CHILTERN RAILWAYS (BICESTER TO OXFORD IMPROVEMENTS)
TWA ORDER RESPONSE TO QUESTIONS OF CLARIFICATION

Objector Name and Reference: Caroline Robertson OBJ234/3

Date submitted: 15 October 2010

Date of Response: 22 October 2010

Response: Responses from CRCL are provided to the questions submitted. The Inspector in document X/6.4 issued on 15 October 2010 determined that certain questions were not questions of clarification and gave individual reasons for each one.

Question Number	Response
1	Appendix 1 to Michael Fraser's Proof, Tables 1.2, 1.4, 1.6, 1.8, 1.10 *How did ERM determine when there were trains?* Train noise was recorded in contiguous five minute samples to form a time history of the noise levels. The data were reviewed, in conjunction with timetable information, to identify where noise levels were elevated by train noise. Train running details were extracted from the rail industry "TRUST" (Train Running System Total operations processing system), which records the time, type, length and tonnage of all trains operated.
2	Appendix 1 to Michael Fraser's Proof, Tables 1.2, 1.4, 1.6, 1.8, 1.10 *Was the train noise determined from the noise measurements taken or predicted according to the Calculation of Railway Noise (CRN)?* The train noise in these tables was taken from the measured samples.
3	Appendix 1 to Michael Fraser's Proof, Tables 1.2, 1.4, 1.6, 1.8, 1.10 *The noise measurements taken are given to one decimal place. What is the error in the noise measurements taken (for example, to ±1dB)?* Modern sound level meters are accurate typically to tolerances less than +/- 0.5 dB. Calibration is checked on site using a field calibrator, and any deviations above 0.1 dB during measurements are recorded. Variations were less than this before and after the measurements that were taken. The noise levels that are used in the assessment are shown in Table 1.1, 1.3, 1.5, 1.7 and 1.9. These are quoted to zero decimal places to reflect the potential uncertainty in environmental noise measurements.

Question Number	Response
4	Appendix 1 to Michael Fraser's Proof, Tables 1.2, 1.4, 1.6, 1.8, 1.10 *Why are many of the noise levels, with the train noise subtracted, at Islip, Table 1.8 higher than the total noise levels?* Baseline data have been collected at Islip, which show that existing noise levels in the area are at least 3 dB below the 55/45 dB LAeq (day/night) threshold criteria (see Table 1.7) that are referenced in Table 6.4 of page 6-6 the ES (CD/1.16). Significant noise impacts include a significant increase in noise in an already noisy area, or the significant exceedance of these stringent thresholds in an area where the ambient noise is currently low. Since the baseline is low in the area at which measurements were taken in Islip, the impact is determined by the exceedance of threshold values rather than the change in baseline noise. Therefore, baseline noise does not form the basis of the assessment. It is acknowledged that minor rounding errors of less than 0.6 dB have occurred in the hourly, which have lead to the inconsistency that you have highlighted in the hourly noise levels. However, for the reasons above these do not affect the assessment of noise.
5	Appendix 1 to Michael Fraser's Proof, Tables 1.2, 1.4, 1.6, 1.8, 1.10 *In Table 1.8, why are no maximum noise levels, Lmax,1h(slow) given? If they were measured, please provide them.* Maximum noise levels were recorded, but during the analysis these were not analysed and put in the table. However, the LAmax values that are shown in these tables are not used in the assessment, and they are included only to illustrate the range of noise levels in the existing noise environment. Since the assessment does not depend on these levels, we would not intend to provide them.
6	Appendix 1 to Michael Fraser's Proof, Tables 1.2, 1.4, 1.6, 1.8, 1.10 *Have the maximum noise levels shown as Lmax,1h(slow) been measured using the 'A' weighted scale as used in the ES? (Should the column heading be LAmax,1h (slow)?)* Yes, the maximum noise levels are A-weighted LAmax, 1h (slow) values. However, as noted above in the answer to question 5, this does not affect the noise assessment.

Question Number	Response
7	Appendix 1 to Michael Fraser's Proof, Tables 1.2, 1.4, 1.6, 1.8, 1.10 *The unattended noise surveys reported in the Environmental Statement (ES) show the wind speed, wind direction and weather conditions. Please provide this information for the noise measurements reported in Appendix 1 to Michael Fraser's Evidence.* The unattended noise survey data have been carefully checked to ensure that the effect of unsuitable weather has been excluded. This meant excluding measurements where the wind was greater than 5 m/s and where rain may have affected the measurements. The results of this showed good agreement with the attended measurements that were made during the ES as discussed in 1.13 of the Appendices to the Proof of Evidence of Michael Fraser (CRCL/P/9/B). Therefore, provision of more detailed information is not expected to be helpful in clarifying how the noise impact has been derived.
8	Appendix 1 to Michael Fraser's Proof, Tables 1.2, 1.4, 1.6, 1.8, 1.10 *Where train noise is shown to contribute to the background in the tables, please can the following details be provided: type of train, time that the train passed.* It has not been necessary to identify individual trains within the recording, as the technique that is used to establish a reliable baseline for comparison with the "with scheme" scenario, is to subtract train noise from measured baseline noise, and then to add train noise back in based on predictions using the official prediction method (Calculation of Railway Noise). This method is in turn based on measured values of the type of trains that currently use the route, but this method enables a controlled comparison of the two scenarios to be undertaken. For your information the trains during the measurement period the passenger trains would have been two-car class 165 Diesel Multiple Units (DMU), with air/disc brakes. The average freight trains during this period would have been as follows: "Binliner": Class 66 diesel loco with 12 bogie wagons loaded with closed containers. Loaded eastbound, train weight 1016t including loco, empty westbound, 607t including loco. Locos and wagons have air/disc brakes. MoD: Class 66 loco with typically 10 wagons = 447t including loco. Mixed empty and loaded in directions, mixed open and covered wagons. Loco has air/disc brakes, and wagons have mixture of air/disc and air/tread brakes. Stone trains. Class 66 loco and 18 open wagons, loaded eastbound at 1898t inc. loco, empty westbound at 563t inc loco. Existing line is single track throughout. Line speed is 40mph passenger, 40mph for freights, but these will be slowing to about 25mph through Wolvercot for Oxford North Junction.

Question Number	Response
9	Appendix 1 to Michael Fraser's Proof, Tables 1.2, 1.4, 1.6, 1.8, 1.10 *In the Environmental Statement (ES), D-34, "fast response" has been used for maximum noise levels. Please explain what difference using "slow", as in the later noise measurements recorded in Mr Fraser's evidence, will make to the peak noise measurements.* Page D-34 is the Glossary of terms, which includes a description of the time weighting used for LAmax in the assessment. It states that "*The 'f' stands for fast response, which is the metric which has been used throughout this assessment*". Whilst it is true that LAmax, fast has been used in table D2.5, D2.6, D2.7 and D2.8 for existing noise measurements these values are not critical to the assessment, and are included only to show the range of noise levels in the environment. This note should more correctly have stated that fast weighting was presented in the measured results. The most important values is that which are predicted in the ES in Table 6.12, 6.13, 6.22 and 6.23. These are LAmax, slow values, which is as described in Table D4.1 on page D-23 of the ES which describes in detail the assessment criteria. This is the correct time weighting for the prediction and assessment of the maximum noise levels, which has been correctly applied through the assessment.

Question Number	Response
10	ES, page 6-11 *Please provide details of the parameters used in predicting railway noise between Water Eaton and Oxford North Junction, such as:* *• Type of train (passenger or freight)* *• How many coaches* *• How many wagons* *• Whether the wagons are empty or full* *• Type of brake* *• Speed* *• Ground cover* *• Single or double track* *• Presence of hedges, garden walls, fences, etc* *• Facade effect* *• Number of trains in daytime* *• Number of trains in nighttime* *• Distance between receptor and track* *• Relative heights of receptor and track* *• Whether the trains are operating under load* *• What are the errors (for example, to ±1dB)* Page 6-11 includes both discussions regarding predicted and existing noise. Since the question refers to prediction of railway noise we assume that this is what is of concern in this question. The main parameters that are required for the prediction of the railway noise are included in Annex D of the ES (CD/1.18) in Section D5. Some factors are specific to individual receptors and we have not produced all of this information in the ES. However, for Lakeside the following are true: • Ground cover – no acoustically soft ground was accounted for given that the distance is too small for this to be a significant effect. • Distance between receptor and track – 19.5 m and 22.8 m to the nearest rails of each track. • Trains on load – trains are not on full power at Lakeside, and therefore no correction for this is required. The following factors *Whether the wagons are empty or full* and *Presence of hedges, and standard fences will not have an appreciable effect on noise attenuation, etc* are not input variables to the prediction method and are therefore not relevant to assessment of the Scheme. *What are the errors (for example, to ±1dB?* The standard prediction method does not estimate the errors, but ERM has measured railway noise during commissioning of barriers which shows good agreement with predicted values, generally showing a slight over prediction of one or two decibels*).*

Question Number	Response
11	Michael Fraser evidence, para 5.107 *Do you mean a 2m minimum distance between the track and the barrier?* Yes
12	Michael Fraser evidence, para 5.107 *Is this measured from the nearest edge or the centre of the track?* This is measured from the nearest edge of the track.
13	Michael Fraser evidence, para 5.107 *What distance from the track has the noise barrier been modelled along Lakeside?* Two metres
14	Michael Fraser evidence, para 5.107 *Is the noise barrier going to be positioned on the embankment with the tracks?* This will depend on the final design of the embankment profile, but the height of 2 metres is specified relative to the top of rail height. Therefore, if the physical height of the barrier needs to be more than this, to account for changes in ground height, this would be done.
15	Michael Fraser evidence, para 5.107 *If the noise barrier is not going to be positioned on the embankment, what height of noise barrier has been modelled?* See answer to 14, height is 2 metres relative to rail height.
16	Michael Fraser evidence, para 5.107 *What type of noise barrier has been modelled? (please included details of materials used in construction, wood, metal, concrete, etc)* The barrier material does not affect the predicted barrier screening in the Calculation of Railway Noise (CRN). However, the type of barrier material will need to be considered during detailed design to ensure that it has sufficient surface mass (kg/m^2). The surface mass required for various barrier insertion losses is defined in CRN. Timber barriers are commonly used, and would be likely to be sufficient for the attenuations required.

Question Number	Response
17	Michael Fraser evidence, para 5.107 *Is the noise barrier proposed absorbent or reflective?* The barrier is modelled with an acoustically absorbent material on the side facing the railway, and a reflective face on the other side.
18	ES, page 6-1 – Scope *What recently approved railway schemes have provided the criteria against which predicted noise and vibration levels are assessed?* The schemes that have provided the criteria are discussed in paragraph 2.27 and 2.28 from Michael Fraser Proof of Evidence (CRCL/P/9/A) and are reproduced below. 2.27 Such standards for assessing noise impacts on railway schemes have been adopted on other rail schemes in the UK. Many of these projects have been subject to Public Inquiries where the criteria and standards adopted were placed under close scrutiny. Schemes for which ERM provided the noise assessment using criteria based on the standards above include the following. • NET Tram System Phase 2, NET (Nottingham) which has gained approval under the Transport and Works Act; • Centro Tram system (Birmingham) which has gained approval under the Transport and Works Act; • Edinburgh Tram Line 1 which gained the approval of the Scottish Parliament; • The Edinburgh Airport Rail Link which gained the approval of the Scottish Parliament; and • the Waverley Railway (now referred to as the Borders Railway) which gained the approval of the Scottish Parliament. 2.28 A review of heavy rail Schemes was also carried out, and the standards adopted for this Order Scheme were found to agree well with other Scheme assessment methodologies. The Schemes that were reviewed included the Glasgow Airport Railway Link (GARL), Hitchin (Cambridge Junction) and the Channel Tunnel Rail Link (CTRL).
19	ES, page 6-1 – Scope *Are any of the schemes above operational?* Only the CTRL is operational in the examples given. Some of the other schemes are under construction, and some have been cancelled due budget cuts.

Question Number	Response
20	ES, page 6-5 *How does the impact rating system differ to that which has been used to assess other railway systems historically?* There is not guidance on how to assess noise from railways. Therefore, current best practice has been used as the basis of the assessment standards that have been adopted. This includes adoption of the Noise Insulation (Railways and Other Guided Systems) Regulations which have only been in force since 1996.
21	ES, page 6-5 *Why has the impact rating system been changed?* The rating system has been changed to reflect recent best practice in the railway industry.
22	ES, page 6-5 *Was this different impact rating system used in the railway schemes mentioned in question 18 above?* Whilst project rating systems differ in detail, we have made sure that the significant impacts are rated in a way that is comparable to the other schemes in 18.
23	ES, page 6-7 *Please provide details, such as:* • *soil/ground type* • *for passenger trains, number of carriages* • *for freight trains, number of wagons and* • *whether they are empty or loaded* Detailed ground investigations have not been undertaken, but reference to the British Geological Survey Maps (sheet 218) suggests that ground consists of clays at Kings Sutton.
24	ES, page 6-7 *What difference does it make to vibration levels if the train is going up hill or accelerating?* Vibration levels are not likely to vary significantly.

Question Number	Response
25	ES, page 6-11 *Why have the lowest ambient levels been used when assessing the likely statutory eligibility under the Noise Insulation Regulations as a result of Phase 1 and Phase 2? Surely to ensure a "worst-case assessment", maximum impact and maximum noise levels should be calculated?* Page 6-11 is referring to the assessment using the criteria that have been adopted for this assessment, and not to the Noise Insulation Regulations. Using the lowest existing level when considering an increase in noise in this assessment results in a worst case.
26	ES, page 6-31 *Please provide details of the parameters used in predicting railway noise between Water Eaton and Oxford North Junction, such as:* *• Type of train (passenger or freight)* *• How many coaches* *• How many wagons* *• Whether the wagons are empty or full* *• Closed wagons or open top* *• Size/age of wagons* *• Type(s) of brake (some wagons have two different types used on same wagon)* *• Type of engine and whether modified* *• Speed* *• Ground cover* *• Single or double track* *• Presence of hedges, garden walls, fences, etc* *• Facade effect* *• Number of trains in daytime* *• Number of trains in nighttime* *• Distance between receptor and track* *• Relative heights of receptor and track* *• Whether the trains are accelerating, decelerating, going up hill, etc* *• Accuracy of the calculation (for example, to ±1dB)* See answer to Question 10. These are the same predictions.

Question Number	Response
27	ES, page 6-31 *As Chiltern Railways does not operate freight trains, why has it been assumed that on freight trains the "inherent noise mitigation measures such as appropriate maintenance for the upgraded rolling stock" will be made?* The full quotation is *"The results are presented assuming inherent noise mitigation measures such as appropriate maintenance for the upgraded track and trains and the use of modern rolling stock on both passenger and freight trains."* We intended this to mean that the track was upgraded, and that Chiltern trains are upgraded compared to those that are used on the route at present. All trains operating over the national rail network (including the Scheme) must be maintained to standards required by Network Rail as the infrastructure controller.
28	Appendix 2 to Michael Fraser's Proof, Tables 2.1 and 2.2 *As the predicted train noise already takes into account "inherent noise mitigation measures" (ES, page 6-31), what further noise mitigation does Table 2.2 refer to?* The noise mitigation in Table 2.2 is a 2 metre high barrier at all three locations considered in Table 2.2.
29	Not QoC
30	Not QoC
31	Allan Dare's Evidence, para 7.2.3 and Figure 11 *How many passengers are assumed to be in the private car shown in Figure 11?* There are assumed to be 1.59 passengers in the private car. The RSSB report used data from DfT Transport Statistics bulletins for 2004. The figure is the average for all types of trips. Commuter and business trips are lower than this (average of 1.2 persons per car) whilst holiday and education trips are higher (average of 2.1. person per car).
32	Allan Dare's Evidence, para 7.2.3 and Figure 11 *In Figure 11, is this an "average" car?* Yes, figure 11 relates to an average car. The average is based on surveys of actual cars parked at rail stations, corroborated with data for new cars registered from Transport Trends 2005 (Office for National Statistics and DfT).

Question Number	Response
33	Allan Dare's Evidence, para 7.2.3 and Figure 11 *In Figure 11, how many passengers are assumed to be in the Class 170 train and how many carriages are there?* The figures assume an average 31% load factor (i.e. the number of passengers as a % of the number of seats). For a class 170 this equates to 17 passengers per carriage in a three-car train, 18.5 in a two-car train; the variation is due to the slightly different seating layouts in three and two car trains. The 31% load factor is the average for trains operated by 26 British train operating companies (Source Association of Train Operating Companies for 2005/6). Note that the average load factor conceals wide variations. A peak-hour commuter train into London in the morning will be very busy, but will carry relatively few passengers on its return journey. Chiltern Railways typically operates with higher load factors (ca 35%), and is thus more efficient in terms of CO2 permissions per passenger.
34	Not QoC
35	Not QoC
36	Not QoC
37	Not QoC
38	Not QoC
39	Not QoC