

Date: 27 February 2017

Dear Sir/Madam

**Contract Title: Hydrology Training Programme**

You are invited to quote for the above in accordance with the enclosed documents.

Instructions on what information we require you to provide is in Section 4 of the following Request for Quotation document.

Your response should be returned to the following email address by close of play on Monday 20 March 2017.

karen.james@environment-agency.gov.uk

Please confirm, by email, receipt of these documents and whether you intend to submit a quote.

If you have any queries, please do not hesitate to contact me.

Yours sincerely

Karen James

E&B Advisor (Hydrology)

E-mail: karen.james@environment-agency.gov.uk

Telephone: 020 302 52302

**Request for Quotation**

**Title: Hydrology Training Programme**

**Section 1**

**Who is the Environment Agency?**

We are an Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs. Our principal aims are to protect and improve the environment, and to promote sustainable development.

Further information on our responsibilities, Corporate Plan and how we are structured can be found on our website.

<https://www.gov.uk/government/organisations/environment-agency/about>

**What do we spend our money on?**

We are a major procurer of goods and services within the UK, spending circa £600M per annum. Our major spend areas are:

* Flood and Coastal Risk Management (design, construction and maintenance)
* ICT and Telecommunications
* Vehicles and Plant
* Environmental Consultancy and Monitoring
* Temporary Staff and Contractors
* Facilities Management, Energy and Utilities
* Flood Management and Water Related Services

**What do we need from our suppliers?**

Suppliers are vital in supporting the delivery of our corporate plan. We aim to support the economy and society whilst delivering more environmental outcomes for every pound we spend. In many areas we are leading the way on environmental and technical developments. It is our role to ensure that suppliers clearly understand our corporate aims and objectives and know that we are committed to delivering the best value most sustainable solutions, taking into account the whole life cost of our procurement decisions. We promote diversity and equality and treat all of our suppliers fairly.

Our procurement strategy may be of interest to you as a potential supplier. It sets out our priorities and key commitments in a range of areas such as delivering our corporate plan, Government policy, supplier management and sustainable procurement:

<https://www.gov.uk/government/organisations/environment-agency/about/procurement#procurement-strategy>

**Government changes and collaboration**

Since 1 April 2013, the Environment Agency is no longer responsible for delivering the environmental priorities of Wales. This is now the remit of Natural Resources Wales (NRW). Further information can be found here:

<http://naturalresources.wales/splash?orig=/>

By bidding for this requirement, you may also be approached by other members of the Defra network, NRW or other government departments that are specifically named in the tender document.

**Further information**

For further information and to see our commitments to Diversity and Equality, please visit our website.

<https://www.gov.uk/government/organisations/environment-agency/about/procurement>

https://www.gov.uk/government/organisations/environment-agency/about/equality-and-diversity

Also, are you up to date on environmental legislation? See links below for further information.

Waste and Environmental Impact - <https://www.gov.uk/browse/business/waste-environment>

Environmental Regulations - <https://www.gov.uk/browse/business/waste-environment/environmental-regulations>’

**Section 2**

**Summary**

This Request for Quotation is for the delivery of an existing programme of hydrology training for the Environment Agency (EA). The training provides knowledge and skills required for the reliable provision of a high quality hydrology service, relevant to the EA’s business needs.

The programme comprises five separate training courses, each designed to be delivered over two consecutive days in a classroom, with practical demonstrations where necessary. The five courses consist of four core “Hydrology Training Programme” modules and a further technical hydraulics course:

* **Hydrology Foundation** – an overview of hydrology in the EA and basic hydrological techniques (co-delivered with an EA hydrologist);
* **Catchment Processes and Behaviour** – a more detailed course covering qualitative catchment characterisation;
* **Hydrological Tools and Techniques** – a course covering quantitative catchment characterisation;
* **Hydrological Assessments** – a course covering designing, undertaking, reporting on and reviewing/auditing hydrological assessments;
* **Hydraulic Theory** – a course covering the theory of open channel hydraulics, touching on pipes and culverts.

## Contract Length

It is anticipated that this contract will be awarded to one supplier for a period of 36 months, to end no later than 31 March 2020. 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 advance of any work commencing and may be subject to further competition. Any amendment to contract prices for the extensions are to be by negotiation.

The Environment Agency Conditions of Contract for Services (Appendix C) shall apply to this contract.

This contract shall be managed on behalf of the Agency byKaren James (karen.james@environment-agency.gov.uk).

## Contact Details and Timeline

Karen James will be your contact for any questions linked to the content of the quote pack or the process. Please submit any questions by email and note that both the question and the response will be circulated to all tenderers.

Key elements of the process have been reviewed. Anticipated dates for planned activities are below:

|  |  |
| --- | --- |
| **Activity** | **Due Date** |
| Supplier responses for Request for Quote | 20 March 2017 |
| Evaluation of Request for Quote submissions | 24 March 2017 |
| Award of contract | 1 April 2017 |
| Project/Contract end date | 31 March 2020 |

It should be noted that these timescales and activities may be subject to change.

**Section 3**

## Evaluation Criteria

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

* Price – 60%
* Quality – 40%

The following quality criteria are weighted in accordance with the importance and relevance attached to each one.

* The capacity of your organisation to deliver the required training and proposed plans to maintain continuity of personnel for the three year duration of the contract – 5%
* Proposed methodology for delivering the learning to ensure engagement of delegates of varying knowledge/abilities, including any practical demonstrations and how you will ensure consistency and quality of training – 20%
* Skill and expertise of key tutors and guest lecturers and your recent experience of carrying out similar contracts – 15%

The criteria listed above will be assessed on a 0 to 10 basis and will reflect the following judgements:

|  |  |
| --- | --- |
| **Rating of Response****The tenderer provides a response which in the opinion of the evaluators is:**  | **Score** |
| **Excellent:** Addresses all of the requirements and provides a response with relevant supporting information which does not contain any weaknesses, giving the Agency complete confidence that the requirements will be met. | 10 |
| **Very Good:** Addresses all of the requirements and provides a response with relevant supporting information, which contains very minor weaknesses, giving the Agency high confidence that the requirements will be met. | 8 |
| **Good:** Addresses all of the requirements and provides a response with relevant supporting information, which contains minor weaknesses, giving the Agency reasonable confidence that the requirements will be met.  | 6 |
| **Satisfactory:** Substantially addresses the requirements and provides a response with relevant supporting information which may contain moderate weaknesses, but gives the Agency some confidence that the requirements will be met.  | 4 |
| **Weak:** Partially addresses the requirements, or provides supporting information that is of limited relevance or contains significant weaknesses, and therefore gives the Agency low confidence that the requirements will be met. | 2 |
| **Nil:** No response or provides a response that gives the Agency no confidence that the requirements will be met.   | 0 |

**Section 4**

**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 Pricing Schedule (Appendix A);
* completed Prior Rights Schedule (Appendix B);
* confirmation that terms and conditions are accepted (Appendix C. Please note that the terms cannot be amended later);
* answers to questions in Appendix E.

**Section 5**

**Specification**

# Background to the Requirement

Hydrologists provide a technical service to managers of Water Resources and Flood and Coastal Risk Management in the EA. Their technical understanding and ability to carry out hydrological assessments are integral to the EA meeting its statutory functions as the English Environmental Regulator. The Hydrology Training Programme provides the key skills and knowledge elements to enable our staff to deliver this element of our work.

The majority of delegates for the courses will be EA hydrologists with some attendees from other related disciplines.

The Hydrology Foundation course is likely to have delegates from a number of other teams (Environment Management, Sampling & Collection, Analysis & Reporting, Integrated Environment Planning, Groundwater & Contaminated Land and Fisheries & Biodiversity) who wish to increase their hydrology awareness.

The courses are also open to delegates from the Met Office, Natural Resources Wales, SEPA and DOENI.

# Specific Objectives/Deliverables

The courses need to be delivered in their current format from April 2017. Course handbooks and PowerPoint presentations already exist for these courses. It is envisaged that these will be provided in full to the successful candidate for this contract, and delivered in the same format.

The successful provider will be expected to deliver using these materials without initial development costs as the materials are generally up to date and fit for purpose. We acknowledge that there will be some familiarisation required and costs associated with this should be included in delivery cost for each course in Appendix A.

With time however, these courses may need maintenance and updating. We expect minor updates to slides to be included as part of the costs for delivering the courses. However the contract will include provisions for more significant updates to the training material when deemed to be required by the EA at agreed costs, as detailed in Appendix A. Any updated materials will belong to the EA and must be provided electronically on completion.

The courses are set up to include ‘classroom’ presentations, group discussions and problem solving by delegates in course workbooks. All presentations are in MS PowerPoint with supporting hard copies of material provided to delegates as required.

The training concentrates on delegates acquiring skills through completion of workbooks on the courses and, for three of the courses, through post-course work. The post-course work is introduced during the courses but is managed internally by the EA. For the Hydraulics course in particular, practical demonstrations of theory (using a flume for instance) give delegates confidence that taught material has real application to their day job.

Courses are delivered to a maximum delegate group size of 16 people, and a minimum of 6 people. Laptops are needed for in-class exercises using standard Microsoft Office software (one laptop shared between two delegates) and therefore the successful provider will need to be able to provide up to 8 laptops for the duration of each course.

Course tutors are expected to have knowledge across the suite of courses being provided, as real-world examples and practical experience are useful to aid learning. The ability for the successful provider to work flexibly with the EA is beneficial, as variable class sizes may mean different numbers of tutors are required to maintain value for money with small classes and quality of learning with large classes.

Delivery of the Hydrology Foundation course would require one course tutor who would deliver the training in collaboration with an experienced EA hydrologist. A flexible approach would be required for the other four courses, with between one and two tutors required depending on the number of delegates.

Delivery must be undertaken with due regard to diversity, equality and inclusion. This may include:

* accessibility arrangements where a venue is provided as part of the contract;
* adjustments to course materials to make them accessible to delegates with particular needs;
* use of inclusive imagery;
* avoidance of bias in discussion.

The successful provider will be required to deliver the training courses in a lively, interesting and engaging style. Copies of all risk assessments and any altered presentations should be delivered to the EA for approval prior to any course delivery.

Based upon past demand the number of courses needed to be run each year are as follows (note that this is an indication only and not a guarantee of work).

|  |  |  |
| --- | --- | --- |
| Course Type | Course Duration (days) | Estimated frequency per year |
| Hydrology Foundation | 2 | 3 |
| Catchment Processes and Behaviour | 2 | 2 |
| Hydrological Tools and Techniques | 2 | 2 |
| Hydrological Assessments | 2 | 2 |
| Hydraulic Theory | 2 | 2 |

For all five courses, delivery is split between presentations and both paper and computer-based exercises.

There is an open-book test at the end of the Hydrology Foundation course. The successful provider will be responsible for marking the course test as part of the two-day course delivery fee.

For the Catchment Processes and Behaviour, Tools and Techniques and Assessments courses, the successful provider will need to introduce delegates to the pre and post course E-learning and coursework, although all assessment and management of these elements of training will be done internally by the EA.

To date, the Hydraulic Theory course has been delivered with the use of a large portable flume to demonstrate the theory in practice. Using a flume enhances the learning experience for delegates and the ability of the successful provider to offer this would be an asset; however alternatives to this can be considered.

Further details on the objectives for each course and the topics covered are provided in Appendix D.

### Timescales/Deadlines

The contract will commence on 01 April 2017 and end on 31 March 2020. We would expect to have a project initiation meeting within the first six weeks of the contract.

### Skills of Personnel Required

Contractors will need to have the skills and numbers of senior staff required to maintain a high-quality, consistent training programme for the duration of the contract.

Key people to be used in the delivery of the training courses should be recognised, published experts in the field of Hydrology with extensive experience of successfully delivering technical training courses. We expect tutors to be appropriately qualified in a relevant discipline, with significant hydrological industry experience.

**Section 6**

**Contract Management**

This contract shall be managed on behalf of the Agency byKaren James.

The successful provider will need to appoint a National Contract Manager who will act as the single point of contact for all matters relating to the management of this contract. The National Contract Manager must be available to meet the EA technical lead at least once a year for progress and management review. The successful provider will need to provide up to date and accurate management information reports (e.g. on number of delegates trained) for these meetings as well as promptly providing any other statistics relating to the contract as the EA shall reasonably require.

Course administration (including dates and joining instructions) will be co-ordinated by our administration team at Shared Services Connected Limited (SSCL).The successful provider will work closely with appropriate staff in a flexible way to agree dates and provision of course materials.

SSCL will raise purchase orders to cover the cost of each course. All invoices must quote the purchase order number in order to be processed. A file copy invoice must be provided to the contract manager, on request. The timescale for payment of invoices will be up to 30 days after we have received a valid invoice.

We require signed attendance forms to be returned back to SSCL and they must be advised within the first hour of the training session of any failures to attend.

We may have to postpone courses at short notice because of our delegate’s emergency response role, and we expect our training provider to be flexible about rescheduling.

We will always work with a provider to reschedule a course for as soon as is possible.

Should we need to cancel a course the following policy will apply:

|  |  |
| --- | --- |
| **Notice of cancellation** | **Percentage of course fee paid** |
| Greater than 4 weeks | 0% |
| 3-4 weeks | 25% |
| 2-3 weeks | 50% |
| 1-2 weeks | 75% |
| Less than one week | 100% |

The successful provider must provide four weeks’ notice for any cancellations and agree a revised schedule as soon as possible. The successful provider will be expected to work in partnership with the EA and be flexible with regards to the postponement or cancellation of courses.

Regular telecons may take place between the successful provider and EA technical lead to discuss feedback and evaluation. You may also be required to submit a brief tutor feedback form to SSCL within five days of the end of each course.

Performance management will form part of the contract and will be reviewed regularly. Full details will be agreed and implemented at the commencement of the contract with the successful provider.

Courses will be evaluated through the use of both delegate responses and skills achievement assessment. The successful provider will need to forward completed copies of the EA’s Course Evaluation forms to the EA technical lead within two weeks of the end of each course. The successful provider will be expected to plan appropriate actions to rectify any consistent themes arising from delegate feedback at their reasonable cost where relevant. Such action plans should be approved by the EA. Course test results for the Hydrology Foundation course will need to be marked and returned to the EA technical lead within four weeks of the end of the course.

**Section 7**

**Sustainability Considerations**

We are committed to continually improving our sustainability performance. The Environment Agency has set itself tough objectives as a clear commitment and contribution to sustainable development throughout England. The Agency recognises that this can only be achieved through commitment from all sectors of society and it is intent on raising awareness amongst industry and commerce.

Contractors must adopt a sound proactive environmental approach, designed to minimise harm to the environment.

Environmental criteria should be considered as part of your tender submission with credit given for innovation. Factors to be considered could include areas such as:

* + - Paper use: All documents and reports prepared by consultants and contractors are produced wherever possible on recycled paper containing at least 100% post consumer waste and printed double sided.
		- Travel: use of public transport, reduce face to face meetings by using email and videoconferencing. Meetings to be held in locations to minimise travel and close to public transport links.
		- Packaging: should be kept to a minimum. Re-use and disposal issues must be considered.
		- Efficient Energy and Water Use.
		- Disposal of Waste: Whilst on site the contractor is responsible for the disposal of their own waste and can only use client facilities with express permission from the on site facilities officer.
		- Whilst on site, contractors should comply with the local environmental policy statement which will be made available to you in advance or on arrival.

**Diversity and Equal Opportunities**

We are committed to promoting equality and diversity in all we do and valuing the diversity of our workforce, customers and communities.  As a public body, we publish regular information about what our equality objectives are and how we’re meeting them.

<https://www.gov.uk/government/organisations/environment-agency/about/equality-and-diversity>

**Health and Safety**

Contractors will be responsible for making sure all required health and safety aspects including risk assessments are undertaken and required management measures are in place to protect worker exposure. This includes management of all partners, consortium members and subcontractors.

**IEM2020:**

## Sustainability Objectives

As the Environment Agency, our overarching aim is to protect and improve the environment for people and wildlife. Over the last 10 years we have achieved significant reductions in our environmental impacts that occur through our everyday operations. This included a 40% reduction in our carbon emissions and a 37% reduction in the number of miles we travel. This year we have launched our new Internal Environmental Management strategy to take us through to 2020, building on these successes and widening our ambition.

**Supply chain**

Our 2020 approach will have a very strong emphasis on the indirect impacts of our supply chain.

Our supply chain accounts for over 70% of our total environmental impacts.

Working with our supply chain we want to be world class in the area of environmental management. The environmental impacts of our work and that delivered by and through our supply chain must be reduced; environmental risks must be effectively managed and opportunities for enhancements investigated.

As an organisation, our environmental management system (EMS) is accredited to ISO14001 and EMAS standards. Our procurement activities form part of this system; driving environmental performance improvements across the value chain.

## Section 8

### Additional Information

### Copyright and confidentiality

Unless otherwise indicated, the copyright in all of the documentation belongs to the Environment Agency, and the documentation is to be returned to us with your tender. The contents of the documentation must be held in confidence by you and not disclosed to any third party other than is strictly necessary for the purposes of submitting your quote. You must also ensure that a similar obligation of confidentiality is placed upon any third party to whom you may need to disclose any of the documentation for the purposes of the tender.

### Accuracy of documentation

You should check all documentation; should any part be found to be missing or unclear you should immediately contact us at the address given in the covering letter. No liability will be accepted by the Environment Agency for any omission or errors in the documentation which could have been identified by you.

### Amendments to documentation

Prior to the date for return of tenders, we may clarify, amend or add to the documentation. A copy of each instruction will be issued to every Tenderer and shall form part of the documentation. No amendment shall be made to the documentation unless it is the subject of an instruction. The Tenderer shall promptly acknowledge receipt of such instructions.

### Alternative Offers

Alternative offers may be considered if they constitute a fully priced alternative and are submitted in addition to a quotation complying with the requirements of the Invitation to Quote Documents. If, for any reason you wish to submit an alternative offer without a fully compliant tender please contact us in accordance with the details in the covering letter.

## Continuity of personnel

The Contractor shall employ sufficient staff to ensure that the Services are provided at all times and in all respects to the Project Standard. It shall be the duty of the Contractor to ensure that a sufficient reserve of staff is available to ensure project delivery in the event of staff holidays, sickness or voluntary absence

The Environment Agency will be notified immediately of any changes to personnel associated with the project. The Contractor will ensure that every effort is made to replace outgoing staff with personnel of equal calibre and expertise. All new members of staff undertaking work for the Project will need to be agreed by the Environment Agency prior to commencement.

At all times, the Contractor shall only employ in the execution and superintendence of the Contract persons who are suitable and appropriately skilled and experienced.

## Intellectual property rights

All results, including material and tools produced, developed or paid for under this contract shall be the property of the Environment Agency.

## References

The Environment Agency may request recent and relevant references prior to the award of the project.

**Contract award**

This Request for Quote is issued in good faith but we reserve the right not to award any or all of this work.

### DATA PROTECTION ACT ADDENDUM TO SPECIFICATION

## Protection of personal data

In order to comply with the Data Protection Act 1998 the Contractor must agree to the following:

* You must only process the personal data in strict accordance with instructions from the Environment Agency.
* 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.

# APPENDIX A - PRICING SCHEDULE

Please ensure the prices you quote are inclusive of ALL costs payable to deliver a course.

For the avoidance of doubt this should include:

* Tutor costs, based on 16 delegates;
* Costs for maintenance of/minor updates to material;
* All travel & subsistence costs;
* Provision of training laptops;
* Provision of printed and bound course notes for each delegate;
* Equipment hire/use e.g. for practical exercises;
* Pre/post course work/evaluation; and
* Associated contract admin/management costs.

You will be evaluated using annual cost based on the number of courses we expect to run as specified in Section 2.

For the purposes of calculating travel and subsistence costs, please note that our courses are likely to be run at venues in Birmingham, Leeds and London, although they may at times be run at other locations.

All costs must be quoted on this schedule. Any costs not detailed will not be paid.

Please detail your costs in the table below.

|  |
| --- |
| **Cost Proposal (To be completed by Supplier)** |
| **Course** | **Cost per course** | **Annual Cost** |
| Hydrology Foundation (per course) |  |  |
| Catchment Processes and Behaviour (per course) |  |  |
| Hydrological Tools and Techniques (per course) |  |  |
| Hydrological Assessments (per course) |  |  |
| Hydraulic Theory (per course) |  |  |
| **Total Overall Annual Cost**  |  |

Please also give an indication of cost of any major redevelopment that we might require during the life of the contract. This is for our information only and will not form part of the evaluation.

|  |  |
| --- | --- |
| **Staff**  | **Cost £ per Day, Excluding VAT** |
|  |  |
|  |  |
|  |  |

**Note to bidders:**

1. All costs/ rates are to be exclusive of Value Added Tax
2. Sums quoted are fully inclusive of all requirements as detailed in the specification, see Section 2 of this quotation document
3. No work shall be carried out at day work rates without the prior agreement of the Environment Agency’s nominated representative
4. The sums shown shall be fixed for the duration of the contract
5. Payment will be made in accordance with the Conditions of Contract, see Section 4.

**Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Position: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Company: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Telephone number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**APPENDIX B - PRIOR RIGHTS SCHEDULE**

Details of Prior Rights held by the Parties (To be updated as Rights are introduced during the period of the Contract)

Prior Rights owned or lawfully used by a Party, whether under licence or otherwise, which it introduces to the Project for the purposes of fulfilling its obligations under the Contract

Held by the Environment Agency

|  |  |  |
| --- | --- | --- |
| **Name and description of Prior Rights** | **Extent of proposed use in the Project**  | **Proprietary owner of the Prior Rights** |
| T442-2 Hydrology Foundation course materials (including PowerPoint presentations, MS Word course handouts MS Excel exercises, MS Word/PDF exercises, course test and solutions) | For the purposes of delivering the T442-2 Hydrology Foundation course | Environment Agency |
| T442-3 Catchment Processes and Behaviour course materials (including PowerPoint presentations, MS Word course handouts MS Excel exercises, MS Word/PDF exercises, course test and solutions) | For the purposes of delivering the T442-3 Catchment Processes and Behaviour course | Environment Agency |
| T442-4 Hydrological Tools and Techniques course materials (including PowerPoint presentations, MS Word course handouts MS Excel exercises, MS Word/PDF exercises, course test and solutions) | For the purposes of delivering the T442-4 Hydrological Tools and Techniques course | Environment Agency |
| T442-5 Hydrological Assessments course materials (including PowerPoint presentations, MS Word course handouts MS Excel exercises, MS Word/PDF exercises, course test and solutions) | For the purposes of delivering the T442-5 Hydrological Assessments course | Environment Agency |
| T437 Hydraulics Theory course materials (including PowerPoint presentations, MS Word course handouts MS Excel exercises, MS Word/PDF exercises, course test and solutions) | For the purposes of delivering the T437 Hydraulic Theory course | Environment Agency |

Held by the Contractor

|  |  |  |
| --- | --- | --- |
| **Name and description of Prior Rights** | **Extent of proposed use in the Project**  | **Proprietary owner of the Prior Rights** |
|  |  |  |
|  |  |  |
|  |  |  |

**Explanation of Contractor's Prior Rights**
All Intellectual Property Rights owned by or lawfully used by the Contractor, whether under licence or otherwise before the date of this Contract. It can also mean any invention and know how or other intellectual property (whether or not patentable) owned by one of the parties prior to the commencement of the Project, or devised or discovered by one of them only in the course of other projects during the Project period and not arising directly from the Project.

**APPENDIX C – ACCEPTANCE OF TERMS AND CONDITIONS**

I/We accept in full the terms and conditions named in Section 2 and appended to this Request for Quote document.

Company \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Print Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Position \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**APPENDIX D: Detailed Course Descriptions**

**Hydrology Foundation**

The Hydrology Foundation course is required to give an introduction to the subject for new entrants and officers from other disciplines.

By the end of the course delegates will be able to:

* understand some of the physical processes in hydrology we need to quantify
* explain how hydrological data is collected, validated and used within the Environment Agency
* describe the main techniques used within hydrology and when they might be used
* deal confidently with some of the standard hydrological data types and analysis techniques
* demonstrate basic competency in applying some fundamental techniques for manipulating hydrological data (flow duration statistics, baseflow separation, frequency analysis).

The topics covered by the course include:

* introduction to the hydrological processes operating at catchment scale
* concept of runoff and baseflow.
* understanding and quantifying the catchment water balance
* discussion of the main anthropogenic influences on hydrological processes.
* introduction to the main hydrological data types, including measurement network, data collection methodologies and data quality review and validation.
* introduction to key river flow analysis techniques
* deriving flow regime statistics
* plotting and using flow duration curves
* naturalising flow series
* baseflow hydrographs
* concepts of probability, return period and risk
* determining the probabilities of extreme events: data requirements and limitations
* industry standard methods for flood and drought frequency analysis
* main techniques for manipulating rainfall including areal rainfall averages, depth-duration calculations, long-term rainfall accumulations, rainfall event frequency.

**Catchment Processes and Behaviour**

This course is required to give an understanding of the physical processes of catchments, and the ability to analyse catchment characteristics and behaviour. The course will give delegates the pre-requisite knowledge essential for applying hydrological tools and techniques and undertaking assessments.

By the end of this course delegates should be able to:

* discuss the physical properties of a catchment, including size, shape and hypsometry;
* apply the water balance equation to hydrological problems at the catchment scale;
* describe the principal rainfall-runoff mechanisms and their spatial and temporal variability;
* describe how catchment properties and rainfall characteristics may affect river regime and flow hydrograph shape;
* explain how steady state flow equations are used to calculate river discharge and depth;
* suggest potential areas of erosion and deposition in a river;
* explain the hydrological role, characteristics and functions of lakes, reservoirs and wetlands at catchment scale;
* discuss catchment behaviour with non-specialists using simple conceptual models.

The topics covered by the course include:

* understanding the catchment;
* catchment properties;
* precipitation;
* evaporation and transpiration;
* storage;
* catchment behaviour;
* rainfall-runoff pathways;
* groundwater recharge and baseflow;
* surface-groundwater interactions in chalk catchments;
* river channel profiles;
* water flow and depth in channels;
* estuaries and tides;
* simple river hydraulics;
* lakes and reservoirs;
* wetlands, peat bogs;
* impact of reservoir operation on hydrological regime and hydroecology.

**Hydrological Tools and Techniques**

This course is required to give an overview of the data, tools and techniques available for undertaking hydrological assessments, and give delegates the ability to select appropriate tools or techniques for particular applications.

By the end this course delegates should be able to:

* identify sources of hydrological and geographical field data and evaluate the suitability of data for use in hydrological assessments;
* describe the range of tools and techniques available for estimating unmeasured data, and their strengths and weaknesses;
* use statistical techniques to characterise relationships between hydrological variables;
* analyse rainfall data in order to calculate rainfall intensities and profiles for any chosen location, duration and return period of event;
* analyse flow data in order to calculate the frequency of high and low flows;
* select suitable techniques to solve to a wide range of hydrological problems, including estuarine, reservoir and groundwater applications.

The topics covered by the course include:

* identifying data requirements and choosing techniques;
* discussion on perceptions and misconceptions;
* types of data;
* data sources;
* measuring data and network design;
* data quality and uncertainties;
* evaluating and validating hydrological data;
* estimating data-overview of tools and techniques;
* tools for estimating precipitation, evaporation, transpiration and soil moisture data;
* tools for estimating infiltration and sub-surface flow data;
* tools for estimating surface runoff data;
* tools for estimating river channel flow and depth data;
* application of runoff and flow estimation methods to extend a historic time series;
* analysing time series and spatial data;
* analysing precipitation data;
* analysing flow data;
* application of flow data analysis methodologies;
* evaluating data and assessing flood return period;
* HEP assessment.

**Hydrological Assessments**

This course is required to provide delegates with the ability to plan and undertake appropriate hydrological assessments, including reviewing assessments undertaken by others, within the context of relevant legislation and best practice guidance.

By the end of this course delegates should be able to:

* describe the main legislative and business drivers for hydrological assessments;
* prepare a plan identifying the objectives, scope, constraints and risks of a hydrological assessment;
* select assessment tools and techniques with reference to the hydrological context, data availability and requirements, timescales for completion, available software and skills, and any requirements for future assessments;
* develop a task list and programme for completion of a hydrological assessment;
* apply hydrological tools and techniques in a scientific manner, providing an audit trail;
* identify sources of hydrological uncertainty and quantifying their effects on results;
* critically evaluate results and present conclusions for a target audience;
* review an assessment’s fitness-for-purpose and provide feedback.

The topics covered by the course include:

* designing hydrological assessments;
* objectives and scope of an assessment;
* drivers of an assessment;
* understanding the context of assessments;
* selecting assessment methods;
* managing an assessment;
* undertaking hydrological assessments;
* collecting data;
* applying tools and techniques;
* managing hydrological uncertainty;
* sources of uncertainty;
* effects of uncertainty on results;
* communicating uncertainty;
* reporting hydrological assessments;
* drawing conclusions;
* communicating results;
* reviewing hydrological assessments;
* review techniques;
* record keeping and archiving.

**Hydraulic Theory**

This course is required to provide delegates with an understanding of hydraulic principles, the ability to use these principles to solve hydraulic problems and the ability to discuss hydraulics with others.

By the end of this course, delegates should be able to:

* understand and communicate key hydraulic variables such as hydraulic radius, wetted perimeter and hydraulic mean depth;
* conceptualise hydraulic problems such as the likely impacts of a hydropower application;
* estimate Manning’s n by looking at channel characteristics;
* select the appropriate equation to estimate flow at a control structure;
* determine the hydraulic evidence and calculations required to make sound decisions on the impacts of licence application proposals (such as hydropower);
* discuss hydraulics at an informed level with external stakeholders;
* estimate the backwater effects of structures in open channels;
* describe the importance of boundary conditions in hydraulic modelling.

The topics covered by the course include:

* definition of key hydraulic variables;
* flow, flow area, wetted perimeter, hydraulic radius, velocity etc.;
* various channel shapes;
* roughness estimation;
* roughness coefficients e.g. (n,ks);
* what influences the roughness coefficients;
* various roughness equations e.g. Jarret, Cowan's, HR Roughness Advisor;
* calculation of roughness value;
* open channel flow;
* introduction on what factors influence open channel flow;
* Manning's Equation;
* Colebrook-White (CW) Equation;
* Conveyance Estimation System;
* Normal Depth, Critical Depth;
* Reynolds number;
* Froude number;
* energy and momentum equations;
* specific energy;
* specific momentum;
* application to flow transition;
* backwater equations;
* standard step;
* direct step;
* backwater length;
* culvert hydraulics;
* inlet control;
* outlet control;
* pipe flow;
* orifice flow.

**APPENDIX E - RESPONSES TO QUESTIONS FOR EVALUATION**

Please complete these questions using the boxes below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Question** | **Capacity - 5%** | **Weighting** | **Word Count** |
| C1 | Explain how you intend to resource this training requirement and how you will maintain continuity of personnel for the duration of the contract. | 5 | 300 |
|   |

|  |  |  |  |
| --- | --- | --- | --- |
| **Question** | **Methodology - 20%** | **Weighting** | **Word Count** |
| M1 | Please explain how you will engage delegates of all abilities/knowledge during the training. Include details of any practical demonstrations/multimedia you will use to bring hydrology and hydraulics to life. | 8 | 750 |
|   |
| M2 | How will you manage the varying delegate group sizes we envisage in order to maintain the highest quality teaching for each two day course?  | 5 | 300 |
|   |
| M3 | What methods will you use to monitor and ensure the consistent quality of delivery of training to delegates? Please also include information on your approach to continuous improvement of delivery. | 7 | 500 |
|   |

|  |  |  |  |
| --- | --- | --- | --- |
| **Question** | **Skill and Expertise - 15%** | **Weighting** | **Word Count** |
| S1 | Please provide us with evidence that your trainers / associates are experts in this field, and how do they make sure that their knowledge remains up to date? | 8 | 500 |
|  |
| S2 | Please give examples of recent experience the tutors have had of delivering similar training. Include evidence that this training has met the objectives required. | 7 | 300 |
|  |