RCloud Tasking Form – Part B: Statement of Requirement (SoR)

Title of Requirement	Call for PhD Proposals **(Lot 1)** and Research Proposals **(Lot 2)** - Emerging technologies for dermal protection against chemical warfare agents.
Requisition No.	**RQ0000011195 – Original R Cloud Competiton** **RQ0000029032 – Lot 2 – EMR Contract – Smart Garment People Ltd.**
SoR Version	**2.0**

1.	**Statement of Requirements**
1.1	**Summary and Background Information**
	Summary Research into new technologies and materials with potential application in dermal protection against chemical and biological (CB) warfare agents. In particular, Dstl CBR (chemical, biological and radiological) Dermal Protection is looking for: 1) Research/development into novel methods of providing dermal protection against CWA (chemical warfare agent) vapours, 2) Research/development into novel methods of providing dermal protection against aerosol particulates, 3) Research/development of non-fluorocarbon technologies to prevent the penetration of low surface energy chemicals through textiles, 4) Research/development of CWA-impermeable materials with improved properties that would facilitate the production of improved CBR dermal protective equipment, 5) Novel solutions to the design and integration of dermal CBR protective equipment, interfaces and closures, ideally as part of a complete dermal protection system. 6) Development of novel adsorbent technology to commercial-scale, particularly of non-metal containing adsorbents with high activity towards toxic industrial chemicals (TICs) **Background** Materials and technologies currently used for CBR Protection are typically based on a small number of base technologies. Whilst these are often very effective at providing protection they can cause additional logistical burden, increase the risk of the user suffering heat stress, may face increasing restrictions on use or are difficult for personnel to use. In particular, Dstl CBR Protection are interested addressing the specific topic areas described below: 1) CBR protective clothing typically utilises a layer of activated carbon to adsorb vapours. This can result in increased physiological burden for the user due to the increased weight and additional layers of fabric required. 2) Aerosol filtration in air-permeable CBR protective clothing is generally achieved by the inclusion of non-woven fabrics in the material system or by applying lightweight membranes or nanofiber webs to one of the materials in the system. These can increase the physiological burden experienced by a user due to a reduction in air permeability and, in addition, the membrane / nanofiber web technologies can lack durability. 3) Historically liquid protection has been afforded by the use of fluoropolymer-containing treatments. The fluoropolymer lowers the surface energy of the fabric sufficiently so that liquids

	(including low surface tension liquids) are prevented from wetting and penetrating to skin level. At the moment, the use of a fluoropolymer is the only way to achieve this repellency to low surface tension liquids. REDACTED Under FOI Exemption 4) Elastomeric materials are typically used to fabricate gloves, overboots and respirators and provide robust CBR protection for the hands, feet and face. However, limitations in the performance of the materials, such as a lack of stretch, can cause dexterity problems for users. 5) The interfaces between different pieces of dermal CBR protective equipment, such as those between the hood and respirator, glove and sleeve, and overboot and trouser, are potential leak points into a system. They can also be difficult to use, especially in confined spaces and when wearing other equipment. Additionally, the small number of sizes typically used for CBR protective clothing can increase the difficulties in achieving an effective interface. 6) Metal-impregnants are frequently applied to activated carbons to increase their activity towards low molecular weight toxic gases such as hydrogen cyanide or hydrogen sulphide. More recently, metal-organic frameworks (MOFs) have been developed for this purpose but these also require the use of potentially toxic metals. **Budget** The budget for this procurement is: Lot 1 – PhD Studentship Opportunities - £140,000.00 (ex VAT) – in total. Lot 2 – Research Proposals - Proposals must not be more than £100k per annum (ex VAT).
1.2	**Requirement**
	<u>Lot 1 – PhD Proposals</u> Requirement: Fund up to 5x PhD studentships in one or more of the following topic areas: Proposals are invited to undertake research and/or development into materials and technologies from across the TRL (Technology Readiness Level) spectrum that can, or have potential to, mitigate the dermal hazard from CWA vapours, liquids and particulates. The materials and/or technologies should fulfil one or more of the following requirements: 1) Dstl would like to investigate the potential of adsorbent fibres that could be used to replace or augment the fibres used in CB protective clothing (typically cotton, polyester, nylon or inherently flame retardant fibres). These fibres should have the potential to be inexpensive, durable and strong in addition to being adsorbent. Other techniques of achieving dermal protection against CWA vapours would also be considered if they are thought likely to reduce the weight, number of layers or airflow resistance of CBR protective clothing systems.

2) Dstl would like to develop woven, robust, air-permeable, particulate filtration fabrics that could be used as the structural (outer) fabric of a CB protective garment. Lightweight membranes / nanofibres applied to the surface of a support fabric would be unlikely to be considered sufficiently robust. A method of producing woven fabrics containing durable nanofibres within the structure of a fabric would be of particular interest.

3) REDACTED Under FOI Exemption [redacted] Approaches can include, but are not limited to, the concept of liquid management via material design, function or fibre morphology. Novel approaches that can prevent penetration of low surface tension liquids through highly air-permeable textiles are especially desirable. Any option that uses fluorocarbons to achieve the liquid control is outside the scope of this call.

4) Dstl would like to investigate the utility of high stretch, barrier elastomers that could be fabricated into CB protective overboots and gloves, with the aim of increasing the manual dexterity of users and a reduction in the overall bulk currently associated with protective overboots. The materials would need to be physically robust enough to withstand military use. They would also need to have the potential to be mass manufactured, though consideration of manufacturability does not need to be addressed in the proposal directly.

5) Dstl would like to investigate novel solutions to the design and integration of dermal CB sub-systems, including interfaces and closures. Of particular interest would be the integration of all the dermal protection components (respirator, gloves, overboots and clothing) into a single, fully-integrated system. Within this, consideration of how gloves and overboots are donned, used and doffed, in respect of their practicality as well as the protection they provided, would be desirable. The respirator-hood interface, and means of fastening the clothing at the neck, would also be another area of high interest. This requirement is primarily focused on design but could be facilitated by novel materials.

Proposals must not take the form of literature reviews or be based entirely upon computational modelling.

Dstl is asking for fully costed proposals to undertake a PhD for a period of not more than 4 years. The final deliverable will be a PhD thesis.

Lot 2 – Extra-Mural Research

Requirement: Fund up to 5 research proposals in one or more of the following topic areas:

Proposals are invited to undertake research and/or development into materials and technologies from across the TRL (Technology Readiness Level) spectrum that can, or have potential to, mitigate the dermal hazard from CWA vapours, liquids and particulates. The materials and/or technologies should fulfil one or more of the following requirements:

1) Dstl would like to investigate the potential of adsorbent fibres that could be used to replace or augment the fibres used in CB protective clothing (typically cotton, polyester, nylon or inherently flame retardant fibres). These fibres should have the potential to be inexpensive, durable and strong in addition to being adsorbent. Other techniques of achieving dermal protection against CWA vapours would also be considered if they are thought likely to reduce the weight, number of layers or airflow resistance of CBR protective clothing systems.

2) Dstl would like to develop woven, robust, air-permeable, particulate filtration fabrics that could be used as the structural (outer) fabric of a CB protective garment. Lightweight membranes /

nanofibres applied to the surface of a support fabric would be unlikely to be considered sufficiently robust. A method of producing woven fabrics containing durable nanofibres within the structure of a fabric would be of particular interest.

3) REDACTED Under FOI Exemption [redacted] Approaches can include, but are not limited to, the concept of liquid management via material design, function or fibre morphology. Novel approaches that can prevent penetration of low surface tension liquids through highly air-permeable textiles are especially desirable. Any option that uses fluorocarbons to achieve the liquid control is outside the scope of this call.

4) Dstl would like to investigate the utility of high stretch, barrier elastomers that could be fabricated into CB protective overboots and gloves, with the aim of increasing the manual dexterity of users and a reduction in the overall bulk currently associated with protective overboots. The materials would need to be physically robust enough to withstand military use. They would also need to have the potential to be mass manufactured, though consideration of manufacturability does not need to be addressed in the proposal directly.

5) Dstl would like to investigate novel solutions to the design and integration of dermal CB sub-systems, including interfaces and closures. Of particular interest would be the integration of all the dermal protection components (respirator, gloves, overboots and clothing) into a single, fully-integrated system. Within this, consideration of how gloves and overboots are donned, used and doffed, in respect of their practicality as well as the protection they provided, would be desirable. The respirator-hood interface, and means of fastening the clothing at the neck, would also be another area of high interest. This requirement is primarily focused on design but could be facilitated by novel materials.

6) Dstl would like to investigate the scale-up of metal-free, adsorbent materials looking to the manufacture of products that could be used within canisters for respiratory or collective protection on a commercial scale. This would include granular and monolithic materials.

Proposals must not take the form of literature reviews or be based entirely upon computational modelling.

If no proposals meet the requirements of Dstl CB Protection then there will be no funds awarded.

All proposals should be formulated to allow aspects of interest to Dstl CB Protection to be funded without the need to fund items of research that are not of interest to Dstl. This requires a breakdown of cost and effort for each part of the work package and identification of which parts are essential to the project.

Proposals are expected to be a maximum of £100k per annum, though such funding levels cannot be guaranteed. Each package must include the delivery of a report detailing the work conducted during that package. The first package must deliver by end of March 2023 and subsequent periods, if funded, will occur annually.

Proposals must be no more than 2 sides of A4, plus illustrations. These should describe the technical work to be undertaken in the first work package, and any samples that may be supplied to Dstl (samples and their analysis will be discussed in detail between Dstl and the contractor post contract award).

Bidders are therefore asked to submit costed proposals for a CORE WP1 (up to 12 months in duration) together with uncosted proposals for additional OPTIONAL Work Packages. Only the first

	work package needs to be fully described in the proposal, with an expected outline of the work required provided for subsequent stages. However, subsequent packages must be based upon manpower and facility costs given in the first package, allowing for annual inflationary uplifts. The detail of subsequent work packages will be determined in discussions between the Authority and the Supplier once the decision to take up the Option to award additional work packages has been made. The Authority shall not be obliged to exercise the option(s).
1.3	**Options or follow on work**
	a. In addition to the Research and Development Services detailed in Section 1.2 of Task Form Part B, the Contractor hereby grants to the Authority the irrevocable option to undertake additional Research and Development Services in accordance with the terms and conditions set out in R-Cloud V4 and this task form, it being agreed that the Authority has no obligation to exercise such options. b. The Authority shall have the right to exercise the options detailed by no later than 3 years post contract award date. Should the Authority wish to exercise the option, the Authority's Representative (Commercial Services) shall approach the Contractor requesting a quotation for the additional Research and Development Services. c. Should the Authority exercise the option, the Authority's Representative (Commercial Services) and the Contractor shall jointly agree pricing and dates for the completion of Contract Deliverables. Following agreement, the Authority's Representative (Commercial Services) will issue a formal Task Amendment. d. The Authority shall not be obliged to exercise the option(s). Where the Authority does identify a requirement, Dstl will request that the supplier provides a detailed proposal when each additional task arises and this will undergo technical and commercial review.
1.4	**Contract Management Activities**
	<u>Lot 1 – Bronze Level Contract Management</u> Quarterly Progress & Technical Review Annual Technical Report Final Year submission of final thesis **<u>Lot 2 – Bronze Level Contract Management</u>** Monthly Progress & Technical Review Final Technical Report
1.5	**Health & Safety, Environmental, Social, Ethical, Regulatory or Legislative aspects of the requirement**
	To be the responsibility of the contractor to identify and action appropriately as required.

1.6	Deliverables & Intellectual Property Rights (IPR) – Lot 1					
Ref.	**Title**	**Due by**	**Format**	**Expected classification (subject to change)**	**What information is required in the deliverable**	**IPR Condition**
D – 1	Quarterly Progress and Technical Review	T0+3 Months	Presentation (.pptx)	O	Presentation pack to include but not limited to: • Update on technical progress	Default RCloud Agreement Terms and Conditions shall apply Full Rights Version
D - 2	Annual technical report	T0+12 Months	Written report	O	Brief written report outlining technical progress	Default RCloud Agreement Terms and Conditions shall apply Full Rights Version
D - 3	End of the PhD - Thesis	End of thesis	University thesis	O	PhD thesis	Default RCloud Agreement Terms and Conditions shall apply Full Rights Version

1.6	Deliverables & Intellectual Property Rights (IPR) – Lot 2					
Ref.	**Title**	**Due by**	**Format**	**Expected classification (subject to change)**	**What information is required in the deliverable**	**IPR Condition**
D – 1	Monthly Progress and Technical Review	T0+1 Months	Presentation (.pptx) via MS Teams	O	Presentation pack to include but not limited to: • Update on technical progress	Default RCloud Agreement Terms and Conditions shall apply Full Rights Version
D - 2	Final technical report	End of contract	Written report	O	Written report outlining technical progress achieved together with methods used and recommendations for further work.	Default RCloud Agreement Terms and Conditions shall apply Full Rights Version

1.	**Deliverable Acceptance Criteria**
	If upon review of the progress reports and/or the final PhD thesis (as relevant), the Authority/Dstl does not accept the deliverables, the Contractor shall provide acceptable replacements at no additional cost to the Authority.

2	**Evaluation Criteria**
2.1	**Method Explanation**

Evaluation is based on technical compliance and affordability.

The proposals will be evaluated by suitably qualified personnel and will be evaluated both technically and commercially according to the criteria below.

Only technically strong proposals will be considered for funding. The academic/research groups or research centre and linkages criteria will be used to further assess the quality of the application(s). The benefit of funding multiple proposals at a research group/centre and the contributions offered outside the Dstl funding will be judged for single and multiple applications from each group/centre.

Stage 1 – Compliance

Criteria	Pass (Compliant) / Fail (Non-Compliant)
(Applicable to Both Lot 1 and Lot 2) Tenderers proposal does not propose the use of fluorocarbons to achieve the liquid control	Pass / Fail
(Applicable to Both Lot 1 and Lot 2) Tenderers proposal does not take the form of literature reviews or be based entirely upon computational modelling.	Pass / Fail
(Applicable Both Lot 1 and Lot 2) Tenderers proposal confirms in writing that their Tender, including any element that may be provided by any part of their supply chain, does not contain any Russian/Belarussian products and/or services.	Pass / Fail
(Applicable to Lot 1 only) Pricing: The Tenderers Total Value of Tender (ex VAT) for LOT1 (PhDs) does not exceed £140,000.00 (ex VAT) and is FIRM Priced i.e. Non-Variable	Pass / Fail
(Applicable to Lot 2 only) Pricing: The Tenderers Total Value of Tender (ex VAT) for LOT2 (EMR) CORE WP1 does not exceed £100,000.00 (ex VAT) and is FIRM Priced i.e. Non-Variable	Pass / Fail
(Applicable to Both Lot 1 and Lot 2) Pricing: The Tenderers proposal uses rates that are no higher than those uploaded previously into R-Cloud	Pass / Fail

(Applicable to Lot 2 only) Tenderers proposal does not exceed 2 (two) sides of A4, plus illustrations. The proposal describes the technical work to be undertaken in the first CORE WP1.	Pass / Fail
(Applicable to Both Lot 1 and Lot 2) Tenderers proposal comprises: a) one (1) full proposal (Technical and Commercial) including all price detail, and b) one (1) Full Technical proposal which excludes all commercial price information	Pass / Fail
(Applicable to Both Lot 1 and Lot 2) The Tenderer has provided a fully completed R-Cloud Task Form Part C including SRGS at Annex A and DEFFORM 711 at Annex B	Pass / Fail
(Applicable to Both Lot 1 and Lot 2) The Tenderer has provided proposed Research Worker Forms where applicable	Pass / Fail

Only those Tenderers who pass all the above compliance criteria will be taken forward to Stage 2. Failure to achieve full compliance will exclude your tender from the Stage 2 evaluation process.

Stage 2 – Technical Evaluation (Scoring)
Tender Scoring Mechanism: Best technically affordable tender

The evaluation shall be conducted under the Most Economically Advantageous Tender (MEAT) principles, with the application of an Absolute Method, defined as the Best technically affordable tender.

The contract shall be awarded to the tender with the highest, non-cost score that is within budget.

Any tenders received that are in excess of the proposed budget above will be automatically deemed non-compliant and will be excluded from the tender evaluation process.

Best technically affordable tender example

In this example, the assumed budget is £28k.

Tender	Cost (£kNPV)	Non-cost score	Technically compliant	Rank
A	20	62	Yes	2
B	24	85	Yes	1
C	29	100	Yes	Non-compliant

Tender C is over budget and is therefore deemed to be non-compliant. Tenders A and B are both compliant but tender B has the highest non-cost score and is awarded the contract.

2.2	**Technical Evaluation Criteria**			
	ID	**Criteria**	**Score**	**Weighting**
	1	**Scientific Quality and Innovation**		
	1.1	The Proposal has demonstrated evidence of how the PhD is applicable to Defence within the context of Emerging Technologies for dermal protection against chemical warfare agents.	0-10	X3
	1.2	The proposal further evidences any novel methods and or techniques that will be utilised in undertaking the work.	0-10	X3
	2	**Proposed Approach and Relevance of the PhD**		
	2.1	The Proposal demonstrates a clear method for undertaking and delivering the work, and the activities identified are relevant to achieving the objectives of the programme.	0-10	X2
	3	**Supplier PhD Management** • Balance of skills of the project team • Time and commitment proposed.		
	3.1	The Proposal demonstrates that the Requirement will be delivered and Supervised by suitably qualified and experience personnel (SQEP).	0-10	X2
	3.2	The proposal includes a populated Risk Register for the performance and delivery of the PhD. The proposal has included clear mitigation of how these risks will be managed.	0-10	X2

Any bid scoring a 0 or 1 in any of the assessment criteria will not be considered for funding. Any bid scoring 30 or less in total will not be considered for funding.

Lot 2 – Research Proposals

Technical Criteria

ID	Criteria	Score	Weighting
1	**Scientific Quality and Innovation**		
1.1	The Proposal has demonstrated evidence of how it is applicable to Defence within the context of Emerging Technologies for dermal protection against chemical warfare agents.	0-10	X3
1.2	The proposal further evidences any novel methods and or techniques that will be utilised in undertaking the work.	0-10	X3
2	**Proposed Approach and Relevance of the Research Work**		
2.1	The Proposal demonstrates a clear method for undertaking and delivering the work, and the activities identified are relevant to achieving the objectives of the programme	0-10	X2

Any bid scoring a 0 or 1 in any of the assessment criteria will not be considered for funding. Any bid scoring 15 or less in total will not be considered for funding.

Technical Evaluation Criteria	
Score	**Definition**
10	Exceeds the Authority's requirement
7	Fully meets the Authority's requirement
5	Adequately meets the Authority's requirement
3	Falls short of the Authority's requirements in a minor respect
1	Falls short of the Authority's requirements in a major respect, or tenderer did not adequately explain their response or did not provide adequate evidence of claimed capability.
0	Tenderer did not respond to the question or tenderer's response indicated that their capabilities wholly failed to meet the Authority's requirements.

2.3	**Commercial Evaluation Criteria**
	The commercial evaluation shall be based on the following Pass / Fail questions (which form part of the Stage 1 Compliance Assessment above): 1. Has the bidder submitted one (1) full proposal (Technical and Commercial) including all price detail, and has the bidder submitted one (1) Full Technical proposal which excludes all commercial price information? 2. Has the bidder submitted the proposal as a Firm price? 3. Are Labour rates and price as per the rates uploaded to RCloud? 4. Has the bidder submitted one (1) completed copy of RCloud Form Part C – Task Response Form including completed SRGS at Annex A and DEFFORM 711 at Annex B? 5. Has the bidder completed Research Worker forms as necessary? A fail on any of the above questions will result in your proposal being excluded from further evaluation and consideration.