

1. CONTRACT (Proc. Inst. Ident.) NO. **IRC-04-79-190** 2. EFFECTIVE DATE **APR 30 1979** 3. REQUISITION/PURCHASE REQUEST/PROJECT NO. **RES-79-190 dated 1/11/79** 4. CERTIFIED FOR NATIONAL DEFENSE UNDER BDSA REG. 2 AND/OR DMS REG. 1.

5. ISSUED BY **U. S. Nuclear Regulatory Commission** 6. ADMINISTERED BY **U. S. Nuclear Regulatory Commission** 7. DELIVERY FOR DESTINATION NATION OTHER (See below)

8. CONTRACTOR NAME AND ADDRESS **Geo-Centers, Inc.** 9. DISCOUNT FOR PROMPT PAYMENT **NET**
(Street, city, county, State, and ZIP code) **381 Elliott Street**
Newton Upper Falls, MA 02164

11. SHIP TO/MARK FOR **U. S. Nuclear Regulatory Commission** 12. PAYMENT WILL BE MADE BY **Fee and Payment**
Office of Nuclear Regulatory Research **U. S. Nuclear Regulatory Commission**
Washington, DC 20555 **Office of the Controller**
ATTN: Mr. Clyde Jupiter **Washington, DC 20555**

13. THIS PROCUREMENT WAS ADVERTISED, NEGOTIATED, PURSUANT TO 10 U.S.C. 2304 (a) 41 U.S.C. 252 (e) 10

14. ACCOUNTING AND APPROPRIATION DATA

B&R NO. **60193003** FIN NO. **B6349** **\$24,257.00**

15. ITEM NO.	16. SUPPLIES/SERVICES	17. QUANTITY	18. UNIT	19. UNIT PRICE	20. AMOUNT
	Subsurface Radar Profiling Study of the Maxey Flats, Kentucky, Waste Disposal Region. The Geo-Centers, Inc. proposal dated January 11, 1978 is incorporated herein by reference.				
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POOR ORIGINAL

21. TOTAL AMOUNT OF CONTRACT \$ **24,257.00**

CONTRACTING OFFICER WILL COMPLETE BLOCK 22 OR 26 AS APPLICABLE

22. CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 4 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, verifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)

26. AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.

23. NAME OF CONTRACTOR **Geo-Centers, Inc.** 27. UNITED STATES OF AMERICA
BY **Edward P. Marram** (Signature of person authorized to sign) BY **Kellogg V. Morton** (Signature of Contracting Officer)

24. NAME AND TITLE OF SIGNER (Type or print) **Edward P. Marram, President** 25. DATE SIGNED **7 May 1979**
28. NAME OF CONTRACTING OFFICER (Type or print) **Kellogg V. Morton** 29. DATE SIGNED **5-31-79**
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SPECIAL PROVISIONS

CONTRACT NO. WRC-04-79-190

This contract consists of:

1. Cover Page
2. Contents of Contract
3. Special Provisions

ARTICLE I - STATEMENT OF WORK

ARTICLE II - PERIOD OF PERFORMANCE

ARTICLE III - CONSIDERATION

ARTICLE IV - ALLOWABLE COST/COMPENSATION

ARTICLE V - PRIVATE USE AND PROTECTION OF UNCLASSIFIED
GOVERNMENT INFORMATION

ARTICLE VI - WORK FOR OTHERS

ARTICLE VII - AUTHORIZED REPRESENTATIVE

ARTICLE VIII - ORDER OF PRECEDENCE

ARTICLE IX - GENERAL PROVISIONS/ALTERATIONS

4. General Provisions (2/15/78)

ARTICLE I - STATEMENT OF WORK

This effort shall be divided into two Phases. The first Phase shall be a feasibility study to test and evaluate the use of subsurface radar profiling as a nonintrusive method of obtaining hydrological and geological information and as a subsurface mapping technique for nuclear waste disposal sites.

Phase I

Phase I shall consist of a subsurface radar profiling experiment conducted at Maxey Flats, Kentucky, during the dry season, together with data processing, interpretation and an evaluation of the method and its application.

Specifically, under Phase I of this effort the Contractor shall provide the necessary qualified personnel, services and equipment to perform the following tasks:

Phase I

- Task 1 Formulate detailed plan for a subsurface radar profiling survey at Maxey Flats in the dry season.
- Task 2 Survey a portion of the MFDS using a ground probing radar system. The extent of the survey will be determined in conjunction with NRC personnel.
- Task 3 Interpret, the resultant radar profiles to determine:
 - a) presence of perched water
 - b) soil moisture content
 - c) location of migration zones and fronts
 - d) location of vertical and lateral conduits
 - e) trench location, size and orientation
 - f) depth and location of containers and other objects
- Task 4 Evaluate the effectiveness of the performance of the radar profiling system, the data analysis and data interpretative functions.

Reporting Requirements for Phase I

1. Provide an informal letter report of plans for field experiment at Maxey Flats 1½ months after start of contract.
2. Provide an informal letter report on the field experiment experience, one month after conducting field test.

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3. Brief NRC staff on work two months after conducting test.
4. Provide a final technical report to NRC, 4 months after date of contract.
5. Concurrent with submission of the final technical report under Phase I, the Contractor shall submit a detailed technical and cost proposal for Phase II.

The final technical report for Phase I shall include as a minimum the following information:

- (1) A description of the impulse radar source and signal detector systems, and the method of deployment and operation;
- (2) Identification and specification of the components of the signal source and detection systems;
- (3) A compilation of data taken during the test;
- (4) A description of all data processing procedures and equipment;
- (5) A description of all data interpretative functions; and
- (6) A summary and discussion of the final processed or interpreted data, together with conclusions and recommendations.

Option Phase II and Extension to the Term of the Contract

There is hereby created in the Government an option for Phase II. Phase II shall consist of additional subsurface radar profiling experiments at Maxey Flats, Kentucky and at least one other location (to be agreed upon by the NRC Program Manager), representing different conditions of soil moisture and composition. Data processing, analysis and interpretation shall be conducted for the Phase II work. Appropriate comparisons and extrapolations shall be made, based on the comparative analysis of the results of Phase I and II.

The Contracting Officer may exercise this option by giving written notice to the Contractor within sixty (60) days after the date of completion and submission of all contract deliverables under Phase I of the contract by the Contractor; provided that the Contracting Officer shall have given preliminary notice of the Government's intention to exercise the option at least thirty (30) days in advance. (Such a preliminary notice will not be deemed to commit the Government to the exercise of the option).

Under Phase II the term of the Contract shall be extended by twelve (12) months. The amount of the option shall be negotiated between the parties prior to exercise of the option.

Specifically, under Phase II the Contractor shall provide the necessary qualified personnel, services and equipment to perform the following tasks:

Task 1 Conduct a subsurface radar profiling experiment at Maxey Flats during the wet season.

Task 2 Analyze and interpret data from Phase II, Task 1 work

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- Task 3 Conduct a subsurface radar profiling experiment at a location agreed upon by the NRC program manager.
- Task 4 Analyze and interpret data for Phase II, Task 3.
- Task 5 Evaluate subsurface radar profiling system as applicable to waste management.

Reporting Requirements Phase II

- 1. Letter report on plans for Task 1
- 2. Letter report on experience from Task 1 and plans for Task 3
- 3. Letter report on experience for Task 3
- 4. Brief NRC
- 5. Final technical report

The final technical report for Phase II shall include as a minimum the following information.

- (1) A description of the impulse radar source and signal detector systems, and the method of deployment and operation;
- (2) Identification and specification of the components of the signal source and detection systems;
- (3) A compilation of data taken during the test;
- (4) A description of all data processing procedures and equipment;
- (5) A description of all data interpretative functions; and
- (6) A summary and discussion of the final processed or interpreted data, together with conclusions and recommendations.

ARTICLE II - PERIOD OF PERFORMANCE

The performance of work described in Article I hereof shall commence as of the effective date of this contract, or as agreed upon, and shall continue to completion thereof, estimated to occur within six (6) months from the effective date of this contract.

ARTICLE III - CONSIDERATION

A. Estimated Cost, Fixed Fee and Obligation

- 1. It is estimated that the total cost to the Government for full performance of Phase I of this contract will be \$24,257.00, of which the sum of \$22,052.00 represents the estimated reimbursable costs, and of which \$2,205.00 represents the fixed fee.

2. There shall be no adjustment in the amount of the contractor's fixed fee by reason of differences between any estimate of cost for performance of the work under this contract and the actual cost performance of that work.
3. The amount presently obligated by the Government with respect to this contract is \$24,257.00.

ARTICLE IV - ALLOWABLE COST/COMPENSATION

Allowable cost and compensation for the contractor's services under this contract shall be determined in accordance with General Provisions Clause No. 5, entitled, "Allowable Cost, Fee, and Payment," in Appendix A hereto and shall constitute full and complete compensation for the performance of the work under this contract.

ARTICLE V - PRIVATE USE AND PROTECTION OF UNCLASSIFIED GOVERNMENT INFORMATION

- a. Except as specifically authorized by this contract, or as otherwise approved by the Contracting Officer, records or other information, documents and material furnished by the Commission to the Contractor in the performance of this contract shall be used only in connection with the work performed under this contract. The Contractor shall, upon completion or termination of this contract, transmit to the Commission all records or other information, documents and materials, and any copies thereof, furnished by the Commission to the Contractor in the performance of this contract.
- b. The Contractor shall be responsible for safeguarding from unauthorized disclosure any information or other documents and materials exempt from public disclosure by the Commission's regulations and made available to the Contractor in connection with the performance of work under this contract. The Contractor agrees to conform to all regulations, requirements, and directions of the Commission with respect to such material.
- c. The Contractor's duties under this clause shall not be construed to limit or affect in any way the Contractor's obligation to conform to all security regulations and requirements of the Commission pertaining to classified information and material.

ARTICLE VII - CONTRACTING OFFICER'S AUTHORIZED REPRESENTATIVE (COAR) (PROJECT OFFICER)

The following authorized representative will represent the Government for the purpose of this contract:

Clyde Jupiter of the Office of Nuclear Regulatory Research

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The authorized representative is responsible for: (1) monitoring the Contractor's technical progress, including the surveillance and assessment of performance and recommending to the Contracting Officer changes in requirements; (2) interpreting the statement of work; (3) performing technical evaluation as required; (4) performing technical inspections and acceptances required by this contract; and (5) assisting the Contractor in the resolution of technical problems encountered during performance. Within the purview of this authority, the representative is authorized to approve payment vouchers for supplies/services required under the contract. The Contracting Officer is responsible for directing or negotiating any changes in terms, conditions, or amount cited in the contract.

For guidance from the authorized representative to the Contractor to be valid, it must: (1) be consistent with the description of work set forth in this contract; (2) not constitute new assignment of work or change to the expressed terms, conditions, or specifications incorporated in to this contract; (3) not constitute a basis for an extension to the period of performance or contract delivery schedule; (4) not constitute a basis for any increase in the contract price.

If the Contractor receives guidance from the COAR which the Contractor feels is not valid under the criteria cited above, the Contractor shall immediately notify the COAR. If the COAR and the Contractor are not able to resolve the question within 5 days, the contractor shall notify the Contracting Officer.

ARTICLE VIII - ORDER OF PRECEDENCE

In the event of any inconsistency between the provision of this contract, the inconsistencies shall be resolved by giving precedence in the following order: (a) the Schedule; (b) FPR Changes and NRC additions to General Provisions; and (c) the General Provisions.

ARTICLE IX - GENERAL PROVISIONS/ALTERATIONS

- A. This contract is subject to the provisions of Appendix A, General Provisions Cost-Type Research and Development Contract with Concerns Other than Educational Institutions, dated 2/15/78 which is attached hereto and by this reference made a part hereof.
- B. In addition to those general provisions set forth in Appendix A hereto which are by their terms self-deleting, the following deletions and/or modifications to Appendix A are as follows:
 1. Clause 23 entitled, "Nuclear Hazards Indemnity - Product Liability" is deleted in its entirety.
 2. Clause 53 entitled, "Private Use of Information and Data" is deleted in its entirety.

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