

WM DOCKET CONTROL CENTER

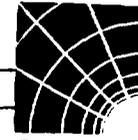
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D1016

PDR-1
LPDR-Wm-10 (2)
Wm-11 (2)
Wm-16 (2)

Wm-RES
WM Record File
D1016
ITASCA

WM Project 10, 11, 16
Docket No.



ITASCA
Consulting Group, Inc.

X PDR ✓
X LPDR ✓ (B, N, S)

13 July 1987

Distribution:
* Tikhinsky
Jean-ticket
(Return to WM, 623-SS) *DL*

David Tiktinsky - SS623
U.S. Nuclear Regulatory Commission
Division of Waste Management
Washington, D.C. 20555

"NRC Technical Assistance
for Design Reviews"
Contract No. NRC-02-85-002
FIN D1016

Dear David:

Enclosed is Progress Report No. 23 for the period 1-30 June 1987 on Task Orders No. 001, 002, 003 and 004, Contract NRC-02-85-002. Also enclosed is the summary sheet for the June voucher. Please call me if you have any questions.

Sincerely,

Roger D. Hart
Roger D. Hart
Program Manager

cc: R. Ballard, Engineering Branch
Office of the Director, NMSS
E. Wiggins, Division of Contracts
DWM Document Control Room

Encl.
rdh/ks

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PDR WMRES EECITAS
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87237929 *H*
WM Project: WM-10,11,16
PDR w/encl
(Return to WM, 623-SS)
WM Record File: D1016
LPDR w/encl

Suite 210 • 1313 Fifth Street SE • Minneapolis, Minnesota 55414
Telephone: (612) 623-9599 • Telex: 201682

4060

ITASCA MONTHLY PROGRESS REPORT

Progress Report No. 23
NRC Technical Assistance
for Design Reviews

13 July 1987
Contract No. NRC-02-85-002

Reporting Period: 1 - 30 June 1987

1. INTRODUCTION

This progress report summarizes the work performed during June 1987 on NRC Contract No. NRC-02-85-002. During June, work progressed on Task Orders No. 001, 002, 003, and 004.

2. ACTIVITIES DURING THE REPORTING PERIOD

- A. Progress Report No. 22 and Invoice No. 022-87-070 were transmitted on 10 June.
- B. On 12 June, the final draft of "Identification and Prioritization of Major NNWSI Design Components" was forwarded to D. Gupta (Task Order No. 003).
- C. On 29 June, the following document reviews were transmitted (Task Order No. 001):
 - (1) Document Review No. 802-001-02-30, "Site Characterization Plan, Chapter 2.0 — Geoengineering (Control Draft 1)" by the U.S. Department of Energy (January 26, 1987); and
 - (2) Document Review No. 802-001-02-36, "Final Preliminary Design Report Permian Basin, Texas" by RKE/PB (ES-225-001, March 1986).

- (4) Itasca Document Review No. 001-02-37, "WIPP Documents" (Task Order No. 001)

| | | |
|--------------------|----------|------------|
| Professional Labor | B. Brady | 10 hours |
| | L. Lorig | 36.5 hours |
| | K. Wahi | 28 hours |

- (5) Review of STRES3D (Task Order No. 001)

| | | |
|--------------------|-----------------|----------|
| Professional Labor | M. Christianson | 35 hours |
|--------------------|-----------------|----------|

- (6) Final Draft, "Site Technical Position on In-Situ Testing at NNWSI" (Task Order No. 002)

| | | |
|--------------------|----------|----------|
| Professional Labor | L. Lorig | 15 hours |
|--------------------|----------|----------|

4.0 QUALITY ASSURANCE

Correspondence logs were monitored and BWIP, NNWSI and SRP documents were received and catalogued.

5.0 DIFFICULTIES

In the May Progress Report (No. 22) it was stated that written authorization has not been received for the document review of STRES3D. Authorization had been received in April. However, authorization for "Final Preliminary Design Reports—Permian Basin, Texas" (ES-225-01)" has not yet been received. Additionally, we have encountered difficulties with incorporating and testing a creep model in MUDEC. A recommendation for completion of this effort in Task Order No. 004 will be proposed during the planned meeting at NRC on 20 July 1987.

6.0 ACTIVITIES PLANNED FOR THE NEXT REPORTING PERIOD

- A. Work will continue on preparation of the following tasks:

- (1) BWIP Task V Engineering Study document review (Task Order No. 001);

- (2) continuum versus discontinuum modeling for BWIP (Task Order No. 005);
- (3) sensitivity analysis for key joint parameters for BWIP (Task Order No. 005); and
- (4) thermomechanical analysis for SRP (Task Order No. 005).

B. Work to Be Completed in Next Reporting Period

1. Final Report, "Site Technical Position on In-Situ Testing at NNWSI" (Task Order No. 002)
2. Final Report, "Identification and Prioritization of Major NNWSI Design Components" (Task Order No. 003)
3. Itasca Document Review No. 001-02-37, "WIPP Documents" (Task Order No. 001)
4. Itasca Document Review No. 001-02-34, "Task V, Engineering Study No. 6, Tunnel Optimization" by RKE/PB (SD-BWI-ES-015, Rev. 0, May 1984) (Task Order No. 001)
5. Itasca Document Review No. 802-001-02-32, "Task V, Engineering Study No. 7, Waste Emplacement Optimization," by RKE/PB (SD-BWI-ES-018, May 1984) (Task Order No. 001)
6. incorporation of creep model into FLAC (Task Order No. 004);
7. documentation of thermal logic in MUDEC (Task Order No. 002);
8. Review of STRES3D (Task Order No. 001)

C. Planned Trips

1. L. Lorig and J. Daemen are scheduled to visit Silver Spring on 16 July to discuss the NNWSI point paper on in-situ testing (Task Order No. 002) and major underground system design components (Task Order No. 003).

2. M. Board and M. Mack are to meet in Silver Spring on 20 July, for three days, to discuss the following:
 - (a) creep model in FLAC (Task Order No. 004);
 - (b) thermal logic in FLAC and MUDEC (Task Order No. 002); and
 - (c) final review of the point paper "Evaluation of Rockburst Potential at the Hanford Site" (Task Order No. 003).

7.0 MEETINGS/TRIPS DURING THE REPORTING PERIOD

No meetings relative to this project were held during June.

8.0 SCHEDULE AND COST PROJECTION

The billing summary for the June invoice is attached. Also included are a labor hour summary by task and a summary of the expenditures versus budgets for each task and task order. Costs are well within the limit authorized for all task orders.

Respectfully submitted,



Roger D. Hart
Program Manager
10 July 1987

Attach.
rdh/ks

VOUCHER

Payor's Name and Address:

U.S. Nuclear Regulatory Commission
Division of Accounting
Office of the Controller
ATTENTION: GOV/COM Accounts Section
Washington, D.C. 20555

Payee's Name and Address

Itasca Consulting Group, Inc.
P.O. Box 14806
Minneapolis, Minnesota 55414

(a) Contract Number: NRC-02-85-002
(b) Title of Project: Technical Assistance
for Design Reviews of High-Level Waste
Geologic Repositories
(c) Voucher Number: 023-87-098
(d) Date of Voucher: July 13, 1987
(e) Contract Amount: \$1,312,270.80
(f) Fixed Fee: \$ 104,981.66

Individual to contact:
John J. Markham (612-623-9599)

(g) This voucher represents reimburseable costs from June 1 thru June 30, 1987

| | <u>AMOUNT BILLED</u> | |
|---|---------------------------|------------------------------|
| | <u>(k) Current Period</u> | <u>(l) Inception to Date</u> |
| (h) <u>DIRECT COSTS</u> | | |
| (1) Direct Labor | \$ 4,187.73 | \$109,898.39 |
| (2) Materials, Supplies and Noncapitalized Equipment | <u>-0-</u> | <u>-0-</u> |
| (3) Consultants | <u>1,884.40</u> | <u>89,329.13</u> |
| (4) Travel - Domestic | <u>-0-</u> | <u>21,270.10</u> |
| (5) Subcontract | <u>-0-</u> | <u>31,682.82</u> |
| (6) Other Costs | <u>108.57</u> | <u>5,869.18</u> |
| TOTAL DIRECT COSTS | <u>\$ 6,180.70</u> | <u>\$258,049.62</u> |
| (i) <u>INDIRECT COSTS</u> | | |
| G & A Expense: 102% of Cost Element (1) | <u>4,271.48</u> | <u>115,481.12</u> |
| TOTAL DIRECT AND INDIRECT COSTS | <u>10,452.18</u> | <u>373,530.74</u> |
| (j) FIXED-FEE EARNED | <u>836.17</u> | <u>29,882.43</u> |
| (m) TOTAL AMOUNTS CLAIMED | <u>11,288.35</u> | <u>403,413.17</u> |
| (n) ADJUSTMENTS | <u>-0-</u> | <u>-0-</u> |
| (o) GRAND TOTALS | <u>11,288.35</u> | <u>403,413.17</u> |

SUPPORTING INFORMATION

TASK ORDER 001
 TASK 2 DOCUMENT REVIEWS

(h) DIRECT COSTS

| (1) Direct Labor | | Hours | | Total |
|------------------|-----------------|--------|---------|----------|
| Labor Category | Name | Billed | Rate | |
| ----- | | ----- | ----- | ----- |
| Admin. Manager | L. Gaarder | 3.0 | \$8.89 | \$26.67 |
| | J. Markham | 2.0 | \$25.96 | \$51.92 |
| Sr. Engineer | M. Board | 40.0 | \$23.56 | \$942.40 |
| | M. Christianson | 35.0 | \$21.15 | \$740.25 |
| Sr. Reviewer | B. Brady | 10.0 | \$31.25 | \$312.50 |
| Secretarial | R. Kaplan | 3.5 | \$6.50 | \$22.75 |
| | K. Sikora | 20.0 | \$10.34 | \$206.80 |
| QA | K. Sikora | 4.0 | \$10.34 | \$41.36 |

Total Direct Labor \$2,344.65

(3) Consultants Labor

| | | | | |
|--|---------|------|---------|------------|
| | K. Wahi | 28.0 | \$67.30 | \$1,884.40 |
|--|---------|------|---------|------------|

Total Consultant Labor \$1,884.40

(6) Other Costs

| | | | | |
|--|-----------|---------|--|---------|
| | Telephone | \$72.06 | | |
| | Postage | \$10.10 | | |
| | | ----- | | \$82.16 |

TOTAL DIRECT COSTS \$4,311.21

(i) INDIRECT COSTS

| | | | | |
|--|-------------------------------------|--|--|------------|
| | G & A Expense (1.02 x Direct Labor) | | | \$2,391.54 |
|--|-------------------------------------|--|--|------------|

TOTAL DIRECT AND INDIRECT COSTS \$6,702.75

(j) FIXED FEE EARNED

\$536.22

(m) TOTAL AMOUNT CLAIMED

\$7,238.97

* Invoice Attached

SUPPORTING INFORMATION

TASK ORDER 003

TASK 2 IDENTIFICATION OF UNDERGROUND SYSTEM DESIGN COMPONENTS

(h) DIRECT COSTS

| (1) Direct Labor | | Hours | | |
|--------------------|------------|--------|---------|----------|
| Labor Category | Name | Billed | Rate | Total |
| Admin. Manager | L. Gaarder | 2.0 | \$8.89 | \$17.78 |
| | J. Markham | 2.0 | \$25.96 | \$51.92 |
| Sr. Engineer | L. Lorig | 1.5 | \$21.15 | \$31.73 |
| Secretarial | K. Sikora | 2.0 | \$10.34 | \$20.68 |
| QA | K. Sikora | 2.0 | \$10.34 | \$20.68 |
| Total Direct Labor | | | | \$142.79 |

(6) Other Costs

Copies \$7.33

\$7.33

TOTAL DIRECT COSTS

\$150.12

(i) INDIRECT COSTS

G & A Expense (1.02 x Direct Labor) \$145.65

TOTAL DIRECT AND INDIRECT COSTS

\$295.77

(j) FIXED FEE EARNED

\$23.66

(m) TOTAL AMOUNT CLAIMED

\$319.43

* Invoice Attached

SUPPORTING INFORMATION

TASK ORDER 002
 TASK 2 THERMOMECHANICAL ANALYSIS

(h) DIRECT COSTS

| (1) Direct Labor | | Hours | | | |
|--------------------|------------|--------|---------|--|----------|
| Labor Category | Name | Billed | Rate | | Total |
| <hr/> | | | | | |
| Admin. Manager | L. Gaarder | 3.0 | \$8.89 | | \$26.67 |
| | J. Markham | 2.0 | \$25.96 | | \$51.92 |
| Asst. Engineer | M. Mack | 39.0 | \$12.50 | | \$487.50 |
| Secretarial | K. Sikora | 2.0 | \$10.34 | | \$20.68 |
| | R. Kaplan | 1.0 | \$6.50 | | \$6.50 |
| QA | K. Sikora | 2.5 | \$10.34 | | \$25.85 |
| <hr/> | | | | | |
| Total Direct Labor | | | | | \$619.12 |
| TOTAL DIRECT COSTS | | | | | \$619.12 |

(i) INDIRECT COSTS

G & A Expense (1.02 x Direct Labor) \$631.50

TOTAL DIRECT AND INDIRECT COSTS \$1,250.62

) FIXED FEE EARNED \$100.05

(m) TOTAL AMOUNT CLAIMED \$1,350.67

* Invoice Attached

SUPPORTING INFORMATION

TASK ORDER 004
 TASK 1 THERMOMECHANICAL MODELING

(h) DIRECT COSTS

| (1) Direct Labor | | Hours | | | |
|--------------------|-----------------|--------|---------|--|----------|
| Labor Category | Name | Billed | Rate | | Total |
| ----- | | | | | |
| Admin. Manager | L. Gaarder | 2.0 | \$8.89 | | \$17.78 |
| | J. Markham | 2.0 | \$25.96 | | \$51.92 |
| Sr. Engineer | M. Christianson | 16.0 | \$21.15 | | \$338.40 |
| Asst. Engineer | M. Mack | 8.0 | \$12.50 | | \$100.00 |
| Secretarial | K. Sikora | 2.0 | \$10.34 | | \$20.68 |
| QA | K. Sikora | 2.0 | \$10.34 | | \$20.68 |
| ----- | | | | | |
| Total Direct Labor | | | | | \$549.46 |
| TOTAL DIRECT COSTS | | | | | \$549.46 |

(i) INDIRECT COSTS

G & A Expense (1.02 x Direct Labor) \$560.45

TOTAL DIRECT AND INDIRECT COSTS \$1,109.91

) FIXED FEE EARNED \$88.79

(m) TOTAL AMOUNT CLAIMED \$1,198.70

* Invoice Attached

Jul-87
 TASK ORDER 001
 TASK 2

TASK LABOR SUMMARY

REVIEW OF DOCUMENTS

| LABOR CATEGORY | BUDGETED HRS | TOTAL HRS BILLED | HRS REMAINING |
|-------------------|-----------------|---------------------|------------------|
| PROGRAM MGR | 96 | 41 | 55 |
| ADMIN MGR | 120 | 129.5 | -9.5 |
| SR. ENGINEER | 980 | 1237.5 | -257.5 |
| ASST. ENGINEER | 300 | 3 | 297 |
| SR. REVIEWER | 48 | 16 | 32 |
| QA | 48 | 26 | 22 |
| SECRETARIAL | 200 | 390 | -190 |
| | ----- | ----- | ----- |
| TOTAL ITASCA | 1792 | 1843 | -51 |
| CONSULTANT | | | |
| | ----- | ----- | ----- |
| J. DAEMEN | 168 | 174 | -6 |
| I. FARMER | 88 | 80 | 8 |
| ASST. ENGINEER | 208 | 0 | 208 |
| R. BARNES | 0 | 20 | -20 |
| K. WAHI | 0 | 153 | -153 |
| R. RAJARAM | 0 | 50 | -50 |
| | ----- | ----- | ----- |
| TOTAL CONSULT | 464 | 477 | -13 |
| SUBCONTRACTOR-NWC | | | |
| | ----- | ----- | ----- |
| PRIN. INVEST. | 256 | 115 | 141 |
| SR ENGINEER | 144 | 0 | 144 |
| ENGINEER/GEOL | 208 | 31.5 | 176.5 |
| DRAFTING | 0 | 2 | -2 |
| CLERICAL | 100 | 78 | 22 |
| | ----- | ----- | ----- |
| TOTAL SUBCONT | 708 | 226.5 | 481.5 |
| | ===== | ===== | ===== |
| TOTAL TASK | 2964 | 2546.5 | 417.5 |

Jul-87
 TASK ORDER 002
 TASK 1

TASK LABOR SUMMARY

SITE SPECIFIC IN-SITU TESTING POINT PAPERS

| LABOR CATEGORY | BUDGETED HRS | TOTAL HRS BILLED | HRS REMAINING |
|--------------------------|-----------------|---------------------|------------------|
| PROGRAM MGR | 72 | 13 | 59 |
| ADMIN MGR | 96 | 53.5 | 42.5 |
| SR. ENGINEER | 872 | 697.5 | 174.5 |
| SR REVIEW | 12 | 16 | -4 |
| QA | 48 | 12.5 | 35.5 |
| SECRETARIAL | 126 | 105.5 | 20.5 |
| TOTAL ITASCA | 1226 | 898 | 328 |
| CONSULTANT | | | |
| J. DAEMEN | 72 | 42 | 30 |
| I. FARMER | 40 | 0 | 40 |
| K. WAHI | 72 | 0 | 72 |
| TOTAL CONSULT | 184 | 42 | 142 |
| SUBCONTRACTOR-NWC | | | |
| PRIN. INVEST. | 72 | 37 | 35 |
| ASST. PROF. | 0 | 4 | -4 |
| CLERICAL | 8 | 18 | -10 |
| TOTAL SUBCONT | 80 | 59 | 21 |
| TASK TOTAL | 1490 | 999 | 491 |

Jul-87
 TASK ORDER 002
 TASK 2

TASK LABOR SUMMARY

THERMOMECHANICAL ANALYSES

| LABOR CATEGORY | BUDGETED HRS | TOTAL HRS BILLED | HRS REMAINING |
|----------------|-----------------|---------------------|------------------|
| PROGRAM MGR | 54 | 23 | 31 |
| ADMIN MGR | 72 | 74 | -2 |
| SR. ENGINEER | 592 | 453 | 139 |
| ASST. ENGINEER | 320 | 657.5 | -337.5 |
| SR REVIEW | 88 | 0 | 88 |
| QA | 16 | 11.5 | 4.5 |
| SECRETARIAL | 112 | 252.5 | -140.5 |
| | ----- | ----- | ----- |
| TOTAL ITASCA | 1254 | 1471.5 | -217.5 |
| CONSULTANT | | | |
| | ----- | ----- | ----- |
| J. DAEMEN | 0 | 31 | -31 |
| K. WAHI | 80 | 85 | -5 |
| | ----- | ----- | ----- |
| TOTAL CONSULT | 80 | 116 | -36 |
| | ===== | ===== | ===== |
| TASK TOTAL | 1334 | 1587.5 | -253.5 |
| | ===== | ===== | ===== |
| TASK ORDER TOT | 2824 | 2586.5 | 237.5 |

Jul-87

TASK LABOR SUMMARY

TASK ORDER 003

TASK 2 IDENTIFICATION AND PRIORITIZATION OF MAJOR
UNDERGROUND SYSTEM DESIGN COMPONENTS FOR NNWSI

| LABOR CATEGORY | BUDGETED HRS | TOTAL HRS BILLED | HRS REMAINING |
|----------------|-----------------|---------------------|------------------|
| PROGRAM MGR | 6 | 3 | 3 |
| ADMIN MGR | 12 | 22 | -10 |
| SR. ENGINEER | 80 | 113 | -33 |
| QA | 4 | 7 | -3 |
| SECRETARIAL | 20 | 41.5 | -21.5 |
| | ----- | ----- | ----- |
| TOTAL ITASCA | 122 | 186.5 | -64.5 |
| CONSULTANT | | | |
| ----- | | | |
| J. DAEMEN | 80 | 20.5 | 59.5 |
| | ----- | ----- | ----- |
| | 80 | 20.5 | 59.5 |
| | ===== | ===== | ===== |
| TASK TOTAL | 202 | 207 | -5 |
| | ===== | ===== | ===== |
| TASK ORDER TOT | 516 | 406 | 110 |

Jul-87
TASK ORDER 004

TASK LABOR SUMMARY

TASK 1 THERMOMECHANICAL MODELING FOR SRP, BWIP AND NNWSI

| LABOR CATEGORY | BUDGETED HRS | TOTAL HRS BILLED | HRS REMAINING |
|-----------------|-----------------|---------------------|------------------|
| PROGRAM MGR | 20 | 0 | 20 |
| ADMIN MGR | 20 | 24 | -4 |
| SR. ENGINEER | 40 | 30 | 10 |
| ASST ENGINEER | 120 | 214.5 | -94.5 |
| ASSOC./REVIEWER | 120 | 109 | 11 |
| QA | 8 | 4.5 | 3.5 |
| SECRETARIAL | 12 | 17.5 | -5.5 |
| | ----- | ----- | ----- |
| TOTAL ITASCA | 340 | 399.5 | -59.5 |
| | ===== | ===== | ===== |
| TASK TOTAL | 340 | 399.5 | -59.5 |
| | ===== | ===== | ===== |
| TASK ORDER TOT | 340 | 399.5 | -59.5 |

Jul-87

NRC TASK BUDGETS
NRC-02-85-002

TASK ORDER NO. 1

TASK 2 DOCUMENT REVIEWS

| DATE | AMT SPENT | TOT AMT SPENT | BUDGET | AMT REMAIN | % COMPLETE |
|-----------|--------------|---------------|--------------|--------------|------------|
| 11 OCT 85 | \$2,315.27 | \$2,315.27 | \$126,602.18 | \$124,286.91 | 1.8% |
| 12 NOV 85 | \$7,605.53 | \$9,920.80 | \$126,602.18 | \$116,681.38 | 7.8% |
| 16 DEC 85 | \$5,541.03 | \$15,461.83 | \$126,602.18 | \$111,140.35 | 12.2% |
| 14 JAN 86 | \$1,156.99 | \$16,618.82 | \$126,602.18 | \$109,983.36 | 13.1% |
| 18 FEB 86 | \$1,963.84 | \$18,582.66 | \$126,602.18 | \$108,019.52 | 14.7% |
| 13 MAR 86 | \$4,480.07 | \$23,062.73 | \$126,602.18 | \$103,539.45 | 18.2% |
| 08 APR 86 | \$3,747.92 | \$26,810.65 | \$126,602.18 | \$99,791.53 | 21.2% |
| 09 MAY 86 | \$5,259.93 | \$32,070.58 | \$126,602.18 | \$94,531.60 | 25.3% |
| 10 JUN 86 | \$4,513.10 | \$36,583.68 | \$126,602.18 | \$90,018.50 | 28.9% |
| 15 JUL 86 | \$19,436.58 | \$56,020.26 | \$126,602.18 | \$70,581.92 | 44.2% |
| 12 AUG 86 | \$8,942.16 | \$64,962.42 | \$126,602.18 | \$61,639.76 | 51.3% |
| 10 SEP 86 | \$696.84 | \$65,659.26 | \$126,602.18 | \$60,942.92 | 51.9% |
| 10 OCT 86 | \$4,063.17 | \$69,722.43 | \$126,602.18 | \$56,879.75 | 55.1% |
| 14 NOV 86 | \$4,413.05 | \$74,135.48 | \$126,602.18 | \$52,466.70 | 58.6% |
| 16 DEC 86 | \$5,300.07 | \$79,435.55 | \$126,602.18 | \$47,166.63 | 62.7% |
| 14 JAN 87 | \$300.00 | \$79,735.55 | \$126,602.18 | \$46,866.63 | 63.0% |
| 17 FEB 87 | \$2,954.98 | \$82,690.53 | \$126,602.18 | \$43,911.65 | 65.3% |
| 17 MAR 87 | \$9,188.06 | \$91,878.59 | \$126,602.18 | \$34,723.59 | 72.6% |
| 07 APR 87 | \$4,443.98 | \$96,322.57 | \$126,602.18 | \$30,279.61 | 76.1% |
| 18 MAY 87 | \$10,227.69 | \$106,550.26 | \$126,602.18 | \$20,051.92 | 84.2% |
| 10 JUN 87 | \$9,687.87 | \$116,238.13 | \$126,602.18 | \$10,364.05 | 91.8% |
| 10 JUL 87 | \$7,238.97 | \$123,477.10 | \$126,602.18 | \$3,125.08 | 97.5% |
| | \$123,477.10 | | | | |

Jul-87

NRC TASK BUDGETS
NRC-02-85-002

TASK ORDER NO. 2
TASK 1 SITE SPECIFIC IN-SITU TESTING POINT PAPERS

| DATE | AMT SPENT | TOT AMT SPENT | BUDGET | AMT REMAIN | % COMPLETE |
|-----------|-------------|---------------|-------------|-------------|------------|
| 09 MAY 86 | \$4,136.36 | \$4,136.36 | \$80,791.49 | \$76,655.13 | 5.1% |
| 10 JUN 86 | \$8,789.36 | \$12,925.72 | \$80,791.49 | \$67,865.77 | 16.0% |
| 15 JUL 86 | \$3,529.06 | \$16,454.78 | \$80,791.49 | \$64,336.71 | 20.4% |
| 12 AUG 86 | \$4,830.43 | \$21,285.21 | \$80,791.49 | \$59,506.28 | 26.3% |
| 10 SEP 86 | \$5,160.25 | \$26,445.46 | \$80,791.49 | \$54,346.03 | 32.7% |
| 10 OCT 86 | \$5,788.64 | \$32,234.10 | \$80,791.49 | \$48,557.39 | 39.9% |
| 14 NOV 86 | \$3,416.02 | \$35,650.12 | \$80,791.49 | \$45,141.37 | 44.1% |
| 16 DEC 86 | \$1,779.08 | \$37,429.20 | \$80,791.49 | \$43,362.29 | 46.3% |
| 14 JAN 87 | \$2,792.75 | \$40,221.95 | \$80,791.49 | \$40,569.54 | 49.8% |
| 17 FEB 87 | \$848.52 | \$41,070.47 | \$80,791.49 | \$39,721.02 | 50.8% |
| 17 MAR 87 | \$4,264.35 | \$45,334.82 | \$80,791.49 | \$35,456.67 | 56.1% |
| 07 APR 87 | \$2,754.14 | \$48,088.96 | \$80,791.49 | \$32,702.53 | 59.5% |
| 10 JUN 87 | \$2,238.40 | \$50,327.36 | \$80,791.49 | \$30,464.13 | 62.3% |
| 10 JUL 87 | \$1,180.58 | \$51,507.94 | \$80,791.49 | \$29,283.55 | 63.8% |
| | \$51,507.94 | | | | |

Jul-87

NRC TASK BUDGETS
NRC-02-85-002

TASK 2 THERMOMECHANICAL ANALYSIS

| DATE | AMT SPENT | TOT AMT SPENT | BUDGET | AMT REMAIN | % COMPLETE |
|-----------|-------------|---------------|-------------|-------------|------------|
| 10 JUN 86 | \$841.86 | \$841.86 | \$73,056.82 | \$72,214.96 | 1.2% |
| 15 JUL 86 | \$4,224.05 | \$5,065.91 | \$73,056.82 | \$67,990.91 | 6.9% |
| 12 AUG 86 | \$16,708.68 | \$21,774.59 | \$73,056.82 | \$51,282.23 | 29.8% |
| 10 SEP 86 | \$7,739.83 | \$29,514.42 | \$73,056.82 | \$43,542.40 | 40.4% |
| 10 OCT 86 | \$9,825.63 | \$39,340.05 | \$73,056.82 | \$33,716.77 | 53.8% |
| 14 NOV 86 | \$3,104.02 | \$42,444.07 | \$73,056.82 | \$30,612.75 | 58.1% |
| 16 DEC 86 | \$1,624.89 | \$44,068.96 | \$73,056.82 | \$28,987.86 | 60.3% |
| 14 JAN 87 | \$1,267.27 | \$45,336.23 | \$73,056.82 | \$27,720.59 | 62.1% |
| 17 FEB 87 | \$6,840.39 | \$52,176.62 | \$73,056.82 | \$20,880.20 | 71.4% |
| 17 MAR 87 | \$622.54 | \$52,799.16 | \$73,056.82 | \$20,257.66 | 72.3% |
| 07 APR 87 | \$4,081.49 | \$56,880.65 | \$73,056.82 | \$16,176.17 | 77.9% |
| 18 MAY 87 | \$1,690.49 | \$58,571.14 | \$73,056.82 | \$14,485.68 | 80.2% |
| 10 JUN 87 | \$452.43 | \$59,023.57 | \$73,056.82 | \$14,033.25 | 80.8% |
| 10 JUL 87 | \$1,350.67 | \$60,374.24 | \$73,056.82 | \$12,682.58 | 82.6% |
| | \$60,374.24 | | | | |

TASK ORDER 2 TOTAL

| AMT SPENT | BUDGET | AMT REMAIN | % COMPLETE |
|--------------|--------------|-------------|------------|
| \$111,882.18 | \$153,848.31 | \$41,966.13 | 72.7% |

Jul-87

NRC TASK BUDGETS
NRC-02-85-002

TASK ORDER NO. 3
TASK 1 ROCKBURST POTENTIAL

| DATE | AMT SPENT | TOT AMT SPENT | BUDGET | AMT REMAIN | % COMPLETE |
|-----------|------------|---------------|-------------|-------------|------------|
| 14 NOV 86 | \$3,173.81 | \$3,173.81 | \$17,732.38 | \$14,558.57 | 17.9% |
| 16 DEC 86 | \$1,878.84 | \$5,052.65 | \$17,732.38 | \$12,679.73 | 28.5% |
| 14 JAN 87 | \$1,367.63 | \$6,420.28 | \$17,732.38 | \$11,312.10 | 36.2% |
| 17 FEB 87 | \$2,338.49 | \$8,758.77 | \$17,732.38 | \$8,973.61 | 49.4% |
| | \$8,758.77 | | | | |

TASK 2 IDENTIFICATION OF UNDERGROUND DESIGN COMPONENTS

| DATE | AMT SPENT | TOT AMT SPENT | BUDGET | AMT REMAIN | % COMPLETE |
|-----------|------------|---------------|-------------|-------------|------------|
| 10 OCT 86 | \$119.49 | \$119.49 | \$11,786.97 | \$11,667.48 | 1.0% |
| 14 NOV 86 | \$123.88 | \$243.37 | \$11,786.97 | \$11,543.60 | 2.1% |
| 16 DEC 86 | \$788.96 | \$1,032.33 | \$11,786.97 | \$10,754.64 | 8.8% |
| 14 JAN 87 | \$2,545.38 | \$3,577.71 | \$11,786.97 | \$8,209.26 | 30.4% |
| 17 FEB 87 | \$2,608.45 | \$6,186.16 | \$11,786.97 | \$5,600.81 | 52.5% |
| 17 MAR 87 | \$638.81 | \$6,824.97 | \$11,786.97 | \$4,962.00 | 57.9% |
| 18 MAY 87 | \$1,289.84 | \$8,114.81 | \$11,786.97 | \$3,672.16 | 68.8% |
| 10 JUN 87 | \$874.62 | \$8,989.43 | \$11,786.97 | \$2,797.54 | 76.3% |
| 10 JUL 87 | \$319.43 | \$9,308.86 | \$11,786.97 | \$2,478.11 | 79.0% |
| | \$9,308.86 | | | | |

TASK ORDER 3 TOTAL

| AMT SPENT | BUDGET | AMT REMAIN | % COMPLETE |
|-------------|-------------|-------------|------------|
| \$18,067.63 | \$29,519.35 | \$11,451.72 | 61.2% |

Jul-87

NRC TASK BUDGETS
NRC-02-85-002

TASK ORDER NO. 4
TASK 1 THERMOMECHANICAL MODELING

| DATE | AMT SPENT | TOT AMT SPENT | BUDGET | AMT REMAIN | % COMPLETE |
|-----------|-------------|---------------|-------------|-------------|------------|
| 14 JAN 87 | \$5,983.57 | \$5,983.57 | \$24,553.24 | \$18,569.67 | 24.4% |
| 17 FEB 87 | \$7,692.76 | \$13,676.33 | \$24,553.24 | \$10,876.91 | 55.7% |
| 17 MAR 87 | \$2,085.46 | \$15,761.79 | \$24,553.24 | \$8,791.45 | 64.2% |
| 07 APR 87 | \$2,442.16 | \$18,203.95 | \$24,553.24 | \$6,349.29 | 74.1% |
| 18 MAY 87 | \$1,225.84 | \$19,429.79 | \$24,553.24 | \$5,123.45 | 79.1% |
| 10 JUN 87 | \$916.66 | \$20,346.45 | \$24,553.24 | \$4,206.79 | 82.9% |
| 10 JUL 87 | \$1,198.70 | \$21,545.15 | \$24,553.24 | \$3,008.09 | 87.7% |
| | \$21,545.15 | | | | |

TASK ORDER 4 TOTAL

| AMT SPENT | BUDGET | AMT REMAIN | % COMPLETE |
|-------------|-------------|------------|------------|
| \$21,545.15 | \$24,553.24 | \$3,008.09 | 87.7% |