Introduction:

A questionnaire was sent to all customers: Post graduate students, Research staff, Principle Investigators as well as to non-UK based scientists (n=154). Commercial customers were the only group excluded from the survey. There was a 61% return with 95% of the surveys being fully completed. As the survey was anonymous, it is impossible to find who did or did not respond. Certainly, some e-mail addresses would have been obsolete for many students and some post-docs who used the IMF in the earlier part of the Survey’s time.

Note: Minor edits have been made to the responses to remove the names or identity of staff and other UK laboratories.

Index:

This report is divided into five Sections:

1. Summary and key points.
2. Bar chart statistics from Survey Monkey.
3. Customer comments from the Survey.
4. IMF responses to the Customers Comments.
5. Letter of complaint and NERC’s reply.
Section 1: Customer Survey Feedback: Summary and Key Points.

General Comments and Observations:

- Six out of NERC’s seven Science Themes have been supported.
- 71% of the IMF customers were totally or partially funded by NERC.
- 98% of customers consider that the IMF is required for their future research.
- 74% of customers will be requiring access more than once in the next five years.
- 80% gained access via the IMF application procedure and are supportive of the rapid ‘one-day’ access for proof of concept.
- 95% of customers got instrument access within <6months from their acceptance letter.
- 99% never had any significant problem with the instrumentation that compromised their project.
- 99% of customers believed the quality of the service and support to be good or excellent.
- 98% of customers viewed the concept and procedure of access to the IMF as good or excellent.
- 80% heard about the IMF via colleagues. This demonstrates the need for better advertising of the Facility by NERC and the IMF so a broader community can become aware of NERC’s Facilities, including the IMF.
- 96% of customers found the IMF web page information useful and confirms the high ‘hit-rate’ this web site has.
- 57% believe the Cameca ims-4f needs updating or replacing.
- More training of every type was requested; hands-on, formal course, web info etc.
- 72% valued the access to the peripheral support facilities.

The appreciation of the support, help and expertise provided by the IMF staff permeates throughout the customers comments and it is recognised that having the instrumentation is only part of providing a successful service.

One complaint was received during this reporting period. The scientist involved was concerned that there may be a limit on the number of applications he could submit to the IMF Steering Committee and there was no reflection of the service provided, which he described as “exemplary”. The complaint was addressed by Dr Gardner from NERC. The two letters are attached in Section 5 with both parties approving publication.

Many customers believe that the ims-4f needs up-grading or replacing. Any significant upgrading is not a viable option with the instrument being 24 years old. The replacement cost is high, at a list price for a Cameca 7f-geo of ~£1.8m.

In response to the request for more training, the IMF staff will produce more details on the Facility web site and documentation on routine analytical procedures. The proposal for a formal course will be discussed with the IMF steering committee and NERC.
1. NERC has seven Science Themes - see NERC’s web site at http://www.nerc.ac.uk/research/themes/ for details. Please indicate which Theme best describes your area of science.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Change</td>
<td>16.3%</td>
<td>15</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>3.3%</td>
<td>3</td>
</tr>
<tr>
<td>Sustainable Use of Natural Resources</td>
<td>6.5%</td>
<td>6</td>
</tr>
<tr>
<td>Earth System Science</td>
<td>73.9%</td>
<td>68</td>
</tr>
<tr>
<td>Natural Hazards</td>
<td>19.6%</td>
<td>18</td>
</tr>
<tr>
<td>Environment, Pollution and Human Health</td>
<td>1.1%</td>
<td>1</td>
</tr>
<tr>
<td>Technologies</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question 92
skipped question 2
Section 2

2. NERC has seven Research Areas - see NERC’s web site at http://www.nerc.ac.uk/research/areas/ for details. Please indicate which research area describes your area of science.

<table>
<thead>
<tr>
<th>Research Area</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atmospheric science</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Earth science</td>
<td>92.5%</td>
<td>86</td>
</tr>
<tr>
<td>Earth observation</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Marine science</td>
<td>14.0%</td>
<td>13</td>
</tr>
<tr>
<td>Polar science</td>
<td>1.1%</td>
<td>1</td>
</tr>
<tr>
<td>Science-based archaeology</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Terrestrial and freshwater</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question 93
skipped question 1

3. Was your science totally or partially funded by NERC?

<table>
<thead>
<tr>
<th>Response</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>71.4%</td>
<td>65</td>
</tr>
<tr>
<td>No (please say how it was funded)</td>
<td>28.6%</td>
<td>26</td>
</tr>
</tbody>
</table>

answered question 91
skipped question 3
### Section 2

4. Are you a NERC Facility customer who gained access to the IMF via the NERC Facility application form and procedures?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes.</td>
<td>79.8%</td>
<td>75</td>
</tr>
<tr>
<td>No.</td>
<td>20.2%</td>
<td>19</td>
</tr>
</tbody>
</table>

- **answered question**: 94
- **skipped question**: 0

5. Is there anything you wish to tell us about "Your Science"?

<table>
<thead>
<tr>
<th>Response</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

- **answered question**: 20
- **skipped question**: 74

6. NERC's IMF Research Facility provides access granted free of charge after peer review and grading of your application by the IMF Steering Committee. What best describes your view of this process?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>76.4%</td>
<td>55</td>
</tr>
<tr>
<td>Good</td>
<td>22.2%</td>
<td>16</td>
</tr>
<tr>
<td>Poor</td>
<td>1.4%</td>
<td>1</td>
</tr>
<tr>
<td>Unnecessary</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

- **answered question**: 72
- **skipped question**: 22
7. The IMF Steering Committee meet twice per year. Do you think this is:

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not often enough</td>
<td>20.8%</td>
<td>15</td>
</tr>
<tr>
<td>About right</td>
<td>76.4%</td>
<td>55</td>
</tr>
<tr>
<td>Too often</td>
<td>2.8%</td>
<td>2</td>
</tr>
</tbody>
</table>

8. How did you find the IMF application form?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>58.3%</td>
<td>42</td>
</tr>
<tr>
<td>It's OK</td>
<td>40.3%</td>
<td>29</td>
</tr>
<tr>
<td>Over Complicated (please expand)</td>
<td>1.4%</td>
<td>1</td>
</tr>
</tbody>
</table>

9. How would you describe the response time between your IMF application and the approval/rejection letter from NERC?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prompt</td>
<td>34.8%</td>
<td>24</td>
</tr>
<tr>
<td>Acceptable</td>
<td>59.4%</td>
<td>41</td>
</tr>
<tr>
<td>Lengthy</td>
<td>5.8%</td>
<td>4</td>
</tr>
</tbody>
</table>

answered question 72
skipped question 22
### Section 2

10. How did you find the response time between your acceptance letter from NERC and instrument time allocation?

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prompt</td>
<td>47.8%</td>
<td>33</td>
</tr>
<tr>
<td>Acceptable</td>
<td>40.6%</td>
<td>28</td>
</tr>
<tr>
<td>Lenghty</td>
<td>11.6%</td>
<td>8</td>
</tr>
</tbody>
</table>

**answered question**: 69  
**skipped question**: 25

11. After receiving the acceptance letter from NERC, how long did you have to wait to get instrument time? If you have had multiple applications over this period, please say the average return time.

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 month after receiving the NERC letter of approval.</td>
<td>4.3%</td>
<td>3</td>
</tr>
<tr>
<td>Between 1 and 3 months after receiving the NERC letter of approval.</td>
<td>52.2%</td>
<td>36</td>
</tr>
<tr>
<td>Between 3 and 6 months after receiving the NERC letter of approval.</td>
<td>39.1%</td>
<td>27</td>
</tr>
<tr>
<td>Longer than 6 months after receiving the NERC letter of approval.</td>
<td>4.3%</td>
<td>3</td>
</tr>
</tbody>
</table>

**answered question**: 69  
**skipped question**: 25
12. How did any delay in getting instrument time affect your research?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>69.1%</td>
<td>47</td>
</tr>
<tr>
<td>Minor problem</td>
<td>29.4%</td>
<td>20</td>
</tr>
<tr>
<td>Major problem</td>
<td>1.5%</td>
<td>1</td>
</tr>
<tr>
<td>Catastrophic (please explain)</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question 68 skipped question 26

13. The IMF has a "One-Day" application procedure to allow for fast access for "short projects" and "proof of concept" studies prior to a full application. Do you consider this type of application to be:

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very useful</td>
<td>63.9%</td>
<td>46</td>
</tr>
<tr>
<td>Useful</td>
<td>18.1%</td>
<td>13</td>
</tr>
<tr>
<td>Not necessary</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Yes, but not used it yet.</td>
<td>18.1%</td>
<td>13</td>
</tr>
<tr>
<td>Don't know</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question 72 skipped question 22
14. Complaints about the application procedure, instrumentation access or support can be sent to either the Chair of the IMF Steering Committee or the Service Contract Officer at NERC. Do you know about this complaints procedure?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>44.4%</td>
<td>32</td>
</tr>
<tr>
<td>Yes, I have used it</td>
<td>1.4%</td>
<td>1</td>
</tr>
<tr>
<td>No, I did not know about it</td>
<td>54.2%</td>
<td>39</td>
</tr>
</tbody>
</table>

answered question 72
skipped question 22

15. Please add any additional comments concerning "Your Application"

Response Count
16

answered question 16
skipped question 78

16. How did you first hear about the IMF?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through other colleagues</td>
<td>80.0%</td>
<td>72</td>
</tr>
<tr>
<td>From the IMF website</td>
<td>11.1%</td>
<td>10</td>
</tr>
<tr>
<td>From the NERC website</td>
<td>2.2%</td>
<td>2</td>
</tr>
<tr>
<td>From a conferences or seminar</td>
<td>2.2%</td>
<td>2</td>
</tr>
<tr>
<td>From the Published literature</td>
<td>10.0%</td>
<td>9</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>7.8%</td>
<td>7</td>
</tr>
</tbody>
</table>

answered question 90
skipped question 4
## 17. Did you find the IMF web pages useful in understanding more about the Facility and how to apply for access?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>95.5%</td>
<td>84</td>
</tr>
<tr>
<td>No</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Did not look</td>
<td>4.5%</td>
<td>4</td>
</tr>
</tbody>
</table>

Please comment on any improvements that can be made to the IMF web page

- answered question: 88
- skipped question: 6

## 18. Did you find the NERC web pages useful in understanding more about the Facility and how to apply for access?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>39.3%</td>
<td>35</td>
</tr>
<tr>
<td>No</td>
<td>10.1%</td>
<td>9</td>
</tr>
<tr>
<td>Did not look</td>
<td>50.6%</td>
<td>45</td>
</tr>
</tbody>
</table>

Please comment on any improvements that can be made to the NERC or IMF web page

- answered question: 89
- skipped question: 5
### Section 2

#### 19. How many years have you been using the IMF

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>22.7%</td>
<td>20</td>
</tr>
<tr>
<td>Between 1 and 5 years</td>
<td>51.1%</td>
<td>45</td>
</tr>
<tr>
<td>More than 5 years</td>
<td>26.1%</td>
<td>23</td>
</tr>
</tbody>
</table>

Answered question: 88
Skipped question: 6

#### 20. How frequently do you use the IMF?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than once per year</td>
<td>13.5%</td>
<td>12</td>
</tr>
<tr>
<td>On average about once per year</td>
<td>37.1%</td>
<td>33</td>
</tr>
<tr>
<td>Less than once per year</td>
<td>49.4%</td>
<td>44</td>
</tr>
</tbody>
</table>

Answered question: 89
Skipped question: 5

#### 21. Based on your experience do you think the Cameca ims 4f is:

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>I've not used this instrument</td>
<td>15.3%</td>
<td>13</td>
</tr>
<tr>
<td>Modern</td>
<td>28.2%</td>
<td>24</td>
</tr>
<tr>
<td>Requires up-dating</td>
<td>47.1%</td>
<td>40</td>
</tr>
<tr>
<td>Requires replacement</td>
<td>9.4%</td>
<td>8</td>
</tr>
</tbody>
</table>

Answered question: 85
Skipped question: 9
### Section 2

22. Based on your experience do you consider the Cameca 1270 to be:

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>I've not used this instrument</td>
<td>44.8%</td>
<td>39</td>
</tr>
<tr>
<td>Modern</td>
<td>52.9%</td>
<td>46</td>
</tr>
<tr>
<td>Requires up-dating</td>
<td>2.3%</td>
<td>2</td>
</tr>
<tr>
<td>Requires replacement</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

answered question 87

skipped question 7

23. Excluding routine maintenance procedures (e.g. gun cleaning) has a major failure of the instrument compromised your project?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>70.8%</td>
<td>63</td>
</tr>
<tr>
<td>Occasionally but did not create any real problem</td>
<td>28.1%</td>
<td>25</td>
</tr>
<tr>
<td>Often and it did create problems with my project</td>
<td>1.1%</td>
<td>1</td>
</tr>
</tbody>
</table>

answered question 89

skipped question 5
## Section 2

### 24. In the event that the instrument failed while you were using it, how did you rate our response?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>94.1%</td>
<td>48</td>
</tr>
<tr>
<td>Adequate</td>
<td>5.9%</td>
<td>3</td>
</tr>
<tr>
<td>Poor</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

- answered question: 51
- skipped question: 43

### 25. Please add any additional comments concerning "Ion Microprobe Instrumentation"

- answered question: 30
- skipped question: 64

### 26. How did you rate the quality of our service and support?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>91.1%</td>
<td>82</td>
</tr>
<tr>
<td>Good</td>
<td>7.8%</td>
<td>7</td>
</tr>
<tr>
<td>Average</td>
<td>1.1%</td>
<td>1</td>
</tr>
<tr>
<td>Poor</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

- answered question: 90
- skipped question: 4
Section 2

27. It is our policy to offer all new and inexperienced users some basic training during their visit. Bearing in mind the limited time available, how do you rate the training provided?

<table>
<thead>
<tr>
<th>Rating</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>67.1%</td>
<td>57</td>
</tr>
<tr>
<td>Good</td>
<td>28.2%</td>
<td>24</td>
</tr>
<tr>
<td>Acceptable</td>
<td>4.7%</td>
<td>4</td>
</tr>
<tr>
<td>Poor</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

Answered question: 85
Skipped question: 9

28. What improvements would you like to see in the training offered?

<table>
<thead>
<tr>
<th>Improvement</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>More 'hands-on' training for a longer period of time</td>
<td>30.6%</td>
<td>19</td>
</tr>
<tr>
<td>More formal tuition or a formal course</td>
<td>30.6%</td>
<td>19</td>
</tr>
<tr>
<td>More notes</td>
<td>30.6%</td>
<td>19</td>
</tr>
<tr>
<td>More web based information</td>
<td>12.9%</td>
<td>8</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>21.0%</td>
<td>13</td>
</tr>
</tbody>
</table>

Answered question: 62
Skipped question: 32
29. How essential was the peripheral support provided by the SEM, EPMA, optical microscopy and sample preparation services to your IMF project?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential</td>
<td>55.8%</td>
<td>48</td>
</tr>
<tr>
<td>Convenient</td>
<td>16.3%</td>
<td>14</td>
</tr>
<tr>
<td>Not required</td>
<td>27.9%</td>
<td>24</td>
</tr>
</tbody>
</table>

answered question 86
skipped question 8

30. Please add any additional comments concerning "The Quality of Service" or how you think it can be improved.

Response Count

answered question 31
skipped question 63

31. The future of the IMF depends on the demand from the scientific community. Do you consider that the IMF is:

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential for your future research</td>
<td>52.3%</td>
<td>46</td>
</tr>
<tr>
<td>Provides a major contribution to your future research</td>
<td>31.8%</td>
<td>28</td>
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<tr>
<td>Provides a supplement to your future research</td>
<td>13.6%</td>
<td>12</td>
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<tr>
<td>Is not required for your future research</td>
<td>2.3%</td>
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answered question 88
skipped question 6
### Section 2

#### 32. Over the next five years, how often do you anticipate applying for IMF time?

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<td>Once in the next five years</td>
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<tr>
<td>More than once in the next five years</td>
<td>73.6%</td>
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<td>never</td>
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Answered question: 87
Skipped question: 7

#### 33. If you have used other Facilities, how do we compare?

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Answered question: 40
Skipped question: 54

#### 34. What changes would you like to see our service, the capability and the instrumentation?

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Answered question: 29
Skipped question: 65
### Section 2

35. Please highlight any other subject that you would like to bring to our attention such as future development that you may need, improvements in the service, changes in the application procedure etc.

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36. Your name (optional)

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37. Your e-mail address (optional)

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<td>skipped question</td>
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Section 3: Customer Comments from the Survey:

Q3. Was your science totally or partially funded by NERC?

Other funding sources:

- JIF and Edinburgh University funding (JIF funds did come via NERC)
- My supervisor was partially funded
- University of Bristol
- Part funded by NERC, British Geological Survey and university funding
- Australian Research Council,
- Stellenbosch University (South Africa).
- U.S. National Science Foundation
- Departmental
- Italian ministry of university
- own external grant
- NSERC (Canadian National Funding agency)
- Institutional funding (CESS) from India.
- University of Birmingham
- Partially by a grant from a private trust
- Natural Sciences and Engineering Research Council (NSERC) of Canada
- Edinburgh University, ECOSSE
- Italian Government
- Samples came from research under the Leverhulme Trust
- STFC, Leverhulme Trust
- Research grant.
- ORS/university PhD project (supervisor received NERC funding)
- Royal Society, London and Istanbul Uni.
- Icelandic Research Council – RANNIS
- Student partly funded by Leverhulme trust for one project
- Italian funding agencies
- ERC

Q5. Is there anything you wish to tell us about "Your Science?"

1) I work in the area of Planetary Science which is not currently identified as an area which NERC IMF facility supports. However, that is what I have used the IMF facility for and see a great potential for growth and Research upon diamonds and inclusions in diamonds; particularly studies of rare diamonds and mineral inclusions originating at depths of ca 250 to 800 km in the Earth’s mantle. Investigations in past have involved trace element studies of inclusions, and measurements of Carbon isotope composition and Nitrogen abundance in diamonds. The last study was on Nitrogen isotopes in diamonds.

2) Key science projects focus on the use of stalagmites and trees to develop high resolution records of environmental change. It is through the EIMF that we have managed to build some of the highest resolution archives of atmospheric pollution signatures, thanks to the ability of the facility to push the boundaries of science and develop innovative techniques.

3) Volcanology

4) Investigates the origin and evolution of the continental crust, using isotopes and geochemistry

5) my access was through the pilot scheme as only a small number of analyses were needed.
6) The main research topics related to the use of IM is Ti-in-Quartz thermometry
7) Tectono Thermal Evolution of Kerala Khondalite Belt.
8) My work represents a departure from the majority of IMF users in that it is motivated by biology and ecology. It has been well-received within my field of stable isotope ecology and, anecdotally, there is much interest amongst colleagues in using microprobe technologies to access novel datasets.
9) My research focuses on the formation of a specific type of mineral deposit (diamond) on a global scale
10) Petrophysics is an important theme of researches. The in-situ analyses allow a new perspective on rock and mineral chemistry, magma evolution, hydrothermal settings. The in-situ trace element measurement on variable sectors of minerals will allow constraints on time of magma evolution and rock alteration. The measurement of O, S, B...isotopes in glass and inclusions within minerals represents a key to understand degasing processes occurring at variable time during magma ascent and the contribite of magmas to gaseous emissions.
11) Cosmochemistry
12) Genesis of diamonds in Archean cratonic lithosphere.
13) PhD student project
14) greater demand in the future.
15) Mineral chemistry
16) My research involves the study of pre-eruptive volatile (carbon dioxide, water) concentrations in magmas supplying Kilauea Volcano, Hawai‘i. Variations in these volatile concentrations strongly influence eruptive behaviour at the volcano and thus an understanding of these is vital for hazard assessment and monitoring of basaltic volcanic systems. Access to the NERC IMF has been absolutely vital for this research as it is the only facility in the UK where analyses of the carbon and water concentrations in my samples could be performed.
17) Analysis of volatiles in glass inclusions within igneous minerals- Quantification of volcanic volatiles.
18) Projects I have been leading could only have been conducted at the IMF in Edinburgh. Analysis by SIMS was integral to the work, which would otherwise not have been possible. This is a unique facility within the UK which is key in enabling cutting edge research to be performed.
19) My research interests are focussed on marine biogeochemical cycles and their impact on climate. Past changes in micro-nutrient and macronutrient cycling in the ocean have the potential to modulate atmospheric CO2 levels. I used the IMF to understand of the role of micronutrient availability on marine biological productivity.

Q15. Please add any additional comments concerning "Your Application"

1) It’s a long form and bits are difficult to fill out. But the staff at Edinburgh are always willing to help.
2) In arranging my application and granting instrument time the IMF staff were very helpful in making me aware of the technical nature of the planned measurements and discussing the availability of necessary standards. This was important because I wished to measure Nitrogen isotopes in diamonds, and these are technically difficult because of the extreme variations in Nitrogen abundance that occur in diamonds.
3) Comment on the Steering Committee peer review process - I disagree with the way applications were ranked, which was on the basis of the perception of whether the science would generate a nature paper (this perception was required for top ranking). This approach is a poor way to judge science, especially when panel of better qualified people may have already approved funding of research by way of NERC Standard Grants. I also think that certain members of the committee had conflicts of interest, especially from a laboratory service point of view.
4) The delay between the meeting of the Steering Committee and the formal letter from NERC seems too long. It is sometimes possible to see that a project has been approved on the EIMF website before hearing from NERC. [Reply #1]

5) Is it really necessary to submit both electronic and paper versions of the proposal?

6) Very satisfied.

7) I cannot stress enough how valuable (scientifically and logistically) the one day application procedure is.

8) I think that the make-up of the steering committee for each application needs to be made clearer to the applicants. If the website is taken at face value, one might imagine that every member of the steering committee would be present at each meeting. This may influence how applicants write the short proposal, particularly in the way in which the background material is described. [Reply #2]

9) I do not understand why PhD students funded by NERC cannot apply for Ion Probe time as the “Principle Investigator”. I imagine in the majority of cases it is the PhD student who actually visits the facility and is likely to be the lead author on subsequent publications. [Reply #3]

10) Ion probe staff at Edinburgh were very helpful.

11) I find the application procedure to be streamlined and accessible.

12) The one-day pilot study program was instrumental in my case to ensure proof-of-concept before committing the time and energy to a full application.

13) I got lucky - my application beat the recent rush. I had four, week-long visits over about 18 months. I only waited a few months for my first visit (2008), but it was nearly 6 months to my last (2010) and some of my friends had to wait a year, which has serious implications for PhD projects now that NERC is insisting on a three deadline.

14) Application procedure is about right...a good balance between having to right a detailed, focussed application which needs to sell the importance of the work without being overly lengthy.

15) I was not allowed to be the PI on the application even though I designed the project and carried out all the work. This was because I was a student (NERC-funded) at Edinburgh and the rules state that I was not allowed to be the PI. I think this is unfair and should be changed if it is still the case. [Reply #3]

16) In practice, allocation of beam time works well, and every time has been able to be tuned to suit the needs of the student user.

17) The wait between approval and instrument time was purely a function of the complexity of our application, requiring different procedures and instruments, so was entirely justified.

18) When it was longer before getting on the instrument (6 months) it was through my own choice as it gave me more time to prepare samples.

Q25. Please add any additional comments concerning “Ion Microprobe Instrumentation”

1) The ims 4f remains a very valuable instrument for making measurements on trace elements; however, updating or replacing the 4f would increase its range of applications. [Reply #4]

2) Although the 1270 is not the latest instrument in its range, it has been enhanced and is clearly a 'state-of-the-art' instrument.

3) The Cameca ims4f, whilst being "mature" is an instrument that does a fantastic job. This can be put down to the effort expended by the facility staff to keep the instrument in such great shape. If an option were available to update to an instrument such as the Cameca ims7f-geo, that should be considered, but possibly as an addition to the existing infrastructure not a replacement. [Reply #4]

4) In nearly 20 years of using the IMF I have lost no more than a day or two to machine down time. Whether a Friday evening or a Monday morning staff came in promptly to fix the problem and so minimise impact.
5) Instrumentation has never ‘failed’ during use. Constant maintenance and support by staff at all hours has ensured successful project completion.

6) *EIMF staff* are always helpful.

7) The staff are excellent.

8) The 4f maybe old but it works well, mainly due to the dedication of *the staff* in particular. It would be great to replace the 4f with a more automated instrument as it is clearly getting old and more difficult to keep running. [Reply #4]

9) I have found IMF staff to have provided an excellent service- really "above and beyond" the call of duty. As someone with limited funds and based in a developing country, being able to send documented samples that can be run for me has been critical in being able to afford to collect data for my project. [Reply #4]

10) Although the ims 4f is a little tricky to use (the sample viewing part anyway), staff are extremely helpful and adept

11) Very, very minor problems - just as you would expect from complex instrumentation. *Staff* are especially great at getting the instruments operational again. He is an expert.

12) It would be nice to be able to programme the 4f to analyse points. [Reply #4]

13) It would be nice to be able to put more sample holders into the 1270 at the same time. [Reply #5]

14) Staff extremely helpful in fixing issues with instrumentation at all hours.

15) On one occasion instrument failure prevented me from obtaining a full dataset during the week allotted to me; EIMF facility members were extremely helpful and went above their duties to ensure that I got the data I needed.

16) The dedication of the EIMF team to "rapid response" in cases of problems or instrument failure, even late at night, is unique and I have never encountered anything similar in another lab worldwide

17) Chillers on roof failed during unusually cold weather. Instrument temperature rose and became unstable. Occurred on final evening of analysis - no real impediment on my project

18) Very well run, reliable, but some upgrade good help to be more efficient and competitive. For example a 1280 upgrade would give more reliable electronics and better software integration. A multiple sample chamber would give much higher throughput. [Reply #5], [Reply #6]

19) The 4f runs well but is very old and ideally, to remain competitive, it could do with update or replacement in the near future. [Reply #4]

20) Caveat to Q21 - IMS4f seems to have been around "for ever" but I don't question its utility in the hands of the IMF staff. Caveat to Q22 - while the 1270 has been superseded, I believe, by a newer version, I think they are basically similar. Nonetheless, I am conscious that even the 1270 must be around 10 years old. [Reply #6]

21) The ims 4f would greatly benefit from automation to allow at least a couple of hours' unattended operation. Would also be helpful to make data processing software available to users off site. [Reply #4]

22) There are more up-to-date ion microprobes in the market and we do not want to fall behind services offered by other countries eg Australia. [Reply #6]

23) Minor issues struck all four of my visits, but were promptly rectified and I was allowed to watch and ask questions (much appreciated).

24) The real quality of the instrument is the support. I have used other SIMS instruments - Edinburgh provide in my view the best service and reliability of any SIMS instrument I have used.

25) Response to instrument failure was more than 'good', it was fantastic, with every effort made to get it back online as soon as possible and where necessary sessions were rescheduled. I was incredibly grateful for this.

26) Support has always been excellent at the facility. Automated setting up of analyses for the 4f would be extremely helpful in my research and would decrease the
amount of time required for analyses as the instrument could run 24 hours a day (and with less delay between each analyses). [Reply #4]

27) My answer to point 11 "Requires updating" implies that the excellent continuous rebuild-refurbish work at the IMF might be time-limited by the availability of genuine components. Therefore, a pervasive updating of electronics may be considered. However, this question can only be addressed meaningfully by the IMF-staff. [Reply #4]

28) I have only ever used the 4f. It has always run perfectly...never had any problems. This is due to the expertise of the IMF staff, who are world class! If only other facilities ran as well!

29) The 4f is not really a modern instrument but I have ticked this box as it continues to operate effectively and produces high quality data within it's remit.

30) There is no other facility in the UK that can offer the expertise that the Cameca ims 4f can offer for geological applications.

31) The professionalism and experience of the staff help to make the facility world-class.

32) The instruments are run very well, thanks to the skill and dedication of the staff. This is the real strength of the facility.

33) I can't find an adequate response to describe the 4f- in my experience it ha been a real work-horse. It clearly isn't modern, but from my perspective does not need replacement. A little 'up-dating' might be useful but this can be more trouble than its worth. From the perspective of the IMF maybe it is becoming increasingly difficult to maintain- hard for a relatively occasional user to know [Reply #4]

34) Instrumentation is perfectly good for current needs, and satisfies a growing demand for measurements which are nonetheless becoming routine (e.g. volatiles in melt inclusions).

Q28. What improvements would you like to see in the training offered?

1) New users should be encouraged to visit the lab and view procedures before their allocated instrument time.

2) The training supplied is ideal.

3) There should a real emphasis on reminding students, who may never have dealt with real data before, that it is extremely important that they keep note of everything that is happening throughout the analyses and get them to focus on running sufficient suitable standards in order to be able to reliably estimate the precision and accuracy of the measurements.

4) I think that the information available has been very good for the one trip that I made to analyse samples myself.

5) Seems fine as it is.

6) The training, from a number of staff, was excellent and adequate for my needs

7) no suggestions, we received thorough, clear and efficient training

8) No improvement - see note 20.

9) I cannot fault the training at all!

10) I can think of no improvements. In my experience IMF staff work with users on a one-to-one basis to give excellent training.

11) It's up to users to engage and question at a level that is relevant to them and their interest

12) Would there be any value in having a one or two day annual short course and user conference? This could combine student/postdoc user presentations with practical discussions/taught sessions on things like how best to prepare samples; and on how to get the most out of the data. Perhaps the geochem group of the Geol Soc and the VMSG could assist with this? [Reply #7]

13) I think a formal one or two day course on the theory once a year would be good for new users or especially students. [Reply #7]
Q30. Please add any additional comments concerning "The Quality of Service" or how you think it can be improved.

1) The staff show great care and patience in their training, and I think the quality of service offered is first class. I suspect problems most often arise because users fail to prepare samples properly, or do not appreciate they are expected to be 'hands on'. If new users could take the opportunity to visit the Ion Microprobe Lab before their actual time allocation (see 28 above), they would be better prepared.

2) My selection for #28 regarding more formal tuition/courses, is aimed at the general need in the community to better understand the operation and application of ion microprobe technology in Earth Science. And the facility staff are the best people to do this. [Reply #7]

3) Some PhD students do come away from the IMF with a black box mentality. I realise the time for training is short, so a web-based tutorial would be helpful before coming up to IMF. I also think that because of IMF’s many years experience a short course could be offered by staff and guest lecturers for new and potential users once every 2 years. This would be along the lines of the old experimental petrology short course, held in Edinburgh in the days when people did experiments there. [Reply #7]

4) Given the complexity of the instrumentation, the training supplied is the best available. More 'notes' would make the analytical time 'literature heavy'. Hands-on training is apparent for as long as the user requires it. Users are never left alone if they do not feel comfortable and help is always on hand if needed. A formal course would be inappropriate given the time constraints whilst undertaking analysis. Given these factors, the training is the optimal which can be expected, maximising both analytical time and enabling ease of operation. [Reply #7]

5) Excellent service all round!

6) I think the IMF team do a great job.

7) Only people who run other machines know how difficult it is especially as a service. This facility is one of the best, if not the best.

8) This is the best facility I have ever used in my 20 years of being in science and having used many machines in various parts of the world. It not only the best in the UK, but I would suggest the best in the world.

9) As previously noted, overall the service provided has been excellent. My one concern has been to do with the time required to develop a matrix correction that could allow my d7Li data to be corrected. The availability of a then unpublished matrix correction for cordierite was the reason why I became interested in using the 4f at Edinburgh in 2007. The publication of the matrix correction has been hampered by the IMF staff member concerned having left the UK half-way through my project. Although other IMF staff have attempted to pick up the pieces, this problem has affected the development of the calibration significantly and has delayed my publications as a result. I am now at the stage where I will need to publish the raw data, without matrix correction. [Reply #8]

10) The quality of service is excellent. Not only were staff extremely helpful when I was looking at rather difficult samples (very small inclusions), but they went above what was requested and also provided some additional data which was also useful.

11) Exceptional support. A facility is only as good as the support scientists are real assets.

12) Again, I did not participate personally to these activities, but i can state that the service and the support that we asked was excellent.

13) I cannot fault the service at all. It is the perfect NERC facility with staff who know how to provide the service.

14) The service cannot be faulted.

15) The service at the ion probe lab in Edinburgh is the best I have experienced in almost twenty years of using geochemistry facilities across four countries and two continents.
16) Staff very helpful
17) Sample preparation was essential for our conodont isotope work
18) Again, the EIMF team goes out of its way to make things happening for customers.
   Regarding question 19: this obviously changes from project to project, but in at least every second project the work could not be done successfully without these ancillary services.
19) People working in the lab well support the research
20) Use of EPMA was essential but not possible in Edinburgh [Reply #9]
21) Not much to add, the quality of service is excellent
22) Staff very helpful and knowledgeable not only with the instrument but also help me a lot with my science.
23) I found the staff at the facility to be highly skilled and helpful and their input considerably improved the project.
24) Most impressed with level of service (though I doubt their families are so impressed!). You are always given enough training/support to avoid breaking anything, but they quickly give you more if appropriate and you demonstrate responsibility (brilliant when a PhD student). You very much feel like one of the family while up there, and staff are quick to respond to e-mailed questions after your visit.
25) Quality of service excellent. Without it, the facility would not be as successful or as productive.
26) Although the instrument did have problems I was most impressed how these were fixed without any loss of time or need for an engineer. It is the staff's expertise that makes the instruments run so well. NERC are lucky to have such excellent and knowledgeable staff.
27) We are all equal - but some of us are more theoretical than others. So - especially for those who never should touch instruments anyway it might be a good idea to establish a permanent position of a skilled technician who can start analytical sessions - and give an introduction to the instrument - on the run. Those who grab the techniques can continue on their own - the rest can work with the technician through the project - This saves instrument-time, gives better results and protects the instruments.
28) Quality of service is top rate. Training is very, very good. Having the SEM available is also very handy.
29) The IMF staff are a great asset. All the staff we have met at the IMF work hard to set-up the instruments and to support us during our sessions, including out-of-hours working. Staff are patient and have always made time to support us in the different stages of each project from planning projects and developments of new techniques through to instrument operation and discussion of results.
30) Quality of service was second to none. The staff are all approachable and always willing to offer help and guidance whenever it was needed (even at unsociable hours if it was necessary to keep the instrument working). I cannot fault the staff (or associated staff) of the IMF facility.
31) The quality of service is excellent
32) All really excellent, from sample preparation to instrument use round the clock!
33) The staff do an amazing job and will drop anything to help with any problems. They are also engaging and keen to discuss the science.
34) The help offered by the team is great. Personally I was unsure about best practices when using the SIMS and felt these could have been explained more.
35) I overall have a very good experience of this facility.

Q33. If you have used other Facilities, how do we compare?

1) Much higher level of support and commitment than other facilities used.
2) Excellent faculty - well run but dedicated and highly skilled staff.
3) Service provided by staff are outstanding and are the equal or better of most facilities I have worked with. The level of science support, both from day to day instrument operation to discussing data reduction and interpretation is second to none. In comparison to other labs, the scheduling of analysis is less flexible - based typically on a week-long basis and not days. Many projects benefit from collecting data in two tranches of shorter periods to allow data reduction and reflection before continued analysis. [Reply #11]

4) The need to use other facilities has never arisen as support has always been obtained at EIMF.

5) I have used a few other geochemical facilities in the UK, and I think that the IMF is the best. The commitment and expertise of the staff is extremely impressive, providing the lab with a strong international reputation. I have also used ion probes in labs in the US and Japan, and think that the strong reputation of the Edinburgh group is well-deserved: they work extremely hard and know what they are doing.

6) The dedication and attention to detail of the Edinburgh IMF staff surpasses that of any other ion microprobe lab I have worked in. This also applies to post-analytical support. I have always felt that the staff are absolutely committed to providing the best quality data - in the case of instrumental problems, the staff are very accommodating in rescheduling work. Other labs around the world could learn from this approach.

7) Excellent supervision and assistance by the facility staff. Very productive and efficient.

8) It's the staff that make a real jewel!

9) This is the best of the services I have used.

10) I haven't used any other ion probe facilities, but in general lab terms the IMF compares very favourably.

11) The best without any doubt. See previous comments.

12) I have used a Cameca 5f at the Institute for Study of the Earth's Interior (Misasa, Japan) for d11B work on tourmaline and have used SHRIMP ionprobes for geochronology extensively at the RSES, Australian National University. I think that the level of support and technical expertise at the IMF is extremely high, and certainly comparable to that at RSES. I haven't used the Cameca 1270 at Edinburgh, so can't directly compare performance of this instrument for U/Pb with that of SHRIMPs-II and RG.

13) As good user support as I have seen anywhere.

14) NERC are lucky to have this jewel in their portfolio.

15) I've used many facilities in the UK and Europe. The Edinburgh facility is by far the best - by a long way. I know how difficult it is to provide this kind of service, I just wish I could do it as well. The staff are excellent in helping and unconditional support - often at some crazy hour of the night. I hope the University and NERC appreciate the work they do. It's a gem of a facility, a jewel, and others should see how facilities should be run!

16) Really great! Reliable data and good reputation.

17) See above. The service is fantastic.

18) Extremely well.

19) I have used two other SIMS facilities (in the US and Germany) and EIMF is one league above (in the quality of the service and as an end-result, in the quality of the data obtained).

20) I ask for other labs, but the responses of the responsible were not appropriate, likely for interest conflict.

21) More responsive.

22) An excellent service and a unique facility within the UK.

23) Better than ***********. Staff is really efficient and experienced.

24) Access times are a lot longer, but support is excellent.
25) Very well, I have used ******** and both labs deliver the results required, offer excellent training and are extremely helpful.

26) IMF is the jewel in the NERC Facility crown offering a first-class Facility with excellent staff engaged with top quality science.

27) Practical user support rivals that provided at synchrotrons. The 'logistics' support were more rudimentary at IMF e.g. rather limited provision of food on site (partly because of snow). Excellent that users are allowed to work out of hours - not permitted at the EPSRC EPR facility in Manchester. Diamond Light Source and the EPSRC EPR facility in Manchester both organise and pay the accommodation and reimburse travel expenses. [Reply #10]

28) I have used SHRIMP and nano SIMS facilities around the world and the IMF facility is one of the best.

29) The turnaround between application submission and notification of acceptance was much was faster than other facilities applied to.

30) Slightly simpler than *******, but then with less instrumentation and faculties this seems likely.

31) Location better; costs generally better (especially if a UK user - I have temporarily left the country for a post-doc); people generally friendlier; results as good.

32) The best without a doubt.

33) Instruments are about similar at most facilities. It is the human interface at the IMF that is outstanding due to high level of expertise regarding the instrumentation and, more importantly, due to critical expert view on the data and what they might tell. So the IMF compares very well to the few similar places (USA) I know.

34) Extremely well. The IMF runs at a significantly higher level than other UK facilities and is at least comparable with large international facilities (synchrotrons etc) which I also use a lot.

35) You are an exemplary facility. This reflects the efforts of IMF staff, both in maintaining the instruments so that they operate efficiently and effectively, and in supporting users.

36) The IMF is extremely well run by an excellent team of people. The science that can be achieved with the Cameca ims 4f is unparalleled in the UK.

37) Much better organised and responsive than the STFC nano SIMS facility at ********

38) Very well.

39) Compared to other NERC facilities - very highly.

40) Very good facility

**Q34. What changes would you like to see our service, the capability and the instrumentation?**

1) The IMF, with its two ion microprobes, electron microprobe and SEM, is an exceptional modern facility. At present, the main additional capability I would like to see would be TEM capability (including focussed ion beam preparation); however, this would also require additional staff. For the coming years, attention must be given to enhancing and renewing, when appropriate, the existing instruments.

2) See above - some more flexibility of access. But outside of that, I would like to see more confidence from NERC in the great work this laboratory does. [Reply #11]

3) Clearer protocols for volatile analysis in glasses, including preference for certain standards, beam conditions, mass resolution etc.

4) It is very clear that demand far outstrips supply for IMF time. This can lead to problems for the progression of NERC funded science. I have anecdotal evidence for and direct experience of situations where projects have been funded by NERC standard grants (with high alpha-4 grading) but the steering committee have rejected the associated IMF application. An outside observer might infer that the process of peer-review, sifting, external review and committee ranking associated...
with the standard NERC grants carries less weight than the IMF steering committee meeting. In fact, I think that this lack of harmony between the grant funding and the provision of IMF time through the steering committee stems from high demand - if there was more capacity in the system then the needs of the community to carry out high quality research (as approved by NERC) would be met. While acquisition of a 1280-HR would meet this demand and secure the facility's international reputation. [Reply #12]

5) The IMF staff deserve more in the way of technical support.

6) A replacement for the 4f would be great. I would like to hear the staff's view on the nano-sims as this would make an ideal addition and from past record would be well run. [Reply #4, Reply #13]

7) As I only visited Edinburgh myself once and used only the 4f ims, my suggestions are really only to do with the imaging on the 4f for target acquisition, which seemed to be quite poor. I am not sure whether this can be improved or not, or whether it is an inherent feature of the older Cameca ims I'd also like to see. for my own purposes, for more matrix effect calibrations to be investigated for stable isotope work, but recognise that this would involve collaborations with other groups e.g. to access MC-ICP-MS. In the future I would definitely be interesting in coming back to work in Edinburgh on stable isotope problems, but would probably concentrate on d18O and d11B work, where there are a wider range of standards available, and matrix effects are better known e.g. d18O for garnet, zircon. [Reply #4, Reply #14]

8) The staff are overworked. It's difficult to sustain this level of service without out more staffing.

9) I have not used the 4f in the last 5 years although I used it many times before this time (about ten years ago). My guess is that this instrument must be getting close to needing a major overhaul or replacement but I don't know from personal experience. [Reply #4]

10) I think it is time to look for a replacement for the aging IMS-4f. A new instrument would make trace element work much easier and faster, and because of largely automated analyses, would allow to bridge the few hours of sleep that even the most dedicated user needs. [Reply #4]

11) More staff support to develop new methods. I have an ongoing supported project which continues to await method development. I understand that the current staff just do not have sufficient time/resource to complete development.

12) It's OK as it is

13) I do feel that for the facility to remain where it is, as one of the most successful and innovative ion probe labs in the world, updates to the 1270 (to be a 1280) in particular would be required in the near future. This will be crucial for my research to have access to the best facilities possible in the UK. Similarly, the 4f, which has been the workhorse for 20 years and still produces excellent science, will need an upgrade or replacement to ensure that its use can flourish and new capabilities can be developed. [Reply #4]

14) While I have every confidence in the ability of IMF staff to maintain the existing instrumentation, it must be of some concern that the basic infrastructure is quite old and, the current economic climate notwithstanding, there must be a strong case for new investment.

15) IMF staff should be allowed a small amount of machine time for their own personal research interests, as is typical at other facilities.

16) More up-to-date instruments if possible. A nano SIMS machine would be a major boost to my research. [Reply #13]

17) The Cameca 1270 is gradually being replaced by the 1280 model. At present I think the IMF is producing data to the same standard (or better) than the 1280 facilities, but if that changes I would hope the support is there for an upgrade. [Reply #6]
18) There is the issue of out of hours support. Our work has been supported regularly out of hours, but this puts a stress on the staff. Good staffing is expensive but it is the key to reliability.

19) For melt inclusion work, I would like to see a transmitted light image of the stage, to better locate inclusions. [Reply #4]

20) In an ideal world, it would be fantastic if the Cameca 4f could be updated such that analyses could become more automated rather than require manual input to set up each measurement. All other aspects of the IMF were brilliant though. [Reply #4]

21) Permanent technician/operator position at the IMF would be a clever addition to the capability. The reason is that the present permanent staff has far too many duties - and it is important to release their burden of trivial tasks - in order to gain a little time for personal research - because it is the personal research that creates their expertise.

22) The service and quality of the service is very hard to fault. No need to change something which works so well! Obviously I just hope that NERC continues to see how important the facility is, and what excellent value for money it offers.

23) What about a nano SIMS? [Reply #13]

24) The 4f is an excellent instrument which operates well and produces high quality data. At some point it will probably need to be replaced. I hoped it will be replaced by an instrument with a similar capability. [Reply #4]

25) It would not hurt to have another female staff member, although I realise this is not necessarily easy to realise.

26) An automated system on the 4f would be useful for obtaining more data, but I accept that this would be very costly. [Reply #4]

27) quicker access more application deadlines

28) How would a new 'next generation' instrument open up new areas of analytical science? And if there is demand across the UK community, how could we fund this?

29) The option to pay for the analysis, especially if you need to do a quick test, is not always there.

Q35. Please highlight any other subject that you would like to bring to our attention such as future development that you may need, improvements in the service, changes in the application procedure etc.

1) IMF is a truly world class facility that is essential for my research. I have been a user since 1993 and my students and post-docs come up regularly. I am always pleased with the service that I get, although as noted on previous page, I do think that IMF has been a little slow in refining and defining protocols for volatile analyses in glasses. There are now many standards available (some provided by Bristol) and it should be a straightforward matter to use certain standards and certain analytical conditions routinely. Sometimes when students come up to use the IMF it seems that the whole business of how to analyses is revisited over again. This is a minor quibble - keep up the great work! [Reply #16]

2) The application forms are short, and sometimes the steering committee may reject a proposal based on technical details that they feel have not been suitably addressed. On some occasions, it would be helpful if resubmitted documents were allowed extra space to deal with technical matters. This is how the response system to reviewers works for Standard Grants, and is good.

3) This IMF facility is the best NERC has and funding must be provided so it can continue. Grants are getting harder to get and these facilities enable us to continue with science.

4) This is exceptionally good use of NERC resources. It allows science to be continued given the difficulties of winning large research grants from NERC.
5) Frankly, from the technical point of view I can state that everything was fine with our collaboration with the IMF lab. I hope that, thanks to NERC funding the access for academic institutions outside UK can be free of charge (in the frame of scientific projects)!

6) More staff are required to reduce the workload.

7) The 4f looks quite old now but I understand it is still a great instrument. But to keep competitive, it should be replaced within the next couple of years. [Reply #4]

8) The 1270 is difficult to use, especially the software. The only reason it works is because of the staff. Again, it’s the staff that makes this facility the best. I cannot over emphasize the professionalism, the knowledge and the dedication they show. Out of hours cover is exceptional, always provided without question and in a great spirit. I don't know what their families must think, but it is really appreciated. I've always looked forward to visiting Edinburgh and hope to continue.

9) A smaller spot size for analysis would be welcome. [Reply #13]

10) A financial support for visiting. [Reply #10]

11) The present system may be allowed to continue for at least a few more years.

12) I found the application procedure to be a very strange process and nowadays avoid it like the plague (I rather go elsewhere then go through the proposal process again). The last time I submitted a proposal, the committee did not just expect a first class research proposal, it also wanted to hear speculative outcomes on what the results will be. I would call that mixing science and fantasy and don't consider that a good application review process. Apart from that, declining an application for a grad student project half a year after submission is blowing a huge hole in strict time lines and I am not exposing my students to such risks anymore.

13) Big instrumentations are expensive and the country must organize a network of operative labs to which researches can operate in collaboration. Sample preparation must be improved and possible to do by considering the specific procedures used by researches. Future developments should regard collaboration asked by specific request done by the NERC to each researcher that gained the access to the lab, on the basis of its competence.

14) I found the review procedure to be unnecessarily unhelpful and that great faith should be placed on scientists with a productive record from the probe rather than needless rewriting of proposals with very little end effect on the science actually done.

15) It would be good to be able to measure three isotopes of oxygen.

16) I think the application process is fair and the facility staff are helpful and supportive. I like the idea of having a fast route to gain some preliminary data.

17) It is a world class facility and I would like to see it fully supported by the NERC. However, some of my research is in planetary science, an area that does not fall under the NERC remit. While I have been granted access via the NERC facilities route to carry out this work, there seems to be a need cross-council support of the Facility.

18) Through colleagues and other contacts I am aware of growing interest in the nano-scale characterisation of biomedical materials. Some of this is fit to NERC remit and may offer opportunities for the UK to build on the foundations offered by the IMF. [Reply #13]

19) I do not have any other comments except that once the application for IMF time is successful, NERC is already committing machine time worth several tens of Ks and it is a shame that they do not consider providing a small sum of associated travel funding (rarely exceeding £500) to enable those investigators who do not have any other source of funding to make multiple trips to the IMF facility. [Reply #10]

20) Staff and tuition excellent. Addition of nano SIMS to the facility would be advantageous. [Reply #13]
21) At present the IMF’s biggest trouble is its popularity; wait times for access are just too long. I do know several people who received months of time on either or both machines, which must be blocking other, less intensive users. As for me, I am now based outside the UK, and my new department has relationships with another facility which costs a bit more but can book me in with a comparatively short turnaround. Much as I would like to use the IMF, in this project it will not be possible, but if I return to the UK it may once again be the best choice.

22) I find the changes in the way that IMF (and other facilities) are included in NERC grants confusing. This needs to be clarified. Is a successful standard NERC grant circumventing the IMF application procedure? Are FEC for IMF time attributed to the grant? [Reply #15]

23) It might be interesting to consider Laser Ablation analysis and profiling of minerals - as an additional method preceding actual Ion Probe analysis. Chemical and isotopic mapping.

24) I think the dedicated staff in charge will have the best perspective on ways to move the facility forward in terms of analytical developments, meshing problems of keeping up-to-date with being able to maintain a first class service. I would have thought that it might be time for further hardware investment, but would not want to foist this rather uninformed advice on the facility. The facility is a shining; sadly rare example of how central facilities can work to be of huge benefit to the wider community and it would not be good to tinker too much with the well tested model.
Section 4: IMF Responses to the Customers Comments.

Reply #1
The IMF staff are aware of the delay between the Steering Group Committee meeting and the letters that are sent from head office at NERC. The aim is to have a turn-round time of less than two weeks.

After receiving the acceptance letter from NERC, instrument time is allocated on a first-come first-served basis. The time constraints of the applicant are accommodated as far as possible.

Reply #2
It is true that some meetings do not have all members of the Steering Group present and our international member only attends once per year. However, if a member cannot attend, their e-mail comments on the applications are presented by the Chair. In future, the IMF will publish the minutes of the meeting on the web site so that the process becomes more transparent.

Reply #3
Any applicant who is eligible to apply for a NERC grant or training award as a PI or a Co-I is eligible to apply for access to a Facility. This NERC policy does exclude PhD students and this comment should be addressed to NERC. Section C of the Research Grants Handbooks gives further details about eligibility. The above policy does not preclude customers, who do not satisfy the above criteria, from receiving support from a Facility in return for the payment.

Reply #4
The Cameca ims-4f is now 24 years old. Replacement components are getting more difficult to source, maintenance time is increasing and instrument reliability decreasing. The modern Cameca ims-7fgeo is its equivalent replacement. There are several design improvements that would improve the precision of the analysis and modern electronics that would improve the stability and reliability, but most significantly some analyses could be automated and unattended overnight operation would be feasible. This alone would improve through-put and ease-of-use for the customers. The list price for a 7fgeo is ~£1,800,000.

Upgrading of the 4f has taken place with a new interface and software. Further upgrades to the vacuum system may be required as the original pumps are no longer supported by the manufacturer. However, any larger upgrades may not be cost effective.

The comments on the quality of the light optics of the 4f are justified. However, all Cameca ims range of instruments have the same optical design and an up-grade to better optical design or installation of transmitted light would be difficult and expensive. The onus is on the customer to become familiar with their gold coated sample in reflected light.

Reply #5
Cameca sell a six-sample air-lock system for ~£140,000. The staff find it difficult to justify this expense and have constructed a 4-sample air lock for the 1270 that should be installed before 2012.

Reply #6
The Cameca ims-1270 is nine years old. The equivalent replacement instrument is the ims 1280HR that has increased transmission and a higher mass resolution, modern electronics, simplified interface and a Windows based operating system. The list price is £3.4m. An upgrade of the 1270 electronics is estimated at £1.2m and is believed not to be cost effective at the current time.
Reply #7
The IMF staff are more than willing to provide as much or as little hands-on training as the customer requests. The onus is on the customer to ask but NERC must recognise the time and cost implications of extending the hands-on training by any significant proportion. Any increase in hands-on training would reduce the number of applications that can be accepted.

The IMF staff acknowledge the need for more training and will discuss with NERC the financing of a UK wide analytical course for new PhD and post-doctoral researchers that should cover all analytical facilities supported by NERC Services and Facilities, and not just the IMF. It will be proposed that this course takes place every two years at various locations throughout the UK.

Documentation, especially on sample preparation and analytical procedures are continually being produced and published on the IMF web site. It is recognised by the IMF staff that more documentation and tutorials need to be provided.

Reply #8
Finding and characterising isotopically homogenous standards for complex solid-solution minerals that covers the compositional range required is an incredibly time consuming task, not helped in this instance by Dr Kasemann leaving Edinburgh for a professorship in Germany. The initial measurements made of lithium isotopes in cordierite demonstrated the presence of a strong matrix dependency (principally correlating with the Mg#). A similar dependency had previously been observed for olivine. Re-analysis of the original standards together with a newly acquired Fe-rich standard has now been made and should help to resolve the calibration issue.

Reply #9
Difficulty in accessing the Electron probe can only be attributed to the lack of dedicated staff at this specific time. During this survey period there were two changes of EPMA staff and continuity of access could not be guaranteed.

Reply #10
The IMF staff are aware that the cost of travel and accommodation can make a visit to the laboratory expensive. For the IMF, it is estimated that if all customers travel and accommodation were supported, it would be close to the running cost of the ims-4f. The IMF Facility will pay for travel and accommodation if the customer needs to return to the Facility because of instrumental failure.

Reply #11
The IMF acknowledges that for some projects, especially experimental work, short and rapid access is essential and shorter periods of access may be a more efficient use of the limited time available. To accommodate these clients the IMF keeps 2-3 days per month available and if the project is feasible within this time frame, and does not disrupt the scheduled work, then these days are available.

Reply #12
There is a common belief in the community that there is a double jeopardy with having to apply to the IMF steering committee as well. The process of assessment and capacity allocation for grant-funded facility access is different from the research grants peer-review process. In most grant applications the actual details of the analytical aspect is absent, so the IMF dimension has not been assessed. Also, peer-reviewers of the grant are not always experts in the facility aspect, so again it will probably not have been expertly reviewed. The facility steering committee also takes into account facility-specific aspects such as capacity, logistics etc. Double jeopardy is addressed in the NERC documentation on the IMF web site.

Reply #13
The Cameca nano-SIMS would complement the existing facilities in Edinburgh but would also require an increase in staffing. Over the previous five years there have only been a
couple of enquiries that the IMF staff has advised the client to contact the nano-sims facilities in Oxford or the Open University.

**Reply #14**
Finding and characterising isotopically homogenous standards for minerals that have complex solid-solutions is an incredibly time consuming task and requires cooperation with other laboratories. The collaboration between the IMF and other NERC facilities has recently been formalised and approved and this should reduce the time-lag in standard development. The development of robust matrix corrections, and the investigation of crystal orientation effects, will however always be a slow process. The Facility is continually developing corrections for a variety of mineral groups.

**Reply #15**
Clarification on the costing of IMF access into grant applications has created confusion over the past five years. This has recently been rectified by NERC and we believe the procedure is more clearly defined in NERC's Services and Facilities Policy and Procedures Manual that is now available on the IMF web site.

**Reply #16**
The development of the analytical procedure for the measurement of carbon in basaltic glasses has been problematical due to the lack of well-characterised standard material of the right composition. Initial calibrations based on alkaline carbon-rich glasses have now been shown to be unsuitable for the calibration of common basaltic glasses. However, IMF has now obtained an extensive suite of basaltic glasses that have been calibrated using a combination of bulk FTIR and weighed concentration data. Original measurements in our lab have been re-calculated based on measurements made on secondary standards (with a close match to basaltic glasses but at the time unknown C contents) which were run together with all the unknowns.
Section 5: Letter of Complaint

Date: Fri Oct 08 17:02:06 BST 2010

From: Jon Blundy To: ionprobe@ed.ac.uk Subject: Message to Steering Committee

Dear Committee,

In anticipation of the upcoming IMF Steering Committee I am writing to clarify my situation with regard to proposals emanating from my group at Bristol.

As you will probably be aware, I have had a long and fruitful relationship with the IMF. I first visited in 1993 since when I have published 48 papers using IMF-generated data, which is a good return, I think. These papers have been quite highly cited too. Latterly I use the IMF much less myself, although I have a large research group, many of whom need the IMF for their own projects. At the moment I have 7 PhD students and 7 post-docs working with me. Of these, only two are post-doctoral fellows and therefore eligible to be PIs on IMF applications. For all of the others, students and post-docs, I stand as PI. This creates the rather unfortunate situation that I, as an individual, appear to be associated with a disproportionate amount of IMF activity. I am concerned that this will prove an impediment to project approval, even if the proposals all met the exacting technical standards of the Committee. Unfortunately there is not a lot I can do about this at the Bristol end. It would be unfair of me to selectively or strategically choose one student or post-doc over another to minimise the number of applications. On the table at the coming Committee meeting there will be proposals with me as PI. I can't imagine that NERC would ever considering limiting the number of three applications per PI, in the style of research grants. The IMF is a scientific instrument not a three-year research grant and for someone with a large group it is inevitable that a large number of applications will be submitted.

This e-mail is designed only as clarification. I am not asking for special treatment and expect that, as ever, all IMF applications will be judged on their individual merit. I just would not like to think that perceptions of unfair distribution of IMF resources would cloud the Committee's judgement. Quite simply, the IMF is key to my own research activity. Were the quality of data not so high, and the level of support not so exemplary, I wouldn't keep coming back! The IMF has really helped my group to produce some great research over the years.

Best,

Jon Blundy
Dear Prof. Blundy,

Ion Microprobe Facility

I am writing in response to your letter to the Ion Microprobe Facility steering committee dated 8th Oct 2010. Apologies for the length of time it has taken to respond.

First of all let me reassure you that NERC has no intention of introducing a limit on the number of proposals a PI can submit to a facility steering committee as we recognise that, as in your case, a PI can oversee several students and junior researchers that are not eligible to apply to use the facility in their own name. Even if a PI has a smaller research group than yours, there are still occasions when the timing of grants/studentships means that facility usage coincides and we receive multiple applications at the same time. We do not want to delay projects by imposing quotas. NERC wishes to support the best science with the resources available and the committee assesses each application on its individual merit.

As you will be aware, on occasions the demand for a facility is greater than their capacity and we have to prioritise projects. There are set guidelines to do this based on the type of project it is, with NERC grant/studentship related work taking priority, and regardless of who is leading the project.

I hope this has addressed your concerns.

Yours sincerely,

Dr Adele Gardner
NERC Services and Facilities
Management Team

c.c. Prof R. Parrish, Prof S. Harley, Dr J. Craven, Dr R. Hinton