal of sludges.

483. Without reference to any consultant, CBC permitted the depositing of a substantial further quantity of excavated and demolition material into the Drums pond. WS Atkins, whose representative Mr Line visited the site in March 1987, was clearly dismayed as to what was going on. He wrote on 30 March 1987 as follows:

“Further to our telephone conversation on Tuesday, 24th March 1987, regarding the potential problems which may result as a consequence of continued backfilling in the drum pond, I visited the site on the following day. Having observed the prevailing

conditions our level of concern is now such that we feel some immediate action has become necessary.

#### Current Situation

As I described to you on Tuesday, approximately a further 15-20,000m<sup>3</sup> of spoil has now been deposited working from the bund created last year and pushing forward a working face into the drum pond. I would estimate that greater than 50% of the deposited material lies below the water level and that the surface area of the remaining pond is in the region of 4/5 of the original.

Following our monitoring programme during the pilot backfilling exercise at the beginning of 1986 we reported to you that, although we believed no critical contamination of the underlying aquifer would result, the physical consequences of an increase in water level would make further backfilling in this area inadvisable.

As predicted, the recent backfilling activities have caused a considerable increase in water level in the drum pond (AOD now greater than 100.0m compared to 97.0m towards the end of 1985), and additionally, a new pond has formed to the west of the 'retaining' bund, due to the intimate hydraulic continuity through the soda slag which underlies the bund.

Our concern rests on the following two points:

- i) The level of contaminated water in this region is now higher than the bed of the adjacent Gretton Brook. We are therefore relying on the integrity of the intervening ground mass to act as a suitable barrier. An uncontrolled, indirect discharge to the Gretton Brook would be in direct contravention of the Control of Pollution Act.
- ii) Although alkaline, stratification in the original drum pond confined the greatest alkalinity to the deepest regions. The water which has been forced through the soda slag to form the new pond is uniformly highly alkaline (approx. pH 12) and therefore very caustic. Although the hazard to anyone becoming immersed in such water has existed for some time, the new pond is clearly visible from the road and more caustic. In addition, the banks adjacent to the new pond (on the Gretton Brook Road) are unstable and there is open access to anyone passing. In essence, a similar hazard exists but the risk of an incident occurring has been heightened.

#### Recommendations

In the light of the above factors, we make the following recommendations:

- a) immediate cessation of tipping activity.
- b) improvement of site security along the relevant part of the northern perimeter of the site, i.e. improved fencing.
- c) posting of suitable warning signs..."

There were thus two contaminated ponds, one being the old Drums Pond and the second to the west and the highly contaminated water had spread the contaminants over a much wider area than if they had been contained in the Drums Pond.

484. It was on 9 April 1987 that CBC secured the licence for the deposit of “controlled waste” at Deene Quarry, the terms of which are set out earlier in this judgement. The inert material which could be deposited was expressly and clearly required to be dry.
485. In May 1987, WS Atkins issued a “Commentary on Current Status” of the Deene Quarry reclamation. They stated that the Toxic Ponds could be backfilled using ground reinforcement techniques and capped. CBC however was unwilling to accept that advice because it saw the area around and to the west of the Toxic Ponds as capable of being developed, albeit it was some considerable time before any particular interest was expressed by anyone in that area. WS Atkins was asked to come up with proposals as to how to achieve this, given that the land would have to accommodate buildings. They produced an initial report on this in June 1987. Geotechnics Ltd, instructed by WS Atkins produced a geotechnical report in July 1987 on the Toxic Ponds (called by them “Chemical Waste Slurry Lagoons”).
486. In or by June 1987, WS Atkins came up with proposals to remove the water for the Drums pond; these had been discussed with the Water Authority and involved the pumping of the water into Gretton Brook stream bed before any more filling of the Drum pond occurred. The requisite pumps were in place by about January 1988 and had started working by late January. Pumping was started before all the joints to the associated pipework had been caulked and there were established complaints of water escaping.
487. By August 1988, Deene Quarry was still open to unauthorised entry. A LRCG meeting of 11 August 1988 records that gates remained to be fitted, and, by inference, that unauthorised tipping was still occurring. Records in 1988 show that mud was reported as being on the roads, presumably coming from Deene Quarry.
488. Mr Webster wrote to the County Council on 7 October 1988:

“TOXIC PONDS 3 & 4 SLUDGE REMOVAL

Further to the telephone conversation between Mr Ward and my Assistant Mr Palmer, I would confirm that the sludges to be removed from the above ponds will be transported within the site to the new tipping area. The sludges will then be capped with a minimum of 1m of clean cohesive material.”

Other than the new tipping area was on Deene Quarry, its precise location has not been identified. Certainly, the sludges could not be described as dry or inert materials and it is probable therefore that this dumping of the substantial quantities of the sludges from Toxic Ponds 3 and 4 was a clear breach by CBC of the Waste licence. As Haiste & Partners later reported in November 1989, although the sludges had been transported by then, CBC had not capped them and they remained exposed; they said in their report (see below) about the work on Toxic Ponds 3 and 4:

“...considerable difficulty was encountered in handling, depositing and grading the sludges, and it was found necessary to mix the excavated sludges with dry material

arising from another earth moving contract in the vicinity. In addition, the volumes excavated were many times greater than had been anticipated from available data.”

Thus it was that over a considerable period the work on the Toxic Ponds was done without any proper supervision from CBC and involved the excavation, transporting, mixing and spreading of highly contaminated material over many months. That material was then left uncapped and open to the elements for well over year or more. CBC had the idea of using a contaminated tip facility on Deene Quarry and this was driven by cost primarily. The cost of removing the worst wastes to another site would have been enormous.

489. There is set out verbatim earlier in this judgement the memo of Mr Downey of 15 December 1988 about his reaction when he saw for the first time the Waste licence. It is confirmation that unauthorised wastes had been deposited at Deene Quarry. Toxic Ponds 3 and 4 were certified as substantially complete on 3 December 1988.

490. In February 1989, CBC had formally let a contract for the removal of sludges from Toxic Ponds 3 and 4 and its taking to another part of Deene Quarry to be capped with some cohesive material; this work had been completed between October and December 1988. From all the available contemporaneous documentation, this idea was not one upon which any independent consultant had advised, albeit that WS Atkins had provided some estimate of the quantities likely to be involved. This work took some time to complete; it was reported at a LRCG meeting in December 1988 as being complete by then. The scope of the works was described as “the removal of sludges from the ponds and disposal to a tipping facility within the site, approximate length of one way haul is 1.9 km”. It involved pumping the water into Toxic Ponds 2 and 5. The sludges were described in the Specification as:

“The general nature of the sludges is such that they are classified as 'Special' under the terms of the Control of Pollution (Special Waste) Regulations 1980.”

There was no requirement for a wheel washing facility and in any event none was provided to limit or prevent vehicles contaminated with mud from Deene Quarry from leaving the site. The work was not supervised by any independent consultant. The material was taken to the old works dry tip, as recorded by Dr Smith in a report of September 1991.

491. On 23 January 1989 BSC reported to CBC that Bennies had completed the slag extraction to the north eastern area of Deene Quarry. Access was still uncontrolled however. A memo from Mr Webster of 25 January 1989 states:

“I must re-iterate my extreme concern at the way the situation has developed regarding unauthorised and uncontrolled tipping by Noone and McGowan.

Whilst verbal agreements may be justified for small quantities of material, the volume involved at Deene Quarry clearly warranted detailed written instructions and drawings and subsequent periodic inspections to ensure they are being complied with. We have

also been left vulnerable to criticism from auditors for not monitoring and recording the quantities involved. Have we been paying Noones to cart away from Willow Brook Balancing Lake at market rates while not charging them for tipping in Deene Quarry? Have they tipped material from other private jobs at no charge? Is this material contaminated?

Obviously I require you to pursue remedial action by Noones to ensure the area is restored in a satisfactory manner and all contaminated material either removed or safely buried.

With regard to future procedure, I consider it necessary to have weekly inspections by a member of your staff of all reclamation sites still in our ownership. These inspections should check site security/fencing and also whether unauthorised tipping has occurred. If it has, we should take immediate action. For any future tipping on our land it should follow a specification plans, and some method of measuring quantities should be devised.

Do we need a gateman at Deene Quarry?"

There was no answer to this and there is no evidence that the suggestions made in this memo were ever implemented. The content of this memo supports the view that there was little or no and no effective control over what went in and out of Deene Quarry.

492. A weekly site log of Mr Downey's for the week commencing 25 January 1989 shows that material from the Willowbrook Storm Balancing Reservoir work was being deposited in Deene Quarry. A site visit attended by Mr Webster, Mr Hussey, Mr Ibbotson and Mr Buckland revealed that tipping of this waste gave rise to concern (which I infer led to the memo that day from Mr Webster). A "Bogmaster" (a large heavy bulldozer) was brought on to level mounds and spread dumped material. This is an example of the further double handling of contaminated material after its transport to Deene Quarry and initial deposition. The Bogmaster exercise is recorded as being somewhat unsuccessful as it kept getting bogged down.

493. On 26 January 1989, Noone & McGowan were written to by Mr Hussey as follows:

"Tipping in the Deene Quarry

I refer to our meeting on 24 January when we inspected part of the Deene Quarry together. We agreed that the tipping which has taken place is very unsatisfactory in the way it has been left, and also that there has been some unauthorised tipping by your Company.

I understand that you had intended in any event to tidy up some of the areas, however the tipped material is holding water and need immediate action.

I therefore require you at your own expense to carry out the following works to remedy the situation; please refer to the attached drawing.

- 1) Immediately cease tipping in the Deene Quarry
- 2) Area A - material to be graded within the curtilage of the reinforced concrete area to levels to the satisfaction of the Engineer such that the material sheds water and can begin to harden. All materials outside the reinforced concrete area to be pulled back within that area or disposed of in the existing void at B as directed by the Engineer.

(3) Area C- slurry arising from Willowbrook Lake scheme which has been tipped in an unauthorised manner.

I will write to you again about the treatment needed in this area.

(4) Carry out remedial works to the haul road shown in red on the drawing to restore it to a similar condition to that which existed prior to your haulage operations.

Remove heaps of material created at the sides of the haul road by your grading work.

5) Remove heaps of lake slurry tipped short of their destination by drivers in a hurry to get home. This material should not in any event have been taken to the Deene Quarry.

6) Draw back material piled against the bases of chain link and palisade fences; the materials is [sic] likely to corrode the fences.

Mr B Downey will supervise your work on the site and will be pleased to point out to you the areas mentioned in this letter.”

This demonstrates that the operation had not been supervised beforehand effectively or at all. Mr Downey was a Safety Officer and was not qualified or experienced as a supervisor of such operations, as his superiors must have known.

494. Mr Hussey’s reply to Mr Webster’s memo on 27 January 1989 was at least frank:

“Thank you for your memo of 25 January.

First of all may I apologise for the Team's lack of proper control over the tipping operations carried out by Noone & McGowan in the Deene Quarry.

I have written to Noones (copy letter enclosed) requiring them to take remedial action at their own expense; this will start on 27 January.

An estimate will be made of the volumes of material tipped without permission, and either a tipping charge levied or the Contractor required to remove such material to his own tip.

Benson Downey has already been briefed about regular inspections and will start straight away. Regarding security to the Deene Quarry, I have today been advised by BSC that Bennie's slag recovery is complete; this means that we can keep the main gate to the area locked.

This measure, together with Benson's 'patrols', should improve things a lot in future, as you suggest, proper tipping conditions will be imposed in writing.”

There is no evidence that any “proper tipping conditions” were imposed thereafter.

495. Some measure of the unauthorised tipping is highlighted in Mr Ibbotson’s letter to CBC of 13 February 1989:

“Following our discussions of 9th February 1989, as promised, I detail below the action which I recommend should be implemented in order to achieve the ultimate objective of the reclamation and restoration of the Deene Quarry, and to clear up the problems caused by the illegal tipping of slurry etc. on the site.

Progressive restoration of the Deene Quarry has been achieved by the planned tipping over many years of excavated material from the main reclamation site into the various

voids in the quarry. Substantial areas of the site were ready for the final treatment and the spreading of top soil prior to cultivation and seeding. However, this may not now be undertaken until such time as the considerable deposits of slurry have been removed. It is estimated that some 60,000 to 70,000 cubic metres of material have been deposited on the site without prior consent, and the majority of the slurry being in the incorrect location. Substantial areas of the quarry are now sterilized for a long period until such time as the site conditions improve and permit the repositioning exercise.

#### Recommendations

1. That the slurry deposits placed in the incorrect locations be transported and placed in the void to be determined by the CDC representative, i.e. Excess material in the Valley of the Drums Area and all the material tipped on TWW's area parallel with Gretton Brook Road. This operation should be undertaken at the contractor's cost.
2. The contractor to be charged a tipping fee of 70,000 cubic metres at 70p -£49,000 for depositing the material in the Deene Quarry. This is in the form of a rate reduction to Noone's Willowbrook Contract. The Council may also consider a further rate reduction by the contractor using internal dump trucks instead of licenced road transport which he would have had to use on the Willowbrook Contract...
5. A feasibility study be undertaken to ascertain the potential of the Deene Quarry Site as both an inert tip and domestic refuse tip. Amendments to the site licence are also to be investigated with the Northamptonshire County Council.
6. The use of the Quarry as a tip will ensure that the deposits of slurry remaining on the site become buried, thus minimising the potential liability to Noones. This will also ensure the covering of the slurry with a minimum of 1 metre covering prior to top soiling and, in addition, generate a tipping royalty to the Corby District Council..."

Mr Hussey reported on this series of events in April 1989; that is set out earlier in this judgment.

496. On 28 February 1989, Mr Downey reported some improvement in the haul road on Deene Quarry used by Noone & McGowan; contaminated material dropped by them on the road was removed. Some more unauthorised dumping into Toxic Pond 4 occurred, which suggested that it had not yet been filled. By 12 April, he reported that it was two thirds to three quarters full.

497. On 15 May 1989, Noone & McGowan replied somewhat belatedly to the criticisms made of it:

"A) Following our internal investigation it would appear from our records that a quantity of between 5,000 cum and 8,000 cum of excavated material arising from the Willowbrook Balancing Lakes Contract has been tipped over and above the quantity required to stabilise the Toxic Ponds Slurries and cover the reinforced concrete blocks.

We apologise unreservedly for this action although we would like to point out that this was not a deliberate act but one brought about by a failure of communication within

our Company...

B) With regard to the grading of the filled area, as you are aware, the nature of the reinforced concrete already in this location, the consistency of the slurry mixture from the toxic ponds and the prevailing weather conditions at the time all contributed to making it impossible to level and grade the fill to the required levels. This operation was therefore held in abeyance until such time as weather conditions permitted. Following the recent dry spell we have commenced work on this regrading and again, we would anticipate completion by the 21<sup>st</sup> May.

C) The remedial works referred to in paragraphs 4 to 6 of your letter have been substantially completed, however we would respectfully point out that the loads of material tipped short of their destination were tipped in order to facilitate tyre repairs on the vehicles which could not have been carried out in their fully laden condition. We accept however that this material should have been immediately removed..."

498. In the context of reviewing some samples from a part of Deene Quarry, WS Atkins wrote on 7 July 1989 to CBC in relation to dusts:

"A final decision on the requirements for remedial measures can only be made in the light of the further analytical information outlined above. However, depending on these data, particularly the available fractions of zinc and boron, it is possible that reclamation could be limited to the application of a suitable depth of topsoil ie. additional cover or barrier layers may not be required. Benson mentioned the possibility of windblow of contaminated dust onto neighbouring farmland. The application of topsoil and grassing of the site should reduce any windblow of contaminants to an insignificant level. It is possible that use of the site for motorcross during dry weather could cause release of relatively small quantities of contaminated dusts but I would not expect these to pose any real hazard either to site users or neighbouring properties."

499. At the LRCG meeting of 31 August 1989, it was noted:

"3.2 Deene Quarry - recent events have highlighted that an overall plan and firm control are required for tipping in Deene Quarry. As ownership is due to pass into CDC hands shortly a tipping scheme can be designed, planning permission obtained etc, in readiness. RI to design the scheme and liaise RCI with D Jones as necessary. Once an accurate picture of the current status of the site is available, consideration can be given to future land use, etc."

Although there had been no completion, the agreement to purchase Deene Quarry had been in place for some 4 years. The minute suggests that there had been no overall plan and no firm control over Deene Quarry by CBC since they had begun depositing large quantities of material on it. As the later history reveals, there was little improvement.

500. At the LRCG meeting of 26 October 1989, the following was minuted:

"Fencing is required for entrances into Deene Quarry in accordance with BSC letter

about covenants. KRW wants to do a comprehensive report of the whole of the Deene Quarry, and asked RCI to extend Derek Jones commission to cover an area to be agreed by RCI and PJH”

It seems that such an audit was not done. It remains unclear what contaminants were placed, where and in what quantities, save for the material which later went into the contaminated tip and the Soothills material. There never was any comprehensive report about Deene Quarry.

501. Haiste & Partners were retained by CBC, in November 1989, to produce in effect a scheme for the disposal of contaminated wastes from the Toxic Ponds which was different from what WS Atkins had recommended. This was because, as said by Haiste:

“A feasibility study is on going by Ove Arup and Partners of the construction of a power station on land which includes Toxic Ponds 1 and 2. The client would not be prepared to allow the wastes in these ponds to remain on the proposed site, and they must be excavated and disposed; Corby District Council are considering allowing these wastes to be contained in the facility to be identified in this document.”

502. Haiste considered the WS Atkins and Geotechnics reports and in its report of November 1989 addressed proposals for Toxic Ponds 1, 2, 5 and 6, the Candy Filter Ponds North and South and the Oil Pond. They recommended an on site disposal facility for the contaminated sludges. CBC was enthusiastic about the idea of the contaminated tip facility. CBC had had the idea initially of using a contaminated tip facility on Deene Quarry and this was driven by cost primarily. The cost of removing the worst wastes to another site would have been enormous. Mr Ibbotson reported to CBC in November 1989 as follows:

“The total reclamation and restoration of the former Deene Quarry Site may be achieved by undertaking a comprehensive reclamation scheme over the site. The tipping void will be restored by the careful planned deposition of waste materials over a number of years, to designed contours, to complete the restoration of the site. Progressive restoration may also be achieved.

The reclamation works undertaken in the correct manner will ensure that all chemical contamination problems which exist on the surface at the present time are eliminated.

An engineered disposal facility to accommodate chemically contaminated material from the Toxic Ponds will ensure that the ponds area is reclaimed and at an acceptable cost to justify Derelict Land Grant funding.

Apart from the removal of a major area of derelict land in an area bordering on high landscape values the reclamation of the site will provide valuable recreational and amenity facilities for the Corby area apart from the substantial revenue which may be generated from tipping on the site.”

503. WS Atkins were asked by CBC about the idea and wrote back on 20 November 1989 in these unenthusiastic terms:

“The most critical factor in our view concerns the disposal of the highly organic wastes from Toxic Waste Pond No 5; the landfilling of such wastes is generally not

favoured by DOE, notwithstanding the fact that they are currently 'landfilled' on this site. Also their physical nature could present significant practical difficulties. Thus, in our earlier assessments considerable attention was given to pre-treatment options. The views of the NRA and the waste disposal authority are crucial, notwithstanding the implications of any special status that the former steelworks site might have viz a viz planning matters. Also of fundamental importance is the Council's proposed use for areas of the Deene Quarry hinterland where wastes might be placed. It is critical that the solution to one issue does not compromise real development options in the future.”

They were not asked to involve themselves further in this context.

504. On 8 December 1989, CBC wrote to Noone & McGowan who were still transporting material on the public roads:

“FILLING IN DEENE AREA

With reference to the agreement to deposit fill material in the Deene area, it is noted that despite many verbal requests, the condition of Phoenix Parkway has not been improved and has an unacceptable amount of mud on it.

Please take immediate action to clean the road, and to keep it clean.

If the condition of the road deteriorates again then the Council will arrange to clean the road and re-charge this to yourselves.”

505. There is set out earlier in this judgment verbatim the memo of Mr Downey of 15 December 1989 about his reaction when he saw for the first time the Waste licence. It is confirmation that unauthorised wastes had been deposited at Deene Quarry.

506. The LRCG meeting of 22 March 1990 records that some earthworks were being done on Deene Quarry. This was probably levelling and grading work on material which had been deposited over the previous 7 years. The contract for this work was formally signed on 3 May 1990 between CBC and C A Blackwell (Contracts) Ltd. The specified scope was:

“The work involves the scrub clearance, general earthworks, excavation and spreading of overburden, etc. and site grading.”

The specification went on:

“1-33 DUST NUISANCE - The Contractor must allow in pricing the work for providing and maintaining water sprays whenever necessary for spraying the haul roads etc. to prevent dust rising which would create a nuisance to adjoining property owners.”

507. By April 1990, the plans for the development of the site at the north west part of Deene Quarry, over Toxic Ponds 1 and 2, to be sold to enable a power station to be built on it were progressing. Corby Works wrote to Mr Ibbotson on behalf of CBC as follows on 17 April 1990:

“Re: Toxic Ponds Area - Gretton Brook Road/Phoenix Parkway

As you will be aware the proposed Corby Power Station is to be constructed on part of the land known as the Toxic Ponds. This project will require the excavation of contaminated sludges and subsoil from the area to be purchased and the transfer of that material to a properly engineered tip facility adjoining the Candy Filter Pond area in Deene Quarry.

Many aspects of this reclamation scheme fall outside of the systems which Corby District Council have operated in the past.

1. The scheme is not to be funded by the District Council from the Derelict Land Grant budget for this or subsequent years, Corby Power will pay all fees and contractors costs associated with the project.

2. A consultant will be appointed to represent the District Council's interests in the following matters so that no further claim can be made against the District Council:-

a) The review of all existing data and technical reports on the toxic pond and Candy Filter Pond areas and the assessment of any further works necessary to provide the information required.

b) The detailed design of the properly engineered tip facility and the methodology of dealing with the excavation material at source, the transportation and disposal of the material within the tipping area.

The tip itself must achieve the following:-

i) Contain and retain, now and in the future, all materials arising from the reclamation of the toxic ponds area so as to prevent any escape into the environment.

ii) Installation of all necessary engineering works to exclude any ground or surface water that might carry contaminants from the tip.

iii) Construct all necessary engineering works to enable long term monitoring of the tip to be carried out economically and efficiently.

iv) Be completed to a stage so as to allow landscaping/amenity use for pedestrians, horses and motorcycles.

c) Gain written approval from the following authorities or authorised agents for all works outlined in (b) above.

1. National Rivers Authority

2. Waste Management Authority and Northamptonshire County Council

3. Department of the Environment

4. East Northants District Council, if necessary for planning approval

5. BSC Plc or other interested parties

6. Liaise with Ove Arup to gain Corby Power agreement

d) Prepare all documents for the tip facility to contain 120,000 cubic metres of material to a stage ready to go to tender by 31st August 1990.

The consultant will be responsible for the design section of the scheme as outlined above. The works may be carried out by the main contractor for the power station site.

The Consultant will supervise the works so as to represent the Council's interests leaving Ove Arup to represent the interests of Corby Power.”

In relation to the reclamation of Toxic Ponds 1 and 2, this is broadly what happened. Dr Smith designed the contaminated tip facility. Ove Arup designed the reclamation. Mr Ibbotson, Dr Smith (to a lesser extent) and Mr Buckland supervised the works.

508. On 20 April 1990, NCC's inspector went to Deene Quarry. In the first inspection sheet in the documents before the Court, he records that there was 24 hour access to Deene Quarry from the Gretton Brook entrance and the entrance off Phoenix Parkway (which was later to become Mitchell Road). There was non inert waste on the site (in breach of the licence) and mud on Gretton Road caused by Weldon road tippers.

509. On 24 May 1990, the LRCG meeting minutes record that the "fencing to Deene Quarry [was] complete-the site is now secure". Whilst the fencing may well have been complete, the site was not and did not remain secure. The following is also minuted:

"KRW [Mr Webster] said he would still like an overall master-plan for Deene Quarry, including constraints and accesses etc, to go to committee. Planning applications could then be submitted as necessary.

Supervision - to control tipping etc - KRW said staffing issues to be considered at next meeting."

There is no evidence that there was "an overall master-plan"; all that happened was an ad hoc use of Deene Quarry as and when it was thought expedient.

510. By the next meeting of the LRCG on 5 July 1990, it was decided that the tip containment facility should also take contaminated material from the Willowbrook North area. Over this period, Dr Smith was researching for the design of the contaminated tip facility and was considering what sort of lining was required. Tenders were invited in August 1990 for the supply and installation of the lining.

511. In September 1990, Ove Arup in a report indicated what Corby Power's intentions were in relation to Toxic Ponds 1 and 2:

"The proposed reclamation works can be summarised as :

1. The removal of oils to a licensed incinerator.
  2. The disposal of polluted water to Anglian Water Limited's Corby Reclamation Works.
  3. The excavation of approximately 100,000m. of contaminated ground to a prepared storage facility.
  4. The backfilling and compaction of material in the void formed by removal of contaminants.
  5. The importation of about 90,000m of fill material to make up site ground levels.
- Corby Power Limited intend to undertake the reclamation works contract starting in December 1990."

The excavation was further described:

"Immediately following the removal of oil and water, it is proposed to excavate a large swathe of ground around the lagoons. All of the excavated material will be transported, by suitable site haul plant, to a prepared storage facility. The design,

supervision and maintenance of the storage point is the responsibility of Corby District Council and their Engineer Mr Rod Ibbotson... Approximately 100,000m<sup>3</sup> of material will be removed to the storage facility.”

Ove Arup summarised their chemical test results:

“The chemical investigation has been undertaken in accordance with the classification system proposed by Kelly (1980). The ground was found to be contaminated by a number of substances, with Ammonia, Cyanide, Phenol, Sulphate, Sulphide, Toluene Extractable Matter and Zinc levels being particularly high.

(Note: Toluene Extractable Matter provides a measure of organic compounds, including mineral oils and Coal Tar Derivatives.)”

512. On 4 September 1990, Mr Webster wrote to NCC explaining what was intended:

“...The proposals are basically as follows:-

1) The existing void to be enlarged to accommodate the increased volume of contaminated material required for disposal, i.e. 100,000 cubic metres plus bulking;  
2). The design capacity of the void, is approximately 120,000 cubic. metres and this will allow for the addition of blending material, plus a capping layer upon completion of the tipping operation...

6) The first operation is to undertake the earthworks on the site to enlarge the existing void and produce side slopes of a gradient of 1 in 3, together with a slag access road around the perimeter of the void. A 300mm layer of sand is to be placed in the bottom of the void prior to the installation of the membrane, for protection purposes. The membrane to be installed to the base and sides of the facility with anchoring trenches around the perimeters of the void. An underfelt material to be placed between the membrane and the bank slopes for protection purposes. A further layer, 300mm thick, of sand to be placed in the bottom of the facility on top of the membrane to prevent damage when infilling takes place. The sides to be protected, also prior to infilling with tyres, etc. Upon completion of the infilling operation a -cover layer of fill materials to be placed over the contaminated tipped material to a minimum thickness of 1 metre. The membrane is then to be installed over the top and welded to the membrane located at the sides of the void. Cover material, minimum thickness 1 metre, is then to be placed over the membrane prior to further restoration on the site.

7) Gas venting tubes to be installed in the top of the membrane layer to vent any gases to the surface. These venting pipes will also enable the long term monitoring of the facility for any gas build up within the membrane.

8) The method of infilling the void is to import the contaminated material from the Toxic Ponds Area, place in the facility in layers and blend with suitable material from the Deene By Products Plant Area to ensure that the fill is more workable. The infilling operation is proposed to commence in December 1990 and take approximately 4 months to complete.

9) A. protective fence is to be erected around the tip facility.

10) The infilling operation to be monitored by representatives of the District Council.”

513. On 24 September 1990, CBC let to Weldon Plant the contract for creating the void for the contaminated tip facility. The Scope of Works was described as:

“The work involves the scrub clearance of the site, general earthworks to form void for future infilling and the importation and stockpiling of fill from adjoining site.”

The usual provision for Dust Nuisance was specified:

“...The Contractor must allow in pricing the work for providing and maintaining water sprays whenever necessary for spraying the haul roads etc. to prevent dust rising which would create a nuisance to adjoining property owners”

The Bills of Quantities identified 31,000 m<sup>3</sup> of the following material to be excavated:

“Excavate in any material in bulk in open, including mass concrete, reinforced concrete, brickwork, grillage foundations, piles, slag and original ground (chemically contaminated) depth varying between 0m and 5m, load, cart away and deposit in stockpile in Deene Quarry”

This involved the further movement of contaminated material which had already been shifted once to that part of Deene Quarry. Another 137,000m<sup>3</sup> of other material from the hill and dale formation was to be excavated. A haul road was to be constructed.

514. The amended waste licence issued on October 1990 entitled CBC to deposit waste now described as:

“2. Types of Waste

The types of waste accepted at the site shall consist of that described in the existing licence and contaminated material from the area of the Toxic Ponds and the Deene By Products Plant as defined by previously submitted analysis. Should waste entering the site appear to fall outside these permitted wastes it should be isolated and the Waste Disposal Authority informed. No free oil or aqueous waste shall be deposited at the site.”

No other material alterations were made. Thus the material to be placed had to be dry.

515. The lining work and the excavation work proceeded in November and December 1990. On 9 January 1991, the CBC contract with Agru was signed in relation to the lining for the contaminated tip facility.
516. Corby Power employed Balfour Beatty as its main contractor with a requirement to use a sub-contractor, Weldon Plant, selected by CBC for the placing of excavated materials into the tip facility.
517. In February 1991, the Environmental Advisory Unit of Liverpool University, having been retained by CBC the previous year, produced its report about Toxic Pond 5. The principal aims of the investigation were to determine the chemical composition of the liquors and

sludges present in that pond and assess the degree of contamination in order to define an appropriate reclamation strategy to allow the pond area to be re-developed. Conclusions included the following:

- i. The pond was found to be contaminated with sludges containing a high proportion of organic material of which a large fraction was composed of hydrocarbons derived from industrial processes...
- ii. The concentrations of inorganic contaminants were found to be generally low and do not preclude the methods proposed for the treatment of the sludges.
- iii. The water perched above the sludges was found to be relatively uncontaminated and poses no significant treatment problem.
- iv. A number of treatment methods have been proposed for the sludge material which include bioremediation, vitrification and consolidation. From the present data available bioremediation appears to represent the most viable option."

This recommendation was not followed in the event.

518. Dr Smith was anxious as to what the nature of the material would be when it arrived at the tip facility. He wrote to CBC on 6 February 1991 a few days before material was supposed to arrive:

"I understand from Rod that infilling is to begin on about the 11<sup>th</sup> February; that you have been informed verbally that some 95 to 100,000 m<sup>3</sup> of material are to be transferred; that ca. 10,000 m<sup>3</sup> will be sludge and the remainder "contaminated soils". Separate dumper fleets will be used for each material and a wet cell will be built in the tip to receive the sludges. We shall attempt a degree of thickening on site with our stock piled Deene Works clays.

I assume you have forwarded all the relevant information in the Council's possession. It appears, then, that you have no written statement of what the contaminated soils and sludges may contain. I cannot easily tell which of the analyses relate to sludge or soil; whether they are "U2"; or whether they are to be dug and transferred. Nor am I happy about trying to draw my own conclusions from a partial set of information when we are dealing with toxic waste, safety and health,

Corby Power would not be allowed by the WDA to move one load of this material off site without full documentation, yet they propose to hand us ca. 200,000 tonnes with so little information."

He wrote to Ove Arup on 15 February 1991 complaining in effect that firm had not supplied the requisite information about the nature of the materials which was to be delivered to the tip facility. He described their behaviour as "cavalier" to Mr Ibbotson on the same day. He had a meeting on 18 February 1991 with Ove Arup who showed him more geotechnical and chemical information so that he was able on 20 February 1991 to report to Mr Ibbotson that on his "crude guess" was that some 63,500 m<sup>3</sup> of slurry type material would be excavated from Toxic Ponds 1 and 2. Tipping started at the tip facility in mid-February 1991.

519. By 21 February 1991, the lining was completed at the tip facility and an extension to the lining was to be provided ( a contract for the extension being signed on 12 May 1991). At a LRCG meeting that day, it was reported that chemical alarms were going off and that vehicle operators at the Corby Power job on Toxic Ponds 1 and 2 were wearing breathing apparatus.

520. Weldon Plant as sub-contractor to Balfour Beatty deposited contaminated material on the haul road. Mr Ibbotson wrote to Ove Arup about this on 20 March 1991:

“Contaminated Tip Facility

Following my site inspection of yesterday I observed contaminated material and slurry being deposited at various locations along the haul road from the dump trucks transporting the excavated material to the tip facility.

I should be grateful if you could bring this matter to the attention of your contractor, Balfour Beatty, and ensure that the necessary precautions are being taken to prevent this happening again in the future.

I would consider that action taken now prior to the commencement of moving the slurry deposits in pond 2 would ensure that there is no disruption to your earthmoving operation as a result of having to clear up the mess along the haul road.

I propose to discuss with you on my next visit to Corby the necessary remedial measures required to clear up the contaminated ground along the haul road.”

521. From a letter dated 11 April 1991 from Mr Ibbotson to Mr Webster, it is clear that CBC was employing a contractor to move the contents of the Oil Pond to the tip facility. This was explained somewhat more in his later letter of 23 April 1991:

“I am pleased to be able to inform you that the majority of the oil, and oil contaminated material in the "Oil Lagoon" has been excavated and the slurry material placed in the tip facility. The pond will be backfilled to prevent filling up with water and the whole area surrounding the lagoon will be excavated and placed in the facility at a later date. I have requested a price from Weldon Plant for undertaking this work and based on moving some 3,000 cubic metres of material and subsequently backfilling the void, the estimated cost is £7,500.00.”

There was no entitlement under the Waste licence for material from the Oil Pond or Lagoon to be placed in Deene Quarry.

522. On 17 May 1991, Dr Smith wrote to Mr Ibbotson about the material deposited by Weldon Plant:

“As requested I sampled on 26.3.91 the windrows of clay-like material accumulating along the edge of the Corby Power haul road as a result of grader activity. The road surface was receiving a constant splattering of sludge and wet soil from the bodies of the trucks and from spillage slopping over the truck sides and tailgates. This was inevitably far worse on the incoming journey than on the return journey to the CP site (we have photos of the separate road surfaces going in and out of the tip). The

windrows comprise a mixture of pre-existing slag and ironstone soil, contaminated by splashing, and of sludges bladed off the haul road.

Representative samples from five separate, evenly spaced locations were analysed at NECL. Results are attached. All the samples are contaminated to levels unacceptable for landscaping etc. (i.e. For plant growth). The windrow materials should, therefore, be properly disposed of in the waste facility, or some other suitable burial site, prior to levelling the area for landscaping. Note the very high sulphate and high ammonia levels that are characteristic of the wastes from TWPl. There can be no doubt that the Corby Power site is the source of the contamination. We have retained samples for more detailed analysis, if required, to match the organic compounds with TWP 1 sludge samples...”

Dr Smith’s results for the relatively limited number of samples taken showed high levels of Toluene extract but low levels of Cadmium. Mr Ibbotson wrote back several days later saying that the contractor had excavated the “windrow material and placed it in the tip facility”.

523. The Deene Quarry site remained insecure. A memo of 27 June 1991 describes an incident:

“This section has recently been made aware of an accident at the above site in which a dog followed a rabbit on to the site and "fell" into a "pond" of sump oil and other toxic chemicals. Its owner gained access to rescue it through damaged fencing around the site. I am concerned that children and other persons may gain access to the area and be exposed to a similar risk. Please advise as to the action taken to avoid any future risk as I am given to understand that this authority is responsible for the maintenance of boundary fences and the security of such "ponds".”

524. By July 1991, the tipping from Toxic Ponds 1 and 2 was completed and CBC wished to secure an extension to the tip facility. A contract was let and work was proceeding by December 1991.

525. Deene Quarry remained insecure. The County Council wrote on 28 November 1991 to Mr Ibbotson (who passed it on to CBC) as follows:

“DEENE QUARRY LANDFILL SITE

At present there is unrestricted access for vehicles to Deene Quarry at the new Power Station end of the site. Recent developments here have meant that the original fencing and gates no longer afford any control of tipping.

This situation may have contributed to the influx of waste consignments containing wood, plastics, bitumen, etc., recently taken onto site and tipped nearby, whether this is tipping by unauthorised people or not, the consent for tipping inert waste only is being ignored and also the indiscriminate disposal of tangled reinforced concrete may give restoration difficulties.

The situation here contrasts sharply with the excellent restoration work achieved in other areas of Deene Quarry and perhaps you could view the area concerned and

establish what needs to be done to correct any of the current licence infringements.”

The internal reaction later in December was that permanent gates needed to be provided. I do not accept that there was excellent restoration work elsewhere in Deene Quarry at least judged by reference to public safety.

526. On 10 January 1992, NCC reported to CBC that more unauthorised depositing of inert waste had occurred at Deene Quarry, on this occasion from the Kingswood part of Corby. Mr Cropley’s apologetic reaction in his reply of 23 January 1992 was:

“The unauthorised importation of material has been suspended until such time as the matter can be regularised.

I am sorry that permission for this work was not sought in advance, this was unfortunately due to a misunderstanding of the situation between officers of this Council.”

The material was said to be for the filling of the Toxic Ponds. This indicates either a conscious disregard for the licence requirements or ignorance on the part of CBC.

527. Access to Deene Quarry was somewhat more restricted but still open by January 1992 as indicated by a CBC memo of 23 January:

“...there are [2] main access points to Deene Quarry. The gates off Gretton Brook Road should be kept locked at all times except when in use by the Council’s contractors. I assume that the Engineers Section have keys and can control usage.

However, in view of the Deene Raceway proposals to use the Gretton Brook Road entrance there is a danger of unauthorised access to the Deene Quarry area from this direction. This will need to be considered and appropriate measures implemented.

With regard to the new road off Phoenix Parkway, Corby Power have now erected fences around their site and I am not aware that they have permission to use any of the Council’s land for contractors compounds *or*

storage purposes. Unauthorised access from this direction is difficult to control without proper fencing. Universal Salvage will be required to fence their particular site. In the meantime I suggest that the land is bunded with access restricted to one point immediately off the new access road with a set of gates provided.”

Fly tipping continued as for instance was reported in NCC’s inspection log of 24 April 1992. Mr Cropley in a note of 27 April recorded that the locks on the Gretton Brook Road entrance gates were broken off and Corby Power was dumping waste on Deene Quarry. He arranged for Mr Bird to visit the site daily to check against unauthorised access and limited the availability of keys.

528. By June 1992, Mr Cropley and his team had prepared tender and design documents for Contract 70 for the reclamation of Toxic Ponds 5 and 6 and the two Candy Filter Ponds. Some 40,000 m<sup>3</sup> of contaminated materials were estimated as requiring excavation and removal. The works were described as follows:

“The works comprise the removal of water and sludges from the ponds. Disposal of sludges to a tipping facility within the site, approximate length of one way haul is 1.4km from Toxic Ponds 5 & 6 and 0.4km from Candy Filter Ponds North and South. Disposal of water to the Corby Sewage Treatment Works by pumping to a gravity sewer. Filling voids with suitable material”

The Engineer for the job was to be Mr Cropley. Relevant parts of the Specification were:

“112 Mud on the Highway

The Contractor shall ensure that the highway in the vicinity of the Works and any other highways used by the Contractor's vehicles are kept clear of mud and other debris falling from vehicles connected with the Works or spreading on highways as a result of the Works in any way and shall comply with Northants County Council Byelaws in this respect. Corby District Council is agent for Northants County Council.

Dust

In the event of protection being required against dusts, eg, when cutting through concrete, or placing and compacting PFA, an ori-nasal respirator with replaceable filter and exhalation valve will be adequate protection.

Vehicles

32. The Contractor shall take all reasonable precautions to prevent contamination of public roads by vehicles leaving the site. These shall include wheelwashing in the event of contact with toxic materials. These precautions are to be agreed with the Engineer.”

Tenders were invited on 7 July 1992.

529. On 25 June 1992, the NCC inspector recorded that there was “no local control, tip users appear to face no restrictions on types of waste brought onto site”. Later, in July, he reported “random tipping” and mud on Gretton Brook Road. Matters had not improved significantly in this regard by August 1992.
530. Weldon Plant was awarded Contract 70 on 10 September 1992. There is set out in the General History chapter of this judgement a history of Contract 70 which will not be repeated here. Mr Cropley, Mr Palmer and Mr Bosence (before he was moved on in about March 1993) were the supervisory team for CBC. Work including a new haul road was to commence on 19 October 1992 as recorded in the minutes of a meeting held on 15 October 1992.
531. The extension to the contaminated tip facility, which was supposed to have been completed many months before, had been suspended since December 1991 and it was only in about September 1992 that work resumed. As recorded in a letter of 6 October 1992 from Mr Ibbotson to CBC, the first thing that needed doing was 24 hour pumping out of a large quantity of water which had accumulated in the hole which had not been capped

beforehand. This must have been contaminated by what had already been deposited there from the Toxic Ponds. The contaminated water was just to be pumped onto adjacent land.

532. Weldon Plant had a independent organisation, Environmental Resources Ltd, do a survey; it reported in November 1992 as follows:

*“AREAS IN DETAIL*

The ponds gave an oily, tarry odour. The fact that they have an odour indicates that they contain some volatile or semi-volatile compounds. The sludges are due to be removed and tipped in a previously prepared toxic dump away from these pits, and the water is supposedly fit to be discharged into the foul sewer. These disposal routes are outlined in the tender specification. The fly tipping around the toxic ponds appeared to contain waste organic materials, again giving organic odours. Some of these wastes are unidentified.

The fly tipping in the central areas of the site appeared to consist of concrete, building wastes and sub-soils, but only on excavation could all of these materials be identified. Stockpiles of materials in the southern and south-western regions of the site appeared to consist of what would usually be described as inert materials, being comprised of excavated subsoils, clays, stone and other materials that for earthmoving purposes would normally be classed as 'muck'.

The central and eastern areas of the site, in the ungraded and rough areas showed several signs that give cause for concern...

- Some fibrous material was found in the surface material in a fuel ash area (ref. TPC/1). Not being wood fibre board or fibreglass, this material was therefore considered to possibly be fibrous asbestos. Subsequent analysis has shown this to be the case...
- Large amounts of exposed slag were present over the central areas. The slags were variable in their density and physical appearance. It was apparent that most of the exposed slag walls which faced the south were covered in white crystalline deposits. It was apparent that these slags were undergoing degradation due to leaching. Products in the slag are dissolved in either rain or groundwater and are deposited on the slag surface as the sun dries out the surface, evaporating the water and leaving the salts behind. This would appear to indicate that these slags are unstable.
- The slags themselves appear fairly variable. The chemical composition of these slags is unknown. Slags from former metal production processes are known to sometimes contain high concentrations of metals and sulphides.
- Leachate was running freely from one of the exposed faces in the central area. The composition of this leachate is currently unknown, as is the final destination of this leachate.
- Several locations in the central area showed signs of oily contamination. Oils seepage and staining were visible, and surface scraping of these areas revealed oily sludges. The type(s) of oil was unknown, but odours were similar to those of quenching oils...

Owing to what was found on the walkover on the site, seventeen samples were taken

of a wide range of materials...”

Cadmium and Chromium were found to be relatively low but there were some raised levels of Nickel and Toluene Extract. The overall results were summarised:

“The results showed that significant contamination was present on the site in some of the samples examined. As stated earlier, this is not a complete contamination testing suite, but it has shown that there are a number of contamination problems on the site which may need addressing prior to work in this part of the site.”

- 533. Weldon Plant was also awarded a contract by CBC on 4 November 1992 for earthworks at the contaminated tip facility. The work involved site works and general earthworks to form the void extension together with the provision of sand infill for the void. Anglian Water permitted the discharge of the water from the ponds into their sewers.
- 534. By 3 December 1992, because the extended tip lining work was incomplete, it was resolved that the sludges for Toxic Ponds 5 and 6 should be deposited temporarily in the Candy Filter Ponds. This was started on 8 December as recorded by Mr Bosence. The County Council recorded mud on Gretton Brook Road on 8 December 1992.
- 535. Sludge in slurry form began to be delivered to the tip facility on 2 February 1993. The haul road was and remained heavily contaminated by spillages from the contractor's dump trucks. On 9 February 1993, complaints were recorded from police as to mud on Gretton Brook Road; the sweeper had broken down, it was noted. The haul road was in part described in records on that day as being in an appalling state. The following day at the request of the police some mud was cleared from the road. But it was still present on 11 February as recorded by Mr Bosence. Mr Bosence asked the contractors to use the inadequate wheelwash.
- 536. On 24 February 1993 at Site Meeting No 5 on Contract 70, there was confirmation that Weldon Plant was mixing other material with the sludge which was in slurry form within the contaminated tip. Thus it was being delivered to the tip wet.
- 537. Sampling was done of the wheel wash water by BSC who reported to Weldon Plant on 2 March 1993 that it was relatively unpolluted. However, as Mr Bosence said, it was not being used much if at all. The haul road continued to be awash with contaminated material. On 9 March 1993, Mr Buckland recorded that spillages were being bulldozed into the hill and dale formation (as opposed to the tip facility). The series of misfortunes which had occurred on Contract 70 led to Mr Ibbotson's letter of 9 March 1993 set out earlier in this judgement.
- 538. By May 1993, the future of Deene Quarry was reviewed by Mr Phillips in a memo to Mr

Webster. 8 acres had been sold to Corby Power (including the site of Toxic Ponds 1 and 2, 20 acres (including the rest of the Toxic Ponds) was on offer to Universal Salvage, and the rest was earmarked as amenity or Deene Raceway or as a "Trails Park".

539. Contract 70 was completed by about 30 June 1993, albeit substantially late. Weldon Plant's final account referred to some 42,000m<sup>3</sup> of sludge or contaminated material being excavated and disposed of. Some 37,000m<sup>3</sup> of slag was imported from elsewhere on the site to mix with the sludge. An extension of time of 10 weeks was sought for the delay.
540. Fly tipping was reported as continuing in August and September 1993. The gates were open and the tipping remained until at least November 1993.
541. Contracts for drainage and tip restoration at Deene Quarry were let by CBC to Noone & McGowan in November 1993. The drainage work was on some 24 acres of Deene Quarry and involved excavation (some 2,700m<sup>3</sup>) and lining for a balancing lake and an associated inlet ditch and outlet structures including a head wall into the Gretton Brook Road. These two sets of work had commenced by January 1994 and the drainage was substantially complete by about April 1994 and the tip restoration by about August 1994.
542. Yet another contract was let by CBC in January 1994 to Weldon Plant for earthworks which comprised excavation and removal of contaminated material, concrete, steel, and existing non-contaminated material, placing in contaminated tip on site, importing cohesive material and placing in layers to provide capping to site. Some 12,500m<sup>3</sup> of contaminated material was expected to be excavated and disposed of in the tip facility. This was complete within a few months and no later than October 1994.
543. In February and March 1994, mud and mud staining was noted by the County council on Gretton Brook Road. There was a real problem over the first four months of the year with mud being taken out by vehicles for Deene Quarry on to the public roads as identified in the CBC memo of 14 April 1994 set out earlier.
544. At some stage in late 1994, CBC sold the 24 acre site which included Toxic Ponds 3 to 7 to Universal Storage. The balancing lake was on or at least partly on that land.
545. Activities proceeded on Deene Quarry. A diary note for 19 January 1995 describes the haul roads to Deene Quarry as "very wet and muddy".
546. In February 1995 a contract was let by CBC to Weldon for landscaping at Deene Quarry. Work on this was to start in March 1995. The formal contract is dated 2 April 1995. The works comprised the excavation and removal of contaminated material, concrete, steel, and existing non-contaminated material, placing in stockpile on site, importing cohesive

material and placing it in layers to provide capping to site and taking topsoil from existing stockpile and spreading and seeding. Over 4,000 m<sup>3</sup> of contaminated material was to be excavated.

547. Mud continued to be a problem emanating from Deene Quarry. NCC wrote on 10 March 1995 to CBC:

“Secondly, it has recently been brought to my attention that there have been problems of mud on the road along Gretton Brook Road associated with activities at Deene Quarry. Whilst it is recognised that there are no conditions imposed upon planning permission 4M which can control this situation, it is felt that more could be done so as to prevent what is potentially a highway safety problem along this stretch of road. It was noted at a visit to the site on 9th March 1995 that a temporary warning sign advising of mud on the road had been installed and I am writing to enquire if it is possible for additional measures to be employed on site to prevent mud being brought out onto the highway.”

548. A diary entry of 20 March 1995 records that Noone & McGowan had taken “loads of unsuitable material” to Deene Quarry. As from April 1995, contaminated material from the Willowbrook North reclamation started to be deposited in the tip facility. By late May 1995, the LRCG was being told that the tip was nearly full. Mud on Gretton Brook Road was again reported. Although on 6 June 1995, the County Council reported the facility as full, it also recorded that Willowbrook material was still being brought in. The tipping continued nonetheless. Although at least Mr Palmer was aware of this concern, it is not minuted as being discussed or raised at the next LRCG meeting on 22 June 1995.

549. Fly tipping continued at Deene Quarry as confirmed in a County Council inspection log for 12 July 1995, which by inference indicates that the entrance at Gretton Brook had not been kept locked. They were then locked but entrance was gained by fly tippers through a gap in the fence.

550. By August 1995, Rockingham Speedway was very interested in buying and developing the eastern end of Deene Quarry. A meeting between CBC and the Environment Agency on 25 August 1995 discussed this. The notes record:

“M.B [Mr Bosence] stated that during the excavation of the cell for the storage of soot/slag material a coal tar lagoon was found, subsequent testing indicated that the material was of very high carcinogenic properties. To compound problems the material was backfilled over reinforced concrete.”

This highlights that some excavation in contaminated material had been carried out over the preceding period to provide a deposition area for the material to be expected from the Soothills reclamation.

551. In about October 1995, CBC had received tenders for the capping of the contaminated tip

facility. A contract was let to Noone & McGowan and the work was proceeding by November.

552. There was evidence referred to in oral testimony which I accept and to some extent in records that much of the tipping of Soothills material was from a face; put another way, lorries were dropping their loads from a great height into the depositing area. In dry conditions, this would have generated substantial quantities of dust.
553. In late 1995 and well into 1996, another contract had been let or possibly a variation to another contract had been issued by CBC for the provision of a liner to cover the tip facility. There is no contract documentation before the Court about this contract or variation but there is reference in LRCG meetings in January and February 1996 to progress on the “liner”.
554. Various NCC inspection logs in the first part of 1996 demonstrate that the wheel wash at the Gretton Brook Road entrance was inadequate. Mud continued to be deposited on Gretton Brook Road.
555. As at 14 March 1996, the LRCG meeting minutes record that the tip works were substantially complete, although later documents suggest that some work remained to be done. The Gretton Brook Road entrance was still being used by a “concentrated number of lorries” on 18 April 1996 as noted by NCC on 22 April 1996.
556. It was in March 1996 that tenders were received for the Soothills reclamation which involved substantial works at Deene Quarry to enable the materials excavated from Soothills to be accommodated.
557. Much of the history relating to the Soothills work is recorded earlier in this judgment and will not be repeated here. Fly tipping continued largely unabated throughout much of 1996 and 1997 and there seems often to have been unauthorised access through the Gretton Brook Road entrance. There are a number of complaints by the NCC inspector about loads, such as tarmac and wet loads, being deposited at Deene Quarry, which were unacceptable. An example is on 13 June 1996 when an unacceptable wet load with tyres was deposited. Work had started on Soothills and material was by then being transferred to Deene Quarry. This history suggests that such controls as CBC had were inadequate and that CBC was and was kept aware of these inadequacies.
558. By July 1996, CBC knew that the area which it had designated for the Soothills wastes would not be large enough. A file note of 19 July 1996 from Mr Palmer confirms this: the extra 75,000m<sup>3</sup> was to be laid in a one metre layer over clay in cells and topped with  $\frac{3}{4}$  of a metre of “clay type material”; it was not proposed “to formally engineer the base or the

cap". It does not appear that this was designed by any independent consultant.

559. Fly tipping persisted through the Gretton Brook Road. The NCC log for 3 September 1996 records that material was tipped on the internal haul road. The gates had not been padlocked or manned.
560. By mid-October 1996, Deene Quarry was receiving up to 180 lorry loads of contaminated material from Soothills. The Mills Road Phase 4 contract works had started in late September 1996 and were probably completed in early December 1996 and that involved the importation of excavated material from the Gretton Brook Road entrance. It was reported as progressing well towards the end of October 1996 in the LRCG meeting minutes for 29 October 1996 as well as the fact that a new void had had to be excavated for the Soothills material as the first was full up.
561. On 12 November 1996, the Environment Agency Report records that the Soothills material continued to be imported into Deene Quarry: "appreciable quantities each week despite lack of void space". On 20 November 1996, the Environment Agency wrote to Mr Ibbotson at CBC referring to the fact that there were on Deene Quarry stockpiles of large quantities of graded waste materials from Soothills. Mr Ibbotson wrote on 24 November 1996 to Mr Webster in relation to that saying that the stockpiling and recycling of such materials appeared to be in breach of the site licence conditions. Site roads were noted as being very muddy and that some mud was getting onto Shelton Road.
562. At the LRCG meeting of 19 December 1996, it was accepted that the security at Deene Quarry would have to be "stepped up" and it was agreed that Mr Buckland would control the site. This suggests, as seems to have been the case in any event, that there had been inadequate security and control up to that stage.
563. By the third week in January 1997 the Environment Agency was recording on its inspection log that the state of the site roads internally was "appalling" and that Soothills material stockpiled on Deene Quarry was being removed. Later on 5 February 1997, it recorded that this was continuing and was contrary to the licence. A later report shows that some of the material was being used for a haul road on site. It was only on 13 February 1997 that Mr Ibbotson told Noone & McGowan to stop. Mr Ibbotson in his letter of 17 February 1997 to Mr Webster told him that the stockpiled slag was found to be "Difficult Waste" and well above threshold levels with regard to arsenic and sulphate and "much greater than the information previously given" to him by Noone & McGowan.
564. Mr McGrenaghan sent a memo to the Chief Executive on 27 January 1997 recording that, although the access gate at Mitchell Road was locked, at Gretton Brook Road was not; he observed a Noone & McGowan lorry enter with a load of "muck" from another site. The Chief Executive's response was that it might be that this was legitimately capping material

for Deene Quarry. vAs at the LRCG meeting of 20 February 1997, there remained capping off of slag deposits at Deene Quarry.

565. On 25 February 1997, Mr Webster wrote in answer to Mr Ibbotson's letter set out earlier in the judgement:

"Thank you for your letter dated 17th February updating me on various matters at Deene Quarry.

We did of course discuss these at length at the Land Reclamation Co-ordination Group meeting on 20th February and I emphasised the need for a strict control regime at the tip, for the following reasons:

- (i) To ensure the Environment Agency is convinced that we are taking our responsibilities seriously, and are acting on their requests.
- (ii) H.M. Customs and Excise can be satisfied that we are ensuring compliance with Landfill Tax regulations,
- (iii) Corby Councillors can be reassured that we are not turning a blind eye to illegal tipping, or failing to collect money from contractors where it is due.

You confirmed that everything would be in place to enable stricter control of the tip from 24th February. Please liaise direct with my Senior Engineering Technician, Mr. Bosence, on any detailed aspects of Noone and McGowan's activities. It would be desirable if the majority of the cover material they are required to bring in to Deene Quarry, under the

Soothills contracts, arrives by the end of March. We can then commence, with the Environment Agency, the procedure for closing the tip and handing back the licence.

One further point is that the local ward councillor is concerned about mud on the Gretton Brook Road and will be objecting to the current planning application for extending the period for the reclamation entrance on Gretton Brook Road. It is imperative that prior to the Planning Committee on 6th March that the mud on the road situation is tackled.

Please ensure that the wheel wash is operational and Noone & McGowan's vehicles use it without exception. Should conditions require it, road sweepers should be used."

This suggests a number of things. First, there was still mud on the road. Secondly, contractors were not using the wheel wash regularly if at all. Thirdly the control of Deene Quarry had been inadequate to date, so that stricter control was required.

566. Mr Bosence wrote what was clearly a frustrated note to Mr Webster on 28 February 1997 to seek explanation as to why there had been breaches of the terms of the licence:

"I attach a copy of the WAMITAB certificate presented to J. Buckland. As you are aware, the tipping operation recently supervised by J. Buckland was the placing of contaminated material excavated from the Soothills Site into a contained cell. I have examined the certificate issued to J. Buckland and it clearly states that it is for the managing of landfill operations of biodegradable waste. The Soothills waste is not biodegradable but is Category F Special Waste. It would appear that the tip supervisor does not hold the correct certificate to manage the filling operations on the behalf of

Corby Borough Council.

I also attach inspection reports regarding the above site No 09308, 09320, 09348, 10014, 10471 issued by the N.C.C. under the Environmental Protection Act 1990. I would make the following observations that I would wish you to investigate.

1. Report No 09308. Why are Weldon Plant using Deene Quarry to tip Contaminated soil from the Eurofleet Site.
2. Report No 09320. N.C.C. tip inspector states that the Contaminated Cell has now been filled. The inspector further states that over filling must not [sic-now] be witnessed. It would appear from that statement that illegal activities took place. What was done to stop this by our independent site inspector employed by C.B.C.?
3. Report No 09348." The amount of imported material has now exceeded that necessary to restore Contaminated cell". Was the material contaminated, where did it come from, what additional provision were made to contain this material and prevent contamination to surrounding areas, has the location of this material been identified and recorded.
4. Report No 10471. The report clearly states that Weldon Plant are importing material from Geddington Road. What provisions were made to record the importation of this material, what system was setup to recharge Weldon Plant when carrying out works for a private client and using the C.B.C. Deene Quarry Tip. Has there been a financial loss to this Council in respect of losses in Tipping fees?

As you can see there may have been a large scale uncontrolled tipping operation at the above site with a possible financial loss to this Council. What records have made by the tip inspector who was responsible for overseeing this operation?"

It is clear from Mr Bosence's evidence that it was his view that there had been large scale uncontrolled tipping at Deene Quarry and that he considered Mr Buckland's involvement as inadequate.

567. On 4 March 1997, Noone & McGowan wrote to CBC saying that 15,000m<sup>3</sup> of material had come from other non-CBC sites. There was evidence that 8,000m<sup>3</sup> came from an old cinema site in Kettering and was probably clay for capping. Mr Buckland's note book for early March shows that contaminated material was still coming from Soothills. As at 13 March 1997, part of the Soothills stockpiles which had not been removed remained on Deene Quarry.

568. On 10 March 1997, Mr Ibbotson wrote to Mr Webster confirming the following:

"There are no specific records of materials being deposited in Deene Quarry, except to say that substantial volumes of fill were being delivered to the site by various contractors, with apparent approval from CBC. This material was used for restoration purposes."

Apart from some notebook notes from Mr Buckland in the late 1996-early 1997 period, there are no records of what was deposited at Deene Quarry or in what quantities or from what source.

569. Dr Smith confirmed on 12 March 1997 that he had had a very limited involvement in Deene Quarry; he had only considered the tar lagoon encountered and considered the one in sixty lorry loads which were sampled.

570. By late March 1997, the remaining stockpiled slag material from Soothills was being placed in Area C of the contaminated tip facility. This continued for some time and large quantities of dust were generated. The capping of the slag deposits had not commenced by the end of April 1997 but it had started by 8 May 1997.

571. On 25 March 1997, the then Safety Officer, Mr Larter, of CBC reported to the Chief Executive about the operation of the Deene Quarry:

“I informed the Chief Executive that I intended to advise the Council on the Current operation of a licenced tip at Deene Quarry.

I have had an opportunity to consider the operation of this tip, the management of the facility and the generation of waste as an Authority and in particular waste and special waste at CBC engineering construction sites.

I am concerned that a substantial number of irregularities are indicated in the documentation provided and I feel it necessary to draw to your attention the concerns I have regarding the proper operation of this facility.

I was not aware of either the existence or the operation of a licensed waste disposal facility until 1992. Prior to this date the Engineering Project Team had its own Safety officer Mr. Benson Downey. I assume it was Benson Downey who was involved in the original application for a Licence and provided a working plan for the work of clearing the Corby Power site.

I was made aware that the Corby Steelworks Deene Quarry tip was to be used for the clearance of the Toxic Ponds in 1992 and Contract 70 described the scope of the works as the removal of water and sludges to a specially designed tipping facility within the site. My understanding was that the Deene Quarry site work was to be overseen by a Consultant Engineer who would arrange to tidy up the existing toxic pond site, dispose of the special waste materials into a waste cell, cap and close and maintain the tip.

This belief was confirmed when I received a letter from R.C. Ibbotson Consultant Engineer dated the 24 November 1995 informing me that the capping of the infilled chemically contaminated site at Corby Steelworks Deene Quarry tip would begin on the 27 November 1995.

The implication was clearly that the site was full and ready for capping.

I was extremely concerned therefore to be informed on the 12 March 1997 that A Licence C20 Deene Quarry was still in operation and that changes in the licence had been applied for and received. I understand that as well as the new materials under the licence being tipped, unauthorised waste outside of the terms of the licence, including special wastes had been placed in the tip with the knowledge and acceptance of employees of Corby Borough Council. I also understand that the site although in control of the CBC Agent Consulting Engineer was open and uncontrolled for a considerable period during which time it is alleged unspecified unauthorised tipping

may have taken place. I was concerned to see that a proposal was made to the DODS [Director of Development Services] by the Consulting Engineer for more (special) waste to be placed on the Deene Quarry tip site as late as February 1997...

As we may be unaware of the contaminants from the unauthorised tipping it is very important to advise any Contractor carrying out this work that known contaminants and unknown contaminants may be present...

Known Contaminants on the site include:

|         |                     |
|---------|---------------------|
| Solids  | Coal tars...        |
|         | Heavy metals        |
| Liquids | Phenols...          |
|         | Toluene             |
|         | Mineral oils        |
| Gases   | Hydrogen Cyanide... |

Unknown Contaminants and the effects of cross contamination and mixtures of unknown chemicals may already be a serious problem...

Records of waste appear to have only been kept over a very short period and those records indicate only inert waste being on site. Other information would indicate differently...

The safety plan is not on site neither is a copy of the notification made by the Planning Supervisor to the HSE of the commencement of Construction works..."

There appears to have been no answer or challenge to the contents of this memo.

572. Unauthorised entry was still being recorded by the Environment Agency near the Gretton Brook Road entrance on 21 May 1997. The membrane work involved in the capping continued in June as did the spreading of material, which included some contaminated material. In late June 1997, ground conditions were said to be muddy due to bad weather.

573. As at 7 July 1997, the LRCG meeting was told that there were some stream works still needed, infilling, bank improvements, grills over both culvert ends, clearing out of stream beds and some 8,000m<sup>3</sup> of earthmoving still required.

574. On 10 July 1997, the Environment Agency wrote to CBC as follows:

"The Environment Agency therefore, accept that Ray Bird and Mark Bosence, with reference to their qualifications and prior experience... should be approved to act as the technically competent persons on a temporary basis for the sole purpose of completing the capping / restorations of the area of deposit of the Soothills waste. This work you have estimated will take 7 weeks to complete. I will require a date when works should be complete to be submitted in writing along with regular updates on the progress of the capping and works still to be done. This approval to continue the works does not in any way give approval for the use of the lime dust over the membrane which is currently subject to discussions between Mark Bosence and my colleague Adrian Lack. Once the works have been satisfactorily completed all works

shall CEASE at the site with the exception of environmental monitoring and any other measures deemed necessary by the Environment Agency for the purpose of preventing pollution of the environment and harm to human health. I understand that the site entrance will be closed off after the specified works have been completed.

No further deposit of waste or restoration work shall occur at the site until further notice pending the independent report on the site and agreement with the Environment Agency. The problem with the technical competent persons on the site will need to be addressed; It may be an option for the Environment Agency to consider a temporary suspension of the licence after the current works are complete.”

The “independent report”, if it was ever obtained, has not been provided to the Court.

575. Mr Bird spent some time after about June overseeing the works at Deene Quarry, being done by Noone & McGowan. By August 1997, the Environment Agency was reporting the Soothills capping on Deene Quarry as complete.
576. Over the following months, there were extensive discussions about the purchase of the north eastern part of the Deene Quarry site by Rockingham Speedway. There was concern to ensure that the substantial quantities of contaminated material particularly from the Toxic and Candy Ponds in the tip containment facility and the Soothills materials were not disturbed and that the monitoring of gas and water continued.
577. In July 1997, Ove Arup was asked by CBC to do a “landfill audit” on most of the areas. By the time of its draft report in March 1998, it had not been given access to the paperwork and had not carried out any site investigation in relation to Deene Quarry or the Toxic Ponds. This part of the audit was never done. The result is that there is no comprehensive back analysis of what contaminants went where and in what quantities; one can only review the historical documentation that remains.
578. There is no record of any significant work being done on Deene Quarry after August 1997. By the time that Rockingham Speedway began work in mid-1999 on the site which it purchased from CBC, the tip containment facility was fenced off. Over the following months, some of the Soothills material was relocated by Rockingham Speedway, as confirmed by the Environment Agency’s inspection logs of 9 October and in December 1999. The quantity is unclear but I infer that it was not insignificant as its relocation continued over some four months. The relocated material was capped. The Rockingham work was sufficiently completed by May 2001 to enable the first race meeting to be held.
579. I conclude from the whole history relating to Deene Quarry as follows:

- (i) save in very limited respects, there was little or no effective control or monitoring on the part of CBC of Deene Quarry;

(ii) very large quantities of contaminated material were deposited by contractors engaged by CBC on Deene Quarry between 1983 and 1997 (inclusive); between 1985 and 1992, much of this was deposited in a relatively indiscriminate fashion and slurries were just deposited on the surface. There was a substantial quantity of material excavated within Deene Quarry itself and transferred to elsewhere on Deene Quarry. There was over the years a substantial re-moving of material which had been deposited earlier.

(iii) with regard to the licence, as amended from time to time, CBC operated without any license until April 1987; thereafter it substantially proceeded as if there was no licence or at the very least in substantial disregard to the provisions of the licence; there were substantive breaches of the waste licence when it was given;

(iv) save as from the last quarter of 1996, no and certainly no effective wheel washing facilities were provided anywhere on Deene Quarry; even that facility provided at Shelton Road was not apparently operated effectively.

(v) over the whole period 1983 to 1997, substantial and significant quantities of contaminated mud and dust were taken out onto the public roads from Deene Quarry on lorries and deposited on those roads;

(vi) over the whole period, dust was created on Deene Quarry by and during haulage of contaminated materials on lorries within the site and by operations on the site, such as earthmoving, grading and levelling of contaminated materials.

### **Soothills**

580. There is already set out in this judgment a substantial part of the history relating to this part of the reclamation and it will not be repeated here.
581. This was an area to the south west of the main part of the BSC site. The site was some 65-70 acres. The Soothills and Sootbanks doubtless colloquially described what had broadly been deposited at the site in question. Materials were deposited by BSC and its predecessors over many years on low land alongside Willow Brook South in the relatively early years of operation of Corby Iron & Steelworks. The materials predominantly comprised waste slags and flue dusts. The proportion of coarse flue dust, locally known as blast furnace “soot”, gave rise to the name of Soot Banks (or Soot Hills). Over the years the heaps were weathered and vegetated naturally with moss, grass and birch scrub.
582. An investigation was carried out by Norwest Hoist Soil Engineering Limited, in 1986 and 1987, to try to establish the nature of the wastes and also to investigate an area of old quarry land to the south. The reclamation strategy at that time had been to excavate a large void in the boulder clay to the south, bury the wastes and cap them, then transport the boulder clay arisings to Willowbrook South, and form the base for an extension of St

James' Industrial Estate. Although the in-situ boulder clay proved very suitable for creation of a containment repository, the strategy was not put into action. Parts of the Soot Banks, which contained particularly high proportions of 'soot', were then excavated by a local contractor who removed the screened fines for various uses including colourant for cement and bricks. These excavations and screening operations continued until early 1996 when the reclamation potential was again recognized as part of the redevelopment of the increasingly rundown industrial estate. The strategy developed by CBC's Special Projects Team (as opposed to independent consultants) entailed removal of the Soothills to a dedicated repository at Deene Quarry. The cell was to be created from old ironstone quarry backfill (consisting of sandy clay), and the wastes would be capped by an impermeable layer. Any material considered unsuitable for this treatment, eg. as a result of particularly elevated metal content, would need to be taken to another nearby commercial tip. Correspondence with the WRA (now the Environment Agency), formalized into the revised Waste Management Licence for Deene Quarry, indicated that any material with heavy metal values similar to, or in excess of, those recorded in a 'hot spot' at pit 5 (in 1986) would not be permitted to go to Deene Quarry. Much of this was set out in Dr Smith's report of June 1996, entitled of Pre-Contract Investigation of Soot Banks Remnants.

583. Having acquired the Soothills and Sootbanks site in 1983, it is clear from an early stage that CBC had high hopes of being able to reclaim the area. It was particularly unsightly in any event. CBC through Mr Ibbotson and Dr Smith retained Norwest Holst in February 1986 to carry out a ground investigation there. Their report dated July 1986 referred to the fact the investigation comprised 31 boreholes and 10 trial pits and that detailed chemical testing was undertaken on selected soil and water samples from across the site. They found underground obstructions which led to boreholes being abandoned; these or at least some of them were probably the fused and solid wastes which were later found in 1996. Cadmium up to 8 mg/kg was found; chromium was not checked; toluene extract was measured and found to be relatively low. At Paragraph 1.6 of Appendix 1 to the report, "Interpretation of Chemical Test results", they wrote:

"The main problems appear to be the high alkalinity and presence of soluble salts such as Na<sub>2</sub>SO<sub>4</sub> plus generally high cadmium levels. TP5 is in a "hot spot" of metal enrichment and may include finer flue dusts from secondary precipitators. Variability of composition can be expected throughout the tips, though the major sub-division appears to be between the pale/grey-white dumps of limy material and the dark brown dumps of slag and flue dusts."

584. The LRCG meeting of 20 March 1991 was told:

"...Soot Banks - construction of the access road for the removal of the soot is underway. SL asked who will check the amount of material which will be taken. MP to check if pile has been surveyed and an estimate made on this basis."

There is very little detail of this work; it is however likely that this work was done either by or certainly with the active approval of CBC. It is likely given the nature of the material,

as eventually experienced, to have created dust and mud on the roads. There was no specification or quality control either of the construction of the access road or “the removal of the soot”. Later documents indicate that access roads were constructed with slag which would have spread contaminants around. At some stage between this time and early 1996, the toxic material from the area of Trial Pit 5 was removed by the organisation which was permitted to do so by CBC without any warning being given to them either not to do so or to take any relevant precautions. This probably took place in 1994-5.

585. Some fencing work was done probably in 1992 by Weldon Plant at Soothills. In March 1995, some site clearance work was being done with CBC’s knowledge at Soothills, as recorded in the LRCG meeting of 2 March 1995. In its application of 18 January 1996 to English Partnerships, CBC described the site as a “danger to local children who break in and play on Soothills”.

586. The invitation to tender for the Soothills reclamation work went out on 6 March 1996. It is of interest to record that the tender documents were drawn up by CBC and not by consultants and the work was designed and planned by CBC. Although Weldon Plant was the lowest tender, it being considered non-compliant, the contract (Contract 108) was awarded to Noone & McGowan later in March 1996. At the first site meeting on 19 April 1996, before work started, the following was recorded in the minutes:

“M Palmer stated that CBC would appoint a Chemist to test material at the Soothills site to determine its suitability as fill material at Deene Quarry. This would be an ongoing operation for the duration of the contract...M Palmer suggested a joint meeting between CBC, the Chemist and N&M to discuss ongoing sampling methods and recording of data.”

587. It was in this context that Dr Smith came on board. Neither he nor Mr Ibbotson was called upon to supervise or monitor the Soothills work although Dr Smith did become involved in checking the lorry load samples and to some extent the dust monitoring. In his letter of 2 May 1996 to CBC, he wrote:

“I looked around the site on 29 April with a view to formulating a strategy for advance sampling to obtain sufficient information to guide excavation and determine the most suitable tip (either the Deene Quarry, in the proposed new cell; or else in a contaminant site as requested by the WRA). Norwest Holst tested only a relatively small number of samples in the 1986 investigation and, I believe, tended to choose samples that were typical of different materials. The high metal results obtained from samples at TP 5 should not, therefore, be considered as applicable only to TP 5 and its vicinity, rather they should be considered as probably typical of the very fine grained variety of brown soot wherever it occurs.

Walking around the heaps, now that they have been dug open and spread around, the amount of white efflorescence is startling. I am fairly sure that this is all sodium sulphate...

The Soot Banks are now so spread out and so patchy that I think the best way of planning it out would be to spend two days trial pitting a.s.a.p. to try to obtain as

many representative samples of different mounds/terraces/materials as possible...”

It is worth bearing in mind that Dr Smith’s view that TP5 should be considered, not as an isolated occurrence but as typical of the brown soots around the site is consistent with what Mr Braithwaite said in evidence. Dr Smith later discovered more material not unlike the TP5 material.

588. Dr Smith’s firm started trial pitting on 8 May 1996 at Soothills. 16 pits were dug and 38 samples taken. He reported on his findings in his June 1996 report. He noticed that the site had obviously changed topographically in the light of the workings by the soot contractor. He reported low Cadmium (up to 2 mg/kg), low Nickel (said to be up to 750 mg/kg) and low Chromium (said to be up to 1500mg/kg). The two latter maximums are well over the ICRCCL trigger values and are possibly transposition errors for the chemical results tables in the Appendix to the report; if so, it does not give great reassurance as to the care with which this report was put together.
589. Mr Bosence was to be the assistant resident engineer. He was not present on the Soothills site all the time. Although there was some discussion in June 1996 about Dr Smith or a close colleague providing supervision, this came to nothing. It seems to have been thought too expensive to employ Dr Smith’s firm.
590. There is little to add to the history which is collectively set out above. I conclude in relation to the Soothills reclamation as follows:
- (i) the project was designed and supervised by CBC, who were not qualified to design or supervise the work;
  - (ii) the site had been substantially disturbed by the activities of the soot removal contractor over a period of several years prior to the commencement of the Soothills reclamation;
  - (iii) no wheel wash was provided on the Soothills site; no wheel wash was provided at the Shelton Road entrance to Deene Quarry until well into August 1996, at the earliest. Even when that wheel wash was provided, it was ineffective;
  - (iv) a very substantial amount of dust was created by the operations on the Soothills site both by the normal excavation and loading operations as well as the breaking up of the substantial quantities of fused material (something over 13,000 m<sup>3</sup>);
  - (v) a substantial amount of material, over 200,000 m<sup>3</sup>, was transported on lorries over public roads to the Deene Quarry site; for the first 1 to 2 months, the lorries were not sheeted as material was taken along Phoenix Parkway and in through the Gretton entrance; thereafter the lorries were sheeted generally but the sheeting was not always effective or provided;

(vi) material from the contaminated Soothills site was deposited on the public roads, in particular Phoenix Parkway, Weldon Road, Steel Road, Shelton Road and Geddington Road.

### **Longhills**

591. The history relating to this part of the reclamation is particularly poorly documented. It is necessary to seek to work out from secondary documentation what happened.
592. This site was known both as the Longhills or Weldon Slagbanks site and it was located to the east of Stamford Road and to the south of Weldon Road. The site was acquired by CBC from BSC in about December 1983, subject to terms that BSC could remove for sale piles of slag present. Perhaps given its location, it attracted interest fairly shortly thereafter. In April 1984, CBC engaged Soils Engineering Ltd to carry out a ground investigation to establish the ground conditions and geotechnical properties of the soils in relation to the design of suitable foundations for a proposed factory building 95 m wide and 220 m long. The total site was larger than that, comprising some 22.5 acres, as referred to in BSC's letter to CBC of 2 March 1983.
593. On 30 October 1983 Mr Ibbotson reported to CBC that "we are at present importing topsoil onto the Slag Bank site". He refers to the fact that Bennies was still removing screened slag from the various stockpiles of material on the site and that fly tipping was taking place.
594. The Soils Engineering report, dated April 1984 refers to it being the site of the old worked out Longhills quarry which had been worked during the 1940s. 22 boreholes were sunk and revealed generally up to a metre of crushed slag underlain by clay with gravel spoil. Residual heaps of crushed slags were found with deeper layers of slag to the north and south. No chemical testing was done although it was recommended.
595. In July 1986, Norwest Holst produced a report for CBC about the Longhills site. They did 62 boreholes and 18 trial pits. It referred to the fact that this site had been used by BSC and its predecessors "as a tip for slag and other iron works waste including flue dust from the primary catchers of the blast furnaces". Much of the slag was said to have been "transported by rail and tipped onto quarry backfill whilst still molten" but that "much of this slag has since been re-processed by crushing and large quantities have been removed from site for use elsewhere". Norwest Holst recommended vibro-compaction or dynamic consolidation of the site if it was to be developed. Some 19 chemical samples were taken (Cadmium up to 3.5mg/kg but no tests for Nickel or Chromium and two toluene extract tests). As to the limited chemical test results obtained, they reported that "metals were elevated, but still within ADAS recommended limits for agricultural soils and would certainly, therefore, present no problems from landscaping, or dust ingestion". They referred to their "reconnaissance analyses, covering the whole range of materials observed

on site, [as having detected] no significant chemical contamination”.

596. By 13 May 1987, Mr Ibbotson was reporting to CBC that Phase 1 of the Weldon Slagbanks was progressing satisfactorily with earthworks at an advanced stage. The order of the Phase 2 works had been given to Steetley for the stone crushing and to Shanks and McEwan for the earthworks. Excavated material was said to be being placed in the gullet with limited quantities being removed off site to Deene Quarry. This work was done by Shanks & McEwan.
597. Belatedly in July 1987, CBC formally signed a contract with Noone and McGowan with regards the provision of an access road to the Longhills development. The work included the construction of a permanent access to the site from the existing carriageway. This work had to be done to enable the development to proceed.
598. On 14 October 1987, CBC let to Cementation Piling and Foundations Limited a contract for the ground stabilisation at the Weldon Slagbanks site.
599. In November 1987, Geotechnics Ltd at the behest of CBC produced a geotechnical investigation report whose object was to establish ground conditions at the site to determine the engineering properties of the soils and to establish the groundwater regime and permeability of the soils with reference to a proposed stormwater balancing Reservoir. Three more boreholes were done and eight trial pits. At the time of this investigation there remained "several heaps of rubble and clinker in the western part of the site".
600. Mr Ibbotson in a progress report to CBC dated 10 April 1988 summarised the works as involving "the basic earthworks, installation of site drainage, the erection of protective fencing and the cultivating and seeding of landscaped areas." At that stage he identified the outstanding works then nearing completion is the crushing of remaining deposits of limestone and the spreading of the final layer of stone over part of the site. He recommended however that further infrastructure works be done to make the site more marketable.
601. At the LRCG meeting of 26 May 1988, it was confirmed that waste material from Longhills, approximating 10,000 m<sup>3</sup>, would be left at that site but would "have to go somewhere". The use of part of the site as a football field was actively being considered.
602. By letter dated 31 May 1988 to CBC, Mr Ibbotson summarised the excavation works which had taken place at this site as:

“...the removal of various miscellaneous deposits of waste materials from the site, the removal of all slag deposits, above and below formation level (wherever found), the

removal of approximately 1M to 1½M of general overburden to the design of formation level. All materials excavated were either removed to tips on site in landscaped areas, or off site to Deene Quarry”

He went on to explain that:

“to complete the site it is still necessary to undertake the removal to tip of surplus material and then to spread and compacted stone backfill upon completion of the earthworks, and the security fence should be erected to the southern boundary.”

603. These works took some time to implement. As at the LRCG meeting of 6 October 1988, it was reported that Mr Ibbotson was currently "completing survey of the muck on the site... and it looks hopeful that the muck can be put in Barnes Place gullet." By December 1988, a possible purchaser or tenant for the site, Matteson Walls, decided not to go ahead.
604. At the LRCG meeting of 9 February 1989 there is reference to separate tenders for the "Slag Banks muck shift" as well as for the landscaping. By the time of the LRCG meeting of 13 April 1989, the Phase 2 earthworks contract is said to be progressing. On 24 May 1989, Mr Ibbotson reported that this work had been completed. He said that the amount of material removed from the site was not sufficient to fill the adjoining gullet. Some 2000 m<sup>3</sup> more was required. By the LRCG meeting of 29 June 1989 the cultivating and seeding of the football pitch area was proceeding.
605. On 1 February 1993, CBC entered into a contract with Weldon Plant Ltd for the provision of a foul water pumping station and associated sewerage and pipe work. These works took a substantial period of time to commence, starting in May 1994 and being certified as substantially complete on 25 September 1994. This work was at the south end of the site and involved some excavation.
606. As from about November 1990 the site began to be used as a Sunday Market. This continued until the Sunday Market site near Asda was available to be used. Other than this use, little was done at Longhills until late 1992.
607. The next project to proceed was the Longhills Balancing Lake which was reported at the LRCG meeting of 1 April 1993 as by then being substantially completed. The contract for the balancing lake was formally signed in December 1993 albeit let to Noone & McGowan in the latter half of 1992. The work involved the excavation of over 60,000 m<sup>3</sup> and disposal of over 53,000 m<sup>3</sup> of material, in the northern half of the site. There was in addition a further landscaping contract let in late 1994.
608. There is no indication that wheel washing or sheeting of lorries were either contractually required for or provided on the various projects on this site.

609. I conclude in relation to the various developments at Longhills as follows:

(i) substantial quantities of contaminated materials were present on the site which had to be and were removed. Some of them were removed to Deene Quarry and therefore would have been carried by lorry on public roads.

(ii) The very limited site investigations indicate the presence of contaminated material on the site which would inevitably have been disturbed by the various operations which took place over the years on this site.

### **Willowbrook North**

610. This area included the site of the Deene Coke Oven and By-Product plant and what was a large slurry lagoon which had been covered over historically by BSC. The By- Products plant was to the north of the Oven. It was all to the north of what became Steel Road. Some of the southernmost areas of Willowbrook North, which became Arkwright Road, Shelton Road and other roads have been addressed in dealing with the Willowbrook South part of the Heavy End (see above). CBC was interested from early 1983 in developing this area, having purchased it in 1981. They were interested in creating areas for industrial development and that is why they arranged for the roads off and to the north of Steel Road to be constructed to service such development.

611. CBC was particularly interested in this area at an early stage. It engaged Norwest Holst in mid-1982 to investigate the site of the Deene and Glebe Coke ovens, which by then had had the superstructures cleared by BSC. The area of the site investigated was 1km by ½ km, which is over 230 acres; 83 boreholes and 45 trial pits or trenches were done over the whole site. Their Ground Investigation report dated November 1982 materially states:

#### **“5.0 HISTORICAL**

Records provided by the Engineer indicate that the ground conditions in the Deene site can be itemised under four basic headings.

1. Undisturbed ground.
2. Excavated ground which has been backfilled and consolidated as part of a cut and fill exercise.
3. Excavated ground which was originally backfilled by the dragline excavators, and then had 2 to 3 metres of material consolidated on top as part of the cut and fill exercise mentioned above.
4. Area of slurry pond and water courses.

5.1 The undisturbed ground consists of the southern area of the site, the approximate boundary being indicated on the site plan. In the mid 1950's, the level of this area was reduced... The maximum depth of material removed was of the order of 5 metres,

5.2 The material removed was consolidated into the trough left between the excavated quarry face, and the discarded spoil tips.

5.3 The remaining areas consisting of the tipped quarried material above the ironstone layer, was also levelled, and the ground level brought up to the 350.00 ft level by consolidating material from the cutting mentioned above, a consolidated thickness of some 2 to 3 metres being recorded. The ground was levelled with the intention of providing an area for the development of a complete new blast furnace, plant. The

B.S.C. engineers therefore took particular care to ensure that consolidation was carried out to the best standards so as to reduce the degree of future settlement. The first phase of this development on the site took place during the late 1950's with the construction of the Deene Coke Ovens and the associated buildings, including the acid plant, gasholder and amentity building.

5.4 Prior to the levelling exercise referred above, the "hill and dale" pattern of the backfilled quarried material was used as an area for settling the slurries arising from the blast furnace area. These were not properly constructed ponds but simply the natural contours allowing the water to find its own level by providing a dam across the valleys at the eastern end...

#### 7.1.4 Coke Ovens

Heavily contaminated ground is associated with the prior use as coke ovens, at two positions.

7.2...It is considered that the sites of the coke oven plants where the made ground is heavily contaminated would be unsuitable for development in their present state and it is recommended that the contaminated ground should be removed prior to development. Provided the materials are replaced with good quality fill compacted in a controlled manner, then it will be possible to construct foundations directly on this material. It is also considered that the material contained within the settling lagoons will be unsuitable for any form of ground treatment and if these areas are to, be developed; then this material will also have to be removed and replaced.

#### 7.4 Contaminated Materials

Preliminary analysis of the contaminated material at the coke oven sites was carried out by the Research Division of British Steel- as an addendum. Additional tests were carried out on selected samples in order to assess the organic content of the material so that a decision could be made as to the need for more specific organic analyses. These tests showed organic contents ranging from 0.24% to 1.42%, suggesting that the conclusions reached by British Steel with regard to heavy metal contamination would also apply to organic pollutants. Nevertheless, there are likely to be specific areas where high concentrations of pollutants are present which would require special treatment when encountered."

It is clear that the Deene Coke Oven area was itself heavily contaminated with oils. Chemical testing was done by BSC and BSC concluded that there were very low levels of zinc, lead and cadmium., although only a few sample s were taken on the Deene Coke Oven site. .

612. In the early days, CBC shared some of the information each obtained in respect of this area with the Commission for New Towns ("CNT") which was to acquire a site to the east but part broadly of this Willowbrook area. In September 1983 Nichols Colton reported to CNT about the eastern end of this area; they had drilled 7 boreholes and reported:

"The hill and dale formation was levelled in the mid 1950's with some additional material placed on top. Before this occurred, however, the north western part of the Willowbrook Industrial Estate was used as lagoons for settling slurries from the steelworks (shown on aerial photograph by Hunting Surveys, 1956 and on drawing

supplied by Commission for the New Towns) the material apparently flooding parts of the hill and dale formation. The original investigation (LR: 4375 dated July, 1981) proved that these soft clay/silt slurry deposits are still present in the area under investigation...

A chemical analysis was carried out by British Steel Corporation, Tubes Division, Corby, who concluded that the material is essentially a non-toxic inert flue dust consisting of a mixture of ore/sinter, coke, lime, limestone particles together with blast furnace volatilisation products such as zinc and lead."

Only sulphate testing appears to have been done. The earlier reports referred to are not available.

613. As early as March 1983, Rodney Environment reported to CNT about Willowbrook East as they described it, in particular about a flood containment system for the Willow Brook. There were liaison meetings about the area between CBC and CNT such as took place on 13 September 1983 when the following was recorded:

"2.05 He [Mr Hinvest of CNT] continued by saying that considerable chemical and bacteriological contamination had been revealed in the area, including raw sewage. This was of particular concern as people had been swimming in the ponds. The consultants report recommended that these ponds be fenced off.

2.07 Mr. Hussey asked what proposals Mr. Ibbotson had included under the recently let contract for dealing with the ponds.

2.08 Mr. Ibbotson replied that they would be emptied.

2.09 Mr. Read asked whether anything of a toxic nature was found.

2.10 Mr. Hinvest replied that the compounds were hazardous to plant life and also to people if exposure was prolonged. Some of the concentrations were above the limits for industrial development, but until further tests were carried out the position could not be clarified. He stated that this applied both to buried sludge and to surface materials and that cyanide, lead and zinc compounds had been found.

2.11 He continued that when the Commission saw the report, they might decide not to develop the area at all."

It is now lost in the mists of time what contract had been let by CBC for the emptying of what ponds. The report was one commissioned by CNT.

614. At a meeting held on 18 October 1983 between CBC and CNT, the following was noted:

"Haiste International have been instructed to examine more closely the 25 acres of land alongside the link road and Doctor Bell of Liverpool University has also been appointed by the Commercial Surveyor to carry out soil testing on Willow Brook. Preliminary indications are the ground on the northern edge of the site and the fill alongside Steel Road is phyto-toxic and the surface lagoons are carcinogenic.

As a result of these findings the fencing contract has been stopped and contractors working in the area have been warned of the findings - particularly the presence of hydrogen sulphide in excavations."

Thus, there were contaminated surface lagoons as well in the area.

615. In his report to CBC in December 1983, Mr Ibbotson described the buried slurry lagoon on these terms:

“LOCATION

The site of the buried lagoon is located to the north of the Deene Coke Ovens and bounded to the north by the "North Brook" and has an area of...32.61 Acres. The lagoon varies in depth between 0M to 9M and extends in an easterly direction onto the land which is in the ownership of the Commission for New Towns. The lagoon has been backfilled and buried to depths varying between 0M and 3M. The site is generally level.

HISTORY

The site under consideration has been opencasted for the winning and working of ironstone by the British Steel Corporation in the mid 1990's. The method of operation was typical hill and dale workings with parallel cuts being excavated in an east west direction. The area was then used as a settling lagoon by pumping slurry from the blast furnace area into the various valleys of the old workings. The slurry material was subsequently buried by placing backfill material over the lagoon and this operation was carried out in the early 1950's.

A limited amount of development has taken place in this area by the construction of the Deene By Products Plant in the late 1950's.”

The proposal was at this stage:

“REMOVAL OF LAGOON AND BACKFILLING

It is proposed to excavate the over burden material overlying the lagoon and store on site for subsequent backfilling, the slurry is to be excavated and deposited in a void in Deene Quarry or an area of land to the east adjoining Gretton Brook Road...Over burden is to be excavated from these areas and transported back to the lagoon area and the void backfilled and consolidated.”

616. Bostock Hill & Rigby produced a report for CNT following a site investigation of Willowbrook Central and West. Only Volume 2 of this report is in the papers before the Court. The investigation involved some 66 trial pits and chemical testing for amongst other elements Cadmium, Chromium, Nickel, Mineral oils, Coal tars and Toluene Extract.
617. At some stage in late 1983, CBC retained Braithwaite Contracting Ltd to carry out reclamation work of derelict land on the Willowbrook Industrial Estate. There is a contract memorandum to that effect. This probably involved some site clearance of surface materials, amongst other things in the southern part of Willowbrook North to the north of Steel Road, as this was the only area on Willowbrook North which was ever developed.
618. On 9 May 1984, WS Atkins' Mr Barry, had been called in by CBC to advise about

amongst other areas, Willowbrook North. He said about the slurry lagoon:

“Slurry lagoons

Your primary question prior to our recent discussions was in respect of the worker hazard in 'slurry' removal. In simple terms the 'slurry' material is not particularly offensive and the principal precautions would be in respect of personal hygiene and avoiding the inhalation of any dusts arising from operations. However, there can be no guarantee that other wastes were not deposited amid the slurry and which could be of a more sinister nature. Accordingly, alertness to such a possibility should be foremost in any removal operation.

There is, however, a further critical factor to be examined and that relates to the material overlying the 'slurry' and which would have to be removed first. This material has not yet been the subject of any effective chemical investigation and taking the nature of the most recent use of part of the area (viz. the Deene coke oven and by-products) it is very probable that high levels of contamination are present. These are most likely to have resulted from the plant demolition rather than from the process operations themselves. It is essential, therefore, before any further consideration is given to the safety, vis a vis the slurry removal, that an appropriate chemical investigation is carried out to determine the nature of the oversite material both from the safety and the disposal points of view.”

This confirms that by this stage no or no effective site, ground or chemical investigation had been initiated by CBC on Willowbrook North.

619. A working party was set up to investigate primarily for water pollution purposes whose terms of reference included the identification of contaminated areas, the identification and quantification of contaminant deposited in those areas and of run-off to and contamination of the Willow Brook and the evaluation of “the contaminants in the critical areas with regard to organic solvents, chlorinated hydrocarbon, heavy metals etc”. CBC had a copy of its report of July 1984 but it is unclear if it was part of the working party which after the report seems to have done little or nothing more. The report is useful in describing what part of the Willow Brook North looked like at this time:

“A map has been produced showing where all the known areas of contamination lie (Appendix 1). The main areas of concern are the areas used for coke ovens and blast furnaces (the Glebe site and Deene Coke ovens), the areas used for treating contaminated wastes (the Northern ponds, the Western ponds the oil ponds and the Candy Filter ponds) and the areas used both past and present for tipping of waste material (the dry tip area and the area north of Willow Brook)...

A number of reports have been written (1, 2) which identify the types of pollution likely to occur on coal coking sites. The main parameters for consideration where the land is to be used for the laying of underground water pipes, the construction of buildings and the prevention of water pollution are:

Sulphate

Ammoniacal Nitrogen

Sulphide

Coal Tars

Phenols  
Cyanides  
Thiocyanate  
Mineral Oils  
pH

A report by Dr. P.J. Say for Soils Engineering (Appendix 3) indicated that the area around the Glebe Coke works (Heavy End) was badly contaminated with phenols, sulphates and sulphides and that the aqueous seepages were well above the "Trigger levels" recommended by DoE (Appendix 4). Whilst the groundwater was contaminated at the Glebe site the contamination does not seem to have migrated to nearby sites. Whilst the site has been excavated to 2.5 to 3.5 metres below existing ground level and backfilled with uncontaminated soil it would seem a wise precaution to check the site again for contaminated groundwater seepage...

The soil which was removed from this site was taken to an area north of Willow Brook (See Appendix 1) and tipped where there is now a scarp of some 6-10m of tipped material over an extensive area which has been graded and flattened. The area is some 100 - 200 m from the stream and so should present no problems with direct run off although groundwater contamination could present a problem. Samples of soil from this area were taken and analysed (Appendix 5) but the area is very extensive and the badly contaminated topsoil is likely to be well buried.

There are no known analysis [sic] of soil samples for the Deene Coke Ovens area, although it must be assumed that the topsoil analysis would be similar to the Glebe site.

It was with the detection of more than double the trigger levels in the Glebe site analysis that the problems of laying plastic water mains in this area were first identified..."

An Addendum added:

"A further development on the site presently being exploited is that the area formerly used for the Deene Coke Ovens has been found to have a buried lagoon containing 2-3 m of slurry. This is under some 2m of topsoil and if it has to be removed could entail moving up to 1,000,000m<sup>3</sup> of land."

The Summary stated:

"It is recommended that a full grid analysis of all sites should be carried out prior to development to identify possible areas of contamination and the contaminants so that appropriate materials and safety techniques can be specified before services are laid. Where areas of contamination are found the soil should be removed and replaced with clean material before mainlaying commences."

This advice was not wholly followed by CBC.

620. Apart from the Deene Coke oven the substructures of which remained to be demolished, the site comprised a flat area to the north of which was a scarp, later referred to as a bank

or embankment.

- 621. WS Atkins were asked to review a proposal for biologically treating the main 25 hectare (60 acre) of the Western and Central areas; in their report of October 1984, they favoured the excavation method.
- 622. Some work started on the site in late October 1984 with contaminated material being spread to see if phosphorus was present, as Mr Downey recorded.
- 623. WS Atkins then reported on their Chemical Investigation of the Central and West parts of Willowbrook North. The first two paragraphs are set out below:

#### “1. EXTENT OF SURVEY

##### 1.1 Physical

A trial pit survey was carried out over some 30 ha of the former steelworks site covering part of the former Deene Coking and By Products Plant, the slurry deposit area and other areas to the east (Fig. 1). About 145 pits were excavated to about 3.5 m depth and some 425 soil and water samples were collected for analysis. Gas tests were carried out at 35 locations. The trial pits were selected to reflect the anticipated presence of contaminants as suggested by the previous site uses (Fig. 3).

##### 1.2 Chemical

The tests for particular chemicals were selected on the basis of their likely presence and their potential relevance to the proposed development, namely industrial units and associated infrastructure. Test requirements were varied slightly between different areas on the site to reflect the potential presence and importance of relevant substances (Tables 1, 2 & 3). On average about 12 chemical tests were carried out on each sample. All chemical analyses were carried out by Bostock Hill and Rigby as part of their annual contract with Corby District Council.

1.3 Previous Relevant Investigations. Bostock Hill and Rigby, on behalf of the Commission for the New Towns, carried out a chemical investigation (by trial pits) of a 25 acre area to the south of the Atkins investigation. Their data is included in this assessment of the total area.

#### 2. PRINCIPAL FINDINGS

##### 2.1 Slurry Deposit Area

Overlying material: The principal relevant contaminants in this material, which varies in thickness from 1.0m to 3.0m, are cyanide compounds, phenols, and coal tars . These contaminants are extensive over the eastern half of the area and are quite consistent with previous activities, namely gas production and related functions. The large majority of the contamination lies in top 1.0 m of ground. Elevated concentrations of sulphates and sulphides were found throughout the site, but this is consistent with the local geochemistry.

Slurry: The slurry deposits are consistently rich in cyanides, organics, sulphur salts and heavy metals, with a large majority of samples being 'heavily contaminated', if

compared with the GLC Guidelines.

## 2.2 Coking Plant Area (remainder of)

This area has been extensively contaminated by the coal gas production and related activities, but the contamination is generally confined to relatively shallow depths. High concentrations of cyanides, organic compounds and heavy metals are unevenly spread over the area. Sulphur salt levels are, again, high or very high over the whole area and to considerable depths. The relevant contamination, however, is largely in the top 0.75 m of ground.

## 2.3 'Other' Areas

There is relatively little cyanide and organic contamination in 'other' areas except for the western part of the '25 acre' site. Slurry deposits were found in the north-western section of this area and these are of a similar character to other slurries on the site. Along the western boundary of the site relatively high cyanide and phenols levels appear to be related to a series of previous minor industries, which also included asbestos-related activities, although no evidence of asbestos contamination was found. In all cases the majority of relevant contamination was found to be in the top 0.5 m of ground except in the western part of the '25 acre' site where it is in the top 0.75 m."

624. The implications of contamination were said to be:

"In addition to worker health, the implications of the various contaminant types are generally as follows:

Cyanides: Groundwater, water supplies

Organics: Groundwater, water supplies and building materials

Sulphur salts: Building materials

Heavy metals: \*Not critical

\* Phytotoxicity, and bioaccumulation within vegetation, is not considered to be a significant factor. In the first instance, since the site is proposed for industrial usage."

625. More information is provided by WS Atkins in another part of the report, which is not titled in the papers before the Court but follows the part of the report of which extracts are set out above:

"1...A number of geotechnical investigations have already been carried out in this area, principally by Haiste International (Ref. 1) and Norwest Holst (Ref. 2). A very limited amount of chemical testing was carried out during those investigations and on only a few samples. Resulting from those investigations a decision was made by the Council to remove the extensive slurry deposits (see Fig. 2) and replace with a suitable engineering material. The slurry removal contract, which is due to commence, in early 1985, is very relevant to this investigation and the recommendations arising therefrom. Since the slurry deposits are overlain with apparently suitable engineering materials, there would be considerable cost benefits if these could be deposited in the slurry excavation and so reduce the need for imported material. Moreover, the slurry excavation could also act as a 'dump' for material elsewhere on the site which was not greatly contaminated and had suitable engineering properties.

The investigated site lies to the north of the currently active British Steel Tube Works.

This area has been extensively filled following the cessation of ironstone workings and up to 15m+ of filled ground has been noted from geotechnical surveys (Refs. 1 & 2). Over a large part of the area, slurried flue dusts, for example, from various processes in the steelworks were deposited over many years in the 'hill and dale' formation of the former opencast workings. These deposits were subsequently covered over and in recent years the eastern section of the site was occupied by the Deene Coking Plant. Fig. 2 shows the general location of these areas.

All above ground and below ground structure and foundations, except for some concrete piles and pile caps, are understood to have been removed as part of the reclamation process prior to this investigation.

### 3.1 Principal Objectives

The primary objective of the investigation was to determine the nature, degree and extent of relevant chemical contamination in the context of the proposed industrial development. Elevated concentrations of certain chemical compounds within the ground mass, which are principally a legacy from the previous industrial activities, could affect the following:

- construction workers
- site users
- building materials and services, and
- plant life

The proposed use of the site for industrial units means that effects on children and horticultural activities, for example, are not relevant to our deliberations, at least in the first instance.

### 4.2 Sampling Locations

The sampling locations were selected principally by using available historical information relating to the previous uses of the various parts of the site. These general locations were then adjusted, as far as reasonable, to conform to a regular grid which facilitated the 'setting out' programme. This resulted in two primary grids: on the eastern part of the site a 50 m grid and on the western part a 75 m grid. Where greater sensitivity was deemed relevant, further sampling positions were selected in addition to the nodes of these grids. These extra pits were generally at the centroids of the grid patterns.

### 4.3 Chemical Tests

Chemical tests were selected on the basis of the likely presence of particular substances and the corresponding sensitivity of the proposed development to those chemicals. A balance was also drawn between the cost of acquiring specific data and the likely usefulness of that data in determining the degree of contamination. For example, heavy metal contamination was not investigated very intensively as they would assume importance only if:

- i) landscaping proposals were extensive, and
- ii) cyanides, organics and sulphur salts were present in very low concentrations.

6.1...Heavy metal contamination is not of critical concern in industrial redevelopment. Moreover, on this site high concentrations are very largely related to slurry deposits and since these deposits are to be removed, this contamination has not contributed significantly to the assessment of ground contamination. Thus, the critical contaminants are considered to be the cyanides and organics. All contamination data were, however, closely examined.”

It was made clear in this part of the report that the authors concentrated on cyanides and organics in terms of contaminants. The preferred recommendation to CBC was for it to excavate to a relevant depth and replace with clean material.

626. This report related to trial pitting and the pits could only go down to some 3-4 metres; it relied on historical earlier information for what was at a greater depth. It was the most comprehensive survey or site investigation commissioned other than that relating to the Exchange Sidings area referred to above. As is known, CBC did not reclaim the bulk of the area investigated by WS Atkins until 1995-6.

627. Haiste and Partners, who had been retained by CNT (and whose earlier report referred to by WS Atkins is not in the Court papers), were asked by CNT to comment on CBC’s proposals to develop the eastern part of the site. Their short report dated November 1984 provided to CBC said amongst other things:

“...the Council's scheme is theoretically a feasible solution. We feel that the development proposed for the land could be constructed using conventional foundations and drainage systems etc. provided that anticipated bearing capacities and settlement limitations as calculated by Soils Engineering can be achieved on site.

However, we believe that there are significant uncertainties about these proposals and until these uncertainties from a technical point of view have been looked at and evaluated by Corby District Council we advise that the Commission should not support this proposal as it stands.”

628. In July 1986, the DoE approved for grant purposes the reclamation of the Deene Coke Ovens site. The site was and must have appeared derelict but open; Mr Downey’s log for 20 October 1986 describes the area as “quiet...fencegates torn down on the northern perimeter allowing access to BSC’s wet and dry tipping area. Noones rumoured to be building an office compound at eastern extremity. Public shoot & scramble & walk dogs in area, Phytotoxicity low.”

629. In May 1987, Haiste and Partners were asked by CBC to prepare an Addendum report following their earlier reports for CNT to consider alternative design criteria in respect of the area of buried slurry. CBC was considering whether in effect the slurry could be left and some type of development take place over it. Previous investigations had revealed, they reported:

“The investigations indicate that the lagoon deposits vary in depth with a maximum proven thickness of 9.00m with an average thickness of 4.25m and are covered by a

surface layer of boulder clay, thicknesses ranging from 1.0m to 4.5m with an average thickness of 2.44m. Areas exist where the deposits are at or very close to the ground surface level.

Because of the wide scatter of boreholes there may be other areas where the capping layer could be much thinner due to the very liquid slurry being pushed up into the boulder clay during capping operations. The capping layer is presumed to have been done to make slurry area safe and not as an initial stage of providing a load bearing strata.”

In their General Comments section, they stated:

“Previous reports have commented on the chemical contamination of the site in particular the high sulphate contents within the boulder clay. Reference should be made to Section 8.0 of Haiste's report, dated August 1983, for detailed comments on the contaminations, but here again it must be emphasised that since the full extent of the contaminations is not known, the significance of the chemical contamination on the proposed development is difficult to assess at present, A specific and chemical testing programme (together with the probe boring recommended earlier in this report) would be necessary for such proposed building. However consideration must be given to the possible pollution of the adjacent brook from chemically contaminated water migrating through the embankment, following the surcharging of the ground from any proposed development. Consequently this could produce a future health hazard both in the brook and its surrounding ground surface. The possibility also arises of any trapped gases being released into the atmosphere following the initial consolidating process”

They concluded that there was no low cost option for developing the site.

630. In February 1988, Mr Ibbotson recommended to CBC that dynamic compaction of the Deene Coke Ovens site be done, saying that contract documents had already been prepared. It is clear that this work was recommended for the area just to the north of Steel Road. At the LRCG meeting of 4 February 1988, the following was minuted:

“RCI said the DOE had raised problems with the consolidation tender. However it is generally true that dynamic consolidation is half the cost of vibro which is in turn half the cost of piling. The main part of the cost of d.c. is getting the machine on site, once it is there the extra cost of tackling larger areas is negligible. It was agreed that the site will be treated in bands; a 20m band along Steel Road for car parking at 40 KN/m; a 100m band for building at 80 KN/m, then a 20m band circulation area at 40m.”

631. Although the documentation is sketchy, the Deene Coke Ovens reclamation work was in progress by February 1988 as noted at the LRCG meeting of 18 February 1988. This work must have involved earthworks and the removal of all or part of the old foundations and building remains, and, as Mr Ibbotson said in evidence, the excavated and demolition material was taken to and deposited on Deene Quarry. In March and April 1988, CBC was giving active consideration to flood protection and stormwater balancing reservoir systems for the Willowbrook North site and retained George Crowder and Geotechnics to report on that aspect. On 5 May 1988, the LRCG was told that work was proceeding well

on the Deene Coke Ovens reclamation and that dynamic consolidation was to start a few days later. Earthworks were reported as complete by 28 May 1988. On 30 June 1988, the work was reported as substantially complete and that Cementation, who had presumably done the dynamic compaction work had finished.

632. In June 1988, Geotechnics reported to CBC about their geotechnical investigation for industrial development at the Willowbrook North site. The site was at the western end just off the line of Steel Road. A desk study, four boreholes and 11 trial pits were done. Made ground was present and high Toluene extract and coal tar was found, albeit low Nickel and Cadmium, but only limited chemical sampling was done. Geotechnics also did a geotechnical investigation and report in August 1988 about the roads for the proposed development. These roads were going to the southern end of the Willowbrook site adjacent to Steel Road. 24 trial pits were dug. Apart from lower original ground, slurry and made ground was found; no chemical testing was done.
633. At the LRCG meeting of 6 October 1988, it was reported that the Willow Brook Balancing Lake and Sewers Contract No 40 had been let to Noone & McGowan “for £1.1m + £50,000 to fill in Toxic Ponds with some muck. October 17th start on site.” The Pre-contract meeting for Contract 40 took place on 7 October 1988. Although George Crowder had designed the balancing lake, CBC supervised the work themselves. The minutes record:

“6.0 Safety with regard to chemical contamination (B Downey)

6.1 Established means of dealing with chemical contamination in sewer trenches shall prevail

6.2 As the balancing lake will partly be constructed in what was once an old tip containing, amongst other things, by-products from the Deene Coke Ovens, a full panoply of measures are required, including eye wash stations and drench showers to prevent serious injury”

The work started on 17 October 1988. The work must have involved considerable quantities of excavation of contaminated materials. Originally the contractor was required to take dry slurry to its own tip but a variation was ordered whereby it was told to take the slurry to Deene Quarry (as confirmed in a note by Mr Hussey of 25 April 1989).

634. From a site instruction dated 16 December 1988 and from the geography then prevailing, it is probable that the considerable quantities of excavated contaminated material from Contract 40 were taken from the site by lorry, unsheeted, on to the public roads, initially onto Steel Road, then east into Birchington Road and then up the Gretton Road into Gretton Brook Road and then into Deene Quarry for depositing there. Complaint was made about large quantities of material on the roads and that cleaning was inadequate. CBC’s letter dated 26 January 1989, set out in the Deene Quarry chapter above, complains to the contractor about the unauthorised, incompetent and indiscriminate dumping of Willowbrook slurry and muck at Deene Quarry. No answer to this letter, if there was one,

remains on file.

635. Excavation works on Contract 40 were not complete and were continuing albeit in delay in April 1989. At Site Meeting No 5, it was recorded that an old tip had been opened whilst trenching from one manhole to another on a sewer line and “pungent coke gases and slurry were in evidence”, but that the gases did not constitute a hazard. However, a site patrol log reported on 3 May 1989 that there were “awful ground conditions” in sewer trenches. At Site Meeting 6 on Contract 40, it was minuted as follows:

“The trench from SI-S2 was being backfilled with select excavated material; the slurry remaining on site to be moved to BSC tip at the finish of the contract.

M Palmer asked if the slurry had been tested for contaminants. H Lorimer said the material was highly alkaline with a PH9+ when tested by B Downey who felt it was unnecessary to treat as a special waste.”

636. On 19 May 1989, the site patrol log recorded that the contractor was “facing appalling stability problems in ground of storm water sewer, trenches collapsing and pipes moving after being backfilled”; the ground was simply an “uncompacted tip”. A later log indicates that the ground conditions necessitated additional cut and fill operations. At Site Meeting No 7 sewer work was still progressing and large areas of “black slurry” were noted on one sewer line. Almost all the LRCG meetings were, surprisingly, told that Contract 40 was progressing “well” albeit after this report in the LRCG meeting of 29 June 1989, it was said that, although a great deal of slurry in drainage trenches had had to be dealt with, the scheme should now be completed in early August; the additional excavation and backfilling would result in considerable additional cost.
637. Contract 40 was reported as substantially completed by the end of August 1989. In the absence of any contractual or final accounting documentation, it is difficult to assess the quantities of contaminated material which was removed and transported on the public roads; it must have been a very substantial amount in six figures. The contract price had been over £1m; a balancing lake would necessarily have involved at least 60,000 to 70,000m<sup>3</sup>, judging by the balancing lake at Longhills; there was a substantial amount of sewer excavation required and some additional excavation work. Clearly there were substantial quantities of recognisable slurry involved.
638. The Willowbrook Roads contract (No 39, later signed on 1 June 1990) was proceeding in November 1989 which must have involved excavation of some contaminated materials; the total excavation billed was 12,800m<sup>3</sup>. The LRCG meeting minutes of 26 October 1989 suggest strongly that this material was deposited on Deene Quarry. These works were behind programme in January as reported at the LRCG meeting of 18 January 1990, but were said to be “all but complete” by 22 March 1990.
639. It had been known since 1982 that the northern part, north of the roads complex of Steel Road, was a significantly contaminated site. Particularly in the By-Products area and by

reason of the extensive slurry lagoon. CBC at the LRCG meetings often discussed what to do with the northern part of Willowbrook North. For instance at the meeting of 24 May 1990, the following was minuted:

“Willowbrook North/By-Products Plant - EGC said future reclamation works may need to be tested. RCI to do feasibility study to estimate scale of contamination.”

There is some mention in some documentation in 1990 of Corby Power doing some work on this part of the site but it is unclear what. It must have been done with CBC's knowledge and consent.

640. After 1990, Mr Ibbotson had no relevant involvement in Willowbrook North which was dealt with almost entirely by CBC internally.
641. In late 1990 and well into 1991 (July), CBC's contractors, PL Construction Ltd were undertaking the construction of the BSC haul road north and south of Steel Road. On the north side, this went through the middle of the Willowbrook North site and did involve the disturbance and removal of contaminated material. There is no complete Bill of Quantities or final account and, therefore, one can not determine with any certainty the quantities involved. However, it is likely that a five figure quantity was involved on the north side, given amongst other things that the haul road had to pass through the bank on the north side.
642. In April 1991, Contest Melbourne Weeks reported to CBC their findings about the Deene Coke Ovens By-Products Plant. The Introduction provides the background and throws some light on what was happening at that site:

“A.1 Corby District Council required that in situ testing be carried out during the earthworks operation at the Deene By Products reclamation site in Corby, Northamptonshire.

The Engineer for the project, Mr. R.C. Ibbotson, appointed Contest Melbourne Laboratories Limited...as Independent Testing Engineers. Weldon Plant Limited were awarded the main earthworks contract and were subsequently instructed to retain the services of Contest Melbourne Laboratories Limited. Weldon Plant Limited, by their order number E583/17221, instructed that such testing work as necessary to determine in situ density be carried out, as required by the Engineer.

Control testing of the earthworks was carried out between 18 February 1991 and 21 March 1991, general supervision was done by the Engineer's Clerk of Works, Mr. J. Buckland.

A.2 The bulk earthworks involved site preparation and the placing of general acceptable fill materials which comprised mainly of well graded, dry, cohesive soils, described as light brown, silty, sandy, stoney clays.”

They were testing the placed material and carried out no chemical tests; it is not revealed

how much excavation had been done beforehand.

643. Through much of 1991 CBC was actively considering converting Willowbrook North into a nature or ecology park and various (undisclosed) reports were obtained in that regard. However, thoughts turned again to what could be done. Mr Palmer produced a report in September 1991 for the Council effectively suggesting the development of the western end, leaving the eastern end untreated. It was thought that 14 acres of the western half was part of the slurry lagoon.
644. Dr Smith reported to CBC in December 1991 about the western half of Willowbrook North. He describes the history:

“The site was originally an opencast ironstone mine (Short Leys Pit) that ceased operating around 1948. The final working face is indicated on plan 1.

On completion of mining the backfill was left as a 'hill and dale' topography. The nearby steelworks used part of the area to dump waste slurries from the blast furnaces. A dam was built across the valleys at the east end of the site and the slurries allowed to find their own level in the natural contours. The slurries originated from the blast furnace cleaning plant and have been described by BSC as "non-toxic inert flue dust made up of ore/sinter, coke, lime/limestone particles and blast furnace volatilisation products".

In the late 1950s the whole site was levelled off to 106.70 m above sea level and the slurry buried under a few metres of backfill.

A portion of the area was later used as the site for the Deene Coke ovens. An additional slurry pond was constructed to hold waste from the blast furnaces (Central Pond No. 1). The use of this pond was covered by disposal licence C/77/003. Slurry was discharged into the site up until 1979.

The Deene coke ovens were demolished in 1982 following the closure of the steelworks. Since then several areas of the more contaminated surface clay fill have been removed and replaced with clean fill.”

He went on to review earlier reports and summarised the current position:

“The buried lagoons are obviously unsuitable for supporting hard development and need to be removed or treated in some way. The options considered have been (a) surcharging to remove the excess moisture and (b) complete removal to another site. Excavation and removal seems the favoured option at present, though no repository site has been selected yet.”

He reviewed the chemical contamination results:

“The following comments apply to analyses that were taken in 1983 and therefore should be treated with caution. Some of the shallower sample points (1-2m) in clay fill will certainly have changed since various rehabilitation works have been carried out.

#### 5.1 Soil/backfill

A trial pit survey was carried out by W.S. Atkins in 1983, the results are shown in

Tables 1 and 2. The range of concentrations is shown in the histograms. The analyses of samples from clay backfill and the slurry show results which are broadly similar for most contaminants. However the slurry does contain a noticeably higher metal content. The following notes can be made on some of the pollutants:

...Cadmium: No samples exceed the ICRL threshold...

Copper, Nickel, Zinc : These elements are phytotoxic but in the alkaline ground conditions here the ICRL thresholds do not apply.

The analyses above refer only to shallow material. Future investigations should check whether material beneath the slurry is contaminated.”

His recommendations were:

#### “RECOMMENDATIONS

5.1 A number of points need to be resolved before any remedial work is undertaken.

a) Volume of slurry. This is difficult to estimate at present due to the limited number of trenches and boreholes that penetrated the full thickness of the slurry. Estimation is made more complex because of the undulating nature of the land onto which the slurry was placed...

c) Concern has previously been expressed in the stability of the north bank during and after any works. In the past lagoon material has been observed in the face of the bank and is known to occur beneath from boreholes drilled in 1988 near the balancing pond. A number of boreholes are needed to investigate the geotechnical properties of the material making up the bank and their stability...

5.2 A preliminary plan of proposed works is indicated below:

a) A total of 70 boreholes are shown with a total meterage of 822 m. Eleven of the boreholes should go to the base of the backfill (approx. 18 m) remainder need only go through the slurry...”

645. In his accompanying letter dated 23 December 1991 to Mr Cropley, he summarised his conclusions:

“a) There are insufficient data to give an accurate volume of the slurry, but there could be more than 500,000 m<sup>3</sup> . More bores or probe holes to prove the slurry base are needed.

b) The slurry is chemically 'contaminated'. So long as no leachate escapes the site, the level of contamination is such that it would not prejudice industrial development of the area (under existing D of E guidelines).

c) The slurry is, however, geotechnically unsound. Treatment such as surcharging will result in contaminated groundwater/leachate expulsion. Excavation and replacement will require further study on (i) suitable repository; (ii) likely leachate chemistry. For these reasons we consider more chemical data are required on the groundwater/leachate within the slurry Existing data are inadequate.

d) We assume that the actual method of geotechnical improvement will depend very much on the availability and cost of a suitable repository area and source of replacement material. These are factors outside our brief.

e) The proposed additional work includes a study of the stability of the northern

embankment, which appears to include slurry. It would also include consideration of the effects of excavation of the slurry pond on adjacent areas (eg. the embankment and the New Town's estate)".

646. Meanwhile, CBC was allowing Willowbrook North to be used as a motor cycle/go-carting venue. Dr Smith wrote to CBC about the site on 19 May 1992:

"After our meeting on 14.5.92 I walked over the site to refresh my memory on the layout and noticed two things that I ought to mention.

a) The motor cycle/go cart racing track has disturbed the surface capping quite significantly in places, digging up mounds of slurry. When these dry they will generate a lot of dust. As far as we know the slurry comprises fine grained coke, iron ore and limestone - but also has high levels of some other metals, particularly lead and zinc. We've not averaged all the data, but guess around 0.2% lead and 0.3% zinc. There is also ca. 0.05% coal tars and a few ppm cyanide. It is not acutely toxic. Given the use of the track, though, conditions could get very dusty and drivers and spectators may get high exposures. We are not occupational hygienists and you would need someone experienced to calculate out the "risk" - which I expect is low and cumulative in effect. It is, however, clearly not a good idea to allow them to plough up more slurry.

b) Approximately at the place marked 'x' there is a redundant oil interceptor on the valley side (south). It is an open topped concrete structure ca. 3 m x 3 m containing about 1 m of oil and sludge (probably with water). It looks as though it could be a danger to children and wildlife and, insofar as it is clearly no longer in use, should perhaps be emptied and filled with stones or demolished..."

No advice was sought before or after about the fairly obvious risk of allowing the use of this contaminated site by the public. Motor bike scrambling had been permitted to go on for several years before this time.

647. A week later following a meeting about Willowbrook North, Dr Smith wrote again on 22 May 1992 to Mr Cropley:

"I walked over the site again last week after our meeting and have written to Glen [Clarke] with a couple of observations. We also obtained a few more reports from Mick's office, but nothing that is directly relevant to the western portion of the site... Looking through the old W S Atkins and Norwest data there appear to be odd patches of slurry in the western part - but not enough to be traced with certainty between holes. Subject to seeing the C.F. report, it still looks as though the slurry problems at the western end will be minor (though the ground is still poor, as a result of being all backfill).

Our brief, if I can try to summarize the meeting is:-

a) Desk Study. Review the existing reports on land adjacent to the known slurry ponds, to the west (area 1) and east (area 3). The eastern strip is New Towns' land, running as far east as Sheldon Road. I don't have a plan with a proper outline. Budget say £5k for s.i. of New Towns' land, on assumption that access will be available. As noted above, we can't do much with the western area without a copy of Continental

Freezer's report. Need to conclude either that area 1 is clean, or else include it in the s.i.

b) Investigation. Review and redraft our proposal of Dec.'91 with regard to an s.i. to:-

- i) test pollution, existing and potential, of groundwater and of water leaking into brook;
- ii) examine chemical contamination of the slurry and of underlying/ overlying materials, with regard to affects on development and potential for generating leachate;
- iii) provide data to quantify slurry and any other unsuitable materials in area 2 (and area 1 if necessary). Actual volume calculations to be done by M Palmer's office, using computer techniques and new topo survey. A target of  $\pm 10\%$  on quantity is proposed but, given the complexity of the old hill and dale, may be difficult to achieve;
- iv) check stability of bank side, wherever access is possible. Note previous report (attached) suggests bank instability at New Towns' site.
- v) S.i. to be ready for start at end July and complete at end Sept. Budget cost £31k for slurry ponds (as before) plus £5k for New Towns.

c) Remediation Options. Review options with CDC Team in light of s.i. interpretation. To include considerations of how our works will affect New Towns' land..."

648. Dr Smith or his assistant saw the "Continental Freezer" report, which is not in the Court papers and wrote to Mr Cropley about it in mid-June 1992:

"A few comments on the Willowbrook investigation after seeing the s i report commissioned by Continental Freezer.

#### WESTERN AREA (Area 1)

The site investigation for Continental Freezer by the John Parkhouse Partnership (JPP) covered an area north of Genner Road where trial pits dug by WSA had previously identified slurry deposits.

Although the description of materials encountered do not match descriptions of the slurries in WSA pits, the JPP boreholes encountered some very soft materials that could be blast furnace slurries.

On Borehole 1 the Standard Penetration Test recorded 'N' values of 1 in two places (3.0-3.45 m and 6.0-6.45 m) corresponding to shear strengths of less than 1.0 kN/m<sup>2</sup>. This borehole lies between WBA pit Nos. 136, 141 and 144 which all recorded slurry deposits. It should be noted that pit no. 136 did not reach the base of slurry,

A loose black/blue clayey fine sand was recorded in borehole 3 from 2.6 to 3.7 m. The SPT recorded an 'N' value of 3 (2.6-3.05 m) corresponding to a shear strength of approximately 15 kN/m<sup>2</sup>.

These results confirm the presence of a small area of slurry with geotechnical properties unsuitable for development.

Other parts of the western area (see plan) had few boreholes put down in previous investigations. There is, therefore, a paucity of data concerning ground conditions, in particular whether the condition that the fill in the site should have a shear strength greater than 40kN/m<sup>2</sup> would be met. To check if the area meets this condition it is advisable that a number of additional geotechnical boreholes be drilled. Some locations are suggested on the plan attached.

Additional pits are also advised to assess the full extent of the area affected by shallow slurry deposits.

EASTERN AREA (area 3)

Boreholes will be needed both to investigate the bank stability and to assess the extent of the slurry deposits over the site. No plans of this area are available yet so the number of boreholes needed cannot be estimated.”

649. In October 1992, CBC retained Contest Melbourne Weeks to determine the subsurface conditions at the Willowbrook North Slurry Ponds. They reported in February 1993. 27 boreholes and 12 trial pits were done. They described the site at that time:

“At the time of the investigation the eastern half of the site was in use as an off road vehicle track and large areas of the site were under shallow water. The central area is relatively flat at an approximate elevation of 106.50m A.O.D. The ground has been raised to approximately 110.00m A.O.D. on the east and north east sides of the site with the entire north boundary forming the top of an embankment at the base of which lies Willow Brook at a level of approximately 100.00m A.O.D. The east and south sides of the site are bounded by roads whilst the west of the site is bounded by as yet undeveloped land.”

Thus the bank was some 3.5 metres high and the site was still being used for off road vehicle racing (which went on until after July 1993). Chemical tests were done for Toluene extract but not for Chromium, Nickel or Cadmium. Slurry was found in 18 boreholes between ground level and 14.75m below and in thicknesses varying between 0.7 and 8.4 metres.

650. In late May 1993 Contest Melbourne Weeks presented their April 1993 “Engineering Report”, in which they distinguished between the clay backfill placed over the slurry and the “slurry derived from blast furnaces and coke ovens and existing as buried ponds within the clay backfill”. In Paragraph 1 they warned against the possibility of variations in the ground conditions not disclosed by the investigation. Moisture contents of the slurry were said to be “very high”. Their investigation showed that the slurry extended under the bank (page 15). They confirmed that testing for contaminants had only been carried out on a limited range of samples from the boreholes in order to investigate the contamination of the clay backfill and ironstone beneath the slurry. They reviewed a number of options for dealing with the site.
651. Mr Webster prepared a report to CBC in about June 1993 about what to do about Willowbrook North. The “problem” was said to be:

“The site as shown on the plan (appendix 1) is a quarry backfilled with boulder clay and slurry derived from blast furnaces and coke ovens the slurry existing as either buried ponds within the clay backfill or laying over the backfill on the surface...The two major findings of the Consultants were that the western section is contaminated with buried slurry (this was previously thought not to be the case) and that the embankment to the Willowbrook is unsafe and part of it has the potential to collapse at any time.”

He recorded that “the survey carried out by W.S. Atkins showed the slurry within the present area of investigation to be rich in cyanides, organics, sulphur salts and heavy metals with the overlying burden being contaminated with cyanide compounds, phenols and coal tars.” He split the site into three:

“Site A

The western end of the site. To the south slurry varies 1- 4m deep mostly on or just below the surface but occasionally in pits, and dips to greater thickness at the north-east and south-west ends.

Site A dimensions        440m east-west  
                                     140m north-south

Area 6.16 Ha (15.2 acres)  
i.e. 20% of site.

Site B

The southern part of the main area where slurry is generally of least thickness excepting occasionally in pockets.

Site B dimensions        590m east-west  
                                     150m north-south

Area 8.8 Ha (21.9 acres)  
i.e. 30% of site.

Site C

The northern part of the site, including the Commission's land. Although there are occasional pockets of good ground the majority consists of thick bands of slurry.

Site C dimensions        950m east-west  
                                     150m north-south

Area 14.25 Ha (35.2 acres)  
i.e. 50% of site

Amounts of slurry on each site (Highly provisional)

Site A        80,000m<sup>3</sup>  
Site B        120,000m<sup>3</sup>  
Site C 350,000m<sup>3</sup>”

He presented options including removal of the slurry and other contaminants. The report was discussed at the next LRCG meeting in July 1993 and was presented to the Corby Industrial Development Consultative Group as well in the following terms:

“The Director of Development Services presented a report which outlined the results of a survey into the land at Willow Brook North which indicates a greater problem of contamination than was envisaged. The possible solutions to this problem range from total removal and reinstatement of the site to its original level at a cost of approximately £15m to simply making the site safe by placing clean clay over a geogrid then covering it with stone.

He stated that the minimum solution would cost £2.3 million and would cost only £2.3m and would allow only open storage use of the land but he believed DoE

approval would be given for the work to be carried out over two years. The total removal and reinstatement of the site would need special consideration and he doubted whether DoE would sanction it. . .

AGREED that:-

The DoE be requested to approve removal and reinstatement of the site but if unsuccessful the minimum solution be adopted.”

652. The DoE referred CBC on to English Partnerships for funding purposes, it having become clear that the total removal option would be unacceptable for financial reasons. There was substantial discussion in 1994 about what should or could be done with Willowbrook North. For instance at a LRCG meeting on 16 June 1994, there was discussion about the possibility of Weldon Plant acquiring part of the site; it was said: “Levels of contamination were to be investigated further as these would be crucial in enabling or preventing development.”
653. By November 1994, Sites B and C were actively being looked at for use as commercial new car parking for Eurofleet which would avoid the need for the removal of the deep covered slurry lagoon. This idea was acceptable to CBC.
654. In February 1995, CBC which had prepared all the tender documents invited tenders for the decontamination of Area A. The works were to be described in the contractor’s later method statement as involving the “excavation and disposal off-site of contaminated material and infilling of void with imported fill”. The Health and Safety Plan prepared by CBC stated:

“The works are to be carried out in an area of open land, formerly used as a quarry for ironstone extraction, subsequently backfilled in a loose hill and dale formation. Slurry residue from steel making processes was then placed within this formation and generally overlain with a layer of locally occurring clay.”

The design was said to be:

“Excavation and disposal off site to a suitable licensed facility for contaminated material is to be undertaken.

Risks to the Health and Safety of construction personnel exist from these operations.”

There were in the Specification by now the usual references to “Mud on the Highway” and the Safety Requirements as to Safety Hazard referring to chemical hazards such as coal tars, heavy metals, toluene extract and mineral oils. There was a requirement which was honoured in the breach or non-observance:

“Vehicles

32. The Contractor shall take all reasonable precautions to prevent contamination of public roads by vehicles leaving the site. These shall include wheelwashing in the event of contact with toxic materials. These precautions are to be agreed with the Engineer.”

Perhaps surprisingly, this clause was set out:

“Chemical Hazards

36. The proposed works are being carried out in ground which historical information suggests is unlikely to present unacceptable contamination hazards. It is possible, however, that isolated contaminated areas may be encountered relating to, for example, spillages or fly tipping of hazardous materials. If such conditions are encountered the site workforce may be required to wear specific protective clothing or to modify conventional techniques.”

In the light of the site investigations generally and in relation to the western end of Willowbrook North, this last clause was wrong and misleading; one can only assume that this happened by accident by the use of what was becoming a standard specification clause.

655. 27,000m<sup>3</sup> of contaminated material was estimated to be required to be excavated and taken away to an appropriate tip, whilst 36,000m<sup>3</sup> of other material, fill above the contaminated material, was to be removed to stockpile and double handled. Weldon Plant was the successful contractor and its method statement stated:

“Where practicable a system of work will be implemented which will enable vehicles to run on clean material to and from point of loading, thereby avoiding the spread of contamination by vehicle wheels.

Should it prove necessary to transport materials on the public highway, vehicles carrying dry contaminated materials will be sheeted before leaving site to prevent windage losses. The sheeting of wet materials should not be necessary due to short distance to off-site tip facility.”

656. Weldon Plant won the contracts to encapsulate Sites B and C as well as the stabilisation of the Bank. All three projects were run or administered together. CBC’s staff running the job were Mr B Clark as Clerk of Works (resident on site and responsible for measurement and inspection of the works), Mr Palmer as Resident Engineer and Mr Poucher as Assistant Resident Engineer, although in the result Mr Poucher did little if anything on these jobs. Nothing was said at the Pre-Contract Meeting of 28 March 1995 as to where the contaminated material was to go. Work started about then.
657. The formal contracts with Weldon Plant for Area A and the North Bank stabilisation works were dated 10 April 1995. In the latter, some 40,000m<sup>3</sup> of material was to be excavated to be disposed of in Deene Quarry.
658. It is not clear when the formal contract with Weldon Plant for Areas B and C was signed as only some of the contract documents have been disclosed. The works were described as:

“Reduce dig to remove top layer, importing suitable cohesive fill and capping with Type 1 granular material together with ancillary works.”

There were the usual provisions about mud, chemical contamination, dust protection and vehicles on public roads. 20,000m<sup>3</sup> of material was to be excavated, as well as over 4,000m<sup>3</sup> of slag and hard material.

659. A weekly site diary, presumably prepared by Mr Clark records that from an early stage contaminated material from Sites A, B and C and the Bank were taken to Deene Quarry, the contaminated tip. There are references in his diary for the week commencing 3 April 1995 as follows:

“Mon- excavation bank and filling lower area in Site B...

Movement of wet slurry material off Eurofleet Site B...moved [?] to Deene Quarry contaminated tip.

Tues-Moving slurry and wet material from site to be too contaminated tip. Filling lower area with good excavated material from bank on Site B...

At 2:30 PM tractor and bowser was discharging contaminated water into the ditch which runs parallel to BSE Haul Road-informed WP to stop this operation...

Wed Contaminated tip at Deene Quarry closed because of construction of new access-no material leaving site

Thurs Contaminated tip at Deene Quarry still closed...

Start work in area A as discussed. Excavation and in far North West corner slag/soot. Dry material being used to fill area B-well compacted...

Fri Contaminated tip at Deene Quarry still closed-All works concentrated in site A. Excavating dry slag/soot using as still in the low area B-well compacted”

660. This suggests that contaminated material was not only taken to Deene Quarry but it was also used to fill low areas on Site B. As the Willow Brook had no bridge over it, the contaminated material taken to Deene Quarry must have been taken by road. A site diary of someone who was monitoring Deene Quarry on 11 April 1995 confirms that "sludge, soot and reinforced concrete etc from Willowbrook" was being taken from Willowbrook and taken to the contaminated tip facility. It is clear from that diary entry that Mr Palmer knew all about this.
661. Work seemed to be proceeding moderately quickly. At Site Meeting No 1, it was reported that in Area A approximately 22,000 m<sup>3</sup> had been excavated whilst in Area B 75% of the encapsulation filling to formation level had been completed; it was said that site clearance was completed on Area C whilst the site of Embankment B had been cleared. It was said that the wheel wash was in operation. As noted that "dust on site to be controlled", which suggests that there was or was likely to be dust created by the various operations. A site instruction from Mr Clarke as late as 23 June 1995 instructed Weldon Plant to damp down access roads "to inhibit flying dust", which suggests that the wheelwash was ineffective..
662. It was clear by the end of April 1995 that Area A "had been found to be more contaminated than expected" although the "full extent of contamination [was] not yet known", as reported at the LRCG meeting of 27 April 1995. The minutes record that the

filling of the contaminated tip facility from Willowbrook should be completed in 6 to 8 weeks.

663. It is clear from a site diary entry for 1 May 1995 that contaminated material from Willowbrook North had to be stockpiled at Deene Quarry, which would lead to double handling. On 9 May 1995, a site note indicates that to the South West black soot had been found some 3 m down.
664. By Site Meeting No 2 on 16 May 1995, 40,000 m<sup>3</sup> of material from Area A was said to have been disposed. The minutes record a problem which had been created at Deene Quarry by Weldon Plant which was that apparently substantial quantities of reinforced concrete and steel which had been removed from the Willowbrook North projects had been dumped at Deene Quarry. All or some of this was to be removed, at the direction of CBC. Loads of wet sludge continued to be taken to Deene Quarry with the knowledge and consent of CBC, for instance as recorded in a site diary of 19 May 1995.
665. At the LRCG meeting of 25 May 1995, it was minuted that, following a site meeting, in relation to Area A "it was decided that the dry contaminants (i.e. slag) should be left in and no further excavation carried out as we are already at 8m depth. Wet contamination will be removed completely but further reclamation will go down to a depth of 2.5m. To summarise the site will be capped with a minimum of 2.5m of clean, cohesive material." Thus, the large hole which had been created down to 8 metres would be left and the remainder of the site would be excavated down to 2.5 metres and replaced with clean clay. Thus, yet more contaminated material was to be removed.
666. Material from Willowbrook North continued to be deposited at Deene Quarry in June 1995. On 22 June 1995, the LRCG meeting minutes record that Area A excavation was 90% complete and that filling was 40% complete. By the LRCG meeting of 27 July 1995, it was said that a small amount of contamination at Site A remained to be removed with filling still to be carried out. Although Weldon Plant applied for a certificate of Substantial Completion of Area A on 21 July 1995, the work was not complete; substantial filling remained to be done.
667. What the minutes do not record is that by this stage there was a very substantial hole in the ground on Site A. Because the contract for Site A was on a re-measurement basis, in effect that project was substantially over budget. Funding had to be sought from English Partnerships to fill the hole. By the end of 1995, on Site A over £700,000 had been paid against a tender total of about £500,000.
668. At a site meeting held on to August 1995, attended by Weldon Plant and CBC, there was reference to the fact that concrete and reinforcing debris had been tipped against the contaminated tip facility and there was a contaminated load which had been dropped into

what was described as the "top concrete tip area" in Deene Quarry.

669. On 17 August 1995, Mr Clark instructed Weldon Plant to move an area of soot down to 2.5m in depth on Area A and take the contaminated material to Deene Quarry.
670. Areas B and C were certified as substantially complete on 28 May 1995; that certificate by Mr Webster is belied by various reports and meeting minutes which suggest that those works were proceeding in June and July at least. Other documentation indicates that CBC was very keen to get Eurofleet on board and in occupation.
671. At the LRCG meeting of 28 September 1995, it was recorded that Sites B and C were now fully occupied by Eurofleet. As for Site A it was said that all decontamination had been carried out but that filling was still required.
672. In February 1996, CBC let to Noone & McGowan a contract for a foul sewer diversion, Contract No 107; the formal contract was signed on 1 April 1996. These works started in February 1996 and problems were encountered with unsuitable material as the sewers were excavated. These works were probably completed in May 1996. The formal agreement was signed on 1 April 1996 recording that the scope of works involved the construction of 160 m of sewer and two pre-cast concrete manholes.
673. As recorded at the LRCG meeting of 13 June 1996, English Partnerships had approved £100,000 for filling the void on Area A. This work however did not proceed for some time.
674. Throughout 1996 and into 1997, Willowbrook A and the hole which had been left was being investigated in the context of possible contractual and tendering irregularities. In November 1996, the Chief Executive produced Reports into Disciplinary Hearings for Messrs Cropley and Palmer. On Willowbrook North, he found Mr Cropley responsible for a lack of management and deferred consideration of a number of charges against him. He said:

“I have no doubt from the evidence I heard that RC and his team were under immense pressure in relation to this job. They undertook a task which patently they were under-resourced for in a wholly unrealistic time scale. In such circumstances something has to give. In this case it was attention to detail...

It is apparent that RC exercised very little supervision of the work of M Palmer in the production of the design and tender documents, the tender scrutiny and the project on site for the Willowbrook North schemes. He maintained contact through the Land Reclamation Team meetings and ad hoc discussions. Essentially he relied on M Palmer to inform him when he felt it necessary to do so, since he had so much other work on. For his part MP tried to avoid troubling RC.”

675. In relation to Mr Palmer, he concluded that the charges of ineffective management, failure satisfactorily to supervise staff and failure to ensure acceptable levels of documentation were proved. There was, he concluded a “virtual lack of supervision” of the Clerk of Works, Mr Clarke. There is a reference to a transfer note for the material being transferred to Deene Quarry but no such note has been produced to the Court.

676. The hole at Willowbrook remained unfilled in 1997. Ove Arup considered in 1998 that the site remained contaminated. At a meeting between Ove Arup, retained to do a landfill audit, and CBC on February 1998, it was reported that there were still large quantities of slurry on Area A, and much of it “above the contamination threshold. On 11 May 1998, Ove Arup wrote to CBC confirming a conversation that “for safety reasons some additional works should be carried out on the Willowbrook North Area A Site”. There had been talk before about placing a one metre layer above the contaminated ground. The letter went on to say:

“Our report entitled Ground Investigation Assessment of 1995 Decontamination work and Reclamation Strategy dated February 1998 section 8.3.1.1, outlined hazards still present on the site and identified two remediation options for your consideration. It appears however that there will be some delay between this report and any future reclamation work. We are therefore duty bound to inform you that the area of exposed steelworks slurry on the site should at the very least be securely fenced off to ensure that the risk to human health from contact with the slurry is minimised.”

This shows that Area A was open and not securely fenced (if at all), the slurry was exposed in an area close to public roads and CBC had done nothing to make the site safe, notwithstanding advice at least since February 1998. The report referred to has not been made available to the Court. A CBC memo of 20 June 1998 suggests that 300 metres of fencing were then being considered. By 31 July 1998, the fencing was in the course of being erected.

677. Following an arbitration with Weldon Plant about the Willowbrook North Area A contract, CBC settled with the contractor in mid-2001 and it seems that some remediation work was done by Weldon Plant as part of that settlement.

678. In summary, I draw the following conclusions:

(i) from a very early stage, there was a growing realisation that the bulk of the Willowbrook North site was heavily contaminated with the slurry lagoon and the areas in and around the Deene Coke Oven and By-Products Plant being overall the worst; by the late 1980s, there was a growing understanding that the cost of fully remediating the site would be prohibitively expensive.

(ii) over the years from 1994 to 1996, a substantial quantity of contaminated material was removed for the Willowbrook North site and transported unsheeted on the public

roads to Deene Quarry where it was initially deposited at the eastern and north eastern end and only in 1995 was it placed generally in the contaminate tip facility as extended.

(iii) There was little if any control of the Willowbrook North site from 1983 until 1998; it was largely unfenced; the public had uncontrolled access and CBC even permitted go-carting and scrambling for some years on the site.

(iv) Substantial quantities of dust are likely to have been generated throughout the period of operations and by the other activities on the site; substantial quantities of mud and dust are likely to have been generated from the transport of the materials on the public roads. There was no wheelwashing facility for most of the period. Even if there was some wheelwashing facility at some stage in 1995, it was ineffective or was not used.

### **Overall Factual Conclusions about Reclamation**

679. Apart from the individual findings above, I can summarise my overall factual conclusions about the reclamation as follows:

(a) From 1983 onwards, CBC's approach was to "dig and dump"; put another way, CBC decided in practice that all the waste and more or less contaminated materials from the sites it acquired (from BSC), occupied, reclaimed or used would be disposed of on the self same sites. Almost invariably, this material was taken to Deene Quarry at the north eastern part of the site. As Mr Braithwaite said in his second report and I accept:

"1.22 One key aspect of the case is that it seems that it was seen by those responsible as, a relatively simple, 'engineering', operation involving unknown quantities of often unknown materials, rather than the highly complex reclamation and remediation process it should have been. In my view it was decided relatively early on that the area of the steel works was contaminated land, and to the north of that was a large dumping ground. If all the contamination could be relocated to the dumping ground, then the site of the steel works could then be redeveloped to re-vitalise Corby. It really was that simple.

1.23 This resulted in over fifteen years of poorly regulated, 'muck shifting', generally from south to north. During this process it is my position that significant quantities of the 'muck' polluted the environment of Corby and as a result became available to its residents.

1.24 Some risks were evaluated but these related to primarily to engineering operations, structural stability, workplace risks, safety of trenches, service runs etc, and risks to ground and surface water. There was no appropriate

assessment of risks to the wider environment and its populations.

1.25 Indeed, I have seen no evidence that anyone was ever employed to undertake such assessments, monitor the subsequent environmental impact, or police the activities of a shockingly inexperienced work force.”

(b) Between 1,500,000m<sup>3</sup> and 2,000,000m<sup>3</sup> of more or less contaminated material was so disposed between 1983 and 1997.

(c) Little or no work of any relevance to the issues in this case was done after August 1997. There was constant work throughout the period 1983 to August 1997, with only relatively minor periods of inactivity.

(d) Very large quantities of more or less contaminated material were carried to CBC’s knowledge on public roads, in particular, Gretton, Gretton Brook, Weldon, Bransgrove, Steel and Geddington Roads and Phoenix Parkway.

(e) Large quantities of more or less contaminated material were dropped on public roads from 1984 to 1997 from lorries going to and from Deene Quarry, with CBC’s knowledge.

(f) Very substantial quantities of dust were created by the reclamation and associated operations from 1984 to 1997. That dust came from operations and materials actually on the site as well as from materials dropped or blown onto the road by or from lorries. So far as this and the previous finding are concerned, I attach weight to the evidence of the parents of the Claimants whose evidence that there were substantial amounts of mud on roads and dust in the air was eminently credible and was not seriously challenged by CBC’s Counsel.

(g) It is more than possible that some of the mud on the road and dust in the air was from time to time from sources other than the old BSC sites being reclaimed by CBC; for instance, there was a substantial amount of other development going in Corby over the period, some of this at least being on green field sites. However, I am satisfied that the bulk of the mud and dust on the road was from the CBC former BSC sites and operations. There has been no evidence before the Court that there were any other sources of relevant contaminated materials.

(h) There were no effective wheel washing facilities for vehicles leaving the sites owned and being reclaimed by CBC at any time; CBC was aware of that.

(i) The many thousands of lorries which left the CBC sites with contaminated materials on them were not sheeted until the final reclamation job at Soothills and then

only after August 1996; the sheeting was then manual and not particularly effective.

(j) CBC at no material time employed as employees any person at senior or middle management levels who had any relevant experience or training in running or managing or supervising reclamation operations involving contaminated sites.

(k) CBC's retention of Mr Ibbotson in the role for which he was retained was not inappropriate as far as it went, that is to provide the services set out in the original retainer agreement; however, he was not retained to advise about risk assessment and he was not qualified as a specialist in dealing with seriously contaminated sites; he was in effect an administrator with some experience of administering reclamations. His and CBC's approach was to treat the reclamation operations purely as civil engineering operations.

(l) CBC's retention through Mr Ibbotson of Dr Smith and his firm was sensible but his involvement was relatively limited. He became increasingly left out of the reclamation overall and visited the site infrequently. It would have been sensible for CBC to have retained Dr Smith or more specialist reclamation engineers on a much more extensive basis than they did, in particular in relation to the design and supervision of the actual reclamation works.

### **The Law**

680. There is no real issue between the parties as to the duty of care owed in tort by CBC. CBC admits in Paragraph 115 of the Defence that a duty was owed by it to the Claimants and their mothers to take reasonable care in the execution of the works to avoid injury to the Claimants and their mothers. It is unnecessary to elaborate on that duty and the admission by CBC was properly made.
681. The standard of care to be exercised by CBC is that of an ordinarily careful local authority embarked on reclamation works of the type involved in Corby. The duty is to be judged by reference to the standards known or reasonably ascertainable and knowledge available at the time. Thus, if standards had materially changed over the period within which this claim is concerned, any breach of the duty would be determinable by reference to the standards applicable at the time of the breach, and not by the later standards.
682. This case is necessarily and obviously concerned with the dispersal of toxic substances from the CBC site. Primarily, the Court must be concerned therefore with any breaches of the duty that caused the dispersal of such substances into areas in which the Claimants' mothers might have ingested or inhaled such substances.

683. So far as foreseeability is concerned, it is not necessary that CBC would or could reasonably have foreseen the precise type of birth defect suffered by the Claimants. It is enough that it was reasonably foreseeable that harm or damage might be caused to embryos or fetuses being carried out by mothers at the material time. It was argued by CBC initially that it had to be established that it was reasonably foreseeable to the defendant that its wrongful act would be likely to cause injury of the types sustained by the Claimant concerned. However, it was accepted in argument, properly, that the formulation referred to above was sufficient.
684. It is generally the case, in negligence, that, provided that the defendant in question has selected independent contractors with reasonable care and skill, that defendant will not be liable for the negligence of those independent contractors save to the extent that it had been negligent itself in supervising and monitoring the work of those contractors. The exception to that, as has been accepted properly by CBC, is that if an employer has engaged or contracted others to carry out work, which by its very nature, involved in the eyes of the law special danger to another, the employer will be liable for the negligence of its contractor. Support for that proposition is contained in Charlesworth and Percy on Negligence 11th edition at Paragraph 2-388. The issue of delegation does not arise in this case for two reasons. The first is that the negligence as found in this judgement primarily lies in CBC's own negligence and breach of statutory duty. Secondly, the excavation, transporting and depositing of seriously contaminated wastes was essentially and specially dangerous to workers and the public at large.
685. The Claimants also put their case in public nuisance. The issue as to whether or not there was a cause of action open to the Claimants in this case was specifically addressed by the Court of Appeal in this litigation, the case citation reference being [2008] EWCA Civ 463 (also been reported at [2009] 2 WLR 609). CBC had applied to strike out the Claimants' case for damages for personal injuries for public nuisance on the basis that such claims were not available in public nuisance. The Court of Appeal decided that it was barred by previous decisions of the courts in which damages claims for personal injuries in public nuisance had been accepted. Necessarily, CBC accepts that that this court is bound by the decision of the Court of Appeal but reserves its position to argue, ultimately, in the House of Lords to the contrary.
686. The Court of Appeal referred to the House of Lords case of **R v Rimmington and R v Goldstein** [2006] 1 AC 459 in which Lord Bingham quoted with approval (bar the reference to morals) a definition of public nuisance in Archbold Criminal Pleading, Evidence and Practice (2005 Ed) at para 31-40:

“A person is guilty of public nuisance...who (a) does an act not warranted by law or (b) omits to discharge a legal duty, if the effect of the act or omission is to endanger the life, health, property, morals or comfort or comfort of the public, or to obstruct the public in the exercise or enjoyment of rights common to all her Majesty's subjects.”

This in effect can be and is translated into a tort as well giving right to legal rights including in appropriate cases damages. Where there is a breach of a statutory duty or a duty of care in tort, there will often be an overlapping public nuisance particularly when the health of the public is concerned.

687. Having reviewed various House of Lords cases, Lord Justice Dyson with whose judgement the other judges agreed referred at Paragraph 22 to “the long established principle that damages for personal injury can be recovered in public nuisance” and that this had not been impliedly reversed by the two higher court cases relied upon. That principle, he said, could not be departed from in the Court of Appeal (Paragraph 23); it was not “self evident that the law should be changed” (Paragraph 24). He said at Paragraph 30

“In these circumstances, it is difficult to see why a person whose life, safety or health has been endangered and adversely affected by an unlawful act or omission and who suffers personal injuries as a result should not be able to recover damages. The purpose of the law which makes it a crime and a tort to do an unlawful act which endangers the life, safety or health of the public is surely to protect the public against the consequences of acts or omissions which do endanger their lives, safety or health. One obvious consequence of such an act or omission is personal injury. The purpose of this law is not to protect the property interests of the public. It is true that the same conduct can amount to a private nuisance and a public nuisance. But the two torts are distinct and the rights protected by them are different”

688. The question arises as to whether negligence is an essential part of the tort of public nuisance, at least where personal injuries or as in this case birth defects are said to arise. In a sense it matters not given the findings of fact which are made in this judgment. The essence of a case in public nuisance in the context of this case is, as set out on Dyson LJ’s judgement, that a person commits a public nuisance if by his unlawful act he endangers the life, health or safety of the public. The pleaded case relates to the escape of toxic material and the spread of such materials onto public highways thereby endangering the health of the public. Strictly speaking, negligence or breach of a statutory duty is not essential in public nuisance although, if there is negligence or a breach of statutory duty which causes life or health to be endangered, there will be a public nuisance.
689. There was much discussion during the trial as to legal issues relating to causation in the context particularly of Issue 3: “whether any such breach [of duty] had the ability to cause upper hand or lower limb defects to the Claimants of the type complained of”. It is uncontroversial that, at least generally, a claimant has the burden of proving on the balance of probabilities that the injuries (or in this case the birth defects) were caused by any breaches of duty or public nuisance which are established.
690. However, the Claimants placed much reliance on the mesothelioma cases, such as

**Fairchild** [2003] 1 AC 32 and **Barker v Corus** [2006] AC 572 in which the Courts have allowed claimants to recover damages in circumstances where they could have inhaled the asbestos causing the condition during different periods of employment by employers in breach of their duty of care to prevent such inhalation and where any cause of the condition other than inhaling asbestos at work could effectively be discounted.

691. I have formed the view that it is not necessary for the Court at this stage to decide the issue, as it has been formulated in this case. The reasons will become clear later in this judgement when one comes to consider the facts. I am also bound by the way in which Issue 3 is formulated: it is a factual issue relating to whether any breach could in effect physically, medically and toxicologically cause the birth defects complained of. As a matter of fact, CBC has not advanced any case or evidence that, if the answer to this issue is in the affirmative, the birth defects in question were or even might have been caused by toxic material or agents from other sources, that is other than a CBC source.
692. The Claimants also put their case on the basis of breach of statutory duty, the statute being the Environmental Protection Act 1990, in particular Sections 33 and 34. This Act only came into force on 1 April 1992 and therefore could only apply to breaches of duty occurring after that time.
693. Section 34 (1) states:
- “34 )1) Subject to subsection (2) below, it shall be the duty of any person who imports, produces, carries, keeps, treats or disposes of controlled waste or, as a broker, has control of such waste, to take all such measures applicable to him in that capacity as are reasonable in the circumstances—
- (a) to prevent any contravention by any other person of section 33 above;
  - (b) to prevent the escape of the waste from his control or that of any other person; and
  - (c) on the transfer of the waste, to secure—
    - (i) that the transfer is only to an authorised person or to a person for authorised transport purposes; and
    - (ii) that there is transferred such a written description of the waste as will enable other persons to avoid a contravention of that section and to comply with the duty under this subsection as respects the escape of waste.”

This is converted expressly into the type of statutory duty, breach of which gives rise to a civil claim of damages by Section 73(6):

“(6) Where any damage is caused by waste which has been deposited in or on land, any person who deposited it, or knowingly caused or knowingly permitted it to be

deposited, in either case so as to commit an offence under section 33(1) or 63(2) above, is liable for the damage except where the damage—

(a) was due wholly to the fault of the person who suffered it; or

(b) was suffered by a person who voluntarily accepted the risk of the damage being caused;

but without prejudice to any liability arising otherwise than under this subsection.”

694. The relevant parts of Section 33 are:

“(1) ...a person shall not—

(c) treat, keep or dispose of controlled waste in a manner likely to cause pollution of the environment or harm to human health.

(6) A person who contravenes subsection (1) above or any condition of a waste management licence commits an offence.

(7) It shall be a defence for a person charged with an offence under this section to prove—

(a) that he took all reasonable precautions and exercised all due diligence to avoid the commission of the offence...”

695. “Controlled waste” is addressed in Section 75:

“(1) The following provisions apply for the interpretation of this Part.

(2) “Waste” includes—

(a) any substance which constitutes a scrap material or an effluent or other unwanted surplus substance arising from the application of any process; and

(b) any substance or article which requires to be disposed of as being broken, worn out, contaminated or otherwise spoiled...

(3) Any thing which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste unless the contrary is proved.

(4) “Controlled waste” means household, industrial and commercial waste or any such waste.”

There is no real issue that all the contaminated material removed from the various sites by CBC and its contractors was “controlled waste” for the purposes of the Act.

696. In my judgment, the civil duty adumbrated by the statute is in effect and practice a duty to exercise reasonable care and skill. The use of the expression in Section 34 (1) that the person owing the duty has to take all such measures applicable to him in that capacity “as are reasonable in the circumstances”, supports that view. Whilst there might in theory (and exceptionally) be a case in which the exercise of reasonable care is insufficient to do what

is “reasonable in the circumstances”, in practical terms there is no difference between the statutory and the tortious test. Mr Wilby QC did not press the contrary firmly if at all in oral argument.

697. An issue arose as to whether the statutory civil duty on CBC was one in which the onus was on it to prove that it had exercised all reasonable care, reliance being had by analogy with Section 33(7). That sub-section however is related to the criminal offence and is comparable with the Health and Safety legislation which reverses the burden of proof for some offences in that way. I do not consider that one can transfer the shifting of the statutory burden in criminal cases to the civil proceedings envisaged by the Act: the Act would and should have so legislated if that had been the intention. It is comprehensible that for the civil proceedings a balance of probabilities standard is to be achieved by the claimant. Section 73(6) provides some additional defences to a defendant in the civil proceedings but it does not reverse the burden of proof.

### **The Pleadings**

698. It is necessary to consider the pleadings at least in general terms, although there has been little or no objection taken to anything which has been argued or put on the basis that it was not pleaded or was contrary to what was pleaded.
699. Initially, the Claimants served Group Particulars of Claim. It would not be unfair to describe this pleading as somewhat prolix and to some extent at least involving a "scattergun" approach. Reference was made to some 75 contracts in connection with which it was said that causative breaches of duty had occurred. At Paragraph 83 they pleaded that "contaminated vapours and/or small particles escaped from the land reclamation sites"; at Paragraph 84, it was pleaded that there was a cluster of upper limb reduction defects to children born in Corby between 1989 and 1999; at Paragraphs 86 to 97, reference was made to PAHs, Heavy Metals, Sodium Sulphate, Cyanide, Phenols, Dioxins and Furans as being the material contaminants. There is reference in Paragraphs 100 to 103 to various medical papers, ICRC guidance notes and consultation papers, statutes and DoE and HSE circulars of which it is said CBC should have been aware. Paragraphs 104 to 106 pleaded, in summary, failures on the part of CDC including failure to provide full and proper environmental assessments, detailed development control and full and proper analysis as well as complaints about inadequate supervision and leaving contracts unfinished with the result that contaminated waste was left exposed and open to the atmosphere for lengthy periods of time. At Paragraphs 108 to 115 there were extensive individual allegations of negligence, many of which are no longer pursued.
700. The Defence was, necessarily, not a short document because it had to deal with hundreds of allegations. Apart from some factual admissions, non-admissions and denials, there were some positive assertions such as that a number of the substances said to have caused the birth defects would not have caused them or that much greater quantities of such

substances would have been required to cause such defects than conceivably could have been generated at the material times.

701. The Court ordered the Claimants to serve Additional Points of Claim in effect to clarify and simplify their claims. They did not abandon their earlier pleading but summarised their case as follows:

“3. ...It is the Claimant’s case that the disabilities were the result of an occurrences occasioned by the Defendant which affected their mothers in pregnancy, causing each child to be born with disabilities which it would otherwise not have suffered. Each of the Claimants’ mothers was exposed before and or during the embryonic stage of pregnancy with toxic waste during the course of the Defendant’s land reclamation programme of various sites which made up the former British Steel Works complex.

4. The Defendant’s urban land reclamation programme and the presence of poisonous waste presented a significant health risk. The poisonous waste was ultra-hazardous and various sites contained substantial quantities of contaminated waste and toxic materials that were likely to cause personal injury to persons in the surrounding area in the event of their escape.

5. The Defendant was under a non-delegable duty at common law to take all reasonable measures to ensure that contaminated waste and toxic chemicals did not escape or cause personal injury.

6. The Claimants’ claims are in negligence, breach of statutory duty and public nuisance...

7. The Defendant and its servants or agents were negligent in:

(a) Causing or permitting the windborne escape of toxic material into the atmosphere from 1985 onwards from the Deene Quarry, Willowbrook North, Sootbills and Sootbanks sites.

(b) Allowing the said sites to remain contaminated notwithstanding reclamation works.

(c) Causing or permitting the disturbance of solid material during the reclamation operations leading to its carriage as dust or small particles in the air and/or the vaporisation of volatile liquids from the sites leading to chemicals being carried as vapours in the air and/or the spreading of toxic sludges along roadways by vehicles during the reclamation works.

(d) Failing to carry out any or any adequate or effective decontamination of toxic waste at the site is whether by dust control, dust suppression, solidification of contaminated waste, or other safety means in order to reduce the risk of exposure to the Claimants’ mothers before and or during the embryonic state of pregnancy...

(f) Failing to prevent contaminated liquids and sludges being deposited by dump trucks during the entire length of the haul road leading to the Deene Quarry contaminated tip and/or along the internal roads and over ground during reclamation work by the use and maintenance of water sprays to dampen down dust, proper facilities to wash the vehicles (including their

wheels), the sheeting of vehicles or other precautions to procure the waste and cover the vehicles and protect the Claimants mothers from contamination.

(g) Failing properly or at all to maintain or decontaminate the all road or internal access roads to the vehicles were allowed to bounce over the site roads causing spillages.

(h) Causing or permitting dozens of lorries to be used to transport substantial quantities of contaminated waste from the Soothills...site... along public roads and the Haul Road (both close to residential and community areas) to the Deene Quarry site... without taking any or any adequate or effective steps to protect the Claimants mothers from the effects of the escape of toxic waste...

(i) Causing or permitting contaminated material to be used in the filling of the toxic ponds and/or be stockpiled within the Deene Quarry site leading to further pollution of the atmosphere.

(j)...

(k) Failing to undertake any or any adequate assessment or management of the potential risks to health caused by the reclamation works despite growing evidence throughout the late 1980s and early 1990s that Deene Quarry, Willowbrook North and Soothills contained high levels of contaminated waste and toxic chemicals... and that unsafe exposure by the reclamation works at the former Steel Works complex had the potential to cause injury to our unborn children during their mother's pregnancy...

(l) Contrary to section 33 (1)(c) of the Environmental Protection Act 1990 disposing of waste in a manner likely to cause pollution of the environment or harm to human health and/or causing or permitting the same and/or contrary to section 34 (1)(b) of the 1990 Act and/or failing to take all measures reasonable in the circumstances to prevent the escape of waste.

(m) Failing properly or effectively to manage the contracts for the reclamation works by:

...(ii) relying upon a small close knit and inexperienced group overall practical purposes had sole effective control over the contracts to the exclusion of other departments and personnel of the Defendant...

(n) Failing to institute ... any or any adequate plan or system to avoid causing some personal injury to the Claimants and their mothers during the reclamation works and decontamination of toxic waste at the former Steel Works complex."

702. There is also reliance upon the doctrine of *res ipsa loquitur* so far as causation is concerned. There is an assertion by the Claimants that it is "self evidently negligent to carry out the reclamation works without an assessment of the potential risk to the health of unborn children in the locality and an effective decontamination programme designed to remove the effects of contaminated waste and toxic chemicals at the various sites in circumstances when a risk to health is reasonably foreseeable".

703. In the Additional Defence, CBC admits that "there was contaminated waste on the site including substances capable of causing injury to health if they escaped" but denies that any of the substances [relied upon as causing the birth defects] were capable, either alone or in combination with others of causing deformities of the type suffered by the Claimants". The allegations of negligence are broadly denied. It is, for instance, asserted that appropriate dust suppression methods (including wheel washes road sweepers and bowzers) were used when needed and that CBC took all reasonable caution to ensure that the effects of pollution were removed. It was admitted that substantial quantities of waste were transported along the public roads but it was denied that effective steps to protect the Claimants' mothers were not taken. It was asserted that there was "an effective decontamination programme".
704. The issues on the pleadings could be reduced in effect to one simple issue: were there any breaches of duty or any public nuisance which realistically may have caused the birth defects in question?

### **The Expert Evidence and Findings of Fact**

705. I now turn to the individual areas of the expert evidence in the context of the facts as found above. I will address the expert evidence in the order in which the experts were called: epidemiological, toxicological, engineering waste management, air pollution/ safety risk management and neonatal/foetal medicine. There was, unfortunately to some extent a mismatch between and within the disciplines of the experts called to deal with the various areas of the case; that was the parties' choice but the Court has had not only to consider which was the appropriate discipline but also which expert to prefer.

### **The Epidemiological Evidence and Findings**

706. In simple terms epidemiology is that branch of medical science which addresses epidemics. In practice, it is a statistical based discipline which seeks to investigate, collate information and analyse whether medical conditions or diseases have occurred in any given country or part of a country to an extent which is over and above what might otherwise be expected.
707. In this case, the epidemiological evidence has concentrated upon a consideration of whether or not there was a "cluster" of limb reduction defects in Corby. The internationally respected Atlanta Centre of Disease Control states:

“A cluster is confirmed when the observed/expected ratio is greater than one and the difference is statistically significant”

Both experts accepted that this was an appropriate definition.

708. It is an unfortunate fact of life that children are born with birth defects for some known reasons but generally for unknown reasons. Science and statistics have not been able at this stage of history to identify the causes of the defects in each case or indeed in many cases. In some cases, there is a genetic throwback for a particular defect in the child's family. Sometimes, abusive substances, such as cocaine, cause defects. Thalidomide, to which various experts have referred, was a prime example of a prescribed drug causing birth defects.
709. It therefore becomes of interest and use to determine whether something out of the ordinary has happened in any given case or whether what has happened is an unfortunate chance event or series of events. It is in that context that the epidemiological experts address the available statistics.
710. The two experts who gave evidence in this context were Professor Parker and Mr Hurley. Professor Parker was and is highly qualified in particular as an epidemiologist in a medical context. She currently holds the chair of Community Health and Epidemiology at Dalhousie University in Nova Scotia, Canada, having previously been Professor of Paediatric Epidemiology at Newcastle University in England. She has been involved in numerous research projects over the years and has written a very substantial number of papers.
711. Mr Hurley classifies himself as an epidemiologist but his background is mathematical and as a statistician. Up to 1990, he was mostly involved in occupational epidemiology (the study of health and disease and their causes in workers); after 1990, he has spent more time on environmental epidemiology, in particular the public health benefits of pollution control. He has not studied the epidemiology of congenital abnormalities beforehand. It was that lack of experience which led him to miscalculating the EMSYCAR rates of upper limb defects in his first report. He has backtracked to some extent from the 2<sup>nd</sup> Expert agreed statement. I considered that his approach was one which sought to diminish any differences between the figures for Corby and elsewhere.
712. Of the two experts, I was most impressed by Professor Parker. Her experience in the particular field with which this case is concerned and her straightforwardness in her reports and giving evidence was striking. I formed the view that Mr Hurley was trying a little too hard to find reasons to support his client's standpoint.
713. As indicated in the history section of this judgement, the investigation and report by Olivier and Morgan ("O&M") in 2000 identified that in the Kettering health area between 1989 and 1998 a total of 14 children were born with upper limb defects; of those six were born to mothers who lived in Corby. Olivier and Morgan concluded that there was not any "cluster".

714. Both experts accept that the 14 cases identified by O&M can and should form the basis for their analysis. I accept that approach. Although the Claimants in this case number eighteen, a number of those children were born to mothers who did not live in Corby at the time of their birth, although there is unchallenged evidence which I accept that they either visited or worked in the Corby area at the time when they first became pregnant with the claimant in question.
715. It is however clear that the epidemiological evidence, whatever I find, is not directly or fully probative. As both experts accepted, the outcome of the epidemiological debate in this case is at best simply a pointer, albeit it may be a strong one. It does not prove conclusively that the cause of all or some of the Claimants' problems was a cause which was specific to Corby (such as the reclamation works). However, it does become increasingly important to the extent that other areas of the evidence show the existence of circumstances which point to something specifically present or happening in Corby at the relevant times.
716. Question 28 of the Issues is:
- “Whether the rate of upper and/or lower limb defects of the Claimants on the Register born between 1985 and 1999 was higher than that of the surrounding districts and constituted a statistically significant cluster of such defects for the location and in the relevant period?”
717. The experts agreed broadly as follows:
- (a) They did not have the information to answer this question fully, specifically in relation to the Claimants. They had the epidemiological data in the O&M report for 1989-1998 which did relate to a clearly defined population and a specific case definition. They agreed to use this data to address this question for 1989-1998.
  - (b) The O&M study defined
    - i. the study population is births 1989-1998 to mothers resident in the former Kettering Health Authority which includes Corby, East Northants, Kettering and Wellingborough at the time of birth; and
    - ii. the defects under consideration are the upper limb deformities as defined in the report.
  - (c) The data in the O&M report should be the main basis for answering Q28, in terms of giving (i) the relevant number of births in Corby 1989-98 and elsewhere in the former Kettering Health Authority; (ii) the relevant number of cases, both in Corby and the other districts of the former Kettering Health Authority.
  - (d) The comparison should be between Corby and elsewhere in the remaining districts in the former Kettering Health Authority, i.e. excluding Corby, because this is the contrast that is most sensitive to relevant differences.
  - (e) In interpreting levels of statistical significance, one needs to be aware of the fact that the O&M investigation resulted from publicity about a small number of cases of limb defects; i.e. the hypothesis that rates were higher in Corby arises at least in

part from observation of what seemed to be an excess of cases in the late 1990s. They did not agree as to how this should be done.

(f) In assessing statistical significance, the cases which gave rise to the initial concerns should not be discarded. They did not agree about whether these cases have the same status as other cases found by O&M.

(i) Professor Parker favoured including all the O&M data on an equal basis, and acknowledging the implications for statistical significance.

(ii) Mr Hurley favoured doing the analyses in two ways, once including and once excluding those years where the set of cases that triggered the initial concerns occurred. This requires establishing which cases gave rise to the public concerns which then led to the O&M study.

718. This highlights a lacuna in the exercise which the two experts have been able to do. They accept, as does the Court, that the Kettering statistics for 1989-1998 are reliable as far as they go but they do not and can not address the position in relation to the years 1985-8 which affects two of the Claimants. It is pointless to speculate what the position would be if information for those years was also available.

719. I also accept (to the extent that there was any difference) that the Corby information from the O&M study should be compared with the rest of the Kettering area (excluding Corby). This is robust and reliable information prepared and collated upon a common basis. The experts agreed that it was comprehensive. It is also obviously right that, as the experts accept, that this comparison should be the main basis for seeking to answer Question 28.

720. Question 29 is:

In the absence of any locally elevated exposures to hazardous substances, what number of children would be expected to have been born with upper and/or lower limb defects during the period between 1985 and 1999 in the location at Corby, Northamptonshire?

721. The experts agreed that epidemiologically this question was similar to Question 28, with the difference being that in Question 28 the comparison population was specified and here it was not. They did not agree about whether it was informative to calculate expected numbers using rates from comparison populations other than elsewhere in the former Kettering Health Authority.

722. Question 30 is:

Is there epidemiological data (and if so what) to establish whether the birth defects complained of (a) arise from a common cause; (b) arise from airborne contamination; (c) arise from reclamation works?

The experts in this field agree that they cannot answer this question.

723. The experts in their Third Joint Statement agreed some further matters:

- (a) The epidemiological and statistical issues in this instance, as in many other reported disease clusters, are complex, and can lead to reasonably held differences of opinion about methods, results and conclusions.
- (b) They could not study epidemiologically the Claimant group as a whole. It was therefore not possible to enumerate the population at risk or to identify all relevant children including those with and without birth defects in such a population, in the relevant time period
- (c) Their focus is principally on the extent to which there has been an excess of birth defects in Corby and the extent to which this excess may be due to chance or arise because of methodological issues
- (d) Valid tests of statistical significance (e.g. of differences between observed and expected numbers of cases) are useful and informative about the plausibility or likelihood of such differences, if chance was alone being considered; they give an understanding of how 'unusual' the observation being made is.
- (e) Tests of statistical significance are not in themselves determinative with regard to possible cause; i.e. that they do not constitute a simple decision rule. Specifically,
  - (i) if a test is "not statistically significant", it is still possible that other causes are operating to affect risks or (if methodological causes) the comparison;
  - (ii) if a test is statistically significant, it is still possible that chance (alone) is an explanation of the differences observed.
- (f) Statistically significant results dispose towards causes other than chance, and that results that are not statistically significant dispose towards chance alone being a possible or plausible explanation of the results. The degree of statistical significance can be taken to a certain extent as an index of the plausibility of a non-chance finding for which there is a causal explanation, or that chance alone is a sufficient explanation of the observed results.

724. The experts described their “Principal Conclusion” as being that, taking into account their work, compared with rates in elsewhere KHA:

“...there was a cluster of upper limb birth defects in Corby, either over the period of the KHA study (1989-1998) (as viewed by Professor Parker) or in 1996 (as viewed by Mr. Hurley). We disagree on the timing of this cluster and whether or not it can reasonably be explained by chance.”

725. Professor Parker concluded that the cluster refers to the period 1989-98 as a whole; rates of upper limb birth defects in children born to mothers resident in Corby were statistically significantly higher than elsewhere in KHA and were unusually high when compared with other contemporary data sets (i.e. EUROCAT), and were higher than the overall rate for East Midlands during the 1990's. Because of the consistency in these findings, Professor Parker considered that causes other than chance should be given precedence when interpreting these differences. Mr. Hurley however thought that the cluster relates to the small number of cases in 1996, or possibly in 1994-96, which led to concerns and media stories about upper limb defects in children in and around Corby; such events were to be expected, from time to time and from place to place, so that the upper limb birth defects in

Corby in 1996 could easily be due to chance; evidence from other years provided no strong support for the idea of a sustained excess of upper limb defects among children born to mothers resident in Corby. He believed that the differences were not statistically significant.

726. The experts disagreed about what rates (from what populations) in the surrounding areas) were valid and appropriate to use in calculating expected numbers of cases, upon the validity of tests of statistical significance which included the original cluster, when the hypothesis to be tested was developed as a result of these data being observed and on whether it was appropriate and usual to assess statistical significance using 1-sided or 2-sided tests of statistical significance.
727. The experts referred to various other registers which record statistics for congenital abnormalities, including limb reduction defects: EUROCAT, EMSYCAR and that for England and Wales. Both experts agreed that for various reasons, the latter register was not useful; I therefore disregard it.
728. The experts agreed that statistical tests are useful tools in providing a measure of how unusual a particular observation is; this in turn helps in interpreting whether the observation is or is not a chance finding. Professor Parker considered that when the question being asked is one sided, as in this case (i.e. is the rate in Corby higher?) a one-sided significance test is appropriate. When the question is two sided, as is not the case here (i.e., is the rate in Corby different i.e., higher or lower?) a two-sided test should be used. One sided tests are commonly used: for example, all the National Radiation Protection Board studies on radiation exposure in atomic weapons testing experiments, supervised by Sir Richard Doll, used one-sided significance tests, reflecting the one-sided nature of the hypotheses. Mr Hurley's view is that there is logically a case for using a one-sided test, given the alternative hypothesis, though one-sided tests, he believed, were very rare in environmental (or occupational) epidemiology, even when examining directly the possible effect of an established or suspected pollutant but that two-sided tests were more common on tobacco smoking studies, for instance.
729. By way of overall summary, Mr Hurley and Professor Parker agreed that the rate of upper limb defects in Corby between 1989 and 1998 is statistically significantly higher than the rates in the surrounding areas only if, all of the following apply
- (a) Comparisons are with rates in elsewhere KHA only and not with EMSYCAR also;
  - (b) Cases identified by O&M as having a family history are excluded.
  - (c) One-sided, and not two-sided, statistical tests are used; and
  - (d) The cases which gave rise to concerns and to the KHA investigation of O&M are included in tests of statistical significance.
730. Where the experts disagreed, I invariably preferred the evidence of Professor Parker who was much the more convincing and knowledgeable of the two experts. In the light of that,

my findings follow in so far as not set out above.

731. Congenital limb reduction defects are relatively rare events which, current statistics indicate, affect about five in 10,000 babies. The aetiology is often difficult to determine but it is established that teratogenic substances can cause such defects; there can often be a genetic component as well. Given that there have been a number of reports and investigations, for instance in the area of landfill sites in the UK and Europe, it is scientifically plausible that there is or at least may be a connection between contaminants of one sort or another and the creation of birth defects.
732. Given that the experts, wholly properly and correctly, decided that it was appropriate to use the data from the O&M report, it is not possible to make any epidemiological findings of fact in relation to children born outside the period of the study, namely in the period prior to 1989 and after 1998. This affects only four of the Claimants.
733. It is right that the primary conclusions on the epidemiological evidence are drawn from the comparison of the numbers of children born with birth defects to mothers living in Corby compared with comparable children born in the rest of the Kettering Health Area. The statistics and records for all such children were prepared in the same way and are robust. The work done by O&M was similarly done properly.
734. In the O&M study, the case definition was:
  - (i) children born in KHA to mothers living in the same area
  - (ii) children born between 1989 and 1998 inclusive
  - (iii) transfers and longitudinal as well as terminal deficiencies of the upper limb
  - (iv) pre-and post axial deficiencies of the upper limb
  - (v) syndactyly
  - (vi) Poland's Syndrome
735. Various children were excluded from the study, such as those suffering from neuromuscular disorders, those who had complex genetic syndromes involving other organ systems and those with a strong family history of limb deformities. 24 children were identified but 10 were excluded for these reasons.

736. Of the 14 children identified as falling within the case definition, six were born to mothers who lived in Corby at the time of the relevant child's birth. Professor Parker produced tables in her second report which I reproduce below which indicate the statistical prevalence of birth defects in Corby compared with the rest of the KHA:

Table 2: Number of Births and Upper limb reduction cases 1989-1998

|                               | Number of<br>b i r t h s<br>1989-1998 | Number of<br>cases | Prevalence Rate<br>(95% CI)<br>Per 10,000 | Rate ratio and 95% Exact<br>Poisson confidence interval<br>for Corby vs. Elsewhere in<br>Kettering Health Authority |
|-------------------------------|---------------------------------------|--------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| KHA                           | 35627                                 | 14                 | 3.9                                       |                                                                                                                     |
| CORBY                         | 7736                                  | 6                  | 7.8(2.8-17)                               |                                                                                                                     |
| KHA<br>Excludin<br>g<br>Corby | 27983                                 | 8                  | 2.9<br>(1.2-5.6)                          | Rate Ratio 2.7<br>(0.93-7.8)<br>1 Sided<br>p= 0.333<br>2 sided<br>p=0.065                                           |
|                               |                                       |                    |                                           |                                                                                                                     |
|                               |                                       |                    |                                           |                                                                                                                     |

Table 3: Number of Births and Upper limb cases 1989-1998

|                           | Number of<br>births | Number of<br>cases | Prevalence Rate<br>(95% CI)<br>Per 10,000 | Rate ratio and 95% Exact<br>Poisson confidence interval<br>for Corby vs. Elsewhere<br>in Kettering Health<br>Authority |
|---------------------------|---------------------|--------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 1989-1993                 |                     |                    |                                           |                                                                                                                        |
| KHA                       | 18527               | 3                  | 1.6 (0.3-4.7)                             |                                                                                                                        |
| Corby                     | 4248                | 1                  | 2.4                                       |                                                                                                                        |
| KHA<br>Excluding<br>Corby | 14279               | 2                  | 1.4 (0.17-5.1)                            | Rate Ratio 1.7<br>(0.15-18.5)<br>1 Sided p= 0.34<br>2 sided p=0.067                                                    |
| 1994-1998                 |                     |                    |                                           |                                                                                                                        |
| KHA                       | 17100               | 11                 | 6.4 (3.2-11.5)                            |                                                                                                                        |
| Corby                     | 3488                | 5                  | 14.3 (4.7-34)                             |                                                                                                                        |

|                           |       |   |               |                                                                         |
|---------------------------|-------|---|---------------|-------------------------------------------------------------------------|
| KHA<br>Excluding<br>Corby | 13612 | 6 | 4.4 (1.6-9.6) | Rate Ratio 3.25<br>(0.99-10.7)<br>1- Sided p= 0.026<br>2 -sided p=0.051 |
|---------------------------|-------|---|---------------|-------------------------------------------------------------------------|

737. These tables show, and I find, that the rate of upper limb reduction defects in Corby was significantly higher than elsewhere in KHA for 1989-1998 whilst it was even higher for the later five-year period, 1994-1998. I accept Professor Parker's evidence that the one sided test is the appropriate one to use in this case because it needs to be used when the question goes, as here, to whether the rate of upper limb defects is higher in Corby than elsewhere.
738. I also accept her evidence that it would be quite wrong to exclude from these figures, as suggested by Mr Hurley, two of the children born in 1996. His argument, and I use the word advisedly, was that 1996 was the year to which the first wave of publicity about birth defects in Corby applied. This argument was wholly illogical in my view. Once it is established that the statistics for births in Corby exhibiting the requisite birth defects are robust and true, there can be no arguable basis for excluding two of the children born with the requisite defects. To do that would skew the statistics and render any conclusion false.
739. There was reference to the EUROCAT statistics for upper limb defects in children born over the same period. EUROCAT collects statistics from a number of regional centres in Europe and provides a web-based assessment tool to determine the statistical significance of apparent clusters of birth defects. It is generally regarded as robust and reliable. Based on a comparison with the EUROCAT statistics, one would have expected 2.2 birth defects in Corby over the period 1989-1998 as opposed to the six cases recorded in the O&M study. EUROCAT statistics would suggest 1.5 birth defects in Corby for 1994-1998 compared with the five actually recorded. The same statistics however do not show a statistically significant difference in the period 1989-1993. I find that by reference to the EUROCAT statistics for the same period as the O&M study the Corby rates for birth defects are unusually high.
740. Specific reliance was placed by Mr Hurley on the statistics derived from EMSYCAR for the period 1998-2006. The EMSYCAR registry does not carry figures for the period 1989-1998. I accept Professor Parker's misgivings about the use of statistics from this source in the context of this trial. The period in question in the trial is not covered by the EMSYCAR statistics save for 1998-9. The EMSYCAR statistics do not provide information about local patterns in the rate of upper limb defects. They were not constructed in the same way as that done by O&M. Furthermore, there is an unexplained trend in the EMSYCAR figures for the later years which shows significant increases in upper limb defects which, although not inaccurate as such, tends to skew the figures to suggest a higher rate of birth defects per 10,000 births. Without some explanation (which

was not forthcoming) as to why this had occurred, any comparisons based on the EMSYCAR figures would be unreliable.

741. Of course, this epidemiological evidence goes only to upper limb birth defects within the period of the O&M study. It does not go to birth defects such as club feet (talipes) which affect two of the Claimants. There was unchallenged evidence that talipes affects about 1 in a thousand babies. There was no statistical information put before the Court as to how many children were born to Corby mothers and Kettering elsewhere mothers with this unfortunate condition. I can make no epidemiological findings in respect of any conditions other than upper limb defects.
742. I will return to the conclusions to be drawn from my findings on the epidemiological evidence towards the end of this judgment.

### **Toxicology Evidence and findings**

743. Toxicology is effectively the science relating to poisons and involves the study of the adverse effects of chemicals on living organisms, including the study of symptoms, mechanisms, treatments and detection of the poisoning of people. The Oxford English Dictionary defines "toxicology" as: "the science of poisons; that department of pathology or medicine which deals with the nature and effects of poisons" and "toxicologist" as "a person versed in toxicology". Other helpful definitions of "toxicologist" include: "one who studies the nature and effects of poisons and their treatment"(Princeton) and "a scientist trained to examine the nature of the adverse effects of chemicals on living organisms and assess the probability of their occurrence". In the UK, the Royal College of Pathologists considers toxicology to be a speciality within the wider field of Pathology.
744. So far as the two experts are concerned, Dr Flaks, called by the Claimants, is eminent and eminently qualified. His background was as a pathologist and toxicologist, with special expertise in toxicity and carcinogenicity of environmental and industrial chemicals and pollutants. As an academic latterly at Bristol University, he carried out research on toxicology and experimental pathology, on mechanisms of carcinogenesis, on the role of environmental pollutants in chronic toxicity and cancer induction, and on the immunotoxicity of dioxins, PCBs (polychlorinated biphenyls) and PAHs. He taught pathology and cancer studies to undergraduate medical and science students, and provided postgraduate training in chemical toxicology, pathology, carcinogenesis and immunotoxicology. Since about 1989, he has gone outside the academic world and acted as Director of and toxicological consultant to InfoResearch, a toxicological and environmental consultancy since 1989. He has considered a number of industrial sites, including coke ovens. He has written numerous papers.
745. Dr Searl, instructed by CBC, however comes from a different academic background. She

has a degree in geology and her PhD in 1986 was in earth sciences. She joined the Institute of Occupational Medicine in 1993 as Head of Mineralogy and has been there since. She accepted in evidence (Day 23) that she was not a toxicologist at all. Her expert evidence was largely based on a review (albeit an intelligent one) of the literature relating to teratogenic effects. Her views were dictated to a large extent by risk assessments provided by regulatory bodies. She had not considered the issue of limb reduction defects before this case. Her papers are on the inhalation of fibres.

746. I have no hesitation in preferring the evidence of Dr Flaks. He was immeasurably better qualified as a toxicologist; his experience as a pathologist gave him a most useful insight of the effects of toxic substances on the human body. Dr Searle was not and did not profess to be a toxicologist. I strongly felt that her approach was almost entirely dictated by her examination of published papers; she did not and could not effectively approach the opinions, research and regulatory approach set out in those papers from a toxicological viewpoint and background. She attached too much importance to the regulatory approach of DEFRA as set out in a set of papers which addressed "Contaminants in Soil". She felt that the regulatory papers provided a point from which to start because, if one did not have regard to them, the chemical industry would be entirely unregulated. That provides a justification for organisations such as DEFRA to recommend maximum or tolerable allowances but in logic they provide no, and are not intended to, provide support for or proof of the level of contaminants which might or would cause birth defects general or limb reductions in particular in embryos or foetuses.
747. Dr Flaks was not effectively challenged on Appendix 2 of his second report which considered what was required to be a toxicologist, supported by research. He summarised what the essential characteristics of a toxicologist were, taking into account the definitions referred to above and other papers:

- "1. Appropriate postgraduate training and/or experience in toxicology, as defined by the Royal College of Pathologists and the UK Register of Toxicologists in Britain, and by the American Board of Toxicology in the U.S.A.
2. An appropriate degree or qualification, generally at least an M.Sc. or Ph.D., specifically based on training, research and scholarship in toxicology.
3. Several years experience in the practice of toxicology (as defined in this document).
4. Evidence of toxicological experience in the form of publications of the results of original toxicological research, in peer-reviewed scientific journals.
5. Evidence of an understanding of disease processes (pathology), their mechanisms and causes."

I accept that evidence as logical and well researched. On that basis, Dr Searle's background and approach carried little by way of authority or persuasiveness, whilst Dr Flaks' was authoritative and convincing. Much of what follows in this part of the judgement is taken from Dr Flaks' reports and evidence, which in substance I accept.

748. The relevance of the toxicological evidence is in connection with the potential impact of various contaminants on the limb development of embryos. This was addressed non-controversially as follows:

“Outline of limb development

Table I shows a timetable for development of human limbs (based on England, 1983; Larsen, 1993; Drews, 1995). It is important to note that the limbs are forming during the 4th to 8th weeks of development and that the upper limb develops in advance of the lower limb. The four main phases in limb development are (1) initiation of limb buds; (2) outgrowth of limb buds during which time the limb plan is established; (3) tissue formation and limb shaping; (4) growth of the miniature limb to adult size. The principles that underlie vertebrate limb development have been derived from studies of mouse and chick embryos and these seem to have been conserved. Although there is only a little direct evidence that the same mechanisms operate in human limb development (Fallon & Crosby, 1977), it seems reasonable to assume that conclusions drawn from animal studies will be relevant to humans.” (Congenital Limb Reduction Defects; Brown, Lumley, Tickle and Keene 1996 HMSO)

749. A number of the papers put before the Court were properly described as regulatory documents. These set maximum daily oral intakes which generally an adult or child can tolerate. They do not obviously or at least expressly apply to pregnant women or the fetuses or embryos they may be carrying. They do not conclude that no birth defects can be caused by intakes less than maximums suggested. Whilst there is no suggestion that they have been put forward in anything other than good faith, they are put forward to provide a benchmark above which various substances should not be present for adults and children to ingest or inhale.
750. Dr Searl considered that, to form a general view about the level of exposure required to produce birth defects, one can extrapolate by body weight scaling to humans from animals exposed to sufficient levels of contaminants to induce birth defects. That approach was described as naïve by Dr Flaks. I agree. There are a number of papers which suggest that any such extrapolation is generally unhelpful. For instance:

“Interpreting animal studies to assess human risks

Pharmacokinetics and metabolism vary markedly between species, and between routes of exposure, so extrapolation to humans must take all those factors into account, on a chemical by chemical basis. In addition, different adverse effects have different thresholds, and there may be a concern that exposures at a level less than those that induce structural malformation might cause covert functional abnormalities. Finally, there are pronounced inter-individual differences in teratogenic response, in which genetic and environmental factors both play a part. Therefore, estimating human risk from animal data requires extensive pharmacokinetic and pharmacodynamic information which is available for only a tiny fraction of chemicals. Without that information, effective exposure levels in animals are uninformative.

Thus, the interpretation of CLRD induction in animals is that the chemical should be considered potentially hazardous to humans, but the probability that it could cause CLRD following real-life exposure is unknown.” (Congenital Limb Reduction Defects-page 2)

751. A primary reason why one can not extrapolate from animal experiments in relation to pregnant mothers and the embryos which they carry and why one should not generally have regard to recommended tolerable daily intakes in the various government reports is that there are numerous physiological changes which the mother undergoes during pregnancy. These are listed in “Toxicology” a book edited by Haley and Brandt (Chapter 7: “Reproductive and Perinatal Toxicology”).

752. The questions which the toxicologist experts were required to consider were:

“20. Which hazardous substances that may have been present in former industrial sites of this type are potentially capable of causing upper and/or lower limb defects of the type complained of?

21. What degree or level of exposure to hazardous or contaminated substances or chemicals was reasonably likely to cause or lead to a risk of upper and/or lower limb defects of the type complained of among the locally exposed population?

22. What is the relationship between the degree of exposure and the likely frequency of such defects in the exposed population?

23. What are the relevant teratogenic substances to which the mothers may have been exposed?

24. Can the human birth defects complained of be caused by the substance(s).

25. If any substance is capable of causing birth defect (s) what is/are the physiological mechanism(s) or mode(s) involved?

26. What is the likelihood of injury caused by maternal exposure to the substance(s)?

27. When and where was the scientific/medical knowledge of the matters set out above published?

753. Dr Flaks, correctly in my judgement, identified PAHs, dioxins and heavy metals as the likely teratogens. The former were present at the BSC site largely as a consequence of the coke making processes used on the site over many years whilst the latter were the by products of the iron and steel making process. Also, dioxins and furans (PCCDs and PCDDs) were produced in the electric arc furnace process as well as in the sintering process. Dioxins and furans accumulate in the body and are only very slowly eliminated.

754. So far as dioxins are concerned, Dr Flaks commented, based on papers and research, that it should have been obvious that the BSC site would be contaminated with dioxins when it closed, it being inevitable that dioxins would have been produced during the steel works operation (in particular the sintering plant); dioxins were and are known to be extremely stable in the soil. Decommissioning should have taken this into account so that any patches of heavily contaminated soil could have been identified and disposed of by incineration.

The toxic characteristics of dioxins had been widely published since the 1970s and the technology for analysis and disposal was readily available in the early 1980s when remediation work at Corby was proposed. The toxic characteristics of dioxins include damage to human health (and potential damage to the embryo). I accept this evidence; it is logical and backed up by numerous papers and research.

755. Dr Flaks was of the view, which I accept, that embryos and fetuses are much more sensitive to toxic chemicals than adults. The dosage of a teratogen required to induce birth defects can be much lower than that which would be required to cause toxic effects in adults and, although its teratogenic effects may be the result of induction by high doses, they may also be induced by low level exposures.
756. During the period from conception until implantation, insults to the embryo are likely to result either in its death and miscarriage or resorption, or in its intact survival. At this stage, the embryo is able to repair itself by multiplication of its undifferentiated cells. The embryonic period, from 18 to 54-60 days after conception, is the period when the organs are developing and is the period of maximum sensitivity to teratogenesis, since tissue damage becomes irreparable. The foetal phase, from the end of the embryonic stage to birth is the period when growth and maturation of previously formed organs takes place, and exposure to teratogens is likely to affect foetal growth, or the size or function of a specific organ, rather than to cause gross structural defects. Human teratogenicity is indicated by a recognizable pattern of anomalies, a statistically higher prevalence of a particular anomaly in patients exposed to an agent (which is an epidemiological facet), the presence of the agent during the stage of development of the affected organ, a lower incidence of the defect in the population prior to the introduction of the agent, and production of birth defects in experimental animals by the agent.
757. To induce a teratogenic effect, teratogenic substances must be administered during organogenesis, the period of embryological differentiation. The critical period of organogenesis in humans is 20-55 days (or 35-70 days after the last menstrual period). The nature and incidence of effects are dependent on the particular developmental stage when exposure occurs. During embryonic differentiation or organogenesis, the embryo is highly susceptible to teratogenic insult. Following differentiation, the foetus becomes progressively less susceptible to teratogenic stimuli, although increasing the dosage may or extend the period of susceptibility.
758. Most known teratogens have been identified through experimental animal studies. It is of course not ethical for any teratogenic tests to be done on pregnant mothers let alone on embryos and fetuses. A problem with this is that there is no exact or mathematical correlation between what will affect a mouse foetus and a human foetus. Only about 19 drugs or groups of drugs and three other chemicals (methyl mercury, toluene and polychlorinated biphenyls) have been established as teratogenic agents in humans (by clusters of abnormalities being observed by physicians) whereas about 1,500 teratogens

have been identified in laboratory animals (mainly by laboratory testing).

759. A teratogenic response depends upon the administration of a specific treatment of a particular dose to a genetically susceptible species when the embryos are in a susceptible stage of development. Susceptibility to teratogenesis by a particular chemical depends on differences between species and between strains within a species. Variables determining strain susceptibility include maternal parity and weight, foetal weight, number of young, size of the placenta, foetal and maternal production of hormones, and maternal utilization of vitamins and other essential nutrients. This is modified by environmental factors, such as diet, season and temperature.
760. Dr Flaks' view, which I accept, is that the most likely teratogenic agents are Dioxins, PAHs and particular heavy metals, namely Chromium, Nickel and Cadmium and respective compounds of these metals. It is at least theoretically possible that other agents might also be active. This does not exclude other agents that might have been present Dr Flaks could not identify what was likely to be the effective dosage of any one of these agents for human teratogenesis because the information does not exist. Further, the precise mechanism whereby any of these teratogens act is largely unknown. Toxicological coupled with epidemiological evidence can provide useful evidence as to the cause of birth defects.
761. Research on the impacts of these teratogenic agents reveals that there may well be some connection between birth defects and the application of the agents during the early foetal stage. For instance, in the case of dioxins, the use of Agent Orange, a dioxin, in Vietnam by American armed forces led to intense investigation into its impact on foetuses and children. A report (Ngo) concluded that parental exposure to Agent Orange appeared to be associated with an increased risk of birth defects. Animal studies reveal a variety of birth defects attributable to the introduction of dioxins of different types albeit that such defects did not include shortened limbs but did include shorter bodies and skeletal variants.
762. PAHs are undoubtedly carcinogenic and there is a wealth of research which shows that workers in coking facilities suffer from a variety of cancers. Animal experiments show that PAHs can and do induce retarded growth in limbs and shortening of bones.
763. As for the heavy metals, Chromium VI is identified in animal experiments as teratogenic producing reduced body size and organs, microphthalmia (small eyes), micromelia (the condition of having disproportionately short or small limbs), abnormal and twisted neck, and club foot. Nickel in various compounds can produce a wide variety of malformations.
764. It is Cadmium which has the most obvious link with teratogenicity. A significant amount of studies have found a clear link between the application of Cadmium or cadmium compounds and birth defects in mice, rats and hamsters; the defects included ectrodactyly, postaxial polydactyly, syndactyly, brachydactyly, adactyly, phocomelia, meromelia,

malrotation of the limbs and fusion of limbs. These or at least some of these defects feature amongst the Claimants.

765. Dr Flaks concluded in his second report that some of the contaminants on the CBC site were and are known to have teratogenic properties, including PAHs, dioxins and heavy metals. He had seen no analyses which had been carried out, prior to disturbance of the site, to assess the degree of contamination with PAHs or by dioxins, which would have persisted on the site. From a human health standpoint he had no doubt that, in the light of knowledge that existed at the time, it would have been prudent to carry out such investigations. The implications of dioxin exposure for human health (cancer and immunodeficiency, as well as potential teratogenesis) were well known at the time of remediation of the area and should have been taken into consideration. The technology for the sampling and analysis of dioxin-contaminated sites, as well as the safe disposal of contaminated waste, was readily available in the early 1980s when the remediation work was planned. I unconditionally accept what he has concluded in these respects.
766. I also accept his evidence that the dosage of a teratogen needed to induce birth defects is generally much lower than that which would be required to cause toxic effects in adults. Dr Searl's evidence on this was broadly to the effect that, since animal experiments involved relatively substantial doses to cause birth defects, very high doses or exposures to large quantities of the relevant contaminants would be required in humans and human fetuses. Dr Flaks rejected that on the basis that one can not correlate the level of dosage to one species with another. What the animal experiments show, he said, is the true potential of certain substances to induce birth defects which is likely to be true in relation to the human species. I accept what he said in this regard. It is not necessary for there to be high levels of exposure to these substances adversely to affect an unborn child.
767. I conclude, as did Dr Flaks, that it is more probable than not that the human birth defects complained of in this case were capable of being caused by the mother's exposure to some or a mixture of PAHs, dioxins and heavy metals (in particular Cadmium, Chromium and Nickel) and there is no reason why they could not be capable of causing limb defects of the type complained of in this case
768. Finally, he concluded that, provided that these teratogens were able to reach the mothers of the Claimants with birth defects during pregnancy, on the balance of probabilities, it was more likely than not that one or more of these teratogens caused the birth defects complained of, although he could not exclude the possibility that some of the mothers may have been exposed to teratogens not related to the Corby steel works site, such as certain diseases and infections. I accept this evidence.
769. It must be borne in mind that these teratogenic substances are present at a background level in any event to a limited degree. The public at large inhales or ingests minimal quantities of them in any event. One then needs to determine whether and if so to what extent that

background level is exceeded by other activities and then determine whether that increase can cause or has caused a particular condition.

770. It is unnecessary for me to decide if any individual Claimant's birth defects were caused by the teratogens present on the CBC site being disturbed or moved during the period 1984 to 1999. What I can and do conclude is that the PAHs, dioxins, Cadmium, Nickel and Chromium were capable of causing the birth defects complained of by the Claimants.

### **Engineering and Waste Management**

771. This area of the case was one where there was a mismatch in the backgrounds of the two experts and in the exercises which they did.
772. Mr Braithwaite was the waste management expert called by the Claimants. His background was working in local authorities in public health and environmental protection between 1971 and 1999. Although he acquired diplomas up to 1991 and an MSc in Environmental Protection in 1995, he was otherwise educated up to A level. Since 1999, he has been an independent consultant dealing with environmental, pollution control, public health and contamination and decontamination issues. His reports are not always wholly measured in tone; for instance, he says:

“8.1 I am loathed [sic] to try to condense this whole debacle down into a few sound bites...

8.3 In the early 1980s the local authority jumped with both feet into a quagmire of contaminated land and embarked upon what could be described as a generation of engineering adversity.

8.9 Later when he [Mr Ibbotson] was sacked by the Council after managing the project for something like 16 years he was described as, "unqualified", and amazingly, "without adequate insurance".

8.10 What does it say about a local authority who cannot even inspect an insurance document?" (2<sup>nd</sup> report-Conclusions)

773. He was however a down to earth but relatively outspoken person who spoke as he thought. He obviously had great experience over the 1980s and 1990s in how local authorities should manage and deal with waste and contaminated material. He was obviously appalled at the way in which CBC conducted itself; that feeling clearly manifested itself in the way in which he gave evidence. As is clear from this judgement, he was right to be appalled.

774. Ms Heasman is an environmental chemist who specialises in advising on environmental

issues and in particular has experience in the environmental impacts of land contamination. She has a BSc in Environmental Chemistry in 1982. She has experience in the assessment of risks involved in investigation, remediation and development of contaminated sites and in measures to reduce and manage the identified risks. She gave her evidence competently and tried to answer the questions posed; the cross examination was sometimes interruptive but she handled it politely.

775. She tended in her report to be somewhat perfunctory, for instance at Paragraph 6.1 and at Paragraph 8.6 of her first report:

“6.1 The nature of the remediation works was based on risk assessments carried out by various parties on behalf of CBC.

8.6 Based on my review of the documentation I conclude that the remediation activities were investigated, planned, implemented and managed in an appropriate manner.”

The first statement is surprising because there were no risk assessments as such at all; in a few cases, such as the engagement of WS Atkins to advise about the Toxic and Candy Filter Ponds and the Valley of the Drums, the advice was in material respects ignored. The second statement ignores the numerous examples of CBC itself internally accepting that their practices had been materially poor, for instance in relation to Toxic Ponds 3 and 4 and Willowbrook North.

776. I found her evidence on a number of topics, for instance as to what she believed the licence granted to BSC on 4 June 1980 for the deposit of controlled waste from storage lagoons meant difficult to comprehend. Notwithstanding that this licence on its face granted BSC the licence to deposit controlled waste, she thought that this allowed anyone to deposit waste on the specified land. This can not be right and that coupled with her somewhat perfunctory views as to the facts and CBC’s performance somewhat undermines any confidence one may have in her views where they seriously differ from other experts’ views.
777. Her principal approach was to analyse the results of the various site investigations over the years for the various parts of the BSC site and list them with a view to the formulation of a view that they did not show sufficient quantities of the types of contaminants which might give rise to the birth defects complained of in this case. Her approach was to pool all the available site investigation data and compare them with the generic commercial/industrial SGVs for the various relevant contaminants and with the ICRCL Action value for PAHs. The results of this exercise show that the maximum concentrations of Arsenic, Chromium, Cadmium, Mercury and Phenols did not exceed the generic SGVs whilst those for total PAHs showed that the average concentrations recorded in the samples from the site investigations did not exceed the ICRCL Action level for landscaped areas. SGVs and

ICRCL values are concerned more with the after-use of sites.

778. Problems arise with the exercises which she did. First, not all the relevant sites were investigated. Secondly, some of the sites were investigated after some contaminated material had already been taken away. Thirdly, some sites were not chemically investigated or, if investigated, not for all the contaminants with which this case is concerned. Fourthly, and in this context I accept Mr Braithwaite's evidence in this respect as logical and right, the vast majority of the investigations put down an inadequate number of boreholes and trial pits and trenches for the large areas with which they were concerned so that it was unlikely that one could have any confidence that one would find the extensive contamination which was undoubtedly present historically on the site. Fifthly, the great majority of the investigations were concerned with the post reclamation usage, namely for industrial or commercial buildings; thus, CBC was interested to know what types of foundations, roads, sewers and drainage would be required and at what cost. Sixthly, the application of SGVs and the ICRCL threshold figures was for the purposes of this case to some extent, at least, inappropriate because the case is concerned not with the after-use of the reclaimed sites but what would be the consequences of disturbing the contaminated sites and transporting the excavated materials.
779. The converse difficulty for Mr Braithwaite was that he is not a geotechnical or chemical engineering expert. He was obviously at some points in his cross-examination labouring when asked questions about these areas and topics.
780. Mr Braithwaite summed up his major criticism or at least one of them:
- “Nobody cared about the wastes and it was the wastes which were the issue. If the wastes were considered then they wouldn't have been allowed to go to Deene Quarry anyway” (Day 24/167)
781. There are on analysis essentially two main areas of issue between Ms Heasman and Mr Braithwaite, the first being whether by the standards prevailing in the relevant period CBC was materially in breach of duty and secondly what is the weight to be given to the site investigation and other readings taken during those periods in relation to the key chemicals in this case in comparison with the evidence of the history of contamination on the BSC site and what was found other than by way of site investigation. I will deal with each separately.

### **Prevailing standards and knowledge**

782. The ability of chemicals of one sort or another as having a teratogenic effect was actually known by CBC in 1982. Mr Sharnock's memorandum circulated on 8 March 1982 specifically referred to teratogenic (amongst) other compounds, Cadmium, Chrome, Nickel, mineral oils and hydrocarbons. Put another way, he was warning CBC to beware

of these compounds and let him know what was found. Coal tar and PAHS were well known at least as carcinogenic at that time and likely to be present on sites similar to or comparable with the BSC site (see ICRCL 18/79 Redevelopment of Contaminated Land: Gas Works Sites (3<sup>rd</sup> Draft) and Problems arising from the Redevelopment of Gas Works and Similar Sites-Wilson and Stephens-Harwell 1981).

783. Dioxins have been known about for a long time. They are a by-product of various industrial processes and in particular steel making. In 1976 there was a disaster at Seveso in Italy in which dioxins were released into the atmosphere. Dr Flaks identifies dioxins as materials which should have been and were known about as harmful substances. PAHs were known at the very least as carcinogens.
784. There is no doubt that by 1985, and probably well before, careful local authorities were aware of the need to have wheel washing facilities for cleaning lorries and other vehicles leaving muddy sites. CBC itself had a requirement in its contracts from 1984 onwards to that effect and even before then to prevent mud being taken on to the roads. This would apply even more where, as here, that local authority was dealing with contaminated material which might otherwise be taken out and deposited on to public roads.
785. Dust is and was known in the early 1980s and well before as a problem created by demolition, excavation, breaking up of hard materials and transporting of materials on and off construction sites. It was known that effective measures had to be taken to prevent or suppress dust.
786. There are references in a number of documents published in and after 1978 about the dangers of dust including dust from contaminated sites. For instance in ICRCL 16/78 issued in October 1979 which addresses "Redevelopment of Contaminated Land: Acceptable Levels of Contaminants in Soils (Consultation Paper), dust was one of the concerns raised about the possible adverse effects on public health and in particular reference to the inhalation of cadmium compounds in dust. Promotional data sent to local authorities in 1981 or shortly before by Harwell's Hazardous Materials Service refers to "the toxic potential of heavy metals and industrial chemicals used in some manufacturing processes", to the release of such materials causing a serious hazard and where "conventional demolition methods would have exposed downwind populations to considerable risks". There are numerous references to the exposure of workers to the inhalation or ingestion of contaminated dust; an example is the paper of November 1981 "Problems arising from the Redevelopment of Gas Works and Similar Sites" by Wilson and Stevens. In any event, CBC itself began introducing, at an early stage, requirements in its construction contracts to reduce or inhibit the generation of dust.
787. It is therefore clear that any competent local authority operating at the latest from 1985 onwards should have been aware of the potential harm to members of the public from dust generated at a site such as the site at Corby and should have taken active steps to ensure

that dust was not generated either on site or by or during the transport of materials from the site. As a matter of common sense, this necessarily needed to be applied even more rigorously where, as here, it was contaminated material which could give rise to dust. It has been suggested that the competent local authority would not necessarily know that dust generated on a site such as this would reach members of the public as opposed to workers. That however is a false point for a number of reasons. First, it was known in the 1980s that dust could be spread by the operation of wind. Secondly, it must have been known that, if uncovered lorries carry dusty materials, the operation of moving them will cause the dissemination of dust; if those lorries carry such materials on public roads, the public would be directly exposed to the dusts. Certainly, by 1991, sheeting of lorries carrying contaminated or otherwise dusty materials was commonplace. In the Health and Safety Executive Guidance Note HS(G) 66 "Protection of Workers and the General Public during the Development of Contaminated Land", there is express reference to the need to sheet lorries in service to prevent either the deposition of those materials or the dispersal of dust whilst those lorries are on the move. Mr Braithwaite said, and I accept, that the requirement for sheeting of lorries had been in place in practice for a number of years before then.

788. I have no doubt that a competent local authority engaged in the reclamation of extensively contaminated land such as that with which CBC was dealing in Corby needed to secure that adequate ground, site and chemical investigations were done so as to provide it with as good a picture as practicable as to what contaminants were present where and at what levels. Without that information, a competent local authority would be proceeding to a large extent in the dark. In the ICRCCL paper 3/78 "Redevelopment of Contaminated Land: General Notes" (revised October 1979), it was stated that local authorities should as a matter of "accepted practice" even before purchase "make an assessment of the site...to identify the nature and extent of any contamination and the likely impact on the development plans for the site." It was stated that "the first step should be the acquisition of as much information as possible about the history of the site...followed by a survey involving boreholes, trial pits and the collection of soil samples for analysis." In the 1981 Wilson Stevens paper referred to above, there is reference to it being a prerequisite to any development on contaminated land that "an adequate chemical site investigation" is carried out. That talks about sampling on a grid of about 25 metres and sampling in any areas of known contamination.
789. So far as site ground and chemical investigation is concerned, it was obvious in the 1980s, as now, that such investigations must be planned by reference to the known history of the site in question but the investigations can not guarantee to find all contamination. The reason is that such investigations are invariably based on boreholes or trial pits or trenches (apart from visual observations); those will reveal whatever they do reveal but will not as such reveal all the prevailing conditions between the geographical location of the boreholes pits or trenches. Whilst competent engineers who carry out these investigations may well be able as a matter of judgement to extrapolate in relation to the conditions between the locations of their boreholes pits or trenches, there can be no certainty.

790. The need for a thorough investigation of contaminated land was contained in a draft code DD175 issued in 1988 "Code of Practice the Identification of Potentially Contaminated Land and its Investigation" issued by the British Standards Institution. This had been around in draft since 1983 approximately.
791. There is a substantial issue between the parties as to whether it was legitimate for CBC to have regard to the ICRCL guideline values in relation to contaminants. In the ICRCL Guidance Note 59/83 second edition July 1987, entitled "Guidance on the Assessment and Redevelopment of Contaminated Land", that organisation set out what it calls a "systematic approach for the assessment of contaminated sites". In the Summary, it stated the following:
- “The concept of "trigger concentrations", which depend upon the intended use of the site, has been introduced to assist in determining the significance of contamination. If, after a thorough investigation, the samples from the site show values below the lower trigger concentrations, it is reasonable to regard the site as uncontaminated and proceed with the development accordingly. If, however, the results exceeded the upper trigger concentrations, it follows that some remedial action is required if the chosen form of development is to proceed. Alternatively, a different use should be considered. Trigger concentrations do not apply the site is already in use, and they may have to be modified where development has already begun before contamination was discovered.”
792. Since it was known, however, that the large bulk of the site acquired by CBC was heavily contaminated, it would never have been reasonable for CBC "to regard the site as uncontaminated". It also follows that, unless there were thorough investigations, it would be inappropriate to use the results from such samples as were obtained as in some way representative of the material likely to be encountered during the reclamation process.
793. This Guidance Note physically identifies that there will be a wide range of potentially harmful substances arising in iron and steel works, such as heavy metals and oily and tarry substances. It also identifies, unsurprisingly, that metals may be ingested for instance by young children playing on contaminated soil and that metals and some organic materials may also be inhaled from dust and soils. It identifies phytotoxicity as a potential problem.
794. It is clear that papers such as this are primarily concerned with the use or, as the case may be, after use of a site. Paragraph 20 of the paper says that "the importance of any hazard on any site depends primarily on the site use, since the use determines who and what may be at risk and the routes by which they may become exposed." The paper goes on to consider what may be considered to be acceptable values for allotments, domestic gardens, amenity and recreational areas, public open spaces and industrial and commercial buildings. The paper is not concerned in itself with the methods by which contaminated materials are to be exposed, excavated and removed. It does give some guidance on the type of site investigation that should be done. Apart from site investigations for ground engineering

and geotechnical purposes being "common practice" (Paragraph 26), it makes it clear that where site history and inspections show that there is likely to be contamination present (as here), a "detailed chemical investigation is also needed". Paragraph 27 identifies that "the number of sampling points needs to be sufficient both to identify the presence of contaminants and to determine their distribution with sufficient certainty for the intended use."

795. In Table 3 at the back entitled "Tentative "Trigger Concentrations" for Selected Inorganic Contaminants", a table is provided which identifies trigger concentrations in mg/kg for Cadmium (3 for domestic gardens and allotments and 15 for parks, playing fields and open spaces), for Chromium (25 for all those locations) and for Nickel (70 for any uses where plants are to be grown, because Nickel is said to be a contaminant which is phytotoxic but not normally hazardous to health). This table is prefaced with the following:

“All values are for concentrations determined on "spot" samples based on an adequate site investigation carried out prior to development. They do not apply to analysis of averaged, bulked or composite samples, nor to sites which have already been developed. All proposed values are tentative.”

796. A Table 4 entitled "Tentative "Trigger Concentrations" for Contaminants Associated with Former Coal Carbonisation Sites" gives values for PAHs being "Threshold" and "Action" values of 50 and 500 mg/kg respectively for domestic gardens, allotments and play areas and 1000 and 10,000 respectively for landscaped areas, buildings and hard cover.
797. Put another way, a local authority might have been justified if it had decided to leave a site as a park or playing field if it only had, following a proper site and chemical investigation, 14 mg/kg of Cadmium or 24 mg/kg of Chromium. This paper is not designed to give guidance or comfort to those who plan to excavate and remove largely on uncovered lorries hundreds of thousands of cubic metres of materials which were suspected to be contaminated.
798. Part of the overall thrust of Ms Heasman's first report involved comparing the indications from soil investigations carried out prior to or around the times of the site remediation works with "generic soil guideline values used currently and at the time in the assessment of the risks to human health from land contamination." The specific soil guideline values referred to were Soil Guideline Values (SGVs), namely current generic ground remediation standards, and for PAHs (for which no SGVs have been determined) ICRL guidelines (withdrawn in 2002 in favour of SGVs).
799. I accept as a matter of logic Dr Cox's views on this. The SGVs are "trigger" values above which there may be concern for human health for populations living or working for long periods on land containing residues of chemical contamination. Three land uses are

considered, referred to above. However, none of these land uses would result in the scale of unearthing and disturbance of the contaminants that would have been associated with the land reclamation activities in the Corby steelworks area. These land uses would, at most, only lead to human exposure through direct contact with the surface layer of the soil, or by uptake of contaminants into food grown on that soil. By contrast, the land reclamation would have involved deep excavation, transport, dispersion and large-scale tipping operations, which by their nature would lead to far greater emissions of materials. Current advice from the Environment Agency states that SGVs should not be used if they are not representative of the site being assessed, and not for short-term or acute exposures. In my judgment, the SGVs are not directly applicable to the type of environmental pathway that is under consideration here.

### **Breaches of Duty**

800. I now turn to consider the issues as to whether CBC was materially in breach of the duty of care and its statutory duty (after April 1992) in connection with what it did or failed to do at its sites in Corby. I am only directly concerned in this case with the period from about October 1985 to October 1998 shortly after the first and last of the Claimants were conceived. One needs however to consider the context prevailing in late 1985.
801. That context is that CBC had started in 1983 to demolish contaminated structures and substructures and to excavate contaminated materials in a major way without either carrying out any site, ground or chemical investigation prior to purchase of the sites or instituting any effective investigation so as to ascertain the extent, location and concentration of contaminants thereafter. Although the first site investigation carried out, by Norwest Holst (report November 1982), related to the Glebe and Deene Coke Ovens area which had been cleared, its purpose was not to determine the extent and location of contaminants but to determine whether the site could be developed for industrial building. Its purpose was not carry out a detailed chemical investigation. Norwest Holst themselves unequivocally made it clear that the sites of the Coke Oven Plants were "heavily contaminated". Notwithstanding this, the Glebe area was cleared and the heavily contaminated materials removed to Deene Quarry. Little was done on the Deene Coke Oven area which was on Willowbrook North.
802. Similar comments can be made about the next Site Investigation in May 1983 by Soils Engineering in relation to the 30 acre Iron Making Plant site; this was not a chemical investigation at all. In any event the 28 boreholes equate to one borehole for every 5000 square yards. The accepted best way of determining chemical contaminants was in any event by trial pit or trench. Identical comments can be made about Soils Engineering's February 1984 report of a ground investigation for a proposed factory development at Longhills.

803. CBC did obtain advice from WS Atkins in Mr Barry's February 1984 report about the Iron Making and BOS Plant areas. As the Preamble to that report makes clear, CBC had invited tenders for the site investigation in those areas which was "centred on acquiring geotechnical data from a comprehensive grid of boreholes numbering some 104 (50 m grid) in the former area and 42 (75 m grid) in the latter". There was to be a requirement for investigating the chemical contamination of the ground. WS Atkins were asked to give recommendations for chemical investigation of those areas. This is the first time that CBC had consciously to apply its minds to this albeit that substantial excavation and transporting of contaminated materials was well under way already. WS Atkins recommended trial pits rather than boreholes (paragraph 3.2). A range of chemical testing was recommended including from Cadmium, Nickel and Toluene extract to provision for testing for cold tars and oils.
804. The investigation by Exploration Associates about the Iron Making and BOS Plant areas, a site of some 80 ha or 192 acres, so far as chemical sampling was concerned, broadly followed WS Atkins' recommendations, albeit that without any explanation 12 trial pits recommended by WS Atkins were not done (as pointed out by them in their January 1985 report to CBC). WS Atkins were critical of the trial pits exercise and stated that there was a very poor recording of samples taken. They were concerned that the trial pits omitted from the central area of the site should be assumed to be potentially contaminated to a similar degree of those around. The primary concentration in the report however was the geotechnical evaluation so far as design of structures and sewers was concerned. The clear recommendation, so far as chemical contamination was concerned, was that the main problem would be dust and fumes and therefore adequate dust control measures "must be taken". Although the highest level of Cadmium was 2.03 kg/mg, it was strongly recommended dust control measures were taken to prevent excessive dust arising. The same was repeated in relation to Nickel. CBC does not appear to have responded to WS Atkins' criticisms of Exploration Associates.
805. By late 1985, CBC was only aware that there were serious contamination problems in the Deene Quarry area of the site which by then it had purchased. It had received advice from WS Atkins as to what to do and what not to do to the Toxic Ponds, the Candy Filter Ponds and the Valley of the Drums. It was only when the DoE had made critical remarks about the Valley of the Drums that as a matter of some urgency CBC was in the process of filling in part of that area.
806. Thus the position was that CBC had embarked in effect with little or no detailed chemical testing on the wholesale demolition, excavation and removal of the Heavy End and areas of Willowbrook South. Hundreds of thousands of cubic metres of what must have been contaminated material had been taken in lorries across public roads, certainly as from 1984 Phoenix Parkway and Steel Road. In many instances, lorries had travelled up those roads and entered Deene Quarry through the Gretton Brook Road entrance. Work had been done on Deene Quarry itself which must have involved contaminated material. No real efforts

had been made by CBC to make the Deene Quarry site secure.

807. In essence, CBC seems to have regarded the sites which it had purchased from BSC as its own to do with what it willed without reference to safety considerations to the general public.
808. Between the end of 1985 and about August 1997, CBC continued in effect throughout that period with a mindset that did not include any material consideration about the impact of their reclamation operations on the public at large. It appears that it simply did not cross the minds of those in charge at CBC that the massive demolition, excavation, transporting, spreading and deposition of enormous quantities of contaminated material might by way of dusts be inhaled or ingested by ordinary people and in particular pregnant women to their possible harm and detriment. CBC not only knew from a very early stage that dust would be and was being created not only by the excavation, transporting and otherwise dealing with the materials from the various sites but also that mud from lorries carrying contaminated materials which were coming off contaminated sites was and was likely to be spread on public roads. There are a large number of observations and complaints about dust and mud not only from CBC employees but also from the public.
809. CBC's performance in relation to the reclamation of the Toxic and Candy Filter Ponds and the Valley of the Drums was very poor. No effective wheel washes were provided and substantial amounts of contaminated mud were tracked out onto the public roads by lorries and other vehicles from the Deene Quarry site in circumstances where CBC expressly knew that the internal haul roads had been seriously contaminated by major spillages from open topped lorries carrying very substantial quantities of contaminated material. The filling of the Valley of the Drums was unsupervised in consequence of which amongst other things a large amount of contaminated material was spread by the overfilled Valley overflowing. The material used to fill the Valley of the Drum was itself contaminated. In relation to Toxic Ponds, much of the highly contaminated material was double handled, for instance by placing it first in the Candy Filter Ponds. Ignoring the advice of WS Atkins, and without the advice of any independent consultants, CBC engaged contractors to remove the sludges from Toxic 3 and 4 and deposit them at the eastern end of the Quarry. The work was done in breach of CBC's waste licence; the sludges appear to have been mixed with other contaminated material, the work was inadequately supervised by CBC and, contrary to its own approach, the deposited sludges were not covered or capped at the very least for several years.
810. Even though CBC was not contractually responsible for the excavation and transporting of sludges and the other contaminated material from Toxic Ponds 1 and 2, it failed to exercise any effective control over the haulage of the material on its own land with the result that yet again there were spillages of contaminated material and the spreading of such material onto public roads. The reclamation of Toxic Ponds 5 and 6 was effected by CBC in house personnel who were not qualified or experienced enough to deal with such reclamation. The work was poorly supervised and controlled and contaminated sludges were deposited

on haul roads and tracked out onto the public roads. Again the sludge was mixed with contaminated material to make it easier to handle. Even so, the material deposited in the contaminated tip was wet and was therefore itself in breach of the waste licence.

811. Throughout the whole period there was ineffective and save for 1996 and 1997 an almost total lack of control by CBC of Deene Quarry. There was a substantial amount of unauthorised and uncontrolled deposition and tipping of contaminated materials. There was unsupervised and uncontrolled spreading and grading of the materials once deposited. Even when the contaminated tip facility, as extended, was being used, Mr Buckland's supervision was inadequate and ineffective. Mr Buckland's part time supervision of the deposition of wastes from the Soot Hills reclamation was palpably poor.
812. From 1985 to 1997, CBC used staff that was unqualified and insufficiently experienced to design, manage and supervise many of the reclamation projects. Mr Copley had no relevant background in reclamation work or at least reclamation work involving substantially contaminated sites. He and Mr Palmer demonstrated by what they did and failed to do and by what they said such a lack of qualification and experience. Mr Webster had no relevant qualifications or experience in reclamation of any sort let alone of contaminated sites. There has been no suggestion that Mr Hussey had either.
813. It is said by CBC that, with regard to dust and the dispersal of mud, it did all that it reasonably could by providing for transporting waste on internal haul roads, siting work areas away from the public, clearing haul and public roads of debris, by providing wheelwashes, by damping down with bowzers, sheeting lorries and placing wastes in appropriate tips and capping them. As to these points, as was and should have been known to CBC, no effective wheelwashing was provided; no effective road sweeping or clearing was provided; no effective damping down of dust was provided; there was no sheeting of lorries until mid-1996 and even then it was ineffective; to begin with material was hauled on internal roads but by 1985, the lorries were crossing what was then public roads and increasingly from 1985 at least the bulk of the material was being transported on public roads for the bulk of its transportation; until the tip containment facility was capped initially, there was little or no capping of wastes which were simply deposited and spread on to Deene Quarry.
814. In my judgement, the Claimants have established that CBC was negligent and in breach of statutory duty in the respects pleaded in Paragraph 7 of the Additional Points of Claim as set out above.

### **Extent of Contamination**

815. The other major issue addressed by Mr Braithwaite and Ms Heasman was in effect the extent of contamination at the sites which were purchased and used by CBC in connection

with the reclamation. Ms Heasman prepared an appendix to her reports (ultimately as Appendix A to her Second Supplementary Report of March 2009) which set out what the various site investigations carried out over the years showed. This shows the maximum and minimum findings of the contaminants which are relevant to this case, albeit that the number of the investigations did not produce chemical testing of some of those contaminants. The Appendix also shows the number of samples which were tested for any given contaminants. A number of the site investigations to which he refers were prepared for clients other than CBC. Some of the investigations were done on areas which had already been partly reclaimed and had presumably had a quantity of the contaminants already removed.

816. In effect, Ms Heasman then, in conjunction with Dr Searle uses this information to support a thesis that it is unlikely that any significant quantity of the material contaminants could realistically or would have reached any of the 18 Claimants' mothers during the first third of each of their pregnancies. For reasons to which I come later in this judgment, I was not impressed with Dr Searle's evidence in this context. It is however necessary to address the likely extent of contamination.
817. Mr Braithwaite's approach is different to Ms Heasman's. He looks at the historical evidence coupled selectively with site, ground and chemical investigation data to conclude that in all probability all areas were seriously contaminated with toxic materials, albeit some worse than others. He is sceptical about Ms Heasman's analysis because he says very few of those investigations were comprehensive or can be taken as representative.
818. In my judgement, the site ground and chemical investigation information from the various reports does not give a true and accurate or representative picture of what was likely to have been present on the sites before CBC began the reclamation process. Save possibly for two of those investigations, such chemical testing as was carried out was based on inadequate sampling. On numerous occasions (for instance Willowbrook North and Soothills), worse material was encountered than might conceivably have been gleaned from the earlier site investigation reports. The history of contamination of this site suggests very strongly that it was widely and seriously contaminated overall. I will briefly review each of the relevant investigation reports in this context.
819. The Norwest Holst Report of November 1982 related broadly to the Willowbrook North area (albeit stretching partly into the Willowbrook South area) and did not test for Nickel, Chromium, Toluene, Coal Tars or oils; some tar is however noted in the trial pit logs. Such chemical tests as were carried out seem to have been taken from the trial pits which were not carried out at great depth. The boreholes reveal made ground to substantial depths; this includes ash and cinder type materials. The report appears to record the slurry lagoons which were present at depth but which were obviously not chemically sampled. Ms Heasman lists 42 samples said to have been done for Cadmium and apparently low readings. She has not however done any qualitative analysis of the trial pit logs and does not suggest that they were necessarily representative. An analysis of the trial pits reveals

the following:

- (a) 45 trial pits or possibly trenches; 4 were abandoned during digging;
- (b) In 7 of them, including the abandoned ones, no samples taken;
- (c) In 4 of them, the logger has identified the presence of a settling lagoon;
- (d) In 12 of them, tarry materials were noted;
- (e) A total of 71 samples were taken; from Ms Heasman's figures, at most only 42 of those were chemically tested.

Ms Heasman in her Second Supplementary Report wrongly records the total number of samples as 40 and the number of trial pits or boreholes as 20.

820. It cannot be said that this site investigation, as set out by Ms Heasman, provides any useful or representative information about the presence of harmful contaminants on this particular site. 41 effective trial pits spread over 150 acres represents one trial pit for every 3.66 acres (17700 square yards). It seems in any event that some of the trial pits were concerned with considering specific areas such as railway ballast areas which may well not provide any information which is useful to the enquiry which has to be conducted in this case. It is quite clear that harmful tar contaminants were found extensively and some settlement lagoons. The report was not in any event primarily prepared for the purpose of testing and sampling contaminants present on any representative basis.
821. The Soils Engineering report relating to the Iron Making plant again was primarily concerned with establishing geotechnical properties to help foundation design. At most "an indication of the existence of any hazardous or toxic chemicals" was called for. Three trial pits and five chemical samples were taken, it not being clear at what depths. It seems clear that one sample was taken from two trial pits and one each from three boreholes. Only Nickel and Cadmium were tested with Nickel being 80 mg/kg (maximum) and Cadmium being 4.5 mg/kg (maximum). These exceed the ICRCL trigger concentrations. The chemical report talks about this site being "erratically contaminated" which should not cause problems for industrial development. The same report indicates gross contamination of groundwater with oils and benzoles. Five samples over 30 acres does not provide any representative assistance as to the presence of harmful contaminants over the whole site.
822. The next report is that of Bostock Hill and Rigby dated February 1984. This was not done for CBC and only part of the report has been put before the court. It related to Willowbrook North. Ms Heasman records that there were 137 samples from 60 trial pits and that in mg/kg there were 13,200 for Toluene extract, 6100 for coal tars, 7.2 for Cadmium and 1100 Chromium (maximum figures). She does not refer to Nickel. The Toluene extract and coal tar figures on the chemical logs are suspect because many of them are the same; in any event they are somewhat indistinct appearing as "1t500". The

Chromium and Cadmium are over the ICRL thresholds. It is difficult to regard this report or the available extracts as providing useful representative information given that the bulk of the report is missing. In any event later reports show that this site was seriously contaminated.

823. In June 1984, Exploration Associates' report related to the Iron Making and BOS plant, a site of over 190 acres. No testing was done for Chromium but Nickel and Cadmium up to a maximum of 64 and 2 mg/kg is recorded by Ms Heasman as found out of a total of 45 samples from 17 trial pits and three boreholes. That equates to one sample for every 4.26 acres; in fact because a number of samples were taken from individual pits or boreholes, sampling was done overall even more sparsely. It may well be the case that some excavation and removal of materials had already taken place.
824. Attached to the July 1984 report of the working party were the results of some chemical testing of Willowbrook East carried out for CNT by Augustus Voelcker and Sons. This was right on the edge of the Willowbrook North site and was owned by CNT and indeed developed by them. It does not provide directly any useful information about the rest of Willowbrook North. The samples seemed to be taken at ground level and 1m down and therefore do not give rise to any representative view as to what might have been present at greater depth. Ms Heasman records for Cadmium, Chromium and Nickel 4.7, 224 and 70 mg/kg respectively, whilst for Toluene extract and coal tar she records 5.34 and 0.8% respectively, which are high figures, as anything above 0.5% would be excessive. There is no interpretive report on these findings, which seem to have been concerned with leaving the site grassed over.
825. Ms Heasman sets out in her Appendix A against the Exploration Associates final report dealing with the BOS plant area of October 1984 for Cadmium, Nickel and Toluene extract 1.57, 41.8 and 31,900 mg/kg respectively. There is no testing for Chromium or Coal tars. There are only 33 samples against this portion of the site which must have been about 100 acres or more. It is not possible to say that this is representative.
826. Ms Heasman does not refer in her Appendix A to the report of WS Atkins of November 1984 in relation to Willowbrook North; this may be because the chemical results are not listed in the copies of the report available to the parties and the Court. 145 trial pits were excavated and 425 soil and water samples were collected for analysis. I have set out references to this report above. This was a systematic chemical investigation which led to conclusions that there were extensive areas of contamination at depths including heavy metals and coal tars. This was done on approximately 50 or 75 metres grid squares.
827. WS Atkins' July 1986 report on sludge samples from the Toxic Ponds showed for Cadmium and Chromium 17.2 and 300 mg/kg respectively and for Toluene extract and Coal tars 55.5 and 5% respectively. There is little doubt that the Toxic Ponds were

seriously contaminated. No tests were done for Nickel.

828. The Norwest Holst report into Soothills of July 1986 involved 13 samples taken from 10 trial pits spread over a nearly 70 acre site. Chromium and Cadmium were recorded as 285 and 8 (maximum) respectively whilst Toluene extract was recorded as 40,050 mg/kg. This was not representative sampling and was presumably done to give some very broad idea as to what might be expected. All the trial pits found only made ground consisting of material which was slag and soot from the iron making operation. Trial Pit 5 records slag and soot and "possible mill sand sediment". It was this trial pit which was recognised to contain highly contaminated material. It is of interest that 40 additional samples not referred to by Ms Heasman record consistently high findings for Cadmium all but one of which exceed the ICRL initial threshold trigger; 28 exceed 5.5 mg/kg.
829. The Exploration Associates' report into the Electric Furnace Plant appears to have followed the removal of at least some of the probably contaminated material. Nickel and Chromium were not tested for nor was Toluene extract but Cadmium to a maximum of 13 mg/kg was found. Over half of the Cadmium samples exceeded 3mg/kg. It is clear that the prime purpose of the investigation was not to carry out a representative chemical sampling exercise.
830. Very limited sampling was done in the investigation carried out by Geotechnics in May 1988 with regard to the Willowbrook Balancing Reservoir. Six samples were taken from five trial pits. The object was not to carry out representative chemical tests but to identify the configuration of the ground conditions within the proposed site area. The primary purpose of the chemical testing was expressed to be to determine the soluble sulphate levels. Patches of tar and oil residues and probable slurry were found in some of the trial pits. It is difficult to consider that this limited sampling exercise provides any assistance.
831. A relatively small investigation was done by Geotechnics at Willowbrook West, their report being dated June 1988. The object was to establish ground conditions at the site and to determine engineering properties of the soils rather than to carry out a chemical investigation. Ms Heasman records there four samples for Cadmium (3 mg/kg), Nickel (48 mg/kg) and Chromium (21 mg/kg), (all maximum figures) and very high maximum figures for Toluene extract and coal tars, 124,200 mg/kg.
832. A report by Ove Arup in May 1989 for Hawker Siddeley in relation to the power station site addressed an investigation in the area in and around Toxic Ponds 1 and 2. Cadmium was found at minimal concentrations but there were found high levels of Toluene extract up to 212,326 mg/kg. It was described as a "preliminary" investigation on a site of some 13 acres. 15 trial pits were dug most of them some distance away from the Toxic Ponds. Nickel and Chromium were not tested for. Another report dated December 1989 in relation to this site from Wimpey Laboratories does not record tests for Cadmium, Nickel or Chromium but did record high levels of Toluene extract (15.47%). Yet another report by

Ove Arup about Toxic Ponds 1, 2 and 3 in December 1990 records nothing about Cadmium, Nickel or Chromium but again found a high level of Toluene extract (150,660 mg/kg).

833. The report of February 1991 from the Environmental Advisory Unit into Toxic Pond 5 only records two samples on Cadmium (maximum 5.1 mg/kg), three on Chromium (242 mg/kg) and none on Nickel. Five samples were done for Toluene extract and two for coal tar, with findings of 489,040 and 47,600 mg/kg respectively. A report done in November 1992 by ERL for Weldon Plant shows low figures for Cadmium and similar figures for Chromium but very high maximum figures for Toluene extract (169,620 mg/kg).
834. The first Contest Melbourne Weeks report dated January 1993 addressed Willowbrook North and in particular the slurry ponds. The context was that it was known that there was a slurry pond at depth. 12 boreholes and 12 trial pits were carried out. Slurry was found between ground level and 14.75 m below. No sampling was done for Cadmium, Nickel or Chromium but 0.84% (maximum) of Toluene extract was found. There was a substantial blanket of fill material comprising a variety of materials including slag, coke and other material.
835. An interesting investigation also by Contest Melbourne Weeks into the Exchange Sidings involved unusually a more detailed chemical investigation although its primary purpose was to determine subsurface conditions for the purpose of foundation design. The report of January 1994 involved 59 boreholes, 14 trial trenches and 23 trial pits. The site was said by these engineers to be only 580m<sup>2</sup> but it had been the subject of demolition beforehand and so it may well be the case that some of the material had been removed already from the site. The report states that 94 tests were carried out for Cadmium and 95 for Toluene extract. Ms Heasman records in her Appendix A that the number of samples was 71 and 72 respectively. Chromium and Nickel were not tested for. Ash and slag among other fill materials were recorded in the trial pits and trenches. Cadmium up to 23 mg/kg was recorded and Toluene extract at 1.04%. This is interesting because it demonstrates that when a thorough investigation was done high levels of contamination were located, which given the history of the site is not surprising.
836. Reliance is placed by Ms Heasman on a Validation Report done by Dr Smith's firm on Phase III of the Rolling Mills area. Nickel and Chromium were not tested for but a maximum Cadmium reading of 5mg/kg was recorded. The reason however that this is a Validation Report is that it relates to a period after there has been substantial removal of contaminated material. Accordingly it does not give any representative picture as to what was present before. No proper investigation was done of the Rolling Mills area before the excavation and removal part of the reclamation was done although part of the area (the Electric Furnace Plant) had been investigated in the early part of May 1987 (see above), when relatively high Cadmium had been found.

837. Another site investigation was done at the power station site by Wardell Armstrong for the power station company in May 1996. It recorded Cadmium, Chromium, Nickel and Toluene extract at maximum figures of 9.2, 700, 150 and 240,000 mg/kg respectively all of which were above the ICRL trigger thresholds or reasonable levels.
838. When Dr Smith's firm investigated Soothills in 1996, they did not check for Nickel but recorded Cadmium and Chromium at maximum figures of 0.5 and 130 mg/kg respectively. That was based on 38 samples. Toluene extract was recorded at a maximum of 0.184%. By this stage it had already been decided that over 150,000 m<sup>3</sup> of material was to be removed from the site and, indeed, a contract had been let to that effect. 16 trial pits were dug and 38 samples taken. Given the size of the site (over 60 acres) and given the fact that it was likely that there had been random dumping of materials historically by BSC, it was always unlikely that the trial pits exercise was going to be representative. Indeed Dr Smith in the report recognised that further trial pitting would be necessary as the heaps were reduced in height. The later investigation by his firm identified two new trial pits in which seriously contaminated material not picked up on the earlier investigation were found. One of the problems encountered however was that substantial quantities of material were in a seriously solidified state so that they would have to be broken up (as proved to be the case) by heavy machinery. Dr Smith recognised that there had been effectively been random excavations by the contractors permitted by CBC onto the site to remove soot and slags. Although he formed the view that the site could be regarded as relatively uniform based on the site investigation which he had done, later events proved that to be wrong. However the intention was that the material was sufficiently contaminated as to be required to be placed in a contained cell on Deene Quarry.
839. There then follows in Ms Heasman's Appendix a number of entries relating to samples from lorries transporting excavated materials from Soothills to Deene Quarry. Broadly the results show low Cadmium and, where tested, low Chromium and Nickel. There has been no and certainly no reliable evidence as to how carefully this sampling exercise was done. It was certainly not done with any view to protect the public from dust because by the time that the results of samples were known the material had already been deposited at Deene Quarry. It was in some ways a pointless exercise in any event for this reason. No instructions were given as to how the samples were to be taken from the backs of lorries or whether the samples should be taken in a way which might be representative. Only some 125 samples were taken over a period of 6 to 7 months and indeed none were taken after February 1997, although the operation continued some months thereafter (some of the documents about this are not in the Court papers albeit referred to by Ms Heasman). As it is known that 200,000 m<sup>3</sup> of material was moved from Soothills to Deene Quarry, assuming lorries with a capacity of 10 or 20 m<sup>3</sup> were used, there would have been 10,000 or 20,000 lorry loads of which 1 in 60 were supposed to be sampled. On either basis, insufficient lorries were sampled to be representative let alone to comply with the Environment Agency's requirements of 1 in 60 lorry loads being sampled. I therefore consider that the lorry load sampling exercise does not assist in determining what levels of contaminants were being disturbed.

840. Ms Heasman also relies on results from dust of monitoring exercise carried out on five days in late September 1996 which recorded very low levels of Nickel, Chromium and Cadmium. Only 10 samples were collected and tested. This exercise was done in response to the very large amounts of dust that were being generated by the excavation operation at Soothills. Again, it is difficult to see that this could be representative of what was or might have been generated by the operations from June 1996 to August 1997.
841. Dr Smith's further report on Soothills about chemical contamination concluded that the waste materials "have been shown to be grossly contaminated". It found Cadmium levels up to 8mg/kg and maximum levels of Nickel of 71 mg/kg. Some limited testing of PAHs was done also. Over all, relatively limited sampling was done. The very fact that this second site investigation revealed in two trial pits very seriously contaminated material demonstrates how un-representative Dr Smith's first investigation had been earlier that year.
842. A validation survey done by Dr Smith's firm in December 1996 on the Rolling Mills site is not particularly helpful because it was done after extensive excavation and material removal had already occurred. However even this revealed high levels of Toluene extract (3.95%) and Nickel at over 10 times the ICRCL threshold (713 mg/kg). Cadmium was 2.5 mg/kg.
843. There is little else in Ms Heasman's Appendix A which adds very much. There are other investigations done by parties usually other than CBC but mostly on sites which had been cleared. High PAHs and Toluene extract were found in a number of samples taken at depth at Deene Quarry from the tar lagoon found during 1996 which delayed Weldon. That lagoon supports a view that there had been random and indiscriminate dumping by BSC over the years of highly contaminated materials. It is likely that BSC did that elsewhere.
844. It is noteworthy that CBC itself actually commissioned very few site, ground or chemical investigations prior to remediation activities:
- (a) Heavy End and Willowbrook South: 7; only one investigation was done at the Heavy End before remediation although one referred to by Ms Heasman in July 1984, relating to the Iron Making Plant and the BOS Plant (on Willowbrook South), was after most of the Blast Furnaces area had been cleared.
  - (b) Willowbrook North: 3; what actually was found on this site when it was worked on in 1985-6 showed that the ground was even more extensively contaminated than the site investigations had revealed.
  - (c) Deene Quarry: 2 (on Toxic Ponds); thus none were done on the vast majority of

this site.

(d) Longhills: 1

(e) Soothills: 2, albeit a further one was done part way through the operation.

845. It would be wrong and misleading in my judgment to base any conclusions on how contaminated the CBC sites were on the information collated by Ms Heasman. It is not that the information is wrong as such. It is simply wrong to assume that this is in some way representative of what was present over the whole site.
846. I broadly accept the thesis put forward by Mr Braithwaite that these sites were heavily contaminated. The history of the operations of BSC and its pre-nationalisation predecessors points very strongly to a largely unregulated, extensive and indiscriminate operation of waste disposal on the site. The Deene Quarry area is the prime example: numerous waste ponds whose highly contaminated sludge and slurry contents were spread from time to time over the rest of that site along with wastes from other operations elsewhere. Other slurry and tar lagoons were placed by them in the Willowbrook North area. There was indiscriminate dumping on the Soothills area. The sites of the remainder had the accumulated wastes of over 50 years, or more, of iron and steelmaking on around and under them.
847. This is something which CBC clearly knew from the earliest stages. It acquired the sites without any site or chemical investigation. It had access to such information as was available from BSC which pointed to extensive contamination. It started demolition, excavation, transporting and deposition of removed materials without any extensive or representative site, ground or chemical investigations. At least one witness from CBC, Mr Webster, indicated that it was unnecessary to carry out extensive site or chemical investigations because CBC knew what was there, which must have been extensive contamination. In these circumstances, one is drawn to the inference that the relevant CBC officers believed that, because BSC had operated in the same way on its own land, it, CBC, could shift large quantities of contaminated material and deposit it on Deene Quarry. However, differences between what BSC had done and what CBC did are that BSC had never moved such large quantities of contaminated material in as short a space of time as CBC did and there is no evidence that BSC ever shifted as much material on open lorries on public roads.
848. The site ground and chemical investigation does provide evidence that there were present on the sites owned and reclaimed by CBC all the contaminants which, the toxicological evidence reveals, could cause almost all the types of birth defects with which this case is concerned. I am satisfied that these contaminants were probably present in large quantities.

### **Air Pollution and Safety Risk Management**

849. Since the primary case made by the Claimants is that the birth defects were caused by the inhalation by the Claimants' mothers during pregnancy of air borne contaminant bearing dusts, the evidence from the experts in the area of air pollution is important to determine how and in what circumstances dusts from the site could or would reach the mothers.
850. Dr Cox MBE, the expert in this field for the Claimants, secured his PhD in air pollution predictive modelling from Imperial College, London in 1975 and, as a chartered mechanical Consulting Engineer, has spent much of his professional career in risk analysis as well as risk management. He has had to address the dispersion and release of gases and the impact of biocidal products and for 10 years he served on the Health and Safety Executive's Advisory Committee on Dangerous Substances. He "spotted" a serious error in published papers by Ove Arup and IEA upon which Ms Heasman and Dr Searle had relied relating to the distance which small particles (under 10 microns) may travel. This had not been picked up either by Ms Heasman and Dr Searle; Ms Heasman ultimately accepted the error. He gave his evidence in a relaxed and self deprecating way and did not seek ever to exaggerate his views.
851. Dr Searle was better qualified to give the evidence in relation to this area of expertise than in relation to toxicology. She has done numerous tests on dust monitoring around the country. She gave her evidence with somewhat greater authority than in relation to toxicology. However, much of her report on air pollution and waste management is based on what she concluded in her toxicology report and evidence. Some of her thought and calculation processes are not set out in her reports; for instance, she did not identify the basis upon which she had made assumptions as to the dilution of pollutants from a point source. This was, she ultimately explained, based on her experience and a Local Authority screening paper. She tended to underestimate the impacts of dust and contaminants. I considered that she was trying too hard to reduce the figures to a level from which one would conclude that insufficient quantities of contaminants would have got through to the mothers of the claimants. In the face of a difficult and at times aggressive cross-examination, she seemingly came close to losing her temper on a number of occasions and was certainly over defensive.
852. Dr Searle was not prepared to adapt her views to reflect the major changes in the distance which small particles (under 10 microns) may travel which Dr Cox established and were agreed to by Ms Heasman. That was surprising in circumstances in which much of her reports was geared to what dust, particularly of the smaller particulate size, could be carried to the various places at which the mothers of the various Claimants lived or worked during the early stages of pregnancy.
853. On balance, I preferred the views and the competence of Dr Cox in this area. He gave his evidence with much greater authority and logic than Dr Searle. His qualifications and

experience were more apt than hers. She has made too many errors in some of her factual assumptions.

854. Before reviewing this area of the case, it is necessary to make findings at least broadly as to what levels of contaminated dust were likely to be present, where and in what quantities. In my judgement, there was a virtually constant generation of contaminated mud and dust from and including 1985 onwards to at least June 1997. There was almost constant work over this period by CBC and its contractors, but, even when there were slacker periods, dust would still have been released from the CBC sites or some of them, particularly Deene Quarry. Substantial quantities of contaminated material were carried on and on to the public roads mostly with unsheeted lorries. The main roads on which they were carried were Gretton Road, Gretton Brook Road, Phoenix Parkway, Steel Road, Shelton Road, Geddington Road and Weldon Road. It is clear and I find that the sweeping of the roads was inadequate and often not done to all. Once deposited on the roads, the mud and dust would inevitably be spread even further around the roads and the town by other vehicles passing over it. There is every reason to conclude in addition that dust was generated in drying and drier weather off the sites during demolition, excavation, transporting, depositing and grading and levelling operations involving the substantial quantities of contaminated materials. In similar conditions, where slurries had been exposed to the air (as on Willowbrook North A) or spread and deposited on the surface (as when Toxic Ponds 3 and 4 were deposited in the north-east corner of Deene Quarry) there would be contaminated dust generated from those sites. It would be facile to believe or expect as a matter of fact that at any one material time during this overall period there was only one precise point source of contaminated dust being generated.
855. As Dr Cox said, not only would vehicles carry material some distance, it would either come off because it was blown off the back or by way of being dropped off the wheels or undercarriage; if the material was wet, it could also spill over at the edges of the lorry. Any material dropped onto the ground including the roads or pavements could then be re-mobilised either by wind or by passing vehicles.
856. Although the prevailing winds, as in many parts of the United Kingdom, are westerly or south-westerly, there are and have been many days in the year (albeit not the majority) when winds blow from other directions. On still days, dust which has been activated could proceed in any direction away from the source which has activated it. Thus, by way of example, a substantial amount of dust was generated on the Soothills site in any event but particularly as the result of the necessary breaking up of over 13,000 m<sup>3</sup> of solidified waste by heavy breaking machinery used by the contractors. I accept the evidence put forward by those witnesses who visited the Exeter estate just to the west of the Soothills site and described substantial quantities of dust during that period.
857. All the relevant experts accept that it is only the finer particles of between 1 and 10 microns, sometimes described as PM<sub>10</sub> or less, which are material in terms of being capable of inhalation and passing into the smallest extremities and be exchanged into the

body's systems can take place. There was ultimately no dispute between the experts that these finer particles of PM<sub>10</sub> or less could be dispersed by wind or turbulence a substantial distance and in any event certainly to those areas in which the various pregnant mothers of the Claimants either lived in or visited in the first trimester of their pregnancies.

858. There was evidence, which I accept, from a number of the Claimant's mothers that when they were pregnant with their children they were exposed to contaminated dusts from the CBC sites in other ways. Thus several mothers described how they would have to wash and otherwise deal with their husbands' dusty clothes which had been rendered dusty by working either on or near to the CBC sites. Again several mothers worked in public houses regularly frequented by workers on the sites, an example being Fiona Taylor who worked with her husband in the King's Arms in Weldon: on a regular basis, Noone & McGowan and Weldon Plant employees used to come in covered in dust and debris; the dust was brought into the public bars and Mrs Taylor had to clean up after them.
859. Dr Cox said, and I accept as logical, that the atmospheric concentration of the contaminated materials at a particular location would have been the result of a complex history of various deposits that had been disturbed and relocated at different times in the recent past and mobilised or re-mobilised by virtue of changing weather and by the action of vehicles. He said in consequence that it was far too complex to be amenable to the type of numerical analysis which Dr Searl has adopted.
860. Both experts were, broadly, of the view that the inhalation of harmful substances released and transported in vapour form was the primary potential source of contaminants entering the body; whilst skin contact with settled dust and ingestion of foodstuffs affected by settled dust represented minor and less significant pathways for contaminants into humans.
861. I accept, as Dr Cox said, that it was clearly foreseeable that very harmful substances would be present on a site that had formerly accommodated large scale coke making processes with their related by-products recovery processes and blast furnaces, all of which are going to generate large quantities of toxic waste, or inert waste contaminated with toxic substances that had been dispersed within the curtilage of the steelworks. He said, correctly in my view, also that by the time that the land reclamation works were undertaken, awareness of the potential environmental impacts of a large operation of the kind embarked upon by CBC was commonplace and that appropriate studies would have shown what safeguards were necessary to control potential exposures of the local population to the harmful substances that were present on the site. It must follow that a competent local authority in the position of CBC should reasonably have foreseen that harmful substances could be dispersed to, amongst others, pregnant mothers within the Corby area.
862. Dr Cox and Dr Searl agreed that maternal exposure to hazardous substances released from the reclamation works could have arisen if they were exposed to sufficient quantities of

dust derived from the reclamation works during the relevant stage of pregnancy (about 7-8 weeks) and, if the dust was heavily laden with those substances. The extent to which mothers were exposed to airborne dust, they agreed, would have depended on the extent of dust release from the works, the weather and maternal behaviour during the relevant stage of pregnancy.

863. The experts also agreed, subject to one small qualification, that dust is released from all construction sites; the extent of dust release depends on the weather, the operations being undertaken, and the effectiveness of dust suppression measures. Whether the dust released during the steelworks redevelopment gave rise to a relevant maternal exposure would have depended on the nature of the material being handled, the handling process, the effectiveness of dust suppression measures, the weather and whether the mother's location and activities gave rise to an abnormally high intake of dust. Dr Searl said that this related to "soil-derived dust". It is clear however that not all the dusts were soil derived; an example is the Soothills material which seemed to have no natural soil being pure wastes; the same can be said about substantial quantity of the Willowbrook North and Toxic Ponds material.
864. In my judgement, Dr Cox's conclusion in his first report is correct that the most likely environmental pathway for transmission of toxic substances from the reclamation works in the local population is by a diverse airborne route, involving material at various times present as slurry, as a mud cake and as a dust aerosol in the air. His view was that this diverse airborne route would probably have involved time lags and therefore directional variation as the weather and wind direction would change from day to day; the dispersion of the pollutants would have been widespread and complex so much so that any attempt at precise mathematical modelling would be likely to fail or to mislead.
865. Dr Searl particularly in her second report has carried out a detailed analysis incorporating weather data to seek to demonstrate that it is unlikely that any of the Claimants' mothers in question could have been exposed to unacceptable levels of the material contaminants. Her starting point in this analysis seems to be to identify what works were going on during the first few weeks of each relevant pregnancy, to apply the highest level of the relevant contaminants recorded in any relevant site, ground or chemical investigation, to take into account material wind and weather over each relevant period, to bear in mind where the relevant mother was either living or visiting during the period in question and then to apply different maximum exposure allowances depending on the location of the particular sites being worked on by CBC in comparison with where the relevant mother was likely to be. She has assumed a single point source; that is at any one time that the contaminants were travelling from one geographical point. She makes additional allowances for visits to Corby and visiting the Sunday markets of those involved in car washing or handling dusty clothing. She then makes a detailed assessment of each mother what is the estimated extreme worst case daily intake of the relevant contaminants.
866. Whilst Dr Cox did not challenge the framework of the analysis adopted by Dr Searl, his

view was that it was wholly inappropriate in this case. I wholly agree with Dr Cox in this regard. Dr Searl's assumption that the level of contaminants from any given source was effectively the worst identified in the various site, ground or chemical investigation reports for that source is simply wrong, given the findings which I have made. Secondly, her assumption of a single point source for the contaminants at any particular time is wrong also. There can be no doubt that the contaminants were being circulated around the eastern side of Corby and beyond and at times a number of different operations were taking place at different locations. Thus, as Dr Cox says, a single point source approach does not reflect the much more complex and diverse routing to the local population which was likely to have been present throughout the period 1985 to 1997; there is also the added complication of the reactivation of the material which has earlier been deposited. Thirdly, her assumptions about a single point source (sometimes also called a source term) assumed relatively the same level of dispersal, whereas, as Dr Cox says, depending on the activities at the place or places where the dust is being generated one is likely to have peaks which may well lead to high concentrations of dispersal. Good examples on the facts of that would be where explosives were used to break up foundations and other underground obstructions in contaminated ground and the breaking up by heavy machinery of large quantities of contaminated material at Soothills. An aspect of her calculations involved the use of 24 hour averages whereas in practice, given that there would be less activity on and around the CBC sites at night, it might well have been much more appropriate to relate the exposure over a shorter daily period, such as 12 to 14 hours.

867. It has not been the function of this trial to analyse in ultimate detail whether each mother was in fact exposed to unacceptably high levels of contaminants at the material time during the pregnancy. That is why the main Group Litigation Order issue on causation is formulated in terms as to whether any relevant breach of duty "had the ability to cause upper and/or lower limb defects of the type complained of". It appears, notwithstanding this, that Dr Searl's assessment on individual mothers was at least in some respects flawed. For instance she did not factor in the fact that Lisa Atkinson was an active security guard during her pregnancy at various sites immediately around the CBC sites. Dr Searl proceeded on the basis that her first two months of pregnancy occurred at the time that no works were in progress, whereas the work on Toxic Ponds 3 and 4 were taking place at that time. She assumes that Mrs Mallin was simply not exposed at all to contaminants as she was not resident in Corby although there was clear unchallenged evidence that she was regularly visiting Corby. She wrongly assumed that Mrs McGrath lived 1 to 3 km away from the CBC site when in fact she lived less than that. She ignored the fact that Mrs Taylor, the mother of George, worked in a public house which was frequented by workers from the CBC sites. I give these by way of examples. In my view the factual assumptions that she has made in this analysis with regard to the individual mothers are often flawed and sufficiently so as to undermine the reliability of her approach.
868. Dr Cox's analysis in relation to the considerable distances travelled by dust particulates and more relevantly the harmful particulates with a size of less than 10um was ultimately accepted by Ms Heasman. However Dr Searl surprisingly, and in my judgement, wrongly did not adjust her figures to reflect the differences in the distance and quantities of

particulates which would consequently be transported considerably further than Dr Searl allowed for in her analysis.

### **Foetal Medicine and Neonatal Evidence**

869. Mr Penman, called by the Claimants, qualified from St Thomas's Hospital Medical School in 1984 and undertook general and specialist training in Obstetrics & Gynaecology in hospital appointments in the UK and elsewhere. He obtained his Certificate of Completion of Specialist Training in Obstetrics & Gynaecology and Sub-speciality accreditation in Maternal & Foetal Medicine in 1997. He was appointed as a Consultant in Obstetrics & Gynaecology and Foetal Medicine at the Medway Maritime Hospital in Kent in 1997 and was an Honorary Consultant at the Harris Birthright Foetal Medicine unit at King's College Hospital in London. Since resigning from the NHS in 2006, he has been in private practice. His workload is divided 80% Foetal Medicine and 20% General Gynaecology. His work as a Consultant in Foetal Medicine involves the diagnosis and management of abnormalities in the unborn child and requires a detailed knowledge of embryology and the problems that arise as a consequence of abnormalities of embryological and foetal development. He currently performs approximately 3000 pregnancy ultrasound examinations per year. During his time as a senior registrar in Foetal Medicine, having noticed an increasing number of cases of gastroschisis (a rare congenital malformation of the abdominal wall caused by vascular disruption in the embryonic period) being seen in the department, he conducted an extensive research project into this congenital abnormality and has published a number of papers from this research.
870. Dr Emmerson, called by CBC, qualified as a medical practitioner in 1983 and was appointed as Neonatal Lecturer at the University of London in 1989 and worked at St Thomas' Hospital. In 1993 he was appointed as a Consultant Neonatal Paediatrician at the North Western Regional Neonatal Medical Intensive Care Unit at St Mary's Hospital in Manchester. Since 1996 he has been the clinical director at St Mary's Hospital for Neonatal Medicine and for both Neonatal Medicine and Neonatal Surgery since 2003. He is also lead clinician for the Greater Manchester Neonatal Network. He is a Fellow of both the Royal College of Physicians and the Royal College of Paediatrics and Child Health.
871. Mr Penman was impressive, straightforward and fair; his approach in giving evidence was to listen carefully to the questions and give precise and reasoned answers. Dr Emmerson also gave his evidence in a straightforward and helpful way; although he clearly and honestly believed what he said, much of what he said seemed to be based upon what he thought the literature did not prove; he had a tendency to say that, because there was no clearly established case in the past, that demonstrated or helped to demonstrate that there could be no case in the future. The problem with the literature based approach is that on that basis there may never be advances in science if one follows the view that, because there is no existing literature on a given teratogen causing birth defects, that teratogen simply can not cause birth defects.

872. Both experts accepted that “without specific mechanistic evidence to the contrary, it is reasonable to assume that any chemical that has caused CLRD in an animal has the potential to do so in humans” (*Congenital Limb Reduction Defects*-Brown et al 1996-page 23). CLRD occurs in 3-5 in 10,000 births (*Congenital Limb Reduction Defects*-Brown et al 1996-page 55). Talipes (club foot) occurs in about 1 in a 1000.
873. It is accepted by the experts that the period of greatest risk to the foetus or embryo of suffering significant abnormalities to organs and limbs is in the third to the eleventh week of pregnancy during the period of organogenesis, which is while the foetal organs and limbs are forming. It is also, rightly, accepted that the impact of teratogens on a given foetus or embryo may well vary widely. A given mother may have built up a certain amount of teratogenic substances in her body. A given mother, foetus or embryo may for a wide variety of reasons have more or less resistance to a given substance or combination of substances.
874. There are, in some ways unfortunately, no precise threshold doses for particular substances causing limb reduction defects. For instance, research into thalidomide shows that not every mother who took thalidomide had a baby with the limb reduction defects which other mothers produced. As Mr Penman says, each teratogen has a threshold dose (which even may be zero or very close to zero), below which there is no risk of teratogenesis; that is supported by a paper by Brent in 2004. He says, obviously correctly, that the risk of birth defects being caused by a teratogen will depend upon a large number of factors including the dose, duration of exposure, gestation at time of exposure, mode of ingestion and the peculiar or specific susceptibility of the mother and embryo to it at the relevant time. He also says (and I accept) that the combination of two or more substances may increase the teratogenic risk by either lowering the threshold dose or even increasing the severity of the damage; he relies upon a paper by Nava-Ocampo in March 2007.
875. The experts are also agreed that the precise physiological mechanism or mode by which limb defects are produced by teratogens is unclear. It was broadly accepted by both experts that there were a number of rational explanations: vascular (with hypertension and cascading effect back from the foetus to the mother), interruption of the modelling process (referred to by both experts as a "sonic hedgehog" approach) and a particular effect of a substance in interrupting or otherwise affecting the organogenesis process or a step back from it so as to cause a disruption of development. Accordingly the Court is not in a position to identify the mode or mechanism. It is theoretically possible that the mechanism may vary between mothers.
876. There was a detailed discussion in evidence as to whether or not the introduction of teratogenic substances would cause bilateral defects; put another way, Dr Emmerson was of the view that the overwhelming probability was that, if teratogens played a part in the birth defects, there would be defects in either both arms or both legs as the case may be. Mr Penman considered however that one could expect unilateral birth defects and he pointed to the fact that a number of thalidomide victims had unilateral defects; it was his

view that the blood supply to the right and left upper limb is not identical due to the arching of the aorta as it rises up from the heart and he points to the studies on live born and stillborn infants in a paper by Harmon in 1995 and a paper by Makhoul in 2003. I prefer the view of Mr Penman in broad terms in this context: the fact that the number of the Claimants have unilateral, as opposed to bilateral, defects does not significantly or at all militate against teratogens being feasible causes of most of the types of birth defects with which this case is concerned.

877. Both Mr Penman and Dr Emmerson agreed that Cadmium has been shown to produce limb defects in animals and may therefore potentially be capable of causing upper or lower limb defects of the type complained of in humans. Dr Emmerson slightly back tracked on that concession by saying that, unless literature demonstrated that such defects had been caused in humans by Cadmium, he could not accept it. Mr Penman referred to what are known as “Koch’s Postulates” after the German physician who in the 19th century isolated the micro organisms responsible for causing anthrax, TB and cholera. His postulates laid down that to establish that an organism is the cause of the disease it must be (a) found in all cases of the disease examined, (b) prepared and maintained in pure culture, (c) capable of producing the original infection, even after several generations in culture, and (d) retrievable from an inoculated animal and cultured again. Since teratogenesis is wholly different from the sort of diseases and conditions which Koch was considering, these postulates have been modified to assist in the definition and identification of teratogenic agents so that (a) the agent must be present during the critical periods of embryonic or foetal development, (b) the agent should produce congenital defects in an experimental animal; the defect rate should be statistically higher in the treated group rather than in the control animals receiving the same vehicle or sham procedure and (c) proof should be obtained that the agent in an unaltered state acts on the embryo or foetus either directly or indirectly through the placenta; in this area, biochemistry and in vitro culture are most often used instead of bacteriology.
878. Mr Penman considered that fulfilment of the first two conditions is sufficient to define a teratogenic agent, but that, although it is desirable that the third condition is met, it is not essential and indeed was not even met by thalidomide. I am wholly satisfied that Mr Penman's evidence on this is to be preferred; since animal experimentation has discovered that the introduction of Cadmium into laboratory animals can cause limb defects, there is no good reason why its introduction into humans at the foetal or embryonic stage can not cause similar defects in humans. The first two conditions are also met in relation to Chromium VI which was present on the CBC sites; animal experimentation has shown that micromelia and club foot can be caused by that compound. In very broad terms, the adapted postulates are met for dioxins and PAHs also.
879. Dr Emmerson was less convincing on the issue as to whether there could be a peak in the blood of mothers of Cadmium which would or could have an effect on the foetus; his thesis was that there would be a background of Cadmium retained over the years in the mother’s body and, although there would be a slight relative rise in the Cadmium as a

result of the inhalation from the potentially harmful source, that would not be likely to be causative of the birth defects. Mr Penman disagreed. In logic, if there is a relatively large inhalation of Cadmium, there is no dispute that a significant part can transpose into the recipient's blood; it stands to reason that, until the Cadmium begins to be retained in the kidney and liver, it will circulate in the blood in significantly greater quantities than the background Cadmium which was always there; if circulating in the blood, it can get through to the foetus or impact upon the supply of nutrients to the foetus. It must have, or have the potential for producing, a greater effect for the period in which the level of the Cadmium was higher as a result of the inhalation. Mr Penman's views are more logical particularly when coupled with Dr Cox's views, which I have accepted, that there can be peak rises in the availability of the contaminants which would have the tendency to introduce enhanced levels of the teratogenic substances into the blood streams of the pregnant mothers. I see no reason to differentiate in this context between the different types of contaminant with which this case is primarily concerned. There is a background level of contaminants in the systems of the mothers with which the body copes and which the body retains but not necessarily in the bloodstream (they could be retained in the liver or kidney, for instance); in time, they may be discharged from the body albeit that may take some considerable period of time. If however there are rises and in particular peak rises, in the air or otherwise, of these contaminants in the first three months of pregnancy, it is this which will primarily have the potential to cause birth defects in the given mother.

880. Mr Penman was also influenced to some extent by the epidemiological evidence and particularly since he personally did substantial research in practice into gastroschisis, in relation to which he was influenced by the number of cases of comparable symptoms which occurred at a particular period. I have already found that there was an unexplained cluster of birth defects to children born of mothers living in Corby between 1985 and 1999. I do not consider that the epidemiological evidence supports the view that a long build up of contaminants in the mothers over some years before the particular pregnancy is material. If it was so, I would have expected a very much higher incidence of birth defects to mothers born in Corby given the level of exposure which must have been present over the years.
881. The problem for both experts is the fact that it is not possible, ethically, for experiments to be carried out on human embryos and fetuses and there is therefore no literature which spells out a direct connection between the introduction of the relevant teratogens to embryos or fetuses and the types of birth defect suffered by the Claimants. What is required is the application of considered foetal medicine and neonatal evidence in any given case. At this stage of the litigation, and in this context, the Court is required only to determine whether any established breaches of duty "had the ability to cause" birth defects of the types complained of.
882. On balance I preferred the evidence of Mr Penman who, having reviewed all the evidence and having been subjected to examination by both counsel, was unequivocally of the view that the relevant substances could realistically cause the birth defects of the types

complained of. There is no doubt that all these substances (Cadmium, Chromium, Nickel, PAHs and dioxins) can cause birth defects in animals of a similar or not dissimilar type to most of those reported by the Claimants. There is no reason to think, other than the lack of literature, that birth defects could not be caused in human embryos or foetuses by the introduction of such substances during the early stages of pregnancy. There is of course no certainty that animal experiments will replicate exactly the human experience; for instance, thalidomide was tested on animals before it was made generally available but it was established later that it was on the wrong type of animals (wrong in the sense that the young of the particular type of animals experimented upon did not exhibit birth defects), albeit that when retested on different animals comparable birth defects were demonstrated. Although there is no certainty that animal experiments, which do or do not demonstrate that particular types of birth defect may happen following the introduction of given substances in the early stages of pregnancy, will be replicated in the human condition, it stands to reason and is supported by the evidence of Mr Penman which I accept that the introduction of any of these substances either on their own or together with other substances could realistically cause birth defects of the types complained of.

883. There are two exceptions to this; the first being the condition reported as Ehler Danlos Syndrome in one of the Claimants. I make no findings as to whether that Claimant, the first of the Claimants to be born, actually suffers from that Syndrome. Both experts accept that this Syndrome could not be caused by teratogens as it would be present in effect genetically at the moment of conception. Therefore it cannot have been caused by the introduction over the following weeks of toxic substances. I am satisfied based on Mr Penman's evidence, to a substantial extent accepted by Dr Emmerson, that the various other conditions, Trisomy 9, epiphysial dysplasia, Poland Syndrome, proximal femoral deficiency and club foot, and the other (simpler) upper and lower limb defects could be caused by the relevant substances. The second exception is the reported condition of the last born Claimant with two fingers on one hand swollen and exceptionally large; this seems very different from the others identified and the mechanism, whatever it was, which produced this very unfortunate condition, was in all probability something wholly different from the introduction of the relevant teratogens in this case; put another way, I am not satisfied that this condition could realistically have been caused by the teratogens with which this case is ultimately concerned.

### **Overall findings**

884. One needs to bring together the findings overall, There was a statistically significant cluster of birth defects between 1989 and 1999. Toxicologically there were present on and from the CBC sites over the whole period from 1985 (and possibly before) until 1997 the types of contaminants which could cause the birth defects complained of by the Claimants. There was an extended period between 1983 and August 1997 in which CBC was extensively negligent in its control and management of the sites which they acquired from BSC and otherwise used. That negligence and, as from 1 April 1992, breach of statutory duty on the part of CBC permitted and led to the extensive dispersal of contaminated mud and dust

over public areas of Corby and into and over private homes with the result that the contaminants could realistically have caused the types of birth defects of which complaint has been made by the Claimants (save in limited respects). It can not however be demonstrated that after August 1997 the birth defects in children conceived thereafter could be caused by any breaches of duty or public nuisance occurring before that time; there can have been no significant emissions of the relevant contaminants after that time which could have caused birth defects of the types with which this case is concerned. CBC is liable in public nuisance, negligence and breach of statutory duty, obviously subject to it being established in later proceedings by individual Claimants that their particular conditions were actually caused by the defaults identified in this judgement.

885. It is very much a combination of findings which have led me to these overall findings. The epidemiological evidence showed that there was an unexplained cluster of birth defects to the children of mothers living in Corby during much of the relevant period. The toxicological evidence demonstrated that there were from the reclamation sites being worked on by CBC contaminants which could realistically cause the birth defects in question. The foetal medicine evidence showed that it was feasible for those contaminants to cause most of the birth defects in question. The actual facts supported by the waste management evidence proved that there had been continuing breaches of the duty of care owed to the Claimants, public nuisance and breaches of statutory duty on the part of CBC covering the whole period; those defaults had led to the extensive dispersal over the period from 1985 (and indeed before) until 1997 of such contaminated materials.
886. The case was opened and pursued by the Claimants on the basis that there was a systemic breakdown within CBC throughout the period; this involved a scattergun approach in the presentation of its case which became more focussed as the trial proceeded. I do not consider that there was a “systemic” breakdown as such within CBC: what happened was that it bit off more than it could chew and did not really appreciate the enormity, ramifications and difficulty of what it was setting out to achieve in terms of removing and depositing very substantial quantities of contaminated material.

#### **The Answers to the Group Litigation Questions**

887. To a large extent, the questions have effectively been addressed in the body of this already lengthy judgement. I will set out however each question and the answers.
888. (1) Whether in the management and execution of land reclamation contracts which involved toxic waste which included heavy metals, Polycyclic Aromatic Hydrocarbons, and dioxins in Corby, Northamptonshire between about 1985 and 1999, the Defendant owed a duty to the Claimants to take reasonable care to prevent the airborne exposure of the Claimants' mothers to such toxic waste before and/or during the embryonic stage of pregnancy.

It is accepted and I hold that CBC owed a duty of care to the Claimants and their mothers in tort to exercise reasonable care and skill in and about the execution of the works to avoid injury or birth defects to them. In practice, that duty involved taking reasonable care to prevent the dispersion of mud and dust containing contaminants from the sites which they owned or were operating on which would lead to the airborne exposure of the Claimants' mothers to teratogens.

889. (2) In the event that such a duty was owed, whether the Defendant was in breach of that duty and, if so, in respect of which contracts, which sources of airborne contamination, which contaminants, at which times and which geographical areas relevant to those Claimants on the Register such airborne contamination extended to.

CBC was in breach of that duty from 1985 until August 1997. The contaminants included Cadmium, Chromium, Nickel, PAHs and dioxins. The contracts, works and the areas which gave rise to the airborne contamination were those set out in this judgment. The sources of airborne contamination are dust from the sites owned or operated on by CBC which they had acquired or were to acquire from BSC, dust generated by the operations carried out or permitted by CBC from 1985 to 1997 and mud and dust taken out of those sites on lorries and vehicles and deposited on roads in the Corby area. So far as the geographical area is concerned that would cover the whole of Corby and also an area of up to 4 kilometres from the sites acquired from BSC owned or worked upon by CBC.

890. (3) Whether any such breach had the ability to cause upper and/or lower limb defects to the Claimants of the type complained of?

Yes except Ehler Danros Syndrome the defects complained of by the penultimate claimant to be borne and that condition experienced by the last Claimant to be born.

891. (4) Whether any alleged loss arising out of such breach was foreseeable

Yes.

892. (5) Whether, in the alternative, the Defendant is liable to the Claimants in public nuisance or under the Environmental Protection Act 1990.

CBC is liable for public nuisance in causing allowing or permitting the dispersal of dangerous and noxious contaminants, in particular Cadmium, Chromium, Nickel, PAHs and dioxins. CBC was also in breach of its statutory duty under Section 34 of the Environmental Protection Act 1990 to the same extent as its breaches of its duty of care in tort, as from 1 April 1992.

893. (6) Given the nature of the industrial operations that had been conducted in the past on the site, what hazardous substances would have been present immediately prior to the commencement of the land reclamation programme in or about 1985? In what locations and in what physical state would these substances have been present?

So far as is material to this case, Cadmium, Chromium, Nickel, PAHs and dioxins were present throughout to a greater or lesser extent prior to 1985. The physical state would have been in small and larger particle sizes contained in other materials, loose, in slurries or in sludges.

894. (7) What scientific knowledge and what authoritative guidance was available both at that time and also during the land reclamation programme regarding environmental health precautions when reclaiming this type of industrial site with such substances present?

This is addressed in the judgement.

895. (8) Was it reasonably foreseeable that the local population might be exposed to hazardous or contaminated substances as a result of the Defendant's land reclamation programme?

Yes.

896. (9) What steps did the Defendant actually take to prepare, establish and implement its land reclamation programme?

This is addressed in the judgement.

897. (10) Whether the Defendant's land reclamation programme was carried out safely and in accordance with best practices at the time for the management and disposal of contaminated waste.

No. The reasons and extent are set out in the judgement.

898. (11) What are the relevant teratogenic substance(s) to which the mothers may have been exposed?

The relevant substances are Cadmium, Chromium, Nickel, PAHs and dioxins, and respective compounds, so far as is material to this litigation.

899. (12) At what reclamation sites managed by the Defendant were there identified teratogenic

substances present which were moved or dispersed in such a manner that injury was capable of being caused by the Defendants?

The reclamation sites were Deene Quarry (including the Toxic, Oil and Candy Filter Ponds and the Valley of the Drums), the Heavy End, Willowbrook North and South, Longhills and Soothills.

900. (13) In respect of each site: When did exposure take place in relation to each site? What precautions to limit or prevent exposure were available? In relation to the identified exposure, what effect would the taking of relevant precautions have had?

This is addressed in the judgement. In broad terms, exposure to the respective Claimants took place over the whole period from 1985 to 1997 inclusive when the sites were being worked upon and whilst contaminants were exposed on the sites and whilst materials dispersed from the sites by vehicles were available to be inhaled by the public. Precautions involved necessary steps to prevent the dispersal of dust and mud from the sites; those included proper site and chemical investigations, effective wheel and vehicle washing facilities, dust suppression, effective and continuing road sweeping, avoiding taking contaminated materials on roads and ensuring that if such materials had to go by road at all they were prevented from getting out of the lorries whilst on the roads.

901. (14) What disturbances, escapes or emissions of hazardous materials that could give rise to personal contamination were reasonably likely to have been created by the Defendant's land reclamation programme?

This is detailed in the judgement. In broad terms, the disturbances, escapes or emissions reasonably likely to have been created by CBC's reclamation operations were by way of windborne or disturbed dust from the sites and by way of transmission of mud and dust by lorry and other vehicles on to public roads.

902. (15) What airborne or other environmental pathways existed by which any hazardous materials identified at 11 above could, with reasonable likelihood, have led to exposure of the local population to such material?

It was primarily by air and not by water that the contaminants were dispersed. The experts agreed and I accept that inadvertent ingestion of dust from foodstuffs, clothing and the like was another potential pathway.

903. (16) To what level or degree were locally resident mothers reasonably likely to have been exposed to such hazardous substances before and/or during the embryonic stage of

pregnancy as a result of the Defendant's land reclamation programme?

To a sufficient degree whereby they could inhale sufficient of the relevant contaminants that could lead to birth defects of the types complained of.

904. (17) Was it reasonably foreseeable that the local population could be exposed to hazardous or contaminated substances by way of airborne or other environmental pathways?

Yes.

905. (18) How and when may mother(s) become exposed to the substance(s) in circumstances such as to cause the birth defect(s)?

Mothers could become exposed at between approximately 18 and 54-60 days after falling pregnant. They could become exposed by inhalation or ingestion of small particulates of contaminated dust. They could become exposed by being in the areas in which such contaminants were present. The judgement addresses this in more detail.

906. (19) How may airborne contamination have arisen such as to give rise to the relevant maternal exposure?

Airborne contamination would arise by the contaminated dusts being blown or otherwise dispersed from the contaminated sites or from mud and dust from CBC's sites deposited on roads and being dispersed from there.

907. (20) Which hazardous substances that may have been present in former industrial sites of this type are potentially capable of causing upper and/or lower limb defects of the type complained of?

Cadmium, Chromium VI, Nickel, PAHs and dioxins and respective compounds are potentially capable of causing birth defects of the types complained of, except for Ehler Danlos Syndrome and the condition suffered by the last born Claimant.

908. (21) What degree or level of exposure to hazardous or contaminated substances or chemicals was reasonably likely to cause or lead to a risk of upper and/or lower limb defects of the type complained of among the locally exposed population?

It is not possible to put a numerical degree or threshold level of exposure because there is an infinite number of factors which could affect a given mother or embryo or foetus. It is

not necessarily a level which is relatively equivalent to what was given to laboratory animals to induce birth defects or one which is laid down or suggested by regulatory authorities.

909. (22) What is the relationship between the degree of exposure and the likely frequency of such defects in the exposed population?

The relevant degree of exposure is a sufficient increase in the level of exposure above the background level of the relevant teratogens to cause an otherwise unexplained increase in the birth defects in question.

910. (23) What are the relevant teratogenic substances to which the mothers may have been exposed?

So far as is material, Cadmium, Chromium VI, Nickel, PAHs and dioxins and their compounds.

911. (24) Can the human birth defects complained of be caused by the substance(s)?

Yes.

912. (25) If any substance is capable of causing birth defect(s) what is/are the physiological mechanism(s) or mode(s) involved?

This can not be determined but the mechanism or model would be either vascular (hypertension and cascading effects from the foetus to the mother) or interruption of the modelling process ("Sonic Hedgehog") or the particular effect of a substance interrupting or affecting organogenesis so as to cause disruption of development.

913. (26) What is the likelihood of injury caused by maternal exposure to the substance(s)?

This has been answered by the answer to Issue 3. Any probability is increased by there being a cluster of unexplained birth defects to children born of mothers living in Corby in the period 1989 to 1998.

914. (27) When and where was the scientific/medical knowledge of the matters set out above published?

Much of this has been known about for some time as set out in the judgment.

915. (28) Whether the rate of upper and/or lower limb defects of the Claimants on the Register born between 1985 and 1999 was higher than that of the surrounding districts and constituted a statistically significant cluster of such defects for the location and in the relevant period?

Yes, to both parts of this question in relation to children born of mothers living in Corby between 1989 and 1998.

916. (29) In the absence of any locally elevated exposures to hazardous substances, what number of children would be expected to have been born with upper and/or lower limb defects during the period between 1985 and 1999 in the location at Corby, Northamptonshire?

For children born from mothers who lived in Corby between 1989 and 1999, the numbers are as referred to in Professor Parker's Tables 2 and 3 set out in this judgement.

917. (30) Is there epidemiological data (and if so what) to establish whether the birth defects complained of (a) arise from a common cause; (b) arise from airborne contamination; (c) arise from reclamation works?

The answer is no, not from the epidemiological data alone. There was however a statistically significant cluster in Corby which needs explanation other than chance.

### **General**

918. In accordance with the usual practice, the draft of this judgement was circulated to the parties' solicitors and Counsel for consideration prior to formal handing down on a confidential basis. They have been invited to submit a list of any typing or other obvious factual errors in the draft and indeed whether there are any crucial findings of fact which in this very long and detailed judgement are thought to have been omitted. Both sides submitted lists of typing errors and, in particular CBC suggested a number of further findings which could be made; I have addressed those suggestions as appropriate. I will also on handing down the judgement consider the extent to which the draft answers to the Issues are sufficient for the purposes of any further hearings which may be necessary between the parties.
919. It is of course for others to judge the impact of this judgment on future works and practices on contaminated sites. The Corby reclamation was, however, in some senses at least, a "one-off" reclamation involving a very large contaminated steel work site which was very

close to a town centre. Whilst there will remain “brown-field” sites in the UK which are contaminated, there will be very few which are so large or so extensively contaminated as the Corby site.