

NETWORK RAIL (CAMBRIDGE SOUTH INFRASTRUCTURE ENHANCEMENT) ORDER

SUMMARY PROOF OF EVIDENCE

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MEDICAL RESEARCH COUNCIL**

1. **QUALIFICATIONS AND EXPERIENCE**

- 1.1 My name is Professor Dr Jan Löwe (FRS ML). I am the Director of the MRC Laboratory of Molecular Biology (LMB), Cambridge with overall responsibility for science delivery supported by our annual £46M budget provided by MRC/UKRI.

2. **BACKGROUND AND PURPOSES OF MRC**

- 2.1 The Medical Research Council is one of the nine councils that together form UK Research and Innovation (UKRI), a non-departmental public body sponsored by the Department for Business, Energy and Industrial Strategy.
- 2.2 The purpose of the MRC is to improve human health through world class medical research. To achieve this we support research across the biomedical spectrum, from fundamental lab-based science to clinical trials and in all major disease areas.
- 2.3 The MRC Strategic Plan is based on four foundations: Discovery Science; Investing in People; New Technologies and Infrastructure; and Fostering Collaboration.
- 2.4 Our work ranges from laboratory research, for example on genes and molecules, right through to research with people, such as clinical trials and population studies. Our science is split into six broad areas of research: infections and immunity, molecular and cellular medicine, neurosciences and mental health, population and systems medicine, global health and research that can be translated into immediate applications.

3. **THE LMB**

- 3.1 The LMB is a research institute dedicated to the understanding of important biological processes at the levels of atoms, molecules, cells and organisms. In carrying out the wide range of experiments at the LMB, we provide knowledge needed to solve key problems in human health such as the elucidation of the DNA double-helix structure, the method for sequencing DNA and the discovery that anti-bodies fight viruses within infected cells.
- 3.2 The LMB has made revolutionary contributions to science and medicine – often through the development of new techniques. Advances in X-ray crystallography and electron cryo-microscopy to determine protein structures are now used for structure-based drug design, DNA sequencing is a cornerstone of molecular medicine and diagnosis, and the development of monoclonal antibodies have led them to become one of the most powerful therapeutic tools.
- 3.3 The combination of ambitious goals, a shared budget and stable long-term support has generated a unique collaborative LMB culture that values boldness and originality. It has resulted in twelve Nobel Prizes awarded for work carried out by LMB scientists, and has contributed, in part, to eleven Nobel Prizes awarded to alumni for work done elsewhere.
- 3.4 The LMB provides a diverse and unsurpassed environment for both young and established researchers, with state-of-the-art facilities and a unique scientific culture. Our scientists are drawn from all over the world, creating a lively international community for the exchange of ideas and technical innovation. Many are inspired by the knowledge that discoveries made at the LMB have made a difference to the world and will continue to do so.
- 3.5 The current, purpose-built building is to the west of the Addenbrooke's site on what is now known as the Cambridge Biomedical Campus.
- 3.6 The building provides around 27,000m² of world-class workspace, divided between three main floors. In overall structure, the building is reminiscent of a paired chromosome, with two long laboratory areas joined by an atrium housing support facilities.
- 3.7 With a fundamental focus on minimising vibrational and electromagnetic interference on the LMB's varied imaging and analytical equipment, all heavy-plant servicing the building is housed either in a separate energy centre, or in the four stainless-steel clad towers linked to the building. This approach removes weight, sources of vibration and significant electromagnetic fields from the laboratory itself. Any significant electrical switching and high voltage

equipment that may generate electromagnetic fields is located at the rear of the energy centre, far away from the main laboratories.

- 3.8 The building accommodates over 600 people including 450 scientists and 160 support staff. To help encourage the exchange of ideas and technical innovation, 40 scientists from the University of Cambridge Molecular Immunity Unit are also based in the building.
- 3.9 In its facilities, the LMB operates a range of extremely sensitive and complex equipment, such as its electron microscopy equipment, nuclear magnetic resonance equipment, confocal microscopy, high resolution optical microscopy, imaging facilities, X-ray crystallography equipment as well as supporting behavioural studies on animals and housing specialist zebrafish facilities which fall under Home Office licences for operation. All of this equipment and others within the facility have a range of sensitivities to air and ground borne vibration.
- 3.10 The LMB's most sensitive equipment are its electron microscopes that have sensitivities that are orders of magnitudes more exacting than other sensitive scientific equipment. This equipment is principally housed in the north east laboratory block on the ground floor. It has been specifically located here to minimise any vibrational noise that may be generated by the existing railway line immediately to the western boundary of the LMB site. However, as electron microscopy requirements expand, there are now lower resolution electron microscopes also housed in the south central laboratory space on the ground floor.
- 3.11 It is imperative that the vibrational performance of the building is not adversely affected from its current levels by the construction or operational changes arising from the proposed Network Rail development.

4. **IMPACTS OF ORDER ON LMB**

4.1 The following impacts are of particular cause for concern:

Vibration from the Construction Works

4.2 External source vibrations such as those arising from heavy road traffic, construction works (piling etc) or train passing events has the potential to create problems at the LMB. Such events can detrimentally affect the performance and reliability of sensitive scientific equipment including high resolution confocal and electron microscopes and can critically impact the efficacy of the experiments meaning they would need to be run again or put on hold for the period when the vibrations are being experienced.

4.3 In order to ensure that the LMB building is not adversely effected through the construction works, or from the ongoing operation of the new rail line and station, the MRC require the following:

4.3.1 Network Rail undertake to produce a detailed method statement for the construction of the works authorised by the Order which are directly adjacent to the LMB.

4.3.2 Network Rail to specify the geometry and location of the proposed new points to the west of the LMB.

4.3.3 Network Rail to use reasonable endeavours that residual vibration from trains would be within the agreed limits.

4.3.4 Network Rail to commit to trigger levels for construction vibration.

4.3.5 With regards to operational vibration, a post completion survey is required to demonstrate that operational vibration is kept within the agreed limits.

Noise

4.4 The LMB is home to a number of laboratory animal species which are used in some of the experiments carried out on Site. Excess noise has an impact on the breeding regimes of the mice, such regimes being key to the experiments that are undertaken.

4.5 There will additionally be noise impacts from the construction works on staff recreational areas external to the LMB building, and while these adverse effects will be real, they do not form the basis of the objection.

- 4.6 In order to ensure that the LMB building is not adversely affected through the construction works, the MRC require Network Rail to commit to monitoring construction noise and use reasonable endeavours to avoid generating noise conditions above the agreed thresholds.

Drainage

- 4.7 Part of the land to be acquired by Network Rail is a ditch area (i.e. the swale) that is part of the drainage plan for the site and designed to cope with a 1 in 100 year flood event. Efforts must be put in place to avoid any impact on the site's drainage strategy.
- 4.8 In addition, Network Rail will commit to carry out any temporary accommodation works in the same manner as the permanent works with regards to mitigating the impacts of noise, vibration, and the generation of dust and dirt.
- 4.9 The MRC also require Network Rail to commit to reinstating the swale at their own cost following the completion of any permanent or temporary construction works.

5. CONSULTATION AND NEGOTIATIONS WITH NETWORK RAIL

- 5.1 The LMB was first contacted by Network Rail via email on the 1st April 2020 where they highlighted that they had started promoting the Cambridge South Station Project and asked if there were any vibration sensitivities within the laboratory that they should be aware of so they could work with us to provide suitable mitigation activities as required.
- 5.2 On the 7th April 2020, the LMB set-out the performance requirements of its building.
- 5.3 Having been provided with outline plans for three station options that NR were exploring on the 27th May, further correspondence followed with the LMB sending details to NR of the most sensitive electron microscopy equipment in the facility and details of their location.
- 5.4 On the 1st July 2020 NR sent an email to the LMB setting out that further questions about the LMB had been raised by their design team and asked for details about other potential impacts including those arising from construction.
- 5.5 A meeting was held on the 14th July 2020 with Network Rail and a representative from their design team (Arcadis).

- 5.6 Following this meeting, NR provided details on the 27th July 2020 of the types of access requested via the MRC car park for a period of around 8 months during construction.
- 5.7 The LMB discussed the request internally and on the 7th August told NR that this access was not considered to be appropriate due to H&S concerns with that volume of construction traffic being routed through a staff car-parking area with extensive pedestrian routes.
- 5.8 On the 8th September 2020 NR asked for the LMB to provide them with details of cycle parking numbers on the LMB site and any details of staff transport movements. The LMB responded with these details on the 8th and 9th September 2020.
- 5.9 On the 5th October 2020, NR contacted the LMB to request details of any equipment that may be subject to electromagnetic interference. On the 13th October 2020, the LMB stated that based upon the proposed changes to the railway lines that had been previously described there were no concerns.
- 5.10 On the 2nd February 2021, designers working for NR contacted the LMB to discuss undertaking vibration measurements of the site to determine whether mitigation activities would be required.
- 5.11 The survey was undertaken on the 8th February 2021 and a meeting was held on the 23rd March to discuss the initial findings from the vibration survey. On the 31st March 2021, the LMB wrote to NR and highlighted that the LMB had concerns about the findings of the survey.
- 5.12 On the 30th April, in email correspondence, NR stated that they recognised the LMB's concerns and that ongoing engagement would be required through the design stage. An engagement plan was provided, but it was made clear that no further actions on vibration were proposed ahead of the Transport and Works Act (TWA0) submission.
- 5.13 On the 17th June 2021, the MRC received a letter concerning the compulsory purchase of land on the LMB site in relation to the South Cambridge Station proposal.
- 5.14 MRC issued a formal objection to the Secretary of State on the 30th July 2021.
- 5.15 Network Rail gave a presentation of the scheme to the MRC on the 29th June 2021, and an on-site meeting was held at the LMB on the 5th August.
- 5.16 Detailed discussions were held with Network Rail (NR) on the 24th September with the MRC's objections including with respect to noise and vibration being explained again to NR.

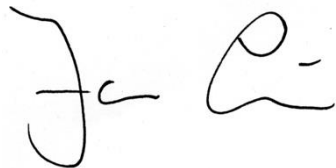
- 5.17 NR issued technical reports from their consultant advisors on noise and vibration to the MRC on the 14th October 2021.

From the 21st October onwards, the MRC and NR have had a weekly meeting to try and close out the concerns arising from the MRC's objections.

6. **SUMMARY AND CONCLUSIONS**

- 6.1 The MRC plays a fundamental role in ensuring that human health continues to improve by carrying out highly specialist and highly technical experiments and clinical research at sites such as the LMB.
- 6.2 As such, it is critical to the ongoing success of the MRC that its laboratories and research centres are allowed to operate without the interference of third party operations.
- 6.3 It is clear that the scheme (both during construction and when the upgraded route is in operation) could have some severe adverse impacts on the LMB, most notably in relation to noise, vibration, and drainage, and it is therefore of paramount importance that Network Rail seek to mitigate any impacts to the fullest extent possible so as not to jeopardise and put at risk the extremely important work that is being undertaken at the LMB.

I confirm that the facts stated within my evidence are true.



Dr Jan Löwe

Director of the Medical Research Council's Laboratory of Molecular Biology

Date: 7 January 2022