

Environment Agency permitting decisions

Variation

We have decided to issue the variation to the permit for Whisby Landfill operated by Lincwaste Limited.

The variation number is EPR/BW2978ID/V006.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Description of the changes introduced by the Variation

This is a Substantial Variation.

This variation is to add the activity of leachate treatment via Short Rotation Coppicing (SRC) and to update the permit conditions in line with our statutory review of permits in the landfill sector.

The activity uses only the leachate produced in the landfill, which is pumped into a primary lagoon where aerobic and anaerobic biological treatment occurs. The treated leachate is transferred into a secondary lagoon within which a second phase of the treatment happens. The treated liquid from the secondary lagoon is discharged to the coppice area where the coppice further treats the leachate. The coppice area is therefore regarded as forming part of the biological treatment process. The SRC treatment is undertaken within sealed and contained areas on the cap of the landfill, and a containment channel surrounds the SRC area to collect any surface run off. All the surface run off drains to the containment channel where it is pumped back into the leachate lagoons or, if the permit conditions are met, the run off can be discharged to the Pike Drain.

The coppice is harvested and used to produce fuel which is then used to generate electricity.

The SRC activity is in line with the Regulatory Position Statement 'Application of treated landfill leachate to short rotation coppice' (Environment Agency, February 2008).

Additionally, the Environment Agency has a duty, under the Environmental Permitting (England and Wales) Regulations 2010, regulation 34(1), to periodically review permits. As a result of that review we have identified a number of necessary changes we must make to the permit to reflect current legislation and best practice. These changes principally relate to:

- The addition of a standard condition for landfill gas management at all landfills;

- A change to the hydrogeological risk assessment condition so that reviews are undertaken every 6 years rather than every 4 years;
- The addition of standard leachate and groundwater quality monitoring tables (schedule 3); and
- A standard reporting table (schedule 4).

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Structure of this document

- Key issues
- Annex 1 the decision checklist
- Annex 2 the consultation, web publicising and newspaper advertising responses

Key issues of the decision

Background

This application has been made to regularise the use of the Short Rotation Coppice as part of the treatment of landfill leachate at the site. This activity commenced circa 2002 and has continued ever since.

In order for the Environment Agency to consider an application for the use of Short Rotation Coppice (SRC) for the treatment of landfill leachate we require the applicant to be able to satisfy us by demonstrate within the application, supporting documents and site specific environmental risk assessment the following issues, which are explained in greater detail later.

- a) An assessment of candidate treatment techniques has been undertaken and the most appropriate techniques have been selected having assessed all potential techniques. The leachate treatment technique and irrigation to coppice is considered to be BAT as it is capable of processing leachate generated at the site.
- b) The treated leachate will be appropriately characterised prior to application to the coppice and that suitable parameters and indicators for monitoring the performance of the process are put forward.
- c) The coppice species that have been selected are suitable for the intended purpose.
- d) The SRC is a closed/contained system that will prevent the escape of leachate from the process system and that there is an engineered barrier and a surface water management system to prevent percolation and horizontal migration.
- e) Where the SRC is to be situated on top of the landfill, it will not result in damage to the cap by roots or pipe work.
- f) The environmental risk assessment establishes the environmental consequences of the activity at the specified location and that the risks are acceptable.
- g) The process will be monitored regularly, including the leachate quality prior to irrigation, the background soil quality, application rates and soil conditions as well as the soil quality after the process has been applied. Appropriate indicators and techniques should be used to monitor the activity.
- h) It will not cause any significant deterioration to the soil quality. It must be demonstrated that the treated leachate is being treated by the coppice environment.
- i) The system will be managed in a manner that will ensure that the environment is protected. For example by only irrigating when there is a soil moisture deficit, and also irrigating at an appropriate rate to prevent, when there are periods of higher rainfall, runoff and leaching of the treated leachate. The application should include an explanation of the operating techniques with respect to soil type, weather, soil moisture deficit, application rates, soil infiltration rates and slope.
- j) The management system should include contingency planning for leachate management when unsuitable conditions arise.

1.0 Assessment of Candidate Leachate Treatment Techniques

There is currently no sector specific guidance or Best Available Technique (BAT) criteria for the use of Short Rotation Coppice (SRC) techniques for the treatment of landfill leachate.

Sector Guidance note IPPC S5.06 (SGN S5.06) – Guidance for the recovery and disposal of Hazardous and Non-hazardous Waste and SGN S5.03 – Guidance for the treatment of landfill leachate – do not currently include the use of SRC for the treatment of Landfill Leachate. Further, the use of open lagoons for the storage of leachate does not fit the criteria of BAT within SGN S5.06, but is indicated in SGN S5.03.

For this application, the Environment Agency Regulatory Position Statement “Application of treated landfill leachate to short rotation coppice Version 1.0 Adopted: February 2008”, which outlines criteria Applications have to satisfy, has been utilised in the absence of any sector specific guidance. The applicant has therefore been required to demonstrate how the application of SRC technology at this site meets the criteria of the RPS within the context of BAT contained within SGN S5.03.

The application includes details which demonstrate that the proposals are in accordance with the RPS and the relevant sections of SGN S5.03, as outlined in this document in Annex 1 – The Decision Checklist.

A BAT assessment, Report Reference: Leachate treatment process description & 5.03 indicative BAT review (Doc Ref: 2280.03.FCC.AGS.LS.A0), was submitted with the application. This appraised several candidate options for a novel waste treatment technology based on facultative treatment lagoons with irrigation onto areas of Short Rotation Coppice (SRC). The candidate options assessed by the applicant were:

1. Treatment and daily discharge to nearest surface water course– this option incorporates ‘Sequence Batch Reactor’ (SBR) including storage of landfill leachate in a lagoon.
2. Treatment and daily discharge to nearest sewer – this option incorporates SBR including storage of landfill leachate in a lagoon.
3. Treatment via Reverse Osmosis (RO) and discharge to surface water.
4. Tankering to an offsite treatment facility for disposal.
5. Facultative treatment - Long retention time lagoon based treatment and direct discharge to sewer.
6. Facultative treatment - Long retention time lagoon based treatment and seasonal discharge onto SRC.

The BAT assessment incorporated use of Raw materials, Raw materials selection, Waste minimisation audit (minimising the use of raw materials), Water, Waste handling, Waste recovery or Disposal, Basic energy requirements and Further energy efficiency requirements.

Option 1 assessed the SBR treatment and daily discharge to the nearest water course. This option was discounted due to energy and raw material consumption, size and that the Pike Drain would not be suitable to continually discharge to.

Option 2 was assessed as the most favourable, however, no suitable sewer connection is currently available in the locality.

Option 3 was discounted because the energy required to produce a high quality effluent suitable for discharge to surface water would be considerable. In addition, there would be an ongoing need to separately dispose of the concentrate via tanker to other specialised disposal routes i.e. incineration.

Option 4 was ruled out due to the number of vehicle movements necessary, energy use (fuel) and the distance to an appropriate disposal site.

Option 5 would be more favourable than Option 6 but as stated above, there is currently no suitable sewer connection in the locality. Also, the operator has argued that the differences between Option 5 and 6 are quite small and there is a need to consider the scale of the effort compared to the size of the site. Therefore, Option 6 is considered to be the most appropriate for this site.

The operator has concluded that a lagoon-based system was preferable to SBR and tankering off site, based upon factors including noise, odour, energy use (GWP), waste produced and water impact. We have accepted the conclusions.

The operator states that the lagoons used for the leachate treatment are pre-existing and they are to be fully Construction Quality Assured (CQA'd) when built.

The operator's assessment, justification and predicted modelling of the treatment processes involved demonstrated to us that the treatment process is not reliant on, or needs, dilution.

2.0 Characterisation of treated leachate

The nature of the Landfill Leachate to be treated at the site has been characterised as per Appendix 10 of the report "Technical Assessment to support as application to vary the environmental permit (report ref: WBYSRC0314)" of the application.

The list of concentration limits stated in the application are those of determinant species within the characterised leachate associated with the individual treatment steps within the SRC process. The limits in the application that are given for the process have been derived from reduction rates seen over the years that the trial has been undertaken at Whisby landfill.

The above report within the application demonstrates substance reduction or removal rates between the various stages of the process (Primary Leachate Lagoon Treatment, Secondary Leachate Lagoon Treatment, and Pre-SRC Irrigation). The specified removal rates obtained from the monitoring of both lagoons over the years of operation have been used to form the limit values for the primary and secondary treatment phases. The landfill leachate characteristic substances need to be monitored to ensure that the SRC

treatment process is working in accordance with the modelled predictions and to ensure that the discharge of the treated leachate to the coppice will not cause pollution of the soils. The landfill leachate characteristic substances for the site and associated removal rate limits have therefore been incorporated into table S3.12 – Process Limits and Monitoring Requirements - Leachate, of the permit.

The final treatment phase (drip irrigation) of the process will combine two processes, namely:

- Biological treatment within the growth medium of the established SRC area, and
- Phyto-treatment by the coppice species which will utilise many of the parameters within the treated leachate as a nutrient source for growth and function.

The processes outlined above are a function of the types of soils to be used within the SRC area and the coppice plant species to be used. The coppice species to be used within the SRC area have been adequately justified by the operator within the Application and Schedule 5 response.

Performance and Process Monitoring Indicators for Soils

The RPS requires operators to demonstrate “that the operation of the SRC treatment will not cause any significant deterioration to the soil quality and, that the treated leachate is being treated by the coppice environment.” We consider that in order for the operator to be able to satisfy this position, baseline chemical characterisation of the soils used within the coppice growing area is required to determine the chemical characterisation of the discharge from the secondary lagoon. As this is not possible a “get no worse baseline” has to be established for surrogate determinands. Determination of the baseline concentrations in the soil will also enable the operator to demonstrate that the operation of the SRC treatment process is not causing any significant deterioration of the SRC soil quality.

The operator has outlined that the method detailed below is in addition to ensuring that soils used in the SRC growing area meet the criteria defined by the guidance on capping and restoration of landfills¹.

The methodology to be utilised involves an approach where soils to be used within the SRC plots will be analysed, using soil leaching characteristics, for the suite of contaminants consistent with the substances which characterise the landfill leachate. The analytical results will then be compared against compliance limits which are protective of surface water receptors as defined in Appendix 10² in the application.

The chemical baseline characterisation of the soils to be used within the SRC plots needs to be established prior to irrigation of the treated leachate. We have updated Table S1.3 of the permit to include improvement condition IC11, which requires the operator to undertake the following:

¹ Briefing Note - The use of waste in restoration at landfills; 5 May 2014

² Technical Assessment to support as application to vary the environmental permit (report ref: WBYSRC0314); August 2014, Version 1.3

- a) characterise the soils to be used in the SRC plot to obtain a background concentration of substances within the soils using the list of substances which characterise the landfill leachate at the site using the method detailed in the Application (Leachate treatment Facility and SRC – Technical Assessment August 2014 Version 1.3)²;
- b) obtain the Environment Agency’s written approval that the monitoring results obtained in accordance with a) are at or below the limit specified in the application;
- c) results of the monitoring approved under b) shall be used to populate Table S3.11, where they are to be used as limits against which future soil monitoring results will be compared.

In order for the operator to show that the operation of the SRC treatment is not leading to significant deterioration of soil quality, we consider that the soil quality within the SRC plots should be analysed either after the coppice growing season, or before commencement of the discharge at the start of the growing season, and the results compared against results of the monitoring specified by improvement condition IC 12. We consider that this soil monitoring should be undertaken for the complete suite of substances characterising the landfill leachate and be conducted for the next 2 years of operation of the treatment process.

Table 3.11 – Process limits and monitoring - Soils, has been inserted into the permit and requires soil monitoring as described above.

We consider that the monitoring described above should be reviewed in consultation with the Environment Agency after 2 years of operation of the discharge of treated landfill leachate to the SRC plots to better determine the monitoring suite and monitoring frequency and that this can be achieved through inclusion of an additional improvement condition within Table S1.3 of the permit (Improvement condition IC 12).

The applicant has also specified that should soils be required to be imported to assist with the restoration profile, the acceptance criteria for new soils will be compared against analysis of the pre-existing soils.

Performance and Process Monitoring Indicators for Surface Waters

We consider the final monitoring stage of the SRC process will be the introduction of the surface water run-off from the treatment area to the surface water system. The site’s surface water is to be the final receptor for the SRC treatment process. Appropriate Environmental Quality Standards (EQS) for surface water are not available for the full suite of determinant substances. Where standards are absent for specific chemical species, we have derived quality standards from information and advice obtained from our Geoscience Technical Team and the Water Supply Regulations 2000. The standards are as follows:

- Where an EQS is not available for a substance, but a different threshold is available, that threshold has been utilised. For those substances where a threshold and EQS is not available, toxicity data has been used.

- Where EQS data is not available, a Predicted No Effect Concentration (PNEC) has been derived where sufficient data is available to provide a guideline for substances of potential concern.
- Due to a lack of statutory concentration limits for Total Petroleum Hydrocarbons (TPH), we have adopted an interim position which is consistent with our guidance Petroleum Hydrocarbons in Groundwater, Supplementary Guidance for Hydrogeological Risk Assessment³, as follows:
 - For the protection of the water environment from Hydrocarbons, Tables 5.1 and 5.2 of the above document, in combination with the standards specified in the data spreadsheet for one of the operator's other operational SRC sites, was considered an appropriate methodology for assessing the TPH concentration compliance limits issue.
 - Although the 10 µg/l limit for individual bands and 60 µg/l limit for total TPH specified by the applicant for the other operational SRC sites are similar to the approaches in Table 5.2, we have determined that any detections above 10 µg/l for individual bands (as set out in Table S3.3 of the permit) should trigger further analysis or assessment to identify, speciate and evaluate the risks associated with individual compounds that may be present. This additional analysis may be needed as an additional check to identify and evaluate the risks of individual substances before any discharge to surface water occurs of these substances that are above the broader TPH concentrations. The 10µg/l emission limit will act as the control that must be met before any decisions are made to allow a discharge off site. This means that in the absence of formal TPH discharge limits, it may be possible to discharge surface waters above the specified limits provided that reasonable steps have been taken to identify individual compounds and their associated risks where these interim limits have been exceeded. We anticipate that some analytical data from other speciated hydrocarbon analyses at the site could be used if appropriate, as part of the assessment. The Environment Agency recommends that, when possible, the Environmental Quality Standard (EQS) should be used in preference to Minimum Reporting Values (MRV) given that the final discharge is to be to surface water.

The available data suggests that the characteristics of the liquid in the pre-SRC irrigation stage contains substances which may bio-accumulate or cause deterioration within the soils forming the growing medium of the SRC. Although the SRC system includes a discharge from the secondary treatment lagoon to the Short Rotation Coppice area, the Short Rotation Coppice area also forms part of the SRC treatment process.

Appendix 10 within the application demonstrates:

³ Petroleum Hydrocarbons in Groundwater, Supplementary Guidance for Hydrogeological Risk Assessment; Environment Agency, 2009.

- (i) the range of predicted values during the facilitative treatment phases within the primary and secondary treatment lagoons of the SRC,
- (ii) the maximum predicted concentration limit of the determinands within the liquid discharged from the Secondary Treatment Lagoon to the SRC area in order to achieve the Soil Water Quality limits within the soils used in the area established as SRC, and
- (iii) the potential limits of the respective determinands at the defined process end-point, the surface water drainage ditch.

The compliance and assessment limits for the individual SRC treatment process stages are detailed within Table S3.12 of the permit.

The monitoring frequency for the soil pore water in Table S3.11 is based on the operator's anticipated SRC growth period and associated application of treated landfill leachate to the SRC crop area between and including the months of April and October.

The operator's inclusion of concentration limits for the individual process phases of SRC treatment through to the final compliance point of the system ensures that the presence of substances which are not subject to beneficial treatment from the system, such as toxic metals, have been considered and limits proposed. The reporting requirements in Schedule 4 of the permit will give us confidence that the SRC treatment process works in accordance with the modelled predictions.

We consider that the monitoring frequency, determinand monitoring suites and assessment and compliance limits for the SRC process steps may need to be amended as confidence is gained by the applicant and the Environment Agency that the SRC treatment system functions in accordance with the modelled predictions or where changes in regulatory guidance occur.

The applicant has proposed that two years of monitoring data from all stages of the SRC treatment process should provide sufficient sample population density with which to demonstrate the SRC treatment system is functioning in accordance with the modelled prediction. We have included IC12 in Table S1.3 of the permit that requires the operator to review the monitoring suite and frequency after two years of operation, where appropriate, following a review of the monitoring data.

The monitoring suites and frequencies for the individual stages of the SRC treatment process are detailed within Schedule 3 of the Permit.

As detailed in Section 2.0 above, the landfill leachate will be treated using primary and secondary leachate treatment lagoons prior to application to the SRC plots.

The facultative treatment process is described within Section 3.1, Section 5 and Section 7 of the application. The operator's drawing Figure 3: Conceptual Model: Environmental Monitoring, provides a schematic representation of the treatment system as a whole. The detail provided by the applicant describes the facultative system which operates with an anaerobic sludge digestion zone at the bottom of the primary treatment lagoon, a facultative biology zone directly above the anaerobic zone, with an oxygen-rich aerobic bacterial zone up to the surface. The operator also details that the process addresses the problem of future flow increases, short circuiting and shock loads, by dispersing and distributing the load throughout

the entire volume of the lagoon. The system has proven to be capable of nitrifying and denitrifying high strength landfill leachate.

The operator details that the process does not rely on creating violent aeration, but relies instead on deep circulation to accelerate the natural methods to oxygenate the water through one of three mechanisms:

- Photosynthesis;
- Surface contact; and
- Wind and wave action.

The applicant also details that three general groups of bacteria are utilised within the facultative treatment process:

1. Aerobic bacteria that require dissolved oxygen;
2. Anaerobic bacteria that function in the absence of dissolved oxygen; and
3. Facultative bacteria that can function with or without dissolved oxygen.

Section 3 of the application – General Process Description, describes how the treatment in the lagoon is reliant on lagoon size and depth. The report further provides evidence from the outputs of an Ammoniacal Nitrogen reduction model incorporating variables such as leachate strength, temperature, retention time in the lagoon and pH and compares the results with data from Whisby and another trial site at Kirby in Bain to demonstrate that the system achieves the expected outcomes.

The detail and validation work provided by the operator suggests that this process performs predictably when treating landfill leachate and that the models provide the basis to design long retention lagoon systems at sites where the leachate feed may vary in terms of daily volume and Ammoniacal Nitrogen concentration.

The treatment process includes phytotreatment by willow coppice. The total SRC growing plot size requirement is based on an understanding of both the hydraulic requirements of the crop and load based criteria in terms of its chemical composition as detailed within section 3.2 of the application.

Appendix 3 of the application – Biological Treatment Processes, describes the biological treatment associated with the individual treatment process steps of the SRC treatment technology.

As discussed in Section 3.1 and 6.1 of the application, the environment within the treatment system is designed to both nitrify and denitrify, and requires both aerobic and anaerobic conditions to be established within the system. The applicant details that alkalinity and pH will be utilised at various stages to indicate that the facultative treatment system is operating successfully at the various treatment steps.

The application explains that one key dependency within the biological process is that although nitrifying bacteria can be grown and reproduce in the presence of most organic compounds, some simplistic and common forms of organic compounds such as alcohols and acids can inhibit their activity and therefore inhibit nitrification. It also explains that most nitrifying bacteria can only use inorganic carbon or carbon dioxide, and a large and diverse

population of organotrophs (bacteria which use organic compounds or carbonaceous waste) must also be present in order to oxidise these simplistic organic compounds and allow the nitrifying bacteria to thrive.

The aeration and non-aggressive mixing provided by the specialised aeration equipment is explained by the applicant. It allows the solids to settle to the bottom of the lagoon, with anaerobic digestion of these solids occurring at the same time as the aerobic system above it reduces the BOD, Ammoniacal Nitrogen and pathogens in the effluent. After an initial anaerobic sludge layer is established in the primary lagoon, the system can maintain a steady-state sludge depth of approximately 20 – 40 cm.

The chemistry of the treatment process is presented within Section 6 of the application.

The treatment processes attributable to the SRC growing area are:

- the volume reduction in liquids input into it as the liquid is taken up by the plant species grown within and also evaporated;
- the take-up of nutrients by the willow coppice species required for growth;
- soil is a biologically active media and it is expected that the emplaced soils will mature and develop over time as the area is cultivated.

With regards to the facultative treatment steps associated with the leachate treatment processes within the primary and secondary lagoons, we are satisfied that individual process steps will be adequately monitored.

Appendix 10 of the application – Monitoring Schedule (re-submitted 07/06/16), details the monitoring and analysis to be carried out at the defined end-points to the individual treatment process steps so that the reaction can be monitored and controlled. Distinct monitoring of the treatment process itself will include individual monitoring of the raw leachate feed, primary and secondary lagoons, SRC plots and perimeter containment channels.

3.0 Coppice species have been selected with evidence that they are suitable for that purpose

Section 4 of the application outlines the SRC establishment and details that the SRC species selection will consist of commercially cropped SRC, normally willow, however other tree species such as poplar, alder and hazel are able to be propagated in the same manner and may be chosen in preference depending on site specific conditions.

We are satisfied that the applicant intends to grow plant species which are appropriate to both the SRC treatment process and commercially viable end use.

4.0 The SRC process is a contained/closed system that will prevent the escape of leachate from the process system. For example there should be an engineered barrier and a surface water management system to prevent percolation and horizontal migration.

Lagoon engineering and design are detailed in section 5 – Engineered Design, Construction and Commissioning, of the application.

Containment of the treatment lagoon is achieved through the incorporation of an HDPE liner within the lagoon construction.

In addition to the containment described above, the application details that a surface water channel is formed at the base of the slopes around the SRC area to collect all clean surface water runoff from the external lagoon flanks. The channel is linked to the existing landfill surface water drainage system and is isolated from the leachate system.

The SRC plots are located on the capped area of the landfill. The topographical profile of the landfill on which the SRC plots are located reflects the profile of the engineered cap. A containment channel is to be constructed around the sides of the perimeter of the SRC plots with sampling location(s) along the north, south, east and west of the SRC plot area. Physical containment of the SRC plot area at this site is achieved by the perimeter containment channel being constructed into areas of the landfill cap.

All drainage from the SRC plots will ultimately drain via gravity to the containment channel which is to be constructed around the SRC plots. We consider that there will be no migration of water from the SRC plot area.

The location of the drainage channel has been chosen based on proximity to the landfill site boundary and nearest sensitive receptors. See Section 7.0 of this document for further details regarding the containment system.

The channels will be tied to the underlying clay cap to provide containment in accordance with the EA Position Statement, and will be located approximately 5 m from the outer edge of the SRC coppice area or beyond the buffer zone planting (as appropriate). As all plots are to be located on the landfill cap of Area A, the separate plots will be dealt with as a whole in terms of hydraulic containment rather than individually.

Distinct monitoring of the treatment process forms part of the application and includes monitoring within the perimeter containment channel. Section 7 of the application report details that the monitoring and containment of the entire system is achieved by the containment channel, which will be installed around the base of the landfill, and the external ground and surface water monitoring already is in place as part of the current landfill operations and Permit requirements. Modelled output at this stage is modelled against specific limits (where available limits are to be preferentially drawn from Environmental Quality Standards (EQS) with reference to other standards i.e. Drinking Water Standards as appropriate).

Should monitoring of water within the containment channel demonstrate that the surface water is clean surface water runoff it will be discharged to the site's perimeter drainage system for discharge off site, as and when required. In the event that concentrations exceed the assessment criteria specified in the permit, the contaminated water will be transferred back to the secondary leachate treatment lagoon to undergo further treatment.

We consider that outside of the SRC growing and irrigation period, there is a need to confirm that the discharge will not exceed the limits and consider that using the results from the monitoring together with a key indicator suite which

can be monitored in the field prior to discharge will achieve our regulatory objectives.

In this way the determinands, monitoring regime and emission limits detailed in Table S3.3 were arrived at to give us confidence that any discharge from the containment ditch meets the emission limits both during the growing season and outside of this period.

5.0 Where the SRC is sited on a landfill cap the integrity of the cap will be maintained and not damaged by roots or pipe work

The applicant details that this criteria is specifically addressed by Section 6.3.1 of the application report. To ensure integrity of the landfill cap, the plots will be covered, in accordance with Environment Agency Technical Guidance, with a minimum of 1.0 m of soil if placed over a geosynthetic cap, or 1.5 m depth of soil if placed over a mineral cap. The cap at Whisby landfill consists of a 1.0 m thick mineral liner covered by a minimum thickness of 1.0 m of restoration soils and topsoil. This is not in accordance with our guidance which requires the depth over a mineral cap to be 1.5 m to be sufficient to prevent tree roots penetrating into the underlying waste mass. We have therefore requested that additional soils be added to the SRC when the next replanting of the coppice is undertaken (Improvement Condition IC8) and, if any 'die back' of the trees is observed, that works are undertaken to repair the cap as soon as possible (Improvement Condition IC7).

All construction work associated with the SRC scheme will be done by independent third party CQA procedures.

Section 5 of the application report details that it is not considered necessary to provide stability calculations for the construction of the SRC plots as this will be undertaken following best practice for restoration of landfill sites with woodland.

6.0 The environmental risk assessment establishes the environmental consequences of the activity at the specified location, and that the risks are acceptable.

With regard to the facultative treatment steps associated with the leachate treatment within the primary and secondary lagoons, we are satisfied that individual process steps will be adequately monitored and that the risks from the process are acceptable.

The measures proposed for surface water monitoring and the contingency measures incorporated within the application should ensure that surface water emissions are within EQS limits.

The last stage of the treatment process is the treatment of the treated landfill leachate by the coppice environment. The demonstration that this final treatment phase is effective is achieved through appropriate monitoring. The application includes surface water monitoring points within the containment channel as demonstrated on drawing 722M132A. These surface water monitoring points are referred to in Tables S3.3 and S3.10 of the permit and include an associated monitoring suite and monitoring frequency.

Demonstration that the agreed emission limits for the containment channel have been met will result in this monitoring representing the end-point of the process. More detail on this matter can be found within the application and the 'Performance and process monitoring indicators for surface water concentration limits' section of this document.

Suitable indicators for monitoring the performance (both success and failure) of the processes have been put forward by the operator. No irrigation will occur where monitoring data for the secondary treatment lagoon are demonstrated to exceed the agreed emission limits in Table S3.12 of the permit. The results of monitoring of the secondary lagoon will dictate whether irrigation to the coppice will take place.

We consider the containment measures proposed are adequate to prevent discharge of contaminated runoff from the SRC system to groundwater and therefore we have not altered the existing groundwater monitoring requirements at the site.

The surface water tables within the permit, Tables S3.3 and S3.10, have been updated with appropriate limits and monitoring requirements to ensure that any discharge from the SRC containment ditch is within appropriate emission limits so as not to cause an adverse impact on the site's surface water system.

7.0 The process will be monitored regularly including leachate quality prior to being irrigated, the background soil quality, application rates and soil conditions, and the soil quality after the process has been applied. Appropriate indicators and techniques should be used to monitor the activity.

The treatment process model and modelling for the leachate treatment and SRC are described within section 7 of the application and includes a Conceptual Model. The monitoring locations, determinands to be monitored, compliance limits and monitoring frequencies for the SRC are in Tables S3.3, S3.10, S3.11 and S3.12 of the permit.

We are satisfied that there will be clear auditable management systems in place for the operation of the SRC treatment system and associated monitoring being undertaken. The situation will be further demonstrated by the operator through completion of improvement condition IC 6 (Table S1.3 of the permit), which requires the operator to provide written Environmental Management Systems and Integrated Management Systems which demonstrate consistence with the application.

The process flow diagrams consist of four Key Assessment Phases within which there are eight distinct tabulated stages comprising a total of twelve inter-linked tables. The determinands to be monitored within each discrete phase of the process are defined within Figure 4 of Section 6 of the application. The models are fundamental in demonstrating how the monitoring of the different stages of the process are interlinked. In developing assessment levels at each stage of the process, the operator has attempted to predict the likelihood of positive detection of key components (i.e. heavy metals and trace organic compounds) when measured against laboratory detection limits at different stages of the process.

Chemical characteristics of the soils to be used for the SRC plots will be established. These will be completed in accordance with improvement condition IC 11, within Table S1.3. The soil monitoring suite and frequency will be reviewed in accordance with improvement condition IC 12 in Table S1.3.

The proposed physical containment of the SRC plots suggests there will be no impact on groundwater from the proposal. Should monitoring of water within the containment channel demonstrate that the water contained within is clean surface water runoff, the permit enables the operator to discharge this surface water to the site's perimeter drainage system for discharge off site. In the event that substance concentrations within the containment ditch water exceed the assessment criteria specified in Appendix 10 of the application, the contaminated water will be transferred back to the secondary leachate treatment lagoon or back to the SRC plot for further treatment as specified in Section 6.5.3 of the Application.

We conclude that the operation of the SRC treatment system is unlikely to negatively impact surface water or groundwater receptors in the area. There are also sufficient monitoring and mitigation measures included in the permit to ensure this.

It should be noted that the operator's proposals do not change the groundwater monitoring requirements or the off-site surface water monitoring requirements of the original permit for the site.

Monitoring Standards (Standard Reference Methods)

Section 6.7.3 of the application report states that "all monitoring will be carried out in accordance with the Environment Agency's Monitoring Certification Scheme (MCERTS) where appropriate".

We have accepted the proposed soil sampling method presented within the Schedule 5 response Question 2. The sampling will follow the industry standard pattern of sampling within the limitation of the coppice row layout.

Soils analysis will be undertaken for the suite of determinands detailed within Appendix 7 of the application and analysed using the methods detailed within that appendix. To ensure that soils are monitored for the full suite of determinands identified by the leachate characterisation, the soil quality monitoring programme has been updated to incorporate the methodology defined within the application.

8.0 It will not cause any significant deterioration of the soil quality. It must be demonstrated that the treated leachate is being treated by the coppice environment

Section 5.4 of the application details that the size of the SRC plots is likely to vary across different landscapes depending on various topographical features. The applicant has determined that an overall average plot size of 1.3 – 3 hectares is appropriate for harvesting and managing the various SRC plots. The applicant has calculated the soil moisture deficit that will be generated by the SRC crop at the Whisby Landfill site to be approximately 3,688 m³/yr and has detailed that the volume of leachate to be abstracted from the Whisby landfill site is 15,000 m³/yr, which equates to a land area of 4

– 8 hectares depending on irrigation rates and time of year, with a total area available for irrigation at the site of 18 ha.

The optimal rate of irrigation to the SRC crops has also been calculated using the chemical composition of the effluent, particularly focusing on the metals and soluble non-organic ions. The chemical composition of the leachate has been derived using site specific information as detailed in Section 5 of the application. The reference sites operated by the operator have provided data related to maximum chemical component loading rates as outlined in the application, based on information gathered from the site, while it also outlines the proposed maximum loading rates that are specific to the Whisby Landfill Site and based on the operator's experience at the site.

The landfill leachate will be characterised both before and after it receives treatment through the primary and secondary lagoons. Knowing the quality of the liquid within the primary and secondary leachate treatment lagoons will inform the initial chemical characterisation substance suite of the soils to be used to construct SRC plots that will establish the Short Rotation Coppice (SRC) site. The soil results of the analysis to derive the soil chemical characterisation will form the baseline against which possible deterioration of soil quality can be assessed.

The operator has provided a methodology to derive the baseline chemical characteristics as describe in section 2.0 – Leachate Characterisation and Monitoring Indicators for the Performance of the Processes within the Decision Document. We have assessed the proposed procedures against our guidance and have accepted them. These have been incorporated into improvement condition IC 11 which requires the operator to characterise the soils to be used in the SRC plot to obtain a “get no worse” concentration of substances within the soils using the list of substances which characterise the landfill leachate at the site as demonstrated in Appendix 10.

The manner in which irrigation to the SRC plots is to be managed to ensure environmental protection is detailed within the application. Section 6.3.2 – Irrigation Model details that the Integrated Management Systems (IMS) procedures for the facility, contains a site specific Irrigation Plan which identifies area of risk and ensures that a sufficient buffer zone is established and implemented. It also details that:

- The SRC crop has a very high water demand and there is a need to balance the irrigation requirements of the crop with the applied load limits (chemical and hydraulic).
- The irrigation plan will optimise the quantity of the effluent applied to the site and balance this with the contribution from natural rainfall according to the crop requirements and soil capacity.
- The ADAS 'IRRIGUIDE' programme is the candidate tool that will be used to plan the irrigation on the site. The ADAS IRRIGUIDE model (v4.2) calculates runoff, evaporation, transpiration and drainage on a daily basis given field-level information on soil type, cropping, irrigation and daily weather data.

In addition to the above, Appendix 10 – Assessment Limits, contains substance limits for the characteristic chemical components of the landfill leachate and associated liquids throughout the treatment process.

Monitoring for trace organic compounds is to be routinely undertaken by the operator to demonstrate the effective removal of these contaminants through the treatment process and the soil pore water held within the SRC soil matrix. The operator has provided evidence from the trial including actual and modelled predicted removal rates, that the SRC treatment process results in concentrations of chemical components and species within the pore water of the SRC plots and the perimeter containment channel will not exceed concentration limits specified within the permit. The specified limits for the respective substances contained within the discharge are included within Table S3.12 of the permit. How the respective limits were derived is detailed earlier within this decision document.

There is a detailed description of the leachate treatment technique for the installation included in the application which describes the premise behind the operation of the facultative treatment system which takes place between the primary and secondary lagoons. Section 5 of the application includes details concerning the treatment process. The treatment process model and monitoring is described within Section 6 of the Application. We consider that Figure 4 within Section 6 of the Application demonstrates a commitment by the applicant to monitor suitable indicators with which to demonstrate the performance (both success and failure) of the process.

The monitoring indicators (with which to demonstrate that the treatment process is not causing any significant deterioration to the soil quality and that the treated leachate is being treated by the coppice environment) together with how these were derived is detailed within sections 2.0, 3.0 and 4.0 of this decision document.

We have discussed with the applicant the potential actions to be taken if the SRC treatment process results indicate significant deterioration of the SRC soils. The operator has outlined various actions to be taken if the treated leachate from the secondary lagoon exceeds permitted levels, including stopping the irrigation of treated leachate to the SRC plots, testing the soils and pore water within the SRC plots and reviewing site operations to prevent future failure. These are detailed in Section 6 of the application.

We have advised the operator that if the process leads to significant deterioration of the SRC soils (as outlined in our Regulatory Position Statement), the operator may be required to remove the source of the contamination, namely, the coppice stands and contaminated soils, which will need to be disposed of in an appropriate disposal facility.

9.0 The system will be managed in a manner that will ensure that the environment is protected. For example by only irrigating when there is a soil moisture deficit, and also irrigating at an appropriate rate to prevent, when there are periods of higher rainfall, runoff and leaching of the treated leachate. The application should include an explanation of the operating techniques with respect to soil type, weather, soil moisture deficit, application rates, soil infiltration rates and slope.

The applicant has detailed that no irrigation to the SRC plots will occur if the assessment limits are breached following analysis from the secondary

lagoon. We have specified within Conditions 3.1.7 and 3.1.8 that no emissions from the primary and secondary lagoons shall take place unless the limits specified within Table S3.12 have been met.

In addition to the use of chemical loading limits set out in Section 5.4.3, the application details that while the planting and irrigation system will be managed as one hydraulic unit, individual plot areas will be separately managed so as to respond to circumstances where there may be differing irrigation requirements. The operator details that, based on the method and timing of the irrigation water, the SRC plots will only be irrigated when there is a soil moisture deficit and that there will be no direct surface water runoff from the SRC plots following irrigation as a result of the quantities of surface water draining from the SRC area unless as a direct result of incidental rainfall outside of the active growing season. The operator considers that this method avoids the need to consider the complexities of physical control measures such as internal bunding around the perimeter of the individual SRC plots and consequential further surface water runoff management issues (ponding, access for plant and machinery etc). We have accepted this position as the SRC plots are contained by a physically engineered construction, namely a containment channel constructed around the perimeter of the SRC plots. The site will, therefore, be operated as a closed system. . Suitable sampling locations will enable monitoring of any potential runoff from the process and the operation and management systems for the site include contingency planning for leachate management when unsuitable conditions arise.

Section 6.3 of the Application details that access to weather station data will be used to demonstrate that irrigation onto the SRC plots is not undertaken during periods when there is no soil moisture deficit.

Section 6.3.2 of the Application details that the Integrated Management Plan (IMP) procedures for the facility contains a site specific Irrigation Management Plan. This plan will be used to optimise the quality and quantity of the leachate to be applied to the SRC. Also, balancing the amount of leachate with the rainfall to ensure the coppice gets sufficient moisture.

The application details that the ADAS 'IRRGUIDE' programme is the candidate tool that will be used to plan the irrigation on the site. The ADAS IRRGUIDE model (v4.2) calculates runoff, evaporation, transpiration and drainage on a daily basis given field-level information on soil type, cropping, irrigation and daily weather data.

Section 6 of the Application details that the application of the treated effluent onto the crop will be monitored by both the quality of the effluent applied to the crop and the load in terms of grams per hectare (g/ha) applied. It also details that to achieve the latter, accurate flow meter records will be maintained.

In order to monitor the integrity and effectiveness of the entire process, interpretation and management of the data arising from this monitoring regime is to be reported against assessment levels specified in the application.

Table S3.11 – Process Limits and Monitoring Requirements - Soils, has been included in the permit to address the Agency's concerns regarding soil

sampling (annually) and soil pore water which is required to have seasonal monitoring (March, May, July, September and November) for a period of two years and thereafter as determined in compliance with Table S1.3, improvement condition IC11.

Table S3.12 – Process Limits and Monitoring Requirements - Leachate, has been included to address the Agency's concerns on the following:

- Raw leachate feed, Primary treatment effluent and Secondary treatment effluent – flow on a monthly basis; and
- Raw leachate feed, Primary treatment effluent and Secondary treatment effluent quality – on a monthly basis.

Tables S3.3 – Point source emissions to water and S3.10 – Surface water, other monitoring requirements, within the permit have been amended to include emission limits for surface water monitoring points CC1, CC2, CC3 and CC4 as shown on drawing 722M132A.

The acceptable concentrations of key determinands will be agreed with the Environment Agency as a improvement condition as outlined in Section 2.0 of this decision document. The soils will be analysed on an annual basis and it is not the intention to analyse the soils on a more frequent basis as the process will be monitored and controlled through analysis of the secondary lagoon prior to irrigation.

The soil sampling methodology has been derived from research undertaken by ADAS at this site and Kirby on Bain landfill site. The programme of soil sample monitoring drawn up by ADAS is contained within Appendix 7 of the application. Soil analysis will be undertaken in accordance with section 5 and 6 of the application and as discussed within section 2.0 of this decision document.

The operator has confirmed that details relating to the method of irrigation, and how it was derived, are included within the IMS documents and that the site specific irrigation management plan is included within the application.

The operator details that maintaining the SRC crop requires application of beneficial minerals and nutrients at specific concentrations in addition to known quantities of water. The required concentrations of beneficial minerals for the SRC crop are detailed within the application and have been taken into consideration in determining the assessment limits. Also the application contains an ADAS report which provides details of the quantities of beneficial plant nutrients, potentially harmful components and heavy metals applied in irrigation water.

To ensure that there is no significant deterioration of the soil quality of the SRC plots and that the treatment process is protected, concentration assessment limits have been defined for the substances within the characterised landfill leachate for each of the individual treatment process stages with which the results of the monitoring programme for the individual treatment process steps will be compared against.

10.0 The management system should include contingency planning for leachate management when unsuitable conditions arise.

The application details that the Environmental Management Systems (EMS) and Integrated Management Systems (IMS) are in place for the use of SRC treatment techniques at this site. Section 6 provides details of the EMS and IMS documents. These documents need to be approved by the Area Environment Compliance Team prior to any discharge from the SRC plots taking place. Table S1.3 within the permit includes an improvement condition (IC 6) relating to this.

The application contains a contingency plan applicable to the component parts of the SRC treatment system as detailed within sections 5 and 6 of the application.

Section 6 of the application details that a minimum freeboard of 1 m will be maintained and, in exceptional circumstances should excess volume threaten the freeboard, then effluent will be tankered directly from the lagoons for third party disposal. This section also details a contingency for tankering the pre-treated leachate from both lagoons off site in the event the maximum free board levels (0.5 m) have been exceeded within the lagoons and no irrigation can be carried out on the site.

The application mentions two different freeboard levels within the lagoon, namely freeboard levels of 0.5 m and 1.0 m. We consider that the treatment lagoons should be maintained with a maximum freeboard of 1.0 m to ensure adequate protection and prevent the risk of overtopping of the lagoons. Table S3.12 of the permit requires the freeboard to be monitored.

Annex 1: decision checklist

This document should be read in conjunction with the application, supporting information and permit/notice.

Aspect considered	Justification / Detail	Criteria met
		Yes
Receipt of submission		
Confidential information	A claim for commercial or industrial confidentiality has not been made.	✓
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential. The decision was taken in accordance with our guidance on commercial confidentiality.	✓
Consultation		
Scope of consultation	<p>The consultation requirements were identified and implemented. The consultation requirements were identified and implemented. The decision was taken in accordance with our Public Participation Statement and our Working Together Agreements.</p> <p>For this application we consulted the following bodies:</p> <ul style="list-style-type: none"> • Director of Public Health – Lincolnshire County Council • Local Authority Environmental Health - North Kesteven District Council • Food Standards Agency • Health and Safety Executive • Public Health England • Local Authority Planning Department – Lincolnshire County Council 	✓
Responses to consultation and web publicising	<p>The web publicising and consultation responses (Annex 2) were taken into account in the decision.</p> <p>The decision was taken in accordance with our guidance.</p>	✓
The facility		
The regulated facility	<p>The extent/nature of the activities and operations taking place at the site required clarification.</p> <p>The decision on the facility was taken in accordance with</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	<p>Appendix 2 of RGN 2 “Understanding the meaning of regulated facility”, Appendix 1 of RGN 2 “Interpretation of Schedule 1”, and “Appendix 2 – Defining the scope of the installation”</p> <p>The regulated facility is an installation which comprises the following activities listed in Part 2 of Schedule 1 to the Environmental Permitting Regulations and the following directly associated activities.</p> <ul style="list-style-type: none"> • Section 5.2 Part A(1) (a), The disposal of waste in a landfill. • Section 5.4, Part A(1)(a)(i), Biological treatment of non-hazardous waste. • Leachate Management: pumping storage and recirculation of leachate pre-discharge by tankering for off-site disposal. • Landfill Gas Flaring: flaring of Landfill Gas for disposal in an appliance. • Water Discharges to controlled waters: discharges of site drainage from the landfill. • Storage of fuel for operation of plant and equipment. 	
European Directives		
Applicable directives	All applicable European directives have been considered in the determination of the application.	✓
The site		
Biodiversity, Heritage, Landscape and Nature Conservation	The application is not within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.	✓
Environmental Risk Assessment and operating techniques		
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p> <p>However we have inserted a number of improvement conditions as proposed in the operator's risk assessment – see 'Key Issues' above</p>	✓
Operating techniques	We have reviewed the techniques used by the operator and compared these with the relevant guidance notes.	✓

Aspect considered	Justification / Detail	Criteria met Yes
	<p>The proposed techniques/emission levels for priorities for control are in line with the benchmark levels contained in the TGN and we consider them to represent appropriate techniques for the facility.</p> <p>We consider that the operational techniques and emission limits included in the permit reflect the BAT for the installation.</p>	
The permit conditions		
<p>Updating permit conditions during consolidation.</p>	<p>We have updated previous permit conditions to those in the new generic permit template as part of permit consolidation. The new conditions have the same meaning as those in the previous permit(s).</p> <p>Certain template conditions have been amended to reflect current best practice. These changes have been developed in consultation with industry having regard to the relevant legislation as follows:</p> <p>Condition 1.5. Generic condition added to reflect the requirements of the Waste Framework Directive</p> <p>2.6.1(a). We have added reference to a specific table to clarify what wastes are permitted at which permitted activity.</p> <p>2.6.2. Added to separately identify the waste types and quantities that can be accepted for restoration. While part of the landfill activity, the waste types and quantities need to be separately identified to confirm they are appropriate for use.</p> <p>2.9. Revised gas management condition imposed for all landfills that accept biodegradable waste to ensure compliance with the relevant requirements of the Landfill Directive.</p> <p>3.1.1. Generic condition imposed on all activities to simplify the sub-conditions. This avoids the need for additional sub-conditions that refer to compliance limits in individual tables in schedule 3</p> <p>3.1.4 – 3.1.5. Revised conditions to reflect the</p>	<p>✓</p>

Aspect considered	Justification / Detail	Criteria met Yes
	<p>terminology used by the Groundwater Directive and to require hydrogeological risk assessment reviews every 6 years rather than every 4 years.</p> <p>Two sub-conditions which referred to limits in specific tables in schedule 3 are deleted as they are now covered by 3.1.1.</p> <p>3.6. Revised generic pests condition imposed on all activities.</p> <p>4.2.2. Amended to ensure that information on ‘annual production/ treatment’ (Schedule 4, Table S4.2) is provided in February each year while annual reports may be submitted at other times of the year. This includes data on landfill gas collection that must be reported to government by April each year.</p> <p>4.2.2(a). Text expanded to clarify the details we require in an annual report.</p> <p>4.2.2(h). New condition requiring annual submission of a plan of monitoring and extraction locations with reference to monitoring tables in Schedule 3 (MEPP Plan).</p> <p>4.3.1. New standard condition requiring the operator to notify the Environment Agency of certain events.</p> <p>Schedule 1, table S1.1. Amended description to the landfill activity to clarify that this includes restoration. Activity references amended to reflect changes introduced by Industrial Emissions Directive (2010/75/EU).</p> <p>Table S1.5. Amended to clarify that restoration is a separate part of the landfill activity unrelated to landfill cover.</p> <p>Schedule 2. Template list of appropriate waste added for landfills for non-hazardous waste. Waste types prohibited by the Landfill Directive have been removed for clarity (please see below in Waste types).</p>	

Aspect considered	Justification / Detail	Criteria met
		Yes
	<p>Schedule 3. Monitoring and compliance tables have been re-ordered so that those with compliance limits appear first. Standard monitoring frequency and parameters have been included for certain routine monitoring requirements.</p> <p>Schedule 4, table S4.1. Amended to only require regular reports of information that relate to compliance limits.</p> <p>Table S4.2. Additional details of landfill gas extracted required to improve climate change data quality.</p> <p>Table S4.3. Amended to include natural gas as an energy source for consistency with other sectors.</p> <p>Schedule 6. Definitions added to clarify meaning of:</p> <ul style="list-style-type: none"> • Inert waste; • Exceeded; • Hazardous substance; • Medicinal product; • Previous year; • Waste acceptance criteria; and • Waste acceptance procedure. 	
Use of conditions other than those from the template	Based on the information in the application, we consider that we need to impose conditions other than those in our permit template, which was developed in consultation with industry having regard to the relevant legislation. See 'Key Issues' (above).	✓
Waste types	<p>We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.</p> <p>The following wastes have been removed as landfill is not the best option for disposal of these wastes and there is a readily available alternative management route. We made these decisions with respect to waste types in accordance with the Landfill Directive and Waste Framework Directive.</p> <p>04 01 04 tanning liquor containing chromium 04 01 05 tanning liquor free of chromium 06 13 03 carbon black</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	<p>08 04 16 aqueous liquid waste containing adhesives or sealants other than those mentioned in 08 04 15</p> <p>16 01 06 end-of-life vehicles, containing neither liquids nor other hazardous components</p> <p>16 05 05 gases in pressure containers other than those mentioned in 16 05 04</p> <p>16 05 09 discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08</p> <p>16 06 04 alkaline batteries (except 16 06 03)</p> <p>16 06 05 other batteries and accumulators</p> <p>16 08 04 spent fluid catalytic cracking catalysts (except 16 08 07)</p> <p>17 08 02 gypsum-based construction materials other than those mentioned in 17 08 01</p> <p>18 01 01 Sharps (except 18 01 03)</p> <p>18 01 07 chemicals other than those mentioned in 18 01 06</p> <p>18 02 03 wastes whose collection and disposal is not subject to special requirements in order to prevent infection</p> <p>20 01 34 batteries and accumulators other than those mentioned in 20 01 33</p> <p>We are satisfied that the operator can accept the waste types shown in tables S2.1 and S2.2 for the following reasons:</p> <ul style="list-style-type: none"> the operator has the necessary management systems in place ensure they are controlled; and the necessary risk assessments and site testing demonstrates that the site infrastructure complied to the standards to accept non-hazardous wastes as required by the Landfill Directive. <p>We made these decisions with respect to waste types in accordance with EPR 5.02 - How to comply with your environmental permit - Additional guidance for: Landfill.</p>	
Pre-operational conditions	<p>Based on the information in the application, we consider that we need to impose pre-operational conditions.</p> <p>The pre-operational conditions have been transposed from a previous variation (EPR/BW2978ID/V002) as the site is currently still “mothballed” and has not accepted any additional waste since the site was permitted under</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	the PPC Regulations 2000. The pre-operational conditions are still required in the event that the operator proposes to recommence disposal operations in Areas A and B.	
Improvement conditions	<p>Based on the information in the application, we consider that we need to impose improvement conditions.</p> <p>The improvement conditions detailed in the previous permits have been completed and table S1.3 has been updated to show that conditions IC 1 to 5 have been completed. The operator has provided the necessary reports and documents required under these improvement conditions which have been incorporated into the Operational Techniques table (Table S1.2) of this consolidated permit.</p> <p>However, we consider that we need to impose new improvement conditions as outlined below.</p> <p>We have imposed improvement conditions to ensure that:</p> <ul style="list-style-type: none"> • the operator revises the environmental management system to include the SRC and that it is made available to the Environment Agency (reference IC6). • an action plan is produced to repair the landfill cap should it be necessary (reference IC7). • an action plan is produced to increase the depth of soils within the SRC to 1.5 m prior to the replanting of the trees (reference IC8). • an action plan is produced to repair the containment ditch surrounding the SRC (reference IC 9). • a revised restoration plan is provided to the Environment Agency (reference IC 10). • the operator obtains a “get no worse” baseline for the SRC soils and soil pore water (reference IC 11). • the operator reviews the parameter and the frequency of monitoring for the leachate, soils and pore waters (reference IC 12). 	✓
Incorporating the application	<p>We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process.</p> <p>These descriptions are specified in the Operating Techniques table in the permit.</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
Emission limits	<p>We have decided that emission limits should be set for the parameters listed in the permit.</p> <p>The emission limits detailed in the tables in Schedule 3 have been translated across from previous variations.</p> <p>The limits regarding the SRC are detailed in the 'Key Issues' section above.</p>	✓
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>Standard monitoring tables for groundwater, leachate and surface water have been added as a result of the Environment Agency Landfill Sector Review. These monitoring requirements have been imposed in order to simplify the monitoring requirements for the operator and ensure monitoring requirements are in line with our regulatory position statement on landfill monitoring and reporting standards.</p> <p>The Hydrogeological Risk Assessment Review (HRA Review) undertaken in 2014 concluded that the leachate level limits and emission into groundwater require to be changed. The Environment Agency found the new levels and limits to be satisfactory and Tables S3.2 and S3.4 has been change to those levels agreed in the HRA Review.</p> <p>The monitoring required in relation to the SRC is detailed in the 'Key Issues' section above.</p>	✓
Reporting	<p>We have specified reporting in the permit.</p> <p>We have inserted a new revised standard table S4.1 as a result of the permit review.</p> <p>We have required additional reporting of the process monitoring in table S4.3 for the SRC.</p> <p>Also, the frequency for reporting of 'Other Surface Water</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	<p>Monitoring' has been changed from 3 months to 12 months.</p> <p>We made these decisions in accordance with standard template for the Landfill Sector Review regarding landfill monitoring and reporting standards and Regulatory Position Statement⁴ on applying treated landfill leachate to short rotation coppice.</p>	
Operator Competence		
Environment management system	<p>There is no known reason to consider that the operator will not have the management systems to enable it to comply with the permit conditions. The decision was taken in accordance with RGN 5 on operator Competence.</p> <p>See Improvement Condition section above.</p>	✓
Technical competence	<p>Technical competency is required for activities permitted. The operator is a member of an agreed scheme.</p>	✓
Financial provision	<p>There is no known reason to consider that the operator will not be financially able to comply with the permit conditions. The decision was taken in accordance with RGN 5 on Operator Competence.</p> <p>Condition 1.2.1 has been amended with the most up to date financial provision arrangements between the operator and the Environment Agency.</p> <p>The financial provision arrangements satisfy the financial provisions criteria.</p>	✓

⁴ Regulatory Position Statement, Application of treated landfill leachate to short rotation coppice (SRC), February 2008

Annex 2: Consultation and web publicising responses

Summary of responses to consultation and web publication and the way in which we have taken these into account in the determination process. (Newspaper advertising is only carried out for certain application types, in line with our guidance.)

Response received from
Local Authority Planning Department - Lincolnshire County Council
Brief summary of issues raised
None
Summary of actions taken or show how this has been covered
None

Response received from
Health and Safety Executive
Brief summary of issues raised
None
Summary of actions taken or show how this has been covered
None

Response received from
Local Authority Environmental Health - North Kesteven District Council
Brief summary of issues raised
None
Summary of actions taken or show how this has been covered
None

Response received from
Public Health England
Brief summary of issues raised
None
Summary of actions taken or show how this has been covered
None

Response received from
Director of Public Health – Lincolnshire County Council
Brief summary of issues raised
None
Summary of actions taken or show how this has been covered
None

Web publication

We received no responses from the public to our publication of the application on our website.