



Item	Discussion and decisions	Action by
1.	<p><b><u>Introductions</u></b></p> <p>i. The Chairman reported apologies as indicated.</p>	
2.	<p><b><u>Minutes of the previous meeting</u></b></p> <p>i. Some changes requested by Dr Busby were agreed.</p>	
3.	<p><b><u>Matters arising</u></b></p> <p><u>Action 20.1: Dr Lewis to liaise with Dr Henderson before sending out a revised version of the report to the Board</u></p> <p>i. Action continuing.</p> <p><u>Action 19.2: Secretary to collect and file all press reports in order to check the level of coverage that had been achieved</u></p> <p>i. Action complete.</p> <p><u>Action 20.3 : Project Manager to approach proposed 3<sup>rd</sup> party and set up contract</u></p> <p>i. Action continuing.</p> <p><u>Action 20.4: Dr Morgan to circulate Professor Wessely's project protocol to the Board.</u></p> <p>i. Action complete.</p> <p><u>Action 20.5: Professor Coggon agreed to seek Dr Henderson's views on this issue.</u></p> <p>i. Action complete. Dr Henderson's view was that the most reliable index of isotope ratio for spiked samples was that calculated from the known amount of DU that was added to each.</p> <p><u>Action 20.6: Professor Coggon agreed to undertake a statistical analysis of the results.</u></p> <p>i. Professor Coggon agreed to conduct a statistical analysis when the testing programme had finished and all analytical data were available.</p> <p><b><u>ACTION 21.1: Professor Coggon to conduct statistical analysis of results at the end of the programme</u></b></p> <p><u>Action 20.7: Professor Coggon agreed to feedback the outcome of the discussion to Dr Etherington.</u></p> <p>i. Action Complete.</p> <p>ii. Dr Etherington had modified his report and it was agreed that the report be circulated to the Board for final comment before publication on the DUOB website.</p> <p><b><u>Action 21.2: Secretary to circulate report to Board for comment.</u></b></p> <p><u>Action 19.7: Dr Busby's Research Proposal</u></p> <p>i. A research proposal had been received from Dr Busby to carry out limited analysis of the currently available data from the test programme. Dr Busby explained that he wanted to understand why the population variance was greater than in the normative study. He was asking a general question about the variation of uranium isotope ratio with geographical region. Professor Coggon felt that a detailed protocol was required for the study. Dr Etherington pointed out that it was the practice at NRPB to produce a detailed protocol before such a study was carried out.</p> <p>ii. Dr Busby's proposal inspired some debate among members of the Board. In particular, Professor Spratt commented that the analysis proposed by Dr Busby might lack the necessary statistical power. However, Dr Busby considered that if all the tests showing low <math>^{238}\text{U}/^{235}\text{U}</math> ratios occurred in participants from Cumbria, for example, then an association might be established.</p>	<p>Professor Coggon</p> <p>Secretary</p>

	<p>iii. In concluding the discussion, Professor Coggon said that he sensed that the Board was happy for the data to be released to Dr Busby. He asked Dr Busby to carry out an analysis on behalf of the DUOB and report back to it. The work was to consist of a) analysis of the mean <math>^{238}\text{U}/^{235}\text{U}</math> isotope ratios and 95% confidence limits by clinic attended, b) examination of the relationship between daily uranium excretion and <math>^{238}\text{U}/^{235}\text{U}</math> ratio, and c) examination of occupational categories. However, data could be examined only from those individuals who had given permission on their questionnaire for the information to be used for research purposes.</p> <p><b><u>ACTION 21.3: Project manager to provide Dr Busby with a list of participants by clinic attended and permission for research granted or withheld.</u></b></p> <p><u>Action 20.8: The Chairman agreed to prepare a draft letter to the Minister which would be circulated to the Board for discussion.</u></p> <p>i. Action complete. A reply had been received from the Minister and circulated to the Board.</p> <p><u>Action 20.9: The Chairman agreed to discuss the normative values report and future studies with IOM.</u></p> <p>i. Action complete. Any comments on the IOM study should be sent to the Secretary.</p> <p><u>Action 20.10: Secretary to locate UK AEA paper and to circulate to the Board.</u></p> <p>i. Action complete. In addition, Professor Hooper had provided a number of relevant papers on alleged health effects of DU in the Iraqi population, which had been circulated to the Board for discussion.</p> <p>ii. Professor Coggon asked what was the evidence for an increased incidence of cancer after as compared with before the war, and Professor Hooper said that the statistics came from the Iraqi cancer registry. Professor Coggon asked what was the quality of the cancer registry data, noting that he had not seen a rigorous paper examining trends in cancer incidence in Iraq. He did not think that any of the papers provided by Professor Hooper presented rigorous epidemiology. Dr Spittle added that there were only two oncology centres in Iraq and they suffered from a shortage of qualified personnel.</p> <p>iii. Mr Brown asked how a causal relationship between exposure to DU and the allegedly increased incidence of cancer had been established, since there were other environmental pollutants in Iraq, which might have contributed to a rise in cancer if there was one. Professor Spratt added that DU had been suggested as a causative factor in Gulf veterans' illnesses, but from the evidence that was now available on levels of exposure, it appeared that it was not. He expressed a wish to see exposure testing of the Iraqi population to establish whether DU could plausibly be a factor in increased rates of ill-health there.</p>	<p><b>Project manager</b></p>
<p>4.</p>	<p><b><u>Sample Collection Update</u></b></p> <p>i. Professor Coggon summarised the progress of the testing programme as at 17<sup>th</sup> October 2005. There had been 356 applications. To date 280 results letters had been issued, 45 results were still pending and 31 applicants had decided not to proceed. 88% of the respondents to the satisfaction survey felt the results and the information provided had been clear. 21% of the respondents had used the helpline facility.</p>	
<p>5.</p>	<p><b><u>Results to date</u></b></p> <p><b><u>a) Spiked Samples</u></b></p> <p>i. Professor Coggon re-iterated that the reported isotopic ratios for spiked samples were</p>	

assessed against the gravimetric calculations of the laboratory producing the samples. So far all spiked samples with calculated  $^{238}\text{U}/^{235}\text{U}$  atomic ratios  $>144$  had successfully been identified as containing DU. The analysing laboratory with the more precise technique had identified DU in all cases where the calculated ratio exceeded 140. Samples with atomic ratios of 138 and 139 had been classed as “suspected DU”.

- ii. Dr Busby commented that he thought the data reported by the analysing laboratories were of good quality. However, he noted that  $\alpha$  radiation was capable of making holes in certain plastic materials and as this would tend to increase their surface permeability. He wondered if significant adsorption of uranium onto sample bottles could occur over time. If so, it might explain why samples reported by Dr Durakovic as positive for DU were not found to contain it when re-analysed some time later. Professor Parrish replied that he had stored a standard batch of urine in a container of the same material as was used in the testing programme. He had measured the uranium concentration from time to time and had not found it to be falling.
- iii. Professor Coggon noted that the uranium concentrations measured by the analysing laboratories in the spiked samples were consistently lower than those reported by the originating laboratory, and agreed that he would write to all three laboratories asking them to confer on the subject and suggest possible explanations.

**ACTION 21.4: Chairman to write to laboratories regarding difference in spiked sample results.**

Chairman

**b) Veterans results**

- i. Professor Coggon reported that none of the veterans tested so far had been found to have DU in their urine. Examination of average  $^{238}\text{U}/^{235}\text{U}$  isotope ratios across all veterans showed no evidence even for low levels of DU, insufficient to give a definite positive result in an individual sample. The mean atomic ratios and confidence intervals from both laboratories were consistent with natural uranium only. If both DU and EU were present, their effects on the isotope ratio must exactly cancel out. Professor Parrish pointed out that if such a phenomenon did occur, it should be evident from detection of the  $^{236}\text{U}$  isotope, since both DU and EU would contribute  $^{236}\text{U}$ . Professor Coggon noted that some relatively high levels of natural uranium excretion had been found. In one case the level was several hundred nanogrammes, although a repeat sample from the same individual fell within the normal range, suggesting that the initial sample had suffered accidental contamination or had reflected a temporarily high dietary intake of soluble uranium.
- ii. Professor Parrish explained his reported borderline detection of  $^{236}\text{U}$  in two veterans’ samples, saying that the mass spectrometric ion counts had been noticeably above the general background level, but insufficient for positive confirmation. In these cases it would be justified to report that there was no evidence of DU.
- iii. The case of a test participant was discussed, in which one of the laboratories had reported an enriched uranium isotope signature and the detection of  $^{236}\text{U}$ . Professor Parrish informed the Board that this information had been wrong. Re-analysis of the same sample had shown that it contained only natural uranium, at a concentration consistent with that reported by the other laboratory.
- iv. One participant had written to the administration contractor seeking details of what the DUOB considered the “normal range” of urinary uranium excretion. Professor Coggon tabled a draft reply, which was considered by the Board and slightly modified. Typical values in the UK population fell in the range 0 – 30 ng, but the distribution was skewed and some 2.5% of results in the testing programme thus far had been above 30 ng.

**c) Updated results summary**

	<p><b><u>ACTION 21.5: Professor Coggon to provide an update to the existing results summary on the DUOB website.</u></b></p>	<p><b>Chairman</b></p>
<p>6.</p>	<p><b><u>Future Planning</u></b></p> <p>i. The chairman had written to the Minister for Veterans, Mr Touhig, proposing a closure date for new test applications of October 31<sup>st</sup> 2005. In his reply, the Minister suggested the end of the year might be a more suitable date. However, given that this fell within the Christmas holiday season, the Board agreed that the closure date should be January 31<sup>st</sup> 2006.</p> <p>ii. Mr Williams reported that the end dates of the current programme contracts had been set on the assumption of a December 31<sup>st</sup> closure date, and the extension into January might require some changes. However, the financial implications were modest as both the laboratories and the four clinics whose services would be retained into 2006 charged on a “per test” basis. The administration contractor would have to remain under contract for some months after the final clinic appointment to deal with the results and maintain the helpline.</p> <p>iii. The Chairman said it was intended to place an advertisement in “The Sun” announcing the closure date. There was also to be a press release. Dr Paterson asked for the press release to make specific mention of entitled civilians. Mr Jones queried if that would suffice to reach the target population. Professor Coggon asked the secretariat to seek advice on the need to advertise in a second newspaper.</p> <p><b><u>ACTION 21.6: The Secretary to seek advice from the press office regarding a second publication</u></b></p> <p>iv. Professor Coggon asked that representatives of the veterans’ organisations help to publicise the closure date, and it was agreed that the Confederation of British Service and Ex-service Organisations (COBSEO) be contacted and asked to promulgate the information throughout the ex-service community. Dr Morgan added that the MoD would send an internal communication through Service channels at the same time as the press release to inform serving personnel.</p> <p>v. Dr Hall asked that a distinction be made between closing the voluntary retrospective DU testing programme and winding up the DU Oversight Board. Professor Coggon added that the DUOB was likely to remain in existence throughout 2006.</p> <p>vi. Dr Hall also requested that the results of the programme be clearly spelt out, i.e. that no evidence of DU in veterans’ urine had so far been found. Professor Coggon said that the summary results would be available as discussed, but since the testing programme was a service to veterans rather than a research project, it would not be appropriate for the Board to publicise them unduly. Professor Hooper said that he and Dr Hall would prepare a suitable information brief for the NGV&amp;FA. Professor Coggon said that he would write a comprehensive report for the website when the testing programme was complete.</p> <p>vii. Professor Parrish informed the Board that he had been analysing the urine samples for the isotope <sup>234</sup>U, even though this had not been requested. He explained that <sup>234</sup>U was derived from <sup>238</sup>U according to the radioactive decay sequence <math>^{238}\text{U} \rightarrow ^{234}\text{Th} \rightarrow ^{234}\text{U}</math>, and that solubility differences between the uranium and thorium in this sequence could lead to large variations in the <sup>238</sup>U/<sup>234</sup>U atomic ratio. Professor Coggon confirmed that the <sup>234</sup>U data should be reported to the Board. Dr Busby asked that they be provided for each sample, not aggregated. Professor Parrish added that a great deal of data had been accumulated during the testing programme that would be of interest to the scientific community, and asked if they could be made generally available. Professor Coggon replied that unlimited release would be difficult because of ethical and confidentiality considerations. However, the Board would welcome any draft scientific papers based on the data that the laboratories might wish to put forward.</p>	<p><b>Secretary</b></p>

7.	<p><b><u>Presentation by Professor Parrish</u></b></p> <p>i. Professor Parrish described the analytical procedure applied in his laboratory. He said that the paper he had co-ordinated on the DUOB pilot study was to be published in the journal “Health Physics” early in 2006. He went on to report the performance of his laboratory in the IRMM-NUSIMEP4 inter-laboratory comparison programme. The major part of Professor Parrish’s presentation concerned his study of pollution and inhalation of DU in Colonie, New York State, where a uranium processing plant had operated between 1965 and 1982. He said that this study might inform the question of whether there is a relation between DU exposure and adverse health effects. Professor Parrish said that his findings to date supported the view that an absence of detectable DU in urine meant that no significant DU exposure had occurred.</p> <p>ii. Professor Hooper said that he felt the DUOB should look at DU exposure among Iraqis. Professor Coggon said that he would write to the relevant Ministers pointing out that a suitable analytical technique was now available, should such a study be commissioned.</p> <p><b><u>ACTION 21.7: Chairman to write to relevant Ministers</u></b></p> <p>iii. Dr Busby suggested that an absence of detectable DU in urine could simply mean that it was locked up in insoluble form within the lung or lymph nodes. Professor Parrish said it had been shown that the coefficient of correlation between the level of uranium excreted in urine and its concentration in drinking water was 0.9. He added that most of the measurements on urine samples from Gulf War veterans carried out privately at NIGL were consistent with natural uranium, although two or three indicated a little DU (maximum <math>^{238}\text{U}/^{235}\text{U}</math> atomic ratio of 144). He also suggested that the results found by Durakovic, which he had been unable to reproduce, might have been misleading due to cross-contamination.</p>	<b>Chairman</b>
8.	<p><b><u>Update on BEIR VII by Dr Etherington</u></b></p> <p>i. Dr Etherington provided the Board with a brief verbal summary of the <i>Biological Effects of Ionising Radiation Publication VII</i> (BEIR VII). The BEIR committee had concluded that there was no threshold for the risk of cancer. There was no major change to the assessment of risk, but uncertainties were addressed for the first time. Dr Busby said that BEIR VII report omitted reference to studies that did not support its conclusions, and in his opinion was biased.</p>	
9.	<p><b><u>Date of Next Meeting:</u></b></p> <p>i. Professor Coggon said that a further meeting would be arranged when the extent of any demand for the test prompted by the closure announcement had become clear.</p>	

Distribution:  
All members  
All observers