

## Drone Survey - Pre Bid Meeting - Replies to the Queries

S No	EOI Clause	Queries	Department Responses
1	Pre-Qualification Criteria: (Mandatory) - <b>S.No.6</b> Technology Experience in Drone: The Bidders or Consortium Partner (Any) should have executed at least one (1) project on drone-based survey to carryout volumetric analysis in the following sectors: a. State Government or Central Government b. Public / Reputed Private sector enterprises in India.	To consider the drone-based survey only to state or central government departments.	As per EOI
2	<b>5.9.</b> Security Deposit The selected agencies / vendors will be required to deposit an amount of Rs.5,00,000/- (Rupees Five Lakhs only) in the form of Bank Guarantee issued by any Nationalized bank in favour of the Commissioner, Department of Geology and Mining, Government of Tamil Nadu, Chennai - 32.	Seeking Security Deposit exemption for MSME organization	As per EOI
3	<b>5.9</b> The L1 price offered by the firms through tender process shall be allotted the work to be executed.	Selection of vendor as per QCBS method. So. You will get the qualitative bidders.	Rates will be fixed by department after opening of Financial Bids.

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4	<b>2.72 (b)</b> Establishment of Ground control points	<p>Indian Bureau of Mines has notified SOP (standard operation procedures) for drone survey. As per SOP, for Mining lease having less than 50 ha have to establish minimum 3 GCPs. For more than 50 ha of ML minimum 5 GCP /sq. km to be established for getting accuracy and the standard deviation is 5 cm. This to create Orthomosaic map. Number of ground control points may be increased to best accuracy There is no standard no of GCP given in the EOI. Hence it is suggested to fix minimum no of Ground control points (GCP)S.</p> <p>Our suggestions are</p> <ul style="list-style-type: none"> <li>•From 0 to 5 Ha: 3 nos</li> <li>•From 1 ha to 10Ha: 4 nos</li> <li>• &gt; 10 Ha to 25 Ha: 6 nos</li> <li>• &gt; 25 Ha to 50 Ha: 8 nos</li> </ul> <p>The scope of constructing GCP will be on lessee scope</p>	<p>As per IBM's SOP. Before undertaking Drone Survey, each mine must establish at least five GCPs per sq. km. of lease area or part thereof with calibrated/certified DGPS instrument. If the area is less than one sq. km. the minimum GCPs required shall be four nos. The GCPs should be well distributed all over the Survey area. GCP must be easily visible in the images obtained from Drone survey. The Dimensions of GCPs thus established should be minimum 50 cm by 50 cm (marked as X with high contrast colours). At least three permanent GCP shall be placed at undisturbed locations and has to be covered in the subsequent surveys to cross check the error in change detection and other analysis. The error of GCP should be</p>

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			less than 5 cm. The Boundary pillars should not be considered as permanent ground control points.
5	<b>3.5</b> Pre-Qualification evaluation	The cumulative annual financial turnover of the company for the last three years for “Drone based survey mentioned in EOI IS Rs 30 lakh. It may be reduced to Rs 25 lakh since the year 19-20 and 20-21 was affected due to pandemic COVID and turn over will be very least.	As per EOI
6	<b>3.5</b> 2. Proof of concept evaluation.	As per the scope Department of Geology and Mining will provide an active mining site and a Total Station survey will be conducted by the department to establish volume and extent. Agency shall conduct two drone survey. 1. Bench mark survey to be done by Drone and DGPS. 2. Second drone survey will be conducted in an interval of 15 days to calculate the differential volume extracted from the POC mining site. Kindly note that the Total Station survey is outdated and its accuracy is lesser compared to the drone and DGPS survey. Hence it is suggested to keep the BENCHMARK survey as the reference to calculate the	As per EOI

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		incremental volume between bench mark (Drone) survey and second survey to arrive the accuracy.	
7	<b>2.6</b> High Accuracy of Survey Data:	Department to explain clearly the accuracy required for the project. The statement is very vague, so we request the department to specify the exact relative, absolute and fundamental accuracy required for the project by mentioning the x, y and z accuracy required.	As per EOI
8	<b>2.6</b> Real-Time Data, On-Demand Survey	On demand survey can be performed by us, but could you please explain in detail what is expected in Real Time Data.	As per EOI
9	<b>2.6</b> The proposed system shall facilitate On-Demand Survey, where Department of Geology & Mining can schedule drone surveys to access Realtime & Up to high resolution data (less than 1 cm)	Less than 1cm accuracy is highly impossible with the current technology to be used for the project. We request the department to modify this clause.	As per IBM's SOP  The resolution of Digital Elevation Model (DEM) should be 15 cm per pixel or better.
10	<b>2.7.1 d.</b> The Bidder shall perform drone survey at regular intervals; Bidder shall perform site preparation for survey, including establishing GCP (wherever required), establishing boundaries (wherever required), preparing flight plan	The number of GCPs to be established per sq.km or Per Mine is requested.	As per IBM's SOP Before undertaking Drone Survey, each mine must establish at least five GCPs per sq. km. of lease area or part thereof with calibrated/certified DGPS instrument. If the area is less than one sq. km. the

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	<p>etc. Necessary marking of ground control points, are required for precise geo-referencing of the images. It is required that each GCP (Ground Control Point) is clearly identifiable in the aerial image after processing</p>		<p>minimum GCPs required shall be four nos. The GCPs should be well distributed all over the Survey area. GCP must be easily visible in the images obtained from Drone survey. The Dimensions of GCPs thus established should be minimum 50 cm by 50 cm (marked as X with high contrast colours). At least three permanent GCP shall be placed at undisturbed locations and has to be covered in the subsequent surveys to cross check the error in change detection and other analysis. The error of GCP should be less than 5 cm. The Boundary pillars should not be considered as permanent ground control points.</p>
11	<p><b>2.7.1 k.</b> The system shall be able to stream the data collected, for volumetric analysis, to the receiver connected to command/control</p>	<p>To clarify that the provision to stream live data from the drone is not possible.</p>	<p>Live streaming is not covered in this EOI.</p>

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	device at ground.		
12	<b>2.7.1 i.</b> Flight planning shall consider optimal overlap, where flight planning includes multiple flights depending on terrain and vertical object changes throughout the mine area.	Overlap percentage for the flight for project execution.	As per IBM's SOP. The Drone survey should be planned in such a way that the forward (front) overlap should be minimum 80% and lateral (side) overlap should be minimum 70%.
13	<b>2.7.1 m.</b> Bidder shall recommend appropriate camera sensors to ensure acceptable Ground Sample Distance (GSD).	Acceptable GSD to be specified	Less than 3.5 cm Ground Sample Distance (GSD)
14	<b>2. Pre-Qualification Evaluation Phase</b> Considering the wide variety of technical capability, skills and resources required to implement the Project, consortium of maximum of four (4) partners is allowed including the prime bidder, where prime bidder can partner with maximum two (2) companies for Drone Survey, Logistics Services etc. and with one (1) company for Data processing, Software Application, Dashboard etc.	As per this clause, is it mandatory for the bidder to have all the mentioned qualifications, please clarify.  Most of the companies who are well versed in surveying, may not be experienced in Drone Survey and DGPS but in web applications and dashboard development they may not experience. So it is a humble request from our end to consider the bidder with any one of the qualifications for the EoI submission.	Bidders can either apply for Drone survey or Single Software platform or both.

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15	<b>3.5 2.A.</b> Department of Geology & Mining will provide an active mining site to perform Proof of Concept. A Total Station Survey will be conducted by the department, to establish the volume & extent of the site before POC execution.	Total station survey and drone survey will have a different accuracy and methodology. Both cannot be used to validate the accuracy of another. If the department is going to validate the drone survey accuracy with the total station surveyed accuracy, please mention the permissible limit of accuracy.	As per EOI
16	<b>3.5 2. A. Pre-Requirement Data and Permissions:</b> Department of Geology & Mining shall ensure, permissions and security clearance are obtained by Drone Agencies from the authorized Government Agencies, under DGCA guidelines like UIN, UAOP, VLOS before UAV survey as a pre-requisite of POC. Department will also share the following data with the service providers	Will the department accept the DAN number of the drone which were procured before DGCA implementation, please clarify.	As per EOI
17	<b>3.5 2.C. PoC Evaluation Criteria</b>	Accuracy percentage calculation for the PoC, requested	As per EOI
18	<b>3.5 2.C. PoC Evaluation Criteria:</b> After completion of EOI evaluation, a detailed empanelment orders will be issued to the shortlisted Bidders by the Department of Geology & Mining	More details on the Service Level Agreement (SLA)	As Per EOI. After empanelment it will be issued.

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	comprising the detailed terms & conditions, detailed technical specification criteria, financial bid details, payment terms & condition, detailed Service Level Agreement (SLA) etc.		
19	<b>6.4 i.</b> Submission of financial bid/ Cost for Drone Survey	The areas which are mentioned in this clause are including survey buffer area or excluding the area. Please clarify. This will help us in quoting the right cost for the survey works	As per IBM's SOP and inclusive of Buffer
20	We request you to kindly consider MSME exemption for the pre-qualification criteria.	For one year old start up registered with MSME, having own DGCA approved PPK drones and required technical expertise to undertake the work. As a startup, not meeting the turnover and technical experience as requested in the pre-qualification. Although the evaluation is going to be based on POC, to relax pre-qualification requirement for start-up registered under MSME.	As per EOI
21	General	Area to be surveyed details (Hectares)	Based on need.
22	General	How many sites to be surveyed	Based on need.
23	General	As per the EOI document, multiple agencies will be empaneled for drone survey but financial submission is only for drone survey. Separate item for submitting the cost of	As per EOI



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		application and infrastructure are not there. Please Clarify.	
24	General	In the Pre-Qualification criteria, both prime and Consortium partner should have drone service experience along with drone survey and an annual turnover of Rs. 30 lakhs and Rs. 25 lakhs respectively for 3 financial years. Kindly gave relaxation of drone services experience of "prime and consortium partner" to "prime or consortium partner".	As per EOI
25	<b>2.7.6</b> Data output and form	Only the data output needs to be show in web platform or any other data layers need to migrated? Please clarify	As per EOI
26	<b>6.4 i)</b> Submission of financial bid/ Cost for Drone Survey	1) whether the area is distributed on one location or it is scattered in multiple locations 2) What is the Project area size in hectare/sq kms?	1. Throughout the State. 2. 1 hec to > 50 hec.
27	General Clause KML File	Request you to please provide KML File for the project	As per EOI
28	General Clause Area of the entire project?	Please specify the total area of the project.	Within the State of Tamil Nadu.
29	<b>3.5 1. A.</b> Department will also share the following data with the service providers: 1. DGPS details of the mining site 2. GCP marker details established at the mining site.		DGPS details for mining site whichever is available.

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30	<b>3.5 1. A.</b> 2. GCP marker details established at the mining site.		This part is deleted
31	<b>2.7.3</b> Dashboard or web-based platform a. Data for multiple sites shall be accessible on a single dashboard, providing access to survey details & volumetric analysis etc., of each mining site.	a) Will the APIs for multiple sites be provided by the department?	Access to empanelled Agencies
32	<b>2.7.5.</b> Infrastructure Requirement, Data Storage b. Department of Geology & Mining will evaluate proposed infrastructure requirement, cost of owning the infrastructure, confidentiality & security of the data etc.; to finalize the hosting model: On-premise hosting or Government Authorized Public Cloud Services.	Should costing be provided for both On Premises and on cloud infrastructures?	1. Cloud costings services will be provided at our end. 2. Other costings details to be informed by the successful bidder.
33	<b>2.7.7</b> Capacity building, Training, Documentation Bidder shall understand capacity building requirements at department, on various components of the solution and provide training, handholding,	a) Resources would have to be trained? B) Can training be done online? C) Will the infrastructure be provided by the department? D) Will there be re-training required and will training be an ongoing process ? E) Will training be required	a. 200 trainees b. On Site training. c. Yes d. Training will be an ongoing process. e. Training may be carried out in multiple locations.

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	training manuals, training videos etc.	to be carried out at multiple locations ?	
34	Second Flight/Survey• Incremental volume of the mineral extracted from the mining site between 1st and 2nd flight would be compared against the physical extracted volume, reported by the department.	No of flights required for data collection by drones	Thrice in a year (January, July, January).
35	<b>2.7.3.</b> , Dashboard or web-based platform	Functionalities expected in web platform or dashboard	District wise, Mineral wise, lessee wise, Volumetric details, etc.
36	<b>2.7.4.</b> , Enterprise Data Sharing based on web server	1) Kind of Enterprise Data sharing. Open source standard or any OEM	Formats of data is clearly mentioned in Clause 2.7.6 and 2.7.3 of EOI.
37	<b>2.7.5.</b> , Infrastructure Requirement, Data Storage	Data storage and Hosting environment on Cloud or on premises is required? – OEM specification requested	1. Cloud costings services will be provided at our end. 2. Other costings details to be informed by the successful bidder
38	<b>2.7.7.</b> , Capacity building, Training, Documentation	1) No of users need to be trained. Level of training is expected like admin level / user level 2) Whether Virtual training is allowed	1. 200 users. 2. Onsite training only
39	General	Project implementation and O&M Timelines?	The project implementation time is 2 months for development and 10 months for warranty from the date of go live. Four years for O&M timeline from

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			completion of warranty.
40	General	Whether Desktop Application need to be provided by vendor for Drone data processing and other analysis?	Windows and web applications
41	<b>Page No.21 Point No.3 Financial Turnover:</b> The Bidders or Consortium Partner (Prime Bidder) should have minimum annual turnover of Rs. 1 crore in implementation ITES/ICT solution & services; for each of the 3 financial years i.e. 2019-20, 2020-21, 2021-22	To consider the annual cumulative average annual turnover for past three years upto 1 cr. Or for the start-ups/MSME there shall be some exemptions provided.	As per EOI
42	<b>2.7.3, 2.7.4, 2.7.5, 2.7.7, 2.7.8 and 2.9</b>	<p>The approved drone agency may collect field data as per the guidelines of the EOI. It collects data, process the data in a suitable software and calculate volume and extent of the given area and submit RAW data, processed data to the department in a hard disk of suitable capacity. They can store the raw and processed data in an external Hard disk for subsequent /future references.</p> <p>Storing the entire data and giving access to the department requires separate establishment and it is purely of IT related. The generated data will be of huge storage.</p>	<p>The data has to be provided as per clause 2.7.4 (c) in EOI.</p> <p>Both Hard Disc for Raw Data and uploading in web platform to be done.</p>

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		<p>It requires separate IT management system for storage, process whenever requires, giving access to department officials. It is better to go for an IT based company for all the above process so that the department objective may be achieved.</p> <p>Hence the fastest mode of achieving the Department goal, it is suggested</p> <ul style="list-style-type: none"> <li>• To select the Drone agency for the drone survey and collect all data in a hard disk and complete the initial survey.</li> <li>• To identifying the single vendor for the above sections may be selected subsequently</li> </ul>	
43	<b>1.6.</b> Volumetric Calculation & Extent Analysis:	Department require the analysis report to be in the web application, or in the desktop application or do the department own any software for the same. Please clarify on what platform does the department require the analysis reports.	As per clause 2.7.6 of EOI, the successful bidders shall share the prescribed data to Single Software platform through APIs and Hard Disc.
44	<b>2.6. Dashboard or web platform:</b> For providing access to survey details, volumetric analysis etc., now the Department of Geology & Mining is looking forward to explore various techno-	Requesting the department to mention in detail the specifications and requirements of the dashboard and web application. We need clarity on the following points, - Open source or paid software platform - will the department	The bidder selected for Software application will need to create software platform. The department will provide the infrastructure.

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	functional components of the proposed Drones based Volumetric Analysis in mines and quarries thus inviting the expression of Interest for further procurement and implementation	provide server space - Hosting environment and server Please share more details on this clause	
45	<b>2.7.3 a.</b> Data for multiple sites shall be accessible on a single dashboard, providing access to survey details & volumetric analysis etc., of each mining site.	Integrating all the mining sites of Tamil Nadu in a single dashboard will make it very clumsy. Please explain in details the department's requirement for the dashboard and web application	As per EOI.
46	<b>2.7.3 b.</b> The Reports shall be prepared as per Department Requirements. The solution should support multiple data, image formats. Reports, Documents and Video data shall be rendered on the Dashboard for each mining site.	Does multiple data mean various timestamp data or various format data. Please clarify. Is it part of our scope to capture mining video?	As per clause 2.7.3 & 2.7.6 the successful bidder needs to share all the video and data in time stamp format provided in the EOI.
47	<b>2.7.4 b.</b> Department of Geology & Mining would provide Data Sharing Guidelines. Bidder shall strictly follow the Data Sharing Guidelines, so as to ensure that Data is accessed by the authorized personnel only	What are the data sharing guidelines please share.	As per 2.7.6 of EOI and as per the IBM guidelines.

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48	<b>2.7.4 c.</b> Bidder shall provide secure API to facilitate data sharing within/other department as per Data Sharing Guidelines	What API does the department require, please specify	As per clause 2.7.6 of EOI, Once the bidder selected for the platform. Department will provide a proper SOP to deliver the data via platform.
49	<b>2.7.5 b.</b> Department of Geology & Mining will evaluate proposed infrastructure requirement, cost of owning the infrastructure, confidentiality & security of the data etc.; to finalize the hosting model: On-premise hosting or Government Authorized Public Cloud Services.	Who are the government authorized public cloud services, please specify	As per the clause 2.7.5 of EOI.
50	<b>2.8 e.</b> Software Application, Dashboard would be common for the proposed implementation. Volumetric & Extent Analysis from various vendors would be ingested and presented to the department in a single software platform.	What is single software platform, please explain	The selected drone agencies have to upload the details of drone survey of the quarry in the single software platform which will be developed by a vendor shortlisted. This will help in analysis of data and extraction of reports.
51	General	How the validation process for the platform.	Validation process is based on the User Acceptance Test.

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52	<p><b>2.7.6</b> The following data output will be provided by Agency to the DGM</p> <ol style="list-style-type: none"> <li>1. Ortho mosaic image of lease area including 100m buffer zone.</li> <li>2. Digital Elevation Model (3D) –DSM &amp; DTM</li> <li>3.Point Cloud</li> <li>4.Slope map</li> <li>5.Contours (1m interval)</li> <li>6.GCPs data</li> <li>7.RMSE Report</li> <li>8.Map of Mining lease showing area of               <ol style="list-style-type: none"> <li>a) actual excavation (mineral and waste) including slope of high wall side</li> </ol> </li> </ol>	<p>Since there is a scope of huge data creation within the RFP which will add upon the data capacity and processing capability of the system. So, please clarify the total area of interest as it will assist to configure the software accordingly.</p>	<p>Drone survey work is proposed to be carried out in all mines/quarries in the State of Tamil Nadu. The area of the work will be allotted after selection of successful bidders.</p>
53	<p><b>2.7.1.</b> The scope includes conducting drone aerial surveys at regular intervals twice in a year during January and July for volumetric analysis, using autonomous and pre-programmed flights for Department of Geology &amp; Mining</p>	<p>As per our understandings, preparation of data and its analysis will be done multiple of times for displaying on the web portal over the AMC period. So, we assume that, after the training period department will deploy a domain personal to look after and perform the activities. Please confirm our understanding.</p>	<p>After the warranty the Department will go for the maintenance of the platform</p>
54	<p><b>2.7.2.</b> The Ground Control Points Established and the DSM/DEM created should be used for Ortho-rectification of imagery</p> <ul style="list-style-type: none"> <li>• Mosaicing and Creating Image Tiles</li> </ul>		



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	<ul style="list-style-type: none"> <li>• Mosaicing of Image strips for contiguity during the Ortho-rectification process</li> <li>• Colour balancing of the images to achieve homogeneity across stripe boundaries</li> <li>• Generation of Image Tiles</li> </ul> <p>c. Integration of 3D models, volumetric calculation, Analysis &amp; change detection comparing old ortho-drone-images.</p>		
55	<p><b>Clause 1.8 b.</b> Bidders are free to raise their queries during the meeting and responses will be conveyed to all the prospective bidders by way of hosting amendments/ clarifications on <a href="http://www.tnmines.tn.gov.in">http://www.tnmines.tn.gov.in</a> on completion of the pre-EOI meeting and all participants (purchased EOI document) would be communicated the pre-EOI minutes. Only those prospective bidders who have purchased the EOI document, shall be permitted to take part in the pre-EOI meeting.</p>		<p><b>Clause 1.8 b. to be read as</b> Bidders are free to raise their queries during the meeting and responses will be conveyed to all the prospective bidders by way of hosting amendments/ clarifications on <a href="http://www.tnmines.tn.gov.in">http://www.tnmines.tn.gov.in</a> on completion of the pre-EOI meeting.</p>

**Sd/-**  
**Commissioner of Geology and Mining**