

## 10 CHAPTER 10: GROUND CONDITIONS AND CONTAMINATION

### 10.1 Introduction

This Chapter of the ESA evaluates the effects of the changes to the Amended Proposed Development, including the extraction methodology, on ground conditions and contamination. Changes to the scheme and methodology are described in Chapter 5 in this ESA.

This Chapter is based on additional information to that presented in the ES submitted in February 2023, including the results of a further suite of chemical testing results carried out in the summer of 2023 to supplement that carried out as part of the 2021 site investigation. Furthermore, it seeks to address various comments and concerns relating to human health and the water environment which were raised by Nottinghamshire County Council's (NCC) contaminated land officer at Via East Midlands in response to the ES.

### 10.2 Legislation, Policy and Guidance

The legislation, policy and guidance detailed in the ground conditions and contamination assessment in Section 10.2 of the ES remain unchanged.

### 10.3 Consultation Responses

NCC provided a consultation response to the Ground Conditions and Contamination section of the ES in a letter dated 19 May 2023.

#### 10.3.1 Key Points Raised

The main points raised in the letter are outlined below:

- Bulk blended samples of PFA have been obtained for geochemical analysis. Discrete samples should be taken from separate layers through the full thickness of the deposits for contamination testing;
- The geotechnical test suite was based on suitability of the material for use in concrete and not on the environmental / contamination risks. Therefore, the potential contaminants of concern, such as heavy metals, asbestos and hydrocarbons have not been tested;
- Whilst it is indicated that no asbestos containing materials (ACMs) were observed, no laboratory asbestos screening has been reported. This is required to identify the presence or otherwise of free fibres, fibre bundles and/or small fragments of bulk ACM within the PFA;
- Groundwater quality monitoring has been carried out, but the locations are very widely spread. This could miss locally more contaminated areas. This could be significant in terms of the potential impact of disturbing contaminated areas. Also, the groundwater concentrations are likely to increase during operations within the areas that are exposed;
- No leachability tests have been carried out. It would have been useful to be able to compare PFA leachability test results from the 3no. PFA groundwater monitoring wells with leachate results from locations in between;
- Surface water monitoring – one location monitored. Would normally expect there to be sampling points upgradient, mid-way and downgradient of the Site; and
- Dust management plan – specific comments were made to provision of further detail for; management of PFA stockpiles; dampening measures employed for stockpiles; recording of dust concentrations in air; restrictions imposed on the worksite during extreme weather conditions.

The conclusions in the letter stated:

*“Disturbance of the PFA lagoons could increase potential pathways significantly, over the duration of the operation. This would increase leaching of potential contaminants into groundwater (due to exposure and decompaction of the disturbed dust deposits), as well as potential mobilisation of dust into the atmosphere, which could be deposited on surrounding land or inhaled by members of the public in the surrounding area. There could also be potential risks to on-site workers during construction and operation.*

*Additional information is required to ensure that the appropriate mitigation measures can be put in place.”*

The recommendations in the letter stated:

- Given the sensitivity of the location receptors, an additional ground investigation and contamination risk assessment are carried out across all of Area A (PFA lagoon areas);
- The contamination test suite should include all significant potential contaminants associated with PFA disposal sites, including asbestos. Samples should be tested at various depths through the deposits, due to the potential for contaminants to have changed over time. Recommended that leachate testing is included;
- If an initial limited geo-environmental ground investigation is carried out at this stage, planning conditions could be potentially included for a more detailed ground investigation to be carried out within each phase / cell, prior to commencing works in that area. This would be subject to review of the initial results and risk assessment;
- It is likely, although not certain, that any contamination risks to human health receptors, if identified, can be mitigated with appropriate control measures. However, it seems unlikely that the operator could completely eliminate the migration of PFA dust off-site, nor could they completely prevent exposure of site workers to PFA dust in external and internal areas of the Site;
- Increased leaching of substances within the PFA into groundwater is likely to be unavoidable during the operational period. It is understood that this risk would need to be managed to comply with the Environmental Permit. However, it is questioned whether the risks (e.g. leaching potential of the PFA) have been adequately identified at this stage;
- Ground investigation and contamination risk assessments are carried out in Area B and Area C, prior to any permanent developments in those areas. However, it would be acceptable to cover these areas with a planning condition; and
- Details of the restoration plan are to be provided to the LPA for agreement, prior to commencing any phases of restoration. In addition, a validation report should be provided to the WPA at the end of the restoration, or each phase of restoration, as appropriate.

## **10.4 Main changes that would impact the Ground conditions and Contamination Risk Assessment**

### **10.4.1 Updated PFA Contaminant Characterisation and Sample Testing**

A ground investigation was undertaken at the Site in mid-2021. The investigation comprised the drilling of 23 boreholes and excavation of four trial pits. The boreholes were extended to a maximum depth of 18m below ground level (bgl) and the trial pits to 4.5 m bgl. Samples of PFA were collected at an approximate vertical sample interval of every 1.5 m and retained for analysis. The field results of this investigation (geology and depth to groundwater) were included in the baseline conditions detailed in Section 9.4 of the ES.

In summary, the PFA ranged in thickness from 0.05 m (BH21) to 15.9 m (BH5). With an average thickness of 3.6 m in the ‘Low-Rise’ and an average of 13.4 m in the ‘High-Rise’. During the course of the investigation and the logging of the exploratory hole arisings, no visual or olfactory indications of

hydrocarbon, other chemical or asbestos contamination were recorded. The PFA was encountered as a soft to firm dark grey slightly sandy silt with occasional dark grey fine sand laminations. The deposit had no observable vertical or lateral variability and was found to be relatively uniform. The visual assessment has been confirmed by laboratory contaminant analysis of the PFA.

Samples collected from each of the 27 intrusive locations during the investigation have undergone a suite of chemical and asbestos laboratory analysis during the summer of 2023. The samples were selected from each exploratory location on the basis of:

- Providing both lateral and vertical delineation to the base of the PFA. Vertical delineation analysis was undertaken at approximate 3 m intervals; and
- A non-targeted basis given the absence of any visual or olfactory indications of contamination recorded during the intrusive works.

The laboratory analysis suite comprised:

- 96 samples for an asbestos identification and quantification;
- 62 samples for metals<sup>1</sup>;
- 62 samples for poly-aromatic hydrocarbons (PAH)<sup>2</sup>; and
- 62 samples for Semi-volatile organic compounds (SVOC).

PFA samples were also selected for leachate analysis that comprised:

- 25 samples for metals<sup>1</sup>;
- 25 samples for poly-aromatic hydrocarbons (PAH)<sup>2</sup>; and
- 25 samples for Semi-volatile organic compounds (SVOC).

There were no concentrations of PAH or SVOC detected above the laboratory limit of detection (LOD) in any of the 62 samples. Metals were detected at anticipated concentrations for PFA (iron, magnesium, titanium, manganese, barium, strontium, vanadium, zinc, arsenic), in accordance with those as detailed in Section 9.4 of the ES. There has been an absence of asbestos detected within the PFA with the exception of a very small asbestos fibre bundle at one isolated location.

For the PFA leachate analysis, none of the 25 samples contained PAH or SVOC above the laboratory limit of detection (LOD). Metals were detected at anticipated concentrations for PFA (magnesium, boron, strontium, titanium, arsenic, molybdenum), in accordance with those as detailed in Section 9.4 of the ES. The results of the leachate analysis are comparable to the concentrations detected within the underlying groundwater.

A Technical Note summarising the data is provided in Volume 3 of this ESA as TA 10.4.

The laboratory analysis of the PFA has demonstrated its constituent components are in accordance with the concentrations of a typical PFA and consistent with those previously identified at the Site, particularly in relation to the presence of heavy metals. The analysis has confirmed the absence of any trace signature of organics (PAH, TPH, SVOC). A trace occurrence of asbestos was encountered in one sample.

Leachate analysis of the PFA is comparable to the concentrations detected within the underlying groundwater which show a heavy metal signature.

Asbestos has been encountered at one isolated location in the north-eastern corner of High-Rise Phase 2 (HR P2). It is not clear how this single occurrence of asbestos is present at this location.

<sup>1</sup> Metals suite - antimony, arsenic, barium, boron, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, selenium, strontium, titanium, vanadium, zinc

<sup>2</sup> PAH suite - acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene, benz[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[ghi]perylene, benzo[a]pyrene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene

Waste licensing documentation provided from the EA confirms that the Site was only licenced to accept PFA. There is no reference to acceptance of any other wastes, which has also been confirmed anecdotally by operatives who worked at the Site when it was accepting PFA and those living next to the Site when it was operational. The EA has stated *“According to our site inspection records, this site was found to be compliant with our permit whilst it was active.”* Historical aerial photography indicates a well-engineered and controlled process of infilling. As such, there is no evidence or information to indicate disposal of non-PFA material or any significant asbestos in any areas of the Site, as demonstrated by the preliminary PFA characterisation analysis. The trace occurrence of asbestos encountered in one sample, owing to the small quantity, does not meet the definition of asbestos as regulated under Regulation 2 of the Control of Asbestos Regulations 2012 (CAR 2012).

Nevertheless, the Applicant is proposing to adopt a precautionary approach. As such, a Discovery Strategy has been prepared, the principal aim of which is to provide detail on implementation of a structured and extensive watching brief to identify and address potential contamination and/or non-conforming material within the PFA should it be encountered during extraction activities. Should potential contamination and/or non-conforming material be identified, the strategy outlines the measures that need to be followed to manage and address the impacted material in a safe way in accordance with health and safety controls and legislation. It would include an asbestos watching brief, the objective of which would be to identify any significant asbestos contamination that might be present and uncovered during the PFA excavation to be identified and managed fully in accordance with the requirements of the Control of Asbestos Regulations (CAR 2012), the accompanying Approved Code of Practice and Guidance as well as CAR-SOIL industry guidance.

The Discovery Strategy is provided in the outline Construction Environmental Management Plan (OCEMP) in TA 5.3, Volume 3 of this ESA.

Additional ground investigations and field visual asbestos screening and asbestos identification and quantification analysis would also be undertaken as part of a further characterisation exercise before PFA excavation is commenced in each extraction phase, to supplement the investigations carried out to date. It is proposed that this would be secured by a suitable planning condition and/or as part of the Site environmental permit. Further detail is provided in ESA Volume 3, Technical Appendix 10.1, Update to Preliminary Land Quality Risk Assessment (PLQRA).

#### **10.4.2 Change in the Extraction Methodology**

The original assessment was undertaken assuming that the excavation and removal of PFA would have been down to the top of the underlying sandstone. When the sandstone was encountered upwelling of groundwater into the excavation would occur, and the groundwater would be abstracted to ensure dry working conditions. This would have included the abstraction of any perched water leaching from the surrounding PFA and rainfall or surface water run-off into the excavation. The abstracted water would then have been discharged through soakaway ponds following filtering. The abstraction and discharge of groundwater would have been undertaken under an Environmental Permit.

However, the extraction methodology has since been updated such that the below groundwater PFA would now be worked wet (i.e. no pumped abstraction) and extracted to approximately 0.2-0.5 m above the top of the sandstone. The thickness of PFA remaining at the base of the excavation is to be confirmed but would ensure that there would be no upwelling of groundwater within the underlying sandstone into the excavation. Whilst there would remain some leaching of perched groundwater within the surrounding PFA and rainfall into the excavation, this would be a much lower volume than if groundwater from the underlying sandstone were encountered. Therefore, the PFA would be worked wet.

Once extracted, the PFA would be placed along the side of the excavation to allow any perched water within the PFA to drain naturally back into the excavation. There would therefore be no active

abstraction or disposal of groundwater required as it would remain in the void with no need to discharge to the soakaway.

The leachate data obtained for the PFA has demonstrated that there would be no increased detrimental impact or further deterioration in groundwater quality, as existing concentrations within the groundwater exhibit similar concentrations to the leachate recorded from the PFA. In addition, the removal of the overlying PFA would ultimately result in removal of a contaminant source and therefore provide betterment over time.

The extraction methodology is set out in Chapter 5 of this ESA. The revised Outline Water Environmental Management Plan (WEMP) and revised Drainage Management Plan (DMP) are provided in TA 9.1 and 9.3 respectively, Volume 3 of this ESA.

### **10.4.3 Update to Dust Monitoring and Mitigation**

An update of the Dust Impact Assessment (DIA) (Volume 3, TA 13.6 of this ESA) and Dust Management and Monitoring Plan (DMMP) (Volume 3, TA 13.7 of this ESA) has been undertaken providing significantly more detail, including a dust monitoring regime, and being more consistent with the higher level of information usually reserved by planning condition. It is also notable that the revision in the extraction methodology would ensure further dust protection. The extraction scheme, including the recent amendment, are very important from a dust management perspective. It is recognised that dust management is at the centre of all operational activities.

Extraction would commence from west to east through Area A, starting at High-Rise Phase 1 (HR P1) closest to Area C. The extraction process would commence by digging a cut into HR P1 and extracting at a lower level, using the in-situ lagoon embankments to provide screening and shielding from the wind. The embankment would only be removed, to be used to restore the void, when extraction in the previous micro-phase had been completed.

PFA would be extracted in Area A using an excavator or dozer (or similar). The use of motor scrapers has been removed from the scheme. PFA would then be transported by a dozer (or similar) to a small temporary holding stockpile before being loaded into a mobile screen (with shredder box) at or close to the extraction face, before being deposited onto an enclosed conveyor for transport to Area A.

The scheme has been designed to further limit open air handling of PFA. This would include using enclosed conveyor belts to transport PFA from the extraction face in Area A to the Main Processing Site in Area C. Importantly, once the PFA is fed into the conveyor hopper, the handling and processing – from this point on – would be fully enclosed; comprising, amongst other things, a reception building under negative pressure, further covered conveyors, pneumatic pipework, enclosed drying plant, pneumatically fed silos, and product taken away in either enclosed powder tankers (for dry PFA) or covered articulated wagons (for conditioned PFA).

The above effectively provides a cut-off for dust generating activities at the conveyor hopper in Area A.

The revised scheme, following that submitted with the original ES, has been designed so that extraction activities in Area A, including processing (shredding and screening), are concentrated in the smallest area possible at any given time, thereby reducing the area where potential dust emissions would be possible.

Key revisions include the following:

- Separating each extraction phase into small micro-phases – where extraction would be focussed, accounting for around 1% (1 ha) of Area A at any given time;
- The semi-fixed Processing Areas 1-3 have been removed from the scheme – meaning no remote processing operations in Area A and/or long haulage distances;
- The covered main conveyor has been repositioned and an adjustable covered spur conveyor would be used to take the reception hopper as close as possible to the extraction face;

- The reception hopper is able to move up and down the spur conveyor; and
- The screen and conveyor hopper are able to move with the extraction face – positioned within the extraction void at a lower level and behind the lagoon embankments.

There would only be a single spur with a moveable hopper, with both repositioned periodically as extraction progresses; with no requirement for multiple spurs. This facilitates short distances between the extraction face, screen and conveyor hopper; meaning operations at higher risk of generating dust would be confined to a very small and manageable area, making them simpler to cover with bowsers, stationary water sprays etc. when necessary. The areas outside of the micro-phase would either be undergoing restoration, covered/treated/compacted, or not yet worked (retained grazing).

Note that all digging, screening and loading into hoppers would be limited to a localised area within the extraction. It is envisaged that any temporary stockpiling would also be focussed in this area and limited, at most, to the wider phase boundary; all of which would be at a lower level and behind the lagoon embankments. Any temporary stockpiles in the extraction void that are to be left unattended, for example, over a weekend or in instance of adverse weather, would be compacted and/or treated to prevent fugitive dust emissions.

During operations, damping down with water is one of the main techniques used for dust suppression and there are a number of material characteristics of PFA that make this a very an effective technique. PFA particles have a high degree of porosity and a large surface area, meaning they contain small pores and voids within their structure. This porosity contributes to the lightweight nature and readiness to absorb water which acts as a highly effective binding agent, suppressing the dust particles, making them heavier and preventing them from becoming airborne. By wetting the dust particles, they lose their ability to float in the air. Water atomisation is therefore highly effective for capturing very fine dust and a fogging system would be employed to prevent wind-blown fugitive dust emissions at the Site.

A series of dust monitoring locations would be set up at the start of extraction. Deposited dust and surface soiling would be monitored using dust deposition gauges fitted with adhesive directional dust samplers around the exterior. The samples would be collected monthly and sent to a UKAS-accredited laboratory. The results would be compared to the benchmarks for the protection of amenity derived from Environment Agency (M17), Government sponsored best practice guidance, and Institute for Air Quality Management guidance on dust monitoring. Deposition rates would be assessed against the thresholds and if rates are above the threshold it would trigger further stages of action.

Further detail on the site-specific dust control measures, dust monitoring requirements, contingencies and action plan are all detailed in the Dust Management and Mitigation Plan (DMMP).

The updated DIA and DMMP are provided in TA 13.6 and TA 13.7 respectively, Volume 3 of this ESA.

## 10.5 Response to Consultee

The Applicant has undertaken further assessment to characterise the constituent nature of the PFA and has also further developed the extraction methodology and dust mitigation measures to further reduce the potential for dust emissions at the Site. The sections below address the main points raised in NCC's consultation response letter dated 19 May 2023.

### 10.5.1 Contaminant Characterisation

The laboratory analysis of the PFA has demonstrated its constituent components are in accordance with the concentrations of a typical PFA<sup>3</sup> and consistent with those detailed in Section 10.4.5 of the ES. The analysis has confirmed the absence of any trace signature of organics (PAH, TPH, SVOC).

---

<sup>3</sup> See data sheets on the UK Quality Ash Association (UKQAA website <http://www.ukqaa.org.uk/>) and other resources such as the European Chemicals Agency (ECHA) <https://echa.europa.eu/substance-information/-/substanceinfo/100.151.318>

Asbestos has been encountered at one isolated location at a depth of between 3m-4.5 m. There is no indication of a wider area of impact, however further data would be collected to confirm that this is the case.

The Applicant has previously committed to undertake a more detailed ground investigation within each phase/cell, prior to commencing extraction works in that area. It is anticipated the detail of the further ground investigation strategy, sampling and contaminant analysis can be confirmed and agreed with NCC under planning condition. The scope and density of sampling would provide further levels of confidence and certainty to the initial data that has been obtained.

Notwithstanding the outcome of the further ground investigation works, and in accordance with the requirements of the ES, a focused watching brief would be implemented to identify any significant contamination, asbestos or other, that might be present and uncovered during the PFA excavation to be identified and managed fully in accordance with the requirements of the Control of Asbestos Regulations CAR 2012, the accompanying Approved Code of Practice and Guidance as well as CAR-SOIL industry guidance. Segregation measures would be employed to separate such areas and the material would be quarantined in an enclosed dedicated area prior to disposal off-site following Duty of Care procedures. The procedures to be followed are detailed in a Discovery Strategy, prepared in support of the ES in TA 5.3, Volume 3 of this ESA. The contractors undertaking the extraction activities would be provided with the strategy pre-commencement and would need to demonstrate evidence of their competency to undertake the required work, in particular with regard to CAR 2012 and in full compliance with its legal duties.

Asbestos mitigation measures are based upon the findings of the PFA characterisation data obtained to date. A single isolated occurrence of trace chrysotile asbestos has been encountered. The works therefore do not require any specific mitigation measures to be implemented. A CAR 2012 compliant risk assessment would be undertaken which would be used to devise a dedicated asbestos plan of works (i.e. a method statement) which would stipulate what control measures would be required to control exposure to identified receptors so that it is at a level which is as low as reasonably practicable (ALARP). As such, the Discovery Strategy includes an asbestos management procedure, in the event that asbestos is encountered during the course of the works. This would also be subject to the findings of the further ground investigation.

In addition to this, a Waste Acceptance Procedure (WAP) has also been produced for the Environment Agency (EA) to support the Environmental Permit which details testing frequencies of the PFA (which would include asbestos). These measures would provide further levels of assurance to ensure the controlled extraction of the PFA, identification of contaminated and/or non-conforming materials should they be present and the management of how it would be addressed as it is being processed to prevent unacceptable exposure to human health, controlled waters and environmental receptors.

The Discovery Strategy and WAP are both contained within the outline Construction and Environmental Management Plan (OCEMP) in TA 5.3, Volume 3 of this ESA.

### **10.5.2 Water Environment**

The potential risks to the water environment have further been addressed through the changes to the working scheme. There would now be no abstraction of groundwater as the PFA would be worked wet. The presence of a residual basal coverage of PFA within excavation areas would provide a further level of protection to infiltration of leachate into groundwater. It is recognised that during the excavation the decrease in the thickness of the overlying low permeability PFA may result in a minor increase in infiltration, and therefore localised mobilisation of PFA contaminants into groundwater within the extraction areas due to exposure and decompaction of the deposits, however the contaminant risk of the PFA is relatively low and the dilution capacity of the of the underlying aquifer is high due to its permeability. The leachate data obtained for the PFA has demonstrated that there would be no increased detrimental impact or further deterioration in groundwater quality, as existing

concentrations within the groundwater exhibit similar concentrations to the leachate recorded from the PFA. The potential loading of PFA contaminants into groundwater is therefore not considered significant during extraction within each phase. In addition, the gradual removal of overlying thicknesses of PFA would ultimately result in removal of a contaminant source and therefore provide betterment over time. Further detail on the mitigation of potential risks to the water environment is detailed within Chapter 9, within this ESA.

### **10.5.3 Dust Exposure**

The PFA that is to be extracted from the Site is saturated because it has been in the ground for many years. The PFA has an in-situ moisture content of 18% to 47%, or an average of 31% across the Site. Natural moisture content and rainfall are the most effective measures that would prevent/minimise emissions in the first instance. As such, PFA would have a very limited potential for dust generation when it is excavated and screened.

Notwithstanding the above, numerous management measures are proposed to ensure that the PFA that is to be moved and processed in the open air is kept moist and sufficiently managed. During operations, damping down with water is one of the main techniques used for dust suppression and there are a number of material characteristics of PFA that make this a very an effective technique. Water atomisation is a highly effective technique for capturing very fine dust and a fogging system would be employed to prevent wind-blown fugitive dust emissions alongside other measures such as monitoring of weather conditions, excavating small areas at a time, stockpile management controls, compacting of material and vehicle wheel washing.

The dust management and mitigation measures have been further updated in the DIA and DMMP to ensure the control and management of operations to prevent the creation and emissions of dust. The plan goes into some detail around the measures proposed, how they would be managed, those responsible, and escalation and contingency measures should monitoring indicate further action is required. The dust monitoring assessment indicates that exposure risk would be mitigated to an acceptable level under the proposed plan to both on-site and off-site receptors. Further detail on the mitigation of potential risks is detailed within Chapter 13, within this ESA.

## **10.6 Assessment methodology and Significance Criteria**

The assessment methodology and significance criteria outlined in Section 10.3 of the ES remain unchanged.

## **10.7 Baseline Conditions**

The baseline conditions detailed in Section 10.4.5 of the ES have been updated. Further understanding of the contaminant characterisation of the PFA has been undertaken which has provided an initial baseline condition of the constituent nature of the PFA. A Technical Note is provided Appendix 10.4 in Volume 3 of this ESA.

## **10.8 Development Design Mitigation**

The approach to the working extraction methodology has been updated as detailed in Chapter 5 of this ESA, together with dust management and mitigation measures in a updated DMMP and DIA. A Discovery Strategy has been prepared to address encountering unexpected contamination. For the protection of the water environment, a revised outline Water Environmental Management Plan (WEMP) and updated Drainage Management Plan (DMP) have been prepared. As such, refinement of the design has been undertaken to further reduce potential adverse effects to human health, controlled waters and the environment. These documents feed into a revised outline Construction Environmental Management Plan (OCEMP) provided in Appendix 5.3, Volume 3 of this ESA.

In addition to the above, a Waste Acceptance Procedure (WAP) has also been produced for the Environment Agency (EA) to support the Environmental Permit which details the works required at



each of the extraction, processing, storage and transportation stages to produce a quality product for use in construction.

## 10.9 Assessment of Likely Effects

The assessment of likely effects has been reviewed to take into account the change in methodology and updated mitigation measures proposed for the protection of human health and the environment.

### 10.9.1 Construction Effects

Section 10.6.1 of the ES details preparatory works and mitigation measures for the temporary construction compounds(s) (TCC) within the Main Processing Site (Area C). The construction phase effects are also to include construction of the permanent structures (where applicable) within the maintenance / haul road/conveyor corridor (Area B) and Main Processing Site (Area C).

#### 10.9.1.1 Human Health

##### 10.9.1.1.1 On-Site Construction Workers

Prior to any permanent development works being undertaken in Area B and Area C a ground investigation would be undertaken, supplemented by contaminant risk assessments based on the proposed uses and where required mitigation measures would be implemented in accordance with findings in relation to the structures, services/utilities. Further mitigation and control measures would include following the updated DMMP and Discovery Strategy. Control procedures would be implemented in accordance with industry good practice and following the principles and framework of the Control of Asbestos Regulations 2012 (CAR 2012). Given the findings from the recent contaminant analysis of PFA the conclusions of the assessment, as recorded in the Volume 1, Chapter 10, Section 10.6.1.1 of the ES, remain unchanged i.e. that the magnitude and significance of impacts on the health of construction workers during the construction phase is negligible.

##### 10.9.1.1.2 On-Site Construction Commercial site workers / visitors

Site workers and visitors who may occupy Area B and Area C would be subject to the same controls as construction workers on the site, however, would have a lower potential exposure risk when present in a commercial (office) setting. A ground investigation would be undertaken, supplemented by contaminant risk assessments based on the proposed uses and where required mitigation measures would be implemented in accordance with findings in relation to the structures, services/utilities. The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.1.1 of the ES, remain unchanged i.e. that the magnitude and significance of impacts on the health of commercial site workers and visitors during the construction phase is negligible.

#### 10.9.1.2 Controlled Waters - Groundwater

##### 10.9.1.2.1 Superficial Aquifer (River Terrace Deposits)

The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.1.2 of the ES, remain unchanged i.e. that the magnitude and significance of impacts to the superficial aquifer during the construction phase is negligible.

##### 10.9.1.2.2 Bedrock Aquifer (Chester Sandstone)

The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.1.2 of the ES, remain unchanged i.e. that the magnitude and significance of impacts to the bedrock aquifer during the construction phase is minor adverse.

### **10.9.1.3**      *Controlled Waters – Surface Water*

#### **10.9.1.3.1**    *Surface Water bodies (Sutton and Lound Gravel Pit SSSI, River Idle)*

The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.1.3 of the ES, remain unchanged i.e. that the magnitude and significance of impacts to surface water during the construction phase is minor adverse.

### **10.9.1.4**      *Property*

#### **10.9.1.4.1**    *Building Foundations & Infrastructure*

The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.1.4 of the ES, remain unchanged i.e. that the magnitude and significance of impacts on building foundations and infrastructure during the construction phase is negligible.

## **10.9.2 Operational Effects**

### **10.9.2.1**      *Human Health*

#### **10.9.2.1.1**    *On-Site Operational Excavation/Processing Workers*

Further ground investigation, sampling, and analysis of the PFA would be undertaken in each phase/micro-phase prior to commencement of works; this applies to all extraction phases in Area A. This would provide further characterisation of the PFA and increased levels of confidence of its constituent components prior to its extraction. Any areas where unacceptable or non-conforming material is identified, would be further assessed and dealt with prior to works commencing. During extraction the mitigation and control measures would include following the updated Dust Management and Monitoring Plan (DMMP) and Discovery Strategy (with asbestos management plan). Control procedures would be implemented in accordance with industry good practice and following the principles and framework of the Control of Asbestos Regulations 2012 (CAR 2012). Given the findings from the recent contaminant analysis of PFA the conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.2.1 of the ES, remain unchanged i.e. that the magnitude and significance of impacts on the health to operational phase site workers is minor adverse.

Reference to construction phase and construction workers within Section 10.6.2.1 of the ES updated to operational phase and operational workers within this ESA.

#### **10.9.2.1.2**    *On-Site Operational Commercial site workers / visitors*

Commercial site workers and visitors who may occupy such areas would be subject to the same controls as operational excavation/processing workers on the Site, however, would have a lower potential exposure risk when present in a commercial (office) setting. The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.2.1 of the ES, remain unchanged i.e. that the magnitude and significance of impacts on the health to operational phase commercial site workers / visitors is negligible.

Reference to construction phase and construction workers within Section 10.6.2.1 of the ES updated to operational phase and operational workers within this ESA.

Office accommodation and welfare facilities provided at the Main Processing Site (Area C) are considered permanent structures.

#### **10.9.2.1.3**    *Off-Site Residential*

The greatest potential exposure pathways are considered associated with the release of airborne particulates that, if not appropriately managed, could be transported and deposited at residential properties closest to the Site, as well as release of dusts from articulated HGV and/or conveyors.

Laboratory contaminant characterisation of the PFA has been undertaken to update the baseline information as detailed in Section 10.4.1. The laboratory analysis of the PFA has demonstrated its constituent components are in accordance with the concentrations of a typical PFA and consistent with those detailed in Section 10.4.5 of the ES. The analysis has confirmed the absence of any trace signature of organics (PAH, TPH, SVOC). Asbestos has been encountered at one isolated location at a depth of between 3m-4.5m. The high existing natural moisture content of the PFA, combined with operational controls designed to mitigate fugitive dust emissions from PFA excavation and stockpiling activities would suppress any potential fugitive respirable asbestos emissions at source. Consequently, it is reasonably concluded based on current knowledge that the potential risk of exposure to off-site receptors would be negligible.

The Applicant has previously committed to further ground investigation, sampling and analysis of the PFA in each phase/cell prior to commencement of works. This would provide further characterisation of the PFA and increased levels of confidence of its constituent components prior to its extraction. Any areas where unacceptable or non-conforming material is identified, would be further assessed and dealt with prior to works commencing.

A Discovery Strategy has been prepared in accordance with the ES. This would include implementation of a focused watching brief during the works by persons competent to identify the potential for visible asbestos. Segregation measures would be employed to separate such areas and the material would be quarantined in an enclosed dedicated area prior to disposal off-site following Duty of Care procedures. The contractors undertaking the extraction activities would be provided with the strategy pre-commencement and would provide confirmation and evidence of their competency to undertake the required work. Control procedures would be implemented in accordance with industry good practice and the Control of Asbestos Regulations 2012 (CAR 2012). During the course of the extraction, any unacceptable or non-conforming material would be identified, removed and addressed in accordance with the procedures.

A Waste Acceptance Procedure (WAP) has also been produced for the EA in support of the Environmental Permit which would provide further levels of assurance to ensure the controlled extraction of the PFA, identification of non-conforming or contaminated materials should they be present and how the management of such materials would be addressed as they are being processed to prevent unacceptable exposure to human health.

The DMMP has been further updated to ensure the control and management of operations to prevent the creation and emissions of dust. The plan goes into some detail around the measures proposed, how they would be managed, those responsible, and escalation and contingency measures should monitoring indicate further action is required. This includes further detail on the monitoring of impacts, and contingency measures that would be implemented when key stages are triggered. Further detail is included such as the employed methodology and measures for wetting of the PFA when the site is not operational (e.g. at weekends), stockpile management, processing of material and removal of unacceptable or non-conforming material off-site. The dust monitoring assessment indicates that exposure risk would be mitigated to an acceptable level under the proposed plan to both on-site and off-site receptors. Further detail on the mitigation of potential risks is detailed in Chapter 13 within this ESA. In summary, further contaminant baseline characterisation of the PFA has been undertaken and would be supplemented by further ground investigation. There have been updates to mitigation controls associated with extraction and dust control, however the overall findings of the assessment remain unchanged from the assessment recorded in Volume 1, Chapter 10, Section 10.6.2.1 of the ES, i.e. that the magnitude and significance of impacts on the health to off-site residential receptors during the operational phase is minor adverse.

#### **10.9.2.1.4 Off-Site Commercial / Industrial**

The greatest potential exposure pathways are considered also to be the release of airborne dusts from Site activities. Off-Site commercial / industrial users would be subject to the same updated management and mitigation measures as referred to for off-site residential receptors. Whilst further

controls would be implemented, the conclusions of the assessment as recorded in Volume 1, Chapter 10, Section 10.6.2.1 of the ES, i.e. that the magnitude and significance of impacts on the health to off-site commercial/industrial receptors during the operational phase is negligible.

#### *10.9.2.1.5 Off-Site Recreational*

The greatest potential exposure pathways are considered also to be the release of airborne dusts from Site activities. Off-Site recreational users would be subject to the same updated management and mitigation measures as referred to for off-site residential receptors. Whilst further controls would be implemented, the conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.2.1 of the ES, i.e. that the magnitude and significance of impacts on the health to off-site recreational receptors during the operational phase is negligible.

#### *10.9.2.2 Controlled Waters - Groundwater*

##### *10.9.2.2.1 Superficial Aquifer (River Terrace Deposits)*

The potential risks to the water environment have further been addressed through the changes to the working scheme. There would now be no abstraction of groundwater as the PFA would be worked wet. The presence of a residual basal coverage of PFA within excavation areas would provide a further level of protection to infiltration of leachate into groundwater. In addition, the leachate data obtained for the PFA has demonstrated that there would be no increased detrimental impact or further deterioration in groundwater quality, as existing concentrations within the groundwater exhibit similar concentrations to the leachate recorded from the PFA. Whilst further controls would be implemented, the conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.2.2 of the ES, remain unchanged i.e. that the magnitude and significance of impacts to the superficial aquifer during the operational phase is negligible.

##### *10.9.2.2.2 Bedrock Aquifer (Chester Sandstone)*

The potential risks to the water environment have further been addressed through the changes to the working scheme. The extraction methodology has been updated such that the PFA would now be extracted to approximately 0.2-0.5m above the top of the sandstone. The thickness of PFA remaining at the base of the excavation is to be confirmed but would ensure that there would be no upwelling of groundwater within the underlying sandstone into the excavation. Whilst there would remain some leaching of perched groundwater within the surrounding PFA and rainfall into the excavation, this would be a much lower volume than if groundwater from the underlying sandstone were encountered.

There would now be no abstraction of groundwater as the PFA would be worked wet. The presence of a residual basal coverage of PFA within excavation areas would provide a further level of protection to infiltration of leachate into groundwater. It is recognised that excavation and removal of PFA may result in the localised mobilisation of PFA contaminants into groundwater within the extraction areas, however the contaminant risk of the PFA is relatively low and the dilution capacity of the of the underlying aquifer is high due to its permeability. The leachate data obtained for the PFA has demonstrated that there would be no increased detrimental impact or further deterioration in groundwater quality, as existing concentrations within the groundwater exhibit similar concentrations to the leachate recorded from the PFA.

The removal of the overlying PFA would ultimately result in removal of a contaminant source and therefore provide betterment over time. Whilst further controls would be implemented, the conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.2.2 of the ES, remain unchanged i.e. that the magnitude and significance of impacts to the bedrock aquifer during the operational phase is minor adverse.

### **10.9.2.3**      *Controlled Waters – Surface Water*

#### **10.9.2.3.1**    *Surface Water bodies (Sutton and Lound Gravel Pit SSSI, River Idle)*

The potential risks to the water environment have further been addressed through the changes to the working scheme. There would now be no abstraction of groundwater as the PFA would be worked wet. As such, there would be no requirement for the discharge of abstracted groundwater into a surface water drainage system or soakaway, thereby further reducing potential risk to surface water receptors. The working scheme also includes retention of sandstone embankments, preventing the potential for interaction with floodwater during an extreme storm event that could lead to PFA being carried into adjacent surface water bodies. The updated controls associated with the Dust Management and Monitoring Plan (DMMP) would ensure that dust deposition would not adversely affect the surface water environment. Whilst further controls would be implemented, the conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.2.3 of the ES, remain unchanged i.e. that the magnitude and significance of impacts to surface water during the operational phase is minor adverse.

### **10.9.2.4**      *Property*

#### **10.9.2.4.1**    *Building Foundations & Infrastructure*

Ground investigation and contamination risk assessments would be undertaken in Area B and Area C prior to construction of any permanent development in those areas. The works would address ground condition mitigation requirements for these areas. The remaining areas of the Site comprise temporary structures which can be further addressed should any of these structures become a permanent feature. Whilst further investigation would be undertaken, the conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.2.4 of the ES, remain unchanged i.e. that the magnitude and significance of impacts on building foundations and infrastructure during the operational phase is negligible.

### **10.9.3** *Restoration Effects*

#### **10.9.3.1**      *Human Health*

##### **10.9.3.1.1**    *On-Site Agricultural*

A restoration plan would be prepared and provided to NCC for agreement prior to commencing with phases of restoration. A validation report would be provided to NCC at the end of each phase of restoration. This would include chemical compliance certificates from the suppliers and/or results of chemical testing from a post-restoration validation sampling exercise, with contamination risk assessment completed for the proposed end-use. The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.3.1 of the ES, remain unchanged i.e. that the magnitude and significance of impacts on the health of on-site agricultural users following restoration is negligible.

##### **10.9.3.1.2**    *On-Site Recreational*

A post-restoration validation sampling exercise with contamination risk assessment would be detailed in a validation report and provided to NCC at the completion of each phase for the proposed end-use. The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.3.2 of the ES, remain unchanged i.e. that the magnitude and significance of impacts on the health of on-site recreational users following restoration is negligible.

### 10.9.3.2 *Controlled Waters – Groundwater*

#### 10.9.3.2.1 *Superficial Aquifer (River Terrace Deposits)*

Due to the site drainage measures and SuDs designed to maintain natural site drainage and infiltration as much as possible to reduce sedimentation and erosion; together with the removal of overlying PFA it is considered that there would be a beneficial effect from the Proposed Development. The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.3.2 of the ES, have been updated such that the magnitude and significance of impacts to the superficial aquifer during the restoration phase is minor beneficial.

#### 10.9.3.2.2 *Bedrock Aquifer (Chester Sandstone)*

Due to the site drainage measures and SuDs designed to maintain natural site drainage and infiltration as much as possible to reduce sedimentation and erosion; together with the removal of overlying PFA it is considered that there would be a beneficial effect from the Proposed Development. The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.3.2 of the ES, have been updated such that the magnitude and significance of impacts to the bedrock aquifer following restoration is moderate beneficial.

### 10.9.3.3 *Controlled Waters – Surface Water*

#### 10.9.3.3.1 *Surface water bodies (Sutton and Lound Gravel Pit SSSI, River Idle)*

Due to the site drainage measures and SuDs designed to maintain natural site drainage and infiltration as much as possible to reduce sedimentation and erosion; together with the removal of overlying PFA it is considered that there would be a beneficial effect from the Proposed Development. The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.3.3 of the ES, have been updated such that the magnitude and significance of impacts to surface water bodies following restoration is moderate beneficial.

### 10.9.3.4 *Property*

#### 10.9.3.4.1 *On-site Grazing Livestock*

A post-restoration validation sampling exercise with contamination risk assessment would be detailed in a validation report and provided to NCC at the completion of each phase for the proposed end-use. The conclusions of the assessment, as recorded in Volume 1, Chapter 10, Section 10.6.3.3 of the ES, remain unchanged i.e. that the magnitude and significance of impacts to on-site grazing livestock following restoration is negligible.

## 10.10 **Cumulative Effects Assessment**

The assessment of cumulative effects detailed in Section 10.8 of the ES remains unchanged.

## 10.11 **Mitigation and Residual Effects**

The embedded mitigation as detailed in Section 10.9 of the ES would include for changes within the updated working extraction methodology, Dust Management and Monitoring Plan (DMMP), Discovery Strategy and Waste Acceptance Procedure (WAP), Outline Water Environmental Management Plan (WEMP) and Drainage Management Plan (DMP) documents. The updated mitigation measures have been refined to include for the further detail required for the protection of human health and the environment. There is also a commitment from the Applicant to further characterise the PFA through completion of ground investigation, sampling and analysis prior to commencement, which would provide a further level of confidence to the findings that have been obtained to date.

Whilst further detail and refinement has taken place, and additional characterisation of the PFA would be undertaken, the overall conclusions detailed within the ES remain unchanged.

## 10.12 Summary of Effects

Table 10.1 provides a summary of effects as detailed within this updated ESA Chapter. It updates and replaces Table 10.11 in the ES.

**Table 10.1: Summary of Effects**

Receptor (sensitivity)	Potential Effect	Magnitude of Effect with embedded mitigation	Justification	Significance of Effect	Additional Mitigation Proposed	Residual Significance
<b>Construction Phase</b>						
On-Site Construction Workers (medium)	Human Health (PFA exposure)	Negligible	Risk assessment and method statements would be followed and PPE measures would be implemented to mitigate exposure risk.	Negligible	None	Negligible
On-Site Commercial site workers / visitors (low)	Human Health (PFA exposure/ ground contamination)	Negligible		Negligible	None	Negligible
Superficial Aquifer (River Terrace Deposits) (medium)	Water Quality (construction spills, leakages, discharges)	Negligible	Pollution control measures detailed in OCEMP/ WCEMP would ensure minimal spillage and a good spill response plan and drainage design to ensure no pollution impact to groundwater. Construction activities controlled through Construction Method Statements (CMS).	Negligible	None	Negligible
Bedrock Aquifer (Chester Sandstone) (high)	Water Quality (construction spills, leakages, discharges)	Negligible		Minor adverse	None	Minor adverse
Surface water bodies (Sutton and Lound Gravel Pit SSSI, River Idle) (very high)	Water Quality (construction spills, leakages, discharges sedimentation/erosion)	Negligible	Pollution control measures detailed in OCEMP/ WCEMP would ensure minimal spillage and a good spill response plan and drainage design to ensure no pollution impact to surface water. Construction activities controlled through Construction Method Statements (CMS).	Minor adverse	None	Minor adverse
Building Foundations & Infrastructure (low)	Property (PFA / ground contamination)	Negligible	Preparation works undertaken to provide ground cover system for construction activities. Risk assessments would be undertaken for temporary and permanent	Negligible	None	Negligible



			structures and utilities/services. Ground investigation would be completed where necessary with design measures implemented.			
<b>Operational Phase</b>						
On-Site Construction Workers (medium)	Human Health (PFA exposure/ ground contamination)	Low	Risk assessment and method statements would be followed and PPE measures would be implemented to mitigate exposure risk. Dust management and monitoring controls would be in place and welfare facilities used. Discovery Strategy (with asbestos management plan) would be implemented.	Minor adverse	None	Minor adverse
On-Site Commercial site workers / visitors (low)	Human Health (PFA exposure/ ground contamination)	Negligible		Negligible	None	Negligible
Off-Site Residential (high)	Human Health (PFA dusts)	Negligible	Dust management and monitoring controls would be implemented to prevent airborne release. OCEMP, Discovery Strategy (with asbestos management plan) would be implemented. Environmental Permit BAT controls in place.	Minor adverse	Community liaison	Minor adverse
Off-Site Commercial / industrial (low)	Human Health (PFA dusts)	Negligible		Negligible	Community liaison	Negligible
Off-Site Recreational (medium)	Human Health (PFA dusts)	Negligible		Negligible	Community liaison	Negligible
Superficial Aquifer (River Terrace Deposits) (medium)	Water Quality (PFA derived chemical pollution, construction spills, leakages, discharges sedimentation/erosion)	Negligible	Extraction methodology updated with no groundwater pumping required. Residual basal coverage of PFA left in-situ. OCEMP/ WCEMP would ensure no pollution impact to groundwater. Environmental Permit controls would be in place to protect groundwater.	Negligible	None	Negligible
Bedrock Aquifer (Chester Sandstone) (high)	Water Quality (PFA derived chemical pollution, construction spills, leakages, discharges sedimentation/erosion)	Negligible		Minor adverse	None	Minor adverse
Surface water bodies (Sutton and Lound Gravel Pit SSSI, River Idle) (very high)	Water Quality (PFA derived chemical pollution, construction spills, leakages,	Negligible	Extraction methodology updated with no discharge to surface water required. OCEMP/ WCEMP would ensure no pollution impact to surface water. Dust management	Minor adverse	None	Minor adverse

	discharges sedimentation/erosion)		and mitigation controls would be implemented to prevent airborne release. Environmental Permit controls would be in place to protect surface water.			
Building Foundations & Infrastructure (low)	Property (PFA / ground contamination)	Negligible	Preparation works undertaken to provide ground cover system for construction activities. Risk assessments would be undertaken for temporary and permanent structures and utilities/services. Ground investigation would be completed where necessary with design measures implemented.	Negligible	None	Negligible

**Restoration Phase**

On-Site Agricultural Users (medium)	Human Health (PFA / soil contamination)	Negligible	Restoration plan would be prepared and followed. Post-restoration validation and risk assessment for end-use undertaken and provided in verification report to WPA. Environmental Permit controls would be in place.	Negligible	None	Negligible
On-Site Recreational Users (medium)	Human Health (PFA / soil contamination)	Negligible		Negligible	None	Negligible
Superficial Aquifer (River Terrace Deposits) (medium)	Water Quality (PFA derived chemical pollution)	Low	Site drainage measures and SuDs would be designed to maintain natural site drainage and infiltration as much as possible to reduce sedimentation and erosion. Embankments would be retained to reduce risk from flood events. Restoration plan would be prepared and followed. Post-restoration validation and risk assessment for end-use undertaken and provided in verification report to WPA. Environmental Permit controls would be in place.	Minor beneficial	None	Minor beneficial
Bedrock Aquifer (Chester Sandstone) (high)	Water Quality (PFA derived chemical pollution)	Low		Moderate beneficial	None	Moderate beneficial
Surface water bodies (Sutton and Lound Gravel Pit SSSI, River Idle) (very high)	Water Quality (PFA derived chemical pollution)	Low		Moderate beneficial	None	Moderate beneficial
Onsite Grazing Livestock (high)	Property (PFA / soil contamination)	Negligible	Restoration plan would be prepared and followed. Post-restoration validation and risk assessment for end-use undertaken and provided in	Negligible	None	Negligible

			verification report to WPA. Environmental Permit controls would be in place.			
--	--	--	--	--	--	--

### **10.12.1 Summary of Restoration Effects**

The restoration of the Site comprises a series of phases whereby restoration follows extraction activities progressively throughout the operation of the Amended Proposed Development. It is proposed to provide a new and permanent network of unlined field ditches as the Site is progressively restored draining to the proposed wet meadow areas, proposed shallow pool, proposed standing water, existing waterbody, and reed beds. These ditches are shown on the Amended Indicative Restoration Landscape Masterplan (Figure 7.12, Volume 2 within this ESA).

A restoration plan would be developed and a post-restoration validation sampling exercise with contamination risk assessment would be detailed in a validation report at the completion of each phase to demonstrate suitability for the proposed end-use. The restoration plan would be prepared and provided to the Waste Planning Authority (WPA) for agreement prior to commencing with phases of restoration, with the validation report provided to the WPA at the end of each phase of restoration.

There are no changes to the magnitude and significance of the restoration effects as detailed in Section 10.10 of the ES.

### **10.12.2 Summary of Cumulative Effects**

There are no changes to the magnitude and significance of the cumulative effects as detailed in Section 10.8 of the ES.

## **10.13 Statement of Significance**

No significant effects in terms of the EIA Regulations are predicted in relation to ground conditions and contamination during the construction, operation, or restoration phases of the Amended Proposed Development.

The excavation methodology and dust monitoring and mitigation measures have undergone design refinement to further reduce the potential for adverse effects to human health, controlled waters, and the environment. The potential for encountering unexpected contamination during extraction and the methods and procedures for dealing with such material have been provided in a Discovery Strategy. Groundwater abstraction would not be required and the volume discharged to soakaway would be greatly reduced thereby significantly reducing risk to groundwater and surface waters as only surface water and treated process water from the drying plant would be discharged; although, it is envisaged that much of the latter would be recycled. The Amended Proposed Development would provide betterment from a contamination perspective, through removal of the PFA and protection of identified receptors.

The Site would be licensed under a waste recovery operation, and therefore restoration would be undertaken in accordance with an EA construction quality assurance (CQA) plan; and would also meet requirements of the OCEMP and WCEMP. A restoration plan would be developed and a post-restoration validation sampling exercise with contamination risk assessment would be detailed in a validation report at the completion of each phase to demonstrate suitability for the proposed end-use. Site drainage measures and SuDs would be designed to maintain natural Site drainage and infiltration as much as possible which would be complimentary to the Site setting and suitable for the long-term land and amenity use of the Amended Proposed Development ensuring the protection of human health, controlled waters and the environment.