

INSPECTORATE OF MINES  
MINES & MINERAL DEVELOPMENT DEPARTMENT  
GOVERNMENT OF SINDH

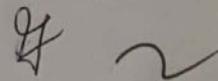
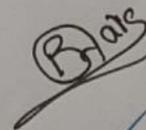
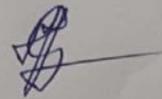
CONSULTANCY SERVICES

FOR

THE STUDY OF "ENVIRONMENTAL MAPPING OF MINING AREAS  
OF SINDH FOR THE CONSERVATION OF MINERALS & NATURAL  
RESOURCES"

DRAFT REQUEST FOR PROPOSALS  
(RFP)

February-2019



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**SECTION-I: LETTER OF INVITATION**



NO: CIM/ADP/E.Mapping/RFP/2019/  
GOVERNMENT OF SINDH  
INSPECTORATE OF MINES  
MINES & MINERAL DEV. DEPARTMENT  
ST-19/1, Block-6, Gulshan-e-Iqbal, Main University Road,  
Karachi,

Dated \_\_\_\_\_ 2019.

To,

\_\_\_\_\_  
\_\_\_\_\_

**SUBJECT: - CONSULTANT BASED STUDY TITLED AS "ENVIRONMENTAL MAPPING OF MINING AREAS OF SINDH FOR THE CONSERVATION OF MINERALS & NATURAL RESOURCES".**

This is to inform you that Committee for selection of Consultants has short listed you/your for Consultancy Services required for the study "Environmental Mapping of Mining Areas of Sindh for the Conservation of Minerals & Natural Resources".

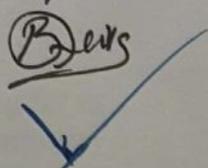
2. Services as per enclosed TORs (Section-V) are required.
3. You are hereby invited to submit Technical and Financial Proposals for Consultancy Services for the above assignment, which would form the basis for a contract agreement between your firm and the procuring Agency if your proposal is found to be the lowest/best evaluated proposal.
4. A firm will be selected in accordance with the Procedures and the method of selection mentioned in the Evaluation Criteria appended as section (VI) of RFP.
5. To enable you to submit a proposal, Procuring Agency provides the following Information.

|              |   |
|--------------|---|
| Section- I   | Letter of Invitation                        |
| Section- II  | Instruction to Consulting Firms & Companies |
| Section- III | Technical proposal – Standard Form          |
| Section- IV  | Financial proposal – Standard Form          |
| Section- V   | Terms of References                         |
| Section- VI  | Eligibility & Evaluation Criteria           |

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6. In order to familiarize yourself with the project and to assess the extent of Services to be provided by your firm/company, you may wish to visit the mining area of Sindh, however, it should be clearly understand that any cost incurred by you for the collection of preliminary information preparation and submission the proposal(s) or the subsequent clarification required will not be reimbursed to you.
7. In the event that you desire additional information procuring agency would endeavor to provide such information expeditiously if available with them but any delay in providing such additional information will not be considered as a reason for extending submission date of your proposal.
8. Your Detailed Technical Proposal should be received (One original and Five copies) along with Financial Proposal (Original) in separate sealed envelopes to the office of the Chief Inspector of Mines, St-19/1, Block-6, University Road, Gulshan-e-Iqbal Karachi, on or before 11-03-2019.
9. A proposal will be treated as non-responsive & will not be considered for evaluation, if any of the information requested in the letter of invitation is omitted or not complied with and no proposal will be accepted upon expiry of deadline date and time for submission.
10. The time for completion of the study titled as "Environmental Mapping of Mining Area of Sindh for the Conservation of Minerals & Natural Resources" Consultancy contract will be of (24) Months from the date of issuance of work order.

(SYED IRSHAD AHMED JILANEE)  
CHIEF INSPECTOR OF MINES, SINDH  
KARACHI


**SECTION II: INSTRUCTION TO CONSULTING FIRMS & COMPANIES**

**1. DEFINITIONS:**

- 1.1. "Procuring Agency (PA)" means the agency with which the selected Consultant signs the contract for the Services.
- 1.2. "Consultant" means any firm or company that may provide or provides the Services to the PA under the contract.
- 1.3. "Contract" means the Contract signed by the Parties and all the attached documents Listed in the General Conditions (GC), the Special Conditions (SC), and the appendices.
- 1.4. "Day" means calendar day.
- 1.5. "Government" means the Government of Sindh.
- 1.6. "Instructions to Consultant" (Section 1 of the RFP) means the document which Provides to Consultants with all information needed to prepare their Proposals.
- 1.7. "Personnel" means professionals and supporting staff provided by the Consultant or by any Sub-consultant and assigned to perform the Services or any part thereof.
- 1.8. "Proposal" means the Technical Proposal and the Financial Proposal.
- 1.9. "RFP" means the Request for proposal prepared by the PA for the selection of Consultant.
- 1.10. "Services" means the works to be performed by the Consultant pursuant to the Contract.
- 1.11. "Sub-Consultant" means any firm or company with which the Consultant sub contracts any part of the services.
- 1.12. "Terms of References" (TORs) means the documents included in the RFP as Section (v) which explain the objectives, scope of work, activities, tasks to be performed, respective responsibilities of the Procuring Agency and the Consultant, and expected results and deliverables of the assignment.
- 1.13. Mining area means all mines other than coal in leased area or out of leased area and all mineral bearing leased area.
- 1.14. Mine means any excavation where any operation for the purpose of searching for or obtaining minerals has been or is being carried on and includes all works, machinery tramways and sidings, mineral processing plants, whether above or below ground, in or adjacent to or belonging to a mine.

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## **2. INTRODUCTION**

- 2.1 The PA will select a Firm / Company as per requirements of Clause 76 of SPPRA RULES-2010, amended in 2017.
- 2.2 Consulting Firms & Companies are invited to submit separately sealed Technical and Financial proposals as per Clause 72(1) of SPPRA Rules 2010, amended in 2017. The assignment shall be implemented in accordance with the logical sequence of the work / consultancy services.
- 2.3 The "Integrity Pact" has to be signed by the Firm or Company at the time of executing the contract agreement.
- 2.4 The Consulting Firm shall furnish information as required through Technical and Financial Proposal for the Study.

## **3. CERTIFICATE OF REGISTRATION**

- a. Consultancy Firm & Companies shall indicate their Registration number and name of personal and their designation who is authorized to sign documents on their behalf otherwise the Procuring Agency reserve the rights to reject the Proposal.

## **4. PREPARATION OF PROPOSALS**

- a. The proposal as well as all related correspondence exchanged by the Consultancy firm & Companies and the Procuring Agency, shall be written in English.

## **5. TECHNICAL PROPOSAL FORMAT AND CONTENT**

The Technical Proposal shall be prepared using the attached Standard Forms (Section III), which should not include any financial information.

## **6. FINANCIAL PROPOSALS**

The Financial Proposal shall be prepared using the attached Standard Form (Section-IV).

## **7. SUBMISSION, RECEIPT AND OPENING OF PROPOSALS.**

- a. Submission letters for both Technical and Financial Proposals should respectively be in the format provided as TECH-1 of Section III, and Financial of Section IV.
- b. An authorized representative of the Consultants shall initial all pages of the original Technical and Financial Proposals. The authorization shall be in the form of a written power of attorney accompanying the Proposal or in any other form demonstrating that the representative has been duly authorized to sign. The signed Technical and Financial Proposals shall be marked "Original".

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- c. The Proposals must be sent to the address/addresses no later than the time and the date indicated in the Letter of Invitation, or any extension in this date granted thereafter. Any proposal received by the Procuring Agency after the deadline for submission shall be returned unopened.
- d. The Procuring Agency shall open the Technical Proposal after the deadline for their submission.
- e. The selected Consultant will be required to submit a performance security in the form of Demand draft, Pay order or Bank Guarantee in favour of the DDO (Development) for an amount of 10% of the contract price. The validity of performance security shall extend at least 90 days beyond the date of completion of contract.
- f. With regard to the scope, quality and extent of the work the Consultant(s) will be required to submit a Certificate of Sufficiency that the work undertaken under his management with any earlier work is sufficient for the work to the highest internationally accepted standards.

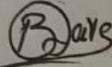
## 8. PROCEDURE OF OPEN COMPETITIVE BIDDING

### Single stage- Two Envelope Procedure

- (a) bid shall comprise a single package containing two separate sealed envelopes. Each envelope shall contain separately the financial proposal and the technical proposal.
- (b) envelopes shall be marked as "FINANCIAL PROPOSAL" and "TECHNICAL PROPOSAL" in bold and legible to avoid confusion.
- (c) initially, only the envelope marked "technical Proposal" shall be opened.
- (d) envelope marked as "FINANCIAL PROPOSAL" shall be retained in the custody of the procuring agency without being opened.
- (e) procuring agency shall evaluate the technical proposal in a manner prescribed in these documents, without reference to the price and reject any proposal which does not conform to the specified requirement.
- (f) During the technical evaluation no amendments in the technical proposal shall be permitted.
- (g) financial proposal of the technically qualified bids shall be opened publically at a time date and venue announced and communicated to the bidders in advance.
- (h) financial proposal of bids found technically non responsive shall be returned un-opened to the respective bidders; and
- (i) bid found to be the lowest evaluated of technically qualified firm shall be accepted.

## 9. METHOD FOR SELECTION OF CONSULTANT

Least cost Selection Method will be adopted. The technically qualified firm with lowest quoted cost or bid shall be selected.

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10. **AWARD OF CONTRACT**

After completing the evaluation and as per the requirements of SPPRA Rules 2010, (amended in 2017) PA shall award the contract to the selected Consultant, and promptly inform all Consultants who submitted proposals.

**SECTION-III TECHNICAL PROPOSAL-STANDARD FORM**

Guidance to the Consultants for the preparation of their "Technical Proposals"

**Technical Proposal Submission form is to be followed.**

- Consultant's Organization and Profile.
- Description of the Technical approach, Methodology and work plan for performing the assignment/services as per TORs.
- Experience in GIS & RS based digital mapping of mineral sector in last 10 years, along with completion certificate of projects, if completed.
- Experience in GIS & RS based digital mapping of other than mineral sector in last 10 years, along with completion certificate of projects, if completed.
- Project team along with attested copies of Degree Certificate and Curriculum Vitae (CV) showing the experience and present attachment status of individual personnel with the Consultant (Permanent employee or hired/associated).
- Staffing Schedule.
- Work Schedule.
- Comments on TORs.

**Note: Technical proposal other than aforesaid format shall not be accepted.**

*[Handwritten marks: a signature, the word "Date" with a line underneath, a checkmark, and a scribble]*

TECH-1 Technical Proposal Submission FORM

To,

[Location, Date]

**The Chief Inspector of Mines,**  
Inspectorate of Mine,  
Mines & Mineral Development Department,  
Government of Sindh,  
Karachi

Dear Sir,

We, the understand offer to provide the consulting services for the study titled as "Environmental Mapping of Mining Area of Sindh for the Conservation of Minerals & Natural Resources" in accordance with your Request for proposal dated \_\_\_\_\_ 2019. We are hereby submitting our proposal, which includes this Technical Proposal, & Financial Proposal sealed under separate envelop.

We are submitting our Proposal in associated with; [insert a list with full name and address of each associated Consultant, if applicable]

We hereby declare that all the information and statement made in this proposal are true and accept that any misinterpretation contained in it may lead to our disqualification.

Our proposal is binding upon us for a period of ninety (90) days from date of opening of Technical Proposal.

We understand you are not bound to accept any proposal you receive.

We remain,

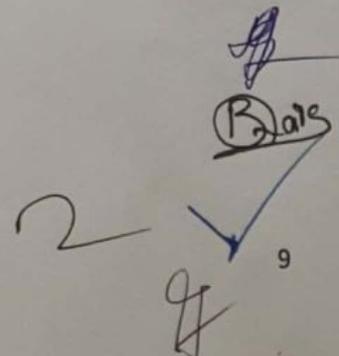
Your sincerely,

Authorized signature [in full and initials]: \_\_\_\_\_

Name and Title of Signatory: \_\_\_\_\_

Name of Firm: \_\_\_\_\_

Address: \_\_\_\_\_

Handwritten signature and initials, including a checkmark and the number 9.

FORM TECH-2  
A – Consulting Firms & Companies Organization

1. Name of the Firm or company \_\_\_\_\_ **(In Block Letter)**
2. Full name of the Chief Executive /  
Managing Director/ Directors etc. \_\_\_\_\_
3. Registration office with address \_\_\_\_\_
4. Telephone Number \_\_\_\_\_
- Fax \_\_\_\_\_
- Email \_\_\_\_\_

- Sole proprietor  
\_\_\_\_\_
- Partnership  
\_\_\_\_\_
- Any other specify  
\_\_\_\_\_

*(Provide partnership deed if working with partners)*

5. Consortium / Joint Venture with any firm Name of the Firm.

*[Handwritten signature]*  
*[Handwritten signature]*  
*[Handwritten checkmark]*  
*[Handwritten initials]*

**SECTION-IV: FINANCIAL PROPOSAL SUBMISSION FORM**

To,

[Location, Date]

**The Chief Inspector of Mines,**  
Inspectorate of Mine,  
Mines & Mineral Development Department,  
Government of Sindh,  
Karachi

Dear Sir,

We, the undersigned offer to provide the work services for the study survey titled as "Environmental Mapping of Mining Area of Sindh for the Conservation of Minerals & Natural Resources" in accordance with your request for proposal dated \_\_\_\_\_ 2019 and our Technical Proposal. Our attached Financial Proposal is as per the following:-

| S. No. | Details  | Cost |
|--------|--|------|
| 1.     | <b>Phase-I</b><br>Total work assignment/services as per TORs of mining areas of Tharparkar, Hyderabad, Sukkur, Sanghar and Thatta Districts.           |      |
| 2.     | <b>Phase-II</b><br>Total work assignment/services as per TORs of mining area of Jamshoro, Karachi, Khairpur, Qamber & Shahdad kot, and Dadu Districts. |      |
| 3.     | Total Cost of the Study  |      |

Our Financial Proposal shall be binding upon us, up to expiration of the validity period of the Proposal, i.e. Ninety (90) days from the date of submission of the proposal.

We remain,

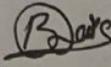
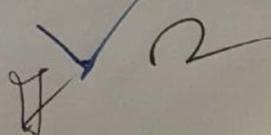
Yours sincerely,

Authorized Signature [In full and initials]: \_\_\_\_\_

Name and Title of Signatory: \_\_\_\_\_

Name of Firm: \_\_\_\_\_

Address: \_\_\_\_\_

  
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## SECTION - V

### TERMS OF REFERENCE (TORs)

For Consultant to conduct

#### "Environmental Mapping of Mining Areas of Sindh for the Conservation of Minerals & Natural Resources".

##### 1. Introduction

The Province of Sindh contains abundant potential for mining of minerals, with a thriving base already established by ongoing operations. However this sector fails to reach its optimum Productivity due to a number of reasons, amongst which is the absence of comprehensive data regarding the location, distribution and surrounding details of the mines throughout the province. This adds into the already limited amount of data available concerning the habitats, physical features, and natural resources in the vicinity of current and prospective mines.

Mines & Minerals Department, Government of Sindh through Inspectorate of Mines has accordingly proposed district wise digital mapping of the entire mining sector to identify all current provisions. This Environmental Mapping can bridge this critical information gap by providing a comprehensive knowledge base containing not just the spatial spread of mines across the province of Sindh with all inherent details, but also the environmental and social features of the areas where these mines are located.

Due to the dearth of a centralized knowledge-based pertaining to the locations and distribution of mines in Sindh, the authorities and responsible department are at a handicap in making well-informed policy decisions. In the past most interventions in terms of provision of Environmental mitigation measures are constrained by the lack of baseline data on environmental and social indicators and the scattered location of the mining sites across the Province in an unorganized manner. The availability of a well-mapped cache of information which should ideally describe in detail the actual, on-ground location and spread of the Mines in Sindh and their surroundings. It would be the first step towards broad-scale development and advancement of the Mining Sector.

Additionally, owing to the environmental degradation inherent to mining operations, the Natural resources in the vicinity of the mines are threatened. These include the pastures for grazing herds, natural/man-made water bodies which provide nourishment for the agricultural bread basket of Sindh, and the protected reserves and sanctuaries housing many precious and endangered wildlife species. These natural resources are scattered all across the Sindh Province and in many locales are in vicinity of the mining operations. Therefore it becomes imperative for the policy body and authorities to be acutely aware of the macro-environment and surroundings of all such mines, particularly in the environmentally sensitive regions which may be at risk due to mining activities. This would allow the authority to plan in advance and ensure that the mine operators do not endanger the natural resources of the province. This ties in to the Sustainability Goals of the Government of Sindh and would allow the province to reap the economic benefits of a sustainable and productive mining sector, whilst conserving the

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environment of the land and the livelihood of the populace dependent on these natural resources.

## 2. General Description of the Project:

Environmental Mapping will include the use of software's and satellite imagery data that would describe the mining industry in spatial pattern from mine and ore body exploration to closure and Reclamation. Geographical Information System (GIS) & Remote Sensing (RS) techniques will be used to generate the spatial maps which will be based on the mineral identification, surrounding natural resources, mining extent & location, environmental sensitive areas, mineral zoning, minerals formation and changes in land & topography etc. The mapping will provide an overview of the current sizing and plotting of mine openings, waste piles, surrounding natural resources and cultural features. It is conducted to delineate areas with different probabilities of hosting certain types of mineralization. Mapping will enable the department to evaluate its current and prospective mining developments.

This will be taken along with separate survey which will be conducted throughout the mining areas of Sindh province for the Mapping study and after confirmation and ground truthing, will be put in the mapping software.

The Environmental Mapping is envisaged to be conducted in two phases over the course of two years through a recognized Consultant. In this study, all the mining areas in the districts of Thatta, Sukkur, Hyderabad, Khairpur, Jamshoro, Sanghar, Qamber & Shahdad kot, Karachi, Dadu and Tharparkar. This part will be called as ground truthing and confirmatory survey. Whilst in the, mapping of all the identified areas will be conducted as per Geographical Information System (GIS) & Remote Sensing (RS) techniques.

In mapping, the basic step for consultant is to develop a base map using high resolution latest satellite imageries. This map will form basis and all information through field surveys and from environmental studies is plotted on it to demonstrate the conditions of the mines, the extent and formality of the operations, their economic prospects and the effects if any on the surrounding area. It would also record in detail, the various environmental features surrounding the mines, the habitations, residences, population and socio-economic conditions. GIS will identify environmentally sensitive areas where the mining activities could lead to an unacceptable level of adverse environmental impacts. These will be represented through detailed Maps included in the final submissions.

The process of GIS is continuous process in a sense that any change on the ground can be compared from the base maps and layer of different environmental attributes will be plotted on the base maps.

At present there are about 25 minerals as mentioned below which are being mined in Sindh, due to which now the Government has taken tremendous efforts for the large-scale mining activities. The Granite and Lake Salt of Tharparkar district are one of them. The limestone and shale are abundant in Sindh.

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## Name of 25 Minerals.

- Granite
- China Clay
- Lime Stone
- Silica Sand
- Clay (Shale Clay Ball Clay Fire Clay)
- Quartzite
- Bentonite
- Dolomite
- Celestine
- Laterite
- Chalk
- Fullers Earth
- Lake Salt
- Trona/Soda Ash
- Red Ochre
- Gypsum
- Calcite
- Flint Stone
- Sand Stone
- Marble
- Aggregate Stone
- Rati/Bajri
- Ordinary Stone
- Gravel
- Ordinary Sand.

### 3. Scope of the project:

The consultant/consulting firm would be required to do following:

- i. A Comprehensive environmental mapping would set the baseline for the natural resources of the province. It would capture the location of the mines (mechanized, small scale, arsenal & illegal) with up-to-date on site data gleaned from field visits by expert with focus on the Spatial Surrounding i.e. Environmental, geographical and geological features of the area. Detailed surveys will reveal the condition of the mine, number of mineworkers (Position Wise), the extent of the operations, change in land (existing land use and land cover mineral resources about 5 sq.km surrounding the mine), their economic prospect and the effects of mining if any on the surrounding area. It would also record in detail, the various environmental features surrounding the mines, the habitation, residences, population and socio-economic condition etc. These shall be represented through detailed maps submitted in final report.

The Component involves development of digital environmental maps for all mining side in project districts. The Geo referenced based data shall be helpful in inventorying all available data sets prevailing in and near vicinity of the mining site and shall be helpful as facilitation tool for overall planning, implementation monitoring of

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investment, resettlement and compensation, environmental monitoring and other related activities.

- ii. Develop the Digital Environmental map of mining areas of Sindh using latest software and satellite imagery data and Geographical Information (GIS) and Remote Sensing (RS) Techniques for real time process and updating the data base which must capture location of each and every mine (other than coal) describing the pattern from ore exploration, exploitation to closure and reclamation.
- iii. This project will also depict mineral identification, mineral resources surrounding natural Resources, mining extent, environmental sensitive areas, mineral zoning, mineral formation, change in land (existing land use & land cover) and topography.

#### **4. Objectives of Project:**

A study of Environmental Mapping for Mining areas of Sindh for the conservation of the Minerals & Natural resources involves the following objectives and expected outcomes:

- To develop digital Environmental Map using Geographical Information System (GIS) this will be available for the Department and enable it to evaluate the current and prospective mining developments.
- To Expand the Mining Sector by focusing on exploration and evaluation of mining Resources.
- To promote the facilitation role of Government to prospecting investors using up-to-date mines information and location as well as promote the environment-friendly mining practices with acute mitigation of environmental hazards for sustainable development of mining sector.
- To identify the informal mining practices and interventions by the department.

#### **5. Project Location/Targeted Areas:**

The Environmental Mapping is envisaged to be conducted in two phases over the course of two years through a recognized Consultant. In phase one, the mining areas in the districts of Thatta, Sukkur, Hyderabad, Sanghar and Tharparkar will be mapped whilst the second phase will cover the mines from the districts of Khairpur, Jamshoro, Karachi, Qamber & Shahdad kot, and Dadu.

#### **6. Duration of Project:**

The scope of the project extends to entire mining areas of Sindh province particularly Tharparkar, Hyderabad, Sukkur, Sanghar, Thatta, Jamshoro, Karachi, Khairpur, Qamber & Shahdad kot, and Dadu districts.

|                               |   |
|-------------------------------|---|
| Duration of the study:        | 02 Years, one year for each phase   |
| Month of commencement         | After issuance of work order (Expected months of commencement is May 2019). |
| Expected month of Completion: | April-2021  |

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## **7. Reporting:**

The consultant will submit the Inception, Interim and Final reports of study besides will also be required to submit monthly progress reports to the Procuring Agency throughout the course of the study. They should provide a true reflection of physical progress to date and should highlight any impediments in executing completion the task to the required standard. On submission of each report, the Consultant will give presentation on the progress of work and after completion of each phase; they will give presentation to PA on end product to demonstrate it as pilot project.

In the technical proposal, the consultant will design work assignment according to time frame for the submission of Inception, Interim & Final reports of each phase and its payment as given below.

In the methodology and approach of Technical proposal the consultant will provide the stages of execution of work and details of each activity which will be covered in inception & interim and final report. They have to submit inception, interim and final report within 03 months 07 months and 12 months respectively after execution of contract/ issuance of work order for 1<sup>st</sup> phase. For 2<sup>nd</sup> phase they have to submit the Inception, Interim & Final reports within 03 months. 07 months and 12 months after completion of 1<sup>st</sup> phase. After evaluation and approval of these reports by Evaluation/Review committee, payment to consultant will be made as follows:

- (1) 20% on the approval of Inception report of each phase.
- (2) 30% on the approval of Interim report of each phase.
- (3) 50% on the approval of Final report of each phase.

No mobilization charges will be paid to the Consultant.

## **8. Man Power Requirement.**

The study will be conducted through reputable consultant per Sindh Public Procurement Rules 2010, amended in 2017. The following technical staff will be associated with the consultant during the study for technical support, liaison and monitoring of project staff. The consultant will train them with every step of study, including preparation of base map, digitization of data, development of Geographical information system (Web Portal), installation and execution of software and coordinates conversation etc.

- One Inspector from (H.Q).
- One Environmental Inspector.
- Two Computer Programmers.
- Area Inspector of each District.

## **9. Capacity Building and Training Programme.**

The consultant will develop a list of activities that builds skills & expands knowledge about the project to the Inspectorate of Mine and with Local & Internal targeted training Program for relevant/technical staff of the Inspectorate of the mines. Moreover the consultant will design

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and deliver a series of workshop and seminar with the collaboration of Mines & Mineral Development Department with regard to the project.

The Consultant shall provide:

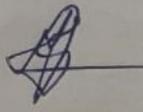
1. Requisite trainings and capacity development programme to the relevant Inspectors and nominated staff.
2. Necessary hardware and software within the project cost for long term sustainability of the project (Its detail and specification should be provided with technical proposal), besides providing details with cost for IT infrastructure.
3. GNSS system with certified and approved Government Licenses within the project cost (Its detail and specification should be provided with technical proposal)

#### **10. Detailed List of Activities.**

The activity may consist of development of the GIS based map with the following assignments.

There should be a separate mine map in a scale 1:50,000 of each district, and all the mining activities in the district should be covered in the study.

1. The consultant should cover all mining activities whether it comes within leased area or illegal mining activities by the locals.
2. The Consultant should provide the coordinates conversion from user grid Degree minutes & seconds and to design application (Mobile App) to access the mining areas.
3. Within 05 KM radius of mining areas the following Environmental information should be identified.
  - **Water** (Surface & Ground water Quality and levels)
  - **Land** (Geology, Soil erosion, Soil Characteristics, crop or Natural vegetation cover etc)
  - **Atmosphere** (Rainfall, temperature, dust, noise, smoke, winds, climatic seasons etc)
  - **Biological Environment** (Flora & Fauna)
  - **Socio-Economic Environments** (Socio-Ecological, Land tenure, NGOs, Population Characteristics etc).
  - **Economic** (Income, living standard, family expenditure etc)
  - **Institutional** (Governments units, agricultural, irrigation, livestock, transport, business and industries, tourism etc)
  - **Cultural** (Archaeological resources, Cultural property, religious sites etc)
4. Previously studies or reports or feasibility studies should be considered as secondary data. Fresh survey should be carried out during the study.

  
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5. The consultant should provide the district wise details of labour working in the mining areas of Sindh.
6. From low to high resolution satellite images with licensed software for GIS should be provided by the consultant.
7. After reconnaissance survey of each district for the collection of base line data of the area the Consultant will liaison with the field Inspector(s) to verify the sites whether it covers all the mining activities in his Jurisdiction or not.
8. The procuring agency shall verify the proposed Project team members with all the key professionals nominated in the technical proposal.
9. The consultant will designate appropriate staff or members of project team to close coordination with the PA's concerned area Inspector, Environmental Inspector and Computer programmer and shall ensure necessary project coordination and field survey verification with them to incorporate their technical feedback.
10. The consultant shall also review existing studies and identify information gaps.

#### **11. Scope of Work**

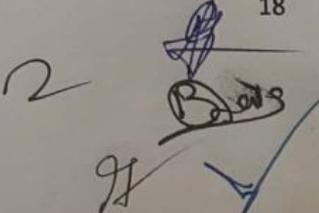
The scheme is initiated by the Inspectorate of Mines, Mines & Mineral Development Department, Government of Sindh to undertake and develop Digital Environmental map and Geodatabase of Mining areas of Sindh province so that compliance of Mining Labour laws to ensure health & safety of the mine workers, may be made easily.

This study comprising on the following two phases.

- Phase-I: -** During first year of the project Environmental Mapping through GIS & RS and detailed survey of mining areas of Tharparkar, Hyderabad, Sukkur, Sanghar and Thatta districts will be conducted.
- Phase-II: -** During the second year of the project Environment Mapping through GIS & RS and detailed survey of mining area of Jamshoro, Karachi, Khairpur, Qamber & Shahdad kot, and Dadu districts will be conducted.

#### **i. Preparation of Base Map and integrated Geodatabase Development:**

The Consultant shall purchase latest (0.4m) resolution multispectral satellite imageries of mining areas of Sindh (estimated area 2000 Sq-km approximately) excluding coal mining and develop baseline mapping integrating topographical/ terrain, spatial distribution of mining areas, social, environmental and infrastructure. The geodatabase and mapping shall incorporate data of mining areas of Sindh as well as Geological Survey of Pakistan GSP maps and sheets. The base map shall contain several layers with attribute data sets capable of generating spatial analysis and generating a variety of thematic maps. These strategic and operational plans would cover land form and land use, loss of natural

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habitat and vegetation, wildlife resources; local population and villages, and other environmental and social issues.

The developed digitalized maps would cover information but not limited to the following:

- Spatial distribution of Mining areas using high/low resolution Digital Model (DEM).
- Distinct distribution with location of a) mine/quarry and b) processing/crushing plants
- Number of workers (Position Wise) employed in each mine/crushing Unit.
- General Topography of the area
- Existing Hydrology and streams/waterways/catchments
- Existing Land use & Land Cover
- Identification of Minerals being mined and of surrounding area of 05 Square kilometer around each mine that involves type of rock/mineral, quantity and usage, mineralogy, geochemistry and geotechnical properties of rock/mineral.
- Wildlife Resources (including large canopy trees)
- Protected Area boundaries
- Nearby villages / cities / population centers/any historical place.
- Existing Infrastructure
- Roads and transportation
- Transmission Lines/ Major Utilities

The Consultant shall also map and digitize the following information near existing mining area:

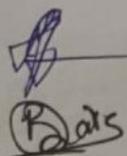
- Population centers, road network, surface water networks, drinking water resources such as tube wells, ponds etc. Health units, clinics and hospitals; schools etc as baseline data as acceptable capture scales nearest to the mining areas.
- Whenever possible, the current infrastructure elements should be shown using maps, graphs and images.

ii. **Geo-Techniques Spatial Data:**

The Consultant shall incorporate the available and existing technical sub-surface technical investigation data of mining bearing area of Sindh including geo spectral surface and sub-surface information of Minerals, available environmental and natural features within 05 km radius of Mining activities. The integrated geo-technical data shall enable in determining whether there is sufficient data to prepare model on the sub surface horizontal and vertical domains. The spatial data will contribute in developing tenement mapping and preparing an integrated geo database.

iii. **Development of GIS based Map/Web Portal.**

The development of digital map on web based GIS for mining areas would be built upon with existing and future mining activities. The consultant shall design a comprehensive mines and minerals web portal with integrated digital spatial data layers and system incorporating software for the management of mining areas and natural resources developed as GIS spatial data layers.

  
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## 12. GIS Software.

### 1 POI (Point of Interest)

A specific point through one may find information

- (i) Location of each every mine (Other Than Coal)
- (ii) Describing the pattern from ore exploration, its exploitation to closer and reclamation.
- (iii) Mineral identification, mineral resources surrounding 05 Sq-km of mine.
- (iv) Mineral zoning, mineral formation.
- (v) Mining extent change in land (existing land uses and cover, topography)
- (vi) Environmental sensitive areas.
- (vii) Environmental, geological and geographical features of surrounding area of mine.
- (viii) All aspects covered under scope of project.

## 13 Integrated Geodatabase

The proposed Mining geodatabase will be specially designed to store, record and maintain data of all the mines and it can be retrieved through query the information which have been discussed above in POI including spatial features comprised of points, lines and polygons.

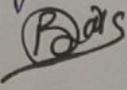
## 14. Web Application

Web Application is special design software/website that can be accessible over network. This website will be very helpful to find any information regarding the mines. The aim is to develop a responsive website compatible with other electronic devices.

GIS System that is responsive to the following requirement:

- The Graphical User Interface (GUI) of the system will be web based that can be accessed on any device with customized user friendly interface.
- GIS based Map/web portal is to be designed to develop a robust and transparent Web Based Geographic System that will provide the web interface for the data management of mineral leases and providing online geodatabase mineral and mining resources information in Sindh. Whereby one can conveniently select and categorize POIs from a given geodatabase. The envisaged system will perform the following major functions:
  - The POIs will be stored in a database that will be integrated with the web interface of the system.
  - User friendly Automatic Dimensions Conversion of coordinates.
  - Provision to update geodatabase and spatial data GIS layers with system secure login and retrieval system

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- User friendly Customization and Toolbar.
- Filtration option by different categories.
- Connectivity & offline Editing.
- A system capable to produce layouts, reports, generates statics and export tables for the management to take proper decision.
- A system that include various level of security and access to the information, set Privileged to different roles.
- Allow saving and exporting spatial and textual, attribute data.
- System should be developed on established standard OGC compliant resource Platform for secure and reliable data dissemination and data accessibility.
- Recovery/backups (failure of any device/data backups).
- Provision of updating the system including revision and updating of maps.
- Primarily the project should be developed as web application and for desktop Computers but it can also be implemented for mobile devices such as PDAs, handheld Devices, cell phone etc.
- Provision of latest remote sensing techniques for valuable visual and spectral data to analyse processing of regional mineral and mining resources map.
- The system should be designed and capable of Real time data streaming and data storage for system update collected with input device i.e. Desktop computer, mobile device as laptop PDAS, handheld devices, cell phones etc.

### 15. Obligations

Consultant/ Consulting firm will furnish:-

- The requirement of software & hardware (router, switches, and pcs etc.)
- Domain purchasing & payment (yearly/monthly)
- Security of GIS.
- Reliability.
- Recovery backup.
- Server owner (Consultant/Department)
- Regular updating of Map or GIS /Continuous process.
- Software for the conversion of user grid to GPS coordinates and Vis-versa.



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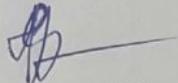
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SECTION - VI

ELIGIBILITY AND EVALUATION CRITERIA

(1) Eligibility Criteria:

- (i) Valid registration up to 2018 with Geological Survey of Pakistan.
- (ii) Undertaking on stamp paper Rs-200 that information submitted by bidder/firms is correct and if found misleading at any stage, the work awarded will be cancelled.
- (iii) The bid Security 5% of bid amount shall be submitted in the shape of pay order/ demand draft from any scheduled Bank in the name of "Drawing and Disbursing officer (Development)" Sindh Karachi.
- (iv) The financial offer to perform the services detailed in the Technical Proposal showing clearly the total cost to perform each one of the phases independently and the cost basis individual sub-contracts, if any in particular the total cost should be identified. Bidders shall submit one original version with five copies of the proposals.

  
Date



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(2) **EVALUATION CRITERIA:**

The Consultant Selection Committee constituted by the Government for the scrutiny of proposals and finalization of the process of appointment/hiring of Consultant on contract through selection on merit, shall evaluate the technical proposal in a manner as mentioned below, without reference to the price and reject any proposal which do not confirm to the specified requirements.

Technical Proposal will be evaluated on points system, which will allocate points in the following categories that will have the corresponding weighting in the evaluation of this over all awards.

|    |  |          |           |
|----|--|----------|-----------|
| 01 | <b>Adequacy of the proposed methodology and work plan in responding by the Consultant and Comprehensive of the task.</b>   |          |           |
|    | (i) Technical approach and methodology. Consultant using high resolution than (0.4m) imageries for base map shall get extra weightage of 10 marks in technical evaluation. | 40 Marks | 50 Marks  |
|    | (ii) Work Plan   | 05 Marks |           |
|    | (iii) Organization and staffing and comments on TORs.  | 05 Marks |           |
| 02 | <b>Experience in GIS &amp; RS based digital mapping of mineral sector and other than Mineral sector in last 10 years.</b>  |          |           |
|    | (i) Experience in GIS & RS based digital mapping of mineral sector (related Projects) in last 10 years.  | 15 Marks | 25 Marks  |
|    | (ii) Experience in GIS & RS based digital mapping of other than mineral sector (relevant Project) in last 10 years.  | 10 Marks |           |
| 03 | <b>Project team along with attested copies of Degree Certificate and Curriculum Vitae (CV) showing the experience.</b>   |          |           |
|    | (i) Ph.D in relevant field with minimum three (03) years experience. Highest number of Ph.Ds will get highest marks.   | 04 Marks | 20 Marks  |
|    | (ii) Master in relevant field, with minimum three (03) years experience. Highest number of Masters will get highest marks.   | 10 Marks |           |
|    | (iii) Graduate in relevant field, with minimum three (03) years experience. Highest number of Graduates will get highest marks.  | 05 Marks |           |
|    | (iv) Auto CAD Certification holder with minimum three (03) years experience.   | 01 Mark  |           |
| 04 | <b>Affiliation with or Technical support from relevant domain experts/institutions demonstrating relevant project.</b>   | 05 Marks | 05 Marks  |
|    |  | Total    | 100 Marks |

The qualifying marks/points for the said technical proposal are 70%.

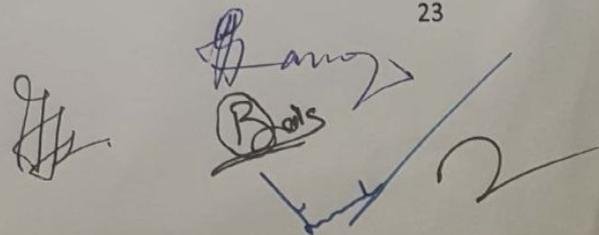
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|    | (iii) Graduate in relevant field, with minimum three (03) years experience. Highest number of Graduates will get highest marks.  | 05 Marks |           |
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| 04 | <b>Affiliation with or Technical support from relevant domain experts/institutions demonstrating relevant project.</b>   | 05 Marks | 05 Marks  |
|    |  | Total    | 100 Marks |

The qualifying marks/points for the said technical proposal are 70%.

Handwritten signatures and initials in blue ink, including a large signature that appears to be 'B. S. S.' and other initials.