

## PARTICLES RETRIEVAL ADVISORY GROUP (DOUNREAY)

### SUMMARY OF DISCUSSION and RECORD OF RECOMMENDATIONS and ACTIONS

#### 10<sup>th</sup> MEETING OF THE PARTICLES RETRIEVAL ADVISORY GROUP (DOUNREAY) – 24<sup>th</sup> October 2012

#### Members Present:

Prof Alex Elliott (Member) – **AE (Chairman)**  
 Prof Tim Atkinson (Member) - **TA**  
 Dr George Hunter (Member) - **GH**  
 Prof Marian Scott (Member) – **MS**  
 Dr Andrew Tyler (Member) - **AT**

#### In Attendance:

Ms Joanne Brown (Observer, HPA) - **JB**  
 Mr Phil Cartwright (Observer, DSRL) - **PC**  
 Mr Hugh Fearn (Observer, SEPA) - **HF**  
 Ms Anna MacConnell (Observer, NDA)- **AM**  
 Mr Bill Thomson (Observer, DSRL) – **BT**

Ms Susan Carswell (SEPA) - **SC**  
 Mrs June Moore (Administration) – **JM**

#### Apologies:

Dr Paul Dale (Technical Secretary) - **PD**  
 Mr Jim Gemmill (Observer, SEPA) – **JG**  
 Mr Martin Macdonald (Observer, SG) - **MM**  
 Mr Mark Toner (SEPA) - **MT**  
 Observer, DSG

Agenda Item	Summary of Discussion	Recommendation	Action	Status	Target Date
<b>1</b> <b>Chairman's Introduction</b>	The Chairman welcomed all present to the 10 <sup>th</sup> PRAG meeting. He advised the meeting that, due to other SEPA commitments, apologies had been received from Dr Paul Dale, Mr Jim Gemmill and Mr Mark Toner. Ms Susan Carswell (SEPA) was in attendance at this meeting as the nominated alternate for Mark Toner.	It was <b>noted</b> that Mr Hugh Fearn was in attendance representing SEPA at this meeting.			

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<b>1</b> <b>Chairman's Introduction</b> <i>(continued)</i>	<p>June Moore advised the Group that apologies had also been received from Mr Martin Macdonald, Observer for the Scottish Government. Mr Macdonald had informed JM yesterday that, regrettably, other SG priorities would prevent him from attending today and requested that his formal apologies be conveyed to the Members.</p>	<p>It was <b>noted</b> that the SG had responded to an invitation to send an Observer to attend PRAG meetings.</p> <p>Due to unavailability of a projector until 12:30 it was <b>agreed</b> that the Agenda would be amended to defer any items with presentations until after lunch.</p>			
<b>2</b> <b>Minutes</b>	<p>AE informed the meeting that the draft note of the August 2011 Workshop is still not available.</p>	<p>It was <b>noted</b> that any actions arising from the August Workshop had been superseded by subsequent minutes.</p>	<p>It was <b>agreed</b> that action to provide a note of the August Workshop would be closed.</p>	<b>Closed</b>	
<b>2.1</b> <b>Record of Previous Meeting(s)</b> <i>Papers M10/01</i>	<p>The draft Summary of Discussion and Record of Recommendations and Actions from the meeting held on 18<sup>th</sup> July 2012, M10/01, was accepted without amendment.</p>	<p>.</p>	<p>July meeting minute to be published on the Website.  <b>JM</b></p>	<b>Open</b>	<b>ASAP</b>
<b>2.2</b> <b>Actions Arising</b> <i>Paper M10/02</i>	<p>In the Tec Sec's absence, the Chairman led the Group through the actions outstanding from the previous meetings.</p>	<p>The outstanding action points in Paper M10/02 were considered and <b>noted</b> as closed, superseded or carried forward as ongoing actions.</p>	<p>Actions carried forward or deferred from previous meetings to be recorded as an appendix to this document.  <b>AE &amp; JM</b></p>	<b>Open</b>	<b>For next meeting</b>

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<p><b>3</b> <b>Dounreay Authorisation</b></p>	<p>The Chairman stated that, in PD's absence, HF would address this item and he invited HF to update the meeting on the Dounreay Authorisation review consultation.</p> <p>GH requested, through the Chair, to inform the meeting that The Scottish Councils Committee on Radioactive Substances (SCCORS) may also respond to the Dounreay Authorisation Consultation and may request the assistance of GH, as a consultant, in preparing such a response.</p> <p>AE thanked GH for formally noting this and, on behalf of the Group, said that he did not envisage any conflict of interest arising from GH's possible input to the SCCORS response to the Consultation.</p> <p>HF informed the meeting that SEPA is currently considering potential changes to Dounreay's Authorisation. SEPA has followed 'normal' procedure by publishing the application and additional documentation on the SEPA website and inviting public consultation. HF advised the Group that SEPA has undertaken an assessment of the beach monitoring requirements and is proposing that the monitoring programme is revised. HF informed the meeting that the authorisation contains a proposal for the revision of the programme of future beach</p>	<p>The Group <b>noted</b> the scope of the SEPA review and the proposed revised beach monitoring regime. It was <b>noted</b> that this document, together with DSRL's application and additional documentation, is available on the SEPA website for review. It was also <b>noted</b> that the closing date for receipt of views or comments on the consultation is <b>30<sup>th</sup> November 2012</b>.</p> <p>The Group discussed the proposed revised beach monitoring programme outlined by HF and <b>noted</b> the merit of a continued programme of surveying on each beach.</p>			

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<p><b>3</b> <b>Dounreay Authorisation</b> <i>(continued)</i></p>	<p>monitoring, which he outlined to the Group. HF confirmed that, as part of the public consultation process, SEPA is seeking views on its proposed revisions to the monitoring regime and has invited comment from this Group.</p> <p>HF led the Group through the SEPA “Consultation for Discretionary Consultees and the Public” and outlined each section of the document. He advised that SEPA is conducting a public consultation to obtain views and comments from all interested parties on the application it has received from DSRL under the Radioactive Substances Act 1993 in respect of premises at Dounreay.</p> <p>HF stated that SEPA’s procedure will review all aspects of the potential programme of requirements, including definition of objective(s) for monitoring, the surveying frequency, equipment detecting capabilities and continuation of future monitoring.</p> <p>HF informed the Group that SEPA was not undertaking a Contaminated Land Assessment at this stage. He advised that Appendix 2 (long term strategy) is included in the authorisation but it will be reviewed periodically and varied as required.</p>	<p>AE <b>suggested</b> that the Group return to deliberations on the beach monitoring regime under Item 4 on the Agenda (4.5)</p> <p>In response to AT’s enquiry regarding the timescale, it was <b>noted</b> that the new authorisation will be issued and implemented sometime during 2013. HF confirmed that, in the meantime, monitoring will continue to the current requirements.</p> <p>The Chairman <b>suggested</b> that the Members read the consultation documentation and give consideration to this issue before the next PRAG meeting. The scope of the Group’s view was discussed and it was <b>recommended</b> that its considerations should extend wider than frequency of monitoring, in accordance with PRAG’s remit to provide advice to SEPA.</p>	<p>It was <b>agreed</b> that PRAG would provide a Group response to SEPA and that this matter would be considered and discussed at the November meeting. <b>AE + Members</b></p> <p>It was <b>agreed</b> (at HF’s request) that if a Group view on beach monitoring is submitted in response to the consultation, it should be accompanied by the Group’s explanation in support of making those recommendations. <b>AE + Members</b></p>	<p><b>Open</b></p> <p><b>Open</b></p>	<p><b>For Nov mtg (before closing date of 30 Nov)</b></p> <p><b>For Nov mtg (before closing date of 30 Nov)</b></p>

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<b>3</b> <b>Dounreay Authorisation</b> <i>(continued)</i>	AE confirmed that, as Chairman of PRAG(D), he had received a letter from SEPA, seeking the Group's views on the consultation. The letter would be disseminated to Members and all other relevant documentation could be accessed on the SEPA website.		SEPA letter requesting PRAG comments on Dounreay Authorisation to be distributed to Members. <b>AE/JM</b>	<b>Open</b>	<b>ASAP</b>
<b>4</b> <b>Surveys Update – Beaches</b>	The Chairman proposed that this item be deferred until after lunch.	Deferred; awaiting projector for DSRL presentation update.			
<b>6 (brought forward)</b> <b>Investigation of 'Unusual Particle'</b>	<p>AE advised that this item would be brought forward for discussion and invited DSRL to provide a resume of the results to date.</p> <p>PC stated that the full report is still pending and laboratory work is taking longer than anticipated. He provided an oral update on the test results available so far and the early indications of further analyses.</p> <p>The Group discussed PC's verbal report at length and various questions and views were considered. PC informed the meeting that two particles, those with 4000:1 and 400:1 beta to beta gamma signals, had dissolved in a strong hydrochloric reflux test.</p> <p>PC reported that a particle, with a low caesium but high beta signal, was found at Barrier 31 this week and is currently being subjected to scanning</p>	<p>It was <b>noted</b> that 5 particles are being subjected to a range of tests, including standard gastric and dissolution tests. Three of these particles, retrieved from Sandside, are being used as 'controls': 3 higher activity particles were selected for this purpose from a total of 58 available.</p>			

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<p><b>6</b> (brought forward)  <b>Investigation of 'Unusual Particle'</b>            (continued)</p>	<p>electron microscopy. This particle was detected close to the surface during routine survey of the licensed site, using an alpha-beta probe.</p> <p>An extensive and wide-ranging discussion ensued during which further information was provided by DSRL on the 'unusual' particles.</p> <p>Various other systems of detection equipment were discussed. PC was of the opinion that the skilled operators monitoring the site over the past two years would not have missed multiple finds of this nature. PC stated that the Groundhog system can detect beta rich particles better than the dedicated beta system, but he did not believe that any equipment currently exists that could specifically detect this type of particle.</p> <p>PC indicated that after an initial review of particles recovered from the Foreshore, Offshore and on Sandside, the data are now being examined more formally and in greater detail to try to determine if there are any links with previous finds. The initial check for caesium and high niobium indicated 9 potentials out of 3,000. PC concluded by stating that the presence of niobium is a 'comforting factor'.</p>	<p>The probability of successfully detecting this type of particle was discussed and it was <b>noted</b> that PC has some confidence of detection by the skilled operators.</p> <p>It was <b>recommended</b> that more information should be sought on the particle provenance and potential source.</p> <p>It was <b>noted</b> that the final report on all tests was expected from the Lab in approximately one month.</p> <p>It was also <b>noted</b> that the same technique has been used for analysis of all other particles, which has given the correct ratios.</p> <p>It was <b>noted</b> that MS suggested that an extension to the completion date of the Group's final report - to the end of the FY - would provide valuable time for a more detailed view of the investigation for inclusion in the report.</p>	<p>Based on the questions, views and suggestions discussed today, it was <b>agreed</b> that further information is required before the Group is able to understand and predict the likelihood of the existence of other caches of this type of particle and any potential hazards and resultant risks it could pose.</p> <p><b>DSRL</b></p> <p>It was also <b>agreed</b> that a chapter on the 'unusual' particle should be included in PRAG's forthcoming report, although the full and final laboratory report may not be available in time for the Group to provide a comprehensive view.</p> <p><b>AE + Members</b></p>	<p><b>Open</b></p> <p><b>Open</b></p>	<p><b>ASAP</b></p> <p><b>For Nov mtg</b></p>

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<p><b>7</b> <b>Preparation of Group's 2011 and Final Reports to SEPA</b></p>	<p>The Chairman invited the Members to consider the various sections required and information for inclusion in the report. He suggested chapters covering:</p> <ul style="list-style-type: none"> <li>• an Introduction, in terms of the last report;</li> <li>• unusual particles as part of above, or in separate section;</li> <li>• underwater recovery, with subsection on data available and comparison between two systems (changed since last report) – how the new system compares to the earlier one;</li> <li>• beach monitoring, to include test data and comment on how it relates to, in theory, finding particles that we would not be expecting it to find.</li> </ul> <p>The potential for the Group's work to be finished upon completion of this report was discussed. AE advised the meeting that, in PD's absence, this was difficult to address, but it was his understanding that SEPA hopes the forthcoming report is the final report from this Group, although there may be a small successor group with a watching brief - which would not be the Particles Retrieval Advisory Group.</p>	<p>It was <b>noted</b> that the Members have all the sub-sea laboratory data in DSRL's report (M10/003), papers M10/004a-d, and as presented today.</p> <p>It was <b>suggested</b> that further data on the beach monitoring may be necessary. AT requested a spectrum from the Sr-90 particle detection, i.e. an indication of bremsstrahlung.</p> <p>During discussion on the beach monitoring data, it was <b>noted</b> that, including the recent find on Barrier 31, there are now 3 particles with unusual characteristics.</p> <p>It was <b>noted</b> that MS and AT have begun work on analysing the data from 2 years of continuous survey on Sandside.</p>	<p>It was <b>agreed</b> that preparation of a draft chapter on underwater retrieval operation(s) can proceed, using the data now available. <b>All Members</b></p> <p>BT agreed to try to obtain the spectrum for AT. <b>DSRL</b></p> <p>It was <b>agreed</b> that work on the draft chapter could begin using the data on Sandside now available. <b>All Members</b></p>	<p><b>Open</b></p> <p><b>Open</b></p> <p><b>Open</b></p>	<p><b>For Nov mtg</b></p> <p><b>ASAP</b></p> <p><b>For Nov mtg</b></p>

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<p><b>4</b> <b>Surveys Update – Beaches</b></p> <p><b>4.1 Sandside Beach</b></p>	<p>The Chairman invited DSRL to provide an update on recent onshore surveys. BT presented an animation, showing Sandside beach elevations from October 2010 to September 2012. The correlation in seasonal sand accretion with the highest number of particle finds was discussed. The beach eroding effect of prevailing winds was considered. BT stated that the primary wind direction was SW, generally coming in at fairly lower strengths. Winds blowing onto the beach from a NW direction tend to be stronger. He advised that the biggest erosion on the beach is attributable to rainfall, particularly storm rain surging down from rivers and stripping the sand away from the beach.</p> <p>BT led the Group through a presentation of the results of beach surveys carried out over a period of 24 months, from October 2010 to September 2012.</p> <p>BT informed the meeting that two years of continuous monitoring had now been undertaken at Sandside, both statutory and enhanced, covering an area of 1280 hectares. A total of 60 particles had been retrieved during this period: 6 <i>Relevant</i> and one ‘unusual’ particle yet to be categorised, which may be of <i>Significant</i> level activity.</p>	<p>It was <b>noted</b> that the total number of particle finds on Sandside beach is 217.</p>			



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<b>4.1 Sandside Beach</b> <i>(continued)</i>	48 Particles had been detected during the first year of continuous monitoring, and 12 during the second year.				
<b>4.2 Dounreay Foreshore</b>	<p>The meeting was informed that there have been 38 surveys on the West Foreshore, a total area of 31.5 hectares, resulting in 7 particles found: 2 <i>Significant</i>, 3 <i>Relevant</i> and 2 <i>Minor</i> activities.</p> <p>A total of 6 particles had been found on the East Foreshore during 20 surveys in this period, covering a total area of 0.5 hectare; 5 <i>Significant</i> and 1 <i>Relevant</i>. The Group was advised that there was no sand present on the East Foreshore on a number of occasions. BT said that particles found on the East Foreshore tend to be of higher activity than those detected on the West Foreshore.</p>	<p>In response to an enquiry from AE, it was <b>noted</b> that the activity of particles found on the West Foreshore has decreased.</p> <p>It was <b>noted</b> that any sand washed up onto the site is monitored, along with routine monitoring of all roads, barrier areas, and possibly some grassy areas.</p>			
<b>4.3 Dunnet Beach</b>	Routine surveying at Dunnet has not detected any particles.				
<b>4.4 Others</b>	<p>All other beaches have been monitored to schedule and no particles have been found.</p> <p>The Chairman thanked PC and BT for their presentation and invited AT and MS to give a presentation they had prepared on particle abundances.</p>				

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<p><b>4</b> <b>Beach Monitoring</b> <i>(continued)</i></p>	<p>AT addressed the meeting and led the Group through the information in the presentation.</p> <p>A discussion ensued on the content of the paper. MS informed the Group that she had looked at previous reports and focused on activity levels rather than number of particles.</p>	<p>It was <b>noted</b> that there is further work to be done to refine the data for the Group's report.</p>			
<p><b>4.5</b> <b>Frequency of Monitoring</b> <i>(added to Agenda arising from Item 3)</i></p>	<p>The issue of the frequency of beach monitoring was discussed at length and various suggestions and views considered. The Group deliberated on the value of strandline monitoring and HF clarified the current and new authorisation programmes. BT suggested that strandline monitoring was not required if the Groundhog system was used and the validity of continued monitoring at Dunnet was discussed. An extensive exchange of views ensued. AE led the Group through a wide-ranging discussion on all aspects of the proposed monitoring programme to try to determine a consensus for each beach.</p> <p>GH suggested that an environmental monitoring programme provides a backdrop to ensure BPM is being applied and working effectively on site. Monitoring could also pick up on any unintentional discharges into the sea as a result of new processes on site.</p>	<p>The Group's <b>recommendation</b> for both Sandside and Foreshore monitoring was to continue with the <i>status quo</i>. It was also <b>recommended</b> that Dunnet beach is monitored quarterly, to include strandline but cease separate monitoring of the "tourist" areas. Agreement for suggested monitoring of the remaining beaches was deferred until the November meeting. All <b>recommendations</b> would be supported in the Group's formal response to the SEPA consultation document.</p> <p>It was <b>suggested</b> that a location map showing all beaches would be useful for the November meeting.</p>	<p>It was <b>agreed</b> that the Group's view on the continuation and frequency of beach monitoring would be considered further and a formal recommendation, with justification for the Group's conclusions, will be conveyed to SEPA in PRAG's response to the consultation document. <b>All Members</b></p> <p>It was also <b>agreed</b> that this issue would also form part of the PRAG report. <b>All Members</b></p> <p>It was <b>agreed</b> that a new area map would be available for the Group. <b>DSRL</b></p>	<p><b>Open</b></p> <p><b>Open</b></p> <p><b>Open</b></p>	<p><b>At Nov mtg (before closing date of 30 Nov)</b></p> <p><b>For Nov mtg</b></p> <p><b>For Nov mtg</b></p>

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<p><b>4.5 Frequency of Monitoring</b> <i>(added to Agenda arising from Item 3)</i></p> <p><i>(continued)</i></p>	<p>HF stated that SEPA's primary purpose for the monitoring programme is for the protection of the public from harm, to reduce the probability of encounters and for public reassurance.</p>	<p>It was <b>noted</b> that the current monitoring regime is detailed within the consultation document, together with SEPA's proposed amendments to the monitoring programme.</p>			
<p><b>5 Offshore Retrieval Operation</b></p> <p><b>ROV Results;</b></p> <p><b>Comparison with previous operation;</b></p> <p><b>Conclusions</b></p>	<p>The Chairman invited BT to speak to DSRL's presentation on the Offshore Operation. BT led the Group through the data and confirmed that a total of 42 Ha had been surveyed during the 2012 operation, an increase on the 36 Ha originally agreed with the contractor. The ROV recovered 299 particles: 16 <i>Significant</i>; 54 <i>Relevant</i>; 229 <i>Minor</i>; 4 Anomalous and 4 In-situ.</p> <p>The report was considered and discussed at length. Several suggestions were tabled for further data and comparative work to try to clarify the potential discrepancy in previously predicted particle recovery, or to provide further information. The possibilities of particle decay, fragmentation or deep burial were considered as part of the potential explanation.</p>	<p>It was <b>noted</b> that some of the model depths were approximate. During the extensive exchange of views, it was <b>suggested</b> that Nuvia or AT could produce calculations on the 'grey zone'.</p>	<p>AT <b>agreed</b> to look into this possibility. <b>AT</b></p>	<p><b>Open</b></p>	<p><b>For Nov mtg</b></p>

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<p><b>5</b> <b>Offshore Retrieval Operation</b> <i>(continued)</i></p> <p><b>ROV Results;</b></p> <p><b>Comparison with previous operation;</b></p> <p><b>Conclusions</b></p>	<p>AE suggested an exercise to take all actual finds and re-run the calculation to compare it with the original DPAG predictions. PC advised that DSRL do have the software to run this; further discussion ensued on comparisons.</p> <p>At PC's request, the Group also considered the data resulting from repeat area surveys and this issue was discussed.</p> <p>Following further discussion and deliberations, PC requested that the Members consider the report and give him their feed-back and suggestions to make the information as helpful as possible. PC said he would endeavour to get any additional work completed in time for the November meeting.</p>	<p>During the discussions, it was <b>recommended</b> that a wave height time series, as used in DPAG's 3<sup>rd</sup> Report and based on weather records held at Dounreay, should be re-examined to search for any big storm events during the 4 years from 2004 to 2008.</p> <p>AE thanked PC and BT for the presentation. The Members <b>noted</b> PC's request for their feed-back on the report.</p>	<p>It was <b>agreed</b> that DSRL would look at this, but PC indicated it could be difficult to reconcile. <b>DSRL</b></p> <p>At the Chairman's request, DSRL <b>agreed</b> to provide the information discussed and try to locate the original algorithm. <b>DSRL</b></p> <p>It was <b>agreed</b> that the Members would advise DSRL of any amendments or additional data required to the report within the next two weeks. <b>All Members</b></p>	<p><b>Open</b></p> <p><b>Open</b></p> <p><b>Open</b></p>	<p><b>For Nov mtg</b></p> <p><b>For Nov mtg</b></p> <p><b>By 7<sup>th</sup> November</b></p>
<p><b>8</b> <b>Future PRAG Work Programme</b></p>	<p>AE confirmed that the next meeting would be held over two days to meet the Group's remit to produce a 2012/2013 report by the end of the calendar year.</p> <p>The Chairman confirmed that the Group would consider draft chapters and work to produce a final draft report during the November meeting.</p>	<p>It was <b>noted</b> that the next meeting would be held over two days, on <b>Tuesday 13<sup>th</sup></b> and <b>Wednesday 14<sup>th</sup></b> November.</p> <p>The next meeting will be held at the <b>Carlton Hotel</b> in <b>Edinburgh</b>.</p>	<p>It was <b>agreed</b> that all Members would produce relevant draft chapters for inclusion in the report, as discussed and agreed at today's meeting. <b>All Members</b></p>	<p><b>Open</b></p>	<p><b>For Nov mtg</b></p>

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<b>9 Any Other Business</b>	There were no items raised under any other items of competent business.				
<b>10 Acting Chairman's Closing Summary</b>	<b>AE</b> thanked those present for their attendance and contributions to the meeting.	It was <b>noted</b> that the date of the December meeting had been changed to <b>Wednesday 18<sup>th</sup> Dec</b> and this was accepted.	It was <b>agreed</b> that the December meeting would commence earlier than usual to allow PC and BT to leave the meeting shortly after lunch. The agenda will be adjusted accordingly to facilitate DSRL's early departure. <b>JM</b>	<b>Open</b>	<b>For Dec mtg</b>

#### Acronyms

DPAG	Dounreay Particles Advisory Group
DSG	Dounreay Stakeholders Group
DSRL	Dounreay Site Restoration Limited
FY	(SEPA) Financial Year: 1 <sup>st</sup> April 2010 to 31 <sup>st</sup> March 2011
HPA	Health Protection Agency
NDA	Nuclear Decommissioning Authority
PRAG(D)	Particles Retrieval Advisory Group (Dounreay)
ROV	Remotely Operated Vehicle
SCCORS	(The) Scottish Councils Committee on Radioactive Substances
SG	(The) Scottish Government
SEPA	Scottish Environment Protection Agency