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Our Ref: 1361-0/RCO/LTRreport1

Stuart Rawlinson
Cotswold District Council
Trinity Road
Cirencester
Gloucestershire
GL7 1PX

30 October 2017

Dear Stuart

PEER REVIEW OF REPORT ON ASBESTOS - RAF UPPER RISSINGTON

Land Quality Management Ltd (LQM) have been commissioned to undertake a technical peer review for Cotswold District Council (CDC) of a Remediation Method Statement (RMS) prepared by Idom Merebrook in relation to the former RAF Little Rissington, Upper Rissington (the “Site”). Details of our remit are contained in our proposal of the 11th Sept 2017 (Ref: 1359-0/RCO/proposal 2).

LQM understand that the former RAF base at Upper Rissington has been redeveloped for housing. The Site was adequately investigated and a RMS was submitted to CDC and approved in 2013. However, during the redevelopment there were significant deviations from the approved RMS that resulted in stockpiles of soil materials remaining in the public open space (POS) areas around the boundaries of the Site. LQM understand that the Developers (Bovis Homes Western and Linden Homes Thames Valley) claim these are required as “noise bunds” in relation to the adjacent operational airfield. However, verification testing suggests that the stockpiles do not meet the criteria for re-use presented in the approved RMS with respect to asbestos and polyaromatic hydrocarbons (PAHs). We also understand that the majority of the residential properties are already occupied and that residents are concerned about risks from asbestos fibres in the stockpiles.

In an attempt to resolve this situation, the Developers’ consultant, Idom Merebrook, has submitted a Remediation Method Statement Addendum (RMSA) that seeks to assess the risks posed if the stockpiles remain within the POS areas and proposes mitigation measures as required. Cotswold District Council have engaged LQM to undertake a third party review of this RMSA.

INFORMATION SUPPLIED TO LQM

The following document was provided to LQM by CDC for review:

- Remediation Method Statement Addendum Former RAF Little Rissington Upper Rissington (2017) Bovis Homes Western And Linden Homes Thames Valley RMSA-17183-17-150 REV C

In addition, the following have been provided to LQM for reference but have not been reviewed:

- Remediation Method Statement Former RAF Little Rissington (2013) Linden Homes Thames Valley and Bovis Homes RMS-17183-13-2 REV B (RMS)
- Email dated 18 September 2017 Karen Toomer to Stuart Rawlinson; summary of current situation.

SUMMARY OF THE RMSA

The RMSA identifies 11 stockpiles (referred to as stockpiles A-L) that consist of variously made ground and natural as-dug arisings.

The RMSA suggests that the natural as-dug arisings in stockpiles A, B and L are “*suitable for export to a site at Moreton-on-Marsh where material was required in order to raise the landform for site drainage purposes*”. It is proposed that these materials will be exported under the provisions of a Materials Management Plan under the Definition of Waste Code of Practice (CL:AIRE, 2011) (DOWCOP). LQM’s remit relates to the materials that are proposed to remain at the Rissington. Consequently, we have not considered the details relating to Stockpiles A, B and L in detail, as these materials will be removed from the Rissington site. Nor have we reviewed the site investigation report relating to the Moreton-on-Marsh site, which is presented in Appendix 6 of the.

The RMSA states that:

- Stockpile D1 consists of 2,930m³ of 6F2 that is apparently intended to be “*a resource material for road construction*”
- Stockpile K consists of 266 m³ of “*imported topsoil*” that is apparently “*assigned to complete residential plots*”

No testing data or further comment is presented within the RMSA. We assume that data is available to demonstrate that these materials are suitable for use at the Site and that they will be used during the completion of the redevelopment.

The RMSA states that “*to achieve the consented landform for the scheme at Rissington, a number of areas requiring infilling on the site have been identified*”. These areas are presented in Appendix 1 as a WSP drawing prepared in Nov 2016. As LQM have not been involved in the approval of the landform, we cannot confirm that achieving the consented landform will require additional materials or that the volume calculations are appropriate. We have reviewed the RMSA on the assumption that this is the case.

The remaining stockpiles C, D, E, F, G and H consist of made ground and represent 14,176; 3,607; 7,652; 3,780; 503 and 1,286m³, respectively. The RMSA presents details of a sampling exercise to confirm that these stockpiles are “*chemically suitable to remain on the site for the intended use*”, which we assume refers to achieving the consented landform. Sampling was reportedly undertaken in Oct 2016. From the information presented, LQM have estimated an apparent sampling density of one sample per 250m³. This resulted in 124 samples being collected. The RMSA indicates that the sampling locations are presented within Appendix 3, but LQM are unable to confirm this as the text in the diagrams within the PDF document provided to us appear corrupted and are not legible. The RMSA states that “*representative samples around each stockpile and from within each stockpile were obtained with the assistance of a machine excavator*”. This suggests that efforts were made to sample throughout the volume of the stockpile, but the exact details of the sampling are not provided and we have assumed that the samples do not constitute composite samples. If composite samples were

collected the validity of statistical analysis below would need to be re-evaluated. Details of the sampling procedure should be requested.

According to the RMSA, “approximately half of the samples from each stockpile were scheduled for analysis”. Overall it is reported that 66 samples were tested for the “identified contaminants of concern at the site”, namely arsenic, PAHs and asbestos. This represents a testing density of one sample per 500m³. With respect to the 66 samples tested in the laboratory for asbestos:

- “bundles of chrysotile asbestos fibres” (< 0.001% w/) were identified in 4 samples;
- “chrysotile present in microscopic cement fragments & as bundles” (0.001%) was identified in 1 further sample,

A risk screening of the data for arsenic and PAHs is presented in Table 3 within the RMSA¹, but unfortunately this is presented for all the samples across all the stockpiles and not on a stockpile by stockpile basis. There were no exceedances for arsenic. However, this indicates a number of exceedances for benzo[a]pyrene, and two other PAH congeners; see below:

Table 4: Summary of PAH Exceedances

Stockpile Ref	No of Tests	Determinand	Sample Ref Exceedance(s)
C	30	Benzo(a)pyrene	MV01, MV29, MV35
		Benzo(b)fluoranthene	MV35
		Dibenz(ah)anthracene	MV01, MV29, MV35
E	16	Benzo(a)pyrene	-
		Benzo(b)fluoranthene	-
		Dibenz(ah)anthracene	MV08, MV12, MV13
F	8	Benzo(a)pyrene	MV09
		Benzo(b)fluoranthene	MV09
		Dibenz(ah)anthracene	MV09

With respect to PAHs: The RMSA applies the CIEH & CL:AIRE (2008) statistical guidance to the concentrations of the 3 PAH congeners in Stockpiles C, E and F. While not specifically designed for stockpiles, the statistical approaches should be relevant as long as the data collected is truly representative of the entire stockpile volume, but without more details of the sampling strategy LQM cannot confirm that this is the case.

We note that there does not appear to have been any attempt to review the data prior to applying the statistical tests in order to identify any patterns or clustering within the data, which is a recommendation within the CIEH & CL:AIRE guidance. The authors of the RMSA also do not state how many samples were <LoD and how they dealt with these samples within the dataset. We also note that the data is non-normal in the majority of cases, the probability plots presented in Appendix 5 appear to suggest that in some cases the datasets may be heavily biased by the number of samples <LoD. The outlier tests contained within the CIEH & CL:AIRE guidance do not seem to have been applied but the RMSA states that “No outliers have been removed from the datasets as there is no strong evidence to suggest that elevated concentrations are not part of the same overall distribution”.

Based on the statistical analysis, the RMSA concludes that the US95 values for the 3 congeners are below the LQM/CIEH S4ULs (POS^{resi} at 1% SOM) in stockpiles C and E but that those for benzo[a]pyrene (BaP) and dibenzo[a,h]anthracene (DahA) exceed the S4ULs in Stockpile F. However, Idon Merebrook erroneously state that this indicates “a potential risk requiring remedial

¹ Risk screening was undertaken using the LQM/CIEH S4ULs for POS^{resi} at 1% SOM

action”; exceeding a GAC suggests that the risk **may** be unacceptable and warrants further consideration but GACs are not action levels above which remediation is required. The RMSA does not summarise the nature of the exceedances in Stockpile F and this information is not easily accessible in the relevant appendices, so LQM cannot comment on the need for remediation with respect to this stockpile. [Notwithstanding this, the language should not be remediation but the materials’ suitability for reuse in the bunds.

However, instead of further characterising the potential risks, the RMSA proposes a remediation solution and uses guidance from the BRE (2004) to derive a recommended thickness for a capping layer using topsoil to be imported from the Moreton-in-Marsh site. The RMSA does not explain why the Moreton-in-Marsh site apparently has surplus topsoil for use in capping the Rissington site while at the same time having a requirement to import made ground materials from the Rissington site.

BRE (2004) was funded by the Department of Trade and Industry (DTI) and undertaken by RSK ENSR Limited, on behalf of the Association of Geotechnical and Geo-environmental Specialists, in partnership with BRE. The guidance states that “*The basic concept of this research is that cover systems do not necessarily break potential exposure pathways, but may be used to reduce exposure*” and considers the likely concentration at the surface after natural and anthropogenic disturbances have thoroughly mixed a 600mm layer. There are a substantial number of limitations to the BRE guidance relevant to this Site including the presence of slopes and a potential prevalence of rabbits/badgers *etc.*

With respect to slopes, BRE (2004) states “*the combined effects of gravity and seeping water on a slope could lead to the failure of a cover system*” and that “*slopes with a gradient in excess of 1 in 12 are not considered appropriate for a cover system*”. LQM are not aware of the proposed gradients of the land form but these limitations should be considered in the design of any cover system. In addition the very need for a capping layer suggests the materials may be classified as waste.

With respect to “*areas where rabbit or badger populations are significant*”, BRE (2004) acknowledges that burrowing could lead to contaminated material being brought to the surface, LQM would argue that the preferred location for animal burrows is in banks and slopes, such as those formed by the stockpiles. BRE (2004) goes on to suggest that in such cases “*a physical break layer such as crushed concrete may provide some further protection*”, although in this case this may accentuate the slope stability and material status issues discussed above.

The capping thickness recommended is between 146mm for BaP and 164mm based on the concentrations of BaP and DahA, respectively, in Stockpile F and the topsoil. However, this is also based on the default mixing depth recommended by BRE (2004) of 600mm. It should be noted that BRE (2004) is based on the principle that mixing of clean capping and dirty underlying soils will be limited to the depth of this mixing zone. It is arguable as to whether this is true for capping of a level site but it is more dubious with respect to stockpiles where burrowing could result in lateral mixing over several meters or indeed the entire stockpile volume. LQM are not aware of the details of the proposed landform but if a mixing depth of 2m (2000mm) is assumed the required capping depths would be closer to 500mm. It is also unclear if the RMSA is proposing this depth of clean soils be applied to only Stockpile F, all the stockpiles² or the POS areas as a whole. CDC should seek explicit clarification on this point.

² We note that section 5.10.3.1 suggest that, as a minimum, the capping will also be applied to stockpiles C and E, which contain low levels of chrysotile asbestos.

With respect to asbestos: LQM understand from the Acceptance Criteria presented in Table 3 of the previous RMS that the original proposal was that asbestos should not be “*detected*” within the upper 1m of soils within the POS areas.

The RMSA presents qualitative and quantitative risk assessments in support of Idon Merebrook’s conclusions that “*the potential risk from exposure to such low quantities is likely to be low to negligible (sic)*” and, presumably, therefore that no remediation is needed with respect to the asbestos in the stockpiles. The qualitative risk assessment is generally in line with Ciria C733 (Nathanail et al., 2014) and considers some of the factors listed in that document that may influence the potential for airborne asbestos fibres to be released from the surface of the stockpiles. LQM would generally agree that at this site many of these factors would limit any potential exposure, but the exposure scenario concludes that “*there are no foreseeable activities that may take place which would disturb the underlying soils to a depth greater than the top 100 mm*”; this seems to exclude any consideration of the activities of burrowing animals as discussed above or even mechanical disturbance that could release fibres from bundles such as those reported in a small fraction of the samples tested.

Quantitative risk assessments for asbestos are complex and require a substantial number of assumptions, which should be clearly and transparently presented to the reader. The methodology for the risk assessment presented in the RMSA, while clearly trying to be transparent, is overly brief and difficult to follow. For example:

- We note that the estimation of the likely airborne fibre concentrations uses a variety of K-values. We assume that these relate to those presented by Alan Jones (Institute of Occupational Medicine) during recent training Ciria courses. LQM are aware that some errors and inconsistencies in these values have subsequently been identified and would recommend that Idon Merebrook satisfy themselves that the values they have used are supported by the data underlying Jones’ work and presented in Addison et al. (1988);
- LQM could not follow the calculations using these K-values to estimate the potential airborne fibre concentration (and the units at various stages). Consequently, we are unable to verify the value derived, although it is of the order that might be expected and overall the underlying assumptions are likely to overestimate any risks. These assumptions include:
 - No capping layer of clean soil is present;
 - No vegetation is present;
 - samples reported as “no asbestos detected” (NAD) contain 0.0001% asbestos (i.e. the limit of detection of the blue book method”);
 - samples that contain asbestos but that are below the Limit of Quantification (0.001%) contain 0.001% asbestos;
 - all asbestos samples collected were from within the surface 100mm of each stockpile;
 - estimating an airborne fibre concentration based on the average soil concentration;
 - estimating airborne asbestos fibre concentrations based on an airborne dust concentration of 100 ug m⁻³, based on ART modelling of shovelling dry powders;
 - any day with <1mm of rainfall will be dry enough to release airborne asbestos fibres;

- exposure from 0-80 yrs of age (i.e. 80 yrs duration).
- It is not clear why Idom Merebrook believe that an event exposure duration of only 6 minutes is considered appropriate, but otherwise agree that the predicted 5yr cumulative exposure seems appropriate and likely to be an overestimate;
- The RMSA states that “*Risk tables have been generated by Merebrook using the risk summary statements for mesothelioma (Table 14.1 in CIRIA C733) and the age adjustment factors table (Table 14.2 in CIRIA C733). This more accurate estimate is obtained by summing the risks for exposures received in successive five year increments and applying the relevant age-adjustment factor to each*”. The RMSA then presents a “*Chrysotile risk table including age adjustment factors (Lifetime risk per 100 000 exposed to 0.000006 fibre/ml.years from age 30 over 5 years = 0.01*” LQM was able to reproduce this novel approach. Rather than undertaking assessments for each 5yr increment of exposure (i.e. 16 increments for 80yr duration) using different age-adjustment factors as proposed in C733, Idom Merebrook have generated Cumulative Age-Adjustment Factors. Some extrapolation was required but cautious assumptions were used. As long as the expected cumulative asbestos exposure is not likely to change with age, as is the case at the POS, this would appear to be an effective way to simplify the assessment process in C733. The “Chrysotile Risk table” presented in the RMSA represents this cumulative age-adjustment factor multiplied by the risk posed by a cumulative exposure of 0.000006 fibres/ml.yrs for 5yrs from age 30. Idom Meerbrook have assumed that this is 0.01 per 100,000 exposed. The risk summaries in C733 suggest that cumulative exposures to chrysotile of less than 0.005 fibres/ml.yrs is “insignificant”³. Idom Merebrook have assumed that “insignificant” is equivalent to the 1 in 10 million risk of death regarded as “tolerable” with respect to normal operation in the nuclear industry (HSE, 1992). It should be noted assuming the same level of risk at 0.000006 fibres/ml.yrs as that assumed at 0.005 fibres/ml.yrs is likely to be cautious. Although not clearly presented, within the RMSA, LQM, believe that this approach is likely to be appropriate in this case and to over-estimate the potential risks.

Idom Merebrook conclude that outdoor exposure within the POS⁴ to the levels of asbestos within the stockpiles could result in an excess lifetime cancer risk (ELCR) of 0.254 per 100,000 people exposed and conclude that “*Using conservative parameters and running the model without the provision of any clean cover and overlying vegetative cover (which would mitigate exposure of underlying soils to weathering), the quantitative risk assessment models for both stockpiles C and E has shown that there is no significant increased overall excess lifetime cancer risk from exposure to asbestos.*”. Based on our understanding of the assessment presented within the RMSA, LQM would tend to agree that the ELCR calculated is likely to be an overestimate and is less than the 1 in 100,000 generally used as an approximation of unacceptable risk.

Although the levels of asbestos in the stockpiles are marginally higher than originally agreed in the previous RMS, and given that a capping layer is proposed with respect to Stockpiles C and E, it seems

³ Based on the numeric progression in the C733 risk summary, it could be argued that the risk at 0.005 fibres/ml.yrs is of the order of 0.01 per 100,000 and that at 0.000006 fibres/ml.yrs is of the order of 0.000012 per 100,000.

⁴ Idon Merebrook assume that airborne asbestos fibres are unlikely to reach the residential properties and that it is unlikely that asbestos fibres would be “tracked back” to allow any indoor exposures. LQM do not have sufficient experience and understanding of the site layout to verify these assumptions but, based on the materials reviewed, they do not seem unreasonable.

unlikely that the levels of asbestos reported would give rise to any unacceptable risks to residents or site users.

However, we would caution against relying on the BRE (2004) guidance to calculate an appropriate capping thickness with respect to any residual risk from asbestos, which the RMSA appears to do. Due to its nature, unlike chemical contaminants, asbestos will not be subject to uniform dilution and mixing. Capping of asbestos should ensure that asbestos fibres are not exposed at the surface. As stated previously, BRE (2004) relies on the concept of mixing of the upper 600mm, it is therefore possible that asbestos will be exposed at the surface in the future (unless a cap of at least 600mm is applied).

CONCLUSIONS

LQM understand that the RMSA represents a proposal to vary the remediation and acceptance criteria originally submitted and agreed in the RMS. Based on the information within the RMSA, it seems unlikely that the concentrations of either PAHs or asbestos within the stockpiled materials will pose any unacceptable risks to residents or users of the POS. Consequently, overall, the proposals within the RMSA do not seem unreasonable or unjustified. A clear statement from Idom Merebrook that the materials used to form the bunds would be safe and suitable for such use and do not pose unacceptable risks, as required by the NPPF should be included in a revised RMSA.

Nonetheless, the RMSA proposes that, as a minimum, stockpiles C, E and F will be capped with clean topsoil to a depth of ~150mm to minimise any potential risks. LQM would suggest that the application of the BRE guidance to calculate this depth may be flawed and that this depth should be regarded as a theoretical minimum given all the limitations in the BRE guidance. Of particular concern is the extent to which burrowing animals may disturb the final landform. LQM are not aware of the likely prevalence of burrowing animals, such as rabbits, badgers and moles, within the POS areas. However, if such animals may be present this should be acknowledged within the RMSA and the potential impact on the potential risk and proposed remediation should be fully explored. Overall it would be better if the BRE Guidance was not relied on or referred to at all.

Finally, given that the RMSA is only needed as the original RMS was not adhered to, we would caution that the site may represent some issues as regards the waste status of the stockpiled materials, particularly if these are outside of the Materials Management Plan for the Site associated with the previous RMS. It should be noted that the conclusion within the RMSA that a capping layer is needed if stockpiles C, E and F are to remain within the POS presents *de facto* evidence that they are not 'suitable for use' and may therefore represent "waste". Strictly speaking, under the DOWCOP (CL:AIRE, 2011) such wastes cannot be used on site if a capping layer is required to mitigate the potential risks as this would represent a waste disposal operation and require a suitable Environmental Permit. CDC may wish to discuss these issues with the relevant regulator and/or the administrators of the DOWCOP system, CL:AIRE.

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Please do not hesitate to contact me on **0115 7484080** or via **richard.ogden@lqm.co.uk** should you have any queries on this matter.

Yours sincerely,

BY EMAIL

BY EMAIL

RICHARD OGDEN

DR PAUL NATHANAIL

SENIOR ENVIRONMENTAL SCIENTIST

COMPANY DIRECTOR

For and on behalf of Land Quality Management Ltd

REFERENCES

Addison J, Davies L, Robertson A, & Willey R. (1988). *The release of dispersed asbestos fibres from soils* (Research Report No. TM/88/14). Institute of Occupational Medicine (Edinburgh, UK).

BRE. (2004). *Cover systems for land regeneration; Thickness of cover systems for contaminated land.*

CIEH, & CL:AIRE. (2008). *Guidance on Comparing Soil Contamination Data with a Critical Concentration*. Chartered Institute of Environmental Health/ Contaminated Land: Applications in Real Environments: London, UK. Accessed from http://www.cieh.org/library/Knowledge/Environmental_protection/Contaminated_land/Statistics_guidance_contaminated_2008.pdf

CL:AIRE. (2011). *The Definition of Waste: Development Industry Code of Practice (Version 2)*. Contaminated Land: Applications in Real Environments (CL:AIRE): London, UK. Accessed from

http://www.claire.co.uk/index.php?option=com_phocadownload&view=file&id=212:initiatives&Itemid=230

HSE. (1992). *The Tolerability of Risk from Nuclear Power Stations*. Health & Safety Executive: Sudbury, UK.

Nathanail C, Jones A, Ogden R, & Robertson A. (2014). *C733 - Asbestos in soil and made ground: a guide to understanding and managing risks*. CIRIA: London, UK.

Summary of Comments on MCE Report (Belper) XP v2.5

Page: 5

 Author: richard Subject: Highlight Date: 12/10/2017 14:56:32

 Author: richard Subject: Highlight Date: 12/10/2017 14:56:39

 Author: richard Subject: Highlight Date: 12/10/2017 14:56:57
What does this mean?

 Author: richard Subject: Highlight Date: 12/10/2017 14:57:34
Is this appropriate for the sampling undertaken?

Page: 6

-
- Author: richard Subject: Sticky Note Date: 12/10/2017 14:58:16
1 sample every ~258 m3

 - Author: richard Subject: Sticky Note Date: 12/10/2017 14:58:10
1 sample every ~240 m3

 - Author: richard Subject: Sticky Note Date: 12/10/2017 14:58:31
1 sample every ~246 m3

 - Author: richard Subject: Sticky Note Date: 12/10/2017 14:58:34

 - Author: richard Subject: Sticky Note Date: 12/10/2017 14:59:10
1 sample every ~252 m3

 - Author: richard Subject: Sticky Note Date: 12/10/2017 14:58:37

 - Author: richard Subject: Sticky Note Date: 12/10/2017 14:59:00
1 sample every ~250 m3

 - Author: richard Subject: Sticky Note Date: 12/10/2017 14:58:51
1 sample every ~214 m3

 Author: richard Subject: Highlight Date: 12/10/2017 15:01:30
This is the total across all stockpiles!

How many in each stockpile?

 Author: richard Subject: Highlight Date: 12/10/2017 15:00:18
This a mean across all stockpiles!
What are the means for each stockpile?

 Author: richard Subject: Highlight Date: 12/10/2017 14:59:47

 Author: richard Subject: Highlight Date: 12/10/2017 14:59:43

 Author: richard Subject: Sticky Note Date: 13/10/2017 16:13:35
It would be informative to know the concentrations in each of these samples

 Author: richard Subject: Sticky Note Date: 12/10/2017 15:02:53
What type of asbestos and ACM ?

 Author: richard Subject: Highlight Date: 12/10/2017 15:03:28
Is this appropriate to the assessment of stockpiles? Please justify

 Author: richard Subject: Highlight Date: 12/10/2017 15:05:27
In what way is it "recognized"?

 Author: richard Subject: Highlight Date: 12/10/2017 15:06:30

 Author: richard Subject: Highlight Date: 12/10/2017 15:06:33

 Author: richard Subject: Highlight Date: 12/10/2017 15:07:40
Not necessarily? Are the GACs appropriate? eg SOM?

 Author: richard Subject: Highlight Date: 12/10/2017 15:12:45
Please justify the use of this guidance.

It is based on mixing to reduce concentrations. What concentration of a carcinogen (like asbestos or BaP) is acceptable at the surface of the stockpile?

 Author: richard Subject: Highlight Date: 12/10/2017 15:29:15
Table 9.1 in C733 lists significantly more factors than this?

 Author: richard Subject: Highlight Date: 12/10/2017 15:29:38
You dont expect any burrowing animals? rabbits?

 Author: richard Subject: Highlight Date: 12/10/2017 15:31:52
It is not the drying of the "underlying" soils that is significant. It is the surface soils. The surface of any mound/bund is likely to be more susceptible to drying due to the better drainage and water shedding and higher wind speeds anticipated above ground level.

 Author: richard Subject: Inserted Text Date: 12/10/2017 16:14:20
any

 Author: richard Subject: Highlight Date: 12/10/2017 16:14:55

 Author: richard Subject: Sticky Note Date: 12/10/2017 16:15:23
What footpaths? will people be walking on these mounds?

 Author: richard Subject: Highlight Date: 12/10/2017 16:17:22

 Author: richard Subject: Sticky Note Date: 12/10/2017 16:21:25
C733 does not give "guidance" on a suitable value - it is a site-specific consideration. section 13.4.2 gives a number of ways to derive such a value.

 Author: richard Subject: Highlight Date: 12/10/2017 16:22:43
Would the authors expect to find these levels in stockpiles raised above the surface?

 Author: Richard Subject: Highlight Date: 13/10/2017 11:40:56
Agreed

 Author: Richard Subject: Highlight Date: 13/10/2017 11:41:30
This doesnt allow for burrowing animals?

 Author: Richard Subject: Highlight Date: 13/10/2017 11:41:43
OK

 Author: Richard Subject: Sticky Note Date: 13/10/2017 11:42:51
Full details are required.
At what stage was the soil concentration combined with the K factor?
Please state the conversion factors used and their source?

 Author: Richard Subject: Highlight Date: 13/10/2017 11:39:53
Probably a cautious assumption

 Author: Richard Subject: Highlight Date: 13/10/2017 11:43:23
Cautious assumption

 Author: Richard Subject: Highlight Date: 13/10/2017 11:47:39
Please justify why you believe exposure will only last for 6mins of each day? What is the activity being considered?

 Author: Richard Subject: Highlight Date: 13/10/2017 11:52:02
5 yrs is not the default - it is the assumed period of occupation within the epidemiological data.

You have assumed that receptors will only be exposed for 5yrs. Why? Residents may live at the Site for longer periods?

 Author: Richard Subject: Highlight Date: 13/10/2017 11:53:35
This will require 16 assessments in 5yr increments. You only seem to have presented a single 5 yr assessment?

 Author: Richard Subject: Highlight Date: 13/10/2017 12:14:42
This sounds very clever but no details are presented as to how this is achieved.
- what base risk has been assumed for (age 30, 5yrs) for chrysotile exposures less than 1 F/ml.yr (the lowest cumulative exposure for which Hodgeson & darnton can quantify the risk?
-What age adjustment factor has been applied for ages over 55, teh highest given in Table 14.2?

 Author: Richard Subject: Highlight Date: 13/10/2017 12:15:32
If I understand correctly, this is ~3x your calculated cumulative exposure?

 Author: Richard Subject: Highlight Date: 13/10/2017 12:39:03
I dont understand the relevance of this observation?

 Author: Richard Subject: Sticky Note Date: 13/10/2017 13:42:36
LQM assume this is a cumulative CF x risk of 0.01 (ie maximum deemed to be insignificant)

 Author: Richard Subject: Highlight Date: 13/10/2017 12:38:15
Probably true

 Author: Richard Subject: Highlight Date: 13/10/2017 13:43:13
Due to the lack of detail provided above, LQM cannot corroborate this value.

 Author: Richard Subject: Highlight Date: 13/10/2017 13:05:52

Notwithstanding the fact that insufficient detail has been provided to verify the QRA, it is likely that the levels of chrysotile reported do not pose any substantial risks. The levels are arguably lower than would be expected in general urban made ground.

