

Memorandum of Understanding For
PREPARATION OF GROUND WATER QUALITY LAYER
UNDER RAJIV GANDHI NATIONAL DRINKING WATER MISSION PROJECT PHASE IV

between

Deputy Director (RS & GIS –AA)
NATIONAL REMOTE SENSING CENTRE
ISRO, Dept. of Space, Govt. of India
Balanagar, Hyderabad-500 625.

and

REGISTRAR
BIRLA INSTITUTE OF TECHNOLOGY MESRA,
RANCHI

Signed on this day of May 11 Year 2011.

MEMORANDUM OF UNDERSTANDING FOR
PREPARATION OF GROUND WATER QUALITY LAYER
UNDER RAJIV GANDHI NATIONAL DRINKING WATER MISSION PROJECT PHASE IV

THE AGREEMENT

THE AGREEMENT made and entered into on this May 11, 2011 day between National Remote Sensing Centre (NRSC), Indian Space Research Organization (ISRO), Dept., of Space (DoS), Government of India, Balanagar, Hyderabad, India (hereinafter called the NRSC which expression shall where the context so admits include its successors and permitted assign) of the one part,

And

Birla Institute of Technology Mesra, Ranchi-835215, Jharkhand

[herein after called 'Partner Institute' which expression shall where the context so admits include its successors and permitted assign] of the other part.

CL.1 PREAMBLE

Whereas the NRSC desires to entrust a part of project work relating to preparation of Ground Water Quality layer using Remote Sensing Data on 1:50,000 scale under 'Rajiv Gandhi National Drinking Water Mission (RGNDWM) Project-PhaseIV' (hereinafter called the PROJECT) to Partner Institute herein and the Partner Institute approached NRSC to undertake and complete the aforesaid work as desired by NRSC represented by Deputy Director, RS&GIS-AA, NRSC strictly following as per the scope of work detailed in Annexure-I & II.

CL.2 PARTIES

CL.2.1 INDENTING PARTY:

NRSC

CL.2.2 EXECUTING PARTY:

BIRLA INSTITUTE OF TECHNOLOGY MESRA, RANCHI-835215, JHARKHAND

CL.3. AUTHORIZED SIGNATORIES

CL.3.1 For and on behalf of NRSC:

Deputy Director, NRSC, ISRO,
DoS, Govt. of India, Balanagar,
Hyderabad – 500625, Andhra Pradesh.

CL.3.2 For and on behalf of Partner Institute:

Registrar, Birla Institute of Technology Mesra,
Ranchi- 835215, Jharkhand

CL.4 FUNCTIONARIES AND CONTACT INFORMATION

CL.4.1 NRSC:

No	Name	Contact Address	Phone	Email
1	Dr.S.K.Subramanian	Scientist-SG & Head Hydrogeology Division, NRSC	040-23884233	manian_sks@nrsc.gov.in
2	Sri.K.Seshadri	Scientist-SF, Hydrogeology Divn, NRSC	040-23884275	seshadri_k@nrsc.gov.in
3	Sri.G.Sreenivasa Reddy	Scientist-SF, Hydrogeology Divn, NRSC	040-23884272	sreenivasareddy_g@nrsc.gov.in

CL.4.2 Partner Institute:

No	Name	Contact Address	Phone	Email
1	Dr. M.S. Nathawat	Head, Department of Remote Sensing	0651-2276003	msnathawat@bitmesra.ac.in msnathawat@yahoo.com
2	Dr. V.S.Rathore	Faculty, Department of Remote Sensing	09431382641	vsrathore@bitmesra.ac.in
3	Dr. A.C. Pandey	Faculty, Department of Remote Sensing	09470561688	arvindrachandrap@yahoo.com

CL.5 EFFECTIVE DATE, DURATION, TERMINATION OF THE AGREEMENT

- CL.5.1 The agreement shall be effective from the date of signing and shall remain in force for a period of 20 months.
- CL.5.2 The agreement shall terminate on the expiry of the period, as in clause CL.13.1 unless extended by both the parties.
- CL.5.3 The NRSC shall have the absolute right to terminate the understanding by causing one month prior notice. If it is noticed that the performance is not up to the expectations of Deputy Director, RS&GIS-AA of NRSC, in such an event the NRSC at its sole discretion shall be entitled to recover back the amount paid in excess to the value of work done as accepted by the NRSC at the time of termination. It shall be the responsibility of the Partner Institute to reimburse such expenditure within a period of 15 days, failing which the NRSC shall become entitled to recover the same under due process of law.
- CL.5.4 During the tenure of the agreement, parties here to terminate the agreement either for breach of any of the terms and conditions of this agreement or otherwise by giving a one month notice in writing to the defaulting party. Failure of either party to terminate the agreement on account of breach or default by the other shall not constitute a waiver of the party's right to terminate this agreement.
- CL.5.5 The agreement arrived at between the parties hereto for the utilization of the intellectual property shall survive the termination of the agreement.

CL.6 SCOPE OF WORK

The NRSC has entrusted part of the work to Partner Institute relating to Project for preparation of Ground Water Quality layer using Remote Sensing Data on 1:50,000 scale.

CL.7 METHODOLOGY

The PROJECT should be executed strictly following the methodology guidelines as prescribed in the manual / technical guidelines more particularly described in the respective technical manuals/guidelines and as per the terms and conditions listed in Annexure-I & II which shall also be treated as part and parcel of this understanding.

CL.8 DELIVERABLES AND GUIDELINES ON DATA/MAP SECURITY

CL.8.1 Deliverables:

- i) Soft copy of all individual element wise layers and the ground water quality map in the form of seamless mosaic.
- ii) Hard copies (5nos) of ground water quality maps on 1:50,000 scale colour prints.
- iii) Satellite data mosaic (soft copy) of the State. The final output as soft copy, in the prescribed format should be submitted to NRSC, along with the data collected in the field such as well data with GPS locations, water table

fluctuations, yield information, recharge structures, field photographs etc;

CL.8.2 Data/Map Security:

- i) The data shall be utilized for the bona-fide official purpose only and stored database format.
- ii) Handling of the data will be as per the security instructions issued during delivery of data. The safe custody and security forms supplied along with the data shall be signed by the Partner Institute.
- iii) The data handed over to the Partner Institute shall be used carefully and exclusively for the execution of the job awarded.

CL.9 SPECIFICATIONS

The work should be executed strictly following the methodology guidelines as prescribed in the manual / technical guidelines maintaining high standard of quality, which will be checked and certified by the internal quality team of Partner Institute having vast experience in the field of Hydrogeology, Remote Sensing and GIS for quality assurance. The Partner Institute shall set up the internal quality team in consultation with NRSC. Prior to final submission of outputs to NRSC, approval of external [ISRO / Dept. of Space (DoS)] quality assurance team as identified by NRSC to be obtained.

CL.10 APPLICABLE DOCUMENTS

Existing geological, geomorphological, hydro geological maps / literature, data if any (published & unpublished) and the ground water quality data pertaining to the study area to be procured by the Partner Institute from respective state / central departments.

CL.11 RESPONSIBILITIES OF EACH PARTY

CL.11.1 RESPONSIBILITIES OF Partner Institute:

- i) Partner Institute shall coordinate the work with NRSC
- ii) Partner Institute shall arrange/assist the NRSC to carry out the work as per the protocol drawn up and agreed to between the parties as detailed in Annexure - I.
- iii) Partner Institute shall complete the work as per the schedule of work enclosed on Annexure- I.
- iv) Partner Institute shall submit a detailed Final Report after completing the work to NRSC as per requirement.

CL.11.2 RESPONSIBILITIES OF NRSC:

- i) The NRSC shall supply the required Satellite data for the assigned work as provided in Annexure- I.
- ii) The NRSC shall arrange/assist/co-operate with Partner Institute smooth completion of the work as per the protocol detailed in Annexure-I.

CL.12 PROJECT SCHEDULE

The project will become operative with effect from the date of signing the MoU and is to be completed with a period of 20 months from the date of commencement.

CL.13 SCHEDULE OF PRICES

CL.13.1 The funds for execution of the project will be released in installments based on the progress of the work as detailed in Annexure II which shall also be treated as part and parcel of this understanding.

CL.13.2 The installments will be released based on the progress and submission of Utilization Certificate.

CL.14 SCHEDULE OF INSTALLATIONS, SUPPLY AND ACCEPTANCE

CL.14.1 The Partner Institute shall supply all the deliverables upon completion of all process steps as prescribed in the manual / technical guidelines maintaining high quality standards.

CL.14.2 Any inaccuracies noticed during quality inspection will have to be corrected to the satisfaction of the Deputy Director RS&GIS-AA/ Quality Assurance (DoS /ISRO) Team without any additional cost.

CL.15 CONSIDERATION

CL.15.1 The work should be executed strictly following the methodology guidelines as prescribed in the manual / technical guidelines maintaining high quality standards, which will be checked and certified by external [ISRO / Dept. of Space (DoS)] quality assurance team as identified by NRSC.

CL.15.2 The Partner Institute shall submit monthly progress report in the prescribed pro-forma to Head, Hydrogeology Division in the first week of the following month.

CL.16 FUNDING AND TERMS & CONDITIONS OF PAYMENT

CL.16.1 The detailed cost of the project is as per Annexure II, which shall also be treated as part and parcel of this understanding.

CL.16.2 A stamped/printed receipt should be sent to NRSC on receipt of the cheque/demand draft towards the payments received.

CL.16.3 The Partner Institute shall submit Half yearly expenditure statement and Utilization Certificate in the prescribed pro-forma to NSC in the first week of the following month.

CL.17 TRAINING

CL.17.1 The orientation training to scientists of the Partner Institute for execution of the project shall be provided by NRSC.

CL.17.2 NRSC and Partner Institute shall chalk out mutually convenient venue and schedule for conducting such training programme.

CL.18 WARRANTY

Not Applicable

CL.19 PROJECT MONITORING

CL.19.1 The project will be monitored by NRSC through existing internal project review mechanism.

CL.19.2 The Deputy Director RS&GIS-AA at his discretion will conduct inspection of the work at working place of the Partner Institute and also carry out field inspection if required. Such inspection will be done by Deputy Director RS&GIS-AA or his authorized representative(s) at such intervals as deemed necessary for which the Partner Institute shall provide the necessary logistic facilities viz; transport, accommodation etc;

CL.20 CONFIDENTIALITY

CL.20.1 During the tenure of the agreement and thereafter Partner Institute undertake on their behalf and on behalf of their employees / representatives / associates to maintain strict confidentiality and prevent disclosure thereof, of any/all the information and data exchanged/generated pertaining to work under this agreement for any purposes other than in accordance with this agreement.

CL.20.2 Both the parties – NRSC & Partner Institute, however, retain the rights to use the R&D results generated during the PROJECT for its own R&D programmes without any obligation to the other.

CL.21 INTELLECTUAL PROPERTY RIGHTS

CL.21.1 Partner Institute shall have to consult NRSC to commercially exploit / use the intellectual property generated in the Project. In such an event, the fee and royalty and other terms and conditions for the commercial exploitation / use of the said intellectual property by Partner Institute shall be decided mutually between the Partner Institute and NRSC for which a separate agreement shall be entered into.

CL.21.2 During the work envisaged under the agreement in the event of Partner Institute scientists exploring, inventing or discovering results over than the specific objectivities of the project, Partner Institute shall retain absolute rights on such

results. Partner Institute shall first order such results to NRSC on negotiated terms by entering into a separate agreement. In case NRSC does not accept the offer Partner Institute shall be free to release such results to other parties without any obligation to NRSC.

CL.22 CHANGE IN THE SCOPE OF THE WORK

Not Applicable

CL.23 MODIFICATIONS / AMENDMENTS HANDLING

No amendment or modification of this agreement shall be valid unless the same is made in writing by both parties and their otherwise representatives and specifically stating the same to be amendment of this agreement. The modification/changes shall be effective from the date on which they are made / executed, unless otherwise agreed to.

CL.24 FORCE MAJEURE

Neither party shall be held responsible for non-fulfillment of their respective obligation under the agreement due to the exigency of one or more of the force majeure events such as but not limited to Acts of God, war, flood, earthquake, strike, lockouts, epidemics, riots, civil commotion etc. provided on the occurrence and cessation of any such events, the party affected thereby shall give a notice in writing to other party within one month of such occurrence or cessation. If the force-majeure conditions continue beyond six months, the parties shall then mutually decide about the future course of action.

CL.25 INDEMNITY BOND

Partner Institute shall exercise reasonable skill, care and diligence in the performance of the contract and indemnify and keep indemnified NRSC in respect of any loss, damage or claim howsoever arising out of or related to breach of contract, statutory duty or negligence by Partner Institute or its employees, agents or sub-contractors in relation to the performance or otherwise of the services to be provided under this contract.

CL.26 ARBITRATION

The parties shall endeavour to resolve any dispute or difference arising from this agreement or any transaction or performance or non-performance under this agreement, by mutual discussion. Any such dispute of difference which can't be so resolved within a reasonable time shall be referred to the sole arbitration of a person nominated by Director, NRSC as such arbitrator in accordance with the arbitration and Conciliation Act, 1996. The award of arbitrator shall be final and binding on the parties. The Arbitrator may from time to time with the consent of the parties enlarge the scope and time for making and publishing the award. The venue of arbitration shall be at Hyderabad. Appropriate Court in Hyderabad alone shall have jurisdiction on any matter arising from this agreement.

जी. बेहरा / G. BEHERA
उप-निदेशक (सु.सं. एवं मौ.सू.प्र.-अ.क्षे.)
Deputy Director (RS & GIS-AA)



राष्ट्रीय सुदूर संवेदन केन्द्र

PROJECT

**GROUND WATER QUALITY LAYER PREPARATION
under RAJIV GANDHI NATIONAL DRINKING WATER MISSION**

1. NRSC shall provide the satellite data (IRS-P6 LISS-III & PAN merged/LISS IV MX Georectified digital data) with WGS-84 datum. A methodology guideline manual will be given by NRSC on preparation of the ground water quality layer to the Partner Institute.
2. The Partner Institute (PI) will identify Project Co-ordinator for this project who will be the focal point for this project. Head, Hydrogeology Division is the Nodal Officer from NRSC.
3. Existing geological, geomorphological, hydro geological maps, ground water quality maps / literature, data if any (published & unpublished) and the ground water quality data pertaining to the study area to be procured by the Partner Institute from respective state / central departments.
4. Fresh water samples to be collected and analyzed using water quality kits/ lab analysis to verify and validate the authenticity of the data collected from the departments concerned. It is expected that 60-70 wells observations have to be taken in the field per toposheet representing all the hydro-geomorphic units.
5. Information on NC / PC habitations available with concerned departments in the respective state to be collected by the Partner Institute.
6. The Ground Water Quality layer - 50K tasks like on screen interpretation, field verification, finalization of maps, creation of geospatial database etc. has to be carried out by the depts./organizations/universities using experienced hydrogeologist / geochemist / scientists trained in Remote Sensing and GIS.
7. The work should be executed strictly following the methodology guidelines as prescribed in the manual / technical guidelines on ground water quality layer, maintaining high standard of quality, which will be checked and certified by the internal quality team having vast experience in the field of Hydrogeology / Geochemistry for quality assurance. The Partner Institutes will set up the internal quality team in consultation with NRSC. Prior to final submission of outputs to NRSC, approval of external [ISRO / Dept. of Space (DoS)] quality assurance team as identified by NRSC to be obtained.
8. Any inaccuracies noticed during quality inspection will have to be corrected to the satisfaction of the Deputy Director RS&GIS-AA/ Quality Assurance (DoS /ISRO) Team without any additional cost.

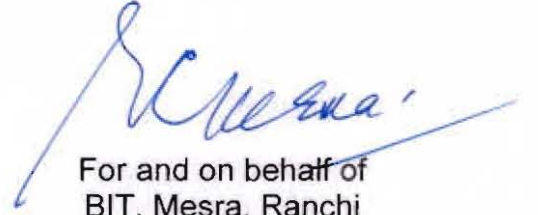
9. The Deputy Director RS&GIS-AA at his discretion will conduct inspection of the work at working place of the Dept. /Organization / University and also carry out field inspection if required. Such inspection will be done by Deputy Director RS&GIS-AA or his authorized representative(s) at such intervals as deemed necessary for which the Dept./Organization/ University should provide the necessary logistic facilities viz; transport, accommodation etc;
10. The final output as soft copy, in the prescribed format should be submitted to NRSC, along with the data collected in the field / lab such as well data with GPS (Lat/Lan) locations, water quality analysis data, water table fluctuations, yield information, recharge structures, field photographs etc;
11. The satellite data handed over to the Dept./Organization / University should be used carefully and exclusively for the execution of the job awarded.
12. The outputs produced by the Dept./Organization/University will be the property of NRSC/DoS and the property / intellectual right vests with DDWS / DoS. The Partner Institute shall *take permission and duly acknowledge NRSC /DoS while publishing.*
13. The funds for execution of the project will be released in installments based on the progress of the work. 20% of the cost will be paid at the initial stage and the subsequent installments will be released based on the progress and Utilization Certificate submitted.
14. A stamped/printed receipt should be sent to NRSC on receipt of the cheque/demand draft towards the payments received.
15. The monthly progress report in the prescribed pro-forma has to be submitted to Deputy Director RS&GIS-AA in the first week of the following month.
16. The Half yearly expenditure statement and Utilization Certificate in the prescribed pro-forma has to be submitted to Deputy Director RS&GIS-AA in the first week of the following month.
17. The interpretation of satellite imagery, field work and preparation of final outputs have to be carried out by the subject experts available with the Dept./ Organization and no part of it should be sub-contracted to the other private/commercial agencies.
18. NRSC reserves the right to terminate the MoU at any stage and also recover the amounts already paid if it is convinced that the amount paid has not been properly utilized or the work on the project has been suspended for an unduly long period or appropriate progress is not being made.

19. The project will become operative with effect from the date of signing the MoU and is to be completed with a period of 20 months from the date of commencement.
20. In the event, the Project coordinator/Focal point to whom the amount is released for the project leaves the institution where the project is being implemented, the Head of the dept. should take the responsibility to nominate another person as Project Co-coordinator in consultation with NRSC, for smooth functioning of the project. The original Project Co-ordination hands over the charge to the new project coordinator including the financial balance.



For and on behalf of
NRSC, Hyderabad

जी. बेहरा / G. BEHERA
उप-निदेशक (सु.सं. एवं भौ.सू.प्र.-अ.क्षे.)
Deputy Director (RS & GIS-AA)
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National Remote Sensing Centre
इसरो / ISRO अन्तरिक्ष विभाग / Dept. of Space
भारत सरकार / Govt. of India
बालानगर, हैदराबाद, भारत/Balanagar, Hyderabad-500 625 India



For and on behalf of
BIT, Mesra, Ranchi

Registrar

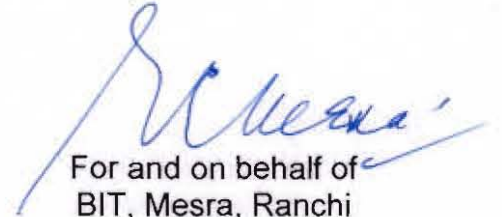
**Birla Institute of Technology
Mesra; Ranchi**

Annexure II

1. Total No of sheets allotted: 100 maps (approx) district covering Rajasthan State. Border of Madhya Pradesh State
2. Cost of mapping one effective toposheet (1:50,000) area (Ground Water Quality layer) of Approx. 700 Sq. KM = ₹.45, 250/- (₹. Forty Five Thousand Two Hundred Fifty only)
3. Initially for the execution of the project 20% of the cost will be paid as advance and the remaining balance amount will be released in 4 – 5 installments based on the progress of the work and submission of expenditure statement and /or Utilization Certificate in the prescribed format enclosed.



For and on behalf of
NRSC, Hyderabad
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