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Natural Resources Wales
Chester Road
Buckley
Flintshire
CH7 3AJ

File Name: 1470/It3 Hafod

FAO: Ian Oakes

4 September 2015

Dear Ian,

RE: CQA Validation Report for the 2015 Western Sidewall (Northern) Liner Construction Works at Hafod Quarry Landfill Site

Further to your recent request, I have examined the CQA Validation Report for the 2015 Western Sidewall (Northern) Liner Construction Works. Whilst the report is adequate in its scope, follows the agreed CQA Plan and provides appropriate details of the construction, I do have some queries on the test results which require clarification.

Section 3.3.7 indicates that the geocomposite testing results confirm that the material meets the Specification. However, the certificates and testing summary table indicate that the in-place flow capacity falls short of the manufacturers data sheet values (0.78 and 0.94 l/m/s rather than >0.99 l/m/s). Given this shortfall I would like to understand whether this is sufficient to meet design requirements despite it falling short of the manufacturer's expectations. Could Stratus please confirm whether this material has sufficient flow capacity. This response needs to be added to Section 6 of the report.

Section 6.3 discusses the low moisture contents determined during testing 3 of the 25 compaction cores. Each of these were found to have a moisture content of 11%, below the 12% lower moisture limit. The text indicates that one of the shear strength test samples also had a moisture content of 11%, yet the results show that in fact two of the shear strength tests were below the 12% liner limit. This means that 5 out of the 38 tests are below the lower limit. I note that two of the 3 air voids failures are from these 5.

Unfortunately, this dataset does not have a permeability determination for a sample at 11% moisture content. Whilst it is noteworthy that the sample failures are 'plastic' I also note that 11% is well below the plastic limit. The high cell pressures in the test have no doubt contributed to this failure mode. I would like Stratus to check back through the past records to see whether there are any permeability results for this material at 11% moisture content that could provide reassurance that even at this moisture content the permeability requirement will still be met. The moisture content in itself is only an indicator of likely performance and providing there is evidence that at these levels, a fully functional impermeable liner can be produced, it should be possible to accept these non-conformances.



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Could you forward these comments to Cory so that the supplementary information can be prepared. Please note that I am out of the office until 14 September. I will respond upon my return.

Yours faithfully,
GEOTECHNOLOGY

A handwritten signature in black ink that reads "Ewan Thomas". The signature is written in a cursive style and is underlined with a single horizontal stroke.

Ewan Thomas
Director