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Request for Quotation

Analysis of Soil Samples for Natural England's Long Term Monitoring Network 2023 - 2024

19th July 2023

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Analysis of Soil Samples for Natural England's Long Term Monitoring Network 2023 - 2024

You are invited to submit a quotation for the requirement described in the specification, Section 2.

Please confirm by email, receipt of these documents and whether you intend to submit a quote or not.

Your response should be returned to the following email address by:

Email: matthew.j.shepherd@naturalengland.org.uk; keeley.spate@naturalengland.org.uk

Date: Wednesday 9th August 2023

Time: 5pm

Ensure you include the name of the quotation and 'Final Submission' in the subject field to make it clear that it is your response.

Contact Details and Timetable

Matthew Shepherd and Keeley Spate will be your contact for any questions linked to the content of the quote or the process. Please submit any clarification questions via email and note that, unless commercially sensitive, both the question and the response will be circulated to all tenderers.

Date of issue of RFQ	19-07-2023 at 17:00 BST / GMT
Deadline for clarifications questions	02-08-2023 at 17:00 BST / GMT
Deadline for receipt of Quotation	09-08-2023 at 17:00 BST / GMT
Intended date of Contract Award	20-08-2023
Intended Contract Start Date	04-09-2023
Intended Delivery Date / Contract Duration	22-03-2024

Section 1: General Information

Glossary

Unless the context otherwise requires, the following words and expressions used within this Request for Quotation shall have the following meanings (to be interpreted in the singular or plural as the context requires):

“Authority”	means Natural England who is the Contracting Authority.
“Contract”	means the contract to be entered into by the Authority and the successful supplier.
“Response”	means the information submitted by a supplier in response to the RFQ.
“RFQ”	means this Request for Quotation and all related documents published by the Authority and made available to suppliers.

Conditions applying to the RFQ

You should examine your Response and related documents ensuring it is complete and in accordance with the stated instructions prior to submission.

Your Response must contain sufficient information to enable the Authority to evaluate it fairly and effectively. You should ensure that you have prepared your Response fully and accurately and that prices quoted are arithmetically correct for the units stated.

By submitting a Response, you, the supplier, are deemed to accept the terms and conditions provided in the RFQ. Confirmation of this is required in Annex 2.

Failure to comply with the instructions set out in the RFQ may result in the supplier's exclusion from this quotation process.

Acceptance of Quotations

By issuing this RFQ the Authority does not bind itself to accept any quotation and reserves the right not to award a contract to any supplier who submits a quotation.

Costs

The Authority will not reimburse you for any costs and expenses which you incur preparing and submitting your quotation, even if the Authority amends or terminates the procurement process.

Self-Declaration and Mandatory Requirements

The RFQ includes a self-declaration response (Annex 1) which covers basic information about the supplier, as well as any grounds for exclusion. If you do not comply with them, your quotation will not be evaluated.

Any mandatory requirements will be set out in Section 2, Specification of Requirements and, if you do not comply with them, your quotation will not be evaluated.

Clarifications

Any request for clarification regarding the RFQ and supporting documentation must be submitted via email no later than the deadline for clarifications set out in the Timetable. The Authority shall be under no obligation to respond to queries raised after the clarification deadline.

The Authority will respond to all reasonable clarifications as soon as possible but cannot guarantee a minimum response time. The Authority will publish all clarifications and its responses to all suppliers via email unless deemed commercially sensitive.

If a supplier believes that a request for clarification is commercially sensitive, it should clearly state this when submitting the clarification request. However, if the Authority considers either that:

the clarification and response are not commercially sensitive; and
all suppliers may benefit from its disclosure,
then the Authority will notify the supplier (via email), and the supplier will have an opportunity to withdraw the request for clarification by sending a further message requesting the withdrawal of the clarification request. If not withdrawn by the supplier within 2 working days of the Authority's notification, the Authority may publish the clarification request and its response to all suppliers and the Authority shall not be liable to the supplier for any consequences of such publication.

The Authority reserves the right to seek clarification of any aspect of a quotation and/or provide additional information during the evaluation phase to carry out a fair evaluation. Where the Authority seeks clarification on any aspect of the quotation, the supplier must respond within the timeframe requested by the Authority.

Amendments

The Authority may amend the RFQ at any time prior to the deadline for receipt. If it amends the RFQ the Authority will notify you via email.

Suppliers may modify their quotation prior to the deadline for Responses. No Responses may be modified after the deadline for Responses.

Suppliers may withdraw their quotations at any time by submitting a notice via the email to the named contact.

Conditions of Contract

The Authority's standard condensed terms (found [here](#)) provided as part of the RFQ will be included in any contract awarded as a result of this quotation process. The Authority will not accept any changes to these terms and conditions proposed by a supplier.

Suppliers should note that the quotation provided by the successful bidder will form part of the Contract.

Prices

Prices must be submitted in £ sterling, inclusive of VAT.

Disclosure

All Central Government Departments, their Executive Agencies and Non Departmental Public Bodies are subject to control and reporting within Government. In particular, they report to the Cabinet Office and HM Treasury for all expenditure. Further the Cabinet Office has a cross-Government role delivering overall Government policy on public procurement, including ensuring value for money and related aspects of good procurement practice. For these purposes, the Authority may disclose within Government any details contained in your quotation. The information will not be disclosed outside Government during the procurement.

In addition, the Authority is subject to the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, which provide a public right of access to information held by public bodies. In accordance with these two statutes, the Authority may be required to disclose information contained in your quotation to any person who submits a request for information pursuant to those statutes.

Further to the Government's transparency agenda, all UK Government organisations must advertise on Contract Finder in accordance with the following publication thresholds:

Central Contracting Authority's: £12,000

Sub Central Contracting Authority's and NHS Trusts: £30,000

For the purpose of this RFQ the Authority is classified as a 'Central Contracting Authority' with a publication threshold of '£12,000' inclusive of VAT.

If this opportunity is advertised via Contracts Finder, we are obliged to publish details of the awarded contract including who has won the contract, the contract value, and indicate whether the winning supplier is a small and medium-sized enterprise ("SMEs") or voluntary organisation or charity. A copy of the contract must also be published with confidential information redacted.

By submitting a Response, you consent to these terms as part of the procurement.

Disclaimers

Whilst the information in this RFQ and any supporting information referred to herein or provided to you by the Authority have been prepared in good faith the Authority does not warrant that this information is comprehensive or that it has been independently verified.

The Authority does not:

- make any representation or warranty (express or implied) as to the accuracy, reasonableness or completeness of the RFQ;
- accept any liability for the information contained in the RFQ or for the fairness, accuracy or completeness of that information; or
- accept any liability for any loss or damage (other than in respect of fraudulent misrepresentation or any other liability which cannot lawfully be excluded) arising as a result of reliance on such information or any subsequent communication.

Any supplier considering entering into contractual relationships with the Authority following receipt of the RFQ should make its own investigations and independent assessment of the Authority and its requirements for the goods and/or services and should seek its own professional financial and legal advice.

Protection of Personal Data

In order to comply with the General Data Protection Regulations 2018 the supplier must agree to the following:

You must only process any personal data in strict accordance with instructions from the Authority.

You must ensure that all the personal data that we disclose to you or you collect on our behalf under this agreement are kept confidential.

You must take reasonable steps to ensure the reliability of employees who have access to personal data.

Only employees who may be required to assist in meeting the obligations under this agreement may have access to the personal data.

Any disclosure of personal data must be made in confidence and extend only so far as that which is specifically necessary for the purposes of this agreement.

You must ensure that there are appropriate security measures in place to safeguard against any unauthorised access or unlawful processing or accidental loss, destruction or damage or disclosure of the personal data.

On termination of this agreement, for whatever reason, the personal data must be returned to us promptly and safely, together with all copies in your possession or control.

General Data Protection Regulations 2018

For the purposes of the Regulations the Authority is the data processor.

The personal information that we have asked you provide on individuals (data subjects) that will be working for you on this contract will be used in compiling the tender list and in assessing your offer. If you are unsuccessful the information will be held and destroyed within two years of the award of contracts. If you are awarded a contract it will be retained for the duration of the contract and destroyed within seven years of the contract's expiry.

We may monitor the performance of the individuals during the execution of the contract, and the results of our monitoring, together with the information that you have provided, will be used in determining what work is allocated under the contract, and in any renewal of the contract or in the award of future contracts of a similar nature. The information will not be disclosed to anyone outside the Authority without the consent of the data subject, unless the Authority is required by law to make such disclosures.

Equality, Diversity & Inclusion (EDI)

The Client is striving to create a diverse and inclusive working environment where every individual has equality of opportunity to progress and to apply their unique insights to making the UK a great place for living. The Service Provider is expected to respect this commitment in all dealings with Natural England staff and service users.

Suppliers are expected to;

support Defra group to achieve its Public Sector Equality Duty as defined by the Equality Act 2010, and to support delivery of [Defra group's Equality & Diversity Strategy](#).

meet the standards set out in the [Government's Supplier Code of Conduct](#)

work with Defra group to ensure equality, diversity and inclusion impacts are addressed (positive and negative) in the goods, services and works we procure, barriers are removed and opportunities realised.

Sustainable Procurement

Addressing global sustainability impacts and realising additional community benefits within commercial activity is core to Defra group's approach, working with its supply chain is key to achieving sustainable outcomes. In addition to supporting Defra group to meet its outcomes we look to understand and reduce negative sustainability impacts associated with our commercial activity and realise benefits.

The Client encourages its suppliers to share these values, work to address negative impacts and realise opportunities, measure performance and success.

Suppliers are expected to have an understanding of the Sustainable Development Goals, the interconnections between them and the relevance to the Goods, Services and works procured on the Client's behalf

Conflicts of Interest

The concept of a conflict of interest includes but is not limited to any situation where an Involved Person or Relevant Body has directly or indirectly, a financial, economic or other personal interest which might be perceived to compromise their impartiality and independence in the context of the procurement procedure and/or affect the integrity of the contract award.

We expect suppliers to mitigate appropriately against any real or perceived conflict of interest through their work with government. A supplier with a position of influence gained through a contract should not use that position to unfairly disadvantage any other supplier or reduce the potential for future competition

Where the supplier is aware of any circumstances giving rise to a conflict of interest or has any indication that a conflict of interest exists or may arise you should inform the Authority of this as soon as possible (whether before or after they have submitted a quotation). Tenderers should remain alert to the possibility of conflicts of interest arising at all stages of the procurement and should update the Authority if any new circumstances or information arises, or there are any changes to information already provided to the Authority. Failure to do so, and/or to properly manage any conflicts of interest may result in a quotation being rejected.

Provided that it has been carried out in an open, fair and transparent manner, routine pre-market engagement carried out by the Authority should not represent a conflict of interest for the supplier.

Section 2: The Invitation

Specification of Requirements

Background to the specific work area relevant to this contract

The Long-term Monitoring Network (LTMN) comprises 37 sites, mainly National Nature Reserves, in England, where a wide range of environmental parameters are being monitored with the aim of detecting long-term changes in biodiversity and ecosystem function associated with climate change, pollution and land management. A suite of soil parameters are included in this monitoring to enable interpretation of above and below-ground environmental changes and to indicate long-term changes in soil characteristics, functions and biodiversity.

This document provides a specification to undertake processing and laboratory analysis of soils samples collected from four sites to be sampled in autumn 2023.

Requirements

This contract requires analysis of soil samples which will be collected from four sites around England during Autumn 2023. Fieldwork to collect the samples is planned to take place between 19th September and 9th October 2023. Within each site, soil sampling and field assessments will be undertaken in five sampling plots.

Please note that this request for quotation includes additional analyses for bulk density samples taken from two of the sites, to test a new collection method. Please ensure that your quotation covers this additional work.

Sites and habitats to be surveyed and sampled are listed in Table 1 below.

Table 1 Sites and habitats to be sampled for soil analysis in 2023.

Site No.	Site (and abbreviated name)	Habitat to be sampled	Dates proposed for sampling
31	Ennerdale / Scoat Fell (ENN)	Upland acid grassland	23rd – 26th September 2023
32	Roudsea Moss (ROU)	Lowland raised bog	19th – 21st September 2023
33	May Moss (MAY)	Upland heath	3rd – 5th October 2023
34	Dark Peak (DKP)	Upland heath on blanket peat	7th – 9th October 2023

Soil samples will be collected from five 20m by 20m sampling plots at each site, with these five representing examples of similar vegetation and soil types. Thus, samples will be collected from a total of twenty sampling plots.

In each sampling plot, four 2m by 2m subplots have been selected randomly, from which the following series of soil cores and samples will be collected.

Core A = Four PVC-C plastic tubes 51mm internal diameter and 150mm long, wrapped in clingfilm and containing intact soil from 15-30 cm below the soil surface. All four soil samples from a single 20m by 20m plot are placed in a single bag and are to be bulked for analysis.

Core B = Four PVC-C plastic tubes 40mm internal diameter and 80mm long, wrapped in clingfilm, capped with gauze, and containing intact soil from 0-8cm below the soil surface. All four soil samples from a single 20m by 20m plot are placed in a single bag and are to be bulked for analysis.

Core C = Four PVC-C plastic tubes 51mm internal diameter and 150mm long, wrapped in clingfilm and containing intact soil from 0-15 cm below the soil surface. All four soil samples from a single 20m by 20m plot are placed in a single bag and are to be bulked for analysis.

Core D = a bag of approximately 500g wet weight of soil collected from 0-15cm below the soil surface, bulked from 12 locations into a single bag.

Core E = a bag of approximately 500g wet weight of soil collected from 0-15cm below the soil surface, bulked from 12 locations into a single bag.

Core F = a single core 40mm in diameter and 150mm long wrapped in clingfilm and containing intact soil from 0-15 cm below the soil surface.

Core P = at Roudsea Moss and Dark Peak, where the soil can be entirely organic (peaty) in texture up to depths >5m (Roudsea) or 2m (Dark Peak), a Russian peat corer will be used to extract sequential peat samples down the profile in one subplot only in each sampling plot, with each core extracted representing 50cm depth of peat, until the entire depth of the peat deposit has been sampled as far as feasible. The last core extracted may represent only a partial core (with mineral material removed from the base), and the length of the peat core sample occupied by peaty material will be measured and noted. Each peat core will be placed in separate labelled bags marked sequentially P1 (for surface peat), P2, P3, P4 etc. Please note, the number of peat samples that the sites will yield has been estimated on the basis of the baseline peat depth data available, but exact numbers of samples will not be known until the survey is complete.

For the purposes of planning, for 2023 it has been estimated that:

- Roudsea Moss will generate approximately 50 peat samples
- Dark Peak will generate approximately 20 peat samples.

In 2023, two further sets of cores will be collected to enable further comparison of the existing sampling method for A and C cores with the 'bulb planter'. We anticipate this will be undertaken at 2 sites: Dark Peak and May Moss.

Core ABP = Four soil cores collected by bulb planter tool (without plastic tubes) 51mm internal diameter and 150mm long, containing intact soil from 15-30 cm below the soil surface. All four soil samples from a single 20m by 20m plot are placed in a single bag and are to be bulked for analysis.

Core CBP = Four soil cores collected by bulb planter tool (without plastic tubes) 51mm internal diameter and 150mm long, containing intact soil from 15-30 cm below the soil surface. All four soil samples from a single 20m by 20m plot are placed in a single bag and are to be bulked for analysis.

From this fieldwork there will therefore be a total of approximately 190 bags of soil samples from the main sampling, comprising: 20 A core samples, 20 B core samples, 20 C core samples, 20 D samples, 20 E samples, 20 F cores and 70 P core samples, and up to a further 80 cores in 20 bags from additional sampling with the bulb planter (1 ABP core samples and 10 CBP samples). The samples to be collected are shown the schematic diagram in Figure 1.

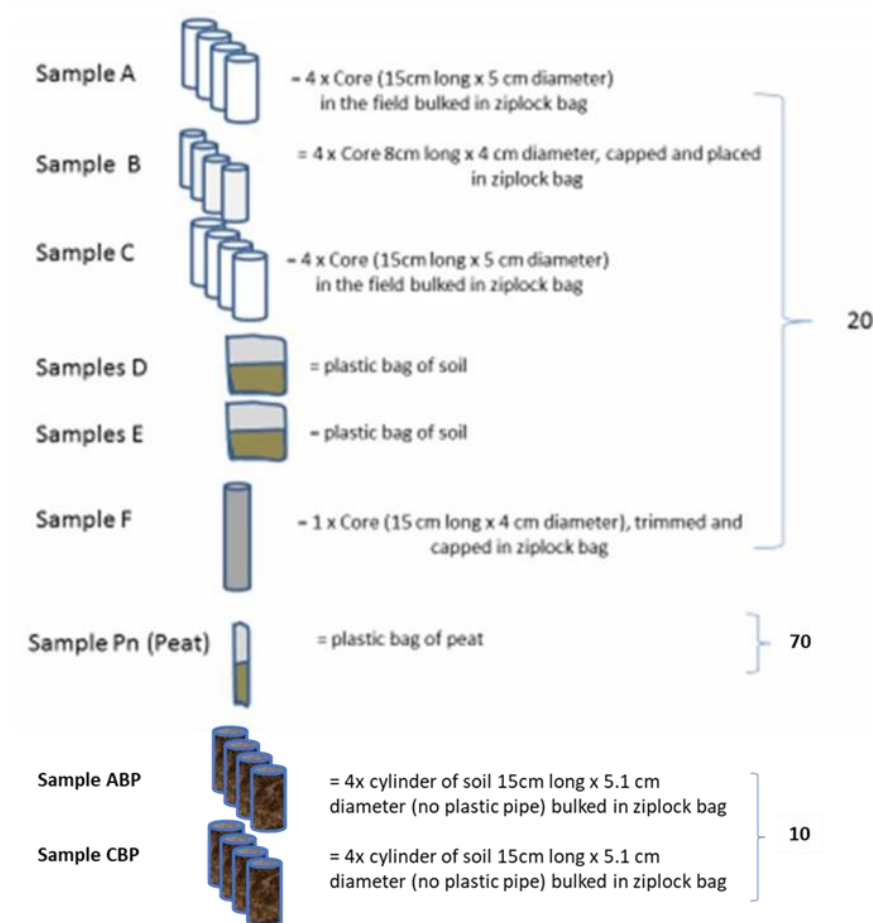


Fig 1. Schematic showing the numbers and types of samples to be collected and analysed during LTMN soils fieldwork Autumn 2023.

Labelling of soil samples

All samples will be supplied in bags labelled using the following system:

Site number X Plot number X [Subplot Number X] Sample Type Letter and number

Note that only cores F and P will be labelled at the subplot level, with the remainder being bulked from 4 subplots in a single bag for analysis.

Thus a bag of 4 A cores (15-30 cm) from of sampling plot 3 at Roudsea Moss will carry the label:

32X3XA

And an F core from Subplot 42 in Sampling plot 49 at Dark Peak will carry the label:

34X49X42XF

All sample bags will also be labelled with the **date, abbreviated site name** and the initials of the surveyor, this information should be transferred to a spreadsheet and used to link analysis results to field data.

Field information relating to the samples taken (such as notes of any missing or short samples) will be supplied to the contractor, to enable them to carry out, interpret and report on the soil analysis required.

Sample storage and transport

Soil samples will be delivered chilled to the contractor in insulated boxes containing frozen freeze blocks.

On receipt of the soil samples they must be placed immediately into cold storage at 4°C.

The contractor must discuss arrangements for receiving the samples with field contractors to ensure that that laboratory staff know that they are arriving and can act to store and preserve them appropriately on arrival.

Samples should be stored for a minimum of time before analysis to limit post-sampling changes to soil communities, properties or functions. This is of particular importance for samples B, D, E and F.

The following processed samples should be sent to Natural England's office at Sterling House, Dix's Field, Exeter, Devon, EX1 1QA for storage and possible further analysis:

Extracted mesofauna samples in 90% alcohol from sample B

Extracted nematode samples in suitable preservative from sample D

Air dried, sieved soils representing A and C samples from the sites surveyed this year are to be sent to

If possible, fresh material from D or E samples should also be archived in a freezer at least – 20°C.

Soil Sample Analysis

Analysis of Physico-chemical attributes

The following analyses should be applied to the following soil samples as collected above. In all cases analyses should as closely as possible conform to those used by the James Hutton Institute for previous monitoring analysis. The JHI method codes for each analysis are provided in brackets below and referred to [here](#):

If the contractor is able to suggest an improved method of analysis, which would allow valid comparison with previous analyses, these must be discussed and agreed with the Natural England project manager before implementing.

Core A and Core C – 15cm by 5cm diameter – bulked samples from 0-15 and 15-30cm.

40 analyses in total (2 depths x 4 sites x 5 sampling plots)

For each set of bulked samples, entire sample collected should each be assessed using, where possible, UKAS approved method for:

% gravimetric water content following drying at 30°C and after further drying at 105°C

% stone weight and volume (volume of mineral particles >2mm diameter)

dry bulk density g cm⁻³

fine earth bulk density (dry bulk density of non-stone material)

to give five measurements per site for A cores and five measurements per site for C cores.

For each sample, and for each core, aliquots of sieved soil should be measured out and analysed for the following parameters using UKAS approved methods:

pH in water and in CaCl₂ (Method DM006)

% dry weight loss on ignition at 375°C¹ (Method DM007)

% dry weight total C and total N (Dumas combustion on air-dried and milled sample, dried at 105°C)

Cation Exchange Capacity and exchangeable cations, comprising Mg, Ca, Na, Mn, K, Fe, Al (Ammonium acetate extraction at pH7, and analysis of cations using ICP-OES) and exchangeable acidity (barium acetate extraction, at pH 7, and titration with barium hydroxide) expressed as milliequivalents per 100g dry soil.

For mineral soil samples only, particle size distribution: gravimetric % sand, silt and clay, using both BSTC and international definitions for silt and sand (laser diffraction)

C Cores only – 15cm by 5cm diameter – bulked samples from 0-15 cm

20 analyses in total (4 sites x 5 sampling plots)

Olsen P: (see below) expressed in mg kg⁻¹ extractable P per unit dry soil.

Cores Pn – <=50cm length cores taken down peat profile to full depth of peat.

~70 analyses in total from Roudsea Moss and Dark Peak.

The 50 cm peat samples of known volume must be weighed wet, dried at 105°C, and reweighed to estimate bulk density following, where possible, a UKAS approved procedure. Dried cores will be subsampled by cutting lengthways and ground in a hammer mill or other suitable machine before being analysed for soil organic matter content by loss on ignition at 375°C¹.

Core ABP and Core CBP – 15cm by 5.1 cm diameter – bulked samples from 0-15 and 15-30cm

1 or optimum temperature for complete combustion of organic matter, while avoiding liberation of carbonate C.

20 analyses in total (2 depths x 2 sites x 5 sampling plots)

For each set of bulked samples, entire sample collected should each be assessed using, where possible, UKAS approved method for:

% gravimetric water content following drying at 30°C and after further drying at 105°C

% stone volume (volume of mineral particles >2mm diameter)

dry bulk density g cm⁻³

fine earth bulk density (dry bulk density of non-stone material)

All analyses should be subject to adequate QC procedures, and documentation on the methods used should be made available to Natural England on request.

Analysis of soil biological parameters and functions

The following analyses and procedures should be undertaken for cores B, D and E.

Sample B – four 8cm by 8cm diameter cores for soil arthropods by Tullgren extraction

20 extractions in total (4 sites X 5 sampling plots)

This sample should be stored at 4°C pending processing, for as little time as possible. Cores B should have their fine gauze carefully removed (to avoid loss of specimens), each bulked set of cores carefully ejected to avoid core damage (**ideally by cutting through the core pipes while still wrapped**), and mounted in a single Tullgren funnel with their original surface facing downward, or lying on their sides. When placing cores into the Tullgren funnel “basket” the basket should be placed over a suitable sized container, to catch material and organisms falling through the mesh.

The basket should be moved to another clean container, and the contents of the original container emptied onto the surface of the cores. This should be repeated as necessary until no material falls through the mesh. The basket should then be moved carefully onto the Tullgren funnel.

Each funnel should be gently heated using a low-wattage incandescent bulb, for an appropriate extraction period (until the soil is no longer losing water – usually at least 5 days) while collecting soil fauna emerging from the base of the funnel in ethanol, following the protocols followed by Emmett *et al* 2008. Samples should be collected and stored in at least 90% ethanol to enable later genetic/metagenetic analysis and morphological identification of the specimens. This contract does not extend to the counting or identification of animals extracted. Extracts should be carefully packed in protective material and sent to Natural England for identification or further processing, using a suitable courier or transport process.

Sample E – 8-12 bulked trowel samples

20 analyses in total (4 sites X 5 sampling plots)

This sample must be stored at 4°C pending analysis, and will be homogenized, and sub-sampled before analysis using UKAS-approved methods where possible, for

Soil microbial PFLAs (S.O.P. CP001; see Zogg et al, 1997; Frostegård et al, 1996, as adapted by Black et al, 2008; 2011). These would be extracted from an appropriate amount of homogenised soil (50-500g depending on organic matter content, Method SEP0000) and analysed by GC-FID or other suitable method (Method CM001) to indicate both total biomass PLFAs, and identification of a range of taxon-specific and unidentified PLFAs (see Appendix 1) following the methods used in the Black et al (2011). Data for individual PLFA species should be reported as $\mu\text{g g}^{-1}$, nmol g^{-1} and % total mol.

A further subsample will be subject to microbial DNA analysis by terminal restriction fragment length polymorphism (tRFLP) on ITS, 16S and archaea genes, following the protocol described in Black (2008; 2011). The data will be reported on by relative abundance of all resulting fragment lengths. An internal size standard should be used which will allow for the reasonable calibration of size fragments between 30 and 550 base pairs. **The resulting data should be harmonised with previous data reported from the LMTN (supplied as necessary) to enable comparison between years.**

Sample D – 8-12 bulked trowel samples

20 extractions/analyses in total (4 sites X 5 sampling plots)

The bulked sample should be subject to a modified Baermann extraction (following the protocols previously used by the James Hutton Institute). This is similar to the method established by Black *et al* (2008, 2011), for the SQID programme, which is based on a modified version of Brown and Boag (1988) for collection of soil nematodes, but uses 200g of soil, instead of 100g. Nematode extracts should be archived using a suitable method. **Previous LTMN monitoring has archived samples in formalin glycol, following the method outlined in Donn et al. (2008, 2012). However, this has proven to be a poor preservative, may damage DNA precluding future genetic analysis, and is carcinogenic. For these reasons we would welcome preservation approaches that represent good preservation, opportunities for DNA analysis and improved health and safety.**

Sample F – Indicator of N mineralisation

20 analyses in total (4 sites X 5 sampling plots)

Core F should be analysed for N mineralisation following the method described by Emmett et al. (2008) which removes soluble N from an intact core by washing through with artificial rainwater, before incubating, and analysis for all KCl-extractable N. This does not produce true N mineralisation rates, but may provide a comparative index of N mineralisation.

The intact core should be removed from its plastic case. The core should be lain on its side on a rack and brought to field capacity and flushed through with “artificial rain” (“UK rain minus N”, Emmett et al. 2008) equivalent in volume to 4 times the pore volume of the core to remove remaining mineral N (as described in Emmett *et al.* 2008).

The core should then be subjected to standard suction to standardise soil water tension before N mineralisation. Soil cores should then be incubated for 28 days at 10 degrees C and extracted with 1M KCl as described in Emmett *et al.* (2008) and soil ammonium-N and nitrate-N

analysed and reported in terms of total ammonium-nitrogen and total nitrate-nitrogen mineralised per mass of soil.

Sample archiving

Sieved (<2mm), dried (30°C) samples from cores A and C (or hammer milled material if peaty) from all sites analysed under this contract should be supplied in labelled bags/containers to Natural England for storage and possible future analysis. The contractor should discuss options for archiving frozen samples of fresh material from the D and/or E samples with the Natural England project manager.

The samples would be contained in labelled plastic bags, and we recognise that these samples will be of various sizes depending on the water content and density of the original sample.

Data analysis and reporting

Raw data should be provided to Natural England, and be processed where this is required to provide biologically meaningful results (e.g. profiling of PLFAs against soil organism groups, processing of tRFLP data to make it compatible with previous years' data). Data should be provided in Excel spreadsheets format and should include metadata to enable all analyses to be duplicated exactly.

Content of clay, silt, sand, water, organic matter, carbon, nitrogen should be expressed in % weight values.

Cations and CEC should be expressed as millequivalents 100g⁻¹ dry soil

Olsen P should be expressed in mg extractable P kg⁻¹ dry soil.

Dry bulk density and stone free dry bulk density should be expressed in g cm⁻³

pH should be expressed in standard units

Ammonium and Nitrate mineralisation should be expressed in mg N kg⁻¹ dry soil day⁻¹.
PLFAs should be reported in ug g⁻¹, nmol g⁻¹ and % total mol

tRFLP should be reported in fragment lengths in base pairs, as described above, and standardised in such a way as to be integrated with results from previous years to enable valid comparison between sites (data from previous years will be provided as necessary), and between sampling periods for those sites with repeated samples.

All results should be supplied to Natural England in the form of Excel spreadsheets. Advice will be given on the format, units or analysis required. Time required to for both sample analysis and data collation should be identified and costed as part of the tender.

There is no requirement for producing a final report, or to conduct any statistical analysis of the data saving that required for identifying PLFAs, tRFs or for calculating the units above.

Details of the analytical protocols used in the analyses described above are to be supplied to NE to enable us to describe the protocols accurately in future publications and specifications.

References

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- Donn, S., Griffiths, B.S., Neilson, R. & Daniell, T.J. (2008) DNA extraction from soil nematodes for multi-sample community studies. *Applied Soil Ecology*, 38, 20–26.
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http://home.dbio.uevora.pt/~hadao/FCT_Proj/Donn%20et%20al%202012.pdf
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- Merrington G. (2006) The development and use of soil quality indicators for assessing the role of soil in environmental interactions. Science Report SC030265, Environment Agency.
- Gregory P. Zogg, G.P., Zak, D. R., Ringelberg, D.B., White, D. C., MacDonald, N. W, Pregitzer K. S. (1997). Compositional and Functional Shifts in Microbial Communities Due to Soil Warming. *Soil Science Society of America Journal*, 61:475-481
- Frostegård, Å., Tunlid, A., Bååth E. (1996). Changes in microbial community structure during long-term incubation in two soils experimentally contaminated with metals. *Soil Biology and Biochemistry*, 28, 55–63

Payment

The Authority will raise purchase orders to cover the cost of the services and will issue to the awarded supplier following contract award.

The Authority's preference is for all invoices to be sent electronically, quoting a valid Purchase Order number. Suppliers may choose to split the invoice and receive payment following the completion of all physico-chemical analysis by 2nd February 2024 or send a single invoice at the end of the contract, on or before 22nd March 2024. (See table 2 below)

It is anticipated that this contract will be awarded for a period of seven months to end no later than 22/03/2024. Prices will remain fixed for the duration of the contract award period. We may at our sole discretion extend this contract to include related or further work. Any extension shall be agreed in writing in advance of any work commencing and may be subject to further competition.

Table 2 Milestone dates. The following project milestones are envisaged, but will be subject to final agreement between the successful contractors and Natural England.

Milestone	Date	Payment Associated
Project initiation teleconference - project plan agreed	w/c 4th September 2023	
All Tullgren and Baermann extracts completed	27th October 2023	
Mineralisable N assay completed	17th November 2023	
All soil physico-chemical measurements completed and data supplied in draft	2nd February 2024	Payment of 60% of contract value
All PLFA and tRFLP data complete	16th February 2024	
All data collation and analysis completed	1st March 2024	
All data supplied and samples supplied to Natural England and final project meeting completed	15th March 2024	
Final invoice submitted	22nd March 2024	Payment of 40% of the contract value.

Evaluation Methodology

We will award this contract in line with the most economically advantageous tender (MEAT) as set out in the following award criteria:

Technical – 50%

Commercial – 50%

Evaluation criteria

Evaluation weightings are 50% technical and 50% commercial, the winning tenderer will be the highest scoring combined score.

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Technical	50%	Service / Product Proposal	Proposed delivery methods	1 Question Q1 (45% of technical score available)
			Delivery capability	1 Question Q2 (25% of technical score available)
			Expertise	1 Question Q3. (20% of technical score available)
			Management of sustainability	1 Question Q4 (10% of technical score available)
Commercial	50%	Whole life cost of the proposed Contract	Commercial Model	1 Question (100% of commercial score available)

Technical (50%)

Technical evaluations will be based on responses to specific questions covering key criteria which are outlined below. Scores for questions will be based on the following:

Very good	100	Addresses all the Authority's requirements with all the relevant supporting information set out in the RFQ. There are no weaknesses and therefore the tender response gives the Authority complete confidence that all the requirements will be met to a high standard.
Good	70	Addresses all the Authority's requirements with all the relevant supporting information set out in the RFQ. The response contains minor weaknesses and therefore the tender response gives the Authority confidence that all the requirements will be met to a good standard.
Moderate	50	Addresses most of the requirements with most of the relevant supporting information set out in

		the RFQ. The response contains moderate weaknesses and therefore the tender response gives the Authority confidence that most of the requirements will be met to a suitable standard.
Weak	20	Substantially addresses the requirements but not all and provides supporting information that is of limited or no relevance or a methodology containing significant weaknesses and therefore raises concerns for the Authority that the requirements may not all be met.
Unacceptable	0	No response or provides a response that gives the Authority no confidence that the requirement will be met.

Technical evaluation is assessed using the evaluation topics and sub-criteria stated in the Evaluation Criteria section above.

Separate submissions for each technical question should be provided and will be evaluated in isolation. Tenderers should provide answers that meet the criteria of each technical question.

Proposed delivery methods	
Q1 Provide details of the methodology and approaches proposed to deliver the requirements of this project.	<p>Your response should include:</p> <ul style="list-style-type: none"> A clear explanation of how the samples will be received, stored and processed, including a timetable to show when the analyses will take place. A brief, clear explanation of the equipment that will be used and its capacity to process samples. A brief referenced description of the methods that will be used to analyse the samples, and brief indication of compatibility with methods used previously. A clear indication of quality control standards to be applied to ensure robust data is generated. Identification of any critical issues relating to the proposed methods to be used, with suggestions for overcome these.

Delivery Capability	
Q2. Provide details on your capability to manage and deliver the project	<p>Your response should include:</p> <ul style="list-style-type: none"> A description of the project's

Delivery Capability	
	<p>management, showing who will have responsibility for different elements of the project.</p> <p>A risk assessment identifying potential threats (such as problems with equipment, staffing, access to facilities).to the delivery of the analysis, and mitigation strategies to overcome these.</p> <p>A general description of the analytical facilities available to deliver the project</p> <p>Any relevant accreditation that attests to your capability to deliver the analyses required.</p> <p>A description of how you will manage any risks to health and safety.</p>

Expertise	
Q3. Provide details on the expertise and experience of key staff members	<p>Your response should include:</p> <p>Brief descriptions of how the training, qualifications and experience of key staff members will enable them to deliver the project.</p> <p>C.V.s of all key staff members.</p>

Sustainability	
Q4. Provide details of how environmental impacts of the projects will be minimized.	<p>Your response should include:</p> <p>A description of how environmental impacts relating to the project will be minimised including reference to protocols for safe disposal of reagents, sustainable reuse or disposal of waste materials, and any other actions you will take to minimize environmental impact of the project.</p>

Commercial (50%)

The Contract is to be awarded as fixed price which will be paid according to the completion of the deliverables stated in the Specification of Requirements.

Suppliers are required to submit a total cost to provide the deliverables stated in the Specification of Requirements. In addition to this the Commercial Response template must be completed to provide a breakdown of the whole life costs against each deliverable used in the delivery of this requirement.

Calculation Method

The method for calculating the weighted scores is as follows:

Commercial

Score = (Lowest Quotation Price / Supplier's Quotation Price) x 50% (Maximum available marks)

Technical

Score = (Bidder's Total Technical Score / Highest Technical Score) x 50% (Maximum available marks)

The total score (weighted) (TWS) is then calculated by adding the total weighted commercial score (WC) to the total weighted technical score (WT): $WC + WT = TWS$.

Information to be returned

Please note, the following information requested must be provided. Incomplete tender submissions may be discounted.

Please complete and return the following information:

- completed Commercial Response template

- separate response submission for each technical question (in accordance with the response instructions)

- completed Mandatory Requirements (Annex 1)

- completed Acceptance of Terms and Conditions (Annex 2)

Award

Once the evaluation of the Response(s) is complete all suppliers will be notified of the outcome via email.

The successful supplier will be issued the contract, incorporating their Response, for signature. The Authority will then counter sign.

Annex 1 Mandatory Requirements

Part 1 Potential Supplier Information

Please answer the following self-declaration questions in full and include this Annex in your quotation response.

Part 1.1 Potential Supplier Information:

1.1(a)	Full name of the potential supplier submitting the information	
1.1(b)	Registered office address (if applicable)	
1.1(c)	Company registration number (if applicable)	
1.1(d)	Charity registration number (if applicable)	
1.1(e)	Head office DUNS number (if applicable)	
1.1(f)	Registered VAT number	
1.1(g)	Are you a Small, Medium or Micro Enterprise (SME)?	(Yes / No)

Note: See EU definition of SME https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

Part 1.2 Contact details and declaration

By submitting a quotation to this RFQ I declare that to the best of my knowledge the answers submitted and information contained in this document are correct and accurate.

I declare that, upon request and without delay you will provide the certificates or documentary evidence referred to in this document.

I understand that the information will be used in the selection process to assess my organisation's suitability to be invited to participate further in this procurement.

I understand that the authority may reject this submission in its entirety if there is a failure to answer all the relevant questions fully, or if false/misleading information or content is provided in any section.

I am aware of the consequences of serious misrepresentation.

1.2(a)	Contact name	
1.2(b)	Name of organisation	
1.2(c)	Role in organisation	
1.2(d)	Phone number	

1.2(e)	E-mail address	
1.2(f)	Postal address	
1.2(g)	Signature (electronic is acceptable)	
1.2(h)	Date	

Part 2 Exclusion Grounds

Part 2.1 Grounds for mandatory exclusion

2.1(a)	Please indicate if, within the past five years you, your organisation or any other person who has powers of representation, decision or control in the organisation been convicted anywhere in the world of any of the offences within the summary below.	
	Participation in a criminal organisation.	(Yes / No) If yes please provide details at 2.1 (b)
	Corruption.	((Yes / No) If yes please provide details at 2.1 (b)
	Fraud.	(Yes / No) If yes please provide details at 2.1 (b)
	Terrorist offences or offences linked to terrorist activities	(Yes / No) If yes please provide details at 2.1 (b)
	Money laundering or terrorist financing	(Yes / No) If yes please provide details at 2.1 (b)
	Child labour and other forms of trafficking in human beings	(Yes / No) If yes please provide details at 2.1 (b)
2.1(b)	<p>If you have answered yes to question 2.1(a), please provide further details.</p> <p>Date of conviction, specify which of the grounds listed the conviction was for, and the reasons for conviction.</p> <p>Identity of who has been convicted If the relevant documentation is available electronically please provide the web address, issuing authority, precise reference of the documents.</p>	
2.1 (c)	If you have answered Yes to any of the points above have measures been taken to demonstrate the reliability of the organisation despite	(Yes / No)

	the existence of a relevant ground for exclusion? (i.e. Self-Cleaning)	
2.1(d)	Has it been established, for your organisation by a judicial or administrative decision having final and binding effect in accordance with the legal provisions of any part of the United Kingdom or the legal provisions of the country in which the organisation is established (if outside the UK), that the organisation is in breach of obligations related to the payment of tax or social security contributions?	(Yes / No)
2.1(e)	If you have answered yes to question 2.3(a), please provide further details. Please also confirm you have paid or have entered into a binding arrangement with a view to paying, the outstanding sum including where applicable any accrued interest and/or fines.	

Part 2.2 Grounds for discretionary exclusion

2.2(a)	The detailed grounds for discretionary exclusion of an organisation are set out on this webpage , which should be referred to before completing these questions. Please indicate if, within the past three years, anywhere in the world any of the following situations have applied to you, your organisation or any other person who has powers of representation, decision or control in the organisation	
2.2(b)	Breach of environmental obligations?	(Yes / No) If yes please provide details at 2.2 (f)
2.2(c)	Breach of social obligations?	(Yes / No) If yes please provide details at 2.2 (f)
2.2(d)	Breach of labour law obligations?	(Yes / No) If yes please provide details at 2.2 (f)
2.2(e)	Shown significant or persistent deficiencies in the performance of a substantive requirement under a prior public contract, a prior contract with a contracting entity, or a prior concession contract, which led to early termination of that prior contract, damages or other comparable sanctions?	(Yes / No) If yes please provide details at 2.2 (f)

2.2 (f)	If you have answered Yes to any of the above, explain what measures been taken to demonstrate the reliability of the organisation despite the existence of a relevant ground for exclusion? (Self Cleaning)	

Annex 2 Acceptance of Terms and Conditions

I/We accept in full the terms and conditions appended to this Request for Quote document.

Company _____

Signature _____

Print Name _____

Position _____

Date _____

Appendix 1

PLFA moieties and combined totals to be reported

Variable name	Description
PLFA _{tot}	Total PLFA community
PLFA _{bac}	Bacterial community
PLFA _{fun}	Fungal community
PLFA _{act}	Actinobacteria
FB ratio	fungal:bacteria ratio

Gpos	Gram positive bacteria
Gneg	Gram negative bacteria
pn ratio	Gram positive: Gram negative ratio
12:0	Unclassified
13:0	Unclassified
14:0i	Unclassified
14:0	Unclassified
14:1ω9c	Unclassified
14:1ω9t	Unclassified
15:0i	Bacterial, Gram positive
15:0ai	Bacterial, Gram positive
15:0	Bacterial
16:0br	Unclassified
16:1i	Unclassified
16:1ω11c	Unclassified
16:0i	Bacterial, Gram positive
16:1ω11t	Unclassified
16:1ω7c	Bacterial, Gram negative
16:1ω7t	Bacterial, Gram negative
16:1ω5c	Bacterial, Gram negative
16:0	Unclassified
17:0br	Unclassified
C16:0(10Me)	Bacterial, Gram positive, Actinobacteria
17:0i	Bacterial, Gram positive
17:0ai	Bacterial, Gram positive
16:0(12 Me)	Unclassified

17:1ω8c	Unclassified
17:0cy	Bacterial, Gram negative
17:1ω7	Unclassified
17:0	Bacterial
17:0(12Me)	Unclassified
17:0(10Me)	Bacterial, Gram positive, Actinobacteria
18:3ω6,8,13	Unclassified
18:2ω8,12	Unclassified
18:2ω6,9	Fungi
18:1ω9	Unclassified
18:1ω7	Bacterial, Gram negative
18:1ω13/18:1ω10 or 11	Unclassified
18:0	Unclassified
19:1ω6	Unclassified
18:0(10Me)	Bacterial, Gram positive, Actinobacteria
19:1ω8	Unclassified
19:0cy	Bacterial, Gram negative
20:4ω6,9,12,15	Unclassified
20:5ω3	Unclassified
20:4ω2,6,10,14/20:4ω3,6,9,12	Unclassified
20:1ω9	Unclassified
20:1	Unclassified
20:0	Unclassified