

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE OF PAGES 1 2
2. AMENDMENT/MODIFICATION NO. Two (2)	3. EFFECTIVE DATE 9/28/90	4. REQUISITION/PURCHASE REQ. NO. RES-89-090 dated 7/25/90	5. PROJECT NO. (if applicable) & Memo of 9/25/90
6. ISSUED BY U.S. Nuclear Regulatory Commission Division of Contracts & Property Management Washington, D.C. 20555		7. ADMINISTERED BY (if other than Item 6)	CODE

8. NAME AND ADDRESS OF CONTRACTOR (No. street, county, State and ZIP Code) Hydrogeologic, Inc. 503 Carlisle Drive, Suite 250 Herndon, VA 22070		9A. AMENDMENT OF SOLICITATION NO.
CODE		9B. DATED (SEE ITEM 11)
FACILITY CODE		10A. MODIFICATION OF CONTRACT/ORDER NO. X NRC-04-89-090
		10B. DATED (SEE ITEM 13) 9/29/89

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
 (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)
 APPN. No. 31X0200 600 B&P NO. 0601925040 FIN No. L12730 AMOUNT: \$29,992.24

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14

<input type="checkbox"/> A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
<input type="checkbox"/> B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/> C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
<input type="checkbox"/> D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 2 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

(Please see the following page.)

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 PDR CONTR
 NRC-04-89-090 PNJ

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) Peter S. Huyakorn, President	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Sharon Bell, Contracting Officer
15B. CONTRACTOR/OFFEROR Peter S. Huyakorn (Signature of person authorized to sign)	15C. DATE SIGNED 9/28/90
16B. UNITED STATES OF AMERICA BY Sharon Bell (Signature of Contracting Officer)	16C. DATE SIGNED 9/27/90

This Modification accomplishes the following:

1. Revises the contract Statement of Work for performance of within scope changes;
2. Raises the contract price;
3. Provides funds; and
4. Extends the contract period of performance.

Therefore, the following changes are hereby made:

1. Section C.1 entitled STATEMENT OF WORK, is revised to include efforts as set forth in ATTACHMENT I of this Modification No. 2.
2. Section B.2 entitled CONSIDERATION AND OBLIGATION--FIRM FIXED PRICE, is revised to read as follows:

"The firm fixed price of this contract is \$134,972.24."

3. Section F.5 entitled DURATION OF THE CONTRACT PERIOD, is revised to read as follows:

"This contract shall commence on September 29, 1989 and expire on January 31, 1991."

All other terms and conditions remain unchanged.

ATTACHMENT 1

STATEMENT OF WORK

FIN NO. L1273

CONTRACT NO. NRC-04-89-090

CONTRACTOR: HydroGeologic Inc.

TITLE: Validation and Testing of the VAM2D Computer Code (SBIR)

Total Term: 6 months

Objective: To model the NRC-licensed Disposal Area (NDA) at the Western New York Nuclear Service Center, Cattaraugus County, New York (West Valley) using the VAM2D code.

Based upon accomplished and ongoing work under the existing contract and attendant Statement of Work (SOW), the contractor will perform additional work to extend the model validation efforts under task 2.2, to model an actual fractured clay site involving a radioactive source inventory.

The Facility Disposal Area (FDA) at the Western New York Nuclear Service Center, Cattaraugus County, New York (West Valley) will be the site to be modeled using the VAM2D code. The contractor shall use data sets from previous NMSS and RES-funded contractor reports (see Bibliography) and staff NUREG-1164 (Nicholson and Hurt) in their simulation studies. The hydrogeologic data sets as presented in USGS WRI's and Professional Paper (see Bibliography) and the "Geoscience Database" from PNL shall be reviewed and used where appropriate. The previous simulation studies and results from both the USGS and PNL (see Bibliography) shall also be reviewed prior to modeling. The source term inventory to be modeled shall be developed from information in NUREG-1164 and consultations with NMSS staff.

The simulation studies shall consist of:

- (1) analysis of existing hydrologic conditions in and adjacent to the FDA using NRC staff provided data sets and reports;
- (2) examination of transport mechanisms and rates in the near-surface weathered zone, and the deep non-weathered fractured zone (the objective being to evaluate differences between transport conditions and rates in the near-surface advective-dominated and deeper diffusion-dominated systems); and
- (3) investigate transient flow paths and transport rates for anticipated future conditions (e.g., local flooding, clay barrier erosion, and increased recharge rates) using NRC staff provided waste disposal inventories and leach rates.

The contractor shall provide a final report on their simulation results. The report shall include data sets analyzed and discretized, and numerical options and calibration techniques used with the VAM2D code. The VAM2D code and final input data shall be transmitted to the NRC staff in machine readable form. A final technical briefing by the contractor on their activities, accomplishments, and technology transfer to the NMSS and RES staff shall be conducted at NRC Headquarters within 60 days of submittal of their final report.

BIBLIOGRAPHY

- Bergeron, Marcel P. et al., "Geohydrologic Conditions at the Nuclear-Fuels Reprocessing Plant and Waste-Management Facilities at the Western New York Nuclear Service Center, Cattaraugus County, New York", Water-Resources Investigations Report 85-4145, U.S. Geological Survey, Ithaca, N.Y. 1987.
- Bergeron, Marcel P. and Edward F. Bugliosi, "Ground-Water Flow Near Two Radioactive-Waste-Disposal Areas at the Western New York Nuclear Service Center, Cattaraugus County, New York - - Results of Simulation", Water-Resources Investigations Report 86-4351, U.S. Geological Survey, Ithaca, N.Y. 1988.
- Bergeron, M.P., T.L. Cadd, J.L. Smoot, and W. Cronin, "Documentation of the Geoscience Database Retrieval and Analysis System for Commercial Low-Level Radioactive Waste Disposal Facilities: West Valley, New York", Pacific Northwest Laboratory, June, 1989.
- Bergeron, M.P., M.L. Kemner, and J.L. Smoot, "Performance Assessment Analysis of the Commercial Low-Level Radioactive Waste Disposal Facility near West Valley, NY", Pacific Northwest Laboratory, Richland, WA, May 1989, (unpublished report available through U.S. NRC, Office of Nuclear Material Safety & Safeguards, Division of Low-Level Waste Management & Decommissioning).
- Kappel, William M., and William E. Harding, "Surface-Water Hydrology of the Western New York Nuclear Service Center, Cattaraugus County, New York", Water-Resources Investigations Report 85-4309, U.S. Geological Survey, Ithaca, N.Y. 1987.
- Nicholson, Thomas J. and R. Davis Hurt, "Information on the Confinement Capability of the Facility Disposal Area at West Valley, New York" NUREG-1164, U.S. Nuclear Regulatory Commission, Washington, DC, December 1985.
- Prodic, David E., "Ground-Water Hydrology and Subsurface Migration of Radionuclides at a Commercial Radioactive-Waste Burial Site, West Valley, Cattaraugus County, New York", U.S. Geological Survey Professional Paper 1325, U.S. Government Printing Office, Washington, D.C., 1986.
- Smoot, J. L., "A Review of Geoscience Characteristics and Disposal Experience at the Commercial Low-Level Radioactive Waste Disposal Facility near West Valley, N.Y.", NUREG/CR-5431, U.S. Nuclear Regulatory Commission, Washington, DC, August 1989.
- Yager, Richard M., "Simulation of Ground-Water Flow Near the Nuclear-Fuel Facility at the Western New York Nuclear Service Center, Cattaraugus County, New York", Water-Resources Investigations Report 85-4308, U.S. Geological Survey, Ithaca, N.Y. 1987.