Natural Resources Wales permitting decisions

Variation

We have decided to issue the variation for Trecatti Landfill operated by Biffa Waste Services Limited.

The variation number is EPR/RP3733PC/V008

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.

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

Site setting and location

Trecatti Landfill Site is located approximately 200m east of the village of Dowlais and approximately 3km northeast and west of Merthyr Tydfil and Rhymney respectively. Access to the installation is via the unclassified public highway named Fochriw Road, which is itself accessed from the north via the A465.

Trecatti Landfill Site is currently operated under Environmental Permit EPR/RP3733PC originally issued on the 9th March 2005. The permit was varied in 2007 to amend the gas management infrastructure and in January 2008 to remove the permit conditions that authorised the deposit of Stable, Non-Reactive Hazardous Wastes (SNRHW) (including asbestos wastes). An NRW led variation was carried out in June 2013 to incorporate changes brought about by the Industrial Emissions Directive.

The application

This variation application has been made to reinstate conditions to authorise the deposit of asbestos containing wastes within a dedicated monocell to be constructed on the southern side slope area of the former opencast engineered void. Prior to the original PPC permit, asbestos wastes were accepted under a former waste management licence. The proposed asbestos monocell cell will result in the deposit of approximately 332,500 m^3 of asbestos containing waste materials (including soil cover). This cell replaces existing void space currently allocated for the deposit of approximately 415,000 m^3 of non-hazardous biodegradable waste. The asbestos cell incorporates the sidewall lining system recently constructed and validated for the acceptance of non-hazardous biodegradable wastes. Engineered separation will be provided internal to the waste mass via stable vertical soil bunds constructed in 1.4m lifts. Temporary storage will be provided on the eastern edge of the landfill area when operational constraints prevent the immediate placement of wastes in the monocell..

As part of the variation application the following Risk Assessments were reviewed, revised and submitted to determine whether any of the proposed changes would have an unacceptable impact on the environment:

- Stability Risk Assessment
- Landfill Gas Risk Assessment
- Hydrogeological Risk Assessment
- Nuisance and Health (Amenity) Risk Assessment

Advertising the application

The application was identified as a Site of High Public Interest in accordance with our guidance document RGN 6: Determining Sites of High Public Interest. The application and supporting documents were advertised on NRW's website from the 17th July to the 26th September 2014 inviting comments from members of the public to be received by 26th September. An advert was also placed in the local newspaper (Merthyr Express) on the 17th July. Community engagement was also held by way of a public surgery held on 9th September 2014. No comments were received in response to the advertising or the public surgery.

Stability Risk Assessment Review

The key issues for developing a dedicated Asbestos Cell are the stability and durability of any engineered structure which separates the waste masses. Accordingly, the most robust means of establishing the acceptability of the proposed design is to apply the guidance that applies to stability and integrity of landfill engineering systems such as basal liners and caps. For the purposes of this section, when talking about guidance, the guidance referred to are Regulatory Guidance Series, No LFD 1Understanding the Landfill Directive, March 2010 and Landfill Engineering Guidance Notes LFE4 - Design, construction and quality assurance of earthworks in landfill engineering unless otherwise stated.

When undertaking geotechnical design established engineering standards have to be applied so that the design can be verified and the numerical results of analysis placed into a consistent framework. Until relatively recently the only standard applied to geotechnical engineering in the UK would be that expressed in the British Standards, particularly BS 6031: Code of Practice for Earthworks. This Standard requires that stability assessments are carried out with cautious estimates of engineering parameters which are then used un-factored in the stability calculations. The resulting single Factor of Safety output from the calculations is then compared to values recommended in the Standard. This approach expresses the entire safety of the system as a single Factor of Safety.

Currently, UK practice is in transition away from the British Standard approach to one expressed in the Europe wide standard EuroCode 7. This European Standard has been brought into UK standards as BS EN 1997-1:2004 and so its provisions can be applied in the UK as well as elsewhere in Europe. EuroCode 7 provides a design approach in which the cautious estimates of parameter values are individually factored prior to use in the calculations. The amount by which each parameter is factored is specified in the UK National Annex to BS EN 1997-1. The resulting calculation outputs, having already been factored are then simply expressing the overdesign ratio.
Natural Resources Wales has adopted the Guidance Document LFE4: Earthworks in Landfill Engineering as its guidance on using earthworks in landfill engineering applications. LFE 4 states that design methods should be based on either Eurocodes or conventional British Standards but EuroCode 7 is the preferred design approach. It was confirmed that the British Standard approach was acceptable and therefore the SRAR reports lumped Factor of Safety rather than Overdesign Ratios.

Adequacy of Stability Risk Assessment and Request for Additional Details

Biffa submitted its application for the Permit variation supported by a document entitled "Stability Risk Assessment Review: BF4857/SRA". Upon review it was noted that the supporting diagrams omitted some key information that would aid interpretation and assessment. Revisions to these diagrams was requested and submitted accordingly.

Initial assessment revealed a number of issues that warranted a significant amount of additional information which were incorporated into a Schedule 5 Notice. In response to this Notice a further meeting was held at Biffa's request to discuss concerns and in September a copy of "Stability Risk Assessment Review: BF4857/SRA Revision 1 was submitted. This revision addresses the issues raised during initial assessment which were:

The submitted documents took a different approach from that discussed in the pre-application meeting of 27th February 2014. The stability model outputs had not been labelled so it was difficult to determine how the model had been built. An annotated sketch was provided so it could be seen which layers had been included in the assessment.

The approach to the SRA follows what is considered to be best practice, with an appropriate numerical model being developed to carry out a stability/deformation analysis. Though the model is sophisticated it is based upon an understanding of strata geometry and strata engineering parameters and the results are therefore only reliable if the model is a realistic representation of the proposed works and the ground beneath.

Concerns were raised regarding model parameters used and justification was required for their selection. Table SRA7 summarises the parameters used in the modelling and for many of these parameters a range of values is specified. The conclusions of the report are based upon a series of model outputs which are included in the appendix to the report yet the actual parameters used for the results presented were not disclosed and we believed this needed clarification.

The strength, density and permeability data all seemed reasonable and in line with expectation though the stiffness values required further explanation. Environment Agency Guidance (R&D Technical Report P1-385/TR1) which is referred to in the SRA states that "even a low level assessment of the values in Figure 8.7 show that the shear stiffness of Municipal Solid Waste (MSW) is significantly less than soil. This has important implications for waste/barrier interaction, and specifically for the distribution and magnitude of strains in steep slope barrier systems". It is this contrast in behaviour that is particularly problematic when making successful steep soil based liners. However, examination of the parameters used in the analysis reveals that the stiffness parameters of the separation bund and that of the MSW have overlapping ranges. Furthermore, it was noted that a lower Poissons Ratio for the MSW than for other strata was used; this has the effect of making the Shear Stiffness of the MSW greater than the lower range Shear Stiffness of the separation bund.

In the development of a sophisticated ground model such as this, many iterations will have been undertaken and sensitivity analysis used which demands a range of input parameters. Justification was required for each of the stiffness parameters used in the assessment (Modulus and Poisson's Ratio) and clarification of the actual

parameters selected for each model output used to determine a result quoted in the report.

Another matter to consider was the anticipated deformation of the corners of the separation bund. Modelling revealed that the separation bund would topple outward by approximately 3.4m, though half of this will occur during filling. The “returns”, experiencing the same ground conditions will experience a similar toppling outward. The consequence is that the front topples forward by 1.8m after completion and the sides topple outward by the same amount. The separation bund is not able to cope with a localised movement of 2.55m pulling it apart and is bound to open a significant tension crack. Clarification was required for this as effectively this would lead to a lack of separation. Clarification was provided and it was noted that the modelling had been carried out using unrealistic parameters that will be discussed later on in the section entitled “Stability Risk Assessment Report Revision”.

Proposed Engineering Works

Biffa intends to develop the Asbestos Cell at the southern edge of the existing landfill. At this location the edge of the opencast void has been reprofiled by a combination of rock excavation and colliery spoil trimming to produce a uniform sideslope of 1 in 2.5. The colliery spoil occupies the lower parts of the southern slope with the rock excavation being confined to the upper part of the slope. The side-slope has been covered with a basal lining system comprising a support layer and an overlying flexible membrane liner. The void is partially filled with waste which currently reaches the level where the colliery spoil beneath peters out, giving way to a rock substrate. It is the upper part of the side-slope that Biffa intends to develop into an asbestos cell, an area that would be expected to be founded on re-profiled bedrock. In order to achieve the required degree of separation between the biodegradable non-hazardous wastes and the asbestos wastes Biffa intends to build a separation bund along the front and at the sides of the asbestos wastes. These bunds will be developed in lifts of 1.4m (on a monthly basis) with each subsequent lift being placed onto the crest of the previous lift. The geometry resulting from many lifts will therefore be a vertical wall which in cross section will have a minimum width of 2m with 1.4m high wedges of bund material extending into the asbestos wastes on the inner side and into the non-hazardous wastes on the outer side. This arrangement is often referred to as a “Christmas tree” profile. It is important that the bund achieves a minimum width of 2m as Section 7.2 of “Waste Acceptance at Landfills, Version1, November 2010” states that all asbestos wastes should at the end of each working day have a covering of at least 1m thickness “on all flanks and surfaces”. This means that at least 1m of cover must completely surround the waste mass. This guidance also states that upon completion of filling, before capping a 2m thick cover must be placed over the asbestos wastes.

The separation “wall” comprises three faces; the front face will attain the maximum height and will extend for the entire length of the cell. It is founded on a bench in the lining system which marked the edge of a construction phase. It is believed that the bench is founded onto a bench in the rock beneath, though an examination of CQA Validation records failed to corroborate this. Photographs that were taken during the construction of the lining system show excavations on the bench which have been dug through granular fill material. This could be rock excavation arisings but the material obscures the sub-grade, which could be bedrock or colliery spoil. There is no doubt that above the bench the sub-grade is entirely rock.

The two other faces form the return of the separation bund, from the front face to the top edge of the site. Whilst these have the same cross-section as the front face they reduce in height from the full height of the front face to nothing at the outer edge of the site. The three vertical faces, connected at two right angle corners together provide complete separation between the asbestos wastes and the surrounding non-hazardous wastes.

The entire asbestos waste mass, as well as the separation bunds, are to be placed onto a layer of fine aggregate which minimises the potential for damage to the lining system beneath. Such an arrangement addresses the possibility of pore water pressure development at the base of the structure but also allows any leachate that arises from the asbestos cell to enter the general leachate collection system. Such an arrangement is provided in LFD1 as an acceptable engineering design.

The separation wall is not inherently stable as it needs to be supported by wastes placed on both sides. On the outside, the wall will be supported by municipal and commercial non-hazardous waste, including a high proportion of biodegradable wastes whilst on the inside the wall will be supported by a limited quantity of asbestos wastes surrounded by a larger quantity of inert cover materials. Because the material on each side of the wall is different in engineering behaviour and different in thickness and as the filling rate on both sides has to keep pace with the construction of the wall lifts there is a need for a sophisticated means to model the stability of the separation system.

Stability Risk Assessment Report Revision

The revised stability risk assessment report revision submitted in response to the Schedule 5 Notice contains sufficient information for assessment of the engineering proposals.

The original SRAR submitted in support of the Permit variation application had taken an overly conservative approach. Where particular design parameters were not available from site specific data then in accordance with guidance the designers consulted published research to obtain parameters before carrying out a sensitivity analysis (whereby the range of values obtained are input, developing a range of outputs). The Operator opted to present in the original report the results of modelling using values of certain parameters that are lower than the published range. Consequently highly conservative results were presented. The Operator also chose to apply fresh waste parameters to wastes that will have been placed for some time even though it is known that certain parameters change with time and depth of burial. The approach of providing the results of unrealistically conservative modelling does have a place in engineering design. However, engineering design based upon a sound understanding of a “cautious low” provides results that are still conservative but are at the lower end of what could be considered plausible.

With reference to recent guidance developed to address the issues of dataset sizes and data spreads in EuroCode 7 documents, the approach to design does not rest on selecting values below the expected range. Rather it focusses on how a “cautious low” value might be determined from the dataset. Hence our comments in the Schedule 5 Notice and during subsequent discussions was how the designers might provide a cautious but more realistic assessment of likely deformation in the separation wall. We are now satisfied that this issue has been addressed and the results presented in the revised report are conservative yet plausible. The revised report also addresses the other issues raised in the request for further information.

Report Structure

The SRAR follows an established format, firstly developing the Conceptual Stability Model, then screening the proposals over the full lifecycle phases of the landfill to determine which elements require detailed assessment. The detailed assessment methodology is then justified along with the input parameters and the selection of appropriate factors of safety in accordance with BS 6031. The analyses are provided and these lead to the stability and integrity assessment which then draw the report to its conclusions. An additional section on monitoring has been added at NRW's request so that the design of the geotechnical monitoring system is rooted in the SRAR.

Conceptual Stability Model

The conceptual stability model has been developed with the benefit of a large body of previous work at the site, including ground investigations, construction activities and phases of lining. An extant Stability Risk Assessment Report has been previously prepared by SLR as well as an ESID Report, both of which are referenced in the SRAR report. The conceptual model considers the sub-grade beneath the base of the landfill as well as the side-slope, the lining system over the base and side-slope as well as the waste mass and the proposed separation wall (bund).

The SRAR report recognises that in developing the conceptual model for the sub-grade the ground conditions beneath the bench on which the separation wall is to be built should be evaluated. Unfortunately, there is no available data to demonstrate the ground conditions here and my examination of past validation reports has also failed to find any evidence. This being the case a ground investigation was considered, though this would require destruction of part of the existing lining system. There are only two possible strata beneath the bench, it is either cut into bedrock or it is cut into the very top of the colliery spoil. This being the case the Operator opted to produce two models, one with a rock sub-grade and one with a colliery spoil sub-grade beneath the bench. We considered this to be an acceptable approach where the possible ground geometry is limited to one of two options.

Risk Screening

The risk screening process is a systematic means of determining which design elements require detailed examination or modelling. Table SRA1 considers the basal sub-grade whilst Table SRA 2 considers the side-slope sub-grade. Both tables identify a range of potential risks and are able to justify that none of these could potentially influence the works and therefore may be screened out of further detailed consideration.

Tables SRA3 and SRA4 consider the screening of the basal and side-slope lining systems, given that there is a slight lack of clarity about whether the base of the asbestos cell is entirely within the side-slope of the existing lining system. This raises the question of whether this should be considered to be the basal liner or the side-slope liner. Accordingly, these have been considered together as the two tables in combination cover all the required elements.

The lining system screening has identified a number of stability risks, some applying directly to the lining materials and others to the proposed surface water collection and extraction system. The Operator has justified screening out from further consideration all aspects of the surface water collection system and many potential risks to the lining system. However, it does conclude that the stability of the lining system beneath the proposed separation wall and asbestos wastes needs to be considered in detail. The screening also identified that the integrity of the lining

system needs to be fully evaluated due to the potential for increased strains within the liner and noted that this evaluation needs to consider timescales during and after construction. We are satisfied that the screening has identified those aspects that require detailed consideration and those that can be screened from further consideration.

Table SRA5 considers how the waste mass might be influenced by the proposals and in this context the waste mass includes the existing and future non-hazardous waste mass outside the asbestos cell and also the proposed asbestos wastes. The screening concludes that the stability of the entire waste masses as well as the stability of the waste masses/lining system needs detailed consideration.

Table SRA6 screens the separation wall and concludes that all aspects of stability and integrity need detailed consideration. The only aspect screened out from further consideration is the unconfined stability of the structure. As this is not designed to be self-supporting in any event, therefore it would not be appropriate to attempt to consider unconfined stability.

Lifecycle Phases

The Operator considers that two scenarios are key to determining the performance of the system: the construction of the separation wall during filling, when waste buttressing is required to maintain stability and the long term, post filling period when settlement of the landfill will result in deformation and will apply significant loads onto the lining system. During pre-application discussion it has become clear that the intention of the engineers is that small amounts of movement in the separation wall occurring during construction will be corrected as each subsequent lift is placed. We are satisfied that appropriate lifecycle points have been selected for detailed modelling.

Selection of Appropriate Factors of Safety

The design standard used in this assessment is BS 6031 and therefore geotechnical parameters have been used without applying partial factors to the input parameters. The output therefore provides a single lumped Factor of Safety to measure the degree of safety against a particular failure mechanism. This process quite simply expresses the ratio between the stresses that collectively destabilise the system against those that collectively stabilise the system. This is easily calculated using a limit equilibrium modelling approach where stability against failure is calculated. However this is more complex where coupled deformation/stability analysis is undertaken (such as required by this assessment). In such cases a Factor of Safety is used to express the safety from instability, a second measure of allowable deformation also has to be adopted to determine whether any element is deformed beyond acceptability.

The Operator has selected 1.3 as the factor of safety against failure to be applied to almost all aspects of the modelling and this is in line with the recommendations of BS 6031. Where residual strength rather than peak strength is used The Operator has adopted a Factor of Safety of 1.0 and where the Factor of Safety relates to the waste mass when limit equilibrium methods are used a value of 1.2 has been chosen as the most appropriate. We consider the Factors of Safety adopted in the SRAR are appropriate.

Modelling Approach and Software

The use of conventional limit equilibrium slope stability software is appropriate for unconfined slopes and the SRA has used this approach in the screening process.

However, when analysing confined geotechnical structures both deformation and stability have to be considered together and limit equilibrium methods are not appropriate. The Operator has carried out finite element analysis in order to determine deformation behaviour of the structure (strain calculations) and this allows the integrity of elements making up the structure to be examined under a range of timescales in a staged construction model. As this method does not directly report factor of safety at each stage of the modelling a c-phi reduction routine has been used to determine the Factor of Safety. The Plaxis software that the Operator has used is appropriate software for undertaking both the deformation analysis and for reporting factor of safety against instability.

Geotechnical Parameters Selected for Analysis

The Operator has had the benefit of examining a large body of site specific data from various reports and past stability analysis. This data related principally to the geological materials beneath the site and the construction materials used at the site. Parameters for waste materials however are not available from site specific measurement. Instead, the approach to determining parameters for waste follows the recommendations in NRW guidance which provides recommended values based upon a conservative assessment of a range of published scientific research papers. The Operator has adopted this approach wherever reliable site specific data is not available and has justified the selection of values by referencing a number of key papers as well as values that are included in this guidance.

Our assessment of the values adopted in the first version of the SRAR found that in order to produce models that were demonstrably highly conservative unrealistically low parameters were selected for certain parameters, particularly waste stiffness which is known to increase with age and depth of burial. By adopting values for shallow, fresh wastes to the entire thick waste mass we felt that the modelling was unrealistic. It was agreed that the parameters would be revised to be cautious low estimates of credible ranges of reported values and that the modelling would realistically approach the assignment of parameters so that the model would simulate actual behaviour more realistically.

The revised SRAR provided by the Operator amended its original parameters. Stiffness now follows the recommendations contained within NRW guidance as does waste strength. Poisson's ratio, an intermediate in converting from Young's Modulus to Shear Modulus has been set at 0.3 rather than the 0.2 originally used. The source of the values adopted in the modelling are now fully disclosed and the presentation of modelling outputs in the Appendices now allows scrutiny of the values used in each model run. We noted that there were minor errors in the transcription of parameter values but the model outputs reveal that appropriate values have been used. We are now satisfied that the geotechnical parameters used in the modelling are appropriate, conservative and realistic.

Stability of the Separation Wall/Waste System

The stability analysis for the staged development of the waste supported separation wall indicates that during waste placement the system has a factor of safety of 1.69. It is important to note that the modelling makes certain underlying assumptions about the geometry of the wastes and the wall. In order to develop a model with the reported factor of safety, the non-hazardous waste slope supporting the separation wall has a gradient of 1 in 3 and has a crest that is 40m from the wall and is level with the highest lift. The asbestos wastes do not exceed the level of the lift and the non-hazardous wastes are at the same level as the bund. Therefore, in order to maintain

stability of the system during construction and filling, there needs to be certainty that this geometry will be established.

After filling is complete and the capping system has been placed the factor of safety reduces to 1.58, this also assumes that a particular geometry is achieved, with the non-hazardous waste slope approaching no closer to the wall than 40m and the level of the waste always being the same as the wall. Whilst we are satisfied that the modelling work has produced a conservative assessment and there is a high degree of confidence in the stability results, their dependence upon a certain geometry being maintained throughout the development and filling of the asbestos cell means that some mechanism for enforceable regulation of the asbestos cell geometry is required.

Integrity of the Basal/Sideslope Lining System

The integrity of the lining system has been examined by carrying out an assessment of the liner strain beneath the proposed asbestos cell and separation wall. This is a suitable approach and follows the available guidance on the assessment of integrity. The results of the strain analysis (reported as axial force and corresponding extensional strain percentage) are compared with a strain guidance limit of 3%, which is a conservative limit applied not to limit rupture by excessive strain but to limit stress cracking. The limit is appropriate and the strains calculated are well below the tolerable limit and therefore we are satisfied that this demonstrates that integrity will not be compromised by excessive strain in the liner system.

Integrity of the Separation Wall

The separation bund will be constructed with a front wall and two side walls (returns). On one side of the wall it will obtain support from soil type material surrounding pockets of asbestos wastes whilst on the other it will be supported by bio-degradable mixed waste including municipal solid waste (MSW). The MSW will experience volumetric shrinkage as time passes due to bio-degradation within the waste mass. It also experiences compression as successive layers of waste are added to the waste thickness. The outcome of this process is that the support medium on the outside of the wall will provide less support over long timescales than the soil type material surrounding the asbestos wastes on the inside of the wall. This complex process has been assessed by finite element modelling so that the deformation of the wall over long timescales can be understood.

In order to develop a suitable model Plaxis2D software has been used. A representative cross section has been developed and used in the analysis in order to quantify realistic worst case deformation. The approach to this modelling work is appropriate.

Various researchers have observed an increase in waste stiffness with depth of burial and age. The stiffness parameters of fresh wastes experiencing small confining stresses are very low and would only be observed for recently placed waste at the surface of the landfill. In order to better represent the increase in stiffness with depth Plaxis allows users to set a surface stiffness as well as a rate of stiffness increase with depth. The original SRAR received with this variation application did not take advantage of this facility, modelling the entire waste thickness as the extremely low stiffness of fresh, shallow waste. This approach is often used to avoid the need for more complex stiffness modelling: if the results of such simulations are acceptable then the more complex stiffness models would also be acceptable. Whilst we are supportive of this approach in simple cases we consider that this complex waste supported geotechnical structure warranted a conservative yet

realistic model, hence our request to produce a model based upon the depth/stiffness profile advocated in NRW guidance.

The Operator has produced an assessment based upon the results of modelling using a conservatively low estimate of stiffness that increases with depth. Accordingly, we are satisfied that the basis of the integrity assessment is sound and that there can be a high degree of confidence in the results of the modelling work. The results show that there is no risk to the integrity of the structure during its operation. Small amounts of movement experienced during the operational life of the facility will be corrected as construction is underway. However, after the site is completed and the surface capped and restored, the wall will experience deformation within the waste mass because of bio-degradation within the non-hazardous wastes. This has been modelled by reducing waste stiffness and applying a gravity loading to the whole waste mass. This very conservative modelling approach yielded a result in which there can be a high degree of confidence.

The modelling predicts that the wall will have experienced a maximum outward deflection (toward the non-hazardous waste) of 320mm 50 years after capping and restoration. The assessment then suggests that a similar outward deflection of the wall return will also take place to give a resultant movement of 453mm between the corner of the front wall and the corner of the return. This is an overestimate as the geometry of the waste mass against the return is shallower than the waste mass supporting the front wall. However, the relative movement could be somewhere between 320mm and 453mm. This movement will be focussed as tension in the corners of the wall and the style of movement will develop a crack at the wall corner, if the strain cannot be accommodated by the wall material.

The development of strains of several hundred millimetres would be fatal to the design of a liner system which serves the purpose of leachate containment. However, it is clearly stated in LFD1 that “the design of the containment for the asbestos cell is to provide a physical separation and isolate the asbestos so that it remains undisturbed”. The means of establishing separation is to develop “internal separation” which Section 2.12 notes “does not have to be compliant with engineering requirements of the (Landfill) Directive”. Accordingly, the only consideration to be made is whether a separation wall that is a minimum of 2m thick can still perform the function of separation if strained to a degree that allows the wall to move up to 453mm.

The separation function has to prevent asbestos wastes coming into contact with the mixed non-hazardous wastes, and it is clear that during waste placement and at the end of the operational period this separation is maintained. The long term case of on-going movement causing a crack tapering from up to 453mm at the top to nothing at the bottom through the full 2m thickness of the wall will not bring the asbestos wastes into contact with the non-hazardous wastes. The wall materials will strain under extension before yielding and then rupturing so any crack that develops will not be the full magnitude of the relative movement. This means that any crack will be narrower than the assessment has suggested:. The geometry of any crack that does develop will not therefore allow the two waste masses to contact one another. Irrespective of this, the Operator proposes to thicken the corners of the wall, placing a 5m wide wedge of additional material to ensure that the separation is maintained in the event of a crack developing. We concluded that whilst the integrity assessment has revealed that post capping movement will cause the wall to move, it will still maintain separation between the two waste masses. The proposal to engineer a thicker wall at the corner provides additional assurance that long term separation will be maintained.

Monitoring

The SRAR concludes with proposals for monitoring the geotechnical performance of the separation wall. This is an essential element to the proposals as it allows the predicted movements of the wall to be tested against actual movements. Because the movement will commence early in the development of the wall, it is important that the monitoring system is built incrementally, with the wall. The proposals are for 3 inclinometers to be placed within the bund during construction, with monitoring before and after each lift is constructed and at 6 monthly intervals. The proposals are acceptable and will be incorporated into permit conditions, as will the need to compare model predictions with actual results during the preparation of the annual monitoring report.

Construction Quality Assurance

The SRAR does not consider the need for Construction Quality Assurance (CQA) to be carried out during the cell development. A CQA Plan needs to be submitted, because construction proposals are for incremental construction the CQA Plan needs to cover the entire development of the cell rather than just the first lift. The CQA Plan will have to be received, reviewed and accepted before construction can commence. Validation reporting should be made upon the completion of each lift. It should be noted however, that although there will be the requirement for a CQA report to be submitted for each lift of the asbestos cell, NRW will not have the standard 4 week period for assessing such CQA reports. The Operator can continue with construction concurrently with our assessment of the CQA report.

Permit Conditions

There were multiple issues arising from the SRAR that need to be dealt through permit conditions. It is important that the site is operated in precisely the way that has been envisaged and modelled in the SRAR. To ensure that the site can only be operated this way permit conditions need to address the following issues:

- The separation bund must be constructed with the geometry used in the stability/integrity modelling
- The separation bund must be constructed in 1.4m high lifts
- The non-hazardous waste outside the asbestos cell must be level with the top of each lift prior to infilling with asbestos waste and must be level for a minimum distance of 40metres
- Beyond a line 40m away from the plan alignment of the wall the waste must be profiled to a gradient of no steeper than 1 in 3
- Asbestos wastes within the cell and non-hazardous wastes outside the cell must never exceed the height of the separation wall
- The corners between the front wall and the returns has to be filled with a 5m wedge of cover material
- A geotechnical monitoring system is to be provided as described and is to be monitored at the intervals stated. The monitoring data is to be reviewed annually, compared with the finite element models and the results reported.
- A CQA Plan is to be presented for the entire construction period with Validation reporting at the end of each lift of the separation wall.

The majority of these requirements will be incorporated into the permit conditions by referencing the SRAR and supporting documents as has been agreed with the Operator as Operating Techniques.

Holistic Considerations

The proposal requires a significant area of MSW to be placed outside the separation bund as it is being raised. The model reveals that a 1.4m lift will be placed monthly, requiring the MSW buttress also to be lifted by1.4m monthly to maintain its level with the bund. Drawing BF4857/1/01 reveals that the separation bund is 235m in length, meaning that the flat area of the waste buttress is 9400m^2. This area will require 13,160m^3 of fresh waste to be placed per month against the separation bund. However, the waste buttress also has a 1 in 3 slope down to the general waste mass. It is unclear how long this slope will be, but taking just half the 100m slope length from the model cross-section in Figure 5 of the SRAR as an example it could be 50m in length. This slope too has to be raised to maintain the required 1 in 3 gradient so that this would be a surface area of 11,750m^2. This requires a further 16,450m^3 of MSW waste to be placed per month to maintain the geometry of the buttress. In short, 29,610m^3 of fresh waste would have to be placed over an open area of 21,150m^2 each month. We queried whether the odour/nuisance implication of such a large open area had been considered and whether appropriate operating procedures have been developed.

Issues Arising from the Review of Stability Risk Assessment Review Report Presented in Support of Permit Variation Application, Trecatti Landfill, Asbestos Cell Proposal

The review of SRAR submitted in support of the variation application showed that the engineering proposals were acceptable. However, during the assessment process we calculated the area of open waste and the rate of waste input required to build the engineering systems in accordance with the proposed design. This calculation revealed an open area of 21,150m^2 and a monthly waste input requirement of 29,610m^3. We felt that the rate of waste placement was not achievable and that the open area may be problematic if an exposed waste surface as large as this was concurrent with large open areas elsewhere on the site. To address these issues a meeting was held at Trecatti on 24th November 2014.

During the meeting the Operators engineering designer, declared that the timescales of 1 month per lift was simply a modelling device used to identify instability within the system caused by rapid construction processes. In reality it was not considered likely that construction speeds would approach this and accordingly the rate of input would not need to be as great as had been calculated. In the meeting the Operator also agreed to consider the phasing of the asbestos cell so that a better assessment of open areas could be made. Consequently we received two supplementary reports; one a letter written by Stratus, reference BF4858/2/RW001 and the other a confirmation e-mail from John Orchard on 4th December 2014. We also received supplementary drawings BF4858/2/301 entitled Cross Sections Through The Proposed Infill Stages and the other BF4858/2/300 entitled Proposed Initial Infill Stages To SNRHW Cell both dated 28/11/2014.

Since the meeting the Operator has produced an earthworks phasing plan to show how the site will develop and to quantify the open areas that will be exposed during

the operational lifespan of the site. The Operator estimates that the worst case open area will be 28,934m^2, however this area represents 8.8% of the site area which is less than the previously agreed maximum open area of 15%.

The matter of waste inputs has been clarified by the Operator. The modelling work was carried out to identify any problems that may arise from rapid construction and was not intended to be a fixed target for completion of each lift. As the SRAR has confirmed that construction over a one month period is acceptable, the Operator is content to limit any construction works to no more than 1 lift per month. Slower construction will not be problematic from a stability perspective as slower construction will result in a more stable system. The Operator appreciates that given the engineering requirements of the design it cannot add a further lift until the required waste has been placed to support the new lift. They have therefore declared:

Biffa can confirm that the asbestos cell lifts would not exceed 1 per month. The lift duration would be dependent upon waste inputs (within our permitted volumes) so we would expect it to take longer than 1 month. We can also confirm that in the event of a spike in waste inputs we would ensure that a lift would not be constructed and completed in less than 1 month duration.

Conclusion

We were satisfied that the SRAR has been carried out in accordance with available guidance and is the result of modelling work based upon a set of conservative engineering parameters. The conclusions of the report are reasonable if the site is developed in precisely the way envisaged in the modelling work. The approval of the SRAR is conditional upon the Permit containing conditions that enforce the site engineering and monitoring requirements identified in this review.

Having received this further information we were satisfied that the issues surrounding the extent of open wastes and the monthly volume of waste inputs have been properly explored.

Hydrologeological risk assessment

In 2012 a HRA for Trecatti Landfill Site was prepared to address additional requirements requested under Improvement Condition 5 of the variation Issued 18/01/2011. In summary, this Improvement Condition required the submission of a revised HRA that provided an updated baseline status for the landfill which describes and explains the existing observed effects of the landfill on groundwater beneath the site. The scope of the 2012 HRAR therefore resulted in a substantial revision to the previous HRA reports submitted in support of the site permit.

In assessing the risk of the landfill to the local hydrogeological regime, Environmental Simulations International Limited (ESI) undertook a full review of the previous HRA submissions in accordance with current guidance. The 2012 HRAR includes revisions to the original conceptual models followed by re-modelling with alternative software in order to appropriately represent observed groundwater chemistry in the site monitoring boreholes.

The proposed asbestos cell will replace existing void space allocated for the deposit of non-hazardous biodegradable waste. The monocell will be constructed on an area

of the site over which a side-wall liner, compliant with the requirements of the Landfill Directive, has already been constructed.

The most recent Hydrogeological Risk Assessment Review (HRA) submitted in support of this variation application considers the effects of proposed changes (introduction of asbestos monocell) on the various elements of the current hydrogeological conceptual model and assessment parameters and is used to determine if there are any significant deviations from those modelled parameters that require further consideration and potentially additional modelling as a consequence of the proposed asbestos monocell.

Summary of Current Model Assessment Parameters & Results

Trecatti Landfill Site consists of two distinct landfill development phases, referred to within the HRA as the "Merthyr" and "Modern" landfill phases. The Merthyr landfill phase was developed prior to the implementation of the Landfill Directive and acquisition of the site by the current operator, Biffa Waste Services. Consequently, the Merthyr phase consists of no engineered geological or artificial containment system. The existing and proposed cells within the modern phase area have been developed in accordance with the requirements of the Landfill Directive. The currently approved designs for the basal and sidewall liners (from top to bottom) comprise:-

- Minimum 300mm thick protection layer;
- Protective geotextile;
- 2.5mm thick HDPE geomembrance (ASL);
- Protection layer (geotextile or 150mm sand); and
- 600mm thick strengthening/support layer comprising colliery spoil between two layers of geogrid (AGB).

The monocell will be located on an existing side-slope lining system originally constructed to accept non-hazardous Household, Commercial and Industrial wastes. The engineered containment system of the cell will therefore provide the same level of containment as approved for site, in accordance with the requirements of the Landfill Directive. The cells will also comprise a soil separation bund to maintain appropriate segregation between the asbestos and non-hazardous biodegradable waste and their products.

Any water falling within the operational footprint of the SNRHW Cell is unlikely to infiltrate and will therefore be managed as surface water. These waters could be collected within the cell area to allow potential asbestos fibres to be filtered out prior to discharge from the site via the existing surface water management system. Surface waters from non-operational areas of the monocell will be diverted via rain flaps installed on the basal lining system and directed to the site's existing surface water management infrastructure.

The base of the asbestos cell will be elevated to approximately 398.5m Above Ordanance Datum (AOD), which is approximately 66m higher than the base of the adjacent modern non-hazardous biodegradable phases, resulting in the same increase in thickness of the unsaturated zone beneath the asbestos cell. Any leachates generated within the cell that result in fugitive emissions through the lining system will therefore percolate through an extended unsaturated zone in excess of 100m, based on current groundwater levels

The wastes deposited within the proposed cell will consist of asbestos containing waste materials and soil cover material. Any asbestos containing waste materials

deposited within the cell will be required to meet the Waste Acceptance Criteria for Stable Non-reactive Hazardous Waste (SNRHW) landfill cells. The majority of soil cover material used within the cell will meet the Waste Acceptance Criteria (WAC) for inert wastes currently accepted at the site.

It is considered that due to the reduction in the total quantity of non-hazardous biodegradable waste material deposited at the Installation, combined with reduced leachate source term concentrations generated by the replacement wastes deposited, the construction of an asbestos cell will not result in any increased risk to groundwater.

Having reviewed the information provided with the application we concluded that the acceptance of asbestos containing wastes within the monocell will not lead to an increased risk to groundwater and consequently do not require any changes to be made to the existing groundwater monitoring infrastructure and the compliance limits set at these locations.

Landfill Gas Risk Assessment Review

The LFGRA submitted as part of the original PPC Permit Application was undertaken in order to assess the impact of landfill gas generated within the waste mass, and to alleviate concerns regarding potential landfill gas issues (i.e. control of emissions) in and around the area of Trecatti Landfill Site. The purpose of this review was to determine if there are any significant deviations from those originally modelled parameters, which could require further consideration and additional modelling as a consequence of the proposed changes.

Assessment Input Parameters

The variation for Trecatti Landfill Site includes the deposition of asbestos containing waste materials in void space currently allocated for the future deposition of a mixture of biodegradable non-hazardous waste and inert waste. The current LFGRA model assumes that from 2005 to 2022 the waste deposits comprise 27.5% inert and the remaining 72.5% comprising biodegradable non-hazardous wastes from a range of municipal, commercial and industrial sources. The rate of deposition during this period is modelled at between 600,000-700,000tpa. The total waste input into the landfill site for modelling purposes was estimated at 16,636,926 tonnes.

The model indicated that peak landfill gas generation of approximately 8,000 m^3/hr would occur in 2023, followed by rapid decline in predicted gas generation to approximately 600m^3/hr by 2050, below which gas utilisation may be impracticable for the existing power-generation systems comprising seven engines with operational capacities of between 520-524 Nm^3/hr (at 50% methane) each. The existing flare system is capable of managing a gas generation rate of more than 100 m^3/hr (assuming all gas is extracted). The previous model predicted that a rate of 100 m^3/hr will occur around 2075. To manage the low gas generation rates after this period, alternative flare systems may be required.

Model Revisions

The introduction of a monocell for the deposit of approximately 332,500 m^3 asbestos containing waste materials (including inert soil cover materials) will substitute existing non-hazardous waste capacity of approximately 415,000 m^3 (including inert covers soils). This equates to a marginal reduction of approximately 2.5% of the total void.

This reduction is unlikely to have any effect on the annual rate of deposit, although the landfill may reach capacity approximately 7-8 months earlier than previously assumed. This is considered to have a marginal influence on the peak gas generation curve presented in Figure LFGRA1, with the peak rate reducing by approximately. 200 m^3/hr and achieved approximately 7-8 months earlier. This reduction in biodegradable waste input is also likely to result in a marginally beneficial influence on the potential for lateral migration and surface emissions.

It was not considered that the proposed changes as part of this variation will have any significant effect on the air quality modelling assessments carried out in support of the 2007 variation application. Furthermore, as a consequence of a marginal reduction in gas generation, no modifications are required to the approved gas management systems for the facility.

Nuisance and Health Risk Assessment

An initial Nuisance and Health Risk Assessment (NHRA) was submitted with the original PPC Permit Application in May 2004. The Risk Assessment considered the effects of the following on the surrounding environment and human health:-

- Noise and Vibration
- Odour
- Particulate Matter
- Litter
- Birds, Vermin and Insects
- Mud on Highway

The original risk assessment submitted in support of this application incorporated the previously submitted NHRA. The environmental assessments have been reviewed with reference to the variation applied for. This resulted in the above bulleted items being assessed. However, this approach caused some confusion for several reasons. The risk assessments referred to an old drawing (ESID2 & 3) which were submitted as part of the original permit application. This caused confusion as most of the risk assessments were based on locations specified in the original application. We acknowledged that whilst the receptors will inevitably not have changed, the location of the asbestos cell has changed which required re-consideration. We also noted that receptor references in the amended NHRA differed from those in the drawing ESID2, for example Heads of the Valley Junction was R4 on the ESID2, but R5 in the NHRA, playgrounds and recreational fields were R3 in ESID2 but R4 in NHRA.

The operator revised the NHRA and re-submitted the risk assessment considering the risks associated with storage and landfilling of asbestos containing wastes. This revised assessment was submitted along with a revised drawing showing receptors entitled Environmental Setting Drawing number BF4857/10/07 dated 05/09/2014 . Whilst this assessment provided some clarification, this assessment did not consider what actions would need to be taken for medium risk receptors.

A revised NHRA was produced based on the Source – Pathway – Receptor format specified in Annex A of the H1 guidance. We were satisfied that the measures specified in the revised NHRA are appropriate for managing the risks associated with the storage and tipping of asbestos wastes. The risk assessment has been

incorporated into the permit as referenced operating techniques. This means that the operator will have to manage these activities in accordance with the NHRA.

Habitats Risk Assessment

An initial screening assessment was undertaken to determine if the proposed activities could have an effect on any statutory or non-statutory designated habitat sites within the vicinity of the development. Habitat sites can be either European designated sites such as Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Ramsar Sites, nationally designated sites such as Sites of Special Scientific Interest (SSSI's), National Nature Reserves (NNRs) or Marine Nature Reserves, or locally / regionally designated sites such as Local Nature Reserves (LNRs) and Local Wildlife Site (LWSs). Non-statutory sites are sites that are not covered by one of the above designations but may be of local or borough importance for conservation.

The Operator undertook a screening exercise to identify any relevant designated and non-designated sites within 5km for European designations and 2km for National designations. No European statutory sites are located within 5km of Trecatti landfill site. Similarly, there remain no nationally designated sites or conservation areas within 2km of the landfill facility.

Great Crested Newts have been sighted within 200 metres of the site. However it is not considered that there is any greater risk to these protected species than the already permitted landfilling activities. Therefore no further action was deemed necessary as we are satisfied this variation will not have any adverse effect upon protected species.

Waste Acceptance Criteria

The facility's existing waste pre-acceptance and acceptance procedures will be updated to incorporate the acceptance of asbestos containing waste materials. These existing procedures will be extended to asbestos wastes that are appropriately packaged in accordance with Health and Safety Executive, 2013, Managing & Working with asbestos Code of Practice and the Control of Asbestos Regulations 2012. Only asbestos containing wastes that are deemed hazardous because of their asbestos content will be accepted for disposal at the facility. Basic characterisation testing will be required to demonstrate that the SNRHW Waste Acceptance Criteria are not exceeded where it is suspected that other hazardous properties could be present.

Emissions to water

Rain flaps are currently installed on the existing sidewall liner on which the asbestos cell will be developed. Surface water diverted by these rain flaps will flow to the existing surface water lagoon for subsequent testing and discharge.

Surface waters from operational areas of the asbestos cell will initially be managed by formation of the waste surfaces to shed water towards a side-riser system comprising 450mm perforated pipe with a gravel and geotextile surround. The surface water will subsequently drain down the side-riser to a sump constructed in the basal fill, and will

be design with sufficient capacity to manage the potential rainfall volumes associated with the locality. The side-riser will be constructed in 6m sections, extended as the height of the waste deposits demand. The quantity of water that will percolate through the waste deposits to generate leachate is considered to be minimal.

It is not considered that the surface water management from the operation areas of the asbestos cell will be significantly contaminated, with the exception of asbestos fibres. Treatment will be limited to filtration prior to discharge via the existing permitted surface water discharge points. If testing confirms additional contamination of these waters, they will be discharge to sewer. Alternatively, if contamination levels are above discharge consent threshold the waters will be treated in the facility's existing leachate treatment plant prior to discharge to sewer. All waters from operational areas of the asbestos cell will be filtered to remove potential asbestos fibres prior to discharge from the site or treatment via the on-site leachate treatment system.

Filtration media from the on-site treatment of surface water will be disposed of in the asbestos cell, unless the leachable concentrations of other key contaminants exceed WAC thresholds.

We have requested that monthly monitoring be carried out to ensure that asbestos fibres do not escape from the asbestos cell. We have placed this requirement in Table S3.3 of the permit and have placed a limit of no detectable fibres be found in surface water of asbestos fibres arising from the operational areas of the asbestos cell.

Emissions to air and monitoring

The release of asbestos fibres into the air will be minimised by the reduced tipping heights, current dust suppression activities and the use of spray bars along the site and asbestos cell perimeter.

Table S3.12 of the permit has been updated to include monitoring for airborne asbestos fibres. Monitoring is to be carried out in accordance with the Environment Agency Technical Guidance Note M17 (Monitoring of Particulate Matter in ambient air around waste facilities; v2 – July 2013). A baseline limit is to be determined for the level of airborne asbestos fibres. We have requested this through Improvement Condition Number 3.

Bespoke Permit Conditions

Because of the precise nature of the stability modelling, we were only able to agree to the proposals if we were able to impose suitable controls through permit conditions as has been explained in the section entitled Stability Risk Assessment Review. Consequently we have amended the following permit conditions to reflect this as follows.

Condition 2.5.4: *No disposal of waste shall take place in a new cell until the operator has submitted a CQA Validation Report and Natural Resources Wales has confirmed that it is satisfied with the CQA Validation Report. A CQA validation report shall be submitted for each lift of the Asbestos cell. No waste shall be deposited at that level in*

the Asbestos cell until Natural Resources Wales has confirmed that it is satisfied with the CQA Validation Report for the respective lift.

Condition 3.5.1 has been amended to include monitoring of the separation bund as follows: *The operator shall, unless otherwise agreed in writing by Natural Resources Wales, undertake the monitoring and any other actions specified in the following tables in schedule 3 to this permit:*

(a) Leachate specified in tables S3.1 and S3.9;

(b) Point source emissions specified in tables S3.2, S3.3 and S3.4;

(c) Groundwater specified in tables S3.5 and S3.11;

(d) Landfill gas specified in tables S3.6, S3.7 and S3.8;

(e) Surface water specified in table S3.10; and

(f) Particulate matter specified in table S3.12.

(g) Separation bund topography as specified in table S3.13.

(h) Separation bund inclination as specified in table S3.13.

Condition 4.1.1 has been amended as follows*:*

All records required to be made by this permit shall:

(a) *be legible;*

(b) *be made as soon as reasonably practicable;*

(c) *if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and*

(d) *be retained, unless otherwise agreed in writing by Natural Resources Wales, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:*

(i) the results of groundwater monitoring;

(ii) sub-surface landfill gas monitoring;

(iii) leachate levels, quality and quantities;

(iv) landfill gas generation and collection;

(v) waste types and quantities;

(vi) the location of hazardous waste deposits; and

(vii) the specification and as built drawings of the basal, sidewall and capping engineering systems.

(viii) the results of the asbestos cell separation bund topographic and inclination surveys.

Condition 4.2.2 has been amended as follows:

A report or reports on the performance of the activities over the previous year shall be submitted to Natural Resources Wales by 31 January (or other date agreed in writing by Natural Resources Wales) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the risk assessments submitted in relation to this installation and any agreed amendments thereto;

(b) the energy consumed at the site, reported in the format set out in schedule 4 table S4.3

(c) the annual production/treatment set out in schedule 4 table S4.2;

(d) the topographical surveys required by condition 3.5.3 other than those submitted as part of a CQA validation report;

(e) the volumetric difference (reported in cubic metres) between the most recent topographical survey and the previous annual topographical survey i.e. the additional volume of the landfill void that is occupied by waste;

(f) an assessment of the settlement behavior of the landfill body based on the difference between the most recent topographical survey and previous annual topographical survey for the areas of the landfill which did not receive waste between the surveys;

(g) a calculation of the remaining capacity (reported in cubic metres) derived from the pre-settlement contours and the most recent topographical survey.

(h) an assessment of the deformation behavior of the separation bund based on the results of topographic surveys and inclinometer readings together with a comparison of this measured deformation to the deformation predicted during the Stability Risk Assessment Review until completion of the asbestos cell.

Following review of the draft permit with the Operator, concerns were expressed with regards to the requirement for CQA validation reporting, especially with regards to NRW having 4 weeks to approve CQA validation reports. Taking on board these concerns from the Operator, NRW re-drafted the permits slightly to clarify that although we require a CQA report, we would not apply the requirements of condition 2.5.9 to the asbestos cell.

Consequently condition 2.5.9 was amended as follows:

For the purposes of conditions 2.5.1,2.5.2, 2.5.4 and 2.5.5 (except for the report required for the asbestos cell), Natural Resources Wales shall be deemed to be satisfied where it has not, within the period of four weeks from the date of receipt of the relevant construction proposals or CQA Validation Report, either:

(a) confirmed whether or not it is satisfied; or

(b) informed the operator that it requires further information.

In making this change NRW also amended condition 2.5.4 as follows: *No disposal of waste shall take place in a new cell until the operator has submitted a CQA Validation Report and Natural Resources Wales has confirmed that it is satisfied with the CQA Validation Report (except for the Asbestos cell CQA report). A CQA report shall be submitted for each lift of the Asbestos cell.*

Improvement Conditions

Improvement Conditions have been imposed as follows. These can be found in Table S1.3 of the permit:

IC1: The Operator is to implement a geotechnical monitoring system as described in the Stability Risk Assessment Review (SNRHW Cell revision 1 dated September 2014) and is to be monitored at the intervals stated. The monitoring data is to be reviewed annually, compared with the finite element models and the results reported to Natural Resources Wales for approval.

IC2: The Operator is to submit for approval by Natural Resources Wales a plan showing additional monitoring points for airborne asbestos fibres at the eastern and northern most perimeter of the site.

IC3: The Operator is to carry out background monitoring to establish baseline levels of airborne asbestos fibres levels prior to disposal of any asbestos wastes. Once a baseline is established all monitoring points are to be monitored on a 6 monthly basis .

IC4: The Operator is to provide a report quantifying how much inert waste is accepted for disposal, how much is to be utilised for engineering purposes and how much will be required for restoration purposes. Using this information the Operator is to provide a restoration plan specifying appropriate quantities, waste acceptance criteria and waste acceptance procedures for approval to NRW. Upon approval this Restoration Plan will be incorporated into the Operators Management Plan.

Annex 1: decision checklist

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

Aspect considered	Justification / Detail	Criteria met Yes
Receipt of submission		
Confidential information	A claim for commercial or industrial confidentiality has been made for the expenditure plan for this site. We have accepted the claim for confidentiality. We consider that the inclusion of the relevant information on the public register would prejudice the applicant's interests to an unreasonable degree. The reasons for this are given in the notice of determination for the claim. The decision was taken in accordance with our guidance on commercial confidentiality.	✓
Consultation		
Scope of consultation	The consultation requirements were identified and implemented. The decision was taken in accordance with RGN 6 High Profile Sites, our Public Participation Statement and our Working Together Agreements.	✓
Responses to consultation, web publicising and newspaper advertising	The web publicising, consultation and newspaper advertising responses (Annex 2) were taken into account in the decision. The decision was taken in accordance with our guidance. No responses to our web publicising and newspaper advertising were received.	✓
European Directives		
Applicable directives	All applicable European directives have been considered in the determination of the application.	✓
The site		
Extent of the site of the facility	The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility. A plan is included in the permit and the operator is required to carry on the permitted activities within the site boundary.	✓
Environmental Risk Assessment and operating techniques		
Environmental risk	We have reviewed the operator's assessment of the environmental risk from the facility.	✓

Aspect considered	Justification / Detail	Criteria met Yes
	The operator's risk assessment is satisfactory.	
Operating techniques	We have reviewed the techniques used by the operator and compared these with the relevant guidance notes. The proposed techniques are considered appropriate for the facility and are in line with EPR 5.02 and LFD1.	✓
The permit conditions		
Updating permit conditions during consolidation.	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. The operator has agreed that the new conditions are acceptable.	✓
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. The following conditions have been amended: Condition 2.5.4 - amended to add specific requirements for CQA to be carried out for each subsequent lift of the asbestos cell. Condition 2.5.9 – amended to specify that NRW do not require 4 weeks for assessment of the CQA report for the asbestos cell. Condition 3.5.1 – amended to add monitoring of separation bund topography and separation bund inclination. Condition 4.1.1 – amended to add the requirement for the Operator to keep records of the results of the separation bund topography and inclination monitoring Condition 4.2.2 – amended to add reporting on the assessment of the deformation of the separation bund. Detailed wording of these conditions can be found in the key issues section of this decision document.	✓
Waste types	We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.	✓

Aspect considered	Justification / Detail	Criteria met Yes
	We are satisfied that the operator can accept these wastes for the following reasons all wastes are wastes containing bound asbestos fibres.	
Improvement conditions	Based on the information on the application, we consider that we need to impose improvement conditions. We have imposed improvement conditions to ensure that: ➢ appropriate management systems and management structures are in place to ensure compliance with all the permit conditions. ➢ the appropriate measures are in place for the closure and decommissioning of the facility. Further details of the improvement conditions we have specified are included in the key issues section of this decision document.	✓
Incorporating the application	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. These descriptions are specified in the Operating Techniques table in the permit.	✓
Emission limits	We have decided that emission limits should be set for the parameters listed in the permit. To verify that the asbestos cell is providing suitable containment and that asbestos fibres are not escaping through any medium. We have therefore set a limit of no asbestos fibres to be detected in surface water emissions and that a baseline limit of asbestos fibres be determined prior to tipping to ensure that asbestos fibres are not released as aerial emissions. It is considered that the ELVs described above will ensure that pollution of the environment and harm to human health is prevented and a high level of protection for the environment secured.	✓
Monitoring	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. These monitoring requirements have been imposed in order to verify that asbestos fibres are not being released	✓

Aspect considered	Justification / Detail	Criteria met Yes
	into the environment. We made these decisions in accordance with M17. We also requested monitoring of the stability of the separation bund. Please see the key issues section for more detail.	
Reporting	We have specified additional reporting in the permit. We requested that the results of of topographic surveys and inclinometer readings of the asbestos cell separation bund be reported in order to measure deformation of the separation bund.	✓
Operator Competence		
Environment management system	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.	✓
Financial provision	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. The current expenditure plan for the site was developed in support of the original PPC application submitted in May 2004. No modifications were made to this expenditure plan in December 2007 following an application to remove the conditions relating to the deposit of SNRHW at the facility. The original expenditure plan is considered appropriate to support the proposals applied for under this environmental permit variation application. The financial provision arrangements satisfy the financial provisions criteria.	✓

Annex 2: Consultation responses

Summary of responses to consultation and the way in which we have taken these into account in the determination process.

Response received from
Merthyr Tydfil County Council - Environmental Health
Brief summary of issues raised
Some concerns regarding the potential for releases of asbestos fibre to atmosphere, however were satisfied that our permit controls such matters.
Summary of actions taken or show how this has been covered
None needed

Response received from
Merthyr Tydfil County Council Planning department
Brief summary of issues raised
None raised
Summary of actions taken or show how this has been covered
None needed