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| 2 | Appendix 3 - Landfill Concept Design Report | Response Post Report Update |
| 2.3 | Landfill stability | |
| a | No calculations have been provided for the stability of the Stage 1 waste that clearly show the parameters used, particularly at the interfaces of the lining system. Without having seen any calculations, the stability of the Stage 1 waste would seem to be marginal with long slopes towards the toe where post peak parameters will apply and only small flat areas where peak parameters may apply. Please provide details of the stability calculations for the Stage 1 filling with clear description of the parameters used, particularly the friction angles at the liner surface and where peak or post peak parameters are used. | The changes to the design have included a revised approach to filling and stage development for the landfill (see Drawings C210 - C214 and Design Report). The proposed approach outlined in the report and drawings is more typical of landfill development and provides a inherently more stable filling regime, Landfill stability calculations have been included in the Design Report with more details provided in the Geotechnical Interpretive Report. However, it should be noted that the filling sequence presented in the design remains indicative and will be developed further (or an alternative adopted) during detail design. At that time further analysis will be required to confirm waste stability as the landfill is developed. |
| 2.4 | Leachate containment | |
| a | Drawing C208, Section 2 shows a very low bund at a low point in the lining system at the edge of Stage 1 comprising a low rise in the HDPE geomembrane liner and a clay bund above. Further detail is required on the expected performance of this to contain leachate within the landfill without seepage/overflow from the landfill. | This detail has been removed and is not required for the design changes proposed along with filling sequence. |
| 2.5 | Material sources and stockpiles | |
| a | Table 5, Section 3.8 identifies that approximately 1.6 Mm3 of soil are required for daily cover and final cover. The timing of when this is excavated compared with when it is required is not clear, but it is likely that large stockpiles will be required to hold surplus excavated material until it is required. The report also identifies the removal of topsoil and alluvium, all of which will need to be stockpiled. The only stockpile shown on the drawings above the site facilities area which covers an area of 2 ha and is unlikely to have sufficient volume. Please clearly show where all stockpiles will be located and the proposed erosion and sediment control measures. | Addressed in section 7.2.9 of the Design Report. The changes to the design have included the addition of a second stockpile to the west of the landfill footprint. This is in addition to the eastern stockpile. As described in the Design Report, it is anticipated that the eastern stockpile will be utilised for longer term storage of topsoil and loess materials (approx. 70,000 CUM and no higher than 5 m) while the western stockpile will be used for bulk earthworks storage. Calculations indicate for the design presented in the report the max. storage requirement is 350,000 CUM - with 70,000 CUM in the eastern stockpile the available storage in the western stockpile is more than enough for the projected balance of 280,000 CUM. Stormwater control measures for both stockpiles are shown on the drawings and described in the Surface Water Report. |
| 2.6 | Stormwater treatment | |
| a | Please provide details of the design parameters and expected performance for the proposed sediment treatment facilities. | Design parameters and performance criteria are described in the Surface Water Report. |
| 2.7 | Leachate collection system | |
| a | Drawing C207 (and others) shows 2 x 200 mm diameter leachate pipes in 300 mm thickness aggregate. Please confirm whether this is the proposed detail or whether additional thickness aggregate will be placed over the pipes to provide separation from the waste above. What aggregate size is proposed for the leachate drainage layer and is a different size proposed for the main leachate drain surround? | The depth of drainage aggregate materials will be locally thickened over the leachate drainage pipes at the edges of the landfill base (via forming a wedge or bench of additional aggregate at the base of the Stage 1 side slopes). This constitutes a construction detail comment and will be addressed in latter design phases. A thickening of drainage aggregate is now noted in the updated drawing set (C207), although accurate depths and profiles are not yet detailed. This issue is discussed in Section 3.11 of the Design Report |
| 2.8 | Landfill liner | |
| a | There is commentary in literature regarding freeze/thaw effects on clay liners and GCL. Do the designers consider this to be an issue at Smooth Hill and, if so, how will this be managed? | Available meteorological data from nearby long term sites confirms that freezing conditions are likely at Smooth Hill (see Section 2 of Design Report). An on-site meteorological station was established in mid 2020. To date insufficient data has been collected to allow reliable correlation with nearby long term data sets. However, it is likely that the on-site station will confirm the risk of freezing conditions. The Design Report notes this (section 3.10) and the likely need to manage this risk by: 1) Minimize the area of liner constructed ahead of filling 2) Cover exposed liner with daily cover type materials or hay blanket type materials. 3) Keep area free draining to minimize water. |
| 2.9 | Landfill settlement | |
| a | Drawing C202 shows the landfill cap contours. Please confirm whether these are proposed to be pre-settlement contours or post-settlement contours, i.e. is filling proposed to be to a higher elevation than shown to allow for future settlement? | Addressed in Design Report - section 3.8 The contours shown are at closure. It is anticipated that some settlement will have occurred before closure and this has been specifically assumed in the landfill waste volume calculations (assumed additional void created by settlement during operations will be offset by daily cover volumes). Therefore, further settlement after closure is possible and will need to be managed to ensure landfill cap surface drainage remains appropriate. It is possible that that an operator may also opt to overfill to allow for long term settlement post closure. However, this has not been assumed in this design. |
| 2.1 | Landfill gas | |
| a | We have concerns regarding some of the details shown on the drawings for the LFG system as noted in our review of the draft documents. However, we acknowledge that these are matters of detailed design and provided there is a consent condition requiring review of designs by a Peer Review Panel, these are matters more appropriately addressed at that time. | Noted |