



REQUEST FOR QUOTATION (RFQ)

for

**Geotechnical Investigations in the Tawi River, near Jammu
City, Jammu and Kashmir (UT), India**

Issued on:

April,30th, 2022

REQUEST FOR QUOTATION (RFQ)

FOR

GEOTECHNICAL INVESTIGATIONS IN TAWI RIVER, NEAR JAMMU CITY, JAMMU AND KASHMIR (UT), INDIA

1 BACKGROUND

The Joint Venture **AQUALOGUS & OILTECH** (hereafter the “Consultant”) is preparing the *Feasibility and Detailed Project Report for Flood Mitigation and Comprehensive River Management Measures for Tawi Basin* (hereafter the “Project”), under a Contract established with the Project Management Unit (PMU), ERA / Jhelum & Tawi Flood Recovery Project (JTFRP), Government of Jammu and Kashmir, funded by the World Bank (WB).

Therefore, the Joint Venture **AQUALOGUS & OILTECH** is requesting quotations from qualified firms (hereafter the “Bidder”) to conduct **Geotechnical Investigations in the Tawi River**, near Jammu city, Jammu and Kashmir (UT), India.

2 SITE INVESTIGATION PLAN

2.1 GENERAL REQUIREMENTS

The proposed geotechnical investigation plan aims to define, quantify and locate the most suitable field works (trial pits, boreholes and *in situ* tests), sampling strategy and laboratory tests to elaborate the geotechnical project of the designed solutions under the scope of the DPR.

Taking in account the proposed solutions and their layout, the geotechnical investigation plan scope is to provide the:

- Geotechnical assessment of the foundation conditions of the new flood control structures, namely flood embankments and flood walls;
- Geotechnical assessment of the foundation conditions of the sluices for the new embankments;
- Geotechnical characterisation of dredged river sediments as construction materials for the embankments.

Regarding the new flood control structures, the site investigation studies aim to assess the geotechnical conditions of their foundation along their alignments. Different kind of field investigations and/or laboratory tests are proposed for different types of flood control solution - embankments or walls.

For the new flood embankments, the assessment will be achieved with trial pits and soil sampling collection. The trial pits were distributed along the alignment of the embankments, although an intensification of the testing mesh were proposed for the higher embankments foundations. The proposed laboratory test includes granulometric analysis (sieving and sedimentation) and Atterberg limits (liquid and plastic limit).

For the new flood walls as well as for the sluices from the new embankments, which are more demanding from the geotechnical point of view, five 25 m long boreholes and CPTU (piezocone tests) are proposed.

Concerning construction materials, the aim is to reuse as much as possible the dredged materials resulting from the channels dredging. Therefore, the identification of the properties of the dredged materials is required to evaluate their reuse adequacy and to estimate the available volume. The realization of trial pits with sampling, located mostly where higher volumes of excavations are required. As laboratory tests, granulometric analysis (sieving and sedimentation), Atterberg limits (liquid, plastic and shrinkage limits), permeability test, organic matter content determination and compaction tests (standard Proctor) are proposed.

The field works are defined in **Appendix A** including respective coordinates.

2.2 TECHNICAL SPECIFICATIONS

2.2.1 Field survey

Trial Pits

Trial pits should be excavated mechanically, using a backhoe, and should reach up 4,0 m deep, if possible.

Logs must be produced for each trial pit, including: different lithologies description, water level position, sampling depths. It must also include pit coordinates.

A photographic report of pit walls and of the excavated materials should be presented.

Boreholes

Boreholes should be carried out by rotary drilling, with full core sampling and using a protection pipe (if necessary). The diameter of the hole should be at least 76 mm (or equivalent).

Boreholes must attain 25 m depth.

Log should be produced for each borehole, which must include: lithologies description, water level position, sampling depths. The *in situ* geotechnical parameters must also be recorded, namely: i) soils - core recovery and N-SPT values; ii) rocks - core recovery; RQD (Rock Quality Designation), weathered degree (W) and discontinuities spacing (F), according to IRMS procedures. It must also include the borehole coordinates.

A photographic report of the borehole recovery cores and SPT samples must be presented.

Standard Penetration Test (SPT)

Standard Penetration test (SPT) must be accomplished for each borehole every 1,5 m drilling, according to IS 2131:1981 or ASTM D - 1586.

The obtained results from the first (15 cm probe) and the second phase (less 45 cm probe) of the test must be recorded in borehole log.

Piezococone (CPTU)

The piezococone (CPTU) should attain the maximal depth as possible. This depth should be as similar as possible to that from the nearest borehole.

Those tests should be performed according to the international reference standards from ISSMGE, 1988. The ISO 22476-1:2012 may be used.

2.2.2 Laboratory tests

The laboratory tests shall be performed on the disturbed samples collected in the trial pits, according to the quantities established in Table 2.1.

Table 2.1 – Laboratory Tests on Disturbed Samples.

	Embankment Pits	Dredging pits	Total
Granulometric analysis	14	12	25
Atterberg Limits			
Liquid and plastic limits	--	12	12
Shrinkage limit	--	6	6
Organic matter content	--	6	6
Permeability test	--	6	6
Compaction Test (Standard Proctor)	--	6	6

Laboratory tests must be accomplished according to Indian Standards or equivalent British Standards or ASTM Standards, such as:

- Granulometric analyses (sieving and sedimentation) - IS 2720: 1985 Part – 4;
- Liquid and plastic limits - IS 2720:1985 Part – 5;
- Shrinkage limit - IS 2720 : 1972 Part – 6;
- Organic matter content - IS 2720 : 1972 Part – 22 ;
- Permeability test - IS 2720 : 1987 Part – 36 (granular soils) and IS 2720 : 1986 Part – 17 (fine grained soils);
- **Compaction test (Normal Proctor) - IS 2720 : 1976 Part – 38.**

2.3 SERVICES SCHEDULE

Taking in account the type of field and laboratory tests proposed and the suggested quantities, the expected services schedule is presented on Table 2.2.

Table 2.2 – Services' Schedule

	Weeks				
	1st	2nd	3rd	4th	5th
Field works					
Trial pits					
Boreholes with SPT					
Piezocones (CPTU)					
Laboratory tests					
Granulometric analysis					
Atterberg Limits					
Liquid and plastic limits					
Shrinkage limit					
Organic matter content					
Permeability test					
Compaction Test (Standard Proctor)					
Geotechnical Report					

3 DELIVERABLES

As deliverables, the contractor should perform:

- A geotechnical report with:
 - The identification of used equipment,
 - The identification of the used standards,
 - A summary table with test results,
 - A summary analysis of the results;
- Trial pits logs according to the provided technical specifications;
- Boreholes logs according to the provided technical specifications;
- CPTU reports, with Q_c/Q_t , F_s and U_2 measurements and graphics;
- Laboratory test reports.

4 QUOTATION FORM

Table 4.1 presents the quotation form to be considered by the bidders.

Table 4.1 – Quotation Form.

SN	Field works and laboratory test designation	Unit	Quantities	Unit Rate (INR)	Total Amount (INR)
1	Mobilisation (equipment and personal)	LS	1		
2 Field works					
2.1	Trial pits (4.0 m) with disturbed soil sampling with backhoe - Embankments	No	14		
2.2	Trial pits (~3m) with disturbed soil sampling with backhoe - Dredging materials	No	12		
2.3	Borehole (rotary with total recovery core)				
2.3.1	Positioning	No	5		
2.3.2	Drilling (d≥ 76 mm)	m	125		
2.3.3	Standard Penetration Tests	No	83		
2.4	Piezocone (CPTU) with about 20/25 m	No	3		
3 Laboratory tests					
3.1	Granulometric analyses (Sieving and hydrometer analysis)	No	26		
3.2	Atterberg Limits				
3.2.1	Liquid and plastic limits	No	12		
3.2.2	Shrinkage	No	6		
3.3	Organic matter content	No	6		
3.4	Permeability tests	No	6		
3.5	Compaction test (light compaction)	No	6		
4	Geotechnical Report (including logs and individual laboratory tests reports)	No	1		
		Total (excluding taxes)			
		All taxes			
		Total (including taxes)			

5 INSTRUCTIONS TO BIDDERS

5.1 DOCUMENTS COMPRISING THE PROPOSAL

The bidder's proposal should include the following elements:

(a) Technical Proposal, including the following elements:

- Firm information, past experience, qualification, available equipment, etc.
- Proposed work schedule and timeline to provide the requested deliverables/products.

(b) Financial Proposal, with a proposed quotation for providing the deliverables previously described in this RFQ.

Instructions on Proposal Submission are detailed in the Section 5.7 of this RFQ document.

5.2 CLARIFICATIONS AND REQUEST FOR INFORMATIONS

The Consultant reserves the right to make clarifications, corrections, or changes in this RFQ at any time prior to the time proposals are opened. Questions and requests for information must be submitted before May 16th 2022 to:

tawiproject@aqualogus.com; and

slathia0000@gmail.com

All prospective Bidders will be informed of said clarifications, corrections, or changes via an emailed addendum. All proposals submitted must acknowledge receipt of all addenda issued by the Consultant.

5.3 REJECTION OF PROPOSALS

Proposals that are not prepared in accordance with Instructions in this RFQ may be rejected. If not rejected, the Consultant may demand correction of any deficiency and accept the deficiently prepared proposal upon compliance with these Instructions by the Bidders.

5.4 ACCEPTANCE OF PROPOSALS

Proposals submitted are offers only and the decision to accept or reject is a function of quality, reliability, capability, reputation, and expertise of the proponent Bidder.

The Consultant reserves the right to accept the proposal that is, in its judgment, the best and most favourable to the interests of the Client and the Project based on the evaluation factors

in this RFQ; to accept any proposal; to reject any and all proposals submitted or in the request for quotation process.

This Request for Quotation (RFQ) does not commit the Consultant to award a contract or to reimburse the Proposer for costs incurred in submitting this proposal.

Additionally, the Consultant reserves the right to reject any or all proposals received as a result of this request, to negotiate with any Proposer, or to amend or cancel in part or in its entirety, this Request for Quotation, pursuant to the best interest of the Client and the Project.

5.5 ELIGIBILITY CRITERIA

The following criteria as per World Bank Guidelines must be satisfied to assess the eligibility of the bidders:

a) Incorporation of the Firm:

- A firm or legal entity registered in the country of its presence should have been in operations internationally or nationally for at least three (3) years with the proof of incorporation/commencement of business.

b) Similar work:

- The bidder should have successfully completed at least three (3) similar works (certificates of completion/ substantial completion issued by the clients to be attached) during the last five (5) years.

c) Turn Over:

- Annual average financial turnover of the bidder should not be less than 50 Lakhs INR (or equivalent in other currency) during last three (3) financial years.

5.6 EVALUATION OF PROPOSALS

The submitted proposals will be reviewed and successful bidder will be selected based upon the following factors:

- 1) Capability to provide the requested deliverables complying with the technical specifications.
- 2) Eligibility criteria as defined under Section 5.5.
- 3) Timeline for providing the requested deliverables/products detailed under Section 2.3.
- 4) Quotation cost.

The Contract will be awarded on Least Cost Selection (LCS) basis among those proposals which will pass the technical evaluation.

5.7 PROPOSAL DUE DATE AND SUBMITTAL PROCEDURE

Financial and Technical proposals should be submitted until **17:00 pm (Indian time) on Monday , May 16th, 2022.**

Proposals received after the time specified above will not be considered.

All proposals must be signed by an authorized official. Proposals that contain omissions, erasures, alterations, or additions not called for, conditional or alternate bids unless called for, or that contain irregularities of any kind may be rejected.

The submittal procedure of technical and financial proposals is detailed below:

a) Technical Proposal

Technical proposal should be submitted to the following email addresses:

Team Leader, Tawi Project: tawiproject@aqualogus.com;

Local Project Coordinator, Tawi Project: slathia0000@gmail.com

copy to:

Director Planning & Coordination, Jhelum & Tawi Flood Recovery Project:
dirpnc@gmail.com

Bidders are encouraged to submit the entire technical proposal as one PDF file.

b) Financial Proposal

The Financial proposal should be submitted in a **password protected pdf file** to the following email address:

Director Planning & Coordination, Jhelum & Tawi Flood Recovery Project:
dirpnc@gmail.com

The **file password should be shared through a separate and explicit email only & only** to the Director Planning & Coordination, Jhelum & Tawi Flood Recovery Project:
dirpnc@gmail.com

Any financial proposal without password protection shall be rejected.

Financial proposals will be opened in presence of the Provisional Sum Committee.

5.8 SCHEDULE OF BIDDING PROCESS

The schedule of the bidding process is as follows:

- Date of Announcement: April 30th, 2022
- Deadline for Submittal of Completed Bid: May 16th, 2022
- Contract Award: May 30th, 2022 (Tentative)

APPENDIX A – LOCATION OF GEOTECHNICAL SITE INVESTIGATION WORKS

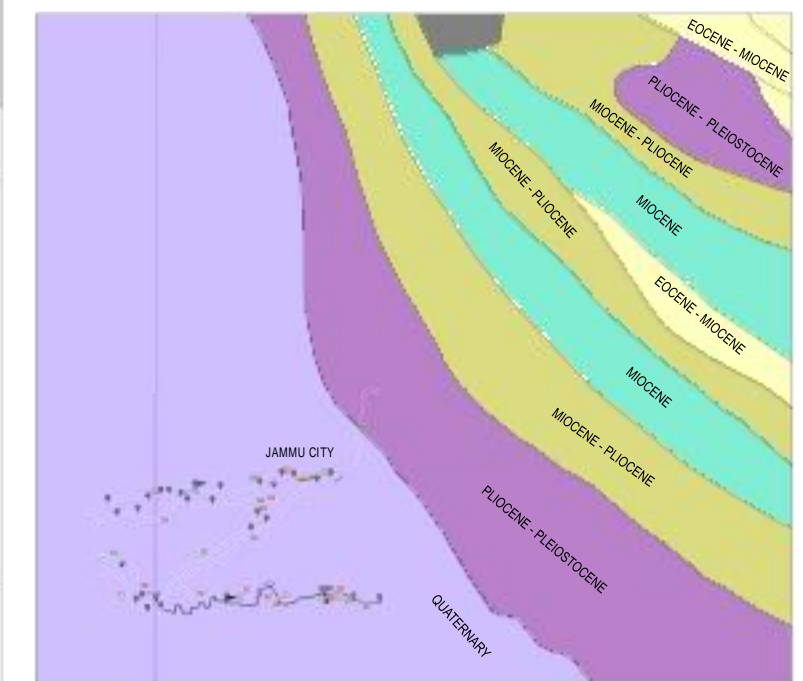


COORDINATES - BOREHOLES		
BH#	M	P
BH1	479068.328	3619917.807
BH2	481005.830	3612912.042
BH3	487112.679	3613372.758
BH4	487107.284	3613300.931
BH5	490552.261	3612803.448

COORDINATES - TRIAL PITS		
TP#	M	P
TP1	485206.830	3620529.364
TP2	484444.108	3620633.802
TP3	480850.093	3619810.011
TP4	480126.556	3618913.229
TP5	478576.608	3618935.981
TP6	476931.454	3619517.489
TP7	475505.400	3618371.184
TP8	474210.974	3618154.136
TP9	473620.765	3618975.243
TP10	482943.433	3618136.553
TP11	476639.743	3612790.583
TP12	476094.909	3612196.917
TP13	475393.008	3612720.940
TP14	488929.911	3612946.506

COORDINATES - TRIAL PITS		
TP#	M	P
TP15	487503.813	3620603.914
TP16	486649.855	3620211.391
TP17	483955.155	3619850.827
TP18	483077.110	3620050.072
TP19	478159.905	3619316.836
TP20	477449.215	3619508.783
TP21	476133.706	3619122.783
TP22	483490.875	3617736.597
TP23	482534.490	3617214.754
TP24	474522.076	3614891.247
TP25	475745.059	3613010.861
TP26	476935.776	3612334.157

COORDINATES - CPTU		
CPTU#	M	P
CPTU1	479068.328	3619917.807
CPTU2	481005.830	3612912.042
CPTU3	487112.679	3613372.758



GEOLOGIC TIMELINE
(ADAPTED FROM BHUKOSH 1:2M)
Scale 1:250 000

SYMBOLY:

- Channel Alluvium: grey sand, silt and clay (late Holocene)
- Terrace Alluvium: grey sand, silt and clay (Holocene)
- Alluvium: unsorted boulders, gravels, sand, silt and clay (Pleistocene)
- Alluvium: oxidized silt-clay with calcium carbonate and micaceous sand (Pleistocene)
- Conglomerate, impersistent sandstone and clay from Swalk (Pliocene-Pleistocene)
- Boulder Conglomerate and sandstone from Swalk (Pliocene-Pleistocene)
- Watercourse Centerline
- Existing Embankment - Setback
- Existing Embankment - Improvement
- New Embankment
- Jammu Smart City Project
- Borehole 8m / SPT
- Trial pit. New embanks
- Trial pit. Eventual borrow materials
- CPTU

NOTES:

- 1 - The lithological types are represented according to Bhukosh - Geological Survey of India (<https://bhukosh.gsi.gov.in>)
 - 2 - Nine boreholes with SPT were drilled along the alignment of the 4th bridge in Jammu, with lengths between 22-30 m, intercepting mainly boulders with sand and core recoveries up to 30%.
- Proposed Desilting Areas

SPATIAL REFERENCE:
Name: WGS 1984 UTM Zone 43N
Datum: WGS 1984
Projection: Transverse Mercator

Revision	Description	Date	Design	Drafter	Check

JHELMUM & TAWI FLOOD RECOVERY PROJECT

FEASIBILITY AND DETAILED PROJECT REPORT FOR FLOOD MITIGATION AND COMPREHENSIVE RIVER MANAGEMENT MEASURES FOR TAWI BASIN

REQUEST FOR QUOTATION

05

1:250 000
1:25 000

LOCATION OF GEOTECHNICAL SITE INVESTIGATION WORKS

220.01.052
MARCH 2022

01/01

220.01.052
MARCH 2022

