

Complete - Last Revised 5/06/03

| Sample Identification | Station Identification | Station Grouping | Collection Date | Comments |
|-----------------------------|------------------------|------------------|-----------------|-------------------------------|
| 02-N01-01-MET-S | N01 | Northstar | 8/3/2002 | |
| 02-N02-01-MET-S | N02 | Northstar | 8/3/2002 | |
| 02-N03-01-MET-S | N03 | Northstar | 8/5/2002 | Field Triplicate |
| 02-N03-02-MET-S | N03 | Northstar | 8/5/2002 | Field Triplicate |
| 02-N03-03-MET-S | N03 | Northstar | 8/5/2002 | Field Triplicate |
| 02-N04-01-MET-S | N04 | Northstar | 8/3/2002 | |
| 02-N05-01-MET-S | N05 | Northstar | 8/3/2002 | |
| 02-N06-01-MET-S | N06 | Northstar | 8/2/2002 | |
| 02-N07-01-MET-S | N07 | Northstar | 8/5/2002 | |
| 02-N08-01-MET-S | N08 | Northstar | 8/5/2002 | |
| 02-N09-01-MET-S | N09 | Northstar | 8/5/2002 | |
| 02-N10-01-MET-S | N10 | Northstar | 8/2/2002 | |
| 02-N11-01-MET-S | N11 | Northstar | 8/2/2002 | |
| 02-N12-01-MET-S | N12 | Northstar | 8/2/2002 | |
| 02-N13-01-MET-S | N13 | Northstar | 8/4/2002 | |
| 02-N14-01-MET-S | N14 | Northstar | 8/5/2002 | |
| 02-N15-01-MET-S | N15 | Northstar | 8/7/2002 | |
| 02-N16-01-MET-S | N16 | Northstar | 8/5/2002 | |
| 02-N17-01-MET-S | N17 | Northstar | 8/5/2002 | |
| 02-N17-01-MET-S(subsurface) | N17 | Northstar | 8/5/2002 | Clay Layer |
| 02-N18-01-MET-S | N18 | Northstar | 8/2/2002 | |
| 02-N19-01-MET-S | N19 | Northstar | 8/2/2002 | |
| 02-N20-01-MET-S | N20 | Northstar | 8/2/2002 | |
| 02-N21-01-MET-S | N21 | Northstar | 8/2/2002 | |
| 02-N23-01-MET-S | N23 | Northstar | 8/5/2002 | |
| 02-L01-01-MET-S | L01 | Liberty | 7/31/2002 | |
| 02-L04-01-MET-S | L04 | Liberty | 7/29/2002 | |
| 02-L06-01-MET-S | L06 | Liberty | 7/30/2002 | |
| 02-L07-01-MET-S | L07 | Liberty | 7/30/2002 | |
| 02-L08-01-MET-S | L08 | Liberty | 7/30/2002 | No Clams |
| 02-L08-02-MET-S | L08 | Liberty | 7/30/2002 | Clams |
| 02-L09-01-MET-S | L09 | Liberty | 7/30/2002 | |
| 02-3A-01-MET-S | 3A | Liberty | 7/29/2002 | |
| 02-3B-01-MET-S | 3B | Liberty | 7/29/2002 | Near Pole Island |
| 02-4A-01-MET-S | 4A | Liberty | 7/31/2002 | |
| 02-4B-01-MET-S | 4B | Liberty | 7/31/2002 | Boulder Patch |
| 02-4C-01-MET-S | 4C | In Between N & L | 7/31/2002 | |
| 02-5A-01-MET-S | 5A | Northstar | 8/3/2002 | |
| 02-5B-01-MET-S | 5B | Northstar | 8/3/2002 | |
| 02-5D-01-MET-S | 5D | Northstar | 8/5/2002 | Lee of STP/West Dock, F.Trip. |
| 02-5D-02-MET-S | 5D | Northstar | 8/5/2002 | Field Triplicate |
| 02-5D-03-MET-S | 5D | Northstar | 8/5/2002 | Field Triplicate |
| 02-5E-01-MET-S | 5E | Northstar | 8/4/2002 | |
| 02-5F-01-MET-S | 5F | Northstar | 8/7/2002 | Gwydyr Bay |
| 02-5H-01-MET-S | 5H | In Between N & L | 8/1/2002 | |
| 02-5(0)-01-MET-S | 5(0) | In Between N & L | 8/1/2002 | |
| 02-5(1)-01-MET-S | 5(1) | In Between N & L | 8/1/2002 | |
| 02-5(5)-01-MET-S | 5(5) | Northstar | 8/1/2002 | |
| 02-5(10)-01-MET-S | 5(10) | Northstar | 8/1/2002 | |
| 02-CAN-01-MET-S | Canning River | Source | 8/9/2002 | |
| 02-KUPB-01-MET-S | Kuparuk | Source | 8/7/2002 | Borrow Pit |

MMS Beaufort Sea ANIMDA Project: Summer 2000 Sampling

Grain Size Distribution in Sediment Samples

| Sample Identification* | Gravel (%) | Sand (%) | Silt (%) | Clay (%) | Total (%) | Comments |
|------------------------|------------|----------|----------|----------|-----------|------------------|
| 00-N01-01-GRS-S | 0.2 | 97.3 | 0.8 | 1.6 | 99.9 | |
| 00-N02-01-GRS-S | 0.2 | 32.3 | 54.2 | 13.3 | 100.0 | |
| 00-N03-01-GRS-S | 0.0 | 17.5 | 47.0 | 35.5 | 100.0 | |
| 00-N04-01-GRS-S | 0.6 | 22.0 | 58.0 | 19.3 | 99.9 | |
| 00-N05-01-GRS-S | 0.0 | 14.2 | 63.1 | 22.7 | 100.0 | |
| 00-N06-01-GRS-S #1 | 0.0 | 69.1 | 24.7 | 6.2 | 100.0 | Lab Duplicate |
| 00-N06-01-GRS-S #2 | 0.0 | 71.9 | 22.2 | 6.0 | 100.1 | Lab Duplicate |
| 00-N07-01-GRS-S | 0.0 | 52.0 | 26.5 | 21.5 | 100.0 | |
| 00-N08-01-GRS-S | 0.0 | 85.6 | 10.5 | 3.9 | 100.0 | |
| 00-N09-01-GRS-S #1 | 0.0 | 87.3 | 8.7 | 3.9 | 99.9 | Lab Duplicate |
| 00-N09-01-GRS-S #2 | 0.0 | 89.1 | 7.9 | 3.0 | 100.0 | Lab Duplicate |
| 00-N10-01-GRS-S | 0.0 | 54.9 | 42.4 | 2.7 | 100.0 | |
| 00-N11-01-GRS-S | 0.9 | 41.7 | 47.5 | 10.0 | 100.1 | |
| 00-N12-01-GRS-S | 2.6 | 7.6 | 64.8 | 25.0 | 100.0 | |
| 00-N13-01-GRS-S | 0.0 | 13.2 | 66.4 | 20.4 | 100.0 | Field Triplicate |
| 00-N13-02-GRS-S | 0.0 | 6.0 | 75.9 | 18.1 | 100.0 | Field Triplicate |
| 00-N13-03-GRS-S | 0.0 | 7.0 | 71.6 | 21.4 | 100.0 | Field Triplicate |
| 00-N14-01-GRS-S | 0.0 | 11.6 | 65.9 | 22.5 | 100.0 | |
| 00-N15-01-GRS-S | 0.3 | 97.6 | 0.7 | 1.5 | 100.1 | |
| 00-N16-01-GRS-S | 0.1 | 33.5 | 49.3 | 17.1 | 100.0 | |
| 00-N17-01-GRS-S | 0.0 | 28.0 | 47.2 | 24.8 | 100.0 | |
| 00-N18-01-GRS-S | 0.0 | 39.3 | 43.0 | 17.5 | 99.8 | |
| 00-N19-01-GRS-S | 1.6 | 35.1 | 45.6 | 17.7 | 100.0 | |
| 00-N20-01-GRS-S | 0.0 | 30.2 | 65.7 | 4.1 | 100.0 | |
| 00-N21-01-GRS-S | 0.0 | 5.7 | 72.4 | 21.8 | 99.9 | |
| 00-N22-01-GRS-S | 60.3 | 38.9 | 0.6 | 0.3 | 100.1 | |
| 00-N23-01-GRS-S | 0.0 | 1.4 | 86.8 | 11.8 | 100.0 | |
| 00-L01-01-GRS-S | 4.5 | 29.5 | 43.0 | 23.1 | 100.1 | |
| 00-L04-01-GRS-S | 0.0 | 40.0 | 41.8 | 18.1 | 99.9 | |
| 00-L06-01-GRS-S | 0.0 | 5.6 | 75.5 | 18.8 | 99.9 | |
| 00-L07-01-GRS-S | 0.5 | 63.7 | 28.0 | 7.8 | 100.0 | |
| 00-L08-01-GRS-S | 0.2 | 62.2 | 26.9 | 10.6 | 99.9 | Field Triplicate |
| 00-L08-02-GRS-S | 0.0 | 77.2 | 15.9 | 6.9 | 100.0 | Field Triplicate |
| 00-L08-03-GRS-S | 0.5 | 67.2 | 24.6 | 7.7 | 100.0 | Field Triplicate |
| 00-L09-01-GRS-S | 36.0 | 58.7 | 3.3 | 2.0 | 100.0 | |
| 00-3A-01-GRS-S | 0.0 | 30.5 | 52.3 | 17.2 | 100.0 | |
| 00-3B-01-GRS-S | 0.0 | 26.7 | 52.0 | 21.3 | 100.0 | |
| 00-4A-01-GRS-S | 1.2 | 14.2 | 49.9 | 34.8 | 100.1 | |
| 00-4B-01-GRS-S | 0.0 | 50.6 | 33.3 | 16.1 | 100.0 | |
| 00-4C-01-GRS-S | 12.9 | 45.3 | 36.7 | 5.1 | 100.0 | |
| 00-5A-01-GRS-S | 0.8 | 14.1 | 59.6 | 25.5 | 100.0 | |
| 00-5B-01-GRS-S | 0.0 | 98.8 | 0.4 | 0.8 | 100.0 | |
| 00-5D-01-GRS-S | 0.0 | 46.0 | 49.0 | 4.9 | 99.9 | |
| 00-5E-01-GRS-S | 0.0 | 53.9 | 24.2 | 21.9 | 100.0 | |
| 00-5F-01-GRS-S | 0.4 | 50.6 | 37.6 | 11.4 | 100.0 | |
| 00-5H-01-GRS-S | 1.2 | 73.6 | 18.0 | 7.2 | 100.0 | |
| 00-5(0)-01-GRS-S | 0.0 | 74.2 | 21.7 | 4.1 | 100.0 | |
| 00-5(1)-01-GRS-S | 3.2 | 66.2 | 24.3 | 6.3 | 100.0 | |
| 00-5(5)-01-GRS-S | 7.3 | 60.1 | 21.0 | 11.6 | 100.0 | |
| 00-5(10)-01-GRS-S | 0.0 | 70.7 | 21.4 | 7.9 | 100.0 | |
| 00-COL-01-GRS-S | 0.0 | 97.5 | 1.7 | 0.7 | 99.9 | |
| 00-COL-02-GRS-S | 0.0 | 61.1 | 33.3 | 5.7 | 100.1 | |

* Sample collection dates are the same as the Metal & Carbon samples.

| Sample Identification | TOC (%) | Comments |
|-----------------------------|---------|------------------|
| 02-N01-01-MET-S | 0.30 | |
| 02-N02-01-MET-S | 0.83 | |
| 02-N03-01-MET-S | 0.87 | Field Triplicate |
| 02-N03-02-MET-S | 1.00 | Field Triplicate |
| 02-N03-03-MET-S | 0.82 | Field Triplicate |
| 02-N04-01-MET-S | 0.58 | |
| 02-N05-01-MET-S #1 | 1.00 | Lab Duplicate |
| 02-N05-01-MET-S #2 | 0.81 | Lab Duplicate |
| 02-N06-01-MET-S | 0.73 | |
| 02-N07-01-MET-S | 1.04 | |
| 02-N08-01-MET-S | 0.84 | |
| 02-N09-01-MET-S | 0.78 | |
| 02-N10-01-MET-S | 0.84 | |
| 02-N11-01-MET-S | 0.45 | |
| 02-N12-01-MET-S | 1.00 | |
| 02-N13-01-MET-S | 1.81 | |
| 02-N14-01-MET-S | 1.43 | |
| 02-N15-01-MET-S | 0.19 | |
| 02-N16-01-MET-S | 0.89 | |
| 02-N17-01-MET-S | 0.85 | |
| 02-N17-01-MET-S(subsurface) | 0.90 | Clay Layer |
| 02-N18-01-MET-S | 0.98 | |
| 02-N19-01-MET-S | 1.15 | |
| 02-N20-01-MET-S | 0.09 | |
| 02-N21-01-MET-S | 1.03 | |
| 02-N23-01-MET-S | 0.91 | |
| 02-L01-01-MET-S | 0.59 | |
| 02-L04-01-MET-S | 0.71 | |
| 02-L06-01-MET-S | 1.17 | |
| 02-L07-01-MET-S | 0.88 | |
| 02-L08-01-MET-S | 0.11 | No Clams |
| 02-L08-02-MET-S | 0.67 | Clams |
| 02-L09-01-MET-S | 0.18 | |
| 02-3A-01-MET-S | 0.86 | |
| 02-3B-01-MET-S | 0.74 | |
| 02-4A-01-MET-S | 0.54 | |
| 02-4B-01-MET-S | 0.77 | |
| 02-4C-01-MET-S | 0.30 | |
| 02-5A-01-MET-S | 0.97 | |
| 02-5B-01-MET-S | 0.41 | |
| 02-5D-01-MET-S | 1.10 | Field Triplicate |
| 02-5D-02-MET-S | 0.84 | Field Triplicate |
| 02-5D-03-MET-S | 0.95 | Field Triplicate |

| Sample Identification | TOC (%) | Comments |
|--------------------------|------------|---------------|
| 02-5E-01-MET-S | 0.08 | |
| 02-5F-01-MET-S | 1.26 | |
| 02-5H-01-MET-S | 0.91 | |
| 02-5(0)-01-MET-S | 0.62 | |
| 02-5(1)-01-MET-S | 0.14 | |
| 02-5(5)-01-MET-S | 0.58 | |
| 02-5(10)-01-MET-S #1 | 0.59 | Lab Duplicate |
| 02-5(10)-01-MET-S #2 | 0.57 | Lab Duplicate |
| 02-CAN-01-MET-S | 1.83 | |
| 02-KUPB-01-MET-S | 6.13 | Borrow Pit |

MMS Beaufort Sea ANIMDA Project: Summer 2002 Sampling

Grain Size Distribution in Sediment Samples.

| Sample Identification* | Gravel (%) | Sand (%) | Silt (%) | Clay (%) | Total (%) | Comments |
|------------------------|------------|----------|----------|----------|-----------|------------------|
| 02-N01-01-GRS-S | 0.4 | 96.1 | 2.4 | 1.0 | 99.9 | |
| 02-N02-01-GRS-S #1 | 0.5 | 33.9 | 45.8 | 19.8 | 100.0 | Lab Duplicate |
| 02-N02-01-GRS-S #2 | 0.5 | 35.0 | 44.2 | 20.3 | 100.0 | Lab Duplicate |
| 02-N03-01-GRS-S | 0.0 | 24.9 | 50.7 | 24.4 | 100.0 | Field Triplicate |
| 02-N03-02-GRS-S | 0.0 | 15.5 | 59.0 | 25.5 | 100.0 | Field Triplicate |
| 02-N03-03-GRS-S | 0.0 | 13.0 | 55.7 | 31.3 | 100.0 | Field Triplicate |
| 02-N04-01-GRS-S | 0.0 | 34.0 | 43.7 | 22.3 | 100.0 | |
| 02-N05-01-GRS-S | 0.0 | 12.8 | 59.5 | 27.7 | 100.0 | Lab Duplicate |
| 02-N06-01-GRS-S #1 | 0.0 | 37.6 | 40.7 | 21.7 | 100.0 | Lab Duplicate |
| 02-N06-01-GRS-S #2 | 0.0 | 38.2 | 40.0 | 21.8 | 100.0 | |
| 02-N07-01-GRS-S | 0.1 | 67.3 | 23.6 | 9.0 | 100.0 | |
| 02-N08-01-GRS-S | 0.0 | 24.8 | 45.5 | 29.7 | 100.0 | |
| 02-N09-01-GRS-S | 0.0 | 39.8 | 39.7 | 20.5 | 100.0 | |
| 02-N10-01-GRS-S | 0.0 | 32.2 | 44.4 | 23.4 | 100.0 | |
| 02-N11-01-GRS-S | 0.2 | 52.6 | 35.2 | 11.9 | 99.9 | |
| 02-N12-01-GRS-S | 10.5 | 9.0 | 62.7 | 17.8 | 100.0 | |
| 02-N13-01-GRS-S | 0.2 | 8.9 | 70.8 | 20.1 | 100.0 | |
| 02-N14-01-GRS-S #1 | 0.0 | 18.7 | 67.9 | 13.4 | 100.0 | Lab Duplicate |
| 02-N14-01-GRS-S #2 | 0.0 | 19.0 | 67.7 | 13.4 | 100.1 | Lab Duplicate |
| 02-N15-01-GRS-S | 9.0 | 86.7 | 2.9 | 1.4 | 100.0 | |
| 02-N16-01-GRS-S | 0.0 | 10.6 | 54.6 | 34.8 | 100.0 | |
| 02-N17-01-GRS-S | 0.0 | 17.1 | 54.4 | 28.5 | 100.0 | |
| 02-N18-01-GRS-S | 0.2 | 48.3 | 33.2 | 18.2 | 99.9 | |
| 02-N19-01-GRS-S | 0.1 | 49.4 | 34.1 | 16.5 | 100.1 | |
| 02-N20-01-GRS-S | 0.1 | 91.1 | 5.6 | 3.2 | 100.0 | |
| 02-N21-01-GRS-S | 0.0 | 13.3 | 67.6 | 19.2 | 100.1 | |
| 02-N23-01-GRS-S | 0.0 | 10.7 | 74.3 | 15.1 | 100.1 | |
| 02-L01-01-GRS-S | 0.0 | 89.3 | 6.9 | 3.8 | 100.0 | |
| 02-L04-01-GRS-S | 1.9 | 45.5 | 35.7 | 16.9 | 100.0 | |
| 02-L06-01-GRS-S | 0.0 | 41.6 | 39.5 | 18.9 | 100.0 | |
| 02-L07-01-GRS-S | 0.0 | 51.2 | 34.2 | 14.5 | 99.9 | |
| 02-L08-01-GRS-S | 1.0 | 92.7 | 3.9 | 2.5 | 100.1 | |
| 02-L08-02-GRS-S | 0.6 | 50.9 | 35.8 | 12.7 | 100.0 | |
| 02-L09-01-GRS-S | 0.0 | 90.3 | 5.0 | 4.7 | 100.0 | |
| 02-3A-01-GRS-S | 1.7 | 22.9 | 54.2 | 21.2 | 100.0 | |
| 02-3B-01-GRS-S | 0.0 | 15.5 | 57.7 | 26.8 | 100.0 | |
| 02-4A-01-GRS-S | 0.3 | 9.7 | 32.4 | 57.6 | 100.0 | |
| 02-4B-01-GRS-S | 0.4 | 89.1 | 7.4 | 3.0 | 99.9 | |
| 02-4C-01-GRS-S | 0.0 | 99.2 | 0.2 | 0.6 | 100.0 | |
| 02-5A-01-GRS-S #1 | 0.0 | 7.5 | 60.3 | 32.2 | 100.0 | Lab Duplicate |
| 02-5A-01-GRS-S #2 | 0.3 | 7.9 | 60.3 | 31.5 | 100.0 | Lab Duplicate |
| 02-5B-01-GRS-S | 0.0 | 95.7 | 1.9 | 2.4 | 100.0 | |
| 02-5D-01-GRS-S | 0.0 | 29.1 | 64.4 | 6.5 | 100.0 | Field Triplicate |
| 02-5D-02-GRS-S | 7.6 | 24.7 | 62.3 | 5.5 | 100.1 | Field Triplicate |
| 02-5D-03-GRS-S | 0.0 | 27.8 | 64.6 | 7.7 | 100.1 | Field Triplicate |
| 02-5E-01-GRS-S | 0.1 | 96.2 | 1.7 | 2.0 | 100.0 | |
| 02-5F-01-GRS-S | 0.0 | 29.0 | 60.6 | 10.4 | 100.0 | |
| 02-5H-01-GRS-S | 0.6 | 76.9 | 15.0 | 7.5 | 100.0 | |
| 02-5(0)-01-GRS-S | 0.0 | 81.5 | 13.7 | 4.7 | 99.9 | |
| 02-5(1)-01-GRS-S | 1.3 | 95.8 | 1.5 | 1.5 | 100.1 | |
| 02-5(5)-01-GRS-S | 0.6 | 58.6 | 28.5 | 12.4 | 100.1 | |
| 02-5(10)-01-GRS-S #1 | 0.0 | 79.1 | 14.5 | 6.4 | 100.0 | Lab Duplicate |
| 02-5(10)-01-GRS-S #2 | 0.0 | 78.7 | 15.0 | 6.3 | 100.0 | Lab Duplicate |

* Sample collection dates are the same as the Metal & Carbon samples.

MMS Beaufort Sea ANIMDA Project: Summer 2002 Sampling

Statistics for Total Organic Carbon (TOC) Content in Sediment Samples (dry weight).
Field Triplicates and Lab Duplicate have been averaged prior to statistical analysis.

| Station Grouping | Statistic | TOC (%) |
|-------------------------------|-----------|---------|
| Northstar Stations N01-N21 | Mean | 0.84 |
| | Std. Dev. | 0.37 |
| | n | 23 |
| | Maximum | 1.81 |
| | Minimum | 0.09 |
| Liberty Stations L01-L09 | Mean | 0.62 |
| | Std. Dev. | 0.37 |
| | n | 7 |
| | Maximum | 1.17 |
| | Minimum | 0.11 |
| BSMP Stations 3A-5(10) | Mean | 0.65 |
| | Std. Dev. | 0.33 |
| | n | 15 |
| | Maximum | 1.26 |
| | Minimum | 0.08 |
| Cumulative* | Mean | 0.74 |
| | Std. Dev. | 0.36 |
| | n | 45 |
| | Maximum | 1.81 |
| | Minimum | 0.08 |

* Excluding CAN and KUPB sediment samples.

MMS Beaufort Sea ANIMDA Project: Summer 2002 Sampling

Quality Assurance and Quality Control Data for Sediment Metal Analyses.

Results for the Marine Sediment Certified Reference Materials (CRMs) MESS-2 and MESS-3 certified by the National Research Council of Canada (NRC) and Standard Reference Material (SRM) Trace Elements in Water #1643d certified by the National Institute of Standards and Technology (NIST).

| Reference Material | TOC (%) |
|-----------------------|---------|
| CRM MESS-2 | - |
| This Study | - |
| | - |
| | - |
| CRM MESS-2 | 2.14** |
| NRC Certified Values | ± 0.03 |
| CRM MESS-3 | 2.05 |
| This Study | 2.08 |
| | 2.08 |
| | 2.07 |
| CRM MESS-3 | 2* |
| NRC Certified Values | - |
| SRM #1643d | - |
| This Study | - |
| SRM #1643d | - |
| NIST Certified Values | - |

* Reference Value, not Certified.

Method Detection Limits (MDLs).

| | TOC (%) |
|------------------------|---------|
| Method Detection Limit | 0.03 |

MMS Beaufort Sea ANIMDA Project: Summer 2002 Sampling

Quality Assurance and Quality Control Data for Sediment Metal Analyses.

Percent Spike Recovery.

| | TOC |
|--------------------|-----|
| Mean | - |
| Standard Deviation | - |
| (n =) | - |

***Final concentrations are corrected for percent spike recovery.

Estimate of Precision as Percent Relative Standard Deviation (RSD) of Lab Duplicates.

| | TOC |
|-------------------|------|
| 02-N05-01-MET-S | 14.8 |
| 02-5(10)-01-MET-S | 2.4 |

$RSD = (\text{standard deviation} / \text{mean}) \times 100$

MMS Beaufort Sea ANIMDA Project: Summer 2000 Sampling

Quality Assurance and Quality Control Data for Sediment TOC Analyses.

Results for the Marine Sediment Standard Reference Material (SRM) MESS-2 certified by the National Research Council of Canada (NRC).

| Standard Reference Material | TOC (%) |
|-----------------------------|---------|
| SRM MESS-2 | 1.99 |
| This Study | 1.97 |
| | 1.89 |
| | 1.93 |
| SRM MESS-2 | 2.14** |
| NRC Certified Values | ± 0.03 |

* Reference Value, not Certified.

** Total Carbon (Inorganic plus Organic).

Method Detection Limits (MDLs).

| | TOC (%) |
|------------------------|---------|
| Method Detection Limit | 0.06 |

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Quality Assurance and Quality Control Data for Sediment Metal Analyses.

Percent Spike Recovery.

| | TOC |
|--------------------|-----|
| Mean | - |
| Standard Deviation | - |
| (n =) | - |

***Final concentrations are corrected for percent spike recovery.

Estimate of Precision as Percent Relative Standard Deviation (RSD) of Lab Duplicates.

| | TOC |
|-------------------|-----|
| 00-N06-01-MET-S | 1.1 |
| 00-N09-01-MET-S | 1.8 |
| 00-5(10)-01-MET-S | - |
| 00-KUP-02-MET-S | 0.6 |

RSD = (standard deviation / mean) X 100

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Trace Metal Concentrations in Sediment Page 1 of 2

| Sample Identification | TOC (%) | Comments |
|-----------------------|---------|-----------------------|
| 00-N01-01-MET-S | N.D. | |
| 00-N01-01-MET-EB | - | |
| 00-N02-01-MET-S | 1.38 | |
| 00-N03-01-MET-S | 0.74 | |
| 00-N04-01-MET-S | 1.68 | |
| 00-N05-01-MET-S | 1.56 | |
| 00-N06-01-MET-S #1 | 0.64 | Lab Duplicate, Metals |
| 00-N06-01-MET-S #2 | 0.63 | Lab Duplicate, Metals |
| 00-N07-01-MET-S | 1.19 | |
| 00-N08-01-MET-S | 0.34 | |
| 00-N09-01-MET-S #1 | 0.77 | Lab Duplicate, Metals |
| 00-N09-01-MET-S #2 | 0.79 | Lab Duplicate, Metals |
| 00-N10-01-MET-S | 1.36 | |
| 00-N11-01-MET-S | 1.41 | |
| 00-N12-01-MET-S | 1.60 | |
| 00-N13-01-MET-S | 1.61 | Field Triplicate |
| 00-N13-02-MET-S | 1.87 | Field Triplicate |
| 00-N13-03-MET-S | 2.18 | Field Triplicate |
| 00-N14-01-MET-S | 4.41 | |
| 00-N15-01-MET-S | N.D. | |
| 00-N16-01-MET-S | 0.86 | |
| 00-N17-01-MET-S | 0.97 | |
| 00-N18-01-MET-S | 0.50 | |
| 00-N19-01-MET-S | 0.83 | |
| 00-N20-01-MET-S | 1.73 | |
| 00-N21-01-MET-S | 2.34 | |
| 00-N22-01-MET-S | N.D. | |
| 00-N23-01-MET-S | 1.80 | |
| 00-L01-01-MET-S | 1.01 | |
| 00-L04-01-MET-S | 0.47 | |
| 00-L06-01-MET-S | 0.90 | |
| 00-L07-01-MET-S | 1.48 | |
| 00-L08-01-MET-S | 0.30 | Field Triplicate |
| 00-L08-02-MET-S | 0.22 | Field Triplicate |
| 00-L08-03-MET-S | 0.19 | Field Triplicate |
| 00-L09-01-MET-S | 0.49 | |

MMS Beaufort Sea ANIMDA Project: Summer 2000 Sampling

Trace Metal Concentrations in Sediment Page 2 of 2

| Sample Identification | TOC (%) | Comments |
|-----------------------|---------|-----------------------|
| 00-3A-01-MET-S | 0.29 | |
| 00-3B-01-MET-S | 0.58 | |
| 00-4A-01-MET-S | 0.59 | |
| 00-4B-01-MET-S | 1.15 | |
| 00-4C-01-MET-S | 0.50 | |
| 00-5A-01-MET-S | 1.70 | |
| 00-5B-01-MET-S | 0.06 | |
| 00-5D-01-MET-S | 1.96 | |
| 00-5E-01-MET-S | N.D. | |
| 00-5F-01-MET-S | 0.51 | |
| 00-5H-01-MET-S | 0.40 | |
| 00-5(0)-01-MET-S | 0.96 | |
| 00-5(1)-01-MET-S | 0.96 | |
| 00-5(5)-01-MET-S | 1.13 | |
| 00-5(10)-01-MET-S #1 | 0.91 | Lab Duplicate, Metals |
| 00-5(10)-01-MET-S #2 | | Lab Duplicate, Metals |
| 00-SAG-01-MET-S | 2.79 | |
| 00-SAG-02-MET-S | 2.43 | |
| 00-COL-01-MET-S | 0.42 | |
| 00-COL-02-MET-S | 1.76 | |
| 00-KUP-01-MET-S | 7.39 | |
| 00-KUP-02-MET-S #1 | 2.34 | Lab Duplicate, Metals |
| 00-KUP-02-MET-S #2 | 2.36 | Lab Duplicate, Metals |
| 00-TWO-01-MET-S | - | |
| 3A-SS-P (2 of 3) | - | 1989 Sample |
| 5F-SS-P (1 of 3) | - | 1989 Sample |
| 5(0)-SS-2 | - | 1989 Sample |

| Year | Region | FieldID | StationID | Matrix | Weight (kg/Kr) | Perylene (μg/Kr) | N/P | C2D/C2P | C3D/C3P | Total PAH (μg/Kr) | total perylene (μg/Kr) | Pyrogenic PAH (μg/Kr) | Petrogenic PAH (μg/Kr) | Pyrogenic/ Petrogenic | TOC(%) | Silt+Clay/ % | Resph Total | TPHC (μg/Kr) | Iso(perm) (μg/Kr) | LALK (μg/Kr) | TALK (μg/Kr) | LALK/ TALK | Phytane/ Pristane | C16/(C15+ C17) | CPI | TotalST (μg/Kr) | T21/T22 | Ts(Ts+ Tm) | OLEANE/ HOMANE | |
|------|---------|------------------|-----------|----------|-------------------|---------------------|------|---------|---------|----------------------|---------------------------|--------------------------|---------------------------|--------------------------|--------|-----------------|----------------|-----------------|----------------------|-----------------|-----------------|---------------|----------------------|-------------------|-------|--------------------|---------|---------------|-------------------|--|
| 1999 | Norstar | 99-5A-01-PHC-S | 5A | SEDIMENT | DRY | 53.00 | 1.40 | .28 | .38 | 646.92 | 59.92 | 45.5 | 32.69 | 5.91 | .50 | 17.40 | 1.10 | 63.9 | 17.40 | 63.9 | 17.40 | 1.10 | .34 | .345 | 4.04 | | | | | |
| 1999 | Norstar | 99-N01-01-PHC-S | N01 | SEDIMENT | DRY | .58 | 1.31 | .43 | .62 | 8.65 | 8.07 | .61 | 7.16 | .085 | .01 | 1.00 | .21 | .21 | .00 | .06 | .00 | .00 | .44 | .369 | 1.66 | 1.18 | 1.00 | .407 | .00 | |
| 1999 | Norstar | 99-N02-01-PHC-S | N02 | SEDIMENT | DRY | 42.00 | 1.38 | .37 | .65 | 465.53 | 423.53 | 35.89 | 373.78 | .096 | .48 | 63.00 | 3.20 | 6.20 | .12 | .46 | 2.31 | .20 | .44 | .369 | 5.82 | | | | | |
| 1999 | Norstar | 99-N03-01-PHC-S | N03 | SEDIMENT | DRY | 74.00 | 1.66 | .29 | .75 | 676.17 | 602.17 | 55.70 | 528.13 | .105 | 1.51 | 89.70 | 5.90 | 11.00 | .18 | .70 | 4.32 | .16 | .45 | .350 | 6.87 | | | | | |
| 1999 | Norstar | 99-N04-01-PHC-S | N04 | SEDIMENT | DRY | 49.00 | 1.43 | .27 | .39 | 590.16 | 541.16 | 48.21 | 486.29 | .102 | 1.93 | 91.30 | 6.20 | 9.80 | .17 | .58 | 3.74 | .30 | .33 | .351 | 5.30 | | | | | |
| 1999 | Norstar | 99-N05-01-PHC-S | N05 | SEDIMENT | DRY | 62.00 | .94 | .28 | .35 | 601.84 | 539.84 | 51.04 | 469.80 | .109 | .90 | 93.60 | 4.40 | 7.80 | .17 | .60 | 2.90 | .20 | .39 | .351 | 5.55 | | | | | |
| 1999 | Norstar | 99-N06-01-PHC-S | N06 | SEDIMENT | DRY | 88.00 | 1.52 | .29 | .31 | 956.05 | 868.05 | 67.80 | 771.15 | .088 | 1.51 | 97.40 | 7.50 | 13.00 | .24 | .96 | 5.47 | .18 | .38 | .360 | 6.05 | 81.58 | .60 | .260 | .04 | |
| 1999 | Norstar | 99-N07-01-PHC-S | N07 | SEDIMENT | DRY | 5.20 | .65 | .38 | .46 | 56.56 | 51.36 | 5.68 | 43.74 | .130 | .09 | 11.90 | .45 | .45 | .02 | .05 | .23 | .23 | .50 | .411 | 3.16 | | | | | |
| 1999 | Norstar | 99-N08-01-PHC-S | N08 | SEDIMENT | DRY | 7.90 | 1.35 | .41 | .56 | 101.36 | 90.16 | 8.36 | 71.40 | .101 | .50 | 17.40 | .40 | .40 | .02 | .05 | .29 | .50 | .18 | .38 | .403 | 2.98 | | | | |
| 1999 | Norstar | 99-N09-01-PHC-S | N09 | SEDIMENT | DRY | 36.00 | 1.35 | .30 | .36 | 368.40 | 332.40 | 27.32 | 294.62 | .093 | .44 | 59.40 | 3.20 | 6.00 | .10 | .41 | 2.33 | .18 | .42 | .366 | 5.30 | | | | | |
| 1999 | Norstar | 99-N10-01-PHC-S | N10 | SEDIMENT | DRY | 69.00 | .90 | .29 | .34 | 724.53 | 655.53 | 58.77 | 573.46 | .103 | 1.51 | 98.80 | 5.60 | 11.00 | .20 | .75 | 3.82 | .20 | .40 | .361 | 2.99 | | | | | |
| 1999 | Norstar | 99-N11-01-PHC-S | N11 | SEDIMENT | DRY | 2.80 | .40 | .42 | .47 | 16.67 | 13.87 | 1.50 | 11.82 | .127 | .60 | 12.10 | .26 | .26 | .00 | .15 | .09 | .26 | .15 | .39 | .378 | 2.07 | | | | |
| 1999 | Norstar | 99-N12-01-PHC-S | N12 | SEDIMENT | DRY | 14.00 | 1.04 | .37 | .29 | 150.89 | 136.89 | 12.66 | 120.66 | .130 | .30 | 20.80 | 1.30 | 2.60 | .04 | .15 | .86 | .17 | .49 | .349 | 3.49 | 5.52 | .95 | | | |
| 1999 | Norstar | 99-N13-01-PHC-S | N13 | SEDIMENT | DRY | 16.00 | .98 | .38 | .57 | 162.34 | 146.34 | 11.14 | 131.15 | .085 | .51 | 14.60 | 1.80 | 3.50 | .04 | .18 | 1.29 | .14 | .42 | .340 | 3.02 | 16.17 | .34 | .366 | .03 | |
| 1999 | Norstar | 99-N14-01-PHC-S | N14 | SEDIMENT | DRY | 4.80 | .98 | .37 | .52 | 46.80 | 42.00 | 3.28 | 37.51 | .087 | .27 | 6.80 | .63 | .63 | .01 | .05 | .33 | .15 | .39 | .366 | 2.56 | 6.46 | 1.13 | .240 | .00 | |
| 1999 | Norstar | 99-N15-01-PHC-S | N15 | SEDIMENT | DRY | 3.4 | 1.33 | .39 | .57 | 8.82 | 7.48 | 5.71 | 4.89 | .085 | .45 | 2.10 | 2.70 | 5.00 | .09 | .32 | 1.79 | .18 | .43 | .356 | 5.27 | 32.89 | .40 | .271 | .05 | |
| 1999 | Liberty | 99-L01-01-PHC-S | L01 | SEDIMENT | DRY | 30.00 | 1.05 | .29 | .35 | 357.72 | 325.72 | 26.01 | 290.95 | .089 | .50 | 1.00 | 2.70 | 5.00 | .09 | .32 | 1.79 | .18 | .43 | .356 | 5.27 | 32.89 | .40 | .271 | .05 | |
| 1999 | Liberty | 99-L02-01-PHC-S | L02 | SEDIMENT | DRY | 53.00 | .84 | .24 | .29 | 490.62 | 437.62 | 43.09 | 378.39 | .114 | .78 | 86.30 | 3.40 | 7.50 | .14 | .51 | 2.29 | .22 | .44 | .373 | 3.31 | | | | | |
| 1999 | Liberty | 99-L03-01-PHC-S | L03 | SEDIMENT | DRY | 77.00 | 1.07 | .25 | .29 | 857.28 | 780.28 | 64.20 | 693.97 | .093 | 1.06 | 93.30 | 8.20 | 16.00 | .26 | .89 | 6.00 | .15 | .38 | .342 | 5.93 | | | | | |
| 1999 | Liberty | 99-L04-01-PHC-S | L04 | SEDIMENT | DRY | 34.00 | 1.12 | .29 | .33 | 396.19 | 362.19 | 28.03 | 324.23 | .086 | .45 | 50.00 | 3.10 | 5.70 | .09 | .35 | 2.38 | .15 | .47 | .354 | 3.15 | | | | | |
| 1999 | Liberty | 99-L05-01-PHC-S | L05 | SEDIMENT | DRY | 21.00 | .87 | .29 | .32 | 132.34 | 111.34 | 11.45 | 95.48 | .120 | .48 | 31.60 | 1.75 | 1.75 | .03 | .16 | 1.10 | .14 | .37 | .347 | 6.35 | | | | | |
| 1999 | Liberty | 99-L06-01-PHC-S | L06 | SEDIMENT | DRY | 54.00 | .83 | .23 | .26 | 449.72 | 395.72 | 37.97 | 343.05 | .111 | .93 | 69.00 | 3.60 | 8.60 | .14 | .51 | 2.43 | .21 | .40 | .343 | 6.14 | 44.70 | .60 | .324 | .06 | |
| 1999 | Liberty | 99-L07-01-PHC-S | L07 | SEDIMENT | DRY | 39.00 | 1.06 | .25 | .29 | 448.97 | 409.97 | 37.12 | 367.13 | .086 | .52 | 54.00 | 3.50 | 6.90 | .11 | .39 | 2.51 | .15 | .45 | .355 | 5.56 | | | | | |
| 1999 | Liberty | 99-L08-01-PHC-S | L08 | SEDIMENT | DRY | 17.00 | 2.02 | .39 | .30 | 300.73 | 283.73 | 19.35 | 253.98 | .076 | .44 | 68.50 | 5.00 | 17.00 | .38 | .91 | 1.71 | .53 | .69 | .462 | 2.92 | | | | | |
| 1999 | Liberty | 99-L09-01-PHC-S | L09 | SEDIMENT | DRY | 29.00 | .87 | .27 | .30 | 264.97 | 235.97 | 23.91 | 203.33 | .118 | .50 | 35.80 | 2.50 | 4.70 | .08 | .27 | 1.63 | .17 | .41 | .391 | 6.67 | 32.76 | .59 | .283 | .04 | |
| 1999 | Liberty | 99-L10-01-PHC-S | L10 | SEDIMENT | DRY | 36.00 | .75 | .26 | .29 | 338.01 | 302.01 | 27.85 | 263.14 | .106 | .63 | 59.80 | 2.50 | 5.20 | .09 | .37 | 1.60 | .23 | .47 | .352 | 2.97 | | | | | |
| 1999 | Liberty | 99-L11-03-PHC-S | L11 | SEDIMENT | DRY | 26.67 | .84 | .25 | .31 | 233.23 | 206.56 | 19.24 | 179.93 | .107 | .54 | 30.77 | 1.77 | 2.60 | .06 | .24 | 1.17 | .20 | .43 | .361 | 5.85 | | | | | |
| 1999 | Liberty | 99-L12-01-PHC-S | L12 | SEDIMENT | DRY | 31.00 | 1.03 | .31 | .31 | 260.33 | 230.33 | 20.33 | 180.33 | .128 | .30 | 20.80 | 1.80 | 3.70 | .06 | .24 | 1.83 | .18 | .43 | .361 | 5.85 | | | | | |
| 1999 | BSPM | 99-3A-01-PHC-S | 3A | SEDIMENT | DRY | 50.00 | .85 | .25 | .30 | 475.99 | 425.99 | 42.43 | 367.53 | .115 | 1.02 | 90.50 | 3.80 | 7.60 | .15 | .53 | 2.61 | .20 | .45 | .353 | 3.05 | 49.21 | .70 | .273 | .04 | |
| 1999 | BSPM | 99-3B-01-PHC-S | 3B | SEDIMENT | DRY | 52.00 | .81 | .25 | .32 | 473.16 | 421.16 | 42.64 | 362.41 | .118 | .90 | 84.00 | 3.70 | 7.90 | .14 | .50 | 2.48 | .20 | .50 | .369 | 3.20 | | | | | |
| 1999 | BSPM | 99-4A-01-PHC-S | 4A | SEDIMENT | DRY | 16.00 | 1.10 | .28 | .31 | 410.86 | 394.86 | 33.47 | 348.03 | .096 | .54 | 32.60 | 2.60 | 5.30 | .10 | .39 | 1.91 | .20 | .41 | .416 | 4.83 | | | | | |
| 1999 | BSPM | 99-4B-01-PHC-S | 4B | SEDIMENT | DRY | 8.70 | 1.07 | .38 | .40 | 87.08 | 81.08 | 7.10 | 64.20 | .105 | .12 | 14.20 | .90 | .90 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | 8.96 | .78 | .306 | .04 | |
| 1999 | BSPM | 99-4C-01-PHC-S | 4C | SEDIMENT | DRY | 1.80 | 1.04 | .39 | .55 | 20.68 | 18.88 | 1.26 | 17.05 | .074 | .10 | 1.80 | .40 | .00 | .00 | .01 | .14 | .08 | .00 | .00 | .553 | 4.38 | | | | |
| 1999 | BSPM | 99-5(0)-01-PHC-S | 5(0) | SEDIMENT | DRY | 64.00 | .94 | .47 | .46 | 443.17 | 379.17 | 24.10 | 346.42 | .058 | 1.38 | 39.10 | 3.50 | 6.40 | .11 | .40 | 2.74 | .15 | .49 | .404 | 2.69 | | | | | |
| 1999 | BSPM | 99-5(1) average | 5(1) | SEDIMENT | DRY | 2.05 | 1.26 | .51 | .47 | 26.71 | 24.68 | 2.73 | 22.18 | .073 | .08 | 5.2 | .52 | .52 | .00 | .02 | .15 | .56 | .10 | .131 | 2.62 | | | | | |
| 1999 | BSPM | 99-5(2)-01-PHC-S | 5(2) | SEDIMENT | DRY | 62.00 | 1.12 | .28 | .36 | 708.50 | 646.50 | 51.20 | 588.00 | .096 | 1.12 | 88.00 | 6.80 | 12.00 | .21 | .83 | 4.56 | .18 | .43 | .280 | 4.80 | | | | | |
| 1999 | BSPM | 99-5(5)-01-PHC-S | 5(5) | SEDIMENT | DRY | 17.00 | 1.14 | .35 | .42 | 165.54 | 148.54 | 12.60 | 131.59 | .096 | .30 | 21.80 | 1.40 | 1.40 | .04 | .16 | .90 | .18 | .43 | .400 | 5.64 | 20.77 | .17 | .235 | .02 | |
| 1999 | BSPM | 99-5B-01-PHC-S | 5B | SEDIMENT | DRY | 1.00 | .69 | .45 | .71 | 24.08 | 23.08 | 2.99 | 19.05 | .157 | .05 | 1.70 | .25 | .25 | .00 | .01 | .11 | .11 | .00 | .357 | 1.85 | | | | | |
| 1999 | BSPM | 99-5D-01-PHC-S | 5D | SEDIMENT | DRY | 29.00 | 1.47 | .40 | .29 | 274.60 | 247.60 | 21.50 | 215.10 | .092 | .40 | 30.00 | 5.00 | 6.80 | .08 | .24 | 1.73 | .33 | .37 | .343 | 3.73 | | | | | |
| 1999 | BSPM | 99-5E-01-PHC-S | 5E | SEDIMENT | DRY | 12.00 | 1.08 | .39 | .50 | 174.54 | 162.54 | 14.59 | 143.14 | .102 | .45 | 18.30 | 4.40 | 11.00 | .05 | .17 | 3.16 | .05 | .38 | .364 | 1.24 | 25.50 | .73 | .331 | .07 | |
| 1999 | BSPM | 99-5F-01-PHC-S | 5F | SEDIMENT | DRY | 17.00 | 1.01 | .42 | .41 | 178.58 | 161.58 | 12.51 | 145.51 | .086 | .24 | 12.50 | 1.90 | 1.90 | .04 | .16 | 1.22 | .13 | .49 | .333 | 2.54 | 5.57 | .45 | | | |
| 1999 | BSPM | 99-5H-01-PHC-S | 5H | SEDIMENT | DRY | 23.00 | 1.08 | .27 | .33 | 266.40 | 243.40 | 20.26 | 215.84 | .094 | .49 | 31.10 | 2.30 | 4.80 | .08 | .26 | 1.69 | .15 | .47 | .403 | 3.47 | | | | | |
| 1999 | Rivers | 99-COL-01-PHC-S | COL-S | SEDIMENT | DRY | 23.00 | 1.14 | .28 | .31 | 253.33 | 230.33 | 19.14 | 185.00 | .090 | .49 | 21.60 | 1.90 | 3.00 | .08 | .16 | 1.45 | .11 | .47 | .404 | 2.98 | 344.79 | .24 | .132 | .00 | |
| 1999 | Rivers | 99-COL-02-PHC-S | COL-S | SEDIMENT | DRY | 230.00 | 1.27 | .30 | .25 | 2222.00 | 1992.00 | 200.96 | 1733.30 | .116 | 2.44 | 19.00 | 31.00 | .41 | 1.66 | 15.06 | .11 | .44 | .368 | .424 | | | | | | |
| 1999 | Rivers | 99-KUP-01-PHC-S | KUP-S | SEDIMENT | DRY | 27.00 | .79 | .37 | .50 | 102.05 | 75.05 | 12.46 | 60.24 | .207 | .472 | 8.50 | 10.80 | .04 | .35 | 5.63 | .06 | .40 | .173 | 3.78 | 72.44 | .07 | .250 | .00 | | |
| 1999 | Rivers | 99-SAG-01-PHC-S | SAG-S | SEDIMENT | DRY | 33.00 | .83 | .56 | .71 | 371.49 | 284.49 | 20.75 | 257.14 | .081 | .25 | 58.00 | .07 | .33 | 1.58 | .21 | .52 | .395 | 5.80 | 25.39 | .19 | .349 | .03 | | | |
| 2000 | Norstar | 00-N01-01-PHC-S | N01 | SEDIMENT | DRY | 50.00 | 1.53 | .30 | .35 | 1778.20 | 1638.20 | 125.00 | 1461.00 | .096 | 1.70 | 85.10 | 6.20 | 10.00 | .36 | 1.54 | 8.35 | .17 | .46 | .410 | 2.38 | 6.85 | .66 | .328 | .10 | |
| 2000 | Norstar | 00-N02-01-PHC-S | N02 | SEDIMENT | DRY | 36.00 | 1.03 | .31 | .35 | 374.26 | 338.26 | 30.34 | 297.42 | .102 | .138 | 67.50 | 3.20 | 6.30 | .10 | .35 | 2.04 | .17 | .45 | .364 | 3.44 | 35.81 | .51 | .276</ | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|-----------|---------------------|-------|----------|-----|--------|------|-----|-----|--------|--------|-------|--------|------|------|---------|---------|-------|------|-------|-------|-----|------|-------|--------|--------|--------|--------|------|-----|
| 2002 | Northstar | 02-N06-01-PHC-S | N06 | SEDIMENT | DRY | 43.00 | 1.14 | .38 | .38 | 514.82 | 471.82 | 42.35 | 415.59 | .102 | .73 | 62.09 | 3.80 | 8.10 | .13 | .49 | 2.51 | 19 | .45 | .395 | 4.26 | 50.37 | .45 | 289.00 | .00 | |
| 2002 | Northstar | 02-N06-01-PHC-S | N07 | SEDIMENT | DRY | 27.00 | .86 | .33 | .42 | 277.81 | 250.81 | 28.29 | 217.36 | .116 | 1.04 | 32.61 | 2.90 | 6.20 | .08 | .32 | 1.71 | 19 | .41 | .367 | 2.58 | 25.55 | .41 | 249.00 | .00 | |
| 2002 | Northstar | 02-N08-01-PHC-S | N09 | SEDIMENT | DRY | 59.00 | .96 | .39 | .40 | 514.36 | 455.96 | 51.42 | 427.63 | .111 | .84 | 75.16 | 3.80 | 6.00 | .15 | .60 | 4.32 | 19 | .45 | .398 | 4.39 | 51.41 | .42 | 480.00 | .00 | |
| 2002 | Northstar | 02-N09-01-PHC-S | N09 | SEDIMENT | DRY | 32.00 | .91 | .34 | .38 | 313.68 | 281.68 | 28.03 | 243.87 | .115 | .78 | 60.21 | 3.30 | 6.00 | .10 | .36 | 2.07 | 17 | .45 | .386 | 3.20 | 31.53 | .56 | 263.00 | .00 | |
| 2002 | Northstar | 02-N10-01-PHC-S | N10 | SEDIMENT | DRY | 59.00 | .92 | .34 | .38 | 529.49 | 470.49 | 46.39 | 408.34 | .114 | .84 | 67.84 | 6.10 | 11.00 | .17 | .65 | 3.82 | 17 | .41 | .373 | 2.68 | 55.39 | .38 | 239.00 | .00 | |
| 2002 | Northstar | 02-N11-01-PHC-S | N11 | SEDIMENT | DRY | 110.00 | .87 | .33 | .34 | 337.10 | 220.10 | 24.70 | 195.00 | .127 | .45 | 47.13 | 4.00 | 6.60 | .07 | .26 | 2.66 | 10 | .46 | .414 | 6.86 | 32.04 | .29 | 455.00 | .00 | |
| 2002 | Northstar | 02-N12-01-PHC-S | N12 | SEDIMENT | DRY | 59.00 | .96 | .39 | .40 | 514.36 | 455.96 | 51.42 | 427.63 | .111 | .84 | 75.16 | 3.80 | 6.00 | .15 | .60 | 4.32 | 19 | .45 | .398 | 4.39 | 51.41 | .42 | 480.00 | .00 | |
| 2002 | Northstar | 02-N13-01-PHC-S | N13 | SEDIMENT | DRY | 110.00 | .94 | .37 | .38 | 830.97 | 727.97 | 73.40 | 625.68 | .117 | 1.81 | 90.99 | 14.00 | 22.00 | .21 | 1.16 | 10.26 | 11 | .42 | .322 | 3.01 | 112.12 | .25 | 234.00 | .00 | |
| 2002 | Northstar | 02-N14-01-PHC-S | N14 | SEDIMENT | DRY | 110.00 | 1.07 | .37 | .40 | 849.95 | 739.95 | 73.50 | 643.29 | .114 | 1.43 | 81.15 | 14.00 | 22.00 | .22 | 1.18 | 9.82 | 12 | .44 | .364 | 2.64 | 105.16 | .26 | 246.00 | .00 | |
| 2002 | Northstar | 02-N15-01-PHC-S | N15 | SEDIMENT | DRY | 20.00 | 1.21 | .35 | .36 | 199.33 | 179.33 | 17.20 | 156.62 | .110 | .19 | 4.30 | 2.40 | 3.70 | .05 | .21 | 1.67 | 13 | .45 | .432 | 2.74 | 22.18 | .32 | 193.00 | .00 | |
| 2002 | Northstar | 02-N16-01-PHC-S | N16 | SEDIMENT | DRY | 78.00 | 1.11 | .37 | .38 | 895.36 | 785.36 | 78.00 | 685.36 | .111 | .89 | 89.44 | 7.00 | 13.00 | .21 | .67 | 4.22 | 19 | .47 | .417 | 3.80 | 44.00 | .32 | 384.00 | .00 | |
| 2002 | Northstar | 02-N17-01-PHC-S | N17 | SEDIMENT | DRY | 76.00 | .88 | .33 | .38 | 620.92 | 544.92 | 56.78 | 469.06 | .121 | .85 | 82.90 | 6.40 | 11.00 | .17 | .69 | 3.87 | 18 | .45 | .395 | 4.58 | 70.44 | .47 | 279.00 | .00 | |
| 2002 | Northstar | 02-N18-01-PHC-S | N18 | SEDIMENT | DRY | 41.00 | 1.04 | .36 | .43 | 413.51 | 372.51 | 34.03 | 327.52 | .104 | .98 | 51.47 | 4.00 | 7.00 | .10 | .38 | 2.45 | 16 | .44 | .402 | 5.17 | 51.24 | .27 | 286.00 | .00 | |
| 2002 | Northstar | 02-N19-01-PHC-S | N19 | SEDIMENT | DRY | 42.00 | 1.15 | .36 | .37 | 513.50 | 471.50 | 38.30 | 419.67 | .109 | 1.15 | 50.54 | 5.30 | 10.00 | .14 | .25 | 2.77 | 16 | .44 | .402 | 5.17 | 51.24 | .27 | 286.00 | .00 | |
| 2002 | Northstar | 02-N20-01-PHC-S | N20 | SEDIMENT | DRY | 76.00 | .88 | .33 | .38 | 620.92 | 544.92 | 56.78 | 469.06 | .121 | .85 | 82.90 | 6.40 | 11.00 | .17 | .69 | 3.87 | 18 | .45 | .395 | 4.58 | 70.44 | .47 | 279.00 | .00 | |
| 2002 | Northstar | 02-N21-01-PHC-S | N21 | SEDIMENT | DRY | 71.00 | 1.03 | .40 | .41 | 646.52 | 575.52 | 49.45 | 509.50 | .097 | 1.03 | 86.74 | 8.20 | 14.00 | .17 | .74 | 5.28 | 14 | .42 | .375 | 5.89 | 64.45 | .26 | 328.00 | .00 | |
| 2002 | Northstar | 02-N23-01-PHC-S | N23 | SEDIMENT | DRY | 56.00 | .88 | .32 | .38 | 419.67 | 363.67 | 37.92 | 311.74 | .122 | .91 | 89.34 | 5.10 | 9.00 | .14 | .48 | 2.98 | 16 | .50 | .402 | 5.35 | 50.90 | .49 | 267.00 | .00 | |
| 2002 | Liberty | 02-L01-01-PHC-S | L01 | SEDIMENT | DRY | 47.00 | .92 | .39 | .40 | 464.22 | 413.22 | 43.20 | 371.22 | .114 | .59 | 10.71 | 13.00 | 2.00 | .10 | .50 | 1.70 | 64 | .44 | .350 | 2.57 | 34.50 | .34 | 303.00 | .00 | |
| 2002 | Liberty | 02-L04-01-PHC-S | L04 | SEDIMENT | DRY | 46.00 | .92 | .39 | .43 | 404.88 | 358.88 | 34.85 | 314.73 | .104 | .71 | 52.56 | 4.40 | 7.10 | .09 | .41 | 3.09 | 13 | .46 | .350 | 2.57 | 34.50 | .34 | 303.00 | .00 | |
| 2002 | Liberty | 02-L06-01-PHC-S | L06 | SEDIMENT | DRY | 41.00 | .86 | .33 | .36 | 419.25 | 378.25 | 36.78 | 329.49 | .112 | 1.17 | 58.41 | 3.40 | 6.50 | .09 | .36 | 2.13 | 17 | .49 | .396 | 4.31 | 32.32 | .49 | 313.04 | .04 | |
| 2002 | Liberty | 02-L07-01-PHC-S | L07 | SEDIMENT | DRY | 37.00 | .85 | .31 | .36 | 340.67 | 303.67 | 27.92 | 266.16 | .105 | .88 | 48.77 | 3.00 | 5.90 | .08 | .35 | 1.98 | 18 | .45 | .452 | 2.35 | 28.34 | .44 | 314.04 | .04 | |
| 2002 | Liberty | 02-L08-02-PHC-S | L08 | SEDIMENT | DRY | 32.00 | 1.21 | .34 | .39 | 337.34 | 305.34 | 23.84 | 271.11 | .092 | .67 | 48.50 | 3.30 | 10.00 | .14 | .41 | 1.89 | 22 | .59 | .466 | 2.27 | 31.78 | .58 | 373.06 | .06 | |
| 2002 | Liberty | 02-L09-01-PHC-S | L09 | SEDIMENT | DRY | 8.40 | .76 | .30 | .39 | 84.48 | 76.08 | 8.04 | 65.48 | .123 | .18 | 9.74 | 1.50 | 3.40 | .03 | .22 | .84 | 26 | .47 | .419 | 2.62 | 11.25 | .31 | 324.05 | .05 | |
| 2002 | BSPM | 02-3A-01-PHC-S | 3A | SEDIMENT | DRY | 38.00 | .92 | .29 | .37 | 371.83 | 333.83 | 33.68 | 288.10 | .117 | .86 | 75.41 | 3.80 | 7.10 | .11 | .40 | 2.47 | 16 | .48 | .346 | 2.63 | 34.68 | .73 | 324.03 | .03 | |
| 2002 | BSPM | 02-3B-01-PHC-S | 3B | SEDIMENT | DRY | 40.00 | .89 | .30 | .34 | 390.89 | 350.89 | 35.18 | 302.71 | .116 | .74 | 84.51 | 4.10 | 8.00 | .11 | .41 | 2.61 | 16 | .50 | .385 | 2.87 | 36.88 | .76 | 297.05 | .05 | |
| 2002 | BSPM | 02-4A-01-PHC-S | 4A | SEDIMENT | DRY | 26.00 | .91 | .32 | .32 | 496.67 | 470.67 | 45.01 | 405.63 | .111 | .54 | 89.98 | 4.50 | 7.80 | .18 | .71 | 2.84 | 25 | .39 | .467 | 3.13 | 28.51 | .78 | 269.00 | .00 | |
| 2002 | BSPM | 02-4B-01-PHC-S | 4B | SEDIMENT | DRY | 8.80 | .70 | .36 | .42 | 82.64 | 73.84 | 7.52 | 63.61 | .118 | .77 | 10.48 | 1.20 | 1.80 | .03 | .14 | .69 | 20 | .46 | 1.000 | 2.22 | 7.64 | .45 | 275.00 | .00 | |
| 2002 | BSPM | 02-4C-01-PHC-S | 4C | SEDIMENT | DRY | 1.10 | .68 | .34 | .64 | 12.07 | 10.97 | 1.25 | 9.30 | .135 | .30 | .78 | .44 | .44 | .00 | .05 | .18 | 26 | .67 | 3.607 | 1.65 | 1.52 | .94 | 397.00 | .00 | |
| 2002 | BSPM | 02-50-01-PHC-S | 5(0) | SEDIMENT | DRY | 22.00 | .71 | .37 | .45 | 168.43 | 146.43 | 14.31 | 127.32 | .112 | .62 | 18.46 | 2.60 | 4.00 | .06 | .26 | 1.66 | 16 | .41 | .689 | 2.50 | 15.10 | .34 | 227.00 | .00 | |
| 2002 | BSPM | 02-5-01-PHC-S | 5(1) | SEDIMENT | DRY | 2.63 | .50 | .33 | .63 | 22.03 | 19.03 | 1.92 | 17.00 | .124 | .14 | 2.97 | 1.00 | 1.00 | .00 | .00 | .00 | 14 | .43 | .408 | 1.58 | 1.24 | .38 | 270.00 | .00 | |
| 2002 | BSPM | 02-5(10)-01-PHC-S | 5(10) | SEDIMENT | DRY | 11.00 | .80 | .33 | .45 | 110.93 | 99.93 | 9.80 | 86.70 | .113 | .58 | 21.09 | 1.30 | 2.10 | .04 | .15 | .76 | 19 | .45 | .412 | 2.60 | 11.49 | .38 | 258.00 | .00 | |
| 2002 | BSPM | 02-5(5)-01-PHC-S | 5(5) | SEDIMENT | DRY | 35.00 | .81 | .34 | .45 | 304.34 | 269.34 | 27.06 | 233.03 | .116 | .58 | 40.83 | 3.10 | 5.30 | .09 | .37 | 2.02 | 18 | .43 | .374 | 2.60 | 29.79 | .39 | 234.00 | .00 | |
| 2002 | BSPM | 02-5B-01-PHC-S | 5B | SEDIMENT | DRY | 5.00 | 1.08 | .35 | .36 | 67.96 | 62.96 | 6.49 | 54.25 | .120 | .41 | 4.30 | .88 | 3.50 | .02 | .09 | .44 | 20 | .42 | .383 | 2.60 | 6.36 | .72 | 328.00 | .00 | |
| 2002 | BSPM | 02-5D-AVC-PHC-S | 5D | SEDIMENT | DRY | 31.00 | .92 | .48 | .48 | 274.62 | 213.62 | 21.68 | 163.62 | .106 | .96 | 47.02 | 6.17 | 10.80 | .07 | .26 | 2.56 | 17 | .46 | .387 | 2.37 | 38.17 | .65 | 270.00 | .00 | |
| 2002 | BSPM | 02-5E-01-PHC-S | 5E | SEDIMENT | DRY | 3.40 | .99 | .36 | .44 | 46.14 | 42.74 | 4.90 | 36.29 | .135 | .08 | 3.72 | .85 | 3.80 | .02 | .06 | .45 | 13 | .46 | .438 | 1.58 | 5.12 | .74 | 308.00 | .00 | |
| 2002 | BSPM | 02-5F-01-PHC-S | 5F | SEDIMENT | DRY | 48.00 | .92 | .40 | .39 | 369.15 | 321.15 | 32.08 | 278.79 | .115 | 1.26 | 70.95 | 5.00 | 8.30 | .10 | .45 | 3.42 | 13 | .44 | .433 | 2.66 | 49.12 | .25 | 476.00 | .00 | |
| 2002 | BSPM | 02-5F-01-PHC-S | 5F | SEDIMENT | DRY | 17.00 | .97 | .36 | .46 | 157.97 | 140.97 | 14.17 | 121.79 | .116 | .91 | 22.51 | 5.00 | 5.00 | .05 | .29 | 1.18 | 14 | .48 | .547 | 2.68 | 16.69 | .33 | 246.05 | .05 | |
| 2002 | Rivers | 02-CAN-01-PHC-CAN-S | CAN-S | SEDIMENT | DRY | 19.00 | 1.10 | .23 | .49 | 491.73 | 429.73 | 42.98 | 372.73 | .183 | .69 | 62.20 | 9.10 | 16.00 | .16 | .40 | 3.42 | 6 | .40 | .342 | 6.05 | 23.31 | .85 | 268.08 | .08 | |
| 2002 | Rivers | 02-CAN-02-PHC-CAN-S | CAN-S | SEDIMENT | DRY | 4.50 | .90 | .18 | .24 | 195.16 | 190.66 | 14.75 | 169.85 | .087 | .16 | 16.00 | 19.00 | .09 | .55 | 13.46 | .04 | .41 | .464 | 9.38 | 18.50 | .52 | 234.23 | .23 | | |
| 2002 | Rivers | 02-CAN-03-PHC-CAN-S | CAN-S | WATERSED | WET | .00 | 1.56 | .00 | .00 | 223.90 | 223.90 | 14.10 | 195.70 | .077 | .00 | 1900.00 | 2900.00 | .80 | 6.84 | .00 | .00 | .00 | .00 | .00 | 15.04 | .00 | .00 | .00 | .00 | |
| 2002 | Rivers | 02-C05-01-PHC-S | C05-S | SEDIMENT | DRY | 63.00 | 1.14 | .36 | .28 | 633.47 | 552.47 | 55.20 | 487.10 | .115 | .50 | 73.11 | 15.00 | .15 | .20 | .14 | .50 | 20 | .48 | .398 | 1.14 | .00 | .38 | 316.00 | .00 | |
| 2002 | Rivers | 02-KUP-01-PHC-S | KUP-S | SEDIMENT | DRY | 25.00 | .64 | .38 | .27 | 89.35 | 64.35 | 11.78 | 50.26 | .234 | .64 | 7.40 | 17.00 | .05 | .15 | 4.17 | .08 | .46 | .732 | 6.21 | 88.98 | .19 | 477.00 | .00 | | |
| 2002 | Rivers | 02-KUP-02-PHC-S | KUP-S | SEDIMENT | DRY | 49.00 | .79 | .35 | .29 | 161.15 | 112.15 | 10.00 | 89.58 | .212 | .19 | 15.00 | 22.00 | .19 | 1.02 | .97 | .11 | .47 | .287 | 2.33 | 144.05 | .11 | 295.00 | .00 | | |
| 2002 | Rivers | 02-SAG-01-PHC-S | SAG-S | SEDIMENT | DRY | 100.00 | .78 | .57 | .55 | 669.18 | 569.18 | 55.26 | 498.19 | .111 | .10 | 16.16 | 15.00 | 18.00 | .19 | 1.00 | 5.95 | 17 | .33 | .286 | 4.41 | 64.75 | .13 | 292.00 | .00 | |
| 1999 | Northstar | 99-N11-01-PHC-L | N11 | TISSUE | WET | 1.10 | 1.52 | .13 | .14 | 15.23 | 13.76 | 1.26 | 10.50 | .116 | .16 | 1.16 | 1.16 | 1.16 | .11 | .49 | .23 | .00 | .00 | .00 | 1.17 | 1.27 | .264 | 1.41 | 4.57 | .00 |
| 1999 | Liberty | 99-L04-01-PHC-L | L04-T | TISSUE | WET | .48 | .49 | .50 | .00 | 80.40 | 79.92 | 16.09 | 57.59 | .279 | .84 | 8.74 | 2.19 | .39 | 2.10 | .19 | .00 | .00 | .00 | .045 | 1.37 | .00 | .00 | .00 | .00 | |
| 1999 | Liberty | 99-L08-01-PHC-L | L08-T | TISSUE | WET | .87 | .66 | .48 | .00 | 15.00 | 14.13 | .85 | 12.43 | .068 | .11 | 1.11 | 1.11 | .01 | .03 | .62 | .05 | .00 | .00 | .346 | 1.20 | 69.15 | 8.48 | .00 | .00 | |
| 1999 | Liberty | 99-L09-01-PHC-L | L09-T | TISSUE | WET | 1.00</ | | | | | | | | | | | | | | | | | | | | | | | | |

| Field ID | 00-N06-01-PHC-S | 00-N18-01-PHC-S | 00-N23-01-PHC-S | 00-COL-02-PHC-S | 00-KUP-01-PHC-S | 00-KUP-02-PHC-S | 00-N00-01-PHC-S | 00-N13-02-PHC-S | 00-N13-01-PHC-S | 00-N19-01-PHC-S | 00-N10-01-PHC-S | 00-N03-01-PHC-S | 00-N07-01-PHC-S | 00-N16-01-PHC-S | 00-N02-01-PHC-S | 00-N01-01-PHC-S | 00-N17-01-PHC-S | 00-SD-01-PHC-S |
|-----------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|
| Lab ID | 20A3468 F2 | 20A3489 F2 | 20A3473 F2 | 20A3474 F2 | 20A3475 F2 | 20A3476 F2 | 20A3482 F2 | 20A3484 F2 | 20A3485 F2 | 20A3486 F2 | 20A3484 F2 | 20A3489 F2 | 20A3490 F2 | 20A3491 F2 | 20A3492 F2 | 20A3493 F2 | 20A3494 F2 | 20A3496 F2 |
| Sample Type | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | PEAT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Size | 19.4 g | 16.79 g | 17.05 g | 21.16 g | 23.02 g | 20.9 g | 21.1 g | 15.88 g | 16.46 g | 16.82 g | 19.31 g | 16.02 g | 16.37 g | 18.17 g | 19.09 g | 23.3 g | 17.86 g | 16.86 g |
| Weight Basis | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| Associated Blank | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA | DH-S-SSPB PCA |
| Field Date | 08/17/00 | 08/17/00 | 08/23/00 | 08/23/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/24/00 |
| Extract Date | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 |
| Analysis Date | 03/06/01 | 03/06/01 | 03/06/01 | 03/06/01 | 03/14/01 | 03/06/01 | 03/14/01 | 03/06/01 | 03/06/01 | 03/06/01 | 03/06/01 | 03/06/01 | 03/06/01 | 03/06/01 | 03/06/01 | 03/06/01 | 03/07/01 | 03/07/01 |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| Percent Solids | 63.8 | 55.6 | 55.5 | 66.1 | 66.2 | 63.1 | 51.4 | 53.7 | 61 | 62 | 51.4 | 64.2 | 59.6 | 54.2 | 59.6 | 54.2 | 57.3 | 54.2 |
| Percent Lipids | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Min Reporting Limit | 0.64 | 0.74 | 0.73 | 0.59 | 0.54 | 0.6 | 0.59 | 0.79 | 0.76 | 0.67 | 0.65 | 0.76 | 0.69 | 0.65 | 0.54 | 0.7 | 0.75 | 0.75 |
| Units | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | | | | | | | | | | | |
| Naphthalene | 12 | 20 | 9 | 81 | 0.46 JB | 2 B | 11 | 28 | 22 | 14 | 11 | 12 | 11 | 12 | 7.4 | 2.1 B | 12 | 12 |
| C1-Naphthalenes | 25 | 44 | 17 | 100 | 0.31 JB | 2.4 B | 10 | 54 | 46 | 30 | 22 | 22 | 21 | 25 | 16 | 4.9 B | 23 | 23 |
| C2-Naphthalenes | 42 | 74 | 35 | 193 | 0.36 JB | 4.2 B | 43 | 100 | 81 | 51 | 48 | 44 | 40 | 45 | 30 | 6.8 B | 47 | 44 |
| C3-Naphthalenes | 39 | 70 | 39 | 200 | 0.26 JB | 3.2 B | 46 | 78 | 77 | 49 | 42 | 49 | 37 | 42 | 29 | 4.6 | 47 | 46 |
| C4-Naphthalenes | 20 | 38 | 21 | 100 | 2.2 | 34 | 48 | 41 | 26 | 23 | 26 | 21 | 22 | 22 | 15 | 2.9 | 25 | 25 |
| Acenaphthylene | ND | ND | ND | ND | 0.025 JB | 0.042 JB | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.036 JB | ND | ND |
| Acenaphthene | 0.88 | 1.5 | 1.2 | 1.9 | 0.034 JB | 0.16 JB | 1.4 | 2.3 | 1.8 | 1.1 | 1 | 1.1 | 1.1 | 1.3 | 0.72 | 0.15 JB | 1.3 | 1.1 |
| Bi phenyl | 5.5 | 9.3 | 6.2 | 14 | 0.16 J | 0.82 | 6.3 | 13 | 10 | 7 | 5.9 | 6.1 | 6.6 | 7.1 | 4.4 | 0.98 | 6.7 | 6.2 |
| Fluorene | 4.9 | 8.8 | 5.6 | 8.7 | 0.093 JB | 0.44 J | 6.6 | 12 | 10 | 6.5 | 5.2 | 6.7 | 5.2 | 6 | 3.7 | 0.83 | 6.8 | 5 |
| C1-Fluorenes | 8.9 | 18 | 9.8 | 16 | 0.13 JB | 0.81 | 13 | 23 | 19 | 12 | 10 | 14 | 8.8 | 11 | 6.7 | 1.5 | 12 | 9.1 |
| C2-Fluorenes | 12 | 24 | 12 | 26 | 0.15 JB | 2.4 | 17 | 30 | 24 | 16 | 14 | 17 | 12 | 13 | 8.1 | 2.1 | 17 | 12 |
| C3-Fluorenes | ND | ND | ND | 3 | 0.2 J | 1.4 | 17 | 31 | 26 | 16 | 13 | 17 | 12 | 13 | 8.3 | 1.8 | 16 | 13 |
| Anthracene | 21 | 37 | 24 | 82 | 0.66 B | 3.9 | 27 | 53 | 42 | 23 | 23 | 26 | 25 | 26 | 17 | 3.6 | 28 | 27 |
| C1-Phenanthrenes/anthracenes | 33 | 59 | 38 | 120 | 0.53 JB | 5.1 | 46 | 84 | 66 | 36 | 43 | 36 | 41 | 41 | 26 | 5.5 | 44 | 43 |
| C2-Phenanthrenes/anthracenes | 28 | 54 | 36 | 110 | 0.54 B | 4.9 | 43 | 73 | 60 | 38 | 34 | 41 | 35 | 37 | 24 | 5.4 | 41 | 41 |
| C3-Phenanthrenes/anthracenes | 24 | 20 | 21 | 48 | 0.35 JB | 2.5 | 48 | 35 | 32 | 26 | 25 | 22 | 23 | 25 | 15 | 3.2 | 24 | 26 |
| C4-Phenanthrenes/anthracenes | 10 | 37 | 18 | 20 | 0.44 J | 5.6 | 23 | 55 | 42 | 24 | 22 | 19 | 21 | 21 | 13 | 3.2 | 23 | 26 |
| Dibenzothiophene | 3.3 | 5.6 | 3.6 | 6.8 | 0.12 JB | 0.54 J | 4.3 | 7.9 | 6.1 | 4 | 3.7 | 4.2 | 3.7 | 4 | 2.8 | 0.58 | 4.4 | 3.7 |
| C1-Dibenzothiophenes | 9.6 | 15 | 10 | 21 | 0.17 JB | 1.2 | 12 | 12 | 11 | 10 | 12 | 10 | 12 | 11 | 7.4 | 1.1 | 10 | 12 |
| C2-Dibenzothiophenes | 9.4 | 15 | 8.8 | 22 | 0.25 JB | 1.9 | 11 | 24 | 19 | 11 | 11 | 12 | 12 | 10 | 7.4 | 1.6 | 12 | 14 |
| C3-Dibenzothiophenes | 7.9 | 11 | 6.5 | 16 | 0.22 JB | 1.3 | 8.4 | 17 | 14 | 8.1 | 7.8 | 8.1 | 7.6 | 8 | 5.2 | 1.2 | 8.1 | 10 |
| Fluoranthene | 4 | 8.1 | 4.8 | 31 | 0.18 JB | 1.4 | 6.4 | 13 | 9.3 | 4.8 | 5.5 | 4.5 | 5.2 | 5.2 | 3.5 | 0.77 | 5.9 | 6.4 |
| Pyrene | 6.1 | 11 | 7.5 | 28 | 0.19 JB | 1.6 | 9 | 16 | 12 | 7.6 | 7.3 | 8.2 | 7.6 | 8 | 5.2 | 1 | 8.3 | 7.7 |
| C1-Fluoranthenes/pyrenes | 17 | 30 | 17 | 72 | 0.23 JB | 3 | 21 | 46 | 34 | 20 | 19 | 20 | 18 | 20 | 12 | 2.7 | 21 | 20 |
| C2-Fluoranthenes/pyrenes | 15 | 29 | 17 | 52 | 0.22 J | 2.5 | 21 | 40 | 32 | 19 | 18 | 20 | 18 | 20 | 11 | 2.6 | 20 | 19 |
| C3-Fluoranthenes/pyrenes | 9.1 | 16 | 11 | 28 | ND | 1.2 | 13 | 24 | 20 | 12 | 10 | 14 | 11 | 13 | 7.3 | 1.8 | 12 | 12 |
| Benzo[a]anthracene | 1.5 | 3 | 1.9 | 15 | 0.5 J | 2.3 | 6 | 4 | 2 | 1.8 | 2 | 2.2 | 2 | 2 | 1.1 | 0.26 J | 2.6 | 2.6 |
| Chrysene | 9.2 | 17 | 12 | 33 | 0.42 J | 2.4 | 14 | 23 | 18 | 12 | 14 | 12 | 12 | 9.3 | 7.8 | 1.7 | 13 | 11 |
| C1-Chrysenes | 9.6 | 17 | 13 | 37 | 0.25 J | 2.5 | 14 | 25 | 22 | 13 | 12 | 13 | 13 | 15 | 7 | 1.6 | 15 | 17 |
| C2-Chrysenes | 7.8 | 15 | 12 | 31 | 0.22 J | 2.4 | 14 | 21 | 12 | 11 | 13 | 10 | 7.2 | 11 | 12 | 1.8 | 12 | 13 |
| C3-Chrysenes | 7.4 | 14 | 9.6 | 28 | ND | 2.2 | 10 | 22 | 16 | 11 | 8.7 | 11 | 9.8 | 11 | 5.5 | 1.4 | 10 | 10 |
| C4-Chrysenes | 3.6 | 6.7 | 5.1 | 12 | ND | 1.1 | 6.2 | 11 | 7.4 | 4.5 | 4 | 4.9 | 4.4 | 5.1 | 3 | 0.77 | 6.1 | 5.1 |
| Benzo[b]fluoranthene | 6 | 11 | 7.4 | 32 | 0.19 J | 2.8 | 9.3 | 17 | 13 | 8.1 | 7.9 | 8.4 | 7.3 | 8.4 | 5 | 1.1 | 8.4 | 8.2 |
| Benzo[k]fluoranthene | 0.86 | 0.92 | 0.83 | 1.4 | 0.034 J | 0.3 J | 1.4 | 1.6 | 0.73 | 0.68 | 0.68 J | 0.86 | 0.91 | 0.99 | 0.49 J | 0.11 J | 0.86 | 0.89 |
| Benzo[a]pyrene | 6.7 | 12 | 9.9 | 19 | 0.17 J | 2 | 11 | 17 | 13 | 9.1 | 8.1 | 10 | 9.3 | 10 | 6.1 | 1.3 | 10 | 8.6 |
| Benzo[b]pyrene | 1.2 | 3.5 | 2 | 12 | 0.13 J | 0.62 | 2.3 | 6 | 4.3 | 2.3 | 2.2 | 2.3 | 2.1 | 2.3 | 1.4 | 0.29 J | 2.4 | 2.6 |
| Perylene | 40 | 78 | 66 | 200 D | 0.74 | 28 | 81 | 120 | 99 | 56 | 63 | 60 | 58 | 6 | 36 | 6 | 64 | 81 |
| Indeno[1,2,3-c,d]pyrene | 4.4 | 3 | 1.7 | 8.8 | 0.051 J | 0.95 | 1.6 | 3.9 | 3.7 | 2.2 | 1.8 | 2.1 | 1.8 | 1.8 | 1.8 | 0.29 J | 2 | 2.2 |
| Dibenz[a,h]anthracene | 0.56 J | 0.97 | 1 | 2.1 | 0.022 J | 0.25 J | 0.77 | 1.6 | 1.3 | 0.94 | 0.73 | 1 | 0.87 | 1.1 | 0.55 J | 0.11 J | 0.96 | 0.9 |
| Benzo[g,h,i]perylene | 12 | 8.1 | 7.1 | 13 | 0.11 J | 1.6 | 6.2 | 12 | 9.2 | 6.2 | 5.2 | 7.3 | 6.7 | 6.8 | 4.2 | 0.86 | 7.2 | 5.7 |
| d8-Naphthalene | 53 | 46 | 41 | 39 | 56 | 47 | 83 | 37 | 51 | 48 | 45 | 72 | 47 | 49 | 56 | 58 | 37 | 42 |
| d10-Acenaphthene | 76 | 64 | 77 | 77 | 62 | 77 | 73 | 75 | 66 | 80 | 59 | 59 | 79 | 75 | 81 | 67 | 68 | 80 |
| d10-Phenanthrene | 102 | 100 | 105 | 107 | 91 | 91 | 99 | 107 | 108 | 102 | 113 | 100 | 105 | 103 | 110 | 93 | 105 | 107 |
| d12-Benzo[a]pyrene | 103 | 106 | 105 | 112 | 111 | 96 | 96 | 102 | 112 | 114 | 107 | 119 | 104 | 108 | 114 | 105 | 111 | 110 |

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| 00-SH-01-PHC-S | 00-4C-01-PHC-S | 00-CL-01-PHC-S | 00-SAG-01-PHC-S | 00-N14-01-PHC-S | 00-N13-03-PHC-S | 00-N12-01-PHC-S | 00-SF-01-PHC-S | 00-N15-01-PHC-S | 00-N21-01-PHC-S | 00-L09-01-PHC-S | 00-L07-01-PHC-S | 00-L08-01-PHC-S | 00-L01-01-PHC-S | 00-4A-01-PHC-S | 00-4B-01-PHC-S | 00-5(1)-01-PHC-S | 00-5(5)-01-PHC-S |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 20A3487 F2 | 20A3499 F2 | 20A3500 F2 | 20A3501 F2 | 20A3504 F2 | 20A3505 F2 | 20A3507 F2 | 20A3511 F2 | 20A3508 F2 | 20A3510 F2 | 20A3511 F2 | 20A3514 F2 | 20A3515 F2 | 20A3516 F2 | 20A3519 F2 | 20A3520 F2 | 20A3521 F2 | 20A3522 F2 |
| N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| 22.17 g | 17.71 g | 24.52 g | 22.34 g | 14.97 g | 17.22 g | 15.4 g | 20.98 g | 25.19 g | 14.71 g | 23.5 g | 21.16 g | 22.2 g | 15.66 g | 21.06 g | 19.42 g | 20.05 g | 20.44 g |
| DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 | DH-S-58PB PCA F2 |
| 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 |
| 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 |
| 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 |
| 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| 69.1 | 57.4 | 73.7 | 72.5 | 49.4 | 60.3 | 68.2 | 77.4 | 68.9 | 73.5 | 73.5 | 73.5 | 73.5 | 73.5 | 71.5 | 66.3 | 66.3 | 66.3 |
| NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 0.6 | 0.7 | 0.51 | 0.56 | 0.84 | 0.72 | 0.81 | 0.6 | 0.5 | 0.85 | 0.53 | 0.59 | 0.56 | 0.59 | 0.64 | 0.62 | 0.61 | 0.61 |
| ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| 3.4 | 6.5 | 2.4 | 2.5 | 21 | 21 | 37 | 7.9 | 0.85 B | 40 | 1.6 B | 3.1 | 5.3 | 9.2 | 12 | 6.7 | 11 | 9.4 |
| 6.1 | 14 | 5 | 5.5 | 49 | 48 | 71 | 19 | 1.8 | 89 | 4.1 | 7 | 10 | 21 | 30 | 16 | 24 | 21 |
| 12 | 27 | 8.9 | 12 | 87 | 82 | 140 | 33 | 2.7 B | 160 | 7.6 | 14 | 22 | 43 | 52 | 30 | 43 | 37 |
| 11 | 26 | 6.3 | 11 | 80 | 74 | 130 | 32 | 1.8 B | 110 | 6 | 16 | 24 | 42 | 44 | 30 | 42 | 35 |
| 8.7 | 12 | 5.1 | 8.6 | 48 | 47 | 20 | 1.2 | 1.2 | 84 | 4.5 | 9.1 | 14 | 27 | 25 | 19 | 23 | 22 |
| ND | ND | ND | 0.064 J | 0.066 J | ND | ND | ND | 0.051 J | ND | 0.063 J | 0.063 J | 0.094 J | ND | ND | 0.076 J | ND | 0.085 J |
| 0.37 J | 0.67 J | 0.17 JB | 0.27 J | 1.9 | 2.8 | 0.79 | 0.088 JB | 3.3 | 1.9 | 0.21 JB | 0.43 J | 0.53 J | 1.2 | 1.1 | 0.84 | 0.91 | 0.82 |
| 2 | 3.1 | 1.1 | 2.2 | 11 | 15 | 15 | 4.6 | 0.31 J | 18 | 1.2 | 10 | 2.4 | 3.3 | 6.7 | 12 | 4.8 | 5.4 |
| 2 | 3.1 | 0.7 | 1.5 | 9.4 | 8.5 | 14 | 3.6 | 0.29 JB | 16 | 0.89 | 1.9 | 2.4 | 5.7 | 7.4 | 4.1 | 6.4 | 4.3 |
| 3.8 | 5.5 | 1.4 | 2.5 | 17 | 15 | 27 | 6.3 | 0.47 JB | 27 | 1.5 | 3.4 | 4.3 | 10 | 13 | 7.2 | 9.7 | 8 |
| 4.9 | 6.6 | 2.3 | 5.1 | 23 | 36 | 8.6 | 0.59 B | 2.2 | 21 | 5.2 | 2.2 | 6.2 | 13 | 15 | 9.2 | 12 | 9.8 |
| 5.2 | 7.7 | 2.8 | 6.7 | 29 | 35 | 9 | 0.56 | 35 | 2.3 | 6.2 | 6 | 13 | 14 | 14 | 9.2 | 12 | 10 |
| ND | ND | 0.14 JB | ND | 1.4 | 1.2 | 1.8 | 0.52 J | 3.1 | 0.13 JB | 0.26 J | 0.42 J | 0.42 J | 0.95 | 0.63 | 0.52 J | 0.53 J | 0.48 J |
| 8.3 | 13 | 6 | 9.8 | 45 | 64 | 18 | 1.3 B | 72 | 4.3 | 8.8 | 10 | 26 | 33 | 33 | 18 | 22 | 19 |
| 14 | 19 | 9.8 | 18 | 71 | 63 | 100 | 19 | 110 | 44 | 7 | 17 | 44 | 53 | 30 | 37 | 35 | 30 |
| 13 | 21 | 9.8 | 19 | 69 | 60 | 93 | 30 | 43 | 7.5 | 17 | 30 | 43 | 27 | 32 | 28 | 32 | 27 |
| 8 | 13 | 5.1 | 11 | 41 | 62 | 19 | 1.4 | 4.7 | 11 | 11 | 27 | 11 | 19 | 21 | 18 | 21 | 18 |
| 6.5 | 8.7 | 3.6 | 7 | 20 | 17 | 25 | 8.8 | 2.6 | 30 | 4.8 | 4.8 | 14 | 12 | 9.4 | 10 | 8.2 | 8.2 |
| 1.3 | 1.9 | 0.76 | 1.6 | 6.7 | 5.8 | 2.6 | 0.21 J | 1.1 | 0.6 | 1.2 | 1.8 | 4.2 | 4.8 | 2.8 | 3.4 | 3 | 3 |
| 2.9 | 3.6 | 2 | 5.5 | 22 | 28 | 10 | 0.46 J | 31 | 1.3 | 2.7 | 3.4 | 15 | 15 | 11 | 12 | 11 | 11 |
| 3.8 | 6.2 | 3 | 9.9 | 22 | 18 | 27 | 9 | 29 | 2.1 | 4.5 | 5.3 | 12 | 12 | 8.2 | 8.9 | 8.3 | 8.3 |
| 3 | 5.2 | 2.4 | 7.3 | 15 | 13 | 20 | 0.51 | 22 | 1.6 | 3.3 | 3.7 | 7.8 | NO | 7.8 | 5.9 | 7.2 | 6.2 |
| 1.6 | 3 | 3 | 2.5 | 11 | 9.9 | 3 | 0.32 JB | 18 | 0.97 | 1.9 | 2.2 | 5.4 | 4.8 | 4.2 | 4.6 | 4.1 | 4.1 |
| 2.4 | 4.1 | 2.9 | 3.2 | 14 | 12 | 20 | 0.43 J | 22 | 1.4 | 3 | 3.3 | 8.8 | 8.3 | 6.3 | 6.5 | 5.5 | 5.5 |
| 5.8 | 8.6 | 6.9 | 7.9 | 34 | 54 | 14 | 1 | 64 | 3.2 | 7.5 | 7.6 | 20 | 22 | 14 | 17 | 15 | 15 |
| 5.6 | 8.1 | 4.7 | 7.2 | 32 | 29 | 46 | 12 | 53 | 7.2 | 3 | 7.1 | 19 | 20 | 13 | 16 | 14 | 14 |
| 4.2 | 5.9 | 3 | 5 | 22 | 31 | 8.5 | 0.7 | 35 | 2.3 | 5.4 | 5.1 | 14 | 14 | 9.9 | 11 | 9.4 | 9.4 |
| 0.44 J | 0.92 | 0.98 | 0.91 | 3.9 | 3.5 | 6.8 | 0.14 J | 3.8 | ND | 0.88 | 0.9 | 2.8 | NO | 1.6 | 2.2 | 1.7 | 1.7 |
| 4.1 | 5.6 | 4.2 | 5.7 | 22 | 26 | 8 | 0.59 | 33 | 2.4 | 6.6 | 6.2 | 14 | 15 | 9.4 | 10 | 8.4 | 8.4 |
| 4.2 | 6 | 4.1 | 6.3 | 22 | 20 | 27 | 0.62 | 34 | 2.6 | 6.2 | 5.8 | 15 | 16 | 10 | 11 | 9.2 | 9.2 |
| 3.9 | 5.8 | 3.7 | 5.6 | 17 | 24 | 24 | 0.63 | 33 | 2.4 | 5.9 | 5.7 | 14 | 13 | 9.6 | 9.6 | 7.7 | 7.7 |
| 2.5 | 4.6 | 2.2 | 3.5 | 12 | 14 | 16 | 0.47 J | 18 | 1.5 | 3.4 | 3.3 | 8.2 | 7.2 | 5.6 | 3.3 | 4.8 | 4.4 |
| 1.5 | 2.2 | 1.6 | 2.6 | 9.7 | 12 | 14 | ND | 15 | 1.2 | 2.5 | 5.3 | 5.7 | 5.3 | 3.6 | 3.9 | 3.4 | 3.4 |
| 2.2 | 3.4 | 3.3 | 4.3 | 16 | 23 | 23 | 5.6 | 26 | 1.3 | 8.2 | 3.2 | 8.2 | 8.9 | 8 | 7.1 | 6.2 | 6.2 |
| 0.28 J | 0.34 J | 0.38 J | 0.03 J | 2 | 1.7 | 2.8 | 0.06 J | 3.5 | 0.12 J | 0.24 J | 0.24 J | 0.8 | 0.81 | 0.53 J | 0.79 | 0.57 J | 0.57 J |
| 2.9 | 4.2 | 2.6 | 4 | 16 | 12 | 20 | 0.41 J | 23 | 1.7 | 3.3 | 3.8 | 11 | 12 | 7.2 | 7.7 | 6.5 | 6.5 |
| 0.58 | 0.9 | 1.1 | 1.1 | 4.6 | 4.2 | 7.6 | ND | 8.3 | 0.27 J | 0.65 | 0.82 | 2.3 | 1.8 | 1.4 | 1.9 | 1.6 | 1.6 |
| 18 | 27 | 18 | 39 | 120 | 97 | 150 | 45 | 170 | 10 | 23 | 31 | 75 | 33 | 46 | 45 | 41 | 41 |
| 0.37 J | 0.67 J | 0.69 | 0.98 | 3.7 | 3 | 5.3 | 0.063 J | 5.2 | 0.25 J | 0.45 J | 0.57 | 1.2 | 1.6 | 1.2 | 1.4 | 1.2 | 1.2 |
| 0.25 J | 0.35 J | 0.19 J | 0.34 J | 1.4 | 1.2 | 1.9 | 0.5 J | 2.1 | 0.14 J | 0.36 J | 0.33 J | 1.3 | 0.97 | 0.6 J | 0.88 | 0.48 J | 0.48 J |
| 1.7 | 2.9 | 1.1 | 1.8 | 9.1 | 6.9 | 13 | 0.19 J | 13 | 0.73 | 1.4 | 3.8 | 6 | 5.9 | 3.8 | 4.2 | 3.4 | 3.2 |
| 38 | 36 | 62 | 63 | 62 | 61 | 44 | 62 | 69 | 58 | 64 | 57 | 36 | 53 | 63 | 55 | 52 | 54 |
| 62 | 70 | 75 | 81 | 85 | 82 | 80 | 76 | 76 | 88 | 75 | 75 | 83 | 83 | 81 | 79 | 77 | 77 |
| 103 | 106 | 94 | 101 | 105 | 103 | 108 | 107 | 91 | 106 | 98 | 107 | 107 | 101 | 100 | 101 | 101 | 101 |
| 108 | 109 | 98 | 77 | 101 | 105 | 97 | 110 | 87 | 105 | 98 | 106 | 104 | 95 | 84 | 98 | 102 | 90 |

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| 00-5(10)-01-PHC-S 20A3523 F2 N SEDIMENT 22.09 g DRY | 00-5(0)-01-PHC-S 20A3525 F2 N SEDIMENT 20.72 g DRY | 00-N05-01-PHC-S 20A3528 F2 N SEDIMENT 16.74 g DRY | 00-N08-01-PHC-S 20A3527 F2 N SEDIMENT 20.26 g DRY | 00-N09-01-PHC-S 20A3528 F2 PCA N SEDIMENT 15.82 g DRY | 00-5A-01-PHC-S 20A3529 F2 N SEDIMENT 12.41 g DRY | 00-3A-01-PHC-S 20A3530 F2 N SEDIMENT 17.64 g DRY | 00-L04-01-PHC-S 20A3531 F2 N SEDIMENT 18.59 g DRY | 00-N11-01-PHC-S 20A3532 F2 N SEDIMENT 17.69 g DRY | 00-N04-01-PHC-S 20A3533 F2 PCA N SEDIMENT 12.66 g DRY | 00-3B-01-PHC-S 20A3534 F2 PCA N SEDIMENT 19.64 g DRY | 00-5B-01-PHC-S 20A3535 F2 N SEDIMENT 23.94 g DRY | 00-5E-01-PHC-S 20A3536 F2 PCA N SEDIMENT 22.39 g DRY | 00-N20-01-PHC-S 20A3537 F2 N SEDIMENT 19.09 g DRY | 00-L08-02-PHC-S 20A3538 F2 PCA N SEDIMENT 19.5 g DRY | 00-L08-03-PHC-S 20A3539 F2 N SEDIMENT 22.72 g DRY | 00-L06-01-PHC-S 20A3540 F2 N SEDIMENT 17.1 g DRY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DH-S-58PB PCA F2 06/25/00 03/07/01 03/16/01 06/30/00 NA 0.56 ug/Kg | DH-S-58PB PCA F2 06/22/00 03/07/01 03/16/01 06/30/00 NA 0.79 ug/Kg | DH-S-58PB PCA F2 06/18/00 03/07/01 03/16/01 06/30/00 NA 0.63 ug/Kg | DH-S-58PB PCA F2 06/20/00 03/07/01 03/16/01 06/30/00 NA 0.63 ug/Kg | DH-S-61PB F2 06/18/00 03/08/01 03/24/01 06/30/00 NA 0.71 ug/Kg | DH-S-61PB F2 06/18/00 03/08/01 03/24/01 06/30/00 NA 0.67 ug/Kg | DH-S-61PB F2 06/20/00 03/08/01 03/24/01 06/30/00 NA 0.71 ug/Kg | DH-S-61PB F2 06/20/00 03/08/01 03/24/01 06/30/00 NA 0.67 ug/Kg | DH-S-61PB F2 06/18/00 03/08/01 03/24/01 06/30/00 NA 0.99 ug/Kg | NA 08/20/00 04/02/01 04/05/01 06/30/00 NA 0.64 ug/Kg | NA 08/17/00 04/02/01 04/05/01 06/30/00 NA 0.54 ug/Kg | DH-S-61PB F2 06/17/00 03/08/01 03/24/01 06/30/00 NA 0.55 ug/Kg | NA 06/18/00 04/02/01 04/05/01 06/30/00 NA 0.65 ug/Kg | DH-S-61PB F2 06/18/00 03/08/01 03/24/01 06/30/00 NA 0.65 ug/Kg | NA 06/21/00 04/02/01 04/05/01 06/30/00 NA 0.64 ug/Kg | DH-S-61PB F2 06/21/00 03/08/01 03/24/01 06/30/00 NA 0.55 ug/Kg | DH-S-61PB F2 06/21/00 03/08/01 03/24/01 06/30/00 NA 0.73 ug/Kg |
| 6.1 | 6.6 | 35 | 13 | 6.9 | 48 | 5.3 | 6.2 | 13 | 52 | 4.6 | 0.65 B | 3.5 | 17 | 7 | 7.1 | 6 |
| 14 | 14 | 78 | 24 | 18 | 100 | 12 | 14 | 29 | 130 | 12 | 1.5 | 10 | 36 | 19 | 16 | 13 |
| 23 | 28 | 130 | 50 | 25 | 180 | 24 | 28 | 56 | 190 | 21 | 2.6 | 17 | 65 | 30 | 28 | 27 |
| 22 | 30 | 110 | 48 | 18 | 150 | 24 | 28 | 48 | 140 | 19 | 1.6 | 15 | 56 | 26 | 24 | 29 |
| 14 | 19 | 68 | 30 | 14 | 87 | 14 | 16 | 31 | 120 | 17 | 0.89 | 13 | 35 | 18 | 12 | 16 |
| 0.074 J | 0.076 J | ND | ND | 0.085 J | ND | 0.1 J | 0.067 J | ND | 0.042 J | 0.024 J | 0.044 J | ND | 0.055 J | 0.09 J | 0.09 J | ND |
| 0.58 | 0.72 | 2.5 | 1 | 0.48 J | 3.2 | 0.71 | 0.79 | 1.2 | 3.4 | 0.61 J | 0.055 J | 0.4 J | 1.4 | 0.66 | 0.44 J | 0.82 |
| 3.2 | 4 | 16 | 6 | 3.1 | 21 | 4.1 | 4.8 | 6.6 | 22 | 3.4 | 0.27 JB | 2.3 | 7.5 | 4.3 | 3.8 | 4.7 |
| 2.7 | 3.8 | 14 | 5.7 | 2.4 | 17 | 3.1 | 3.6 | 5.4 | 18 | 2.6 | 0.24 JB | 1.9 | 6 | 2.7 | 2 | 3.5 |
| 4.6 | 6.7 | 24 | 11 | 4.8 | 31 | 5.5 | 6 | 10 | 34 | 4.9 | 0.46 J | 3.9 | 11 | 5.3 | 3.5 | 6.1 |
| 5.8 | 8.8 | 30 | 16 | 6.4 | 39 | 6.8 | 8 | 13 | 44 | 6.8 | 0.61 | 5.7 | 14 | 7.5 | 4.6 | 8.1 |
| 12 | 16 | 61 | 31 | 7.3 | 38 | 7.3 | 8.2 | 14 | 47 | 7.7 | 0.68 | 6 | 15 | 7.9 | 4.7 | 8.9 |
| 0.31 J | 0.49 J | 1.6 | 0.97 | 0.39 J | 2.1 | 0.55 J | 0.67 | 0.84 | 2.1 | 0.38 J | ND | 0.35 J | 0.84 | 0.4 J | 0.27 J | 0.47 J |
| 12 | 16 | 61 | 31 | 7.3 | 38 | 7.3 | 8.2 | 14 | 47 | 7.7 | 0.68 | 6 | 15 | 7.9 | 4.7 | 8.9 |
| 19 | 27 | 94 | 39 | 31 | 120 | 20 | 31 | 40 | 150 | 26 | 1.7 | 20 | 47 | 26 | 12 | 30 |
| 39 | 18 | 25 | 17 | 110 | 25 | 17 | 31 | 39 | 110 | 31 | 1.8 | 16 | 42 | 21 | 13 | 32 |
| 12 | 16 | 58 | 27 | 13 | 72 | 15 | 18 | 26 | 92 | 15 | 1.2 | 12 | 30 | 16 | 7.6 | 19 |
| 5.3 | 7.6 | 24 | 11 | 5.8 | 35 | 6 | 7.3 | 12 | 40 | 7.8 | 0.6 | 7.2 | 13 | 6.6 | 3.6 | 8.7 |
| 1.9 | 2.4 | 10 | 3.7 | 1.9 | 2.2 | 2.2 | 2.6 | 4.1 | 14 | 2.1 | 0.18 J | 1.9 | 4.6 | 2.5 | 1.6 | 2.4 |
| 3.7 | 13 | 27 | 13 | 3.6 | 35 | 4.5 | 5.9 | 13 | 38 | 4.4 | 0.46 J | 3.7 | 14 | 4.7 | 2.8 | 5.5 |
| 5.3 | 8.1 | 25 | 12 | 6.2 | 30 | 5.7 | 8.2 | 11 | 41 | 6.3 | 0.59 | 6.3 | 13 | 8 | 4 | 8.2 |
| 3.7 | 5.7 | 16 | 8.8 | 4.2 | 25 | 5.1 | 6.2 | 8.7 | 25 | 4.5 | 0.43 J | 4.4 | 9 | 5.7 | 3.1 | 6.5 |
| 3.7 | 13 | 26 | 16 | 5.5 | 3 | 3.1 | 3.7 | 5.9 | 19 | 3.7 | 0.42 JB | 2.6 | 14 | 3 | 3.6 | 1.4 |
| 3.6 | 5 | 17 | 7.2 | 4 | 22 | 5 | 5.6 | 8 | 26 | 4.5 | 0.5 J | 3.9 | 9.6 | 4.2 | 2.3 | 5.3 |
| 9.8 | 13 | 52 | 22 | 9.6 | 64 | 11 | 14 | 22 | 70 | 10 | 0.96 | 8.4 | 27 | 9.9 | 5 | 14 |
| 8.6 | 11 | 46 | 18 | 8.6 | 58 | 11 | 12 | 20 | 62 | 9.6 | 0.93 | 8 | 23 | 9.2 | 4.5 | 13 |
| 5.7 | 7.9 | 29 | 12 | 5.8 | 37 | 7.9 | 8.9 | 13 | 40 | 7.1 | 0.64 | 5.8 | 14 | 6.6 | 3.3 | 9.2 |
| 0.88 | 1.4 | 4.7 | 2 | ND | 5.9 | 1.2 | 1.6 | 2.1 | 7.5 | 1.9 J | ND | 3 | 1.2 | 0.5 J | 0.3 J | 1.2 |
| 5.6 | 7.8 | 28 | 11 | 5.5 | 33 | 7.6 | 9.3 | 11 | 38 | 7.5 | 0.6 | 6.5 | 13 | 7.3 | 3.5 | 9 |
| 5.6 | 8.4 | 27 | 11 | 6.2 | 33 | 8.5 | 9.8 | 12 | 43 | 9.3 | 0.51 J | 7.2 | 13 | 9.1 | 3.8 | 9.8 |
| 5.2 | 7.7 | 24 | 10 | 5.2 | 29 | 7.6 | 9 | 11 | 35 | 8.1 | 0.42 J | 5.6 | 12 | 7.8 | 3.6 | 9.2 |
| 3.1 | 4.4 | 16 | 6.2 | 3.9 | 16 | 4.6 | 5.2 | 6 | 26 | 4.7 | 0.3 J | 3.9 | 7 | 4.9 | 2.2 | 5.2 |
| 2.2 | 2.9 | 12 | 5.2 | 2.3 | 14 | 3.6 | 3.3 | 5 | 15 | 4.5 | 0.23 J | 3 | 5.6 | 3.1 | 1.6 | 4 |
| 19 | 3.5 | 4.8 | 19 | 7.5 | 3.3 | 24 | 4.6 | 5.2 | 8.9 | 24 | 0.38 J | 3.8 | 10 | 3.6 | 1.8 | 4.6 |
| 0.31 J | 0.52 J | 1.5 | 0.99 | 0.4 J | 2.2 | 0.46 J | 0.5 J | 0.94 | 0.47 J | 0.08 J | 0.43 J | 1 | 0.53 J | 0.19 J | 0.46 J | |
| 3.8 | 5.6 | 19 | 7.8 | 3.8 | 24 | 5.9 | 6.5 | 8.9 | 26 | 5.7 | 0.42 J | 5.1 | 9.7 | 4.8 | 2.5 | 6.4 |
| 1 | 1.3 | 5.7 | 2.2 | 1.1 | 7.2 | 1.2 | 1.3 | 2.6 | 8.4 | 1 | 0.09 J | 0.96 | 3.2 | 1 | 0.09 | 0.46 J |
| 24 | 41 | 110 | 45 | 20 | 140 | 37 | 48 | 98 | 160 | 35 | 1.8 | 25 | 84 | 40 | 15 | 49 |
| 0.61 | 0.74 | 4 | 1.4 | 0.85 | 4.3 | 0.9 | 0.93 | 1.7 | 5.7 | 1 | 0.08 J | 1 | 1.9 | 0.92 | 0.32 J | 0.8 |
| 0.3 J | 0.44 J | 1.8 | 1.65 | 0.42 J | 2.3 | 0.74 | 0.74 | 0.73 | 2.8 | 0.52 J | 0.037 J | 0.61 | 0.84 | 0.53 J | 0.27 J | 0.88 J |
| 2 | 2.5 | 11 | 4.2 | 2.5 | 13 | 3.5 | 3.2 | 4.9 | 18 | 3.7 | 0.26 J | 3.9 | 5.3 | 3.1 | 1.2 | 3.1 |
| 56 | 47 | 59 | 63 | 52 | 52 | 53 | 56 | 52 | 53 | 47 | 70 | 47 | 48 | 53 | 54 | 50 |
| 76 | 72 | 81 | 73 | 78 | 78 | 83 | 81 | 77 | 80 | 80 | 79 | 70 | 74 | 77 | 74 | 74 |
| 96 | 102 | 100 | 100 | 88 | 93 | 97 | 95 | 95 | 84 | 89 | 95 | 80 | 89 | 80 | 90 | 88 |
| 97 | 100 | 102 | 101 | 90 | 93 | 95 | 94 | 91 | 86 | 88 | 97 | 83 | 83 | 83 | 88 | 85 |

| | | | | | | | | | | | |
|---|------------------|--------------------|------------------|-------------------|---------------------|-------------------|--------------------|--------------------|-------------------|---------------------|-------------------|
| Arthur D. Little | | | | | | | | | | | |
| Environmental Monitoring and Analysis | | | | | | | | | | | |
| Minerals Management Service - Animida Phase I. | | | | | | | | | | | |
| Summer 1999 Final Data (Surrogate Corrected) - PAH Results - Tissue | | | | | | | | | | | |
| Field ID | 00-N18-01-PHC-AN | 00-N13-01-PHC-T-AN | 00-N03-01-PHC-AN | 00-3A-01-PHC-T-AS | 00-N12-01-PHC--T-AN | 00-5F-01-PHC-T-CY | 00-L08-01-PHC-T-AS | 00-L09-01-PHC-T-AS | 00-4A-01-PHC-T-AN | 00-5(0)-01-PHC-T-AN | 00-5H-01-PHC-T-AS |
| Lab ID | 20A3472F2 | 20A3483F2 | 20A3495F2 | 20A3498F2 | 20A3502F2 | 20A3509F2 | 20A3512F2 | 20A3513F2 | 20A3517F2 | 20A3522F2 | 20A3524F2 |
| Sample Type | N | N | N | N | N | N | N | N | N | N | N |
| Matrix | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE |
| Sample Size | 9.76 g | 9.66 g | 2.68 g | 8.72 g | 9.26 g | 9.72 g | 8.94 g | 8.36 g | 7.96 g | 9.92 g | 9.17 g |
| Weight Basis | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET |
| Associated Blank | DH-S-64PBF2 | DH-S-64PBF2 | DH-S-64PBF2 | DH-S-64PBF2 | DH-S-64PBF2 | DH-S-64PBF2 | DH-S-64PBF2 | DH-S-64PBF2 | DH-S-64PBF2 | DH-S-64PBF2 | DH-S-64PBF2 |
| Field Date | 08/25/00 | 08/19/00 | 08/17/00 | 08/20/00 | 08/19/00 | 08/19/00 | 08/21/00 | 08/21/00 | 08/21/00 | 08/22/00 | 08/22/00 |
| Extract Date | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 |
| Analysis Date | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| Percent Solids | 23.6 | 23.3 | 22 | 13.8 | 24.2 | 20.8 | 14.6 | 15.5 | 20.5 | 22.9 | 15 |
| Percent Lipids | 4.48 | 0.987 | NA | 4.54 | 12.8 | 1.24 | 1.78 | 2.97 | 3.24 | 1.96 | 1.56 |
| Min Reporting Limit | 1.3 | 1.3 | 4.7 | 1.4 | 1.3 | 1.3 | 1.4 | 1.5 | 1.6 | 1.3 | 1.4 |
| Units | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | | | | |
| Naphthalene | 1.6 B | 0.94 JB | 3.5 JB | 0.7 JB | 1.8 B | 0.7 JB | 0.85 JB | 0.82 JB | 1.8 B | 2.6 B | 0.89 JB |
| C1-Naphthalenes | 1.1 JB | 0.72 JB | 2 JB | 0.42 JB | 1.8 B | 0.83 JB | 0.62 JB | 0.76 JB | 1.4 JB | 2.8 | 0.7 JB |
| C2-Naphthalenes | 2.4 B | 3.7 | 2 JB | 0.59 JB | 4.4 | 4.2 | 2.3 B | 2.8 B | 3.4 | 5.2 | 2.5 B |
| C3-Naphthalenes | 0.74 J | 0.82 J | ND | 0.48 J | 1 J | 2.3 | 0.96 J | 1.4 J | 1.4 J | 1.4 | 0.76 J |
| C4-Naphthalenes | ND | ND | ND | ND | ND | 2.6 | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Acenaphthene | 0.09 JB | 0.063 JB | 0.27 JB | 0.074 JB | 0.091 JB | 0.12 JB | 0.085 JB | 0.087 JB | 0.15 JB | 0.14 JB | 0.069 JB |
| Biphenyl | 0.31 JB | 0.25 JB | 1.1 JB | 0.24 JB | 0.45 JB | 0.32 JB | 0.27 JB | 0.24 JB | 0.48 JB | 0.52 JB | 0.25 JB |
| Fluorene | 0.35 JB | 0.25 JB | 0.81 JB | 0.25 JB | 0.34 JB | 0.35 JB | 0.2 JB | 0.32 JB | 0.52 JB | 0.44 JB | 0.25 JB |
| C1-Fluorenes | 0.37 J | 0.4 J | 0.3 J | 0.3 J | ND | 0.74 J | 0.47 J | 0.53 J | 0.95 J | ND | 0.43 J |
| C2-Fluorenes | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C3-Fluorenes | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Anthracene | 0.1 JB | 0.091 JB | 0.19 JB | 0.04 JB | 0.057 JB | 0.14 JB | 0.13 JB | 0.058 JB | 0.23 JB | 0.14 JB | 0.051 JB |
| Phenanthrene | 1.1 JB | 1.1 JB | 3.2 JB | 1.1 JB | 1.1 JB | 2.1 B | 1.4 B | 1.8 B | 2.3 B | 1.4 B | 1.2 JB |
| C1-Phenanthrenes/anthracenes | 0.58 JB | 0.64 JB | 1.3 JB | 0.65 JB | 0.76 JB | 2.8 | 1.2 JB | 1.2 JB | 1.1 JB | 0.76 JB | 1.1 JB |
| C2-Phenanthrenes/anthracenes | 0.78 JB | 0.77 JB | 1.8 JB | 0.76 JB | 0.86 JB | 4.2 | 1.3 JB | 1.4 JB | 1.2 JB | 0.79 JB | 1.4 B |
| C3-Phenanthrenes/anthracenes | 0.55 JB | 0.79 JB | 1.1 JB | 0.51 JB | 0.82 JB | 2.7 | 0.89 JB | 0.89 JB | 0.78 JB | 0.54 JB | 0.9 JB |
| C4-Phenanthrenes/anthracenes | ND | 0.89 J | 0.84 J | ND | ND | 4.3 | ND | ND | ND | 0.51 J | 0.62 J |
| Dibenzothiophene | 0.098 JB | 0.099 JB | 0.23 JB | 0.081 JB | 0.11 JB | 0.28 J | 0.15 JB | 0.16 JB | 0.18 JB | 0.15 JB | 0.12 JB |
| C1-Dibenzothiophenes | 0.2 JB | 0.2 JB | 0.33 JB | 0.14 JB | 0.21 JB | 0.75 J | 0.28 JB | 0.3 JB | 0.29 JB | 0.24 JB | 0.24 JB |
| C2-Dibenzothiophenes | 0.34 JB | 0.39 JB | 0.65 JB | 0.34 JB | 0.44 JB | 2.3 | ND | 0.58 JB | 0.53 JB | 0.34 JB | 0.47 JB |
| C3-Dibenzothiophenes | 0.35 J | 0.4 J | ND | ND | 0.52 J | 2.9 | ND | 0.31 J | ND | 0.21 J | 0.38 J |
| Fluoranthene | 0.28 JB | 0.28 JB | 0.7 JB | 0.19 JB | 0.28 JB | 1.2 JB | 0.38 JB | 0.42 JB | 0.56 JB | 0.54 JB | 0.28 JB |
| Pyrene | 0.21 JB | 0.28 JB | 0.54 JB | 0.17 JB | 0.26 JB | 1.1 J | 0.34 JB | 0.36 JB | 0.32 JB | 0.38 JB | 0.3 JB |
| C1-Fluoranthenes/pyrenes | 0.3 J | 0.32 J | 0.56 J | 0.26 J | 0.51 J | 1.8 | 0.39 J | 0.38 J | 0.33 J | 0.3 J | 0.47 J |
| C2-Fluoranthenes/pyrenes | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C3-Fluoranthenes/pyrenes | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo[a]anthracene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Chrysene | ND | ND | ND | ND | ND | ND | 0.47 J | 0.48 J | 0.087 J | 0.18 J | 0.39 J |
| C1-Chrysenes | ND | ND | 0.34 J | ND | ND | ND | 0.32 J | 0.3 J | ND | ND | 0.38 J |
| C2-Chrysenes | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C3-Chrysenes | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| C4-Chrysenes | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo[b]fluoranthene | 0.14 J | 0.19 J | 0.29 J | 0.1 J | 0.18 J | ND | 0.19 J | 0.14 J | ND | 0.25 J | 0.17 J |
| Benzo[k]fluoranthene | 0.044 J | 0.033 J | 0.1 J | 0.033 J | 0.026 J | ND | ND | ND | ND | ND | ND |
| Benzo[e]pyrene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo[a]pyrene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Perylene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Indeno[1,2,3,-c,d]pyrene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Dibenzo[a,h]anthracene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzo[g,h,i]perylene | 0.064 J | 0.058 J | ND | ND | 0.068 J | 0.14 J | 0.13 J | 0.091 J | ND | 0.088 J | 0.14 J |
| d8-Naphthalene | 54 | 47 | 39 & | 52 | 41 & | 50 | 35 & | 64 | 28 & | 41 & | 47 |
| d10-Acenaphthene | 73 | 59 | 57 | 63 | 61 | 67 | 46 | 92 | 38 & | 58 | 58 |
| d10-Phenanthrene | 83 | 65 | 71 | 75 | 65 | 75 | 74 | 105 | 42 & | 66 | 65 |
| d12-Benzo[a]pyrene | 83 | 64 | 72 | 74 | 61 | 74 | 54 | 90 | 42 & | 65 | 66 |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - PAH Results - Field QC

| | | |
|---------------------|------------------|------------------|
| Field ID | 00-N01-01-PHC-EB | 00-N13-01-PHC-FB |
| Lab ID | 20A3487 | 20A3503 |
| Sample Type | N | N |
| Matrix | WATER | WATER |
| Associated Blank | DH-S-68PB | DH-S-68PB |
| Field Date | 08/17/00 | 08/19/00 |
| Extract Date | 04/06/01 | 04/06/01 |
| Analysis Date | 04/11/01 | 04/11/01 |
| Date Received | 08/30/00 | 08/30/00 |
| Percent Solids | NA | NA |
| Percent Lipids | NA | NA |
| Min Reporting Limit | 190 | 150 |
| Units | ng/L | ng/L |

| Polynuclear Aromatic Hydrocarbons | | |
|-----------------------------------|-------|-------|
| Naphthalene | 100 J | 23 JB |
| C1-Naphthalenes | ND | ND |
| C2-Naphthalenes | ND | ND |
| C3-Naphthalenes | ND | ND |
| C4-Naphthalenes | ND | ND |
| Acenaphthylene | ND | ND |
| Acenaphthene | ND | ND |
| Biphenyl | ND | ND |
| Fluorene | ND | ND |
| C1-Fluorenes | ND | ND |
| C2-Fluorenes | ND | ND |
| C3-Fluorenes | ND | ND |
| Anthracene | ND | ND |
| Phenanthrene | 33 J | 11 JB |
| C1-Phenanthrenes/anthracenes | 24 J | ND |
| C2-Phenanthrenes/anthracenes | ND | ND |
| C3-Phenanthrenes/anthracenes | ND | ND |
| C4-Phenanthrenes/anthracenes | ND | ND |
| Dibenzothiophene | 12 J | ND |
| C1-Dibenzothiophenes | 14 J | ND |
| C2-Dibenzothiophenes | 43 J | ND |
| C3-Dibenzothiophenes | ND | ND |
| Fluoranthene | 19 J | ND |
| Pyrene | 12 J | ND |
| C1-Fluoranthenes/pyrenes | ND | ND |
| C2-Fluoranthenes/pyrenes | ND | ND |
| C3-Fluoranthenes/pyrenes | ND | ND |
| Benzo[a]anthracene | ND | ND |
| Chrysene | ND | ND |
| C1-Chrysenes | ND | ND |
| C2-Chrysenes | ND | ND |
| C3-Chrysenes | ND | ND |
| C4-Chrysenes | ND | ND |
| Benzo[b]fluoranthene | ND | ND |
| Benzo[k]fluoranthene | ND | ND |
| Benzo[e]pyrene | ND | ND |
| Benzo[a]pyrene | ND | ND |
| Perylene | ND | ND |
| Indeno[1,2,3-c,d]pyrene | ND | ND |
| Dibenzo[a,h]anthracene | ND | ND |
| Benzo[g,h,i]perylene | ND | ND |
| d8-Naphthalene | 57 | 66 |
| d10-Acenaphthene | 62 | 70 |
| d10-Phenanthrene | 60 | 68 |
| d12-Benzo[a]pyrene | 57 | 53 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4104
Data Table: PAH Results - SPMDs - Surrogate Corrected

| Field ID | 02-3M1-01-PHC-T-SP | 02-3M2-01-PHC-T-SP | 02-3M3-01-PHC-T-SP | 02-NM1-01-PHC-T-SP |
|---------------------|---------------------|---------------------|---------------------|---------------------|
| Sample Type | N | N | N | N |
| Matrix | SPMD | SPMD | SPMD | SPMD |
| Sample Size | 1 | 1 | 1 | 1 |
| Weight Basis | NA | NA | NA | NA |
| Associated Blank | DZ-S-49PB | DZ-S-49PB | DZ-S-49PB | DZ-S-49PB |
| Field Date | 08/20/02 | 08/20/02 | 08/20/02 | 08/18/02 |
| Extract Date | 11/11/02 | 11/11/02 | 11/11/02 | 11/11/02 |
| Analysis Date | 11/27/02 | 11/27/02 | 11/27/02 | 11/27/02 |
| Date Received | 08/23/02 | 08/23/02 | 08/23/02 | 08/23/02 |
| Percent Solids | NA | NA | NA | NA |
| Dilution Factor | 1 | 1 | 1 | 1 |
| Percent Lipids | NA | NA | NA | NA |
| Min Reporting Limit | 27 | 31 | 26 | 36 |
| Units | ng/2 SPMD Membranes | ng/2 SPMD Membranes | ng/2 SPMD Membranes | ng/2 SPMD Membranes |

| Polynuclear Aromatic Hydrocarbons | | | | |
|-----------------------------------|--------|--------|--------|------|
| Naphthalene | 71 B | 130 | 79 B | 110 |
| C1-Naphthalenes | 96 | 110 | 110 | 110 |
| C2-Naphthalenes | 120 | 120 | 120 | 130 |
| C3-Naphthalenes | 84 | 87 | 81 | 94 |
| C4-Naphthalenes | 54 | 64 | 57 | 61 |
| Acenaphthylene | 1.1 J | 1.2 J | 1.1 J | 1.6 |
| Acenaphthene | 3.2 J | 6.4 J | 3.4 J | 4.6 |
| Biphenyl | 37 B | 98 B | 41 B | 11 |
| Fluorene | 27 | 50 | 26 | 14 |
| C1-Fluorenes | 30 | 36 | 34 | 29 |
| C2-Fluorenes | 40 | 40 | 42 | 43 |
| C3-Fluorenes | 62 | 46 | 66 | 51 |
| Anthracene | ND | ND | ND | |
| Phenanthrene | 57 B | 77 | 56 B | 51 |
| C1-Phenanthrenes/anthracenes | 45 | 42 | 43 | 47 |
| C2-Phenanthrenes/anthracenes | 66 | 65 | 72 | 73 |
| C3-Phenanthrenes/anthracenes | ND | ND | ND | |
| C4-Phenanthrenes/anthracenes | ND | ND | ND | |
| Dibenzothiophene | 5.6 J | 7 J | 5.5 J | 5.2 |
| C1-Dibenzothiophenes | 12 J | 10 J | 13 J | 12 |
| C2-Dibenzothiophenes | 25 J | 20 J | 26 | 23 |
| C3-Dibenzothiophenes | 32 | 23 J | 30 | 33 |
| Fluoranthene | 18 J | 18 J | 19 J | 20 |
| Pyrene | 12 J | 11 J | 13 J | 16 |
| C1-Fluoranthenes/pyrenes | 18 J | 11 J | 15 J | 21 |
| C2-Fluoranthenes/pyrenes | 17 J | ND | 13 J | 14 |
| C3-Fluoranthenes/pyrenes | ND | ND | ND | |
| Benzo[a]anthracene | ND | ND | ND | |
| Chrysene | 4.3 J | 4.9 J | 4.5 J | 6 |
| C1-Chrysenes | ND | ND | ND | 2.8 |
| C2-Chrysenes | ND | ND | ND | |
| C3-Chrysenes | ND | ND | ND | |
| C4-Chrysenes | ND | ND | ND | |
| Benzo[b]fluoranthene | ND | ND | 1.3 J | 2.4 |
| Benzo[k]fluoranthene | ND | ND | 1 J | 2 |
| Benzo[e]pyrene | 1.2 J | ND | 1.2 J | 2 |
| Benzo[a]pyrene | ND | ND | ND | |
| Perylene | 1.9 J | 2.5 J | 1.9 J | 4.6 |
| Indeno[1,2,3-c,d]pyrene | ND | ND | ND | 0.93 |
| Dibenzo[a,h]anthracene | ND | ND | ND | |
| Benzo[g,h,i]perylene | 1.9 JB | 4.1 JB | 1.4 JB | 11 |
| d8-Naphthalene | 72 | 67 | 72 | 63 |
| d10-Acenaphthene | 80 | 80 | 82 | 79 |
| d10-Phenanthrene | 83 | 85 | 89 | 87 |
| d12-Benzo[a]pyrene | 67 | 66 | 71 | 63 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4104
Data Table: PAH Results - SPMDs - Surrogate Corrected

| | | 02-NM3-01-PHC-T-SP | | 02-NM3-02-PHC-FB-SP |
|------------------------------|----|---------------------|---------------------|---------------------|
| Field ID | | 02-NM2-01-PHC-T-SP | | |
| Sample Type | | N | N | N |
| Matrix | | SPMD | SPMD | SPMD |
| Sample Size | | 1 | 1 | 1 |
| Weight Basis | | NA | NA | NA |
| Associated Blank | | DZ-S-49PB | DZ-S-49PB | DZ-S-49PB |
| Field Date | | 08/18/02 | 08/18/02 | 08/18/02 |
| Extract Date | | 11/11/02 | 11/11/02 | 11/11/02 |
| Analysis Date | | 11/27/02 | 11/27/02 | 11/27/02 |
| Date Received | | 08/23/02 | 08/23/02 | 08/23/02 |
| Percent Solids | | NA | NA | NA |
| Dilution Factor | | 1 | 1 | 1 |
| Percent Lipids | | NA | NA | NA |
| Min Reporting Limit | | 34 | 27 | 26 |
| Units | | ng/2 SPMD Membranes | ng/2 SPMD Membranes | ng/6 Exposures |
| Polynuclear Aromatic Hydro | | | | |
| Naphthalene | B | 100 B | 56 B | 510 |
| C1-Naphthalenes | | 110 | 110 | 550 |
| C2-Naphthalenes | | 120 | 120 | 230 |
| C3-Naphthalenes | | 90 | 86 | 76 |
| C4-Naphthalenes | | 68 | 65 | 44 |
| Acenaphthylene | J | 1.1 J | 1.3 J | 5.7 J |
| Acenaphthene | J | 3.8 J | 3.5 J | 5.6 J |
| Biphenyl | JB | 72 B | 12 JB | 29 B |
| Fluorene | J | 39 | 16 J | 13 J |
| C1-Fluorenes | J | 36 | 29 | 18 J |
| C2-Fluorenes | | 42 | 43 | 24 J |
| C3-Fluorenes | | 54 | 52 | ND |
| Anthracene | ND | ND | ND | ND |
| Phenanthrene | B | 67 | 54 B | 28 B |
| C1-Phenanthrenes/anthracenes | | 42 | 45 | 18 J |
| C2-Phenanthrenes/anthracenes | | 70 | 74 | ND |
| C3-Phenanthrenes/anthracenes | ND | ND | ND | ND |
| C4-Phenanthrenes/anthracenes | ND | ND | ND | ND |
| Dibenzothiophene | J | 6.4 J | 5.4 J | 2.8 J |
| C1-Dibenzothiophenes | J | 12 J | 13 J | 6 J |
| C2-Dibenzothiophenes | J | 22 J | 28 | 14 J |
| C3-Dibenzothiophenes | J | 30 J | 32 | 15 J |
| Fluoranthene | J | 21 J | 24 J | 7.8 JB |
| Pyrene | J | 13 J | 18 J | 4.9 JB |
| C1-Fluoranthenes/pyrenes | J | 19 J | 22 J | ND |
| C2-Fluoranthenes/pyrenes | J | 18 J | 15 J | ND |
| C3-Fluoranthenes/pyrenes | ND | ND | ND | ND |
| Benzo[a]anthracene | ND | ND | ND | ND |
| Chrysene | J | 7.6 J | 7.8 J | ND |
| C1-Chrysenes | J | 4 J | 3.1 J | ND |
| C2-Chrysenes | ND | ND | ND | ND |
| C3-Chrysenes | ND | ND | ND | ND |
| C4-Chrysenes | ND | ND | ND | ND |
| Benzo[b]fluoranthene | J | 2.2 J | 2.6 J | ND |
| Benzo[k]fluoranthene | J | 1.9 J | 1.9 J | ND |
| Benzo[e]pyrene | J | 1.9 J | 2.2 J | ND |
| Benzo[a]pyrene | ND | ND | ND | ND |
| Perylene | J | 6.1 J | 4.9 J | ND |
| Indeno[1,2,3,-c,d]pyrene | J | 0.6 J | ND | ND |
| Dibenzo[a,h]anthracene | ND | ND | ND | ND |
| Benzo[g,h,i]perylene | J | 4.4 JB | 2 JB | 2.3 JB |
| | | | | |
| d8-Naphthalene | | 49 | 73 | 63 |
| d10-Acenaphthene | | 62 | 84 | 77 |
| d10-Phenanthrene | | 67 | 93 | 82 |
| d12-Benzo[a]pyrene | | 70 | 73 | 68 |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - SHC Results - Sediment

| Field ID | 00-N06-01-PHC-S | 00-N18-01-PHC-S | 00-N23-01-PHC-S | 00-COL-02-PHC-S | 00-KUP-01-PHC-S | 00-KUP-02-PHC-S | 00-N00-01-PHC-S | 00-N13-02-PHC-S | 00-N13-01-PHC-S | 00-N19-01-PHC-S | 00-N10-01-PHC-S | 00-N03-01-PHC-S | 00-N07-01-PHC-S | 00-N16-01-PHC-S | 00-N02-01-PHC-S |
|---------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Lab ID | 20A3468 | 20A3469 | 20A3473 | 20A3474 | 20A3475 | 20A3476 | 20A3482 | 20A3484 | 20A3485 | 20A3486 | 20A3488 | 20A3489 | 20A3490 | 20A3491 | 20A3492 |
| Sample Type | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | PEAT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Associated Blank | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB |
| Field Date | 08/17/00 | 08/17/00 | 08/23/00 | 08/24/00 | 08/24/00 | 08/24/00 | 08/26/00 | 08/19/00 | 08/19/00 | 08/17/00 | 08/17/00 | 08/17/00 | 08/17/00 | 08/17/00 | 08/17/00 |
| Extract Date | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 |
| Analysis Date | 03/02/01 | 03/02/01 | 03/02/01 | 03/08/01 | 03/02/01 | 03/08/01 | 03/09/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| Percent Solids | 63.8 | 55.6 | 56.5 | 68.8 | 75.6 | 66.2 | 66.1 | 51.4 | 53.7 | 61 | 62 | 51.4 | 54.2 | 59.6 | 62.4 |
| Percent Lipids | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Min Reporting Limit | 0.025 | 0.03 | 0.029 | 0.024 | 0.022 | 0.024 | 0.024 | 0.031 | 0.03 | 0.027 | 0.026 | 0.031 | 0.03 | 0.028 | 0.026 |
| Units | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| SHC/TPH | | | | | | | | | | | | | | | |
| n-Nonane | 0.0074 J | 0.0098 J | 0.005 J | 0.0087 J | ND | ND | 0.0038 J | 0.0035 J | 0.016 J | 0.0073 J | 0.0049 J | 0.0033 J | 0.006 J | 0.005 J | 0.0036 J |
| n-Decane | 0.012 J | 0.017 J | 0.0094 J | 0.015 J | 0.00089 J | 0.0013 J | 0.0091 J | 0.012 J | 0.022 J | 0.014 J | 0.0083 J | 0.0087 J | 0.011 J | 0.0095 J | 0.0069 J |
| n-Undecane | 0.015 J | 0.022 J | 0.011 J | 0.024 | 0.00047 J | 0.0028 J | 0.01 J | 0.02 J | 0.029 J | 0.018 J | 0.012 J | 0.01 J | 0.014 J | 0.014 J | 0.0094 J |
| n-Dodecane | 0.016 J | 0.021 J | 0.014 J | 0.029 | 0.00049 J | 0.0023 J | 0.012 J | 0.028 J | 0.032 | 0.019 J | 0.014 J | 0.013 J | 0.016 J | 0.018 J | 0.011 J |
| n-Tridecane | 0.022 J | 0.029 J | 0.025 J | 0.045 | 0.00053 J | 0.0042 J | 0.021 J | 0.046 | 0.044 | 0.026 J | 0.022 J | 0.019 J | 0.025 J | 0.029 | 0.017 J |
| Isoprenoid RRT 1380 | 0.0074 J | 0.0097 J | 0.0079 J | 0.024 | ND | 0.003 J | 0.0069 J | 0.016 J | 0.014 J | 0.0086 J | 0.0088 J | 0.0061 J | 0.0078 J | 0.009 J | 0.0057 J |
| n-Tetradecane | 0.027 | 0.035 | 0.029 | 0.064 | 0.00081 J | 0.0074 J | 0.06 | 0.027 | 0.03 | 0.031 | 0.024 J | 0.03 | 0.034 | 0.02 J | 0.02 J |
| Isoprenoid RRT 1470 | 0.018 J | 0.025 J | 0.022 J | 0.082 | ND | 0.0097 J | 0.019 J | 0.045 | 0.035 | 0.022 J | 0.026 | 0.018 J | 0.021 J | 0.022 J | 0.014 J |
| n-Pentadecane | 0.038 | 0.051 | 0.052 | 0.12 | 0.0014 J | 0.032 | 0.047 | 0.092 | 0.074 | 0.053 | 0.043 | 0.048 | 0.052 | 0.031 | 0.031 |
| n-Hexadecane | 0.039 | 0.056 | 0.052 | 0.1 | 0.0018 J | 0.021 J | 0.052 | 0.095 | 0.074 | 0.048 | 0.068 | 0.048 | 0.051 | 0.032 | 0.032 |
| Isoprenoid RRT 1650 | 0.02 J | 0.028 J | 0.023 J | 0.059 | ND | 0.0053 J | 0.025 | 0.045 | 0.035 | 0.023 J | 0.039 | 0.024 J | 0.023 J | 0.024 J | 0.017 J |
| n-Heptadecane | 0.059 | 0.097 | 0.087 | 0.17 | 0.0059 J | 0.13 | 0.089 | 0.16 | 0.14 | 0.086 | 0.12 | 0.085 | 0.078 | 0.09 | 0.057 |
| Pristane | 0.043 | 0.068 | 0.081 | 0.21 | 0.001 J | 0.014 J | 0.065 | 0.11 | 0.086 | 0.065 | 0.074 | 0.07 | 0.068 | 0.058 | 0.044 |
| n-Octadecane | 0.048 | 0.077 | 0.068 | 0.14 | 0.0032 J | 0.057 | 0.074 | 0.13 | 0.1 | 0.063 | 0.081 | 0.067 | 0.062 | 0.064 | 0.042 |
| Phytane | 0.019 J | 0.032 | 0.031 | 0.06 | ND | 0.0042 J | 0.031 | 0.046 | 0.038 | 0.027 | 0.047 | 0.032 | 0.028 J | 0.028 | 0.02 J |
| n-Nonadecane | 0.07 | 0.13 | 0.12 | 0.23 | 0.0085 J | 0.16 | 0.12 | 0.22 | 0.18 | 0.098 | 0.11 | 0.1 | 0.098 | 0.11 | 0.066 |
| n-Eicosane | 0.059 | 0.11 | 0.093 | 0.23 | 0.0054 J | 0.22 | 0.11 | 0.18 | 0.15 | 0.09 | 0.12 | 0.091 | 0.087 | 0.09 | 0.057 |
| n-Heneicosane | 0.12 | 0.24 | 0.22 | 0.48 | 0.013 J | 0.58 | 0.22 | 0.45 | 0.38 | 0.19 | 0.24 | 0.19 | 0.18 | 0.19 | 0.11 |
| n-Docosane | 0.089 | 0.16 | 0.15 | 0.34 | 0.011 J | 0.39 | 0.16 | 0.31 | 0.25 | 0.13 | 0.16 | 0.14 | 0.12 | 0.13 | 0.079 |
| n-Tricosane | 0.25 | 0.49 | 0.37 | 1.4 | 0.026 | 1.8 | 0.39 | 0.98 | 0.78 | 0.36 | 0.51 | 0.34 | 0.31 | 0.34 | 0.19 |
| n-Tetracosane | 0.074 | 0.14 | 0.13 | 0.35 | 0.011 JB | 0.36 | 0.15 | 0.28 | 0.23 | 0.12 | 0.15 | 0.13 | 0.11 | 0.12 | 0.068 |
| n-Pentacosane | 0.23 | 0.46 | 0.44 | 1.2 | 0.035 | 2.4 | 0.42 | 0.9 | 0.72 | 0.37 | 0.55 | 0.35 | 0.33 | 0.36 | 0.2 |
| n-Hexacosane | 0.071 | 0.12 | 0.12 | 0.28 | 0.017 JB | 0.28 | 0.12 | 0.23 | 0.19 | 0.11 | 0.12 | 0.12 | 0.096 | 0.11 | 0.062 |
| n-Heptacosane | 0.32 | 0.64 | 0.68 | 1.7 | 0.052 | 3.2 | 0.63 | 1.3 | 1 | 0.51 | 0.82 | 0.52 | 0.49 | 0.53 | 0.29 |
| n-Octacosane | 0.053 | 0.08 | 0.092 | 0.21 | 0.017 JB | 0.18 | 0.097 | 0.16 | 0.14 | 0.085 | 0.089 | 0.11 | 0.08 | 0.086 | 0.05 |
| n-Nonacosane | 0.23 | 0.45 | 0.6 | 1.1 | 0.042 | 1.7 | 0.54 | 0.91 | 0.74 | 0.4 | 0.55 | 0.44 | 0.42 | 0.44 | 0.24 |
| n-Triacontane | 0.082 | 0.3 | 0.43 | 0.2 | 0.014 JB | 0.52 | 0.26 | 0.46 | 0.38 | 0.17 | 0.52 | 0.22 | 0.2 | 0.24 | 0.1 |
| n-Hentriacontane | 0.2 | 0.39 | 0.54 | 0.94 | 0.031 | 1.2 | 0.46 | 0.85 | 0.68 | 0.33 | 0.48 | 0.37 | 0.36 | 0.38 | 0.2 |
| n-Dotriacontane | 0.038 | 0.034 | 0.04 | 0.12 | 0.0072 JB | 0.078 | 0.043 | 0.11 | 0.057 | 0.042 | 0.082 | 0.091 | 0.081 | 0.058 | 0.028 |
| n-Tritriacontane | 0.052 | 0.1 | 0.13 | 0.38 | 0.0082 J | 0.3 | 0.14 | 0.23 | 0.2 | 0.1 | 0.15 | 0.11 | 0.11 | 0.12 | 0.065 |
| n-Tetratriacontane | 0.006 J | 0.0076 J | 0.009 J | 0.029 | 0.0023 JB | 0.019 J | 0.013 J | 0.02 J | 0.015 J | 0.012 J | 0.011 J | 0.016 J | 0.011 J | 0.012 J | 0.0073 J |
| n-Pentatriacontane | 0.01 J | 0.02 J | 0.017 J | 0.076 | 0.0028 J | 0.044 | 0.025 | 0.039 | 0.032 | 0.02 J | 0.026 | 0.022 J | 0.019 J | 0.019 J | 0.012 J |
| n-Hexatriacontane | 0.0035 J | 0.0054 J | 0.0063 J | 0.013 J | 0.0011 J | 0.006 J | 0.0075 J | 0.01 J | 0.0083 J | 0.006 J | 0.0053 J | 0.0074 J | 0.0052 J | 0.0062 J | 0.0042 J |
| n-Heptatriacontane | 0.0028 J | 0.0046 J | 0.0065 J | 0.012 J | 0.00083 J | 0.0058 J | 0.0097 J | 0.0075 J | 0.0052 J | 0.0067 J | 0.006 J | 0.0046 J | 0.0067 J | 0.0063 J | 0.0033 J |
| n-Octatriacontane | 0.0021 J | 0.0037 J | 0.0042 J | 0.0081 J | ND | 0.0041 J | 0.005 J | 0.0071 J | 0.0059 J | 0.0035 J | 0.0035 J | 0.0046 J | 0.0031 J | 0.004 J | 0.0023 J |
| n-Nonatriacontane | 0.0017 J | 0.0024 J | 0.0025 J | 0.0052 J | ND | 0.0018 J | 0.003 J | 0.0045 J | 0.0037 J | 0.0022 J | 0.002 J | 0.0029 J | 0.002 J | 0.0025 J | 0.0014 J |
| n-Tetracontane | 0.002 J | 0.0029 J | 0.0028 J | 0.0058 J | ND | 0.0026 J | 0.0032 J | 0.0052 J | 0.004 J | 0.0026 J | 0.0025 J | 0.0026 J | 0.0023 J | 0.0025 J | 0.0017 J |
| TPH (RES) | 3.4 | 6 | 5.9 | 15 | 0.55 B | 16 | 6.1 | 12 | 9.4 | 5.2 | 8 | 5.7 | 5.4 | 5.4 | 3.2 |
| TPH | 7.1 | 12 | 10 | 25 | 0.55 B | 18 | 10 | 20 | 16 | 10 | 26 | 12 | 11 | 10 | 6.3 |
| %ortho-terphenyl | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & |
| %5A-androstane | 84 | 85 | 82 | 90 | 74 | 73 | 79 | 86 | 89 | 77 | 97 | 85 | 93 | 87 | 86 |
| %d50-tetracosane | 88 | 90 | 85 | 89 | 83 | 73 | 81 | 86 | 89 | 82 | 99 | 87 | 94 | 94 | 89 |

| | | | | | | | | | | | | | | | |
|---------------------|-----------------|-----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| Field ID | 00-N01-01-PHC-S | 00-N17-01-PHC-S | 00-5D-01-PHC-S | 00-5H-01-PHC-S | 00-4C-01-PHC-S | 00-C0L-01-PHC-S | 00-SAG-01-PHC-S | 00-N14-01-PHC-S | 00-N13-03-PHC-S | 00-N12-01-PHC-S | 00-5F-01-PHC-S | 00-N15-01-PHC-S | 00-N21-01-PHC-S | 00-L09-01-PHC-S | 00-L07-01-PHC-S |
| Lab ID | 20A3493 | 20A3494 | 20A3496 | 20A3497 | 20A3499 | 20A3500 | 20A3501 | 20A3504 | 20A3505 | 20A3506 | 20A3507 | 20A3508 | 20A3510 | 20A3511 | 20A3514 |
| Sample Type | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Associated Blank | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB | DH-S-55PB |
| Field Date | 08/17/00 | 08/17/00 | 08/22/00 | 08/22/00 | 08/21/00 | 08/24/00 | 08/25/00 | 08/19/00 | 08/19/00 | 08/19/00 | 08/19/00 | 08/19/00 | 08/19/00 | 08/21/00 | 08/21/00 |
| Extract Date | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 02/20/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 |
| Analysis Date | 03/08/01 | 03/08/01 | 03/08/01 | 03/09/01 | 03/09/01 | 03/14/01 | 03/14/01 | 03/14/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/14/01 | 03/14/01 |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| Percent Solids | 75.4 | 57.3 | 54.2 | 69.1 | NA | 57.4 | 79.7 | 49.4 | 57.2 | 50.3 | 66.2 | 82.2 | 48.9 | 77.4 | 70.7 |
| Percent Lipids | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Min Reporting Limit | 0.021 | 0.028 | 0.03 | 0.022 | 0.028 | 0.02 | 0.022 | 0.033 | 0.029 | 0.032 | 0.024 | 0.02 | 0.034 | 0.021 | 0.024 |
| Units | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |

SHC/TPH

| | | | | | | | | | | | | | | | |
|---------------------|-----------|----------|----------|----------|----------|-----------|-----------|----------|----------|----------|-----------|-----------|----------|-----------|-----------|
| n-Nonane | 0.0013 J | 0.005 J | 0.004 J | 0.002 J | 0.0016 J | 0.00095 J | 0.0028 J | 0.012 J | 0.012 J | 0.012 J | 0.0045 J | ND | 0.02 J | 0.0012 J | 0.0023 J |
| n-Decane | 0.0029 J | 0.0091 J | 0.0075 J | 0.0034 J | 0.0039 J | 0.0026 J | 0.007 J | 0.022 J | 0.02 J | 0.019 J | 0.0085 J | 0.0009 J | 0.033 J | 0.0028 J | 0.0046 J |
| n-Undecane | 0.0031 J | 0.012 J | 0.011 J | 0.0038 J | 0.0058 J | 0.0044 J | 0.011 J | 0.033 | 0.029 | 0.03 J | 0.012 J | 0.00088 J | 0.048 | 0.0034 J | 0.006 J |
| n-Dodecane | 0.0034 J | 0.015 J | 0.016 J | 0.0042 J | 0.0077 J | 0.0053 J | 0.014 J | 0.042 | 0.034 | 0.037 | 0.015 J | 0.0011 J | 0.06 | 0.0039 J | 0.0075 J |
| n-Tridecane | 0.0041 J | 0.022 J | 0.028 J | 0.0068 J | 0.012 J | 0.0074 J | 0.018 J | 0.058 | 0.046 | 0.055 | 0.021 J | 0.0014 J | 0.086 | 0.0057 J | 0.011 J |
| Isoprenoid RRT 1380 | 0.0013 J | 0.0079 J | 0.01 J | 0.0024 J | 0.0046 J | 0.0032 J | 0.0054 J | 0.018 J | 0.015 J | 0.02 J | 0.007 J | 0.00054 J | 0.028 J | 0.002 J | 0.004 J |
| n-Tetradecane | 0.0048 J | 0.028 | 0.036 | 0.0085 J | 0.015 J | 0.0093 J | 0.021 J | 0.063 | 0.051 | 0.072 | 0.023 J | 0.0016 J | 0.098 | 0.0063 J | 0.013 J |
| Isoprenoid RRT 1470 | 0.0028 J | 0.021 J | 0.028 J | 0.0067 J | 0.011 J | 0.0078 J | 0.013 J | 0.046 | 0.037 | 0.056 | 0.018 J | 0.0011 J | 0.072 | 0.0049 J | 0.0093 J |
| n-Pentadecane | 0.0066 J | 0.05 | 0.055 | 0.015 J | 0.027 J | 0.018 J | 0.027 | 0.091 | 0.072 | 0.11 | 0.034 | 0.002 J | 0.13 | 0.0094 J | 0.019 J |
| n-Hexadecane | 0.0068 J | 0.053 | 0.056 | 0.017 J | 0.028 | 0.013 J | 0.025 | 0.086 | 0.068 | 0.11 | 0.034 | 0.0023 J | 0.12 | 0.0092 J | 0.02 J |
| Isoprenoid RRT 1650 | 0.0029 J | 0.024 J | 0.024 J | 0.008 J | 0.014 J | 0.0076 J | 0.013 J | 0.04 | 0.033 | 0.052 | 0.016 J | 0.0013 J | 0.056 | 0.0049 J | 0.011 J |
| n-Heptadecane | 0.01 J | 0.097 | 0.13 | 0.034 | 0.047 | 0.031 | 0.046 | 0.19 | 0.12 | 0.18 | 0.067 | 0.0041 J | 0.22 | 0.017 J | 0.037 |
| Pristane | 0.0083 J | 0.065 | 0.061 | 0.021 J | 0.04 | 0.016 J | 0.02 J | 0.093 | 0.076 | 0.12 | 0.036 | 0.0025 J | 0.14 | 0.012 J | 0.027 |
| n-Octadecane | 0.0089 J | 0.081 | 0.081 | 0.024 | 0.038 | 0.018 J | 0.025 | 0.13 | 0.087 | 0.14 | 0.045 | 0.0034 J | 0.16 | 0.012 J | 0.026 |
| Phytane | 0.0038 J | 0.031 | 0.026 J | 0.01 J | 0.019 J | 0.0079 J | 0.0091 J | 0.04 | 0.033 | 0.052 | 0.016 J | 0.0011 J | 0.06 | 0.0053 J | 0.011 J |
| n-Nonadecane | 0.012 J | 0.11 | 0.17 | 0.037 | 0.058 | 0.047 | 0.027 | 0.15 | 0.047 | 0.25 | 0.085 | 0.0048 J | 0.29 | 0.018 J | 0.039 |
| n-Eicosane | 0.0099 J | 0.099 | 0.18 | 0.042 | 0.062 | 0.027 | 0.047 | 0.24 | 0.13 | 0.21 | 0.092 | 0.0049 J | 0.25 | 0.022 | 0.039 |
| n-Heneicosane | 0.02 J | 0.2 | 0.42 | 0.07 | 0.1 | 0.058 | 0.068 | 0.66 | 0.31 | 0.53 | 0.17 | 0.01 J | 0.64 | 0.028 | 0.073 |
| n-Docosane | 0.016 J | 0.14 | 0.28 | 0.054 | 0.074 | 0.042 | 0.047 | 0.44 | 0.22 | 0.36 | 0.12 | 0.0076 J | 0.43 | 0.021 | 0.046 |
| n-Tricosane | 0.039 | 0.37 | 0.83 | 0.14 | 0.18 | 0.17 | 0.14 | 1.3 | 0.65 | 1.2 | 0.33 | 0.022 | 1.4 | 0.048 | 0.11 |
| n-Tetracosane | 0.017 J | 0.14 | 0.27 | 0.072 | 0.077 | 0.046 | 0.056 | 0.4 | 0.21 | 0.35 | 0.11 | 0.013 JB | 0.4 | 0.021 | 0.044 |
| n-Pentacosane | 0.04 | 0.38 | 0.95 | 0.17 | 0.23 | 0.13 | 0.18 | 1.3 | 0.61 | 1.1 | 0.34 | 0.033 | 1.3 | 0.053 | 0.13 |
| n-Hexacosane | 0.02 JB | 0.12 | 0.21 | 0.074 | 0.068 | 0.037 | 0.05 | 0.31 | 0.18 | 0.27 | 0.087 | 0.03 B | 0.3 | 0.024 B | 0.039 |
| n-Heptacosane | 0.061 | 0.56 | 1.4 | 0.23 | 0.31 | 0.14 | 0.24 | 1.9 | 0.86 | 1.6 | 0.45 | 0.059 | 1.8 | 0.082 | 0.19 |
| n-Octacosane | 0.019 JB | 0.097 | 0.16 | 0.065 | 0.059 | 0.031 B | 0.041 B | 0.23 | 0.14 | 0.2 | 0.065 | 0.035 B | 0.22 | 0.021 B | 0.032 B |
| n-Nonacosane | 0.046 | 0.48 | 1 | 0.2 | 0.23 | 0.098 | 0.23 | 1.4 | 0.63 | 1.1 | 0.33 | 0.049 | 1.3 | 0.07 | 0.13 |
| n-Triacontane | 0.021 B | 1.1 | 0.12 | 0.025 B | 0.12 | 0.052 | 0.21 | 1.1 | 0.35 | 0.68 | 0.23 | 0.03 | 0.83 | 0.031 | 0.13 |
| n-Hentriacontane | 0.036 | 0.4 | 0.85 | 0.17 | 0.18 | 0.07 | 0.19 | 1.2 | 0.57 | 0.99 | 0.28 | 0.035 | 1.1 | 0.055 | 0.1 |
| n-Dotriacontane | 0.01 JB | 0.036 | 0.055 | 0.044 | 0.025 J | 0.01 JB | 0.018 J | 0.075 | 0.051 | 0.062 | 0.02 J | 0.014 JB | 0.07 | 0.012 JB | 0.014 JB |
| n-Tritriacontane | 0.013 J | 0.12 | 0.25 | 0.068 | 0.055 | 0.029 | 0.066 | 0.34 | 0.17 | 0.3 | 0.086 | 0.012 J | 0.33 | 0.017 J | 0.031 |
| n-Tettratriacontane | 0.003 JB | 0.013 J | 0.017 J | 0.022 | 0.0088 J | 0.0052 JB | 0.0074 J | 0.024 J | 0.02 J | 0.027 J | 0.0075 J | 0.0042 JB | 0.023 J | 0.003 JB | 0.0044 JB |
| n-Pentatriacontane | 0.0031 J | 0.022 J | 0.039 | 0.024 | 0.012 J | 0.0086 J | 0.022 | 0.05 | 0.033 | 0.045 | 0.018 J | 0.0036 JB | 0.049 | 0.0039 JB | 0.0072 J |
| n-Hexatriacontane | 0.0012 J | 0.007 J | 0.0074 J | 0.014 J | 0.0047 J | 0.0028 JB | 0.0036 J | 0.01 J | 0.013 | 0.013 J | 0.0037 J | 0.0017 JB | 0.012 J | 0.0019 JB | 0.0028 JB |
| n-Heptatriacontane | 0.00085 J | 0.0067 J | 0.0093 J | 0.013 J | 0.0044 J | 0.0024 J | 0.0033 J | 0.012 J | 0.0096 J | 0.012 J | 0.0035 J | 0.0012 J | 0.012 J | 0.0017 J | 0.0023 J |
| n-Octatriacontane | 0.0018 J | 0.023 J | 0.0046 J | 0.012 J | 0.0036 J | 0.0019 JB | 0.0024 JB | 0.0073 J | 0.0066 J | 0.0093 J | 0.0029 JB | 0.0011 JB | 0.0079 J | 0.0016 JB | 0.002 JB |
| n-Nonatriacontane | ND | 0.0026 J | 0.0028 J | 0.008 J | 0.0024 J | 0.0016 J | 0.0016 J | 0.004 J | 0.0043 J | 0.005 J | 0.0018 J | 0.00063 J | 0.0046 J | 0.001 J | 0.0012 J |
| n-Tetracontane | ND | 0.0035 J | 0.0033 J | 0.0085 J | 0.0031 J | 0.0017 J | 0.0016 J | 0.0046 J | 0.0044 J | 0.0058 J | 0.0024 J | 0.00071 J | 0.0056 J | 0.0011 J | 0.0011 J |
| TPH (RES) | 0.84 B | 5.7 | 12 | 2.6 | 3.3 | 1.7 | 2.8 | 16 | 8.4 | 14 | 4.7 | 0.61 B | 16 | 1 B | 2.2 |
| TPH | 1.5 B | 11 | 17 | 4.1 | 6.1 | 4.3 | 6.5 | 24 | 14 | 24 | 7.8 | 1 B | 27 | 1.9 | 6.9 |
| %ortho-terphenyl | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & |
| %5A-androstane | 74 | 79 | 81 | 77 | 77 | 82 | 86 | 83 | 84 | 90 | 86 | 76 | 89 | 86 | 93 |
| %d50-tetracosane | 77 | 84 | 84 | 81 | 81 | 89 | 91 | 87 | 89 | 94 | 92 | 85 | 92 | 89 | 94 |

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Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - SHC Results - Sediment

| | | | | | | | | | | | | | | | |
|---------------------|-----------------|-----------------|----------------|----------------|------------------|------------------|------------------|-------------------|-----------------|-----------------|-----------------|----------------|----------------|-----------------|-----------------|
| Field ID | 00-L08-01-PHC-S | 00-L01-01-PHC-S | 00-4A-01-PHC-S | 00-4B-01-PHC-S | 00-5(1)-01-PHC-S | 00-5(5)-01-PHC-S | 00-5(10)-01PHC-S | 00-5(0)-01 -PHC-S | 00-N05-01-PHC-S | 00-N08-01-PHC-S | 00-N09-01-PHC-S | 00-5A-01-PHC-S | 00-3A-01-PHC-S | 00-L04-01-PHC-S | 00-N11-01-PHC-S |
| Lab ID | 20A3515 | 20A3516 | 20A3518 | 20A3519 | 20A3520 | 20A3521 | 20A3523 | 20A3525 | 20A3526 | 20A3527 | 20A3528 | 20A3529 | 20A3530 | 20A3531 | 20A3532 |
| Sample Type | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Associated Blank | DH-S-58PB | DH-S-58PB | DH-S-58PB | DH-S-58PB | DH-S-58PB | DH-S-58PB | DH-S-58PB | DH-S-58PB | DH-S-58PB | DH-S-58PB | DH-S-61PB | DH-S-61PB | DH-S-61PB | DH-S-61PB | DH-S-61PB |
| Field Date | 08/21/00 | 08/21/00 | 08/21/00 | 08/21/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/18/00 | 08/18/00 | 08/18/00 | 08/18/00 | 08/20/00 | 08/20/00 | 08/18/00 |
| Extract Date | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 |
| Analysis Date | 03/14/01 | 03/14/01 | 03/14/01 | 03/14/01 | 03/14/01 | 03/14/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/17/01 | 03/17/01 | 03/17/01 | 03/17/01 | 03/17/01 |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| Percent Solids | 73.5 | 51.9 | 71.5 | 63.3 | 66.3 | 68.3 | 73.4 | 69.1 | 54.1 | 67.3 | 65.8 | 40.9 | 58.6 | 61.2 | 58 |
| Percent Lipids | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Min Reporting Limit | 0.022 | 0.032 | 0.024 | 0.026 | 0.025 | 0.024 | 0.023 | 0.024 | 0.03 | 0.025 | 0.025 | 0.04 | 0.028 | 0.027 | 0.028 |
| Units | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| SHC/TPH | | | | | | | | | | | | | | | |
| n-Nonane | 0.0031 J | 0.0052 J | 0.013 J | 0.0032 J | 0.0056 J | 0.0045 J | 0.0029 J | 0.001 J | 0.019 J | 0.0069 J | 0.0029 J | 0.023 J | 0.0028 J | 0.0049 J | 0.0068 |
| n-Decane | 0.0086 J | 0.0097 J | 0.022 J | 0.0075 J | 0.011 J | 0.0089 J | 0.0079 J | 0.0032 J | 0.034 | 0.013 J | 0.0055 J | 0.039 J | 0.0048 J | 0.0093 J | 0.012 |
| n-Undecane | 0.016 J | 0.014 J | 0.031 | 0.01 J | 0.012 J | 0.012 J | 0.0078 J | 0.0061 J | 0.044 | 0.016 J | 0.0075 J | 0.056 | 0.0081 J | 0.014 J | 0.016 |
| n-Dodecane | 0.025 | 0.017 J | 0.034 | 0.013 J | 0.014 J | 0.013 J | 0.0087 J | 0.008 J | 0.05 | 0.018 J | 0.0084 J | 0.067 | 0.011 J | 0.018 J | 0.02 |
| n-Tridecane | 0.044 | 0.03 J | 0.045 | 0.021 J | 0.018 J | 0.017 J | 0.012 J | 0.013 J | 0.065 | 0.024 J | 0.011 J | 0.089 | 0.021 J | 0.026 J | 0.03 |
| Isoprenoid RRT 1380 | 0.022 | 0.0098 J | 0.012 J | 0.0068 J | 0.0059 J | 0.0057 J | 0.0042 J | 0.0046 J | 0.021 J | 0.0079 J | 0.0041 J | 0.028 J | 0.0068 J | 0.0081 J | 0.011 |
| n-Tetradecane | 0.054 | 0.035 | 0.046 | 0.022 J | 0.024 J | 0.014 J | 0.02 J | 0.017 J | 0.073 | 0.028 | 0.014 J | 0.1 | 0.023 J | 0.029 | 0.036 |
| Isoprenoid RRT 1470 | 0.038 | 0.025 J | 0.026 | 0.017 J | 0.016 J | 0.014 J | 0.01 J | 0.012 J | 0.05 | 0.019 J | 0.0096 J | 0.07 | 0.017 J | 0.019 J | 0.029 |
| n-Pentadecane | 0.07 | 0.057 | 0.067 | 0.038 | 0.033 | 0.03 | 0.021 J | 0.027 | 0.1 | 0.039 | 0.019 J | 0.13 | 0.037 | 0.043 | 0.056 |
| n-Hexadecane | 0.06 | 0.055 | 0.058 | 0.038 | 0.034 | 0.03 | 0.021 J | 0.028 | 0.096 | 0.038 | 0.019 J | 0.13 | 0.035 | 0.04 | 0.066 |
| Isoprenoid RRT 1650 | 0.034 | 0.026 J | 0.028 | 0.019 J | 0.017 J | 0.015 J | 0.011 J | 0.013 J | 0.048 | 0.02 J | 0.0093 J | 0.06 | 0.017 J | 0.018 J | 0.032 |
| n-Heptadecane | 0.074 | 0.11 | 0.089 | 0.078 | 0.063 | 0.052 | 0.036 | 0.056 | 0.15 | 0.064 | 0.028 | 0.2 | 0.068 | 0.078 | 0.12 |
| Pristane | 0.062 | 0.075 | 0.062 | 0.059 | 0.043 | 0.036 | 0.026 | 0.031 | 0.11 | 0.05 | 0.022 J | 0.14 | 0.047 | 0.043 | 0.069 |
| n-Octadecane | 0.045 | 0.068 | 0.053 | 0.046 | 0.039 | 0.037 | 0.027 | 0.037 | 0.12 | 0.051 | 0.024 J | 0.16 | 0.045 | 0.054 | 0.077 |
| Phytane | 0.038 | 0.032 | 0.028 | 0.023 J | 0.018 J | 0.016 J | 0.011 J | 0.014 J | 0.05 | 0.021 J | 0.0094 J | 0.063 | 0.021 J | 0.019 J | 0.038 |
| n-Nonadecane | 0.058 | 0.12 | 0.093 | 0.084 | 0.076 | 0.063 | 0.04 | 0.062 | 0.18 | 0.078 | 0.034 | 0.24 | 0.071 | 0.1 | 0.12 |
| n-Eicosane | 0.053 | 0.11 | 0.09 | 0.07 | 0.063 | 0.054 | 0.035 | 0.056 | 0.11 | 0.063 | 0.03 | 0.21 | 0.064 | 0.092 | 0.12 |
| n-Heneicosane | 0.11 | 0.2 | 0.14 | 0.17 | 0.14 | 0.11 | 0.069 | 0.11 | 0.33 | 0.15 | 0.059 | 0.47 | 0.12 | 0.25 | 0.25 |
| n-Docosane | 0.064 | 0.14 | 0.1 | 0.11 | 0.095 | 0.077 | 0.049 | 0.099 | 0.23 | 0.098 | 0.043 | 0.33 | 0.087 | 0.16 | 0.17 |
| n-Tricosane | 0.17 | 0.34 | 0.2 | 0.26 | 0.26 | 0.21 | 0.13 | 0.24 | 0.69 | 0.27 | 0.12 | 1 | 0.21 | 0.46 | 0.54 |
| n-Tetracosane | 0.062 | 0.13 | 0.094 | 0.12 | 0.086 | 0.072 | 0.048 | 0.14 | 0.21 | 0.1 | 0.042 | 0.3 | 0.084 | 0.15 | 0.17 |
| n-Pentacosane | 0.21 | 0.37 | 0.2 | 0.27 | 0.24 | 0.2 | 0.14 | 0.26 | 0.61 | 0.24 | 0.12 | 0.91 | 0.24 | 0.49 | 0.6 |
| n-Hexacosane | 0.059 | 0.1 | 0.078 | 0.099 | 0.072 | 0.059 | 0.053 | 0.13 | 0.17 | 0.082 | 0.044 B | 0.25 | 0.087 B | 0.12 B | 0.14 |
| n-Heptacosane | 0.33 | 0.57 | 0.29 | 0.41 | 0.35 | 0.28 | 0.21 | 0.34 | 0.82 | 0.32 | 0.16 B | 1.2 | 0.39 | 0.7 | 0.96 |
| n-Octacosane | 0.05 | 0.08 | 0.062 | 0.08 | 0.056 | 0.046 | 0.053 | 0.1 | 0.12 | 0.066 | 0.039 B | 0.18 B | 0.082 B | 0.095 B | 0.11 |
| n-Nonacosane | 0.25 | 0.5 | 0.31 | 0.34 | 0.26 | 0.21 | 0.17 | 0.27 | 0.59 | 0.23 | 0.13 B | 0.86 | 0.34 | 0.54 | 0.85 |
| n-Triacontane | 0.21 | 0.23 | 0.19 | 0.23 | 0.14 | 0.11 | 0.098 | 0.16 | 0.28 | 0.1 | 0.048 B | 0.39 | 0.18 | 0.46 | 0.53 |
| n-Hentriacontane | 0.2 | 0.42 | 0.26 | 0.27 | 0.22 | 0.18 | 0.13 | 0.22 | 0.49 | 0.2 | 0.1 B | 0.74 | 0.28 | 0.44 | 0.55 |
| n-Dotriacontane | 0.027 | 0.054 | 0.037 | 0.039 | 0.04 | 0.032 | 0.042 | 0.069 | 0.083 | 0.045 | 0.014 JB | 0.057 B | 0.028 B | 0.044 B | 0.039 |
| n-Tritriacontane | 0.058 | 0.12 | 0.083 | 0.087 | 0.071 | 0.058 | 0.053 | 0.081 | 0.16 | 0.065 | 0.034 B | 0.22 | 0.079 | 0.12 | 0.17 |
| n-Pentatriacontane | 0.0072 J | 0.011 J | 0.01 J | 0.013 J | 0.0073 J | 0.0058 JB | 0.018 J | 0.024 | 0.016 J | 0.0095 J | 0.0046 JB | 0.021 JB | 0.01 JB | 0.011 JB | 0.012 |
| n-Pentatriacontane | 0.011 J | 0.019 J | 0.016 J | 0.018 J | 0.012 J | 0.01 J | 0.019 J | 0.024 | 0.03 | 0.016 J | 0.0071 JB | 0.039 J | 0.015 JB | 0.018 J | 0.027 |
| n-Hexatriacontane | 0.0035 JB | 0.0061 J | 0.0052 J | 0.0087 J | 0.0039 J | 0.0032 JB | 0.011 J | 0.012 J | 0.0094 J | 0.0068 J | 0.0023 JB | 0.011 J | 0.0046 JB | 0.005 JB | 0.0055 |
| n-Heptatriacontane | 0.0031 J | 0.0051 J | 0.0045 J | 0.0068 J | 0.0034 J | 0.0026 J | 0.0099 J | 0.0087 J | 0.0081 J | 0.0048 J | 0.0027 JB | 0.0092 J | 0.004 JB | 0.006 J | 0.0063 |
| n-Octatriacontane | 0.0028 JB | 0.0042 JB | 0.0042 JB | 0.0047 JB | 0.0025 JB | 0.0021 JB | 0.0072 J | 0.0069 J | 0.0067 J | 0.004 JB | 0.0024 J | 0.0072 J | 0.003 J | 0.0033 J | 0.0031 |
| n-Nonatriacontane | 0.0013 J | 0.0024 J | 0.0022 J | 0.0034 J | 0.0015 J | 0.0013 J | 0.005 J | 0.0037 J | 0.0039 J | 0.0026 J | ND | 0.004 J | 0.0015 J | 0.0013 J | 0.0018 |
| n-Tetracontane | 0.0013 J | 0.0032 J | 0.0024 J | 0.0036 J | 0.0019 J | 0.0013 J | 0.0051 J | 0.0031 J | 0.0044 J | 0.0028 J | ND | 0.0041 J | 0.0016 J | 0.0017 J | 0.002 |
| TPH (RES) | 3.9 | 5.8 | 4.2 | 4.8 | 3.6 | 3 | 2.3 | 3.6 | 8.9 | 4.2 | 1.9 B | 12 | 3.9 | 6.2 | 8.1 |
| TPH | 11 | 12 | 8.1 | 16 | 6.5 | 5.6 | 4.7 | 6.5 | 16 | 14 | 4.1 | 22 | 7.4 | 7.7 | 20 |
| %ortho-terphenyl | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 |
| %5A-androstane | 93 | 87 | 91 | 91 | 87 | 88 | 100 | 94 | 88 | 86 | 69 | 72 | 69 | 72 | 76 |
| %d50-tetracosane | 96 | 88 | 94 | 91 | 89 | 92 | 104 | 98 | 88 | 88 | 75 | 76 | 74 | 76 | 79 |

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| | | | | | | | | |
|---------------------|-----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| Field ID | 00-N04-01-PHC-S | 00-3B-01-PHC-S | 00-5B-01-PHC-S | 00-5E-01-PHC-S | 00-N20-01-PHC-S | 00-L08-02-PHC-S | 00-L08-03-PHC-S | 00-L06-01-PHC-S |
| Lab ID | 20A3533 | 20A3534 | 20A3535 | 20A3536 | 20A3537 | 20A3538 | 20A3539 | 20A3540 |
| Sample Type | N | N | N | N | N | N | N | N |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Associated Blank | DH-S-61PB | DH-S-61PB | DH-S-61PB | DH-S-61PB | DH-S-61PB | DH-S-61PB | DH-S-61PB | DH-S-61PB |
| Field Date | 08/18/00 | 08/20/00 | 08/17/00 | 08/17/00 | 08/18/00 | 08/21/00 | 08/21/00 | 08/21/00 |
| Extract Date | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 |
| Analysis Date | 03/16/01 | 03/16/01 | 03/16/01 | 03/17/01 | 03/17/01 | 03/17/01 | 03/17/01 | 03/17/01 |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| Percent Solids | 41.7 | 63.3 | 76.2 | 74.8 | 62.7 | 64.7 | 75.2 | 56 |
| Percent Lipids | NA | NA | NA | NA | NA | NA | NA | NA |
| Min Reporting Limit | 0.039 | 0.025 | 0.022 | 0.022 | 0.026 | 0.026 | 0.022 | 0.029 |
| Units | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |

| SHC/TPH | | | | | | | | | |
|---------------------|----|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| n-Nonane | J | 0.024 J | 0.0025 J | ND | 0.0023 J | 0.0089 J | 0.005 J | 0.0038 J | 0.0032 J |
| n-Decane | J | 0.038 J | 0.0056 J | 0.0014 J | 0.0044 J | 0.015 J | 0.0098 J | 0.01 J | 0.0076 J |
| n-Undecane | J | 0.052 | 0.007 J | 0.0011 J | 0.0061 J | 0.021 J | 0.017 J | 0.019 J | 0.011 J |
| n-Dodecane | J | 0.06 | 0.0095 J | 0.0011 J | 0.0071 J | 0.025 J | 0.025 J | 0.03 | 0.015 J |
| n-Tridecane | | 0.082 | 0.017 J | 0.0015 J | 0.011 J | 0.037 | 0.044 | 0.053 | 0.025 J |
| Isoprenoid RRT 1380 | J | 0.026 J | 0.0053 J | ND | 0.0034 J | 0.013 J | 0.02 J | 0.027 | 0.0085 J |
| n-Tetradecane | | 0.091 | 0.02 J | 0.0017 J | 0.012 J | 0.043 | 0.051 | 0.064 | 0.028 J |
| Isoprenoid RRT 1470 | | 0.064 | 0.014 J | ND | 0.0082 J | 0.032 | 0.037 | 0.043 | 0.019 J |
| n-Pentadecane | | 0.12 | 0.032 | 0.0028 J | 0.019 J | 0.059 | 0.067 | 0.08 | 0.039 |
| n-Hexadecane | | 0.12 | 0.033 | 0.0028 J | 0.019 J | 0.059 | 0.058 | 0.068 | 0.038 |
| Isoprenoid RRT 1650 | | 0.056 | 0.015 J | ND | 0.0096 J | 0.028 | 0.034 | 0.04 | 0.018 J |
| n-Heptadecane | | 0.19 | 0.068 | 0.0066 J | 0.028 | 0.1 | 0.075 | 0.067 | 0.073 |
| Pristane | | 0.14 | 0.039 | 0.0061 J | 0.026 | 0.068 | 0.061 | 0.066 | 0.052 |
| n-Octadecane | | 0.15 | 0.04 | 0.0044 J | 0.025 | 0.075 | 0.05 | 0.046 | 0.049 |
| Phytane | | 0.06 | 0.018 J | 0.0021 J | 0.012 J | 0.031 | 0.037 | 0.045 | 0.02 J |
| n-Nonadecane | | 0.25 | 0.061 | 0.006 J | 0.034 | 0.13 | 0.066 | 0.043 | 0.084 |
| n-Eicosane | | 0.21 | 0.053 | 0.0045 J | 0.028 | 0.12 | 0.063 | 0.04 | 0.075 |
| n-Heneicosane | | 0.49 | 0.1 | 0.026 | 0.047 | 0.27 | 0.13 | 0.063 | 0.18 |
| n-Docosane | | 0.34 | 0.074 | 0.012 J | 0.036 | 0.18 | 0.08 | 0.036 | 0.12 |
| n-Tricosane | | 1.1 | 0.19 | 0.022 B | 0.078 | 0.6 | 0.23 | 0.087 | 0.32 |
| n-Tetracosane | | 0.32 | 0.073 | 0.018 JB | 0.036 B | 0.18 | 0.081 | 0.034 B | 0.11 |
| n-Pentacosane | | 0.98 | 0.25 | 0.028 B | 0.087 B | 0.62 | 0.3 | 0.1 | 0.42 |
| n-Hexacosane | B | 0.25 | 0.071 B | 0.022 B | 0.04 B | 0.15 B | 0.08 B | 0.034 B | 0.088 B |
| n-Heptacosane | | 1.3 | 0.39 | 0.036 B | 0.13 B | 0.92 | 0.46 | 0.16 B | 0.59 |
| n-Octacosane | B | 0.18 B | 0.056 B | 0.022 B | 0.035 B | 0.11 B | 0.066 B | 0.03 B | 0.066 B |
| n-Nonacosane | | 0.92 | 0.29 | 0.03 B | 0.11 B | 0.62 | 0.32 | 0.13 B | 0.41 |
| n-Triacontane | | 0.47 | 0.014 JB | 0.052 B | 0.14 | 0.45 | 0.33 | 0.079 B | 0.54 |
| n-Hentriacontane | | 0.78 | 0.22 | 0.025 B | 0.093 B | 0.53 | 0.25 | 0.11 B | 0.32 |
| n-Dotriacontane | B | 0.079 | 0.027 B | 0.009 JB | 0.017 JB | 0.047 B | 0.031 B | 0.021 JB | 0.052 B |
| n-Tritriacontane | | 0.24 | 0.068 | 0.0084 JB | 0.031 B | 0.17 | 0.07 | 0.031 B | 0.091 |
| n-Tettratriacontane | JB | 0.019 JB | 0.0074 JB | 0.0032 JB | 0.0047 JB | 0.012 JB | 0.0075 JB | 0.0044 JB | 0.0084 JB |
| n-Pentatriacontane | J | 0.038 J | 0.013 JB | 0.0032 JB | 0.0065 JB | 0.027 | 0.012 JB | 0.0076 JB | 0.015 JB |
| n-Hexatriacontane | JB | 0.011 J | 0.0041 JB | 0.0021 JB | 0.0026 JB | 0.0064 JB | 0.0037 JB | 0.0028 JB | 0.0051 JB |
| n-Heptatriacontane | J | 0.0091 J | 0.0034 JB | 0.0014 JB | 0.002 JB | 0.0064 J | 0.0032 JB | 0.0017 JB | 0.0053 JB |
| n-Octatriacontane | J | 0.017 J | 0.0024 J | ND | 0.0016 J | 0.0036 J | 0.0016 J | 0.0018 J | 0.048 |
| n-Nonatriacontane | J | 0.0039 J | 0.0013 J | ND | 0.00092 J | 0.0022 J | 0.001 J | 0.00072 J | 0.0022 J |
| n-Tetracontane | J | 0.0043 J | 0.0011 J | ND | 0.00083 J | 0.0025 J | ND | 0.0008 J | 0.0018 J |
| TPH (RES) | | 13 | 3.5 | 0.91 B | 1.6 B | 7.9 | 4.9 | 3.2 | 5.9 |
| TPH | | 23 | 6.4 | 5.9 | 3.5 | 17 | 14 | 11 | 11 |
| %ortho-terphenyl | & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & |
| %5A-androstane | | 76 | 76 | 57 | 71 | 65 | 85 | 64 | 73 |
| %d50-tetracosane | | 79 | 76 | 60 | 74 | 65 | 84 | 67 | 75 |

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| | 00-N18-01-PHC- | | 00-N03-01-PHC- | | 00-3A-01-PHC-T-AS | 00-N12-01-PHC-T-AN | 00-5F-01-PHC-T-CY | 00-L08-01-PHC-T-AS | 00-L09-01-PHC-T-AS | 00-4A-01-PHC-T-AN | 00-5(0)-01-PHC-T-AN | 00-5H-01-PHC-T-AS |
|---------------------|----------------|--------------------|----------------|-----------|-------------------|--------------------|-------------------|--------------------|--------------------|-------------------|---------------------|-------------------|
| Field ID | AN | 00-N13-01-PHC-T-AN | AN | AN | 00-3A-01-PHC-T-AS | 00-N12-01-PHC-T-AN | 00-5F-01-PHC-T-CY | 00-L08-01-PHC-T-AS | 00-L09-01-PHC-T-AS | 00-4A-01-PHC-T-AN | 00-5(0)-01-PHC-T-AN | 00-5H-01-PHC-T-AS |
| Lab ID | 20A3472 | 20A3483 | 20A3495 | 20A3498 | 20A3502 | 20A3509 | 20A3512 | 20A3513 | 20A3517 | 20A3522 | 20A3524 | |
| Sample Type | N | N | N | N | N | N | N | N | N | N | N | N |
| Matrix | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE |
| Sample Size | 9.76 g | 9.86 g | 2.68 g | 8.72 g | 9.26 g | 9.72 g | 8.94 g | 8.36 g | 7.96 g | 9.92 g | 9.17 g | |
| Weight Basis | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET | |
| Associated Blank | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB |
| Field Date | 08/25/00 | 08/19/00 | 08/17/00 | 08/20/00 | 08/19/00 | 08/19/00 | 08/21/00 | 08/21/00 | 08/21/00 | 08/22/00 | 08/22/00 | 08/22/00 |
| Extract Date | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 |
| Analysis Date | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| Percent Solids | 23.6 | 23.3 | 22 | 13.8 | 24.2 | 20.8 | 14.6 | 15.5 | 20.5 | 22.9 | 15 | |
| Percent Lipids | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Min Reporting Limit | 0.051 | 0.051 | 0.19 | 0.057 | 0.054 | 0.051 | 0.056 | 0.06 | 0.063 | 0.05 | 0.054 | |
| Units | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |

| SHC/TPH - Wet | | | | | | | | | | | | |
|---------------------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|
| n-Octane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Nonane | ND | ND | ND | ND | ND | 0.012 J | ND | ND | ND | ND | ND | ND |
| n-Decane | ND | 0.002 J | ND | ND | ND | 0.002 J | ND | ND | ND | ND | 0.0058 J | 0.0025 J |
| n-Undecane | ND | ND | ND | ND | ND | 0.0032 J | ND | ND | ND | ND | ND | ND |
| n-Dodecane | ND | ND | ND | ND | ND | 0.01 J | 0.0034 J | 0.0028 J | ND | 0.0022 J | 0.0024 J | |
| n-Tridecane | ND | 0.0041 J | ND | ND | 0.0021 J | ND | ND | ND | ND | 0.0027 J | ND | ND |
| Isoprenoid RRT 1380 | 0.0097 J | 0.0087 J | ND | ND | 0.003 J | 0.0043 J | 0.0012 J | 0.0016 J | ND | 0.003 J | ND | ND |
| n-Tetradecane | 0.0022 J | 0.0039 J | ND | 0.0018 J | 0.0032 J | 0.0022 J | ND | ND | 0.0034 J | 0.0038 J | ND | ND |
| Isoprenoid RRT 1470 | 0.0048 J | 0.017 J | ND | ND | 0.0091 J | 0.014 J | 0.0038 J | 0.0044 J | 0.0049 J | 0.007 J | 0.0033 J | |
| n-Pentadecane | 0.043 J | 0.023 J | 0.086 J | 0.0026 J | 0.0063 J | 0.088 | 0.0044 J | 0.0042 J | 0.085 | 0.095 | 0.0042 J | |
| n-Hexadecane | 0.0036 JB | 0.0046 JB | 0.012 JB | 0.0027 JB | 0.0072 JB | 0.0033 JB | 0.0033 JB | 0.0027 JB | 0.0096 JB | 0.0068 JB | 0.003 JB | |
| Isoprenoid RRT 1650 | 0.0018 J | 0.0046 J | ND | 0.0026 J | 0.0038 J | ND | ND | 0.0023 J | 0.0028 J | 0.0033 J | 0.0014 J | |
| n-Heptadecane | 0.071 | 0.038 JB | 0.13 J | 0.0048 JB | 0.13 | 0.0054 JB | 0.0056 JB | 0.0051 JB | 0.15 | 0.15 | 0.0056 JB | |
| Pristane | 14 D | 9 | 2.2 | 0.0048 J | 14 D | 0.012 J | 0.0079 J | 0.0079 J | 22 D | 23 D | 0.009 J | |
| n-Octadecane | 0.0046 JB | 0.0063 JB | 0.015 JB | 0.0028 JB | 0.0097 JB | 0.0032 JB | 0.0029 JB | 0.0026 JB | 0.011 JB | 0.0081 JB | 0.0037 JB | |
| Phytane | 0.0029 J | 0.0096 J | ND | ND | 0.0066 J | ND | ND | ND | ND | 0.0027 J | ND | ND |
| n-Nonadecane | 0.0031 J | 0.0058 J | 0.014 J | ND | 0.0081 J | 0.003 J | ND | 0.0021 J | 0.0069 J | 0.0052 J | 0.0027 J | |
| n-Eicosane | 0.0029 J | 0.0051 J | ND | ND | ND | 0.0052 J | ND | ND | 0.0038 J | ND | ND | ND |
| n-Heneicosane | 0.011 JB | 0.046 JB | 0.023 JB | 0.0032 JB | 0.02 JB | 0.0067 JB | 0.0041 JB | 0.0048 JB | 0.014 JB | 0.012 JB | 0.0048 JB | |
| n-Docosane | 0.011 JB | 0.023 JB | 0.035 JB | 0.0047 JB | 0.018 JB | 0.0076 JB | 0.0066 JB | 0.007 JB | 0.014 JB | 0.0099 JB | 0.0073 JB | |
| n-Tricosane | 0.036 JB | 0.076 B | 0.09 JB | 0.014 JB | 0.046 JB | 0.022 JB | 0.018 JB | 0.017 JB | 0.03 JB | 0.034 JB | 0.022 JB | |
| n-Tetracosane | 0.025 JB | 0.023 JB | 0.11 JB | 0.022 JB | 0.026 JB | 0.019 JB | 0.027 JB | 0.026 JB | 0.028 JB | 0.033 JB | 0.034 JB | |
| n-Pentacosane | 0.048 JB | 0.044 JB | 0.21 B | 0.046 JB | 0.052 JB | 0.04 JB | 0.052 JB | 0.05 JB | 0.056 JB | 0.072 B | 0.075 B | |
| n-Hexacosane | 0.045 JB | 0.03 JB | 0.26 B | 0.062 B | 0.044 JB | 0.062 B | 0.044 JB | 0.065 B | 0.062 JB | 0.079 B | 0.099 B | |
| n-Heptacosane | 0.064 B | 0.047 JB | 0.34 B | 0.086 B | 0.067 B | 0.075 B | 0.095 B | 0.091 B | 0.088 B | 0.11 B | 0.14 B | |
| n-Octacosane | 0.054 B | 0.034 JB | 0.3 B | 0.078 B | 0.053 JB | 0.056 B | 0.08 B | 0.08 B | 0.077 B | 0.09 B | 0.12 B | |
| n-Nonacosane | 0.056 B | 0.042 JB | 0.31 B | 0.078 B | 0.061 B | 0.066 B | 0.083 B | 0.081 B | 0.087 B | 0.092 B | 0.13 B | |
| n-Triacontane | 0.042 JB | 0.026 JB | 0.22 B | 0.057 B | 0.042 JB | 0.044 JB | 0.058 B | 0.057 JB | 0.06 JB | 0.062 B | 0.1 B | |
| n-Hentriacontane | 0.041 JB | 0.027 JB | 0.21 B | 0.053 JB | 0.044 JB | 0.046 JB | 0.053 JB | 0.053 JB | 0.056 JB | 0.057 B | 0.085 B | |
| n-Dotriacontane | 0.024 JB | 0.016 JB | 0.12 JB | 0.032 JB | 0.027 JB | 0.024 JB | 0.03 JB | 0.031 JB | 0.034 JB | 0.035 JB | 0.047 JB | |
| n-Tritriacontane | 0.017 JB | 0.0097 JB | 0.085 JB | 0.02 JB | 0.02 JB | 0.018 JB | 0.019 JB | 0.019 JB | 0.021 JB | 0.023 JB | 0.032 JB | |
| n-Tettratriacontane | 0.0084 JB | 0.006 JB | 0.045 JB | 0.01 JB | 0.01 JB | 0.0073 JB | 0.01 JB | 0.0096 JB | 0.013 JB | 0.013 JB | 0.016 JB | |
| n-Pentatriacontane | 0.006 JB | 0.0061 JB | 0.03 JB | 0.0061 JB | 0.0081 JB | 0.005 JB | 0.0061 JB | 0.0062 JB | 0.0086 JB | 0.0084 JB | 0.0087 JB | |
| n-Hexatriacontane | 0.0033 J | 0.0026 J | 0.016 J | 0.003 J | 0.0054 J | 0.0024 J | 0.0028 J | 0.0046 J | 0.0038 J | 0.0038 J | 0.0044 J | |
| n-Heptatriacontane | 0.0019 J | ND | 0.0099 J | ND | 0.0036 J | ND | ND | ND | ND | 0.0023 J | 0.0024 J | |
| n-Octatriacontane | 0.0024 J | 0.0089 J | 0.012 J | ND | ND | ND | ND | 0.0051 J | ND | ND | ND | ND |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - SHC Results - Tissue

| | | | | | | | | | | | | |
|-------------------|----------------|--------------------|----------------|-------------------|--------------------|-------------------|--------------------|--------------------|-------------------|---------------------|-------------------|----|
| | 00-N18-01-PHC- | | 00-N03-01-PHC- | | | | | | | | | |
| Field ID | AN | 00-N13-01-PHC-T-AN | AN | 00-3A-01-PHC-T-AS | 00-N12-01-PHC-T-AN | 00-5F-01-PHC-T-CY | 00-L08-01-PHC-T-AS | 00-L09-01-PHC-T-AS | 00-4A-01-PHC-T-AN | 00-5(0)-01-PHC-T-AN | 00-5H-01-PHC-T-AS | |
| Lab ID | 20A3472 | 20A3483 | 20A3495 | 20A3498 | 20A3502 | 20A3509 | 20A3512 | 20A3513 | 20A3517 | 20A3522 | 20A3524 | |
| Sample Type | N | N | N | N | N | N | N | N | N | N | N | |
| Matrix | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | |
| Sample Size | 9.76 g | 9.86 g | 2.68 g | 8.72 g | 9.26 g | 9.72 g | 8.94 g | 8.36 g | 7.96 g | 9.92 g | 9.17 g | |
| Weight Basis | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET | |
| Associated Blank | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | DH-S-64PB | |
| Field Date | 08/25/00 | 08/19/00 | 08/17/00 | 08/20/00 | 08/19/00 | 08/19/00 | 08/21/00 | 08/21/00 | 08/21/00 | 08/22/00 | 08/22/00 | |
| Extract Date | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | |
| Analysis Date | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | 04/07/01 | |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | |
| Percent Solids | 23.6 | 23.3 | 22 | 13.8 | 24.2 | 20.8 | 14.6 | 15.5 | 20.5 | 22.9 | 15 | |
| n-Nonatriacontane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| n-Tetracontane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TPH (RES) | 13 B | 10 B | 6.9 B | 1.3 B | 20 B | 1.5 B | 3 B | 1.6 B | 32 | 30 | 1.9 B | |
| TPH | 15 | 14 | 12 | 1.6 | 26 | 4.4 | ND | ND | ND | ND | ND | ND |
| | | | | | | | | | | | | |
| 5A-androstane | 66 | 52 | 59 | 59 | 50 | 68 | 45 | 60 | 39 | 57 | 53 | |
| d50-tetracosane | 70 | 56 | 63 | 63 | 51 | 70 | 47 | 61 | 40 | 59 | 53 | |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - SHC Results - Field QC

| | | |
|---------------------|------------------|------------------|
| Field ID | 00-N01-01-PHC-EB | 00-N13-01-PHC-FB |
| Lab ID | 20A3487 | 20A3503 |
| Sample Type | N | N |
| Matrix | WATER | WATER |
| Associated Blank | DH-S-68PB | DH-S-68PB |
| Field Date | 08/17/00 | 08/19/00 |
| Extract Date | 04/06/01 | 04/06/01 |
| Analysis Date | 04/10/01 | 04/10/01 |
| Date Received | 08/30/00 | 08/30/00 |
| Percent Solids | NA | NA |
| Percent Lipids | NA | NA |
| Min Reporting Limit | 7.7 | 5.9 |
| Units | ug/L | ug/L |

SHC/TPH

| | | |
|---------------------|---------|---------|
| n-Nonane | ND | ND |
| n-Decane | 0.36 JB | ND |
| n-Undecane | ND | ND |
| n-Dodecane | ND | ND |
| n-Tridecane | ND | ND |
| Isoprenoid RRT 1380 | ND | ND |
| n-Tetradecane | ND | ND |
| Isoprenoid RRT 1470 | ND | ND |
| n-Pentadecane | ND | ND |
| n-Hexadecane | ND | ND |
| Isoprenoid RRT 1650 | ND | ND |
| n-Heptadecane | ND | ND |
| Pristane | ND | ND |
| n-Octadecane | ND | ND |
| Phytane | ND | ND |
| n-Nonadecane | ND | ND |
| n-Eicosane | ND | ND |
| n-Heneicosane | 0.33 J | ND |
| n-Docosane | 0.48 J | 0.18 J |
| n-Tricosane | 1.3 J | 0.55 JB |
| n-Tetracosane | 1.5 J | 0.77 J |
| n-Pentacosane | 3 J | 1.6 J |
| n-Hexacosane | 3.8 J | 2.1 J |
| n-Heptacosane | 5.2 J | 2.7 J |
| n-Octacosane | 5.3 J | 3.4 J |
| n-Nonacosane | 4.8 J | 2.8 J |
| n-Triacontane | 3.5 J | 2.4 J |
| n-Hentriacontane | 3.2 J | 2.4 J |
| n-Dotriacontane | 1.9 J | 1.7 J |
| n-Tritriacontane | 1.4 J | 1.3 J |
| n-Tetratriacontane | 0.98 J | 0.85 J |
| n-Pentatriacontane | 0.59 J | 0.66 J |
| n-Hexatriacontane | 0.47 J | 0.38 J |
| n-Heptatriacontane | 0.28 J | 0.24 J |
| n-Octatriacontane | 0.56 J | 0.43 J |
| n-Nonatriacontane | ND | ND |
| n-Tetracontane | ND | ND |
| %ortho-terphenyl | 60 | 67 |
| %5A-androstane | 60 | 67 |
| %d50-tetracosane | 60 | 67 |

Arthur D. Little
Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - ST Results - Sediment

| | | | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|------------------|------------------|-------------------|------------------|
| Field ID | 00-C0L-01-PHC-S | 00-SAG-01-PHC-S | 00-N14-01-PHC-S | 00-N13-03-PHC-S | 00-N12-01-PHC-S | 00-5F-01-PHC-S | 00-N15-01-PHC-S | 00-N21-01-PHC-S | 00-L07-01-PHC-S | 00-L08-01-PHC-S | 00-L01-01-PHC-S | 00-4A-01-PHC-S | 00-4B-01-PHC-S | 00-5(1)-01-PHC-S | 00-5(5)-01-PHC-S | 00-5(10)-01-PHC-S | 00-5(0)-01-PHC-S |
| Lab ID | 20A3500 F1 | 20A3501 F1 | 20A3504 F1 | 20A3505 F1 | 20A3506 F1 | 20A3507 F1 | 20A3508 F1 | 20A3510 F1 | 20A3514 F1 | 20A3515 F1 | 20A3516 F1 | 20A3518 F1 | 20A3519 F1 | 20A3520 F1 | 20A3521 F1 | 20A3523 F1 | 20A3525 F |
| Sample Type | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Size | 24.52 g | 22.34 g | 14.97 g | 17.22 g | 15.4 g | 20.98 g | 25.19 g | 14.71 g | 21.18 g | 22.2 g | 15.66 g | 21.06 g | 19.42 g | 20.05 g | 20.44 g | 22.09 g | 20.72 g |
| Weight Basis | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| Associated Blank | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA |
| Field Date | 08/24/00 | 08/25/00 | 08/19/00 | 08/19/00 | 08/19/00 | 08/19/00 | 08/19/00 | 08/21/00 | 08/21/00 | 08/21/00 | 08/21/00 | 08/21/00 | 08/21/00 | 08/22/00 | 08/22/00 | 08/22/00 | 08/22/00 |
| Extract Date | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 | 03/07/01 |
| Analysis Date | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/15/01 | 03/16/01 | 03/16/01 |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| Percent Solids | 79.7 | 72.5 | 49.4 | 57.2 | 50.3 | 68.2 | 82.2 | 48.9 | 70.7 | 73.5 | 51.9 | 71.5 | 63.3 | 66.3 | 68.3 | 73.4 | 69.1 |
| Percent Lipids | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Min Reporting Limit | 0.51 | 0.56 | 0.72 | 0.72 | 0.81 | 0.6 | 0.5 | 0.85 | 0.59 | 0.56 | 0.8 | 0.59 | 0.64 | 0.62 | 0.61 | 0.56 | 0.6 |
| Units | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| Sterane-Triterpane Biomarkers | | | | | | | | | | | | | | | | | |
| T4-C23Diterpane | 0.5 J | 0.65 | 2 | 1.2 | 2.1 | 0.74 | 0.083 J | 2.2 | 0.81 | 1.4 | 1.7 | 0.59 | 3.2 | 0.72 | 0.56 J | 0.57 | 0.54 J |
| S4-Diacholestane | 0.4 J | 1 | 2.4 | 1.6 | 2.2 | 0.82 | 0.065 J | 2.6 | 0.93 | 1.5 | 2.1 | 1.1 | 3.4 | 0.89 | 0.73 | 0.62 | 0.73 |
| S5-Diacholestane | 0.27 J | 0.53 J | 1.6 | 1 | 1.6 | 0.55 J | 0.059 J | 1.8 | 0.63 | 1.1 | 1.4 | 0.72 | 2.2 | 0.6 J | 0.51 J | 0.44 J | 0.54 J |
| T9-C29Tricyclitriterpane | 0.12 J | 0.12 J | 0.36 J | 0.19 J | 0.26 J | 0.11 J | 0.018 J | 0.45 J | 0.3 J | 0.32 J | 0.36 J | 0.16 J | 0.79 | 0.099 J | 0.096 J | 0.096 J | 0.098 J |
| T10-C29Tricyclitriterpane | 0.11 J | 0.16 J | 0.38 J | 0.27 J | 0.43 J | 0.16 J | 0.013 J | 0.33 J | 0.15 J | 0.29 J | 0.32 J | 0.14 J | 0.69 | 0.13 J | 0.065 J | 0.084 J | 0.087 J |
| T11-Triarhopane(TS) | 0.43 J | 0.51 J | 1.4 | 0.92 | 1.8 | 0.5 J | 0.051 J | 1.2 | 0.41 J | 0.94 | 1.5 | 0.61 | 1.1 | 0.47 J | 0.38 J | 0.47 J | 0.47 J |
| T12-Triarhopane(TM) | 1.8 | 1.4 | 7.2 | 5 | 9 | 2.2 | 0.17 J | 9.9 | 0.99 | 1.6 | 3.6 | 1.9 | 2.7 | 2.4 | 1.9 | 1.7 | 1.5 |
| S24-Methylcholestane | 2 | 1.1 | 5.9 | 4.8 | 9.6 | 1.9 | 0.14 J | 10 | 0.82 | 2.1 | 3 | 1.2 | 3 | 2 | 1.6 | 1 | 1.1 |
| S25-Ethylcholestane | 0.46 J | 0.48 J | 1.6 | 1.3 | 1.4 | 0.5 J | 0.059 J | 2.2 | 0.35 J | 0.64 | 0.98 | 0.7 | 1.3 | 0.4 J | 0.22 J | 0.43 J | 0.56 J |
| S28-Ethylcholestane | 6.7 | 3.6 | 60 | 31 | 57 | 16 | 0.7 | 65 | 5.4 | 10 | 14 | 6.5 | 12 | 9.5 | 8.2 | 5.8 | 6.2 |
| T15-Norhopane | 3.3 | 3.3 | 20 | 12 | 19 | 5.6 | 0.43 J | 22 | 2.8 | 6.2 | 11 | 5.2 | 7.9 | 5.6 | 4.5 | 3.6 | 4 |
| T18-Oleanane | ND | 0.076 J | 0.43 J | 0.2 J | 0.19 J | 0.14 J | ND | 0.38 J | 0.28 J | 0.4 J | 0.32 J | 0.25 J | 0.62 J | ND | ND | ND | 0.12 J |
| T19-Hopane | 4.2 | 4.4 | 17 | 12 | 19 | 6.4 | 0.44 J | 24 | 2.8 | 5.7 | 10 | 6.4 | 8.3 | 5.8 | 4.7 | 3.9 | 4.1 |
| T21-Homohopane | 1.4 | 1.4 | 5.6 | 3.9 | 6.8 | 1.9 | 0.16 J | 9.5 | 1 | 2.4 | 3.7 | 2.3 | 2.8 | 1.8 | 1.3 | 1.1 | 1 |
| T22-Homohopane | 4.9 | 11 | 20 | 12 | 20 | 10 | 0.48 J | 25 | 2.4 | 3.1 | 8 | 4.2 | 4.8 | 5.4 | 5.9 | 3.4 | 4.2 |
| SB(H)-Cholane | 93 | 96 | 98 | 99 | 100 | 104 | 95 | 102 | 95 | 108 | 108 | 103 | 94 | 106 | 102 | 83 | 112 |

Arthur D. Little
Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - ST Results - Sediment

| 00-N05-01-PHC-S 20A3526 F1 | 00-N08-01-PHC-S 20A3527 F1 | 00-L09-01-PHC-S 20A03511REF F1 | 00-N09-01-PHC-S 20A3528 F1 | 00-5A-01-PHC-S 20A3529 F1 | 00-3A-01-PHC-S 20A3530 F1 | 00-L04-01-PHC-S 20A3531 F1 | 00-N11-01-PHC-S 20A3532 F1 | 00-N04-01-PHC-S 20A3533 F1 | 00-3B-01-PHC-S 20A3534 F1 | 00-5B-01-PHC-S 20A3535 F1 | 00-5E-01-PHC-S 20A3536 F1 | 00-N20-01-PHC-S 20A3537 F1 | 00-L08-02-PHC-S 20A3538 F1 | 00-L08-03-PHC-S 20A3539 F1 | 00-L06-01-PHC-S 20A3540 F1 | 00-N06-01-PHC-S 20A3468 REF F1 | 00-N18-01-PHC-S 20A3469 REF F1 | 00-N23-01-PHC-S 20A3473 REF F1 | 00-COL-02-PHC-S 20A3474 REF F1 |
|-------------------------------|-------------------------------|-----------------------------------|-------------------------------|------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| 16.74 g | 20.26 g | 23.5 g | 19.82 g | 12.41 g | 17.64 g | 18.59 g | 17.69 g | 12.66 g | 19.64 g | 23.04 g | 22.59 g | 19.09 g | 19.5 g | 22.72 g | 17.1 g | 19.64 g | 16.79 g | 17.05 g | 21.16 g |
| DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| DH-S-58PB PCA | DH-S-58PB PCA | DH-S-58PB PCA | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-61PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 |
| 08/18/00 | 08/18/00 | 08/21/00 | 08/18/00 | 08/18/00 | 08/20/00 | 08/20/00 | 08/18/00 | 08/18/00 | 08/20/00 | 08/17/00 | 08/17/00 | 08/18/00 | 08/21/00 | 08/21/00 | 08/21/00 | 08/17/00 | 08/17/00 | 08/23/00 | 08/24/00 |
| 03/07/01 | 03/07/01 | 03/07/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 03/08/01 | 02/20/01 | 02/20/01 | 02/20/01 |
| 03/16/01 | 03/16/01 | 03/21/01 | 03/20/01 | 03/20/01 | 03/20/01 | 03/20/01 | 03/21/01 | 03/21/01 | 03/21/01 | 03/21/01 | 03/21/01 | 03/21/01 | 03/21/01 | 03/21/01 | 03/21/01 | 03/27/01 | 03/27/01 | 03/27/01 | 03/27/01 |
| 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| 54.1 | 67.3 | 77.4 | 65.8 | 40.9 | 58.6 | 61.2 | 58 | 41.7 | 63.3 | 76.2 | 74.8 | 62.7 | 64.7 | 75.2 | 56 | 63.8 | 55.6 | 56.5 | 68.8 |
| NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 0.75 | 0.62 | 0.53 | 0.63 | 1 | 0.71 | 0.67 | 0.71 | 0.99 | 0.64 | 0.54 | 0.55 | 0.65 | 0.64 | 0.55 | 0.73 | 0.64 | 0.74 | 0.73 | 0.59 |
| ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| 1.7 | 2.6 | 0.21 J | 0.28 J | 1.7 | 0.76 | 0.52 J | 1.2 | 1.6 | 0.58 J | 0.87 | 0.56 | 1 | 1.6 | 1.1 | 0.65 J | 0.73 | 1.1 | 1.4 | 1.6 |
| 2 | 2.4 | 0.34 J | 0.39 J | 2.1 | 1.1 | 0.87 | 1.4 | 2 | 0.77 | 0.81 | 0.58 | 1 | 1.8 | 1.5 | 1.1 | 0.97 | 1.4 | 2.1 | 1.8 |
| 1.4 | 1.6 | 0.22 J | 0.26 J | 1.4 | 0.64 J | 0.55 J | 0.87 | 1.4 | 0.48 J | 0.48 J | 0.39 J | 0.7 | 1.1 | 0.74 | 0.65 J | 0.49 J | 0.98 | 1.4 | 1.6 |
| 0.35 J | 0.58 J | 0.042 J | 0.17 J | 0.4 J | 0.21 J | 0.24 J | 0.3 J | 0.48 J | 0.15 J | 0.29 J | 0.17 J | 0.2 J | 0.39 J | 0.31 J | 0.26 J | 0.48 J | 0.24 J | 0.46 J | 0.38 J |
| 0.32 J | 0.56 J | 0.052 J | 0.21 J | 0.4 J | 0.24 J | 0.18 J | 0.19 J | 0.42 J | 0.16 J | 0.23 J | 0.14 J | 0.18 J | 0.39 J | 0.3 J | 0.19 J | 0.17 J | 0.23 J | 0.42 J | 0.38 J |
| 1.7 | 0.78 | 0.22 J | 0.38 J | 2.1 | 0.78 | 0.74 | 1 | 2.1 | 0.64 | 0.28 J | 0.5 J | 0.98 | 1.3 | 1.2 | 0.83 | 0.91 | 1.1 | 1.3 | 0.83 |
| 6.4 | 2.8 | 0.6 | 1.1 | 8.4 | 1.8 | 2.1 | 3.8 | 9.1 | 1.6 | 0.34 J | 1.4 | 4.2 | 2 | 1.3 | 1.9 | 2.3 | 4.5 | 3.6 | 21 |
| 5.9 | 3.2 | 0.56 | 1.1 | 8.4 | 1.8 | 1.4 | 2.8 | 9.6 | 1.4 | 0.54 | 1.2 | 3.8 | 2.1 | 1.8 | 1.6 | 2.4 | 4.5 | 3.4 | 23 |
| 1.7 | 0.74 | 0.15 J | 0.31 J | 1.6 | 0.73 | 0.67 | 0.73 | 2 | 0.54 J | 0.3 J | 0.45 J | 1 | 0.97 | 1.2 | 0.66 J | 0.54 J | 1.1 | 1.4 | 2.6 |
| 26 | 10 | 2.2 | 5.1 | 44 | 10 | 23 | 31 | 51 | 7.8 | 0.75 | 4.2 | 28 | 17 | 5.7 | 24 | 9.7 | 20 | 20 | 86 |
| 16 | 6.5 | 1.7 | 3.2 | 20 | 6.2 | 7 | 12 | 20 | 4.2 | 0.95 | 3.6 | 11 | 8.8 | 5.3 | 5.7 | 5.7 | 11 | 10 | 29 |
| 0.15 J | 0.34 J | 0.11 J | ND | ND | 0.17 J | 0.3 J | 0.17 J | 0.25 J | 0.21 J | 0.13 J | 0.086 J | 0.29 J | 0.59 J | 0.42 J | 0.42 J | 0.098 J | 0.13 J | 0.52 J | ND |
| 15 | 7.2 | 1.8 | 2.9 | 21 | 5.6 | 6 | 9.8 | 21 | 4.7 | 1 | 4.2 | 10 | 6.6 | 5.6 | 12 | 6.5 | 12 | 11 | 34 |
| 4.6 | 2.2 | 0.7 | 1.4 | 8.9 | 2.3 | 2.3 | 3.9 | 7.5 | 1.8 | 0.4 J | 1.8 | 3.8 | 2.7 | 2.4 | 2.1 | 2.4 | 4.6 | 4.2 | 18 |
| 14 | 6 | 1.8 | 2.9 | 20 | 3.5 | 5.2 | 13 | 20 | 2.9 | 0.4 J | 2.5 | 13 | 5.1 | 3.3 | 4.9 | 5.1 | 14 | 6.4 | 62 |
| 103 | 107 | 78 | 83 | 81 | 89 | 86 | 84 | 83 | 90 | 77 | 76 | 76 | 86 | 79 | 78 | 77 | 69 | 73 | 72 |

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Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - ST Results - Sediment

| 00-KUP-01-PHC-S 20A3475 REF F1 | 00-KUP-02-PHC-S 20A3476 REF F1 | 00-N00-01-PHC-S 20A3482 REF F1 | 00-N13-02-PHC-S 20A3484 REF F1 | 00-N13-01-PHC-S 20A3485 REF F1 | 00-N19-01-PHC-S 20A3486 REF F1 | 00-N10-01-PHC-S 20A3488 REF F1 | 00-N03-01-PHC-S 20A3489 REF F1 | 00-N07-01-PHC-S 20A3490 REF F1 | 00-N16-01-PHC-S 20A3491 REF F1 | 00-N02-01-PHC-S 20A3492 REF F1 | 00-N01-01-PHC-S 20A3493 REF F1 | 00-N17-01-PHC-S 20A3494 REF F1 | 00-5D-01-PHC-S 20A3496 REF F1 | 00-5H-01-PHC-S 20A3497 REF F1 | 00-4C-01-PHC-S 20A3499 REF F1 |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| N 23.02 g DRY | PEAT 20.9 g DRY | N 21.1 g DRY | N 15.88 g DRY | N 16.46 g DRY | N 18.62 g DRY | N 19.31 g DRY | N 16.02 g DRY | N 16.37 g DRY | N 18.17 g DRY | N 19.09 g DRY | N 23.3 g DRY | N 17.86 g DRY | N 16.66 g DRY | N 22.17 g DRY | N 17.71 g DRY |
| DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 | DH-S-55PB F1 |
| 08/24/00 | 02/20/01 | 08/24/00 | 02/20/01 | 08/19/00 | 02/20/01 | 08/17/00 | 08/17/00 | 08/17/00 | 08/17/00 | 08/17/00 | 08/17/00 | 08/17/00 | 08/22/00 | 08/22/00 | 08/21/00 |
| 02/20/01 | 03/27/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 |
| 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| 75.6 | 66.2 | 66.1 | 51.4 | 53.7 | 61 | 62 | 51.4 | 54.2 | 59.6 | 62.4 | 75.4 | 57.3 | 54.2 | 69.1 | 57.4 |
| NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 0.54 | 0.6 | 1.2 | 0.79 | 0.76 | 0.67 | 0.65 | 1.6 | 0.76 | 0.69 | 0.65 | 0.54 | 0.7 | 0.75 | 0.56 | 0.7 |
| ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| | | | | | | | | | | | | | | | |
| 0.1 J | 0.29 J | 1 J | 1.3 | 1 | 0.87 | 1.7 | 1.3 J | 1.3 | 1.1 | 0.74 | 0.18 J | 1.2 | 1.1 | 0.67 | 0.4 J |
| 0.062 J | 0.38 J | 1.6 | 1.8 | 1.6 | 1.2 | 1.5 | 1.7 | 1.8 | 1.5 | 1 | 0.19 J | 1.4 | 1.4 | 0.84 | 0.67 J |
| 0.035 J | 0.21 J | 0.89 J | 1.3 | 1.1 | 0.75 | 1 | 1 J | 1 | 0.94 | 0.56 J | 0.13 J | 0.96 | 0.86 | 0.49 J | 0.35 J |
| ND | 0.092 J | 0.3 J | 0.32 J | 0.28 J | 0.22 J | 0.3 J | 0.32 J | 0.34 J | 0.37 J | 0.19 J | 0.044 J | 0.3 J | 0.3 J | 0.17 J | 0.13 J |
| ND | 0.1 J | 0.28 J | 0.33 J | 0.28 J | 0.22 J | 0.28 J | 0.35 J | 0.34 J | 0.35 J | 0.22 J | 0.043 J | 0.33 J | 0.31 J | 0.2 J | 0.12 J |
| 0.06 J | 0.18 J | 1.3 | 1.3 | 1 | 0.86 | 1.4 | 1.3 J | 1.4 | 1.2 | 0.84 | 0.2 J | 1.3 | 0.71 J | 0.57 | 0.48 J |
| 0.12 J | 2.2 | 3.4 | 6.8 | 5.2 | 3.3 | 3.7 | 3.4 | 3.4 | 3.2 | 2.2 | 0.41 J | 3.2 | 4 | 1.4 | 1.2 |
| 0.06 J | 0.6 | 3.1 | 7 | 5.3 | 3 | 2.6 | 3.4 | 3.5 | 3.2 | 2.2 | 0.38 J | 3.3 | 3.4 | 1.5 | 1.1 |
| 0.033 J | 0.27 J | 1.2 | 1.3 | 1.1 | 0.78 | 0.85 | 1.1 J | 1 | 0.7 | 0.12 J | 1 | 1.2 | 0.51 J | 0.37 J | |
| 0.38 J | 22 | 18 | 40 | 30 | 15 | 31 | 16 | 16 | 18 | 8.5 | 1.4 | 16 | 48 | 9.6 | 5.7 |
| 0.4 J | 6 | 11 | 14 | 14 | 7.5 | 12 | 8.6 | 9.9 | 10 | 5.2 | 1.1 | 8.7 | 14 | 4.2 | 3.2 |
| ND | 0.077 J | 0.48 J | 0.31 J | 0.28 J | 0.17 J | 0.28 J | 0.41 J | 0.21 J | 0.16 J | 0.12 J | 0.17 J | 0.61 J | 0.14 J | 0.14 J | |
| 0.45 J | 5 | 11 | 16 | 13 | 9 | 9.4 | 9.9 | 10 | 9.9 | 6.2 | 1.2 | 9.7 | 10 | 4.2 | 3.6 |
| 0.14 J | 1.4 | 4 | 6 | 4.6 | 3.5 | 3.6 | 4.1 | 4 | 4.2 | 2.4 | 0.53 J | 4 | 3.4 | 1.7 | 1.4 |
| 0.35 J | 12 | 9.4 | 18 | 14 | 8 | 14 | 6.6 | 7.5 | 8.2 | 4.7 | 0.8 | 7 | 15 | 3.3 | 3.9 |
| 72 | 64 | 82 | 79 | 79 | 86 | 75 | 83 | 80 | 83 | 82 | 80 | 86 | 84 | 83 | 82 |

| | | | | | | | | | | | |
|-------------------------------|-------------------|-------------------|-------------------|-------------------|---------------------|------------------|---------------------|--------------------|------------------|--------------------|--------------------|
| Field ID | 00-3A-01-PHC-T-AS | 00-4A-01-PHC-T-AN | 00-5H-01-PHC-T-AS | 00-5F-01-PHC-T-CY | 00-5(0)-01-PHC-T-AN | 00-N03-01-PHC-AN | 00-N12-01-PHC--T-AN | 00-N13-01-PHC-T-AN | 00-N18-01-PHC-AN | 00-L08-01-PHC-T-AS | 00-L09-01-PHC-T-AS |
| Lab ID | 20A3498F1 | 20A3517F1 | 20A3524F1 | 20A3509F1 | 20A3522F1 | 20A3495F1 | 20A3502F1 | 20A3483F1 | 20A3472F1 | 20A3512F1 | 20A3513F1 |
| Matrix | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE |
| Sample Size | 8.72 g | 7.96 g | 9.17 g | 9.72 g | 9.92 g | 2.68 g | 9.26 g | 9.86 g | 9.76 g | 8.94 g | 8.36 g |
| Weight Basis | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET |
| Associated Blank | DH-S-64PBF1 | DH-S-64PBF1 | DH-S-64PBF1 | DH-S-64PBF1 | DH-S-64PBF1 | DH-S-64PBF1 | DH-S-64PBF1 | DH-S-64PBF1 | DH-S-64PBF1 | DH-S-64PBF1 | DH-S-64PBF1 |
| Field Date | 08/20/00 | 08/21/00 | 08/22/00 | 08/19/00 | 08/22/00 | 08/17/00 | 08/19/00 | 08/19/00 | 08/25/00 | 08/21/00 | 08/21/00 |
| Extract Date | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 | 03/28/01 |
| Analysis Date | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 | 04/12/01 |
| Date Received | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 | 08/30/00 |
| Percent Solids | 13.8 | 20.5 | 15 | 20.8 | 22.9 | 22 | 24.2 | 23.3 | 23.6 | 14.6 | 15.5 |
| Percent Lipids | 4.54 | 3.24 | 1.56 | 1.24 | 1.96 | NA | 12.8 | 0.987 | 4.48 | 1.78 | 2.97 |
| Min Reporting Limit | 1.4 | 1.6 | 1.4 | 1.3 | 1.3 | 4.7 | 1.3 | 1.3 | 1.3 | 1.4 | 1.5 |
| Units | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| Sterane-Triterpane Biomarkers | | | | | | | | | | | |
| T4-C23Diterpane | 0.044 J | 0.095 J | 0.066 J | 0.096 J | 0.071 J | 0.38 J | 0.13 J | 0.23 J | 0.12 J | 0.1 J | 0.06 J |
| S4-Diacholestane | 0.066 J | 0.14 J | 0.12 J | 0.13 J | 0.1 J | 0.27 J | 0.14 J | 0.21 J | 0.13 J | 0.086 J | 0.097 J |
| S5-Diacholestane | 0.048 J | ND | 0.087 J | 0.069 J | 0.083 J | 0.22 J | 0.092 J | 0.15 J | 0.082 J | 0.062 J | 0.078 J |
| T9-C29Tricyclitriterpane | ND | ND | ND | ND | ND | ND | ND | 0.07 J | ND | ND | ND |
| T10-C29Tricyclitriterpane | ND | ND | ND | ND | ND | ND | ND | 0.047 J | ND | ND | ND |
| T11-Trisnorhopane(TS) | 0.07 J | 0.11 J | 0.25 J | 0.1 J | 0.069 J | 0.5 J | 0.19 J | 0.22 J | 0.12 J | 0.096 J | 0.11 J |
| T12-Trisnorhopane(TM) | 0.078 J | 0.072 J | 0.15 J | 0.19 J | 0.073 J | 0.44 J | 0.13 J | 0.18 J | 0.099 J | 0.11 J | 0.088 J |
| S24-Methylcholestane | 0.078 J | 0.11 J | 0.13 J | 0.14 J | 0.074 J | 0.25 J | 0.14 J | 0.13 J | 0.096 J | 0.09 J | 0.13 J |
| S25-Ethylcholestane | 0.059 J | 0.16 J | 0.14 J | 0.1 J | 0.11 J | 0.23 J | 0.11 J | 0.13 J | 0.074 J | 0.1 J | 0.086 J |
| S28-Ethylcholestane | 0.19 J | 0.29 J | 0.39 J | 0.66 J | 0.24 J | 0.59 J | 0.42 J | 0.46 J | 0.31 J | 0.23 J | 0.24 J |
| T15-Norhopane | 0.24 J | 0.29 J | 0.64 J | 0.49 J | 0.22 J | 0.96 J | 0.48 J | 0.61 J | 0.36 J | 0.33 J | 0.24 J |
| T18-Oleanane | 0.6 J | 0.55 J | 0.56 J | 0.6 J | 0.45 J | 2 J | 0.53 J | 0.54 J | 0.55 J | 0.52 J | |
| T19-Hopane | 0.31 J | 0.34 J | 0.88 J | 0.51 J | 0.3 J | 1.2 J | 0.46 J | 0.59 J | 0.43 J | 0.46 J | 0.36 J |
| T21-Homohopane | 0.12 J | 0.11 J | 0.29 J | 0.2 J | 0.1 J | 0.5 J | 0.18 J | 0.26 J | 0.19 J | 0.23 J | 0.19 J |
| T22-Homohopane | 0.12 J | 0.15 J | 0.28 J | 0.36 J | 0.15 J | 0.55 J | 0.24 J | 0.31 J | 0.22 J | 0.22 J | 0.29 J |
| 5B(H)-Cholane | 76 | 48 | 74 | 78 | 70 | 72 | 66 | 70 | 83 | 52 | 71 |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - ST Results - Field QC

| | | |
|---------------------|------------------|------------------|
| Field ID | 00-N01-01-PHC-EB | 00-N13-01-PHC-FB |
| Lab ID | 20A3487 | 20A3503 |
| Sample Type | N | N |
| Matrix | WATER | WATER |
| Sample Size | 0.065 L | 0.085 L |
| Weight Basis | WET | WET |
| Associated Blank | DH-S-68PB | DH-S-68PB |
| Field Date | 08/17/00 | 08/19/00 |
| Extract Date | 04/06/01 | 04/06/01 |
| Analysis Date | 04/12/01 | 04/12/01 |
| Date Received | 08/30/00 | 08/30/00 |
| Percent Solids | NA | NA |
| Percent Lipids | NA | NA |
| Min Reporting Limit | 190 | 150 |
| Units | ng/L | ng/L |

Sterane-Triterpane Biomarkers

| | | |
|---------------------------|------|----|
| T4-C23Diterpane | ND | ND |
| S4-Diacholestane | ND | ND |
| S5-Diacholestane | ND | ND |
| T9-C29Tricyclitriterpane | ND | ND |
| T10-C29Tricyclitriterpane | ND | ND |
| T11-Trisnorhopane(TS) | ND | ND |
| T12-Trisnorhopane(TM) | ND | ND |
| S24-Methylcholestane | ND | ND |
| S25-Ethylcholestane | ND | ND |
| S28-Ethylcholestane | ND | ND |
| T15-Norhopane | 23 J | ND |
| T18-Oleanane | ND | ND |
| T19-Hopane | 24 J | ND |
| T21-Homohopane | ND | ND |
| T22-Homohopane | ND | ND |

| | | |
|---------------|----|----|
| 5B(H)-Cholane | 72 | 84 |
|---------------|----|----|

| | | | | | | | |
|---------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Field ID | 02-3A-01-PHC-S | 02-3B-01-PHC-S | 02-4A-01-PHC-S | 02-4B-01-PHC-S | 02-4C-01-PHC-S | 02-5A-01-PHC-S | 02-5B-01-PHC-S |
| Sample Type | N | N | N | N | N | N | N |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Size | 19.17 g | 18.04 g | 20.89 g | 22.18 g | 24.91 g | 17.51 g | 24.26 g |
| Weight Basis | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| Associated Blank | DY-S-69PB | DY-S-69PB | DY-S-66PB | DY-S-66PB | DY-S-66PB | DY-S-63PB | DY-S-63PB |
| Field Date | 07/29/02 | 07/29/02 | 07/31/02 | 07/31/02 | 07/31/02 | 08/03/02 | 08/03/02 |
| Extract Date | 10/17/02 | 10/17/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/15/02 | 10/15/02 |
| Analysis Date | 10/31/02 | 10/31/02 | 10/29/02 | 10/29/02 | 10/29/02 | 10/25/02 | 10/26/02 |
| Date Received | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 |
| Percent Solids | 63.1 | 59.6 | 68.9 | 73 | 81.9 | 57.6 | 79.7 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Percent Lipids | NA | NA | NA | NA | NA | NA | NA |
| Min Reporting Limit | 0.65 | 0.69 | 0.6 | 0.56 | 0.5 | 0.71 | 0.52 |
| Units | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |

| Sterane-Triterpane Biomarkers | | | | | | | |
|-------------------------------|--------|--------|---------|---------|---------|--------|---------|
| T4-C23Diterpane | 0.79 | 0.83 | 0.37 J | 0.14 J | 0.034 J | 1.1 | 0.14 J |
| S4-Diacholestane | 1.2 | 1.2 | 0.77 | 0.23 J | 0.037 J | 1.6 | 0.18 J |
| S5-Diacholestane | 1.1 | 1.1 | 0.52 J | 0.16 J | 0.04 J | 0.68 J | 0.11 J |
| T9-C29Tricyclitriterpane | 0.25 J | 0.25 J | 0.099 J | 0.036 J | ND | 0.28 J | 0.038 J |
| T10-C29Tricyclitriterpane | 0.22 J | 0.23 J | 0.093 J | 0.032 J | ND | 0.3 J | 0.036 J |
| T11-Trisnorhopane(TS) | 1.2 | 1.1 | 0.7 | 0.19 J | 0.079 J | 1.9 | 0.19 J |
| T12-Trisnorhopane(TM) | 2.5 | 2.6 | 1.9 | 0.5 J | 0.12 J | 5.1 | 0.39 J |
| S24-Methylcholestane | 2.4 | 2.3 | 1.2 | 0.39 J | 0.067 J | 4.4 | 0.35 J |
| S25-Ethylcholestane | 0.79 | 0.81 | 0.76 | 0.16 J | 0.042 J | 1.1 | 0.17 J |
| S28-Ethylcholestane | 3.8 | 5.8 | 6.6 | 2 | 0.24 J | 24 | 1.3 |
| T15-Norhopane | 6.6 | 6.3 | 4.4 | 1 | 0.24 J | 10 | 0.97 |
| T18-Oleanane | 0.23 J | 0.36 J | ND | ND | ND | ND | ND |
| T19-Hopane | 6.7 | 6.8 | 5.4 | 1.2 | 0.29 J | 12 | 1.2 |
| T21-Homohopane | 2.9 | 3.1 | 2.5 | 0.5 J | 0.16 J | 4.6 | 0.54 |
| T22-Homohopane | 4 | 4.1 | 3.2 | 1.1 | 0.17 J | 10 | 0.75 |
| 5B(H)-Cholane | 78 | 82 | 89 | 85 | 82 | 80 | 76 |

| 02-5D-01-PHC-S | 02-5D-02-PHC-S | 02-5D-03-PHC-S | 02-5E-01-PHC-S | 02-5F-01-PHC-S | 02-5H-01-PHC-S | 02-5(0)-01-PHC-S | 02-5(1)-01-PHC-S |
|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|
| N | N | N | N | N | N | N | N |
| SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| 21.49 g | 21.12 g | 20.24 g | 23.44 g | 21.38 g | 23.29 g | 22.38 g | 24.8 g |
| DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| DY-S-63PB | DY-S-63PB | DY-S-63PB | DY-S-63PB | DY-S-63PB | DY-S-66PB | DY-S-66PB | DY-S-66PB |
| 08/07/02 | 08/07/02 | 08/07/02 | 08/04/02 | 08/07/02 | 08/01/02 | 08/01/02 | 08/01/02 |
| 10/15/02 | 10/15/02 | 10/15/02 | 10/15/02 | 10/15/02 | 10/16/02 | 10/16/02 | 10/16/02 |
| 10/25/02 | 10/25/02 | 10/25/02 | 10/25/02 | 10/25/02 | 10/29/02 | 10/29/02 | 10/29/02 |
| 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 |
| 71.1 | 69.9 | 66.9 | 77.5 | 71.2 | 77.4 | 73.2 | 82.2 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NA | NA | NA | NA | NA | NA | NA | NA |
| 0.58 | 0.59 | 0.62 | 0.53 | 0.58 | 0.54 | 0.56 | 0.5 |
| ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| | | | | | | | |
| 0.37 J | 0.45 J | 0.46 J | 0.11 J | 0.5 J | 0.24 J | 0.21 J | 0.044 J |
| 0.62 | 0.81 | 0.74 | 0.14 J | 0.98 | 0.38 J | 0.37 J | 0.051 J |
| 0.33 J | 0.34 J | 0.36 J | 0.093 J | 0.25 J | 0.28 J | 0.22 J | 0.058 J |
| 0.12 J | 0.16 J | 0.17 J | 0.036 J | 0.17 J | 0.067 J | 0.071 J | 0.017 J |
| 0.11 J | 0.15 J | 0.13 J | 0.037 J | 0.15 J | 0.074 J | 0.08 J | 0.0091 J |
| 0.69 | 0.85 | 0.89 | 0.16 J | 2 | 0.32 J | 0.27 J | 0.063 J |
| 1.7 | 2.4 | 2.2 | 0.36 J | 2.2 | 0.98 | 0.92 | 0.17 J |
| 1.4 | 1.9 | 1.6 | 0.26 J | 2.2 | 0.77 | 0.6 | 0.1 J |
| 0.44 J | 0.62 | 0.64 | 0.16 J | 0.67 | 0.29 J | 0.18 J | 0.048 J |
| 8.7 | 12 | 12 | 1 | 15 | 4.6 | 4.6 | 0.61 |
| 3.6 | 5 | 5.1 | 0.81 | 6 | 2.1 | 1.9 | 0.34 J |
| ND | ND | ND | ND | ND | 0.12 J | ND | ND |
| 4.2 | 5.8 | 5.3 | 0.96 | 6.5 | 2.4 | 2.2 | 0.38 J |
| 1.5 | 2.1 | 1.9 | 0.42 J | 2.5 | 0.97 | 0.88 | 0.18 J |
| 7.2 | 11 | 9.5 | 0.57 | 10 | 2.9 | 2.6 | 0.51 |
| 78 | 77 | 81 | 67 | 80 | 88 | 93 | 84 |

| 02-5(5) -01-PHC-S | 02-5(10)-01-PHC-S | 02-L01-01-PHC-S | 02-L04-01-PHC-S | 02-L06-01-PHC-S | 02-L07-01-PHC-S | 02-L08-02-PHC-S | 02-L09-01-PHC-S |
|-------------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| N | N | N | N | N | N | N | N |
| SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| 20.94 g | 22.82 g | 23.37 g | 20.67 g | 20.85 g | 21.24 g | 21.97 g | 23.74 g |
| DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| DY-S-66PB | DY-S-66PB | DY-S-69PB | DY-S-69PB | DY-S-69PB | DY-S-69PB | DY-S-69PB | DY-S-69PB |
| 08/01/02 | 08/01/02 | 07/31/02 | 07/30/02 | 07/30/02 | 07/30/02 | 07/30/02 | 07/30/02 |
| 10/16/02 | 10/16/02 | 10/17/02 | 10/17/02 | 10/17/02 | 10/17/02 | 10/17/02 | 10/17/02 |
| 10/29/02 | 10/29/02 | 10/31/02 | 10/31/02 | 10/31/02 | 10/31/02 | 10/31/02 | 10/31/02 |
| 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 |
| 69.4 | 75.9 | 76.8 | 67.4 | 68.1 | 69.2 | 73 | 78.7 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NA | NA | NA | NA | NA | NA | NA | NA |
| 0.6 | 0.55 | 0.53 | 0.6 | 0.6 | 0.59 | 0.57 | 0.53 |
| ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| 0.43 J | 0.18 J | 0.18 J | 0.46 J | 0.6 | 0.49 J | 1.4 | 0.15 J |
| 0.67 | 0.28 J | 0.36 J | 0.93 | 1.1 | 0.88 | 2.2 | 0.27 J |
| 0.44 J | 0.21 J | 0.33 J | 0.72 | 1 | 0.94 | 1.8 | 0.3 J |
| 0.13 J | 0.046 J | ND | 0.19 J | 0.22 J | 0.17 J | 0.49 J | 0.055 J |
| 0.097 J | 0.046 J | ND | 0.17 J | 0.15 J | 0.13 J | 0.36 J | 0.059 J |
| 0.58 J | 0.25 J | 0.39 J | 1 | 1 | 0.87 | 1.9 | 0.35 J |
| 1.9 | 0.72 | 0.79 | 2.3 | 2.2 | 1.9 | 3.2 | 0.73 |
| 1.4 | 0.6 | 0.63 | 1.5 | 1.9 | 1.6 | 3.8 | 0.59 |
| 0.39 J | 0.24 J | 0.34 J | 0.73 | 0.89 | 0.65 | 1.9 | 0.19 J |
| 8.8 | 3 | 4.9 | 7.5 | 4.2 | 4.5 | 7 | 2.4 |
| 3.9 | 1.5 | 2 | 5.5 | 5.5 | 4.9 | 8.7 | 1.5 |
| ND | ND | ND | ND | 0.26 J | 0.21 J | 0.53 J | 0.092 J |
| 4.6 | 1.8 | 2.2 | 5.7 | 6 | 4.9 | 9 | 1.8 |
| 1.8 | 0.72 | 0.85 | 2 | 2.4 | 1.9 | 3.5 | 0.66 |
| 4.6 | 1.9 | 2.2 | 5.8 | 4.9 | 4.3 | 6 | 2.1 |
| 80 | 80 | 77 | 81 | 78 | 78 | 77 | 81 |

| 02-N01-01-PHC-S | 02-N02-01-PHC-S | 02-N03-01-PHC-S | 02-N03-02-PHC-S | 02-N03-03-PHC-S | 02-N04-01-PHC-S | 02-N05-01-PHC-S | 02-N06-01-PHC-S |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| N | N | N | N | N | N | N | N |
| SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| 23.62 g | 19.17 g | 16.42 g | 15.1 g | 14.49 g | 19.49 g | 16.67 g | 18.92 g |
| DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| DY-S-66PB | DY-S-63PB | DY-S-66PB | DY-S-66PB | DY-S-66PB | DY-S-63PB | DY-S-63PB | DY-S-69PB |
| 08/03/02 | 08/03/02 | 08/05/02 | 08/05/02 | 08/05/02 | 08/03/02 | 08/03/02 | 08/02/02 |
| 10/16/02 | 10/15/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/15/02 | 10/15/02 | 10/17/02 |
| 10/28/02 | 10/25/02 | 10/29/02 | 10/29/02 | 10/29/02 | 10/25/02 | 10/26/02 | 10/31/02 |
| 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 |
| 77.8 | 62.9 | 54.3 | 50 | 48.2 | 64.1 | 55.4 | 62.9 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NA | NA | NA | NA | NA | NA | NA | NA |
| 0.53 | 0.65 | 0.76 | 0.83 | 0.86 | 0.64 | 1.5 | 0.66 |
| ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| | | | | | | | |
| 0.11 J | 1 | 0.82 | 1 | 0.97 | 0.79 | 1.2 J | 0.73 |
| 0.14 J | 1.3 | 1.1 | 1.4 | 1.6 | 1.1 | 1.7 | 1.1 |
| 0.099 J | 0.79 | 0.7 J | 0.86 | 0.98 | 0.57 J | 0.96 J | 1 |
| 0.046 J | 0.31 J | 0.23 J | 0.29 J | 0.28 J | 0.21 J | 0.36 J | 0.29 J |
| 0.031 J | 0.24 J | 0.18 J | 0.28 J | 0.21 J | 0.22 J | 0.28 J | 0.24 J |
| 0.18 J | 1.1 | 1.2 | 1.6 | 1.4 | 1.5 | 1.9 | 1.3 |
| 0.39 J | 3.2 | 3.3 | 4.4 | 4 | 4 | 6 | 3.2 |
| 0.38 J | 2.9 | 2.9 | 3.7 | 3.3 | 3.7 | 5.3 | 2.9 |
| 0.16 J | 0.71 | 0.81 | 1.1 | 0.74 J | 0.86 | 1.2 J | 0.71 |
| 1.5 | 13 | 16 | 18 | 18 | 20 | 28 | 14 |
| 0.87 | 7.3 | 7.1 | 8.8 | 8.8 | 8.4 | 12 | 6.8 |
| 0.28 J | ND | ND | ND | 10 | ND | ND | ND |
| 1 | 8.2 | 8.3 | 10 | 9.7 | 9.3 | 14 | 7.8 |
| 0.52 J | 3.3 | 3.4 | 4.7 | 4 | 3.8 | 5.4 | 3.2 |
| 0.74 | 6 | 6.5 | 8 | 7.4 | 9 | 12 | 7.1 |
| 84 | 76 | 79 | 82 | 88 | 74 | 81 | 78 |

| 02-N07-01-PHC-S | 02-N08-01-PHC-S | 02-N09-01-PHC-S | 02-N10-01-PHC-S | 02-N11-01-PHC-S | 02-N12-01-PHC-S | 02-N13-01-PHC-S | 02-N14-01-PHC-S |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| N | N | N | N | N | N | N | N |
| SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| 20.37 g | 16.74 g | 18.97 g | 17.49 g | 22.58 g | 18.68 g | 14.31 g | 16.8 g |
| DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| DY-S-66PB | DY-S-66PB | DY-S-66PB | DY-S-66PB | DY-S-69PB | DY-S-69PB | DY-S-66PB | DY-S-63PB |
| 08/05/02 | 08/05/02 | 08/05/02 | 08/02/02 | 08/02/02 | 08/02/02 | 08/04/02 | 08/07/02 |
| 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/17/02 | 10/17/02 | 10/16/02 | 10/15/02 |
| 10/29/02 | 10/28/02 | 10/28/02 | 10/30/02 | 10/31/02 | 10/31/02 | 10/29/02 | 10/25/02 |
| 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 |
| 67.8 | 54.8 | 62.6 | 57.2 | 74.2 | 61.5 | 47.3 | 55.9 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NA | NA | NA | NA | NA | NA | NA | NA |
| 0.61 | 0.75 | 0.66 | 0.71 | 0.55 | 0.67 | 0.87 | 0.74 |
| ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| | | | | | | | |
| 0.37 J | 0.76 | 0.52 J | 0.77 | 0.61 | 0.61 J | 1.1 | 0.9 |
| 0.59 J | 1.2 | 0.69 | 1.1 | 0.76 | 1.2 | 1.5 | 1.4 |
| 0.35 J | 0.53 J | 0.46 J | 0.67 J | 0.2 J | 0.88 | 0.56 J | 0.53 J |
| 0.088 J | ND | 0.15 J | 0.17 J | ND | 0.2 J | 0.27 J | 0.29 J |
| 0.09 J | ND | 0.12 J | 0.16 J | ND | 0.22 J | 0.29 J | 0.24 J |
| 0.53 J | 2.3 | 0.75 | 1.1 | 1.5 | 1.5 | 1.8 | 1.6 |
| 1.6 | 2.8 | 2.1 | 3.5 | 1.8 | 3.6 | 5.9 | 4.9 |
| 1.4 | 3 | 1.8 | 3 | 1.4 | 2.4 | 4.8 | 4.3 |
| 0.33 J | 0.77 | 0.54 J | 0.62 J | 0.67 | 1.2 | 1.1 | 1.1 |
| 6.9 | 15 | 8.8 | 18 | 5.2 | 7.4 | 45 | 40 |
| 3.4 | 7 | 4.3 | 7.3 | 5.7 | 8.9 | 13 | 13 |
| ND | ND | ND | ND | ND | ND | ND | ND |
| 4.1 | 8.4 | 5.2 | 8 | 5.3 | 8.8 | 13 | 13 |
| 1.7 | 3.8 | 2.2 | 3 | 2 | 3.5 | 4.8 | 4.9 |
| 4.1 | 8.2 | 3.9 | 8 | 6.9 | 11 | 19 | 19 |
| 82 | 84 | 78 | 92 | 81 | 73 | 83 | 71 |

| 02-N15-01-PHC-S | 02-N16-01-PHC-S | 02-N17-01-PHC-S | 02-N18-01-PHC-S | 02-N19-01-PHC-S | 02-N20-01-PHC-S | 02-N21-01-PHC-S | 02-N23-01-PHC-S |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| N | N | N | N | N | N | N | N |
| SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| 24.41 g | 15.18 g | 16.92 g | 19.81 g | 15.45 g | 25.03 g | 17.81 g | 20.88 g |
| DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| DY-S-63PB | DY-S-66PB | DY-S-66PB | DY-S-69PB | DY-S-69PB | DY-S-69PB | DY-S-69PB | DY-S-63PB |
| 08/07/02 | 08/05/02 | 08/05/02 | 08/02/02 | 08/02/02 | 08/02/02 | 08/02/02 | 08/05/02 |
| 10/15/02 | 10/16/02 | 10/16/02 | 10/17/02 | 10/17/02 | 10/17/02 | 10/17/02 | 10/15/02 |
| 10/25/02 | 10/28/02 | 10/29/02 | 10/31/02 | 10/31/02 | 10/31/02 | 10/31/02 | 10/26/02 |
| 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 |
| 79.7 | 50.2 | 56.2 | 65.6 | 50.4 | 83.4 | 58.6 | 68.5 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NA | NA | NA | NA | NA | NA | NA | NA |
| 0.51 | 0.82 | 0.74 | 0.63 | 0.81 | 0.5 | 0.7 | 0.6 |
| ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| | | | | | | | |
| 0.22 J | 1.1 | 0.99 | 0.66 | 0.67 J | 0.1 J | 0.87 | 0.89 |
| 0.31 J | 1.6 | 1.4 | 0.95 | 0.98 | 0.16 J | 1.4 | 1.4 |
| 0.16 J | 0.8 J | 0.8 | 0.92 | 0.94 | 0.11 J | 1 | 0.67 |
| 0.051 J | 0.3 J | 0.24 J | 0.17 J | 0.22 J | ND | 0.28 J | 0.26 J |
| 0.062 J | 0.34 J | 0.21 J | 0.19 J | 0.13 J | ND | 0.2 J | 0.25 J |
| 0.31 J | 2.1 | 1.7 | 1.2 | 1.2 | 0.15 J | 2.1 | 1.2 |
| 1.3 | 5.4 | 4.4 | 3 | 3 | 0.41 J | 4.3 | 3.3 |
| 1.2 | 4.4 | 3.6 | 2.5 | 2.7 | 0.29 J | 3.6 | 2.7 |
| 0.27 J | 1 | 1 | 0.65 | 0.69 J | 0.1 J | 1.1 | 0.93 |
| 8.3 | 22 | 22 | 13 | 15 | 0.8 | 12 | 13 |
| 2.6 | 10 | 9.7 | 6.6 | 8.7 | 0.94 | 10 | 7.9 |
| ND | 12 | ND | ND | ND | ND | ND | ND |
| 2.9 | 12 | 11 | 7.4 | 7 | 1.1 | 10 | 8.3 |
| 1.1 | 5.1 | 4.3 | 3 | 2.9 | 0.35 J | 3.6 | 3.3 |
| 3.4 | 9.9 | 9.1 | 11 | 8 | 1.2 | 14 | 6.8 |
| 81 | 82 | 90 | 80 | 78 | 77 | 74 | 75 |

| 02-COL-01-PHC-S | 02-COL-01-PHC-P | 02-SAG-01-PHC-S | 02-SAG-01-PHC-P | 02-CAN-01-PHC-S | 02-CAN-02-PHC-S | 02-KUP-01-PHC-S | 02-KUP-01-PHC-P |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| N | N | N | N | N | N | N | N |
| SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| 19.12 g | 7.18 g | 15.41 g | 12.27 g | 19.5 g | 16.36 g | 22.57 g | 12.81 g |
| DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| DY-S-69PB | DY-S-69PB | DY-S-69PB | DY-S-69PB | DY-S-63PB | DY-S-63PB | DY-S-63PB | DY-S-63PB |
| 08/13/02 | 08/13/02 | 08/14/02 | 08/14/02 | 08/09/02 | 08/09/02 | 08/06/02 | 08/06/02 |
| 10/17/02 | 10/17/02 | 10/17/02 | 10/17/02 | 10/15/02 | 10/15/02 | 10/15/02 | 10/15/02 |
| 10/31/02 | 10/31/02 | 10/31/02 | 11/01/02 | 10/25/02 | 10/25/02 | 10/25/02 | 10/25/02 |
| 08/23/02 | 08/23/02 | 08/23/02 | 08/23/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 |
| 63.6 | 23.6 | 50.4 | 40.8 | 64 | 54.3 | 74.9 | 42.3 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NA | NA | NA | NA | NA | NA | NA | NA |
| 0.65 | 1.7 | 0.81 | 1 | 0.64 | 0.76 | 0.55 | 0.98 |
| ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| | | | | | | | |
| 0.71 | 0.54 J | 0.68 J | 0.29 J | 0.3 J | 0.18 J | 2 | 0.5 J |
| 0.92 | 0.84 J | 1.5 | 0.45 J | 0.72 | 0.54 J | 4.1 | 0.65 J |
| 0.48 J | 0.24 J | 1.1 | ND | 0.26 J | 0.21 J | 1.4 | 0.11 J |
| 0.22 J | ND | 0.33 J | 0.15 J | 0.11 J | 0.12 J | 0.74 | 0.14 J |
| 0.18 J | ND | 0.26 J | 0.12 J | 0.12 J | 0.089 J | 0.64 | 0.37 J |
| 2.4 | ND | 1.4 | ND | 0.98 | 0.55 J | 3.1 | 0.66 J |
| 5.2 | 2.6 | 3.4 | 5.2 | 1.5 | 1.8 | 3.4 | 5.6 |
| 5.4 | 2 | 2.4 | 0.53 J | 0.53 J | 0.28 J | 2.6 | 7.1 |
| 1.1 | ND | 0.98 | 0.25 J | 0.5 J | 0.22 J | 2.5 | 0.24 J |
| 19 | ND | 13 | 4.7 | 4.2 | 2.7 | 17 | 20 |
| 9.9 | 90 | 6 | 5.7 | 4.1 | 4 | 12 | 12 |
| ND | ND | ND | 0.95 J | 0.39 J | 0.81 | ND | 1.7 |
| 11 | 5.2 | 8.9 | 5.8 | 4.8 | 3.5 | 11 | 15 |
| 4.6 | 2.1 | 2.8 | 1.7 | 2.2 | 1.2 | 4.5 | 3.2 |
| 12 | 4.9 | 22 | 12 | 2.6 | 2.3 | 24 | 25 |
| 76 | 71 | 69 | 79 | 78 | 74 | 70 | 60 |

| | |
|-----------------|-----------------|
| 02-KUP-02-PHC-S | 02-KUP-02-PHC-P |
| N | N |
| SEDIMENT | SEDIMENT |
| 18.18 g | 12.83 g |
| DRY | DRY |
| DY-S-63PB | DY-S-63PB |
| 08/07/02 | 08/07/02 |
| 10/15/02 | 10/15/02 |
| 10/25/02 | 10/25/02 |
| 08/15/02 | 08/15/02 |
| 59.9 | 42.4 |
| 1 | 1 |
| NA | NA |
| 0.69 | 0.97 |
| ug/Kg | ug/Kg |

| | |
|--------|-----|
| | |
| 1.2 | 6.2 |
| 2 | 13 |
| 0.82 | 5 |
| 0.48 J | 2.2 |
| 0.35 J | 1.9 |
| 2.3 | 5.1 |
| 5.5 | 15 |
| 1.8 | 6.2 |
| 1.6 | 9 |
| 52 | 77 |
| 25 | 98 |
| ND | ND |
| 11 | 37 |
| 4 | 14 |
| 36 | 100 |
| 74 | 77 |

| | | |
|---------------------|---------------|-------------------|
| Field ID | Northstar Oil | KUPARIC WELL 3H-5 |
| Sample Type | N | N |
| Matrix | OIL | CRUDE OIL |
| Sample Size | 5.18 mg | 5.2 mg |
| Weight Basis | OIL | OIL |
| Associated Blank | DY-S-77PB | EB-S-61PB |
| Field Date | 07/18/02 | 08/12/01 |
| Extract Date | 10/17/02 | 02/20/03 |
| Analysis Date | 10/18/02 | 02/25/03 |
| Date Received | 07/19/02 | 08/31/01 |
| Percent Solids | NA | NA |
| Dilution Factor | 1 | 1 |
| Percent Lipids | NA | NA |
| Min Reporting Limit | 4.8 | 4.8 |
| Units | mg/Kg | mg/Kg |

| Sterane-Triterpane Biomarkers | | |
|-------------------------------|-----|-----|
| T4-C23Diterpane | 41 | 84 |
| S4-Diacholestane | 42 | 33 |
| S5-Diacholestane | 23 | 21 |
| T9-C29Tricyclitriterpane | 18 | 22 |
| T10-C29Tricyclitriterpane | 16 | 20 |
| T11-Trisnorhopane(TS) | 14 | 22 |
| T12-Trisnorhopane(TM) | 6.6 | 34 |
| S24-Methylcholestane | 11 | 13 |
| S25-Ethylcholestane | 21 | 36 |
| S28-Ethylcholestane | 16 | 31 |
| T15-Norhopane | 26 | 99 |
| T18-Oleanane | ND | ND |
| T19-Hopane | 49 | 100 |
| T21-Homohopane | 19 | 47 |
| T22-Homohopane | 13 | 38 |
| 5B(H)-Cholane | 107 | 100 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 1004084
Data Table: ST Results - Tissues - Surrogate Corrected

| Field ID | 02-3A-01-PHC-T-AS | 02-4A-01-PHC-T-AN | 02-4A-02-PHC-T-AN | 02-5H-01-PHC-T-AS | 02-5F-01-PHC-T-CY | 02-5(0)-01-PHC-T-AN | 02-L08-01-PHC-T-AS | 02-L09-01-PHC-T-AS | 02-N03-01-PHC-T-AN | 02-N04-01-PHC-T-AN | 02-N12-01-PHC-T-AN |
|-------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Sample Type | N | N | N | N | N | N | N | N | N | N | N |
| Matrix | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE |
| Sample Size | 10.21 g | 5.7 g | 10.06 g | 10.14 g | 10.03 g | 10.02 g | 10.01 g | 10.07 g | 10.13 g | 10.09 g | 10.17 g |
| Weight Basis | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET | WET |
| Associated Blank | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-76PB | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB |
| Field Date | 07/29/02 | 07/31/02 | 08/20/02 | 08/01/02 | 08/07/02 | 08/01/02 | 07/30/02 | 07/30/02 | 08/10/02 | 08/11/02 | 08/03/02 |
| Extract Date | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 |
| Analysis Date | 11/03/02 | 11/03/02 | 11/04/02 | 11/03/02 | 11/02/02 | 11/03/02 | 11/03/02 | 11/03/02 | 11/02/02 | 11/02/02 | 11/03/02 |
| Date Received | 08/15/02 | 08/15/02 | 08/23/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 |
| Percent Solids | 11.9 | 21.8 | 26.9 | 13.5 | 45.3 | 22.3 | 12.8 | 9.56 | 24.7 | 25.1 | 21.7 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Percent Lipids | 0.644 | 3.07 | 0.209 | 0.373 | 0.14 | 0.128 | 0.178 | 0.183 | 2.36 | 0.17 | 0.256 |
| Min Reporting Limit | 1.2 | 2.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| Units | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| Sterane-Triterpane Biomarkers | | | | | | | | | | | |
| T4-C23Diterpane | 0.051 J | 0.092 J | 0.066 J | 0.062 J | 0.07 J | 0.068 J | 0.081 J | 0.055 J | 0.11 J | 0.09 J | 0.069 J |
| S4-Diacholestane | 0.06 J | 0.098 J | 0.12 J | 0.072 J | 0.092 J | 0.11 J | 0.068 J | 0.048 J | 0.22 J | 0.1 J | 0.074 J |
| S5-Diacholestane | 0.086 J | 0.2 J | 0.14 J | 0.11 J | 0.14 J | 0.12 J | 0.13 J | 0.085 J | 0.22 J | 0.13 J | 0.075 J |
| T9-C29Tricyclitriterpane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| T10-C29Tricyclitriterpane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| T11-Trisnorhopane(TS) | 0.052 J | 0.098 J | 0.072 J | 0.095 J | 0.12 J | 0.096 J | ND | 0.069 J | 0.2 J | 0.11 J | 0.07 J |
| T12-Trisnorhopane(TM) | 0.058 J | 0.12 J | 0.16 J | 0.1 J | 0.2 J | 0.14 J | 0.089 J | 0.068 J | 0.16 J | 0.16 J | 0.09 J |
| S24-Methylcholestane | 0.074 J | 0.1 J | 0.1 J | 0.46 J | 0.12 J | 0.073 J | ND | ND | 0.14 J | 0.13 J | 0.045 J |
| S25-Ethylcholestane | ND | 0.048 J | ND | ND | ND | ND | ND | ND | 0.098 J | ND | ND |
| S28-Ethylcholestane | 0.15 J | 0.3 J | 0.34 J | 0.34 J | 0.82 J | 0.28 J | 0.15 J | 0.12 J | 0.44 J | 0.35 J | 0.3 J |
| T15-Norhopane | 0.16 J | 0.37 J | 0.33 J | 0.23 J | 0.43 J | 0.29 J | 0.24 J | 0.16 J | 0.52 J | 0.39 J | 0.23 J |
| T18-Oleanane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| T19-Hopane | 0.2 J | 0.55 J | 0.39 J | 0.28 J | 0.51 J | 0.35 J | 0.27 J | 0.24 J | 0.58 J | 0.4 J | 0.24 J |
| T21-Homohopane | 0.092 J | 0.16 J | 0.15 J | 0.12 J | 0.2 J | 0.16 J | 0.091 J | 0.11 J | 0.27 J | 0.18 J | 0.12 J |
| T22-Homohopane | 0.085 J | 0.17 J | 0.2 J | 0.15 J | 0.43 J | 0.28 J | 0.12 J | 0.1 J | 0.24 J | 0.21 J | 0.17 J |
| 5B(H)-Cholane | 64 | 68 | 65 | 62 | 62 | 60 | 54 | 60 | 48 | 66 | 70 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 1004084
Data Table: ST Results - Tissues - Surrogate Corrected

| | 02-N13-01-PHC-T- | 02-N18-01-PHC-T- | 02-PM1-01-PHC-T- | 02-NM1-01-PHC-T- | 02-NM2-01-PHC-T- | 02-NM3-01-PHC-T- | 02-3M1-01-PHC-T- | 02-3M2-01-PHC-T- | 02-3M3-01-PHC-T- |
|---------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Field ID | AN | AN | MU | MU | MU | MU | MU | MU | MU |
| Sample Type | N | N | N | N | N | N | N | N | N |
| Matrix | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE | TISSUE |
| Sample Size | 10.06g | 10.06g | 10.08g | 10.09g | 10.07g | 10.14g | 10.06g | 10.15g | 10.12g |
| Weight Basis | WET | WET | WET | WET | WET | WET | WET | WET | WET |
| Associated Blank | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB | DY-S-72PB |
| Field Date | 08/04/02 | 08/02/02 | 07/29/02 | 08/18/02 | 08/18/02 | 08/18/02 | 08/20/02 | 08/20/02 | 08/20/02 |
| Extract Date | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 |
| Analysis Date | 11/03/02 | 11/03/02 | 11/03/02 | 11/03/02 | 11/03/02 | 11/03/02 | 11/03/02 | 11/03/02 | 11/03/02 |
| Date Received | 08/15/02 | 08/15/02 | 08/15/02 | 08/23/02 | 08/23/02 | 08/23/02 | 08/23/02 | 08/23/02 | 08/23/02 |
| Percent Solids | 25.3 | 23.3 | 8.35 | 10 | 10.5 | 9.16 | 9.22 | 8.59 | 10.1 |
| Dilution Factor | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Percent Lipids | 0.28 | 0.274 | 0.637 | 0.918 | 0.535 | 0.676 | 1.91 | 0.284 | 0.361 |
| Min Reporting Limit | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| Units | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg | ug/Kg |
| Sterane-Triterpane Bior | | | | | | | | | |
| T4-C23Diterpane | 0.066J | 0.081J | 0.06J | 0.049J | 0.054J | 0.051J | 0.059J | 0.061J | 0.068J |
| S4-Diacholestane | 0.13J | 0.073J | 0.056J | 0.061J | 0.059J | 0.045J | 0.073J | 0.055J | 0.11J |
| S5-Diacholestane | 0.12J | 0.1J | 0.1J | 0.092J | 0.078J | 0.082J | 0.084J | 0.099J | 0.13J |
| T9-C29Tricyclitriterpane | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| T10-C29Tricyclitriterpane | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| T11-Trisnorhopane(TS) | 0.12J | 0.08J | 0.061J | 0.081J | 0.078J | 0.05J | 0.065J | 0.063J | 0.11J |
| T12-Trisnorhopane(TM) | 0.16J | 0.099J | 0.054J | 0.12J | 0.073J | 0.093J | 0.095J | 0.092J | 0.12J |
| S24-Methylcholestane | 0.097J | ND | 0.096J | 0.12J | 0.15J | 0.1J | 0.095J | 0.057J | 0.08J |
| S25-Ethylcholestane | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| S28-Ethylcholestane | 0.58J | 0.26J | 0.1J | 0.26J | 0.33J | 0.22J | 0.19J | 0.22J | 0.25J |
| T15-Norhopane | 0.36J | 0.28J | 0.17J | 0.21J | 0.27J | 0.2J | 0.2J | 0.2J | 0.24J |
| T18-Oleanane | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| T19-Hopane | 0.36J | 0.35J | 0.2J | 0.26J | 0.28J | 0.25J | 0.24J | 0.25J | 0.32J |
| T21-Homohopane | 0.14J | 0.13J | 0.072J | 0.11J | 0.15J | 0.1J | 0.12J | 0.091J | 0.1J |
| T22-Homohopane | 0.28J | 0.16J | 0.064J | 0.17J | 0.18J | 0.14J | 0.13J | 0.15J | 0.15J |
| 5B(H)-Cholane | 64 | 68 | 66 | 65 | 64 | 67 | 67 | 64 | 57 |

| | | | | |
|---------------------|-----------------|-----------------|--------------------|------------------|
| Field ID | 02-CAN-03-PHC-S | 02-5F-01-PHC-EB | 02-5(5) -01-PHC-FB | 02-L08-01-PHC-EB |
| Sample Type | N | N | N | N |
| Matrix | WATER/SEDIMENT | WATER | BOTTLE BLANK | WATER |
| Sample Size | 0.09 L | 0.085 L | 1 | 0.065 L |
| Weight Basis | WET | WET | As Received | WET |
| Associated Blank | DY-S-75PB | DY-S-75PB | DY-S-75PB | DY-S-75PB |
| Field Date | 08/09/02 | 08/07/02 | 08/01/02 | 07/30/02 |
| Extract Date | 10/16/02 | 10/16/02 | 10/16/02 | 10/16/02 |
| Analysis Date | 10/18/02 | 10/18/02 | 10/18/02 | 10/18/02 |
| Date Received | 08/15/02 | 08/15/02 | 08/15/02 | 08/15/02 |
| Percent Solids | NA | NA | NA | NA |
| Dilution Factor | 1 | 1 | 1 | 1 |
| Percent Lipids | NA | NA | NA | NA |
| Min Reporting Limit | 140 | 150 | 12 | 190 |
| Units | ng/L | ng/L | ng | ng/L |

Sterane-Triterpane Biomarkers

| | | | | |
|---------------------------|----|----|----|----|
| T4-C23Diterpane | ND | ND | ND | ND |
| S4-Diacholestane | ND | ND | ND | ND |
| S5-Diacholestane | ND | ND | ND | ND |
| T9-C29Tricyclitriterpane | ND | ND | ND | ND |
| T10-C29Tricyclitriterpane | ND | ND | ND | ND |
| T11-Trisnorhopane(TS) | ND | ND | ND | ND |
| T12-Trisnorhopane(TM) | ND | ND | ND | ND |
| S24-Methylcholestane | ND | ND | ND | ND |
| S25-Ethylcholestane | ND | ND | ND | ND |
| S28-Ethylcholestane | ND | ND | ND | ND |
| T15-Norhopane | ND | ND | ND | ND |
| T18-Oleanane | ND | ND | ND | ND |
| T19-Hopane | ND | ND | ND | ND |
| T21-Homohopane | ND | ND | ND | ND |
| T22-Homohopane | ND | ND | ND | ND |

| | | | | |
|---------------|----|----|----|----|
| 5B(H)-Cholane | 95 | 94 | 96 | 96 |
|---------------|----|----|----|----|

Project Title : MMS - AMINIDA - PHASE II - TASK 2
Data Package: 4069
Data Table: BS-BSD - Surrogate Corrected

| | |
|---------------------|------------------|
| Field ID | Procedural Blank |
| Sample Type | PB |
| Matrix | WATER |
| Sample Size | 0.15 L |
| Weight Basis | WET |
| Associated Blank | NA |
| Field Date | 10/16/02 |
| Extract Date | 10/16/02 |
| Analysis Date | 10/18/02 |
| Date Received | 10/16/02 |
| Percent Solids | NA |
| Dilution Factor | 1 |
| Percent Lipids | NA |
| Min Reporting Limit | 83 |
| Units | ng/L |

Polynuclear Aromatic Hydrocarbons

| | |
|------------------------------|-------|
| Naphthalene | 6.7 J |
| C1-Naphthalenes | 2.9 J |
| C2-Naphthalenes | 6.1 J |
| C3-Naphthalenes | ND |
| C4-Naphthalenes | ND |
| Acenaphthylene | ND |
| Acenaphthene | ND |
| Biphenyl | ND |
| Fluorene | ND |
| C1-Fluorenes | ND |
| C2-Fluorenes | ND |
| C3-Fluorenes | ND |
| Anthracene | 1.2 J |
| Phenanthrene | 6.2 J |
| C1-Phenanthrenes/anthracenes | ND |
| C2-Phenanthrenes/anthracenes | ND |
| C3-Phenanthrenes/anthracenes | ND |
| C4-Phenanthrenes/anthracenes | ND |
| Dibenzothiophene | ND |
| C1-Dibenzothiophenes | ND |
| C2-Dibenzothiophenes | ND |
| C3-Dibenzothiophenes | ND |
| Fluoranthene | 2.7 J |
| Pyrene | 2.7 J |
| C1-Fluoranthenes/pyrenes | ND |
| C2-Fluoranthenes/pyrenes | ND |
| C3-Fluoranthenes/pyrenes | ND |
| Benzo[a]anthracene | ND |
| Chrysene | ND |
| C1-Chrysenes | ND |
| C2-Chrysenes | ND |
| C3-Chrysenes | ND |
| C4-Chrysenes | ND |
| Benzo[b]fluoranthene | ND |
| Benzo[k]fluoranthene | ND |
| Benzo[e]pyrene | ND |
| Benzo[a]pyrene | ND |
| Perylene | ND |
| Indeno[1,2,3,-c,d]pyrene | ND |
| Dibenzo[a,h]anthracene | ND |
| Benzo[g,h,i]perylene | ND |

| | |
|--------------------|----|
| d8-Naphthalene | 71 |
| d10-Acenaphthene | 80 |
| d10-Phenanthrene | 84 |
| d12-Benzo[a]pyrene | 79 |

Project Title : MMS - AMINIDA - PHASE II - TASK 2

Data Package: 4069

Data Table: BS-BSD - Surrogate Corrected

| | |
|---------------------|------------------|
| Field ID | Procedural Blank |
| Sample Type | PB |
| Matrix | WATER |
| Sample Size | 0.15 L |
| Weight Basis | WET |
| Associated Blank | NA |
| Field Date | 10/16/02 |
| Extract Date | 10/16/02 |
| Analysis Date | 10/18/02 |
| Date Received | 10/16/02 |
| Percent Solids | NA |
| Dilution Factor | 1 |
| Percent Lipids | NA |
| Min Reporting Limit | 83 |
| Units | ng/L |

Sterane-Triterpane Biomarkers

| | |
|----------------------------|----|
| T4-C23Diterpane | ND |
| S4-Diacholestane | ND |
| S5-Diacholestane | ND |
| T9-C29Tricyclictriterpane | ND |
| T10-C29Tricyclictriterpane | ND |
| T11-Trisnorhopane(TS) | ND |
| T12-Trisnorhopane(TM) | ND |
| S24-Methylcholestane | ND |
| S25-Ethylcholestane | ND |
| S28-Ethylcholestane | ND |
| T15-Norhopane | ND |
| T18-Oleanane | ND |
| T19-Hopane | ND |
| T21-Homohopane | ND |
| T22-Homohopane | ND |

| | |
|---------------|----|
| 5B(H)-Cholane | 89 |
|---------------|----|

| | | | | |
|---|---------------|------|-------|---|
| ICF Consulting | | | | |
| Environmental Chemistry and Forensics | | | | |
| Project Title : MMS - AMINIDA - PHASE II - TASK 2 | | | | |
| Data Package: 4069 | | | | |
| Data Table: ORS - Surrogate Corrected | | | | |
| | Oil Reference | | | |
| Field ID | Standard | | | |
| Sample Type | ORS | | | |
| Matrix | OIL | | | |
| Sample Size | 5.1 mg | | | |
| Weight Basis | OIL | | | |
| Associated Blank | NA | | | |
| Field Date | 04/23/02 | | | |
| Extract Date | 04/23/02 | | | |
| Analysis Date | 10/18/02 | | | |
| Date Received | 04/23/02 | | | |
| Percent Solids | NA | | | |
| Dilution Factor | 1 | | | |
| Percent Lipids | NA | | | |
| Min Reporting Limit | 4.9 | | | |
| Units | mg/Kg | T | %D | Q |
| Polynuclear Aromatic Hydrocarbons | | | | |
| Naphthalene | 774 | 710 | 9.01 | |
| C1-Naphthalenes | 1440 | 1600 | -10 | |
| C2-Naphthalenes | 2060 | 2300 | -10.4 | |
| C3-Naphthalenes | 1720 | 1960 | -12.2 | |
| C4-Naphthalenes | 968 | 1180 | -18 | |
| Acenaphthylene | ND | | | |
| Acenaphthene | ND | | | |
| Biphenyl | 222 | 214 | 3.74 | |
| Fluorene | 105 | 95.2 | 10.3 | |
| C1-Fluorenes | 247 | 239 | 3.35 | |
| C2-Fluorenes | 359 | 356 | 0.843 | |
| C3-Fluorenes | 348 | 396 | -12.1 | |
| Anthracene | ND | | | |
| Phenanthrene | 283 | 260 | 8.85 | |
| C1-Phenanthrenes/anthracenes | 628 | 612 | 2.61 | |
| C2-Phenanthrenes/anthracenes | 702 | 752 | -6.65 | |
| C3-Phenanthrenes/anthracenes | 517 | 534 | -3.18 | |
| C4-Phenanthrenes/anthracenes | 313 | 308 | 1.62 | |
| Dibenzothiophene | 252 | 222 | 13.5 | |
| C1-Dibenzothiophenes | 508 | 484 | 4.96 | |
| C2-Dibenzothiophenes | 636 | 658 | -3.34 | |
| C3-Dibenzothiophenes | 583 | 574 | 1.57 | |
| Fluoranthene | ND | | | |
| Pyrene | 14.3 | 13.4 | 6.72 | |
| C1-Fluoranthenes/pyrenes | 90.3 | 83.9 | 7.63 | |
| C2-Fluoranthenes/pyrenes | 159 | 142 | 12 | |
| C3-Fluoranthenes/pyrenes | 172 | 158 | 8.86 | |
| Benzo[a]anthracene | ND | | | |
| Chrysene | 56.1 | 49.2 | 14 | |
| C1-Chrysenes | 93.7 | 81.5 | 15 | |
| C2-Chrysenes | 105 | 102 | 2.94 | |
| C3-Chrysenes | 95 | 79.6 | 19.3 | |
| C4-Chrysenes | 66.8 | 64 | 4.37 | |
| Benzo[b]fluoranthene | 7.21 | 7.62 | -5.38 | |
| Benzo[k]fluoranthene | ND | | | |
| Benzo[e]pyrene | 12.1 | 12.4 | -2.42 | |
| Benzo[a]pyrene | ND | | | |
| Perylene | ND | | | |
| Indeno[1,2,3,-c,d]pyrene | ND | | | |
| Dibenzo[a,h]anthracene | 1.46 J | | | |
| Benzo[g,h,i]perylene | 3.44 J | 3.18 | 8.18 | |
| d8-Naphthalene | 90 | | | |
| d10-Acenaphthene | 97 | | | |
| d10-Phenanthrene | 98 | | | |
| d12-Benzo[a]pyrene | 108 | | | |

| Field ID | Instrument | Reference Standard | | | |
|---------------------|------------|--------------------|---|----|---|
| Sample Type | IRM | | | | |
| Matrix | IRM | | | | |
| Sample Size | 0.1 | mL | | | |
| Weight Basis | WET | | | | |
| Associated Blank | NA | | | | |
| Field Date | 10/15/02 | | | | |
| Extract Date | 10/15/02 | | | | |
| Analysis Date | 10/18/02 | | | | |
| Date Received | 10/15/02 | | | | |
| Percent Solids | NA | | | | |
| Dilution Factor | 1 | | | | |
| Percent Lipids | NA | | | | |
| Min Reporting Limit | 250 | | | | |
| Units | ug/L | | T | %D | Q |

| Polynuclear Aromatic Hydrocarbons | | | | |
|-----------------------------------|------|-----|--------|--|
| Naphthalene | 6640 | ### | -3.63 | |
| C1-Naphthalenes | ND | | | |
| C2-Naphthalenes | ND | | | |
| C3-Naphthalenes | ND | | | |
| C4-Naphthalenes | ND | | | |
| Acenaphthylene | 6640 | ### | -4.6 | |
| Acenaphthene | 6490 | ### | -10.8 | |
| Biphenyl | 6960 | ### | -0.571 | |
| Fluorene | 6200 | ### | -14.7 | |
| C1-Fluorenes | ND | | | |
| C2-Fluorenes | ND | | | |
| C3-Fluorenes | ND | | | |
| Anthracene | 7060 | ### | -9.72 | |
| Phenanthrene | 6850 | ### | -2.28 | |
| C1-Phenanthrenes/anthracenes | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | | | |
| Dibenzothiophene | ND | | | |
| C1-Dibenzothiophenes | ND | | | |
| C2-Dibenzothiophenes | ND | | | |
| C3-Dibenzothiophenes | ND | | | |
| Fluoranthene | 6110 | ### | 3.38 | |
| Pyrene | 5840 | ### | -0.849 | |
| C1-Fluoranthenes/pyrenes | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | | | |
| Benzo[a]anthracene | 3420 | ### | -4.74 | |
| Chrysene | 7040 | ### | 0.142 | |
| C1-Chrysenes | ND | | | |
| C2-Chrysenes | ND | | | |
| C3-Chrysenes | ND | | | |
| C4-Chrysenes | ND | | | |
| Benzo[b]fluoranthene | 5420 | ### | 3.24 | |
| Benzo[k]fluoranthene | 5720 | ### | 2.69 | |
| Benzo[e]pyrene | 5730 | ### | 1.96 | |
| Benzo[a]pyrene | 6670 | ### | -1.77 | |
| Perylene | 6950 | ### | -2.39 | |
| Indeno[1,2,3,-c,d]pyrene | 6110 | ### | -2.86 | |
| Dibenzo[a,h]anthracene | 5490 | ### | 5.98 | |
| Benzo[g,h,i]perylene | 5200 | ### | -1.7 | |
| | | | | |
| d8-Naphthalene | 98 | | | |
| d10-Acenaphthene | 97 | | | |
| d10-Phenanthrene | 97 | | | |
| d12-Benzo[a]pyrene | 94 | | | |

Project Title : MMS - AMINIDA - PHASE II - TASK 2

Data Package: 4069

Data Table: ORS - Surrogate Corrected

| | | | | |
|---------------------|---------------|---|----|---|
| Field ID | Oil Reference | | | |
| Sample Type | Standard | | | |
| Matrix | ORS | | | |
| Sample Size | OIL | | | |
| Weight Basis | 5.1 mg | | | |
| Associated Blank | OIL | | | |
| Field Date | NA | | | |
| Extract Date | 04/23/02 | | | |
| Analysis Date | 04/23/02 | | | |
| Date Received | 10/18/02 | | | |
| Percent Solids | 04/23/02 | | | |
| Dilution Factor | NA | | | |
| Percent Lipids | 1 | | | |
| Min Reporting Limit | NA | | | |
| Units | 4.9 | | | |
| | mg/Kg | T | %D | Q |

Sterane-Triterpane Biomarkers

| | | | |
|---------------------------|------|------|-------|
| T4-C23Diterpane | 56.9 | 58.9 | -3.4 |
| S4-Diacholestane | 39.6 | 46.8 | -15.4 |
| S5-Diacholestane | 23.8 | 26.1 | -8.81 |
| T9-C29Tricyclitriterpane | 13.7 | 15.7 | -12.7 |
| T10-C29Tricyclitriterpane | 13.7 | 15 | -8.67 |
| T11-Trisnorhopane(TS) | 22.5 | 24.8 | -9.27 |
| T12-Trisnorhopane(TM) | 25 | 31 | -19.4 |
| S24-Methylcholestane | 30.6 | 26.2 | 16.8 |
| S25-Ethylcholestane | 48 | 39.8 | 20.6 |
| S28-Ethylcholestane | 36.2 | 33.9 | 6.78 |
| T15-Norhopane | 82.9 | 83.8 | -1.07 |
| T18-Oleanane | ND | | |
| T19-Hopane | 119 | 113 | 5.31 |
| T21-Homohopane | 53.6 | 46.1 | 16.3 |
| T22-Homohopane | 42 | 35.2 | 19.3 |

5B(H)-Cholane 110

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4070
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | Procedural Blank | Blank Spike | | | |
|--|------------------|------------------|-------------|-----|-----|---|
| Sample Type | PB | PB | BS | | | |
| Matrix | OIL | Oil | Oil | | | |
| Sample Size | 5 mg | 5 mg | 5 mg | | | |
| Weight Basis | OIL | OIL | OIL | | | |
| Associated Blank | NA | NA | EB-S-61PB | | | |
| Field Date | 10/17/02 | 02/20/03 | 02/20/03 | | | |
| Extract Date | 10/17/02 | 02/20/03 | 02/20/03 | | | |
| Analysis Date | 10/18/02 | 02/25/03 | 02/25/03 | | | |
| Date Received | 10/17/02 | 02/20/03 | 02/20/03 | | | |
| Percent Solids | NA | NA | NA | | | |
| Dilution Factor | 1 | 1 | 1 | | | |
| Percent Lipids | NA | NA | NA | | | |
| Min Reporting Limit | 5 | 5 | 5 | | | |
| Units | mg/Kg | mg/Kg | mg/Kg | T | %R | Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | |
| Naphthalene | 0.16 J | ND | 210 | 200 | 105 | |
| C1-Naphthalenes | 0.17 J | ND | 0.29 J | | | |
| C2-Naphthalenes | 0.25 J | ND | ND | | | |
| C3-Naphthalenes | 0.14 J | ND | ND | | | |
| C4-Naphthalenes | ND | ND | ND | | | |
| Acenaphthylene | ND | ND | 220 | 200 | 110 | |
| Acenaphthene | ND | 0.13 J | 220 | 200 | 110 | |
| Biphenyl | ND | ND | ND | | | |
| Fluorene | ND | ND | 210 | 200 | 105 | |
| C1-Fluorenes | ND | ND | ND | | | |
| C2-Fluorenes | ND | ND | ND | | | |
| C3-Fluorenes | ND | ND | ND | | | |
| Anthracene | ND | 0.13 J | 210 | 200 | 105 | |
| Phenanthrene | ND | 0.15 J | 210 | 200 | 105 | |
| C1-Phenanthrenes/anthracenes | ND | ND | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | ND | 0.38 J | | | |
| C3-Phenanthrenes/anthracenes | ND | ND | 0.28 J | | | |
| C4-Phenanthrenes/anthracenes | ND | ND | ND | | | |
| Dibenzothiophene | ND | ND | ND | | | |
| C1-Dibenzothiophenes | ND | ND | ND | | | |
| C2-Dibenzothiophenes | ND | ND | ND | | | |
| C3-Dibenzothiophenes | ND | ND | ND | | | |
| Fluoranthene | ND | 0.19 J | 220 | 200 | 110 | |
| Pyrene | ND | 0.29 J | 210 | 200 | 105 | |
| C1-Fluoranthenes/pyrenes | ND | ND | 0.43 J | | | |
| C2-Fluoranthenes/pyrenes | ND | ND | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | ND | ND | | | |
| Benzo[a]anthracene | ND | ND | 210 | 200 | 105 | |
| Chrysene | ND | ND | 210 | 200 | 105 | |
| C1-Chrysenes | ND | ND | 0.22 J | | | |
| C2-Chrysenes | ND | ND | ND | | | |
| C3-Chrysenes | ND | ND | ND | | | |
| C4-Chrysenes | ND | ND | ND | | | |
| Benzo[b]fluoranthene | ND | ND | 220 | 200 | 110 | |
| Benzo[k]fluoranthene | ND | ND | 180 | 200 | 90 | |
| Benzo[e]pyrene | ND | ND | ND | | | |
| Benzo[a]pyrene | ND | ND | 230 | 200 | 115 | |
| Perylene | ND | ND | ND | | | |
| Indeno[1,2,3,-c,d]pyrene | ND | ND | 230 | 200 | 115 | |
| Dibenzo[a,h]anthracene | ND | ND | 240 | 200 | 120 | |
| Benzo[g,h,i]perylene | 0.066 J | 0.36 J | 210 | 200 | 105 | |
| d8-Naphthalene | 104 | 93 | 95 | | | |
| d10-Acenaphthene | 109 | 95 | 97 | | | |
| d10-Phenanthrene | 111 | 94 | 95 | | | |
| d12-Benzo[a]pyrene | 112 | 102 | 102 | | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control IRM

| Field ID | Instrument Reference | | | Instrument Reference | | |
|--|----------------------|------|-------|----------------------|------|--------|
| | Standard | | | Standard | | |
| Lab ID | BX30IRM | | | BY42IRM | | |
| Sample Type | IRM | | | IRM | | |
| Matrix | IRM | | | IRM | | |
| Sample Size | 0.1 mL | | | 0.1 mL | | |
| Weight Basis | WET | | | WET | | |
| Associated Blank | NA | | | NA | | |
| Field Date | 01/04/01 | | | 03/28/01 | | |
| Extract Date | 01/04/01 | | | 03/28/01 | | |
| Analysis Date | 03/21/01 | | | 04/05/01 | | |
| Date Received | 01/04/01 | | | 03/28/01 | | |
| Percent Solids | NA | | | NA | | |
| Percent Lipids | NA | | | NA | | |
| Min Reporting Limit | 250 | | | 250 | | |
| Units | ug/L | T | %D Q | ug/L | T | %D |
| Polynuclear Aromatic Hydrocarbons | | | | | | |
| Naphthalene | 6400 | 6890 | -7.11 | 6580 | 6890 | -4.5 |
| C1-Naphthalenes | ND | | | ND | | |
| C2-Naphthalenes | ND | | | ND | | |
| C3-Naphthalenes | ND | | | ND | | |
| C4-Naphthalenes | ND | | | ND | | |
| Acenaphthylene | 6210 | 6960 | -10.8 | 6280 | 6960 | -9.77 |
| Acenaphthene | 6440 | 7280 | -11.5 | 6440 | 7280 | -11.5 |
| Biphenyl | 6650 | 7000 | -5 | 6970 | 7000 | -0.428 |
| Fluorene | 6340 | 7270 | -12.8 | 6350 | 7270 | -12.6 |
| C1-Fluorenes | ND | | | ND | | |
| C2-Fluorenes | ND | | | ND | | |
| C3-Fluorenes | ND | | | ND | | |
| Anthracene | 7010 | 7820 | -10.4 | 7030 | 7820 | -10.1 |
| Phenanthrene | 6720 | 7010 | -4.14 | 7070 | 7010 | 0.856 |
| C1-Phenanthrenes/anthracenes | ND | | | ND | | |
| C2-Phenanthrenes/anthracenes | ND | | | ND | | |
| C3-Phenanthrenes/anthracenes | ND | | | ND | | |
| C4-Phenanthrenes/anthracenes | ND | | | ND | | |
| Dibenzothiophene | ND | | | ND | | |
| C1-Dibenzothiophenes | ND | | | ND | | |
| C2-Dibenzothiophenes | ND | | | ND | | |
| C3-Dibenzothiophenes | ND | | | ND | | |
| Fluoranthene | 5510 | 5910 | -6.77 | 5880 | 5910 | -0.508 |
| Pyrene | 5550 | 5890 | -5.77 | 5870 | 5890 | -0.34 |
| C1-Fluoranthenes/pyrenes | ND | | | ND | | |
| C2-Fluoranthenes/pyrenes | ND | | | ND | | |
| C3-Fluoranthenes/pyrenes | ND | | | ND | | |
| Benzo[a]anthracene | 3120 | 3590 | -13.1 | 3460 | 3590 | -3.62 |
| Chrysene | 6740 | 7030 | -4.12 | 7040 | 7030 | 0.142 |
| C1-Chrysenes | ND | | | ND | | |
| C2-Chrysenes | ND | | | ND | | |
| C3-Chrysenes | ND | | | ND | | |
| C4-Chrysenes | ND | | | ND | | |
| Benzo[b]fluoranthene | 4920 | 5250 | -6.28 | 4980 | 5250 | -5.14 |
| Benzo[k]fluoranthene | 5470 | 5570 | -1.8 | 6080 | 5570 | 9.16 |
| Benzo[e]pyrene | 5540 | 5620 | -1.42 | 5910 | 5620 | 5.16 |
| Benzo[a]pyrene | 6370 | 6790 | -6.18 | 6510 | 6790 | -4.12 |
| Perylene | 7270 | 7120 | 2.11 | 7500 | 7120 | 5.34 |
| Indeno[1,2,3,-c,d]pyrene | 5560 | 6290 | -11.6 | 6110 | 6290 | -2.86 |
| Dibenzo[a,h]anthracene | 5030 | 5180 | -2.9 | 5310 | 5180 | 2.51 |
| Benzo[g,h,i]perylene | 4670 | 5290 | -11.7 | 5240 | 5290 | -0.945 |
| d8-Naphthalene | 106 | | | 93 | | |
| d10-Acenaphthene | 105 | | | 100 | | |
| d10-Phenanthrene | 104 | | | 99 | | |
| d12-Benzo[a]pyrene | 99 | | | 95 | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control IRM

| Field ID | Instrument Reference | | | | Instrument Reference | | | |
|--|----------------------|------|------|-------|----------------------|------|------|-------|
| Lab ID | Standard | | | | Standard | | | |
| Sample Type | BX30IRM-1 | | | | BX30IRM-2 | | | |
| Matrix | IRM | | | | IRM | | | |
| Sample Size | 0.1 mL | | | | 0.1 mL | | | |
| Weight Basis | WET | | | | WET | | | |
| Associated Blank | NA | | | | NA | | | |
| Field Date | 01/04/01 | | | | 01/04/01 | | | |
| Extract Date | 01/04/01 | | | | 01/04/01 | | | |
| Analysis Date | 03/14/01 | | | | 03/21/01 | | | |
| Date Received | 01/04/01 | | | | 01/04/01 | | | |
| Percent Solids | NA | | | | NA | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | 250 | | | | 250 | | | |
| Units | Q | ug/L | T | %D | Q | ug/L | T | %D |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | |
| Naphthalene | | 6400 | 6890 | -7.11 | | 6400 | 6890 | -7.11 |
| C1-Naphthalenes | | ND | | | | ND | | |
| C2-Naphthalenes | | ND | | | | ND | | |
| C3-Naphthalenes | | ND | | | | ND | | |
| C4-Naphthalenes | | ND | | | | ND | | |
| Acenaphthylene | | 6170 | 6960 | -11.4 | | 6210 | 6960 | -10.8 |
| Acenaphthene | | 6440 | 7280 | -11.5 | | 6440 | 7280 | -11.5 |
| Biphenyl | | 6690 | 7000 | -4.43 | | 6650 | 7000 | -5 |
| Fluorene | | 6350 | 7270 | -12.6 | | 6340 | 7270 | -12.8 |
| C1-Fluorenes | | ND | | | | ND | | |
| C2-Fluorenes | | ND | | | | ND | | |
| C3-Fluorenes | | ND | | | | ND | | |
| Anthracene | | 6930 | 7820 | -11.4 | | 7010 | 7820 | -10.4 |
| Phenanthrene | | 6680 | 7010 | -4.71 | | 6720 | 7010 | -4.14 |
| C1-Phenanthrenes/anthracenes | | ND | | | | ND | | |
| C2-Phenanthrenes/anthracenes | | ND | | | | ND | | |
| C3-Phenanthrenes/anthracenes | | ND | | | | ND | | |
| C4-Phenanthrenes/anthracenes | | ND | | | | ND | | |
| Dibenzothiophene | | ND | | | | ND | | |
| C1-Dibenzothiophenes | | ND | | | | ND | | |
| C2-Dibenzothiophenes | | ND | | | | ND | | |
| C3-Dibenzothiophenes | | ND | | | | ND | | |
| Fluoranthene | | 5480 | 5910 | -7.28 | | 5510 | 5910 | -6.77 |
| Pyrene | | 5450 | 5890 | -7.47 | | 5550 | 5890 | -5.77 |
| C1-Fluoranthenes/pyrenes | | ND | | | | ND | | |
| C2-Fluoranthenes/pyrenes | | ND | | | | ND | | |
| C3-Fluoranthenes/pyrenes | | ND | | | | ND | | |
| Benzo[a]anthracene | | 3080 | 3590 | -14.2 | | 3120 | 3590 | -13.1 |
| Chrysene | | 6740 | 7030 | -4.12 | | 6740 | 7030 | -4.12 |
| C1-Chrysenes | | ND | | | | ND | | |
| C2-Chrysenes | | ND | | | | ND | | |
| C3-Chrysenes | | ND | | | | ND | | |
| C4-Chrysenes | | ND | | | | ND | | |
| Benzo[b]fluoranthene | | 4760 | 5250 | -9.33 | | 4920 | 5250 | -6.28 |
| Benzo[k]fluoranthene | | 5830 | 5570 | 4.67 | | 5470 | 5570 | -1.8 |
| Benzo[e]pyrene | | 5770 | 5620 | 2.67 | | 5540 | 5620 | -1.42 |
| Benzo[a]pyrene | | 6380 | 6790 | -6.04 | | 6370 | 6790 | -6.18 |
| Perylene | | 7520 | 7120 | 5.62 | | 7270 | 7120 | 2.11 |
| Indeno[1,2,3,-c,d]pyrene | | 5500 | 6290 | -12.6 | | 5560 | 6290 | -11.6 |
| Dibenzo[a,h]anthracene | | 4950 | 5180 | -4.44 | | 5030 | 5180 | -2.9 |
| Benzo[g,h,i]perylene | | 4880 | 5290 | -7.75 | | 4670 | 5290 | -11.7 |
| d8-Naphthalene | | 106 | | | | 106 | | |
| d10-Acenaphthene | | 104 | | | | 105 | | |
| d10-Phenanthrene | | 105 | | | | 104 | | |
| d12-Benzo[a]pyrene | | 96 | | | | 99 | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control IRM

| | Instrument Reference | | | | Instrument Reference | | | |
|-----------------------------------|----------------------|------|-------|----|----------------------|------|-------|----|
| Field ID | Standard | | | | Standard | | | |
| Lab ID | BY42IRM | | | | BX30IRM-1 | | | |
| Sample Type | IRM | | | | IRM | | | |
| Matrix | IRM | | | | IRM | | | |
| Sample Size | 0.1 mL | | | | 0.1 mL | | | |
| Weight Basis | WET | | | | WET | | | |
| Associated Blank | NA | | | | NA | | | |
| Field Date | 03/28/01 | | | | 01/04/01 | | | |
| Extract Date | 03/28/01 | | | | 01/04/01 | | | |
| Analysis Date | 03/28/01 | | | | 03/05/01 | | | |
| Date Received | 03/28/01 | | | | 01/04/01 | | | |
| Percent Solids | NA | | | | NA | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | 250 | | | | 250 | | | |
| Units | Q | | T | %D | Q | | T | %D |
| | ug/L | | | | ug/L | | | |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | |
| Naphthalene | 6800 | 6890 | -1.31 | | 6320 | 6890 | -8.27 | |
| C1-Naphthalenes | ND | | | | ND | | | |
| C2-Naphthalenes | ND | | | | ND | | | |
| C3-Naphthalenes | ND | | | | ND | | | |
| C4-Naphthalenes | ND | | | | ND | | | |
| Acenaphthylene | 6620 | 6960 | -4.88 | | 6170 | 6960 | -11.4 | |
| Acenaphthene | 6760 | 7280 | -7.14 | | 6440 | 7280 | -11.5 | |
| Biphenyl | 7270 | 7000 | 3.86 | | 6770 | 7000 | -3.28 | |
| Fluorene | 6570 | 7270 | -9.63 | | 6350 | 7270 | -12.6 | |
| C1-Fluorenes | ND | | | | ND | | | |
| C2-Fluorenes | ND | | | | ND | | | |
| C3-Fluorenes | ND | | | | ND | | | |
| Anthracene | 7140 | 7820 | -8.7 | | 7030 | 7820 | -10.1 | |
| Phenanthrene | 7210 | 7010 | 2.85 | | 6670 | 7010 | -4.85 | |
| C1-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| Dibenzothiophene | ND | | | | ND | | | |
| C1-Dibenzothiophenes | ND | | | | ND | | | |
| C2-Dibenzothiophenes | ND | | | | ND | | | |
| C3-Dibenzothiophenes | ND | | | | ND | | | |
| Fluoranthene | 5910 | 5910 | 0 | | 5550 | 5910 | -6.09 | |
| Pyrene | 5930 | 5890 | 0.679 | | 5540 | 5890 | -5.94 | |
| C1-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| Benzo[a]anthracene | 3330 | 3590 | -7.24 | | 3110 | 3590 | -13.4 | |
| Chrysene | 7400 | 7030 | 5.26 | | 6820 | 7030 | -2.99 | |
| C1-Chrysenes | ND | | | | ND | | | |
| C2-Chrysenes | ND | | | | ND | | | |
| C3-Chrysenes | ND | | | | ND | | | |
| C4-Chrysenes | ND | | | | ND | | | |
| Benzo[b]fluoranthene | 4950 | 5250 | -5.71 | | 4590 | 5250 | -12.6 | |
| Benzo[k]fluoranthene | 6380 | 5570 | 14.5 | | 6110 | 5570 | 9.69 | |
| Benzo[e]pyrene | 5930 | 5620 | 5.52 | | 5800 | 5620 | 3.2 | |
| Benzo[a]pyrene | 6670 | 6790 | -1.77 | | 6420 | 6790 | -5.45 | |
| Perylene | 7780 | 7120 | 9.27 | | 7590 | 7120 | 6.6 | |
| Indeno[1,2,3,-c,d]pyrene | 5580 | 6290 | -11.3 | | 5350 | 6290 | -14.9 | |
| Dibenzo[a,h]anthracene | 5360 | 5180 | 3.47 | | 4980 | 5180 | -3.86 | |
| Benzo[g,h,i]perylene | 5100 | 5290 | -3.59 | | 4920 | 5290 | -6.99 | |
| d8-Naphthalene | 101 | | | | 107 | | | |
| d10-Acenaphthene | 98 | | | | 104 | | | |
| d10-Phenanthrene | 98 | | | | 103 | | | |
| d12-Benzo[a]pyrene | 92 | | | | 95 | | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control IRM

| Instrument Reference | |
|----------------------|---------------|
| Field ID | Standard |
| Lab ID | BX30IRM-2 |
| Sample Type | IRM |
| Matrix | IRM |
| Sample Size | 0.1 mL |
| Weight Basis | WET |
| Associated Blank | NA |
| Field Date | 01/04/01 |
| Extract Date | 01/04/01 |
| Analysis Date | 03/14/01 |
| Date Received | 01/04/01 |
| Percent Solids | NA |
| Percent Lipids | NA |
| Min Reporting Limit | 250 |
| Units | Q ug/L T %D Q |

| Polynuclear Aromatic Hydrocarbons | | | | |
|-----------------------------------|------|------|-------|--|
| Naphthalene | 6400 | 6890 | -7.11 | |
| C1-Naphthalenes | ND | | | |
| C2-Naphthalenes | ND | | | |
| C3-Naphthalenes | ND | | | |
| C4-Naphthalenes | ND | | | |
| Acenaphthylene | 6170 | 6960 | -11.4 | |
| Acenaphthene | 6440 | 7280 | -11.5 | |
| Biphenyl | 6690 | 7000 | -4.43 | |
| Fluorene | 6350 | 7270 | -12.6 | |
| C1-Fluorenes | ND | | | |
| C2-Fluorenes | ND | | | |
| C3-Fluorenes | ND | | | |
| Anthracene | 6930 | 7820 | -11.4 | |
| Phenanthrene | 6680 | 7010 | -4.71 | |
| C1-Phenanthrenes/anthracenes | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | | | |
| Dibenzothiophene | ND | | | |
| C1-Dibenzothiophenes | ND | | | |
| C2-Dibenzothiophenes | ND | | | |
| C3-Dibenzothiophenes | ND | | | |
| Fluoranthene | 5480 | 5910 | -7.28 | |
| Pyrene | 5450 | 5890 | -7.47 | |
| C1-Fluoranthenes/pyrenes | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | | | |
| Benzo[a]anthracene | 3080 | 3590 | -14.2 | |
| Chrysene | 6740 | 7030 | -4.12 | |
| C1-Chrysenes | ND | | | |
| C2-Chrysenes | ND | | | |
| C3-Chrysenes | ND | | | |
| C4-Chrysenes | ND | | | |
| Benzo[b]fluoranthene | 4760 | 5250 | -9.33 | |
| Benzo[k]fluoranthene | 5830 | 5570 | 4.67 | |
| Benzo[e]pyrene | 5770 | 5620 | 2.67 | |
| Benzo[a]pyrene | 6380 | 6790 | -6.04 | |
| Perylene | 7520 | 7120 | 5.62 | |
| Indeno[1,2,3-c,d]pyrene | 5500 | 6290 | -12.6 | |
| Dibenzo[a,h]anthracene | 4950 | 5180 | -4.44 | |
| Benzo[g,h,i]perylene | 4880 | 5290 | -7.75 | |
| d8-Naphthalene | 106 | | | |
| d10-Acenaphthene | 104 | | | |
| d10-Phenanthrene | 105 | | | |
| d12-Benzo[a]pyrene | 96 | | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control SRM

| Field ID | Standard Reference | | | Standard Reference | | |
|--|--------------------|------|---------|--------------------|------|---------|
| | Material 1944 | | | Material-1944 | | |
| Lab ID | DH-S-63SRM F2 | | | DH-S-60SRM | | |
| Sample Type | SRM | | | SRM | | |
| Matrix | SEDIMENT | | | SEDIMENT | | |
| Sample Size | 1.03 g | | | 1.04 g | | |
| Weight Basis | DRY | | | DRY | | |
| Associated Blank | DH-S-61PB F2 | | | DH-S-58PB PCA F2 | | |
| Field Date | 03/08/01 | | | 03/07/01 | | |
| Extract Date | 03/08/01 | | | 03/07/01 | | |
| Analysis Date | 03/23/01 | | | 03/15/01 | | |
| Date Received | 03/08/01 | | | 03/07/01 | | |
| Percent Solids | 98.8 | | | 98.8 | | |
| Percent Lipids | NA | | | NA | | |
| Min Reporting Limit | 97.1 | | | 12 | | |
| Units | ug/Kg | T | %D Q | ug/Kg | T | %D Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | |
| Naphthalene | 866 | 1650 | -47.5 & | 834 | 1650 | -49.4 & |
| C1-Naphthalenes | 513 | | | 478 | | |
| C2-Naphthalenes | 1540 | | | 1470 | | |
| C3-Naphthalenes | 1970 | | | 2210 | | |
| C4-Naphthalenes | 2330 | | | 2310 | | |
| Acenaphthylene | 832 | | | 916 | | |
| Acenaphthene | 438 | | | 434 | | |
| Biphenyl | 141 | | | 142 | | |
| Fluorene | 670 | | | 700 | | |
| C1-Fluorenes | 825 | | | 885 | | |
| C2-Fluorenes | 1260 | | | 1270 | | |
| C3-Fluorenes | 1590 | | | 1650 | | |
| Anthracene | 1390 | 1770 | -21.5 | 1340 | 1770 | -24.3 |
| Phenanthrene | 5090 | 5270 | -3.42 | 4210 D | 5270 | -20.1 |
| C1-Phenanthrenes/anthracenes | 5670 | | | 5220 | | |
| C2-Phenanthrenes/anthracenes | 6370 | | | 5800 | | |
| C3-Phenanthrenes/anthracenes | 4180 | | | 3810 | | |
| C4-Phenanthrenes/anthracenes | 3600 | | | 3200 | | |
| Dibenzothiophene | 732 | | | 699 | | |
| C1-Dibenzothiophenes | 1770 | | | 1740 | | |
| C2-Dibenzothiophenes | 2610 | | | 2580 | | |
| C3-Dibenzothiophenes | 2460 | | | 2060 | | |
| Fluoranthene | 8870 | 8920 | -0.56 | 7500 D | 8920 | -15.9 |
| Pyrene | 9480 | 9700 | -2.27 | 8080 D | 9700 | -16.7 |
| C1-Fluoranthenes/pyrenes | 7270 | | | 6730 | | |
| C2-Fluoranthenes/pyrenes | 3380 | | | 2960 | | |
| C3-Fluoranthenes/pyrenes | 1580 | | | 1400 | | |
| Benzo[a]anthracene | 4490 | 4720 | -4.87 | 3980 D | 4720 | -15.7 |
| Chrysene | 5560 | 5900 | -5.76 | 4280 D | 5900 | -27.4 |
| C1-Chrysenes | 3500 | | | 3780 | | |
| C2-Chrysenes | 2170 | | | 2270 | | |
| C3-Chrysenes | 1120 | | | 1170 | | |
| C4-Chrysenes | 673 | | | 710 | | |
| Benzo[b]fluoranthene | 6830 | 5960 | 14.6 | 5040 D | 5960 | -15.4 |
| Benzo[k]fluoranthene | 1730 | 2300 | -24.8 | 1340 | 2300 | -41.7 & |
| Benzo[e]pyrene | 3580 | 3280 | 9.15 | 2910 D | 3280 | -11.3 |
| Benzo[a]pyrene | 4140 | 4300 | -3.72 | 3320 D | 4300 | -22.8 |
| Perylene | 1110 | 1170 | -5.13 | 1100 | 1170 | -5.98 |
| Indeno[1,2,3,-c,d]pyrene | 2800 | 2780 | 0.719 | 2270 D | 2780 | -18.3 |
| Dibenzo[a,h]anthracene | 754 | 759 | -0.659 | 912 | 759 | 20.2 |
| Benzo[g,h,i]perylene | 2350 | 2840 | -17.2 | 2860 | 2840 | 0.704 |
| d8-Naphthalene | 57 | | | 55 | | |
| d10-Acenaphthene | 80 | | | 77 | | |
| d10-Phenanthrene | 99 | | | 104 | | |
| d12-Benzo[a]pyrene | 95 | | | 98 | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control SRM

| | | | | |
|---------------------|---------------------------|----------|-----------|----------|
| | Standard Reference | | | |
| Field ID | Material- 1944 | | | |
| Lab ID | DH-S-57SRM F2 | | | |
| Sample Type | SRM | | | |
| Matrix | SEDIMENT | | | |
| Sample Size | 1.03 g | | | |
| Weight Basis | DRY | | | |
| Associated Blank | DH-S-55PB PCA | | | |
| Field Date | 02/20/01 | | | |
| Extract Date | 02/20/01 | | | |
| Analysis Date | 03/06/01 | | | |
| Date Received | 02/20/01 | | | |
| Percent Solids | 98.8 | | | |
| Percent Lipids | NA | | | |
| Min Reporting Limit | 97.1 | | | |
| Units | ug/Kg | T | %D | Q |

| Polynuclear Aromatic Hydrocarbons | | | | |
|--|------|------|--------|--|
| Naphthalene | 1360 | 1650 | -17.6 | |
| C1-Naphthalenes | 489 | | | |
| C2-Naphthalenes | 1480 | | | |
| C3-Naphthalenes | 2400 | | | |
| C4-Naphthalenes | 2610 | | | |
| Acenaphthylene | 938 | | | |
| Acenaphthene | 452 | | | |
| Biphenyl | 167 | | | |
| Fluorene | 809 | | | |
| C1-Fluorenes | 948 | | | |
| C2-Fluorenes | 1390 | | | |
| C3-Fluorenes | 1750 | | | |
| Anthracene | 1610 | 1770 | -9.04 | |
| Phenanthrene | 5350 | 5270 | 1.52 | |
| C1-Phenanthrenes/anthracenes | 5780 | | | |
| C2-Phenanthrenes/anthracenes | 6400 | | | |
| C3-Phenanthrenes/anthracenes | 4000 | | | |
| C4-Phenanthrenes/anthracenes | 3490 | | | |
| Dibenzothiophene | 771 | | | |
| C1-Dibenzothiophenes | 1780 | | | |
| C2-Dibenzothiophenes | 2920 | | | |
| C3-Dibenzothiophenes | 2380 | | | |
| Fluoranthene | 9020 | 8920 | 1.12 | |
| Pyrene | 9450 | 9700 | -2.58 | |
| C1-Fluoranthenes/pyrenes | 6960 | | | |
| C2-Fluoranthenes/pyrenes | 3440 | | | |
| C3-Fluoranthenes/pyrenes | 1490 | | | |
| Benzo[a]anthracene | 5100 | 4720 | 8.05 | |
| Chrysene | 5350 | 5900 | -9.32 | |
| C1-Chrysenes | 3570 | | | |
| C2-Chrysenes | 2040 | | | |
| C3-Chrysenes | 1110 | | | |
| C4-Chrysenes | 576 | | | |
| Benzo[b]fluoranthene | 6220 | 5960 | 4.36 | |
| Benzo[k]fluoranthene | 1900 | 2300 | -17.4 | |
| Benzo[e]pyrene | 3550 | 3280 | 8.23 | |
| Benzo[a]pyrene | 4220 | 4300 | -1.86 | |
| Perylene | 1160 | 1170 | -0.855 | |
| Indeno[1,2,3,-c,d]pyrene | 3460 | 2780 | 24.5 | |
| Dibenzo[a,h]anthracene | 677 | 759 | -10.8 | |
| Benzo[g,h,i]perylene | 2900 | 2840 | 2.11 | |
| d8-Naphthalene | 37 | | | |
| d10-Acenaphthene | 84 | | | |
| d10-Phenanthrene | 121 | | | |
| d12-Benzo[a]pyrene | 117 | | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control DUP

| | 00-N09-01-PHC-S | 00-N09-01-PHC-S | | 00-C0L-01-PHC-S |
|---------------------|-----------------|-------------------|-------|------------------|
| Field ID | 00-N09-01-PHC-S | DUP | | 00-C0L-01-PHC-S |
| Lab ID | 20A3528 F2 PCA | 20A3528DUP F2 PCA | | 20A3500 F2 |
| Sample Type | N | DUP | | N |
| Matrix | SEDIMENT | SEDIMENT | | SEDIMENT |
| Sample Size | 19.82 g | 19.96 g | | 24.52 g |
| Weight Basis | DRY | DRY | | DRY |
| Associated Blank | NA | NA | | DH-S-58PB PCA F2 |
| Field Date | 08/18/00 | 08/18/00 | | 08/24/00 |
| Extract Date | 04/02/01 | 04/02/01 | | 03/07/01 |
| Analysis Date | 04/05/01 | 04/05/01 | | 03/15/01 |
| Date Received | 08/30/00 | 08/30/00 | | 08/30/00 |
| Percent Solids | 65.8 | 65.8 | | 79.7 |
| Percent Lipids | NA | NA | | NA |
| Min Reporting Limit | 0.63 | 0.63 | | 0.51 |
| Units | ug/Kg | ug/Kg | RPD Q | ug/Kg |

| Polynuclear Aromatic Hydrocarbons | | | | |
|-----------------------------------|---------|---------|-----|---------|
| Naphthalene | 6.9 | 7.3 | 5.6 | 2.4 |
| C1-Naphthalenes | 18 | 19 | 5.4 | 5 |
| C2-Naphthalenes | 25 | 26 | 3.9 | 8.9 |
| C3-Naphthalenes | 18 | 20 | 10 | 6.3 |
| C4-Naphthalenes | 14 | 19 | 30 | 5.1 |
| Acenaphthylene | 0.085 J | 0.072 J | 16 | 0.064 J |
| Acenaphthene | 0.48 J | 0.55 J | 14 | 0.17 JB |
| Biphenyl | 3.1 | 3.3 | 6.2 | 1.1 |
| Fluorene | 2.4 | 2.6 | 8 | 0.7 |
| C1-Fluorenes | 4.8 | 5.2 | 8 | 1.4 |
| C2-Fluorenes | 6.4 | 6.6 | 3.1 | 2.3 |
| C3-Fluorenes | 7.2 | 7.2 | 0 | 2.8 |
| Anthracene | 0.39 J | 0.31 J | 23 | 0.14 JB |
| Phenanthrene | 13 | 13 | 0 | 6 |
| C1-Phenanthrenes/anthracenes | 21 | 22 | 4.6 | 9.8 |
| C2-Phenanthrenes/anthracenes | 17 | 16 | 6.1 | 9.8 |
| C3-Phenanthrenes/anthracenes | 13 | 13 | 0 | 5.1 |
| C4-Phenanthrenes/anthracenes | 5.8 | 6.1 | 5 | 3.6 |
| Dibenzothiophene | 1.9 | 2.1 | 10 | 0.76 |
| C1-Dibenzothiophenes | 3.6 | 3.9 | 8 | 2 |
| C2-Dibenzothiophenes | 6.2 | 6.2 | 0 | 3 |
| C3-Dibenzothiophenes | 4.2 | 4 | 4.9 | 2.4 |
| Fluoranthene | 3 | 2.6 | 14 | 3 |
| Pyrene | 4 | 3.7 | 7.8 | 2.9 |
| C1-Fluoranthenes/pyrenes | 9.6 | 9.2 | 4.2 | 6.9 |
| C2-Fluoranthenes/pyrenes | 8.6 | 8.8 | 2.3 | 4.7 |
| C3-Fluoranthenes/pyrenes | 5.8 | 5.8 | 0 | 3 |
| Benzo[a]anthracene | ND | ND | | 0.98 |
| Chrysene | 5.5 | 5.6 | 1.8 | 4.2 |
| C1-Chrysenes | 6.2 | 6.3 | 1.6 | 4.1 |
| C2-Chrysenes | 5.2 | 5.1 | 1.9 | 3.7 |
| C3-Chrysenes | 3.9 | 3.7 | 5.3 | 2.2 |
| C4-Chrysenes | 2.3 | 2.3 | 0 | 1.6 |
| Benzo[b]fluoranthene | 3.3 | 3.3 | 0 | 3.3 |
| Benzo[k]fluoranthene | 0.4 J | 0.35 J | 13 | 0.38 J |
| Benzo[e]pyrene | 3.8 | 3.9 | 2.6 | 2.6 |
| Benzo[a]pyrene | 1.1 | 0.96 | 14 | 1.1 |
| Perylene | 20 | 22 | 9.5 | 18 |
| Indeno[1,2,3-c,d]pyrene | 0.85 | 0.79 | 7.3 | 0.69 |
| Dibenzo[a,h]anthracene | 0.42 J | 0.37 J | 13 | 0.19 J |
| Benzo[g,h,i]perylene | 2.5 | 2.6 | 3.9 | 1.1 |
| d8-Naphthalene | 52 | 52 | | 62 |
| d10-Acenaphthene | 78 | 74 | | 75 |
| d10-Phenanthrene | 88 | 83 | | 94 |
| d12-Benzo[a]pyrene | 90 | 83 | | 98 |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control DUP

| | | |
|---------------------|------------------------|-----|
| | 00-C0L-01-PHC-S | |
| Field ID | DUP | |
| Lab ID | 20A3500DUP F2 | |
| Sample Type | DUP | |
| Matrix | SEDIMENT | |
| Sample Size | 24.52 g | |
| Weight Basis | DRY | |
| Associated Blank | DH-S-58PB PCA F2 | |
| Field Date | 08/24/00 | |
| Extract Date | 03/07/01 | |
| Analysis Date | 03/15/01 | |
| Date Received | 08/30/00 | |
| Percent Solids | 79.7 | |
| Percent Lipids | NA | |
| Min Reporting Limit | 0.51 | |
| Units | ug/Kg | RPD |

| Polynuclear Aromatic Hydrocarbons | | |
|-----------------------------------|---------|-----|
| Naphthalene | 2.5 | 4.1 |
| C1-Naphthalenes | 4.9 | 2 |
| C2-Naphthalenes | 9.2 | 3.3 |
| C3-Naphthalenes | 7.5 | 17 |
| C4-Naphthalenes | 5.7 | 11 |
| Acenaphthylene | 0.069 J | 7.5 |
| Acenaphthene | 0.19 JB | 11 |
| Biphenyl | 1.1 | 0 |
| Fluorene | 0.78 | 11 |
| C1-Fluorenes | 1.6 | 13 |
| C2-Fluorenes | 2.7 | 16 |
| C3-Fluorenes | 2.9 | 3.5 |
| Anthracene | 0.14 JB | 0 |
| Phenanthrene | 6.2 | 3.3 |
| C1-Phenanthrenes/anthracenes | 9.8 | 0 |
| C2-Phenanthrenes/anthracenes | 9.8 | 0 |
| C3-Phenanthrenes/anthracenes | 5.1 | 0 |
| C4-Phenanthrenes/anthracenes | 4.2 | 15 |
| Dibenzothiophene | 0.78 | 2.6 |
| C1-Dibenzothiophenes | 2.1 | 4.9 |
| C2-Dibenzothiophenes | 3.1 | 3.3 |
| C3-Dibenzothiophenes | 2.4 | 0 |
| Fluoranthene | 3.1 | 3.3 |
| Pyrene | 3 | 3.4 |
| C1-Fluoranthenes/pyrenes | 7.4 | 7 |
| C2-Fluoranthenes/pyrenes | 5.2 | 10 |
| C3-Fluoranthenes/pyrenes | 3.1 | 3.3 |
| Benzo[a]anthracene | 1 | 2 |
| Chrysene | 4.5 | 6.9 |
| C1-Chrysenes | 4.1 | 0 |
| C2-Chrysenes | 3.5 | 5.6 |
| C3-Chrysenes | 2 | 9.5 |
| C4-Chrysenes | 1.4 | 13 |
| Benzo[b]fluoranthene | 3.5 | 5.9 |
| Benzo[k]fluoranthene | 0.37 J | 2.7 |
| Benzo[e]pyrene | 2.6 | 0 |
| Benzo[a]pyrene | 1.2 | 8.7 |
| Perylene | 19 | 5.4 |
| Indeno[1,2,3-c,d]pyrene | 0.66 | 4.4 |
| Dibenzo[a,h]anthracene | 0.24 J | 23 |
| Benzo[g,h,i]perylene | 1.1 | 0 |

| | |
|--------------------|----|
| d8-Naphthalene | 52 |
| d10-Acenaphthene | 68 |
| d10-Phenanthrene | 94 |
| d12-Benzo[a]pyrene | 87 |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control DUP

| | | 00-N06-01-PHC-S | 00-N06-01-PHC-S | |
|--|----|-----------------|-----------------|-------|
| Field ID | | DUP | DUP | |
| Lab ID | | 20A3468 F2 | 20A3468DUP F2 | |
| Sample Type | | N | DUP | |
| Matrix | | SEDIMENT | SEDIMENT | |
| Sample Size | | 19.64 g | 19.2 g | |
| Weight Basis | | DRY | DRY | |
| Associated Blank | | DH-S-55PB PCA | DH-S-55PB PCA | |
| Field Date | | 08/17/00 | 08/17/00 | |
| Extract Date | | 02/20/01 | 02/20/01 | |
| Analysis Date | | 03/06/01 | 03/06/01 | |
| Date Received | | 08/30/00 | 08/30/00 | |
| Percent Solids | | 63.8 | 63.8 | |
| Percent Lipids | | NA | NA | |
| Min Reporting Limit | | 0.64 | 0.65 | |
| Units | Q | ug/Kg | ug/Kg | RPD Q |
| Polynuclear Aromatic Hydrocarbons | | | | |
| Naphthalene | | 12 | 12 | 0 |
| C1-Naphthalenes | | 25 | 25 | 0 |
| C2-Naphthalenes | | 42 | 42 | 0 |
| C3-Naphthalenes | | 39 | 43 | 9.8 |
| C4-Naphthalenes | | 20 | 23 | 14 |
| Acenaphthylene | ND | | ND | |
| Acenaphthene | | 0.88 | 0.9 | 2.2 |
| Biphenyl | | 5.5 | 5.4 | 1.8 |
| Fluorene | | 4.9 | 5.3 | 7.8 |
| C1-Fluorenes | | 8.9 | 11 | 21 |
| C2-Fluorenes | | 12 | 14 | 15 |
| C3-Fluorenes | | 11 | 14 | 24 |
| Anthracene | ND | | ND | |
| Phenanthrene | | 21 | 22 | 4.6 |
| C1-Phenanthrenes/anthracenes | | 33 | 35 | 5.9 |
| C2-Phenanthrenes/anthracenes | | 28 | 32 | 13 |
| C3-Phenanthrenes/anthracenes | | 14 | 15 | 6.9 |
| C4-Phenanthrenes/anthracenes | | 20 | 20 | 0 |
| Dibenzothiophene | | 3.3 | 3.3 | 0 |
| C1-Dibenzothiophenes | | 9.6 | 10 | 4.1 |
| C2-Dibenzothiophenes | | 9.4 | 9.5 | 1 |
| C3-Dibenzothiophenes | | 7.9 | 6.7 | 16 |
| Fluoranthene | | 4 | 4.5 | 12 |
| Pyrene | | 6.1 | 6.1 | 0 |
| C1-Fluoranthenes/pyrenes | | 17 | 16 | 6.1 |
| C2-Fluoranthenes/pyrenes | | 15 | 15 | 0 |
| C3-Fluoranthenes/pyrenes | | 9.1 | 9.8 | 7.4 |
| Benzo[a]anthracene | | 1.5 | 1.6 | 6.4 |
| Chrysene | | 9.2 | 8.9 | 3.3 |
| C1-Chrysenes | | 9.6 | 9.1 | 5.3 |
| C2-Chrysenes | | 7.8 | 7.8 | 0 |
| C3-Chrysenes | | 7.4 | 7 | 5.6 |
| C4-Chrysenes | | 3.6 | 3.3 | 8.7 |
| Benzo[b]fluoranthene | | 6 | 6.1 | 1.6 |
| Benzo[k]fluoranthene | | 0.86 | 0.71 | 19 |
| Benzo[e]pyrene | | 6.7 | 6.7 | 0 |
| Benzo[a]pyrene | | 1.9 | 1.8 | 5.4 |
| Perylene | | 40 | 40 | 0 |
| Indeno[1,2,3,-c,d]pyrene | | 1.2 | 1.5 | 22 |
| Dibenzo[a,h]anthracene | | 0.56 J | 0.49 J | 13 |
| Benzo[g,h,i]perylene | | 4.4 | 4.4 | 0 |
| d8-Naphthalene | | 53 | 38 | |
| d10-Acenaphthene | | 76 | 54 | |
| d10-Phenanthrene | | 102 | 90 | |
| d12-Benzo[a]pyrene | | 103 | 87 | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control BS-BSD

| Field ID | Procedural Blank | Blank Spike | Procedural Blank |
|---------------------|------------------|--------------|------------------|
| Lab ID | DH-S-61PB F2 | DH-S-62BS F2 | DH-S-58PB PCA F2 |
| Sample Type | PB | BS | PB |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Size | 20 g | 20 g | 20 g |
| Weight Basis | DRY | DRY | DRY |
| Associated Blank | NA | DH-S-61PB F2 | NA |
| Field Date | 03/08/01 | 03/08/01 | 03/07/01 |
| Extract Date | 03/08/01 | 03/08/01 | 03/07/01 |
| Analysis Date | 03/23/01 | 03/23/01 | 03/15/01 |
| Date Received | 03/08/01 | 03/08/01 | 03/07/01 |
| Percent Solids | 100 | 100 | 100 |
| Percent Lipids | NA | NA | NA |
| Min Reporting Limit | 0.62 | 0.62 | 0.62 |
| Units | ug/Kg | ug/Kg | T %R Q ug/Kg |

| Polynuclear Aromatic Hydrocarbons | | | | |
|-----------------------------------|---------|------|----|-----|
| Naphthalene | 0.37 J | 40 | 50 | 79 |
| C1-Naphthalenes | 0.28 J | 2.7 | | |
| C2-Naphthalenes | 0.35 J | 4 | | |
| C3-Naphthalenes | ND | ND | | |
| C4-Naphthalenes | ND | ND | | |
| Acenaphthylene | ND | 38 | 50 | 76 |
| Acenaphthene | ND | 40 | 50 | 80 |
| Biphenyl | 0.056 J | 0.63 | | |
| Fluorene | 0.06 J | 40 | 50 | 80 |
| C1-Fluorenes | ND | ND | | |
| C2-Fluorenes | ND | ND | | |
| C3-Fluorenes | ND | ND | | |
| Anthracene | ND | 40 | 50 | 80 |
| Phenanthrene | 0.26 J | 45 | 50 | 89 |
| C1-Phenanthrenes/anthracenes | 0.15 J | 4.6 | | |
| C2-Phenanthrenes/anthracenes | 0.18 J | 6.8 | | |
| C3-Phenanthrenes/anthracenes | 0.11 J | 5 | | |
| C4-Phenanthrenes/anthracenes | ND | ND | | |
| Dibenzothiophene | ND | 0.85 | | |
| C1-Dibenzothiophenes | ND | 1.8 | | |
| C2-Dibenzothiophenes | ND | 2.8 | | |
| C3-Dibenzothiophenes | ND | 3 | | |
| Fluoranthene | 0.086 J | 48 | 50 | 96 |
| Pyrene | 0.068 J | 49 | 50 | 98 |
| C1-Fluoranthenes/pyrenes | ND | 3 | | |
| C2-Fluoranthenes/pyrenes | ND | ND | | |
| C3-Fluoranthenes/pyrenes | ND | ND | | |
| Benzo[a]anthracene | ND | 51 | 50 | 102 |
| Chrysene | ND | 51 | 50 | 102 |
| C1-Chrysenes | ND | 1.5 | | |
| C2-Chrysenes | ND | 1.6 | | |
| C3-Chrysenes | ND | ND | | |
| C4-Chrysenes | ND | ND | | |
| Benzo[b]fluoranthene | ND | 52 | 50 | 104 |
| Benzo[k]fluoranthene | ND | 48 | 50 | 96 |
| Benzo[e]pyrene | ND | ND | | |
| Benzo[a]pyrene | ND | 49 | 50 | 98 |
| Perylene | ND | ND | | |
| Indeno[1,2,3-c,d]pyrene | ND | 47 | 50 | 94 |
| Dibenzo[a,h]anthracene | ND | 47 | 50 | 94 |
| Benzo[g,h,i]perylene | ND | 41 | 50 | 82 |
| d8-Naphthalene | 68 | 3 & | | |
| d10-Acenaphthene | 73 | 3 & | | |
| d10-Phenanthrene | 80 | 3 & | | |
| d12-Benzo[a]pyrene | 81 | 3 & | | |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control BS-BSD

| | |
|---------------------|------------------|
| Field ID | Blank Spike |
| Lab ID | DH-S-59BS PCA F2 |
| Sample Type | BS |
| Matrix | SEDIMENT |
| Sample Size | 20 g |
| Weight Basis | DRY |
| Associated Blank | DH-S-58PB PCA F2 |
| Field Date | 03/07/01 |
| Extract Date | 03/07/01 |
| Analysis Date | 03/15/01 |
| Date Received | 03/07/01 |
| Percent Solids | 100 |
| Percent Lipids | NA |
| Min Reporting Limit | 0.62 |
| Units | ug/Kg |
| | T %R |

| Polynuclear Aromatic Hydrocarbons | | | |
|-----------------------------------|---------|----|-----|
| Naphthalene | 48 | 50 | 95 |
| C1-Naphthalenes | 2.3 | | |
| C2-Naphthalenes | 2.8 | | |
| C3-Naphthalenes | 1.2 B | | |
| C4-Naphthalenes | ND | | |
| Acenaphthylene | 46 | 50 | 92 |
| Acenaphthene | 48 | 50 | 96 |
| Biphenyl | ND | | |
| Fluorene | 49 | 50 | 98 |
| C1-Fluorenes | ND | | |
| C2-Fluorenes | ND | | |
| C3-Fluorenes | ND | | |
| Anthracene | 33 | 50 | 66 |
| Phenanthrene | 47 | 50 | 93 |
| C1-Phenanthrenes/anthracenes | 0.29 JB | | |
| C2-Phenanthrenes/anthracenes | ND | | |
| C3-Phenanthrenes/anthracenes | ND | | |
| C4-Phenanthrenes/anthracenes | ND | | |
| Dibenzothiophene | ND | | |
| C1-Dibenzothiophenes | ND | | |
| C2-Dibenzothiophenes | ND | | |
| C3-Dibenzothiophenes | ND | | |
| Fluoranthene | 51 | 50 | 102 |
| Pyrene | 52 | 50 | 104 |
| C1-Fluoranthenes/pyrenes | ND | | |
| C2-Fluoranthenes/pyrenes | ND | | |
| C3-Fluoranthenes/pyrenes | ND | | |
| Benzo[a]anthracene | 48 | 50 | 96 |
| Chrysene | 48 | 50 | 96 |
| C1-Chrysenes | ND | | |
| C2-Chrysenes | ND | | |
| C3-Chrysenes | ND | | |
| C4-Chrysenes | ND | | |
| Benzo[b]fluoranthene | 65 | 50 | 130 |
| Benzo[k]fluoranthene | 52 | 50 | 104 |
| Benzo[e]pyrene | ND | | |
| Benzo[a]pyrene | 51 | 50 | 102 |
| Perylene | ND | | |
| Indeno[1,2,3,-c,d]pyrene | 57 | 50 | 114 |
| Dibenzo[a,h]anthracene | 54 | 50 | 108 |
| Benzo[g,h,i]perylene | 43 | 50 | 86 |

| | |
|--------------------|----|
| d8-Naphthalene | 82 |
| d10-Acenaphthene | 83 |
| d10-Phenanthrene | 90 |
| d12-Benzo[a]pyrene | 76 |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control BS-BSD

| Field ID | Procedural | Blank | Blank Spike | | |
|--|---------------|---------------|-------------|-----|--|
| Lab ID | DH-S-55PB PCA | DH-S-56BS PCA | | | |
| Sample Type | PB | BS | | | |
| Matrix | SEDIMENT | SEDIMENT | | | |
| Sample Size | 20 g | 20 g | | | |
| Weight Basis | DRY | DRY | | | |
| Associated Blank | NA | DH-S-55PB PCA | | | |
| Field Date | 02/20/01 | 02/20/01 | | | |
| Extract Date | 02/20/01 | 02/20/01 | | | |
| Analysis Date | 03/14/01 | 03/14/01 | | | |
| Date Received | 02/20/01 | 02/20/01 | | | |
| Percent Solids | 100 | 100 | | | |
| Percent Lipids | NA | NA | | | |
| Min Reporting Limit | 0.62 | 1.2 | | | |
| Units | Q ug/Kg | ug/Kg | T %R | Q | |
| Polynuclear Aromatic Hydrocarbons | | | | | |
| Naphthalene | 0.44 J | 47 | 50 | 93 | |
| C1-Naphthalenes | 1 | 0.47 JB | | | |
| C2-Naphthalenes | 1.8 | 0.45 JB | | | |
| C3-Naphthalenes | 0.83 | ND | | | |
| C4-Naphthalenes | ND | ND | | | |
| Acenaphthylene | 0.043 J | 43 | 50 | 86 | |
| Acenaphthene | 0.04 J | 45 | 50 | 90 | |
| Biphenyl | ND | ND | | | |
| Fluorene | 0.087 J | 45 | 50 | 90 | |
| C1-Fluorenes | 0.13 J | 0.18 JB | | | |
| C2-Fluorenes | 0.15 J | ND | | | |
| C3-Fluorenes | ND | ND | | | |
| Anthracene | 0.03 J | 35 | 50 | 70 | |
| Phenanthrene | 0.26 J | 44 | 50 | 87 | |
| C1-Phenanthrenes/anthracenes | 0.32 J | 0.22 JB | | | |
| C2-Phenanthrenes/anthracenes | 0.2 J | 0.18 JB | | | |
| C3-Phenanthrenes/anthracenes | 0.17 J | 0.082 JB | | | |
| C4-Phenanthrenes/anthracenes | ND | ND | | | |
| Dibenzothiophene | 0.08 J | 0.28 JB | | | |
| C1-Dibenzothiophenes | 0.13 J | ND | | | |
| C2-Dibenzothiophenes | 0.19 J | ND | | | |
| C3-Dibenzothiophenes | 0.13 J | ND | | | |
| Fluoranthene | 0.038 J | 48 | 50 | 96 | |
| Pyrene | 0.057 J | 48 | 50 | 96 | |
| C1-Fluoranthenes/pyrenes | 0.096 J | 0.078 JB | | | |
| C2-Fluoranthenes/pyrenes | ND | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | ND | | | |
| Benzo[a]anthracene | ND | 46 | 50 | 92 | |
| Chrysene | ND | 47 | 50 | 94 | |
| C1-Chrysenes | ND | ND | | | |
| C2-Chrysenes | ND | ND | | | |
| C3-Chrysenes | ND | ND | | | |
| C4-Chrysenes | ND | ND | | | |
| Benzo[b]fluoranthene | ND | 52 | 50 | 104 | |
| Benzo[k]fluoranthene | ND | 44 | 50 | 88 | |
| Benzo[e]pyrene | ND | ND | | | |
| Benzo[a]pyrene | ND | 47 | 50 | 94 | |
| Perylene | ND | ND | | | |
| Indeno[1,2,3-c,d]pyrene | ND | 55 | 50 | 110 | |
| Dibenzo[a,h]anthracene | ND | 52 | 50 | 104 | |
| Benzo[g,h,i]perylene | ND | 50 | 50 | 100 | |
| d8-Naphthalene | 83 | 93 | | | |
| d10-Acenaphthene | 87 | 95 | | | |
| d10-Phenanthrene | 96 | 98 | | | |
| d12-Benzo[a]pyrene | 97 | 97 | | | |

Project Title : MMS - AMINIDA - PHASE II - TASK 2

Data Package: 4068

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference | | | |
|---------------------|---------------|------|--------|---|
| Sample Type | Standard | | | |
| Matrix | ORS | | | |
| Sample Size | OIL | | | |
| Weight Basis | 5.02 mg | | | |
| Associated Blank | OIL | | | |
| Field Date | NA | | | |
| Extract Date | 05/16/02 | | | |
| Analysis Date | 05/16/02 | | | |
| Date Received | 10/17/02 | | | |
| Percent Solids | 05/16/02 | | | |
| Dilution Factor | NA | | | |
| Percent Lipids | 1 | | | |
| Min Reporting Limit | NA | | | |
| Units | 0.199 | | | |
| | ug/mg | T | %D | Q |
| SHC/TPH | | | | |
| n-Nonane | 5.1 | 4.8 | 6.25 | |
| n-Decane | 4.25 | 4.2 | 1.19 | |
| n-Undecane | 4.17 | 4.3 | -3.02 | |
| n-Dodecane | 4.07 | 4 | 1.75 | |
| n-Tridecane | 3.71 | 4 | -7.25 | |
| Isoprenoid RRT 1380 | 1.29 | 1 | 29 | |
| n-Tetradecane | 4.48 | 4.2 | 6.67 | |
| Isoprenoid RRT 1470 | 1.44 | 1.4 | 2.86 | |
| n-Pentadecane | 3.42 | 3.7 | -7.57 | |
| n-Hexadecane | 3.38 | 3.2 | 5.62 | |
| Isoprenoid RRT 1650 | 1.72 | 1.5 | 14.7 | |
| n-Heptadecane | 2.79 | 3.2 | -12.8 | |
| Pristane | 2.02 | 2.2 | -8.18 | |
| n-Octadecane | 2.64 | 2.9 | -8.96 | |
| Phytane | 1.45 | 1.6 | -9.38 | |
| n-Nonadecane | 2.52 | 2.6 | -3.08 | |
| n-Eicosane | 2.68 | 2.7 | -0.741 | |
| n-Heneicosane | 2.26 | 2.4 | -5.83 | |
| n-Docosane | 2.22 | 2.2 | 0.909 | |
| n-Tricosane | 2.04 | 2 | 2 | |
| n-Tetracosane | 1.86 | 2 | -7 | |
| n-Pentacosane | 1.67 | 1.7 | -1.76 | |
| n-Hexacosane | 1.46 | 1.5 | -2.67 | |
| n-Heptacosane | 1.09 | 1.2 | -9.17 | |
| n-Octacosane | 0.929 | 0.88 | 5.57 | |
| n-Nonacosane | 0.768 | 0.81 | -5.18 | |
| n-Triacontane | 0.67 | 0.65 | 3.08 | |
| n-Hentriacontane | 0.748 | 0.58 | 29 | |
| n-Dotriacontane | 0.406 | 0.44 | -7.73 | |
| n-Tritriacontane | 0.352 | 0.4 | -12 | |
| n-Tetratriacontane | 0.336 | 0.35 | -4 | |
| n-Pentatriacontane | 0.419 | 0.35 | 19.7 | |
| n-Hexatriacontane | 0.273 | 0.23 | 18.7 | |
| n-Heptatriacontane | 0.229 | 0.23 | -0.435 | |
| n-Octatriacontane | 0.222 | 0.22 | 0.909 | |
| n-Tetracontane | 0.189 J | 0.19 | -0.526 | |
| TPH (RES) | 171 | 220 | -22.3 | |
| TPH | 550 | 660 | -16.7 | |
| %ortho-terphenyl | 100 | | | |
| %5A-androstane | 103 | | | |
| %d50-tetracosane | 103 | | | |

Project Title : MMS - AMINIDA - PHASE II - TASK 2

Data Package: 4068

Data Table: DUP - Surrogate Corrected

| Field ID | 02-NOR-01-PHC-0 | 02-NOR-01-PHC-0DUP | | |
|---------------------|-----------------|--------------------|-----|---|
| Sample Type | N | DUP | | |
| Matrix | OIL | OIL | | |
| Sample Size | 5.18 mg | 5.08 mg | | |
| Weight Basis | OIL | OIL | | |
| Associated Blank | DY-S-77PB | DY-S-77PB | | |
| Field Date | 07/18/02 | 07/18/02 | | |
| Extract Date | 10/17/02 | 10/17/02 | | |
| Analysis Date | 10/18/02 | 10/18/02 | | |
| Date Received | 07/19/02 | 07/19/02 | | |
| Percent Solids | NA | NA | | |
| Dilution Factor | 1 | 1 | | |
| Percent Lipids | NA | NA | | |
| Min Reporting Limit | 0.19 | 0.2 | | |
| Units | ug/mg | ug/mg | RPD | Q |
| SHC/TPH | | | | |
| n-Nonane | 12 | 12 | 0 | |
| n-Decane | 10 | 10 | 0 | |
| n-Undecane | 9.2 | 9.5 | 3.2 | |
| n-Dodecane | 8.5 | 8.8 | 3.5 | |
| n-Tridecane | 7.6 | 8 | 5.1 | |
| Isoprenoid RRT 1380 | 2.3 | 2.4 | 4.2 | |
| n-Tetradecane | 8.4 | 8.7 | 3.5 | |
| Isoprenoid RRT 1470 | 2.8 | 2.9 | 3.5 | |
| n-Pentadecane | 6.8 | 7.1 | 4.3 | |
| n-Hexadecane | 6.2 | 6.4 | 3.2 | |
| Isoprenoid RRT 1650 | 3 | 3.1 | 3.3 | |
| n-Heptadecane | 5.2 | 5.6 | 7.4 | |
| Pristane | 3.5 | 3.8 | 8.2 | |
| n-Octadecane | 4.3 | 4.5 | 4.5 | |
| Phytane | 2.2 | 2.2 | 0 | |
| n-Nonadecane | 4.2 | 4.2 | 0 | |
| n-Eicosane | 3.9 | 4.1 | 5 | |
| n-Heneicosane | 3.2 | 3.3 | 3.1 | |
| n-Docosane | 3 | 3.1 | 3.3 | |
| n-Tricosane | 2.8 | 3 | 6.9 | |
| n-Tetracosane | 2.4 | 2.5 | 4.1 | |
| n-Pentacosane | 2.2 | 2.3 | 4.4 | |
| n-Hexacosane | 1.8 | 1.8 | 0 | |
| n-Heptacosane | 1.5 | 1.6 | 6.4 | |
| n-Octacosane | 1.2 | 1.3 | 8 | |
| n-Nonacosane | 1.1 | 1.1 | 0 | |
| n-Triacontane | 0.95 | 0.99 | 4.1 | |
| n-Hentriacontane | 0.94 | 0.99 | 5.2 | |
| n-Dotriacontane | 0.58 | 0.58 | 0 | |
| n-Tritriacontane | 0.51 | 0.52 | 1.9 | |
| n-Tetratriacontane | 0.38 | 0.38 | 0 | |
| n-Pentatriacontane | 0.4 | 0.41 | 2.5 | |
| n-Hexatriacontane | 0.24 | 0.24 | 0 | |
| n-Heptatriacontane | 0.2 | 0.22 | 9.5 | |
| n-Octatriacontane | 0.19 | 0.21 | 10 | |
| n-Tetracontane | 0.14 J | 0.14 J | 0 | |
| TPH (RES) | 230 | 240 | 4.2 | |
| TPH | 500 | 530 | 5.8 | |
| %ortho-terphenyl | 85 | 85 | | |
| %5A-androstane | 82 | 82 | | |
| %d50-tetracosane | 85 | 85 | | |

Project Title : MMS - AMINIDA - PHASE II - TASK 2
Data Package: 4068
Data Table: BS-BSD - Surrogate Corrected

| | |
|---------------------|------------------|
| Field ID | Procedural Blank |
| Sample Type | PB |
| Matrix | WATER |
| Sample Size | 0.15 L |
| Weight Basis | WET |
| Associated Blank | NA |
| Field Date | 10/16/02 |
| Extract Date | 10/16/02 |
| Analysis Date | 10/17/02 |
| Date Received | 10/16/02 |
| Percent Solids | NA |
| Dilution Factor | 1 |
| Percent Lipids | NA |
| Min Reporting Limit | 3.3 |
| Units | ug/L |

| SHC/TPH | |
|---------------------|--------|
| n-Nonane | ND |
| n-Decane | ND |
| n-Undecane | ND |
| n-Dodecane | ND |
| n-Tridecane | ND |
| Isoprenoid RRT 1380 | ND |
| n-Tetradecane | ND |
| Isoprenoid RRT 1470 | ND |
| n-Pentadecane | ND |
| n-Hexadecane | ND |
| Isoprenoid RRT 1650 | ND |
| n-Heptadecane | ND |
| Pristane | ND |
| n-Octadecane | ND |
| Phytane | ND |
| n-Nonadecane | ND |
| n-Eicosane | ND |
| n-Heneicosane | ND |
| n-Docosane | 0.18 J |
| n-Tricosane | 0.68 J |
| n-Tetracosane | 1.2 J |
| n-Pentacosane | 1.6 J |
| n-Hexacosane | 2 J |
| n-Heptacosane | 2.4 J |
| n-Octacosane | 2.5 J |
| n-Nonacosane | 2.2 J |
| n-Triacontane | 1.7 J |
| n-Hentriacontane | 1.5 J |
| n-Dotriacontane | 0.89 J |
| n-Tritriacontane | 0.5 J |
| n-Tetratriacontane | 0.27 J |
| n-Pentatriacontane | 0.14 J |
| n-Hexatriacontane | ND |
| n-Heptatriacontane | ND |
| n-Octatriacontane | ND |
| n-Tetracontane | ND |
| TPH (RES) | 92 |
| TPH | 92 |
| %ortho-terphenyl | 70 |
| %5A-androstane | 63 |
| %d50-tetracosane | 66 |

Project Title : MMS - AMINIDA - PHASE II - TASK 2
Data Package: 4068
Data Table: BS-BSD - Surrogate Corrected

| | |
|---------------------|------------------|
| Field ID | Procedural Blank |
| Sample Type | PB |
| Matrix | OIL |
| Sample Size | 5 mg |
| Weight Basis | OIL |
| Associated Blank | NA |
| Field Date | 10/17/02 |
| Extract Date | 10/17/02 |
| Analysis Date | 10/18/02 |
| Date Received | 10/17/02 |
| Percent Solids | NA |
| Dilution Factor | 1 |
| Percent Lipids | NA |
| Min Reporting Limit | 0.2 |
| Units | ug/mg |

| SHC/TPH | |
|---------------------|----------|
| n-Nonane | ND |
| n-Decane | ND |
| n-Undecane | ND |
| n-Dodecane | ND |
| n-Tridecane | ND |
| Isoprenoid RRT 1380 | ND |
| n-Tetradecane | ND |
| Isoprenoid RRT 1470 | ND |
| n-Pentadecane | ND |
| n-Hexadecane | ND |
| Isoprenoid RRT 1650 | ND |
| n-Heptadecane | ND |
| Pristane | ND |
| n-Octadecane | ND |
| Phytane | ND |
| n-Nonadecane | ND |
| n-Eicosane | ND |
| n-Heneicosane | ND |
| n-Docosane | ND |
| n-Tricosane | ND |
| n-Tetracosane | ND |
| n-Pentacosane | ND |
| n-Hexacosane | ND |
| n-Heptacosane | ND |
| n-Octacosane | ND |
| n-Nonacosane | 0.0069 J |
| n-Triacontane | ND |
| n-Hentriacontane | ND |
| n-Dotriacontane | ND |
| n-Tritriacontane | ND |
| n-Tetratriacontane | ND |
| n-Pentatriacontane | ND |
| n-Hexatriacontane | ND |
| n-Heptatriacontane | ND |
| n-Octatriacontane | ND |
| n-Tetracontane | ND |
| TPH (RES) | 0.88 |
| TPH | 0.88 |
| %ortho-terphenyl | 85 |
| %5A-androstane | 78 |
| %d50-tetracosane | 80 |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4070

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference | | | | Oil Reference | | | |
|---------------------|---------------|---|----|---|---------------|---|----|---|
| Sample Type | Standard | | | | Standard | | | |
| Matrix | ORS | | | | ORS | | | |
| Sample Size | OIL | | | | OIL | | | |
| Weight Basis | 5.1 mg | | | | 5.34 mg | | | |
| Associated Blank | OIL | | | | OIL | | | |
| Field Date | NA | | | | NA | | | |
| Extract Date | 04/23/02 | | | | 12/31/02 | | | |
| Analysis Date | 04/23/02 | | | | 12/31/02 | | | |
| Date Received | 10/18/02 | | | | 02/25/03 | | | |
| Percent Solids | 04/23/02 | | | | 12/31/02 | | | |
| Dilution Factor | NA | | | | NA | | | |
| Percent Lipids | 1 | | | | 1 | | | |
| Min Reporting Limit | NA | | | | NA | | | |
| Units | 4.9 | | | | 4.68 | | | |
| | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q |

Sterane-Triterpane Biomarkers

| | | | | | | |
|----------------------------|------|------|-------|------|------|-------|
| T4-C23Diterpane | 56.9 | 58.9 | -3.4 | 48.1 | 58.9 | -18.3 |
| S4-Diacholestane | 39.6 | 46.8 | -15.4 | 44.8 | 46.8 | -4.27 |
| S5-Diacholestane | 23.8 | 26.1 | -8.81 | 28 | 26.1 | 7.28 |
| T9-C29Tricyclictriterpane | 13.7 | 15.7 | -12.7 | 15.8 | 15.7 | 0.637 |
| T10-C29Tricyclictriterpane | 13.7 | 15 | -8.67 | 12.5 | 15 | -16.7 |
| T11-Trisnorhopane(TS) | 22.5 | 24.8 | -9.27 | 21.9 | 24.8 | -11.7 |
| T12-Trisnorhopane(TM) | 25 | 31 | -19.4 | 25.2 | 31 | -18.7 |
| S24-Methylcholestane | 30.6 | 26.2 | 16.8 | 28.4 | 26.2 | 8.4 |
| S25-Ethylcholestane | 48 | 39.8 | 20.6 | 41.4 | 39.8 | 4.02 |
| S28-Ethylcholestane | 36.2 | 33.9 | 6.78 | 36.7 | 33.9 | 8.26 |
| T15-Norhopane | 82.9 | 83.8 | -1.07 | 80.6 | 83.8 | -3.82 |
| T18-Oleanane | ND | | | ND | | |
| T19-Hopane | 119 | 113 | 5.31 | 118 | 113 | 4.42 |
| T21-Homohopane | 53.6 | 46.1 | 16.3 | 49.7 | 46.1 | 7.81 |
| T22-Homohopane | 42 | 35.2 | 19.3 | 36.5 | 35.2 | 3.69 |
| 5B(H)-Cholane | 110 | | | 99 | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4070
Data Table: DUP - Surrogate Corrected

| Field ID | Northstar Oil | Northstar Oil DUP | | | KUPARIC WELL 3H-5 | KUPARIC WELL 3H-5 | | |
|--------------------------------------|---------------|-------------------|-----|---|-------------------|-------------------|-----|---|
| Sample Type | N | DUP | | | N | DUP | | |
| Matrix | OIL | OIL | | | CRUDE OIL | CRUDE OIL | | |
| Sample Size | 5.18 mg | 5.08 mg | | | 5.2 mg | 4.92 mg | | |
| Weight Basis | OIL | OIL | | | OIL | OIL | | |
| Associated Blank | DY-S-77PB | DY-S-77PB | | | EB-S-61PB | EB-S-61PB | | |
| Field Date | 07/18/02 | 07/18/02 | | | 08/12/01 | 08/12/01 | | |
| Extract Date | 10/17/02 | 10/17/02 | | | 02/20/03 | 02/20/03 | | |
| Analysis Date | 10/18/02 | 10/18/02 | | | 02/25/03 | 02/25/03 | | |
| Date Received | 07/19/02 | 07/19/02 | | | 08/31/01 | 08/31/01 | | |
| Percent Solids | NA | NA | | | NA | NA | | |
| Dilution Factor | 1 | 1 | | | 1 | 1 | | |
| Percent Lipids | NA | NA | | | NA | NA | | |
| Min Reporting Limit | 4.8 | 4.9 | | | 4.8 | 5.1 | | |
| Units | mg/Kg | mg/Kg | RPD | Q | mg/Kg | mg/Kg | RPD | Q |
| Sterane-Triterpane Biomarkers | | | | | | | | |
| T4-C23Diterpane | 41 | 42 | 2.4 | | 84 | 90 | 6.9 | |
| S4-Diacholestane | 42 | 43 | 2.4 | | 33 | 32 | 3.1 | |
| S5-Diacholestane | 23 | 25 | 8.3 | | 21 | 21 | 0 | |
| T9-C29Tricyclitriterpane | 18 | 18 | 0 | | 22 | 22 | 0 | |
| T10-C29Tricyclitriterpane | 16 | 17 | 6.1 | | 20 | 20 | 0 | |
| T11-Trisnorhopane(TS) | 14 | 14 | 0 | | 22 | 22 | 0 | |
| T12-Trisnorhopane(TM) | 6.6 | 7.8 | 17 | | 34 | 36 | 5.7 | |
| S24-Methylcholestane | 11 | 13 | 17 | | 13 | 18 | 32 | |
| S25-Ethylcholestane | 21 | 20 | 4.9 | | 36 | 37 | 2.7 | |
| S28-Ethylcholestane | 16 | 18 | 12 | | 31 | 29 | 6.7 | |
| T15-Norhopane | 26 | 28 | 7.4 | | 99 | 100 | 1 | |
| T18-Oleanane | ND | ND | | | ND | ND | | |
| T19-Hopane | 49 | 48 | 2.1 | | 100 | 110 | 9.5 | |
| T21-Homohopane | 19 | 19 | 0 | | 47 | 49 | 4.2 | |
| T22-Homohopane | 13 | 13 | 0 | | 38 | 40 | 5.1 | |
| 5B(H)-Cholane | 107 | 107 | | | 100 | 100 | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4070
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | Procedural Blank |
|---------------------|------------------|------------------|
| Sample Type | PB | PB |
| Matrix | OIL | Oil |
| Sample Size | 5 mg | 5 mg |
| Weight Basis | OIL | OIL |
| Associated Blank | NA | NA |
| Field Date | 10/17/02 | 02/20/03 |
| Extract Date | 10/17/02 | 02/20/03 |
| Analysis Date | 10/18/02 | 02/25/03 |
| Date Received | 10/17/02 | 02/20/03 |
| Percent Solids | NA | NA |
| Dilution Factor | 1 | 1 |
| Percent Lipids | NA | NA |
| Min Reporting Limit | 5 | 5 |
| Units | mg/Kg | mg/Kg |

Sterane-Triterpane Biomarkers

| | | |
|----------------------------|----|----|
| T4-C23Diterpane | ND | ND |
| S4-Diacholestane | ND | ND |
| S5-Diacholestane | ND | ND |
| T9-C29Tricyclictriterpane | ND | ND |
| T10-C29Tricyclictriterpane | ND | ND |
| T11-Trisnorhopane(TS) | ND | ND |
| T12-Trisnorhopane(TM) | ND | ND |
| S24-Methylcholestane | ND | ND |
| S25-Ethylcholestane | ND | ND |
| S28-Ethylcholestane | ND | ND |
| T15-Norhopane | ND | ND |
| T18-Oleanane | ND | ND |
| T19-Hopane | ND | ND |
| T21-Homohopane | ND | ND |
| T22-Homohopane | ND | ND |

5B(H)-Cholane

109

102

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4070
Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | |
|--|------------------------|------|-------|---|------------------------|------|--------|---|------------------------|------|--------|---|
| Sample Type | ORS | | | | ORS | | | | ORS | | | |
| Matrix | OIL | | | | OIL | | | | OIL | | | |
| Sample Size | 5.1 mg | | | | 5.1 mg | | | | 5.34 mg | | | |
| Weight Basis | OIL | | | | OIL | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | |
| Field Date | 04/23/02 | | | | 04/23/02 | | | | 12/31/02 | | | |
| Extract Date | 04/23/02 | | | | 04/23/02 | | | | 12/31/02 | | | |
| Analysis Date | 10/18/02 | | | | 10/23/02 | | | | 02/25/03 | | | |
| Date Received | 04/23/02 | | | | 04/23/02 | | | | 12/31/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 4.9 | | | | 4.9 | | | | 4.68 | | | |
| Units | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | | | | | |
| Naphthalene | 774 | 710 | 9.01 | | 832 | 710 | 17.2 | | 752 | 710 | 5.92 | |
| C1-Naphthalenes | 1440 | 1600 | -10 | | 1510 | 1600 | -5.62 | | 1600 | 1600 | 0 | |
| C2-Naphthalenes | 2060 | 2300 | -10.4 | | 2100 | 2300 | -8.7 | | 2210 | 2300 | -3.91 | |
| C3-Naphthalenes | 1720 | 1960 | -12.2 | | 1600 | 1960 | -18.4 | | 1830 | 1960 | -6.63 | |
| C4-Naphthalenes | 968 | 1180 | -18 | | 927 | 1180 | -21.4 | | 1060 | 1180 | -10.2 | |
| Acenaphthylene | ND | | | | ND | | | | ND | | | |
| Acenaphthene | ND | | | | ND | | | | ND | | | |
| Biphenyl | 222 | 214 | 3.74 | | 233 | 214 | 8.88 | | 226 | 214 | 5.61 | |
| Fluorene | 105 | 95.2 | 10.3 | | 103 | 95.2 | 8.19 | | 100 | 95.2 | 5.04 | |
| C1-Fluorenes | 247 | 239 | 3.35 | | 253 | 239 | 5.86 | | 246 | 239 | 2.93 | |
| C2-Fluorenes | 359 | 356 | 0.843 | | 344 | 356 | -3.37 | | 353 | 356 | -0.843 | |
| C3-Fluorenes | 348 | 396 | -12.1 | | 340 | 396 | -14.1 | | 348 | 396 | -12.1 | |
| Anthracene | ND | | | | ND | | | | ND | | | |
| Phenanthrene | 283 | 260 | 8.85 | | 290 | 260 | 11.5 | | 278 | 260 | 6.92 | |
| C1-Phenanthrenes/anthracenes | 628 | 612 | 2.61 | | 584 | 612 | -4.58 | | 615 | 612 | 0.49 | |
| C2-Phenanthrenes/anthracenes | 702 | 752 | -6.65 | | 628 | 752 | -16.5 | | 758 | 752 | 0.798 | |
| C3-Phenanthrenes/anthracenes | 517 | 534 | -3.18 | | 483 | 534 | -9.55 | | 507 | 534 | -5.06 | |
| C4-Phenanthrenes/anthracenes | 313 | 308 | 1.62 | | 258 | 308 | -16.2 | | 290 | 308 | -5.84 | |
| Dibenzothiophene | 252 | 222 | 13.5 | | 258 | 222 | 16.2 | | 235 | 222 | 5.86 | |
| C1-Dibenzothiophenes | 508 | 484 | 4.96 | | 477 | 484 | -1.45 | | 478 | 484 | -1.24 | |
| C2-Dibenzothiophenes | 636 | 658 | -3.34 | | 618 | 658 | -6.08 | | 630 | 658 | -4.26 | |
| C3-Dibenzothiophenes | 583 | 574 | 1.57 | | 525 | 574 | -8.54 | | 543 | 574 | -5.4 | |
| Fluoranthene | ND | | | | ND | | | | ND | | | |
| Pyrene | 14.3 | 13.4 | 6.72 | | 16.3 | 13.4 | 21.6 | | 13.9 | 13.4 | 3.73 | |
| C1-Fluoranthenes/pyrenes | 90.3 | 83.9 | 7.63 | | 83.8 | 83.9 | -0.119 | | 79 | 83.9 | -5.84 | |
| C2-Fluoranthenes/pyrenes | 159 | 142 | 12 | | 142 | 142 | 0 | | 138 | 142 | -2.82 | |
| C3-Fluoranthenes/pyrenes | 172 | 158 | 8.86 | | 147 | 158 | -6.96 | | 155 | 158 | -1.9 | |
| Benzo[a]anthracene | ND | | | | ND | | | | ND | | | |
| Chrysene | 56.1 | 49.2 | 14 | | 51.6 | 49.2 | 4.88 | | 53 | 49.2 | 7.72 | |
| C1-Chrysenes | 93.7 | 81.5 | 15 | | 80.6 | 81.5 | -1.1 | | 92.3 | 81.5 | 13.2 | |
| C2-Chrysenes | 105 | 102 | 2.94 | | 93.8 | 102 | -8.04 | | 106 | 102 | 3.92 | |
| C3-Chrysenes | 95 | 79.6 | 19.3 | | 80.8 | 79.6 | 1.51 | | 88.3 | 79.6 | 10.9 | |
| C4-Chrysenes | 66.8 | 64 | 4.37 | | 57.7 | 64 | -9.84 | | 62.7 | 64 | -2.03 | |
| Benzo[b]fluoranthene | 7.21 | 7.62 | -5.38 | | 7.32 | 7.62 | -3.94 | | 6.67 | 7.62 | -12.5 | |
| Benzo[k]fluoranthene | ND | | | | ND | | | | ND | | | |
| Benzo[e]pyrene | 12.1 | 12.4 | -2.42 | | 12.2 | 12.4 | -1.61 | | 12.1 | 12.4 | -2.42 | |
| Benzo[a]pyrene | ND | | | | ND | | | | ND | | | |
| Perylene | ND | | | | ND | | | | ND | | | |
| Indeno[1,2,3-c,d]pyrene | ND | | | | ND | | | | ND | | | |
| Dibenzo[a,h]anthracene | 1.46 J | | | | 1.16 J | | | | 1.41 J | | | |
| Benzo[g,h,i]perylene | 3.44 J | 3.18 | 8.18 | | 3.17 J | 3.18 | -0.314 | | 3.48 J | 3.18 | 9.43 | |
| d8-Naphthalene | 90 | | | | 93 | | | | 93 | | | |
| d10-Acenaphthene | 97 | | | | 98 | | | | 93 | | | |
| d10-Phenanthrene | 98 | | | | 96 | | | | 95 | | | |
| d12-Benzo[a]pyrene | 108 | | | | 106 | | | | 107 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4070
Data Table: IRM - Surrogate Corrected

| Field ID | Instrument Reference | | | | Instrument Reference | | | | Instrument Reference | | | |
|--|----------------------|------|--------|---|----------------------|------|-------|---|----------------------|------|--------|---|
| Sample Type | Standard | | | | Standard | | | | Standard | | | |
| Matrix | IRM | | | | IRM | | | | IRM | | | |
| Sample Size | 0.1 mL | | | | 0.1 mL | | | | 0.1 mL | | | |
| Weight Basis | WET | | | | WET | | | | WET | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | |
| Field Date | 10/15/02 | | | | 10/15/02 | | | | 10/15/02 | | | |
| Extract Date | 10/15/02 | | | | 10/15/02 | | | | 10/15/02 | | | |
| Analysis Date | 10/18/02 | | | | 10/23/02 | | | | 02/25/03 | | | |
| Date Received | 10/15/02 | | | | 10/15/02 | | | | 10/15/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 250 | | | | 250 | | | | 250 | | | |
| Units | ug/L | T | %D | Q | ug/L | T | %D | Q | ug/L | T | %D | Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | | | | | |
| Naphthalene | 6640 | 6890 | -3.63 | | 6850 | 6890 | -0.58 | | 6750 | 6890 | -2.03 | |
| C1-Naphthalenes | ND | | | | ND | | | | ND | | | |
| C2-Naphthalenes | ND | | | | ND | | | | ND | | | |
| C3-Naphthalenes | ND | | | | ND | | | | ND | | | |
| C4-Naphthalenes | ND | | | | ND | | | | ND | | | |
| Acenaphthylene | 6640 | 6960 | -4.6 | | 6690 | 6960 | -3.88 | | 6540 | 6960 | -6.03 | |
| Acenaphthene | 6490 | 7280 | -10.8 | | 6590 | 7280 | -9.48 | | 6430 | 7280 | -11.7 | |
| Biphenyl | 6960 | 7000 | -0.571 | | 7130 | 7000 | 1.86 | | 7070 | 7000 | 1 | |
| Fluorene | 6200 | 7270 | -14.7 | | 6390 | 7270 | -12.1 | | 6230 | 7270 | -14.3 | |
| C1-Fluorenes | ND | | | | ND | | | | ND | | | |
| C2-Fluorenes | ND | | | | ND | | | | ND | | | |
| C3-Fluorenes | ND | | | | ND | | | | ND | | | |
| Anthracene | 7060 | 7820 | -9.72 | | 7160 | 7820 | -8.44 | | 7260 | 7820 | -7.16 | |
| Phenanthrene | 6850 | 7010 | -2.28 | | 7030 | 7010 | 0.285 | | 6940 | 7010 | -0.998 | |
| C1-Phenanthrenes/anthracenes | ND | | | | ND | | | | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | | | | ND | | | | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | | | | ND | | | | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | | | | ND | | | | ND | | | |
| Dibenzothiophene | ND | | | | ND | | | | ND | | | |
| C1-Dibenzothiophenes | ND | | | | ND | | | | ND | | | |
| C2-Dibenzothiophenes | ND | | | | ND | | | | ND | | | |
| C3-Dibenzothiophenes | ND | | | | ND | | | | ND | | | |
| Fluoranthene | 6110 | 5910 | 3.38 | | 6110 | 5910 | 3.38 | | 6010 | 5910 | 1.69 | |
| Pyrene | 5840 | 5890 | -0.849 | | 6000 | 5890 | 1.87 | | 5850 | 5890 | -0.679 | |
| C1-Fluoranthenes/pyrenes | ND | | | | ND | | | | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | | | | ND | | | | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | | | | ND | | | | ND | | | |
| Benzo[a]anthracene | 3420 | 3590 | -4.74 | | 3360 | 3590 | -6.41 | | 3540 | 3590 | -1.39 | |
| Chrysene | 7040 | 7030 | 0.142 | | 7040 | 7030 | 0.142 | | 7140 | 7030 | 1.56 | |
| C1-Chrysenes | ND | | | | ND | | | | ND | | | |
| C2-Chrysenes | ND | | | | ND | | | | ND | | | |
| C3-Chrysenes | ND | | | | ND | | | | ND | | | |
| C4-Chrysenes | ND | | | | ND | | | | ND | | | |
| Benzo[b]fluoranthene | 5420 | 5250 | 3.24 | | 5690 | 5250 | 8.38 | | 5360 | 5250 | 2.1 | |
| Benzo[k]fluoranthene | 5720 | 5570 | 2.69 | | 5610 | 5570 | 0.718 | | 5740 | 5570 | 3.05 | |
| Benzo[e]pyrene | 5730 | 5620 | 1.96 | | 5930 | 5620 | 5.52 | | 5790 | 5620 | 3.02 | |
| Benzo[a]pyrene | 6670 | 6790 | -1.77 | | 6860 | 6790 | 1.03 | | 6750 | 6790 | -0.589 | |
| Perylene | 6950 | 7120 | -2.39 | | 7120 | 7120 | 0 | | 7080 | 7120 | -0.562 | |
| Indeno[1,2,3-c,d]pyrene | 6110 | 6290 | -2.86 | | 6540 | 6290 | 3.97 | | 6010 | 6290 | -4.45 | |
| Dibenzo[a,h]anthracene | 5490 | 5180 | 5.98 | | 5680 | 5180 | 9.65 | | 5440 | 5180 | 5.02 | |
| Benzo[g,h,i]perylene | 5200 | 5290 | -1.7 | | 5340 | 5290 | 0.945 | | 5100 | 5290 | -3.59 | |
| d8-Naphthalene | 98 | | | | 96 | | | | 99 | | | |
| d10-Acenaphthene | 97 | | | | 94 | | | | 97 | | | |
| d10-Phenanthrene | 97 | | | | 94 | | | | 96 | | | |
| d12-Benzo[a]pyrene | 94 | | | | 91 | | | | 96 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4070
Data Table: DUP - Surrogate Corrected

| Field ID | Northstar Oil | Northstar Oil DUP | | | KUPARIC WELL 3H-5 | KUPARIC WELL 3H-5 | | |
|--|---------------|-------------------|-----|---|-------------------|-------------------|-----|---|
| Sample Type | N | DUP | | | N | DUP | | |
| Matrix | OIL | OIL | | | CRUDE OIL | CRUDE OIL | | |
| Sample Size | 5.18 mg | 5.08 mg | | | 5.2 mg | 4.92 mg | | |
| Weight Basis | OIL | OIL | | | OIL | OIL | | |
| Associated Blank | DY-S-77PB | DY-S-77PB | | | EB-S-61PB | EB-S-61PB | | |
| Field Date | 07/18/02 | 07/18/02 | | | 08/12/01 | 08/12/01 | | |
| Extract Date | 10/17/02 | 10/17/02 | | | 02/20/03 | 02/20/03 | | |
| Analysis Date | 10/18/02 | 10/18/02 | | | 02/25/03 | 02/25/03 | | |
| Date Received | 07/19/02 | 07/19/02 | | | 08/31/01 | 08/31/01 | | |
| Percent Solids | NA | NA | | | NA | NA | | |
| Dilution Factor | 2 | 2 | | | 1 | 1 | | |
| Percent Lipids | NA | NA | | | NA | NA | | |
| Min Reporting Limit | 4.8 | 4.9 | | | 4.8 | 5.1 | | |
| Units | mg/Kg | mg/Kg | RPD | Q | mg/Kg | mg/Kg | RPD | Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | |
| Naphthalene | 1000 D | 1100 D | 9.5 | | 590 | 650 | 9.7 | |
| C1-Naphthalenes | 1800 | 1800 | 0 | | 1200 | 1300 | 8 | |
| C2-Naphthalenes | 2600 | 2700 | 3.8 | | 1900 | 2000 | 5.1 | |
| C3-Naphthalenes | 1900 | 1900 | 0 | | 1700 | 1800 | 5.7 | |
| C4-Naphthalenes | 900 | 900 | 0 | | 1000 | 1100 | 9.5 | |
| Acenaphthylene | ND | ND | | | ND | ND | | |
| Acenaphthene | ND | ND | | | ND | ND | | |
| Biphenyl | 330 | 340 | 3 | | 130 | 140 | 7.4 | |
| Fluorene | 180 | 190 | 5.4 | | 56 | 60 | 6.9 | |
| C1-Fluorenes | 280 | 300 | 6.9 | | 180 | 190 | 5.4 | |
| C2-Fluorenes | 340 | 350 | 2.9 | | 310 | 330 | 6.2 | |
| C3-Fluorenes | 300 | 300 | 0 | | 360 | 380 | 5.4 | |
| Anthracene | ND | ND | | | ND | ND | | |
| Phenanthrene | 310 | 320 | 3.2 | | 210 | 240 | 13 | |
| C1-Phenanthrenes/anthracenes | 690 | 680 | 1.4 | | 500 | 550 | 9.5 | |
| C2-Phenanthrenes/anthracenes | 750 | 710 | 5.5 | | 660 | 710 | 7.3 | |
| C3-Phenanthrenes/anthracenes | 500 | 490 | 2 | | 530 | 570 | 7.3 | |
| C4-Phenanthrenes/anthracenes | 240 | 250 | 4.1 | | 300 | 340 | 12 | |
| Dibenzothiophene | 94 | 95 | 1 | | 190 | 200 | 5.1 | |
| C1-Dibenzothiophenes | 210 | 200 | 4.9 | | 490 | 520 | 5.9 | |
| C2-Dibenzothiophenes | 210 | 220 | 4.6 | | 780 | 860 | 9.8 | |
| C3-Dibenzothiophenes | 150 | 150 | 0 | | 880 | 940 | 6.6 | |
| Fluoranthene | ND | ND | | | ND | ND | | |
| Pyrene | 25 | 25 | 0 | | 8.7 | 8.8 | 1.1 | |
| C1-Fluoranthenes/pyrenes | 100 | 98 | 2 | | 54 | 57 | 5.4 | |
| C2-Fluoranthenes/pyrenes | 160 | 160 | 0 | | 100 | 120 | 18 | |
| C3-Fluoranthenes/pyrenes | 160 | 160 | 0 | | 140 | 150 | 6.9 | |
| Benzo[a]anthracene | ND | ND | | | ND | ND | | |
| Chrysene | 51 | 48 | 6.1 | | 37 | 41 | 10 | |
| C1-Chrysenes | 90 | 82 | 9.3 | | 80 | 84 | 4.9 | |
| C2-Chrysenes | 120 | 120 | 0 | | 96 | 100 | 4.1 | |
| C3-Chrysenes | 94 | 86 | 8.9 | | 91 | 100 | 9.4 | |
| C4-Chrysenes | 60 | 67 | 11 | | 63 | 69 | 9.1 | |
| Benzo[b]fluoranthene | 7 | 6.5 | 7.4 | | 4.1 J | 4.9 J | 18 | |
| Benzo[k]fluoranthene | ND | ND | | | 1 J | 1 J | 0 | |
| Benzo[e]pyrene | 13 | 14 | 7.4 | | 6.5 | 7.1 | 8.8 | |
| Benzo[a]pyrene | ND | ND | | | ND | ND | | |
| Perylene | ND | ND | | | ND | ND | | |
| Indeno[1,2,3,-c,d]pyrene | ND | ND | | | ND | ND | | |
| Dibenzo[a,h]anthracene | 1.2 J | 1.4 J | 15 | | 1.5 J | 1.6 J | 6.4 | |
| Benzo[g,h,i]perylene | 1.6 J | 1.8 J | 12 | | 1.8 J | 1.9 J | 5.4 | |
| d8-Naphthalene | 105 | 103 | | | 91 | 92 | | |
| d10-Acenaphthene | 110 | 109 | | | 91 | 93 | | |
| d10-Phenanthrene | 110 | 111 | | | 90 | 91 | | |
| d12-Benzo[a]pyrene | 115 | 112 | | | 101 | 101 | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| Field ID | Oil Reference | | | Oil Reference | | |
|--|---------------|------|-------|---------------|------|-------|
| Lab ID | Standard | | | Standard | | |
| Sample Type | BX28ORS | | | BY32ORS | | |
| Matrix | ORS | | | ORS | | |
| Sample Size | OIL | | | OIL | | |
| Weight Basis | 5.04 mg | | | 5.12 mg | | |
| Associated Blank | OIL | | | OIL | | |
| Field Date | NA | | | NA | | |
| Extract Date | 12/19/00 | | | 03/21/01 | | |
| Analysis Date | 12/19/00 | | | 03/21/01 | | |
| Date Received | 03/22/01 | | | 04/05/01 | | |
| Percent Solids | 12/19/00 | | | 03/21/01 | | |
| Percent Lipids | NA | | | NA | | |
| Min Reporting Limit | NA | | | NA | | |
| Units | 4.96 | | | 4.88 | | |
| | mg/Kg | T | %D Q | mg/Kg | T | %D Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | |
| Naphthalene | 745 | 710 | 4.93 | 764 | 710 | 7.6 |
| C1-Naphthalenes | 1470 | 1600 | -8.12 | 1830 | 1600 | 14.4 |
| C2-Naphthalenes | 2070 | 2300 | -10 | 2160 | 2300 | -6.09 |
| C3-Naphthalenes | 1560 | 1960 | -20.4 | 1830 | 1960 | -6.63 |
| C4-Naphthalenes | 912 | 1180 | -22.7 | 1110 | 1180 | -5.93 |
| Acenaphthylene | ND | | | ND | | |
| Acenaphthene | ND | | | ND | | |
| Biphenyl | 219 | 214 | 2.34 | 228 | 214 | 6.54 |
| Fluorene | 97.3 | 95.2 | 2.2 | 104 | 95.2 | 9.24 |
| C1-Fluorenes | 234 | 239 | -2.09 | 259 | 239 | 8.37 |
| C2-Fluorenes | 309 | 356 | -13.2 | 383 | 356 | 7.58 |
| C3-Fluorenes | 318 | 396 | -19.7 | 411 | 396 | 3.79 |
| Anthracene | ND | | | ND | | |
| Phenanthrene | 277 | 260 | 6.54 | 286 | 260 | 10 |
| C1-Phenanthrenes/anthracenes | 581 | 612 | -5.06 | 646 | 612 | 5.56 |
| C2-Phenanthrenes/anthracenes | 720 | 752 | -4.26 | 712 | 752 | -5.32 |
| C3-Phenanthrenes/anthracenes | 472 | 534 | -11.6 | 571 | 534 | 6.93 |
| C4-Phenanthrenes/anthracenes | 242 | 308 | -21.4 | 311 | 308 | 0.974 |
| Dibenzothiophene | 229 | 222 | 3.15 | 238 | 222 | 7.21 |
| C1-Dibenzothiophenes | 476 | 484 | -1.65 | 453 | 484 | -6.4 |
| C2-Dibenzothiophenes | 579 | 658 | -12 | 706 | 658 | 7.29 |
| C3-Dibenzothiophenes | 497 | 574 | -13.4 | 557 | 574 | -2.96 |
| Fluoranthene | ND | | | ND | | |
| Pyrene | 12.9 | 13.4 | -3.73 | 15 | 13.4 | 11.9 |
| C1-Fluoranthenes/pyrenes | 76.8 | 83.9 | -8.46 | 78.5 | 83.9 | -6.44 |
| C2-Fluoranthenes/pyrenes | 133 | 142 | -6.34 | 138 | 142 | -2.82 |
| C3-Fluoranthenes/pyrenes | 134 | 158 | -15.2 | 150 | 158 | -5.06 |
| Benzo[a]anthracene | ND | | | ND | | |
| Chrysene | 53.7 | 49.2 | 9.15 | 51.3 | 49.2 | 4.27 |
| C1-Chrysenes | 83.9 | 81.5 | 2.94 | 88.2 | 81.5 | 8.22 |
| C2-Chrysenes | 105 | 102 | 2.94 | 106 | 102 | 3.92 |
| C3-Chrysenes | 83.4 | 79.6 | 4.77 | 92.9 | 79.6 | 16.7 |
| C4-Chrysenes | 62.2 | 64 | -2.81 | 74.6 | 64 | 16.6 |
| Benzo[b]fluoranthene | 8.51 | 7.62 | 11.7 | 7.28 | 7.62 | -4.46 |
| Benzo[k]fluoranthene | ND | | | ND | | |
| Benzo[e]pyrene | 14.7 | 12.4 | 18.5 | 13.3 | 12.4 | 7.26 |
| Benzo[a]pyrene | ND | | | ND | | |
| Perylene | ND | | | ND | | |
| Indeno[1,2,3-c,d]pyrene | ND | | | ND | | |
| Dibenzo[a,h]anthracene | 1.68 J | | | 1.55 J | | |
| Benzo[g,h,i]perylene | 3.97 J | 3.18 | 24.8 | 3.63 J | 3.18 | 14.2 |
| d8-Naphthalene | 93 | | | 89 | | |
| d10-Acenaphthene | 95 | | | 99 | | |
| d10-Phenanthrene | 94 | | | 98 | | |
| d12-Benzo[a]pyrene | 79 | | | 100 | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| Field ID | Oil Reference | | | Oil Reference | | |
|--|---------------|------|--------|---------------|------|-------|
| Lab ID | Standard | | | Standard | | |
| Sample Type | BX28ORS-1 | | | BX28ORS-2 | | |
| Matrix | ORS | | | ORS | | |
| Sample Size | OIL | | | OIL | | |
| Weight Basis | 5.04 mg | | | 5.04 mg | | |
| Associated Blank | OIL | | | OIL | | |
| Field Date | NA | | | NA | | |
| Extract Date | 12/19/00 | | | 12/19/00 | | |
| Analysis Date | 12/19/00 | | | 12/19/00 | | |
| Date Received | 03/14/01 | | | 03/22/01 | | |
| Percent Solids | 12/19/00 | | | 12/19/00 | | |
| Percent Lipids | NA | | | NA | | |
| Min Reporting Limit | NA | | | NA | | |
| Units | 4.96 | | | 4.96 | | |
| | mg/Kg | T | %D Q | mg/Kg | T | %D Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | |
| Naphthalene | 723 | 710 | 1.83 | 745 | 710 | 4.93 |
| C1-Naphthalenes | 1490 | 1600 | -6.88 | 1470 | 1600 | -8.12 |
| C2-Naphthalenes | 2080 | 2300 | -9.56 | 2070 | 2300 | -10 |
| C3-Naphthalenes | 1540 | 1960 | -21.4 | 1560 | 1960 | -20.4 |
| C4-Naphthalenes | 906 | 1180 | -23.2 | 912 | 1180 | -22.7 |
| Acenaphthylene | ND | | | ND | | |
| Acenaphthene | ND | | | ND | | |
| Biphenyl | 224 | 214 | 4.67 | 219 | 214 | 2.34 |
| Fluorene | 95.9 | 95.2 | 0.735 | 97.3 | 95.2 | 2.2 |
| C1-Fluorenes | 232 | 239 | -2.93 | 234 | 239 | -2.09 |
| C2-Fluorenes | 300 | 356 | -15.7 | 309 | 356 | -13.2 |
| C3-Fluorenes | 313 | 396 | -21 | 318 | 396 | -19.7 |
| Anthracene | ND | | | ND | | |
| Phenanthrene | 274 | 260 | 5.38 | 277 | 260 | 6.54 |
| C1-Phenanthrenes/anthracenes | 566 | 612 | -7.52 | 581 | 612 | -5.06 |
| C2-Phenanthrenes/anthracenes | 647 | 752 | -14 | 720 | 752 | -4.26 |
| C3-Phenanthrenes/anthracenes | 446 | 534 | -16.5 | 472 | 534 | -11.6 |
| C4-Phenanthrenes/anthracenes | 206 | 308 | -33.1 | 242 | 308 | -21.4 |
| Dibenzothiophene | 228 | 222 | 2.7 | 229 | 222 | 3.15 |
| C1-Dibenzothiophenes | 471 | 484 | -2.68 | 476 | 484 | -1.65 |
| C2-Dibenzothiophenes | 552 | 658 | -16.1 | 579 | 658 | -12 |
| C3-Dibenzothiophenes | 473 | 574 | -17.6 | 497 | 574 | -13.4 |
| Fluoranthene | ND | | | ND | | |
| Pyrene | 14 | 13.4 | 4.48 | 12.9 | 13.4 | -3.73 |
| C1-Fluoranthenes/pyrenes | 71.5 | 83.9 | -14.8 | 76.8 | 83.9 | -8.46 |
| C2-Fluoranthenes/pyrenes | 129 | 142 | -9.15 | 133 | 142 | -6.34 |
| C3-Fluoranthenes/pyrenes | 143 | 158 | -9.49 | 134 | 158 | -15.2 |
| Benzo[a]anthracene | ND | | | ND | | |
| Chrysene | 48.8 | 49.2 | -0.813 | 53.7 | 49.2 | 9.15 |
| C1-Chrysenes | 78.5 | 81.5 | -3.68 | 83.9 | 81.5 | 2.94 |
| C2-Chrysenes | 94.5 | 102 | -7.35 | 105 | 102 | 2.94 |
| C3-Chrysenes | 84.6 | 79.6 | 6.28 | 83.4 | 79.6 | 4.77 |
| C4-Chrysenes | 66.2 | 64 | 3.44 | 62.2 | 64 | -2.81 |
| Benzo[b]fluoranthene | 9.08 | 7.62 | 19.2 | 8.51 | 7.62 | 11.7 |
| Benzo[k]fluoranthene | ND | | | ND | | |
| Benzo[e]pyrene | 14.9 | 12.4 | 20.2 | 14.7 | 12.4 | 18.5 |
| Benzo[a]pyrene | ND | | | ND | | |
| Perylene | ND | | | ND | | |
| Indeno[1,2,3-c,d]pyrene | ND | | | ND | | |
| Dibenzo[a,h]anthracene | ND | | | 1.68 J | | |
| Benzo[g,h,i]perylene | 3.58 J | 3.18 | 12.6 | 3.97 J | 3.18 | 24.8 |
| d8-Naphthalene | 100 | | | 93 | | |
| d10-Acenaphthene | 97 | | | 95 | | |
| d10-Phenanthrene | 99 | | | 94 | | |
| d12-Benzo[a]pyrene | 80 | | | 79 | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| Field ID | Oil Reference | | | Oil Reference | | |
|--|---------------|------|-------|---------------|------|-------|
| Lab ID | Standard | | | Standard | | |
| Sample Type | BY32ORS | | | BX28ORS-1 | | |
| Matrix | ORS | | | ORS | | |
| Sample Size | OIL | | | OIL | | |
| Weight Basis | 5.12 mg | | | 5.04 mg | | |
| Associated Blank | OIL | | | OIL | | |
| Field Date | NA | | | NA | | |
| Extract Date | 03/21/01 | | | 12/19/00 | | |
| Analysis Date | 03/21/01 | | | 12/19/00 | | |
| Date Received | 03/29/01 | | | 03/05/01 | | |
| Percent Solids | 03/21/01 | | | 12/19/00 | | |
| Percent Lipids | NA | | | NA | | |
| Min Reporting Limit | NA | | | NA | | |
| Units | 4.88 | | | 4.96 | | |
| | mg/Kg | T | %D Q | mg/Kg | T | %D Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | |
| Naphthalene | 785 | 710 | 10.6 | 732 | 710 | 3.1 |
| C1-Naphthalenes | 1610 | 1600 | 0.625 | 1430 | 1600 | -10.6 |
| C2-Naphthalenes | 2260 | 2300 | -1.74 | 2030 | 2300 | -11.7 |
| C3-Naphthalenes | 1700 | 1960 | -13.3 | 1500 | 1960 | -23.5 |
| C4-Naphthalenes | 980 | 1180 | -16.9 | 843 | 1180 | -28.6 |
| Acenaphthylene | ND | | | ND | | |
| Acenaphthene | ND | | | ND | | |
| Biphenyl | 238 | 214 | 11.2 | 225 | 214 | 5.14 |
| Fluorene | 106 | 95.2 | 11.3 | 97.3 | 95.2 | 2.2 |
| C1-Fluorenes | 260 | 239 | 8.79 | 230 | 239 | -3.76 |
| C2-Fluorenes | 340 | 356 | -4.49 | 297 | 356 | -16.6 |
| C3-Fluorenes | 353 | 396 | -10.8 | 325 | 396 | -17.9 |
| Anthracene | ND | | | ND | | |
| Phenanthrene | 292 | 260 | 12.3 | 279 | 260 | 7.31 |
| C1-Phenanthrenes/anthracenes | 593 | 612 | -3.1 | 561 | 612 | -8.33 |
| C2-Phenanthrenes/anthracenes | 706 | 752 | -6.12 | 676 | 752 | -10.1 |
| C3-Phenanthrenes/anthracenes | 498 | 534 | -6.74 | 444 | 534 | -16.8 |
| C4-Phenanthrenes/anthracenes | 285 | 308 | -7.47 | 227 | 308 | -26.3 |
| Dibenzothiophene | 239 | 222 | 7.66 | 228 | 222 | 2.7 |
| C1-Dibenzothiophenes | 476 | 484 | -1.65 | 461 | 484 | -4.75 |
| C2-Dibenzothiophenes | 598 | 658 | -9.12 | 621 | 658 | -5.62 |
| C3-Dibenzothiophenes | 546 | 574 | -4.88 | 483 | 574 | -15.8 |
| Fluoranthene | ND | | | ND | | |
| Pyrene | 14.1 | 13.4 | 5.22 | 12.4 | 13.4 | -7.46 |
| C1-Fluoranthenes/pyrenes | 85.8 | 83.9 | 2.26 | 71.4 | 83.9 | -14.9 |
| C2-Fluoranthenes/pyrenes | 140 | 142 | -1.41 | 127 | 142 | -10.6 |
| C3-Fluoranthenes/pyrenes | 146 | 158 | -7.59 | 125 | 158 | -20.9 |
| Benzo[a]anthracene | ND | | | ND | | |
| Chrysene | 56.4 | 49.2 | 14.6 | 50.2 | 49.2 | 2.03 |
| C1-Chrysenes | 84.1 | 81.5 | 3.19 | 77 | 81.5 | -5.52 |
| C2-Chrysenes | 105 | 102 | 2.94 | 94.2 | 102 | -7.65 |
| C3-Chrysenes | 85 | 79.6 | 6.78 | 77.1 | 79.6 | -3.14 |
| C4-Chrysenes | 63.2 | 64 | -1.25 | 56.8 | 64 | -11.2 |
| Benzo[b]fluoranthene | 7.01 | 7.62 | -8 | 7.91 | 7.62 | 3.8 |
| Benzo[k]fluoranthene | ND | | | ND | | |
| Benzo[e]pyrene | 12.6 | 12.4 | 1.61 | 15.6 | 12.4 | 25.8 |
| Benzo[a]pyrene | ND | | | ND | | |
| Perylene | ND | | | ND | | |
| Indeno[1,2,3-c,d]pyrene | ND | | | ND | | |
| Dibenzo[a,h]anthracene | 1.37 J | | | ND | | |
| Benzo[g,h,i]perylene | 3.26 J | 3.18 | 2.52 | 3.56 J | 3.18 | 11.9 |
| d8-Naphthalene | 97 | | | 98 | | |
| d10-Acenaphthene | 96 | | | 97 | | |
| d10-Phenanthrene | 97 | | | 97 | | |
| d12-Benzo[a]pyrene | 101 | | | 79 | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| | | | | |
|---------------------|---------------|---|----|---|
| Field ID | Oil Reference | | | |
| Lab ID | Standard | | | |
| Sample Type | BX28ORS-2 | | | |
| Matrix | ORS | | | |
| Sample Size | OIL | | | |
| Weight Basis | 5.04 mg | | | |
| Associated Blank | OIL | | | |
| Field Date | NA | | | |
| Extract Date | 12/19/00 | | | |
| Analysis Date | 12/19/00 | | | |
| Date Received | 03/14/01 | | | |
| Percent Solids | 12/19/00 | | | |
| Percent Lipids | NA | | | |
| Min Reporting Limit | NA | | | |
| Units | 4.96 | | | |
| | mg/Kg | T | %D | Q |

| Polynuclear Aromatic Hydrocarbons | | | | |
|-----------------------------------|--------|------|--------|--|
| Naphthalene | 723 | 710 | 1.83 | |
| C1-Naphthalenes | 1490 | 1600 | -6.88 | |
| C2-Naphthalenes | 2080 | 2300 | -9.56 | |
| C3-Naphthalenes | 1540 | 1960 | -21.4 | |
| C4-Naphthalenes | 906 | 1180 | -23.2 | |
| Acenaphthylene | ND | | | |
| Acenaphthene | ND | | | |
| Biphenyl | 224 | 214 | 4.67 | |
| Fluorene | 95.9 | 95.2 | 0.735 | |
| C1-Fluorenes | 232 | 239 | -2.93 | |
| C2-Fluorenes | 300 | 356 | -15.7 | |
| C3-Fluorenes | 313 | 396 | -21 | |
| Anthracene | ND | | | |
| Phenanthrene | 274 | 260 | 5.38 | |
| C1-Phenanthrenes/anthracenes | 566 | 612 | -7.52 | |
| C2-Phenanthrenes/anthracenes | 647 | 752 | -14 | |
| C3-Phenanthrenes/anthracenes | 446 | 534 | -16.5 | |
| C4-Phenanthrenes/anthracenes | 206 | 308 | -33.1 | |
| Dibenzothiophene | 228 | 222 | 2.7 | |
| C1-Dibenzothiophenes | 471 | 484 | -2.68 | |
| C2-Dibenzothiophenes | 552 | 658 | -16.1 | |
| C3-Dibenzothiophenes | 473 | 574 | -17.6 | |
| Fluoranthene | ND | | | |
| Pyrene | 14 | 13.4 | 4.48 | |
| C1-Fluoranthenes/pyrenes | 71.5 | 83.9 | -14.8 | |
| C2-Fluoranthenes/pyrenes | 129 | 142 | -9.15 | |
| C3-Fluoranthenes/pyrenes | 143 | 158 | -9.49 | |
| Benzo[a]anthracene | ND | | | |
| Chrysene | 48.8 | 49.2 | -0.813 | |
| C1-Chrysenes | 78.5 | 81.5 | -3.68 | |
| C2-Chrysenes | 94.5 | 102 | -7.35 | |
| C3-Chrysenes | 84.6 | 79.6 | 6.28 | |
| C4-Chrysenes | 66.2 | 64 | 3.44 | |
| Benzo[b]fluoranthene | 9.08 | 7.62 | 19.2 | |
| Benzo[k]fluoranthene | ND | | | |
| Benzo[e]pyrene | 14.9 | 12.4 | 20.2 | |
| Benzo[a]pyrene | ND | | | |
| Perylene | ND | | | |
| Indeno[1,2,3,-c,d]pyrene | ND | | | |
| Dibenzo[a,h]anthracene | ND | | | |
| Benzo[g,h,i]perylene | 3.58 J | 3.18 | 12.6 | |
| d8-Naphthalene | 100 | | | |
| d10-Acenaphthene | 97 | | | |
| d10-Phenanthrene | 99 | | | |
| d12-Benzo[a]pyrene | 80 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4079
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | Blank Spike | | | | Procedural Blank |
|--|------------------|-------------|----|-----|---|------------------|
| Sample Type | PB | BS | | | | PB |
| Matrix | SEDIMENT | SEDIMENT | | | | SEDIMENT |
| Sample Size | 20 g | 20 g | | | | 20 g |
| Weight Basis | DRY | DRY | | | | DRY |
| Associated Blank | NA | DY-S-66PB | | | | NA |
| Field Date | 10/16/02 | 10/16/02 | | | | 10/28/02 |
| Extract Date | 10/16/02 | 10/16/02 | | | | 10/28/02 |
| Analysis Date | 10/27/02 | 10/27/02 | | | | 11/05/02 |
| Date Received | 10/16/02 | 10/16/02 | | | | 10/28/02 |
| Percent Solids | 100 | 100 | | | | 100 |
| Dilution Factor | 1 | 1 | | | | 1 |
| Percent Lipids | NA | NA | | | | NA |
| Min Reporting Limit | 0.62 | 0.62 | | | | 0.62 |
| Units | ug/Kg | ug/Kg | T | %R | Q | ug/Kg |
| Polynuclear Aromatic Hydrocarbons | | | | | | |
| Naphthalene | 0.25 J | 57 | 50 | 114 | | 0.44 J |
| C1-Naphthalenes | 0.088 J | 0.2 JB | | | | 0.21 J |
| C2-Naphthalenes | 0.088 J | 0.18 JB | | | | 0.17 J |
| C3-Naphthalenes | ND | 0.13 J | | | | ND |
| C4-Naphthalenes | ND | ND | | | | ND |
| Acenaphthylene | ND | 58 | 50 | 116 | | 0.022 J |
| Acenaphthene | 0.025 J | 56 | 50 | 112 | | 0.055 J |
| Biphenyl | 0.068 J | 0.1 JB | | | | 0.21 J |
| Fluorene | 0.062 J | 60 | 50 | 120 | | 0.18 J |
| C1-Fluorenes | ND | ND | | | | ND |
| C2-Fluorenes | ND | ND | | | | ND |
| C3-Fluorenes | ND | ND | | | | ND |
| Anthracene | ND | 43 | 50 | 86 | | 0.057 J |
| Phenanthrene | 0.37 J | 58 | 50 | 115 | | 1.4 |
| C1-Phenanthrenes/anthracenes | 0.073 J | 0.34 JB | | | | 0.26 J |
| C2-Phenanthrenes/anthracenes | ND | 0.22 J | | | | 0.14 J |
| C3-Phenanthrenes/anthracenes | ND | 0.072 J | | | | ND |
| C4-Phenanthrenes/anthracenes | ND | ND | | | | ND |
| Dibenzothiophene | 0.019 J | 0.21 J | | | | 0.058 J |
| C1-Dibenzothiophenes | ND | ND | | | | ND |
| C2-Dibenzothiophenes | ND | ND | | | | ND |
| C3-Dibenzothiophenes | ND | ND | | | | ND |
| Fluoranthene | 0.094 J | 68 | 50 | 136 | & | 0.53 J |
| Pyrene | 0.055 J | 65 | 50 | 130 | & | 0.19 J |
| C1-Fluoranthenes/pyrenes | ND | 0.15 J | | | | ND |
| C2-Fluoranthenes/pyrenes | ND | ND | | | | ND |
| C3-Fluoranthenes/pyrenes | ND | ND | | | | ND |
| Benzo[a]anthracene | ND | 58 | 50 | 116 | | ND |
| Chrysene | ND | 60 | 50 | 120 | | ND |
| C1-Chrysenes | ND | ND | | | | ND |
| C2-Chrysenes | ND | ND | | | | ND |
| C3-Chrysenes | ND | ND | | | | ND |
| C4-Chrysenes | ND | ND | | | | ND |
| Benzo[b]fluoranthene | ND | 69 | 50 | 138 | & | ND |
| Benzo[k]fluoranthene | ND | 68 | 50 | 136 | & | ND |
| Benzo[e]pyrene | ND | ND | | | | ND |
| Benzo[a]pyrene | ND | 63 | 50 | 126 | & | ND |
| Perylene | ND | ND | | | | ND |
| Indeno[1,2,3,-c,d]pyrene | ND | 73 | 50 | 146 | & | ND |
| Dibenzo[a,h]anthracene | ND | 72 | 50 | 144 | & | ND |
| Benzo[g,h,i]perylene | ND | 67 | 50 | 134 | & | ND |
| d8-Naphthalene | 63 | 67 | | | | 65 |
| d10-Acenaphthene | 70 | 74 | | | | 66 |
| d10-Phenanthrene | 80 | 85 | | | | 74 |
| d12-Benzo[a]pyrene | 79 | 79 | | | | 74 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4079
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Blank Spike | | | | Procedural Blank | | | | Blank Spike | | | | |
|-----------------------------------|-------------|----|-----|---|------------------|--|--|--|-------------|----|-----|---|--|
| Sample Type | BS | | | | PB | | | | BS | | | | |
| Matrix | SEDIMENT | | | | SEDIMENT | | | | SEDIMENT | | | | |
| Sample Size | 20 g | | | | 20 g | | | | 20 g | | | | |
| Weight Basis | DRY | | | | DRY | | | | DRY | | | | |
| Associated Blank | DZ-S-03PB | | | | NA | | | | DY-S-69PB | | | | |
| Field Date | 10/28/02 | | | | 10/17/02 | | | | 10/17/02 | | | | |
| Extract Date | 10/28/02 | | | | 10/17/02 | | | | 10/17/02 | | | | |
| Analysis Date | 11/05/02 | | | | 10/29/02 | | | | 10/29/02 | | | | |
| Date Received | 10/28/02 | | | | 10/17/02 | | | | 10/17/02 | | | | |
| Percent Solids | 100 | | | | 100 | | | | 100 | | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | | |
| Min Reporting Limit | 0.62 | | | | 0.62 | | | | 0.62 | | | | |
| Units | ug/Kg | T | %R | Q | ug/Kg | | | | ug/Kg | T | %R | Q | |
| Polynuclear Aromatic Hydro | | | | | | | | | | | | | |
| Naphthalene | 57 | 50 | 113 | | 0.33 J | | | | 53 | 50 | 105 | | |
| C1-Naphthalenes | 0.28 JB | | | | 0.11 J | | | | 0.26 JB | | | | |
| C2-Naphthalenes | 0.21 JB | | | | 0.13 J | | | | 0.19 JB | | | | |
| C3-Naphthalenes | ND | | | | ND | | | | ND | | | | |
| C4-Naphthalenes | ND | | | | ND | | | | ND | | | | |
| Acenaphthylene | 54 | 50 | 108 | | ND | | | | 51 | 50 | 102 | | |
| Acenaphthene | 54 | 50 | 108 | | 0.029 J | | | | 52 | 50 | 104 | | |
| Biphenyl | 0.26 JB | | | | 0.084 J | | | | 0.13 JB | | | | |
| Fluorene | 54 | 50 | 108 | | 0.076 J | | | | 53 | 50 | 106 | | |
| C1-Fluorenes | ND | | | | ND | | | | ND | | | | |
| C2-Fluorenes | ND | | | | ND | | | | ND | | | | |
| C3-Fluorenes | ND | | | | ND | | | | ND | | | | |
| Anthracene | 37 | 50 | 74 | | 0.021 J | | | | 38 | 50 | 76 | | |
| Phenanthrene | 52 | 50 | 101 | | 0.49 J | | | | 50 | 50 | 99 | | |
| C1-Phenanthrenes/anthracenes | 0.14 JB | | | | 0.13 J | | | | 0.13 JB | | | | |
| C2-Phenanthrenes/anthracenes | 0.11 JB | | | | ND | | | | 0.068 J | | | | |
| C3-Phenanthrenes/anthracenes | 0.054 J | | | | ND | | | | ND | | | | |
| C4-Phenanthrenes/anthracenes | ND | | | | ND | | | | ND | | | | |
| Dibenzothiophene | 0.16 JB | | | | ND | | | | ND | | | | |
| C1-Dibenzothiophenes | ND | | | | ND | | | | ND | | | | |
| C2-Dibenzothiophenes | ND | | | | ND | | | | ND | | | | |
| C3-Dibenzothiophenes | ND | | | | ND | | | | ND | | | | |
| Fluoranthene | 65 | 50 | 129 | & | 0.15 J | | | | 59 | 50 | 118 | | |
| Pyrene | 61 | 50 | 122 | | 0.072 J | | | | 56 | 50 | 112 | | |
| C1-Fluoranthenes/pyrenes | ND | | | | ND | | | | ND | | | | |
| C2-Fluoranthenes/pyrenes | ND | | | | ND | | | | ND | | | | |
| C3-Fluoranthenes/pyrenes | ND | | | | ND | | | | ND | | | | |
| Benzo[a]anthracene | 60 | 50 | 120 | | ND | | | | 54 | 50 | 108 | | |
| Chrysene | 62 | 50 | 124 | | ND | | | | 56 | 50 | 112 | | |
| C1-Chrysenes | ND | | | | ND | | | | ND | | | | |
| C2-Chrysenes | ND | | | | ND | | | | ND | | | | |
| C3-Chrysenes | ND | | | | ND | | | | ND | | | | |
| C4-Chrysenes | ND | | | | ND | | | | ND | | | | |
| Benzo[b]fluoranthene | 75 | 50 | 150 | & | ND | | | | 62 | 50 | 124 | | |
| Benzo[k]fluoranthene | 72 | 50 | 144 | & | ND | | | | 62 | 50 | 124 | | |
| Benzo[e]pyrene | ND | | | | ND | | | | ND | | | | |
| Benzo[a]pyrene | 60 | 50 | 120 | | ND | | | | 56 | 50 | 112 | | |
| Perylene | ND | | | | ND | | | | ND | | | | |
| Indeno[1,2,3-c,d]pyrene | 72 | 50 | 144 | & | ND | | | | 62 | 50 | 124 | | |
| Dibenzo[a,h]anthracene | 72 | 50 | 144 | & | ND | | | | 62 | 50 | 124 | | |
| Benzo[g,h,i]perylene | 71 | 50 | 142 | & | ND | | | | 60 | 50 | 120 | | |
| d8-Naphthalene | 61 | | | | 67 | | | | 64 | | | | |
| d10-Acenaphthene | 65 | | | | 75 | | | | 72 | | | | |
| d10-Phenanthrene | 74 | | | | 82 | | | | 80 | | | | |
| d12-Benzo[a]pyrene | 64 | | | | 77 | | | | 74 | | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: DUP - Surrogate Corrected

| Field ID | 02-N10-01-PHC-S | 02-N10-01-PHC-S DUP | | | 02-N23-01-PHC-S | 02-N23-01-PHC-S DUP |
|---------------------|-----------------|---------------------|-----|---|-----------------|---------------------|
| Sample Type | N | DUP | | | N | DUP |
| Matrix | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT |
| Sample Size | 17.49 g | 17.46 g | | | 20.6 g | 20.65 g |
| Weight Basis | DRY | DRY | | | DRY | DRY |
| Associated Blank | DY-S-66PB | DY-S-66PB | | | DZ-S-03PB | DZ-S-03PB |
| Field Date | 08/02/02 | 08/02/02 | | | 08/05/02 | 08/05/02 |
| Extract Date | 10/16/02 | 10/16/02 | | | 10/28/02 | 10/28/02 |
| Analysis Date | 10/28/02 | 10/28/02 | | | 11/06/02 | 11/06/02 |
| Date Received | 08/15/02 | 08/15/02 | | | 08/15/02 | 08/15/02 |
| Percent Solids | 57.2 | 57.2 | | | 68.5 | 68.5 |
| Dilution Factor | 1 | 1 | | | 1 | 1 |
| Percent Lipids | NA | NA | | | NA | NA |
| Min Reporting Limit | 0.71 | 0.72 | | | 0.61 | 0.6 |
| Units | ug/Kg | ug/Kg | RPD | Q | ug/Kg | ug/Kg |

| Polynuclear Aromatic Hydrocarbons | | | | | | |
|-----------------------------------|---------|---------|-----|---|----------|----------|
| Naphthalene | 12 | 11 | 8.7 | | 7.4 | 7.2 |
| C1-Naphthalenes | 25 | 24 | 4.1 | | 16 | 17 |
| C2-Naphthalenes | 41 | 40 | 2.5 | | 29 | 30 |
| C3-Naphthalenes | 28 | 29 | 3.5 | | 22 | 22 |
| C4-Naphthalenes | 14 | 15 | 6.9 | | 15 | 15 |
| Acenaphthylene | 0.039 J | 0.085 J | 74 | & | 0.048 JB | 0.046 JB |
| Acenaphthene | 1 | 1 | 0 | | 0.89 | 0.89 |
| Biphenyl | 6.4 | 6.2 | 3.2 | | 5.2 | 5.2 |
| Fluorene | 5.4 | 5.5 | 1.8 | | 4 | 3.9 |
| C1-Fluorenes | 9.4 | 9.6 | 2.1 | | 7.1 | 6.7 |
| C2-Fluorenes | 13 | 13 | 0 | | 9.6 | 9.5 |
| C3-Fluorenes | 11 | 12 | 8.7 | | 8.6 | 9.2 |
| Anthracene | 0.66 J | 0.6 J | 9.5 | | 0.61 | 0.58 J |
| Phenanthrene | 27 | 26 | 3.8 | | 19 | 19 |
| C1-Phenanthrenes/anthracenes | 39 | 39 | 0 | | 30 | 30 |
| C2-Phenanthrenes/anthracenes | 32 | 33 | 3.1 | | 26 | 26 |
| C3-Phenanthrenes/anthracenes | 22 | 22 | 0 | | 17 | 18 |
| C4-Phenanthrenes/anthracenes | 10 | 9.6 | 4.1 | | 8.8 | 8.8 |
| Dibenzothiophene | 4.1 | 4 | 2.5 | | 2.9 | 3 |
| C1-Dibenzothiophenes | 8.8 | 8.7 | 1.1 | | 6.3 | 6.4 |
| C2-Dibenzothiophenes | 11 | 11 | 0 | | 8.4 | 7.9 |
| C3-Dibenzothiophenes | 8.4 | 8.6 | 2.4 | | 6.5 | 6.1 |
| Fluoranthene | 6.2 | 5.7 | 8.4 | | 4.2 | 4.3 |
| Pyrene | 7.8 | 7.7 | 1.3 | | 6.1 | 6.2 |
| C1-Fluoranthenes/pyrenes | 20 | 20 | 0 | | 15 | 15 |
| C2-Fluoranthenes/pyrenes | 20 | 19 | 5.1 | | 14 | 14 |
| C3-Fluoranthenes/pyrenes | 12 | 12 | 0 | | 9.3 | 9 |
| Benzo[a]anthracene | 1.7 | 1.8 | 5.7 | | 1.6 | 1.6 |
| Chrysene | 12 | 12 | 0 | | 10 | 10 |
| C1-Chrysenes | 13 | 12 | 8 | | 11 | 12 |
| C2-Chrysenes | 12 | 12 | 0 | | 9.9 | 10 |
| C3-Chrysenes | 6 | 6.1 | 1.6 | | 4.4 | 4.5 |
| C4-Chrysenes | 3.2 | 3 | 6.4 | | 3.6 | 3.1 |
| Benzo[b]fluoranthene | 7.2 | 7.1 | 1.4 | | 6.5 | 6.3 |
| Benzo[k]fluoranthene | 0.6 J | 0.85 | 34 | & | 0.47 J | 0.48 J |
| Benzo[e]pyrene | 8.7 | 8.8 | 1.1 | | 8.2 | 8 |
| Benzo[a]pyrene | 2.2 | 2.2 | 0 | | 1.6 | 1.7 |
| Perylene | 59 | 57 | 3.4 | | 56 | 56 |
| Indeno[1,2,3,-c,d]pyrene | 1.7 | 1.7 | 0 | | 1.3 | 1.4 |
| Dibenzo[a,h]anthracene | 0.89 | 0.85 | 4.6 | | 0.75 | 0.83 |
| Benzo[g,h,i]perylene | 6.1 | 6 | 1.6 | | 5.4 | 5.8 |
| d8-Naphthalene | 54 | 46 | | | 50 | 56 |
| d10-Acenaphthene | 77 | 73 | | | 75 | 76 |
| d10-Phenanthrene | 95 | 95 | | | 92 | 93 |
| d12-Benzo[a]pyrene | 97 | 95 | | | 83 | 90 |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: DUP - Surrogate Corrected

| Field ID | 02-SAG-01-PHC-S | 02-SAG-01-PHC-S | | | |
|---------------------|-----------------|-----------------|--|--|--|
| Sample Type | N | DUP | | | |
| Matrix | SEDIMENT | SEDIMENT | | | |
| Sample Size | 15.41 g | 15.2 g | | | |
| Weight Basis | DRY | DRY | | | |
| Associated Blank | DY-S-69PB | DY-S-69PB | | | |
| Field Date | 08/14/02 | 08/14/02 | | | |
| Extract Date | 10/17/02 | 10/17/02 | | | |
| Analysis Date | 10/30/02 | 10/30/02 | | | |
| Date Received | 08/23/02 | 08/23/02 | | | |
| Percent Solids | 50.4 | 50.4 | | | |
| Dilution Factor | 1 | 1 | | | |
| Percent Lipids | NA | NA | | | |
| Min Reporting Limit | 0.81 | 0.82 | | | |
| Units | RPD Q ug/Kg | ug/Kg RPD Q | | | |

| Polynuclear Aromatic Hydro | | | | | |
|------------------------------|-----|---------|---------|-----|--|
| Naphthalene | 2.7 | 6.9 | 7.4 | 7 | |
| C1-Naphthalenes | 6.1 | 17 | 15 | 12 | |
| C2-Naphthalenes | 3.4 | 35 | 34 | 2.9 | |
| C3-Naphthalenes | 0 | 41 | 38 | 7.6 | |
| C4-Naphthalenes | 0 | 25 | 24 | 4.1 | |
| Acenaphthylene | 4.2 | 0.084 J | 0.097 J | 14 | |
| Acenaphthene | 0 | 0.81 | 0.78 J | 3.8 | |
| Biphenyl | 0 | 6.1 | 5.8 | 5 | |
| Fluorene | 2.5 | 5.5 | 5.3 | 3.7 | |
| C1-Fluorenes | 5.8 | 7.3 | 7.2 | 1.4 | |
| C2-Fluorenes | 1 | 12 | 11 | 8.7 | |
| C3-Fluorenes | 6.7 | 12 | 12 | 0 | |
| Anthracene | 5 | 0.83 | 0.81 J | 2.4 | |
| Phenanthrene | 0 | 26 | 25 | 3.9 | |
| C1-Phenanthrenes/anthracenes | 0 | 47 | 45 | 4.3 | |
| C2-Phenanthrenes/anthracenes | 0 | 44 | 44 | 0 | |
| C3-Phenanthrenes/anthracenes | 5.7 | 29 | 29 | 0 | |
| C4-Phenanthrenes/anthracenes | 0 | 14 | 13 | 7.4 | |
| Dibenzothiophene | 3.4 | 4.1 | 4.1 | 0 | |
| C1-Dibenzothiophenes | 1.6 | 21 | 19 | 10 | |
| C2-Dibenzothiophenes | 6.1 | 25 | 25 | 0 | |
| C3-Dibenzothiophenes | 6.3 | 16 | 18 | 12 | |
| Fluoranthene | 2.4 | 6.9 | 6.8 | 1.4 | |
| Pyrene | 1.6 | 8.6 | 8.6 | 0 | |
| C1-Fluoranthenes/pyrenes | 0 | 23 | 23 | 0 | |
| C2-Fluoranthenes/pyrenes | 0 | 20 | 20 | 0 | |
| C3-Fluoranthenes/pyrenes | 3.3 | 15 | 14 | 6.9 | |
| Benzo[a]anthracene | 0 | 2.3 | 2.6 | 12 | |
| Chrysene | 0 | 13 | 13 | 0 | |
| C1-Chrysenes | 8.7 | 16 | 17 | 6.1 | |
| C2-Chrysenes | 1 | 20 | 15 | 28 | |
| C3-Chrysenes | 2.2 | 9.5 | 10 | 5.1 | |
| C4-Chrysenes | 15 | 6 | 7 | 15 | |
| Benzo[b]fluoranthene | 3.1 | 9.5 | 9.4 | 1 | |
| Benzo[k]fluoranthene | 2.1 | 0.96 | 0.93 | 3.2 | |
| Benzo[e]pyrene | 2.5 | 8.8 | 9.1 | 3.4 | |
| Benzo[a]pyrene | 6.1 | 4.4 | 3.9 | 12 | |
| Perylene | 0 | 100 | 97 | 3 | |
| Indeno[1,2,3,-c,d]pyrene | 7.4 | 2.5 | 2.4 | 4.1 | |
| Dibenzo[a,h]anthracene | 10 | 1.1 | 1 | 9.5 | |
| Benzo[g,h,i]perylene | 7.1 | 6 | 5.9 | 1.7 | |

| | | |
|--------------------|----|----|
| d8-Naphthalene | 44 | 51 |
| d10-Acenaphthene | 66 | 81 |
| d10-Phenanthrene | 78 | 93 |
| d12-Benzo[a]pyrene | 74 | 90 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4079
Data Table: SRM - Surrogate Corrected

| Field ID | Standard Reference Material - 1944 | | | | Standard Reference Material - 1944 | | | | Standard Reference Material - 1944 |
|--|---------------------------------------|------|-------|---|---------------------------------------|------|-------|---|---------------------------------------|
| Sample Type | SRM | | | | SRM | | | | SRM |
| Matrix | SEDIMENT | | | | SEDIMENT | | | | SEDIMENT |
| Sample Size | 1.01 g | | | | 1.01 g | | | | 1.02 g |
| Weight Basis | DRY | | | | DRY | | | | DRY |
| Associated Blank | DY-S-66PB | | | | DZ-S-03PB | | | | DY-S-69PB |
| Field Date | 10/16/02 | | | | 10/28/02 | | | | 10/17/02 |
| Extract Date | 10/16/02 | | | | 10/28/02 | | | | 10/17/02 |
| Analysis Date | 10/27/02 | | | | 11/05/02 | | | | 10/29/02 |
| Date Received | 10/16/02 | | | | 10/28/02 | | | | 10/17/02 |
| Percent Solids | 98.8 | | | | 98.8 | | | | 98.8 |
| Dilution Factor | 2 | | | | 1 | | | | 1 |
| Percent Lipids | NA | | | | NA | | | | NA |
| Min Reporting Limit | 49.5 | | | | 99 | | | | 49 |
| Units | ug/Kg | T | %D | Q | ug/Kg | T | %D | Q | ug/Kg |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | | |
| Naphthalene | 935 | 1650 | -43.3 | & | 762 | 1650 | -53.8 | & | 694 |
| C1-Naphthalenes | 459 | | | | 374 | | | | 379 |
| C2-Naphthalenes | 1380 | | | | 1170 | | | | 1230 |
| C3-Naphthalenes | 1790 | | | | 1620 | | | | 1820 |
| C4-Naphthalenes | 1980 | | | | 2270 | | | | 2140 |
| Acenaphthylene | 1060 | | | | 903 | | | | 894 |
| Acenaphthene | 452 | | | | 358 | 570 | -37.2 | & | 391 |
| Biphenyl | 157 | | | | 123 | 320 | -61.6 | & | 116 |
| Fluorene | 699 | | | | 592 | 850 | -30.4 | | 625 |
| C1-Fluorenes | 837 | | | | 716 | | | | 718 |
| C2-Fluorenes | 1290 | | | | 1150 | | | | 1040 |
| C3-Fluorenes | 1520 | | | | 1420 | | | | 1300 |
| Anthracene | 1680 | 1770 | -5.08 | | 1380 | 1770 | -22 | | 1370 |
| Phenanthrene | 5780 | 5270 | 9.68 | | 4670 | 5270 | -11.4 | | 4430 |
| C1-Phenanthrenes/anthracenes | 6140 | | | | 4950 | | | | 5200 |
| C2-Phenanthrenes/anthracenes | 6480 | | | | 5100 | | | | 5740 |
| C3-Phenanthrenes/anthracenes | 4310 | | | | 3610 | | | | 3700 |
| C4-Phenanthrenes/anthracenes | 3710 | | | | 2870 | | | | 3100 |
| Dibenzothiophene | 862 | | | | 685 | 620 | 10.5 | | 731 |
| C1-Dibenzothiophenes | 2040 | | | | 1580 | | | | 1660 |
| C2-Dibenzothiophenes | 3120 | | | | 2560 | | | | 2950 |
| C3-Dibenzothiophenes | 2850 | | | | 2270 | | | | 2380 |
| Fluoranthene | 10200 D | 8920 | 14.3 | | 8990 | 8920 | 0.785 | | 7940 |
| Pyrene | 10400 D | 9700 | 7.22 | | 9290 | 9700 | -4.23 | | 8120 |
| C1-Fluoranthenes/pyrenes | 8950 | | | | 6550 | | | | 6860 |
| C2-Fluoranthenes/pyrenes | 4450 | | | | 3060 | | | | 2940 |
| C3-Fluoranthenes/pyrenes | 1760 | | | | 1340 | | | | 1570 |
| Benzo[a]anthracene | 5880 | 4720 | 24.6 | | 4590 | 4720 | -2.75 | | 4320 |
| Chrysene | 7050 | 4860 | 45.1 | & | 5190 | 5900 | -12 | | 5010 |
| C1-Chrysenes | 4560 | | | | 3420 | | | | 3730 |
| C2-Chrysenes | 2740 | | | | 2050 | | | | 2120 |
| C3-Chrysenes | 1290 | | | | 910 | | | | 1140 |
| C4-Chrysenes | 474 | | | | 406 | | | | 752 |
| Benzo[b]fluoranthene | 7760 | 5960 | 30.2 | | 5840 | 5960 | -2.01 | | 5220 |
| Benzo[k]fluoranthene | 2200 | 2300 | -4.35 | | 1980 | 2300 | -13.9 | | 1680 |
| Benzo[e]pyrene | 4400 | 3280 | 34.1 | | 3420 | 3280 | 4.27 | | 3140 |
| Benzo[a]pyrene | 5400 | 4300 | 25.6 | | 3890 | 4300 | -9.53 | | 3750 |
| Perylene | 1330 | 1170 | 13.7 | | 1020 | 1170 | -12.8 | | 1050 |
| Indeno[1,2,3-c,d]pyrene | 3860 | 2780 | 38.8 | & | 2810 | 2780 | 1.08 | | 2690 |
| Dibenzo[a,h]anthracene | 1000 | 759 | 31.8 | | 657 | 759 | -13.4 | | 786 |
| Benzo[g,h,i]perylene | 3610 | 2840 | 27.1 | | 2680 | 2840 | -5.63 | | 2580 |
| d8-Naphthalene | 52 | | | | 44 | | | | 45 |
| d10-Acenaphthene | 76 | | | | 72 | | | | 75 |
| d10-Phenanthrene | 98 | | | | 98 | | | | 97 |
| d12-Benzo[a]pyrene | 98 | | | | 92 | | | | 95 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4079
Data Table: SRM - Surrogate Corrected

Field ID
Sample Type
Matrix
Sample Size
Weight Basis
Associated Blank
Field Date
Extract Date
Analysis Date
Date Received
Percent Solids
Dilution Factor
Percent Lipids
Min Reporting Limit
Units

T %D Q

| Polynuclear Aromatic Hydro | | | |
|------------------------------|------|-------|---|
| Naphthalene | 1650 | -57.9 | & |
| C1-Naphthalenes | | | |
| C2-Naphthalenes | | | |
| C3-Naphthalenes | | | |
| C4-Naphthalenes | | | |
| Acenaphthylene | | | |
| Acenaphthene | | | |
| Biphenyl | | | |
| Fluorene | | | |
| C1-Fluorenes | | | |
| C2-Fluorenes | | | |
| C3-Fluorenes | | | |
| Anthracene | 1770 | -22.6 | |
| Phenanthrene | 5270 | -15.9 | |
| C1-Phenanthrenes/anthracenes | | | |
| C2-Phenanthrenes/anthracenes | | | |
| C3-Phenanthrenes/anthracenes | | | |
| C4-Phenanthrenes/anthracenes | | | |
| Dibenzothiophene | | | |
| C1-Dibenzothiophenes | | | |
| C2-Dibenzothiophenes | | | |
| C3-Dibenzothiophenes | | | |
| Fluoranthene | 8920 | -11 | |
| Pyrene | 9700 | -16.3 | |
| C1-Fluoranthenes/pyrenes | | | |
| C2-Fluoranthenes/pyrenes | | | |
| C3-Fluoranthenes/pyrenes | | | |
| Benzo[a]anthracene | 4720 | -8.47 | |
| Chrysene | 5900 | -15.1 | |
| C1-Chrysenes | | | |
| C2-Chrysenes | | | |
| C3-Chrysenes | | | |
| C4-Chrysenes | | | |
| Benzo[b]fluoranthene | 5960 | -12.4 | |
| Benzo[k]fluoranthene | 2300 | -27 | |
| Benzo[e]pyrene | 3280 | -4.27 | |
| Benzo[a]pyrene | 4300 | -12.8 | |
| Perylene | 1170 | -10.2 | |
| Indeno[1,2,3,-c,d]pyrene | 2780 | -3.24 | |
| Dibenzo[a,h]anthracene | 759 | 3.56 | |
| Benzo[g,h,i]perylene | 2840 | -9.15 | |

d8-Naphthalene
d10-Acenaphthene
d10-Phenanthrene
d12-Benzo[a]pyrene

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: IRM - Surrogate Corrected

| | Instrument Reference | | | | Instrument Reference | | | |
|-----------------------------------|----------------------|------|-------|---|----------------------|------|-------|---|
| Field ID | Standard | | | | Standard | | | |
| Sample Type | IRM | | | | IRM | | | |
| Matrix | IRM | | | | IRM | | | |
| Sample Size | 0.1 mL | | | | 0.1 mL | | | |
| Weight Basis | WET | | | | WET | | | |
| Associated Blank | NA | | | | NA | | | |
| Field Date | 10/15/02 | | | | 10/15/02 | | | |
| Extract Date | 10/15/02 | | | | 10/15/02 | | | |
| Analysis Date | 10/27/02 | | | | 11/01/02 | | | |
| Date Received | 10/15/02 | | | | 10/15/02 | | | |
| Percent Solids | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | 250 | | | | 250 | | | |
| Units | ug/L | T | %D | Q | ug/L | T | %D | Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | |
| Naphthalene | 6940 | 6890 | 0.726 | | 6990 | 6890 | 1.45 | |
| C1-Naphthalenes | ND | | | | ND | | | |
| C2-Naphthalenes | ND | | | | ND | | | |
| C3-Naphthalenes | ND | | | | ND | | | |
| C4-Naphthalenes | ND | | | | ND | | | |
| Acenaphthylene | 6770 | 6960 | -2.73 | | 6550 | 6960 | -5.89 | |
| Acenaphthene | 6550 | 7280 | -10 | | 6560 | 7280 | -9.89 | |
| Biphenyl | 7180 | 7000 | 2.57 | | 7170 | 7000 | 2.43 | |
| Fluorene | 6320 | 7270 | -13.1 | | 6210 | 7270 | -14.6 | |
| C1-Fluorenes | ND | | | | ND | | | |
| C2-Fluorenes | ND | | | | ND | | | |
| C3-Fluorenes | ND | | | | ND | | | |
| Anthracene | 7300 | 7820 | -6.65 | | 7160 | 7820 | -8.44 | |
| Phenanthrene | 7040 | 7010 | 0.428 | | 6830 | 7010 | -2.57 | |
| C1-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| Dibenzothiophene | ND | | | | ND | | | |
| C1-Dibenzothiophenes | ND | | | | ND | | | |
| C2-Dibenzothiophenes | ND | | | | ND | | | |
| C3-Dibenzothiophenes | ND | | | | ND | | | |
| Fluoranthene | 6080 | 5910 | 2.88 | | 6080 | 5910 | 2.88 | |
| Pyrene | 5990 | 5890 | 1.7 | | 6000 | 5890 | 1.87 | |
| C1-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| Benzo[a]anthracene | 3450 | 3590 | -3.9 | | 3440 | 3590 | -4.18 | |
| Chrysene | 7460 | 7030 | 6.12 | | 7310 | 7030 | 3.98 | |
| C1-Chrysenes | ND | | | | ND | | | |
| C2-Chrysenes | ND | | | | ND | | | |
| C3-Chrysenes | ND | | | | ND | | | |
| C4-Chrysenes | ND | | | | ND | | | |
| Benzo[b]fluoranthene | 5490 | 5250 | 4.57 | | 5600 | 5250 | 6.67 | |
| Benzo[k]fluoranthene | 5920 | 5570 | 6.28 | | 5590 | 5570 | 0.359 | |
| Benzo[e]pyrene | 6050 | 5620 | 7.65 | | 5790 | 5620 | 3.02 | |
| Benzo[a]pyrene | 7000 | 6790 | 3.09 | | 6830 | 6790 | 0.589 | |
| Perylene | 7360 | 7120 | 3.37 | | 7020 | 7120 | -1.4 | |
| Indeno[1,2,3,-c,d]pyrene | 6380 | 6290 | 1.43 | | 6210 | 6290 | -1.27 | |
| Dibenzo[a,h]anthracene | 5660 | 5180 | 9.27 | | 5570 | 5180 | 7.53 | |
| Benzo[g,h,i]perylene | 5400 | 5290 | 2.08 | | 5340 | 5290 | 0.945 | |
| d8-Naphthalene | 94 | | | | 94 | | | |
| d10-Acenaphthene | 94 | | | | 94 | | | |
| d10-Phenanthrene | 92 | | | | 92 | | | |
| d12-Benzo[a]pyrene | 90 | | | | 90 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: IRM - Surrogate Corrected

| Field ID | Instrument Reference | | | | Instrument Reference | | | |
|-----------------------------------|----------------------|------|--------|---|----------------------|------|--------|---|
| Sample Type | Standard | | | | Standard | | | |
| Matrix | IRM | | | | IRM | | | |
| Sample Size | 0.1 mL | | | | 0.1 mL | | | |
| Weight Basis | WET | | | | WET | | | |
| Associated Blank | NA | | | | NA | | | |
| Field Date | 10/15/02 | | | | 10/15/02 | | | |
| Extract Date | 10/15/02 | | | | 10/15/02 | | | |
| Analysis Date | 11/05/02 | | | | 10/29/02 | | | |
| Date Received | 10/15/02 | | | | 10/15/02 | | | |
| Percent Solids | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | 250 | | | | 250 | | | |
| Units | ug/L | T | %D | Q | ug/L | T | %D | Q |
| Polynuclear Aromatic Hydro | | | | | | | | |
| Naphthalene | 7050 | 6890 | 2.32 | | 6700 | 6890 | -2.61 | |
| C1-Naphthalenes | ND | | | | ND | | | |
| C2-Naphthalenes | ND | | | | ND | | | |
| C3-Naphthalenes | ND | | | | ND | | | |
| C4-Naphthalenes | ND | | | | ND | | | |
| Acenaphthylene | 6520 | 6960 | -6.32 | | 6400 | 6960 | -7.33 | |
| Acenaphthene | 6570 | 7280 | -9.75 | | 6400 | 7280 | -12.1 | |
| Biphenyl | 7160 | 7000 | 2.28 | | 6900 | 7000 | -1.43 | |
| Fluorene | 6370 | 7270 | -12.4 | | 6200 | 7270 | -14.7 | |
| C1-Fluorenes | ND | | | | ND | | | |
| C2-Fluorenes | ND | | | | ND | | | |
| C3-Fluorenes | ND | | | | ND | | | |
| Anthracene | 7140 | 7820 | -8.7 | | 7000 | 7820 | -11 | |
| Phenanthrene | 6820 | 7010 | -2.71 | | 6800 | 7010 | -3.71 | |
| C1-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| Dibenzothiophene | ND | | | | ND | | | |
| C1-Dibenzothiophenes | ND | | | | ND | | | |
| C2-Dibenzothiophenes | ND | | | | ND | | | |
| C3-Dibenzothiophenes | ND | | | | ND | | | |
| Fluoranthene | 6030 | 5910 | 2.03 | | 6000 | 5910 | 1.35 | |
| Pyrene | 5860 | 5890 | -0.509 | | 5800 | 5890 | -0.679 | |
| C1-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| Benzo[a]anthracene | 3400 | 3590 | -5.29 | | 3400 | 3590 | -5.29 | |
| Chrysene | 7140 | 7030 | 1.56 | | 7000 | 7030 | 0.142 | |
| C1-Chrysenes | ND | | | | ND | | | |
| C2-Chrysenes | ND | | | | ND | | | |
| C3-Chrysenes | ND | | | | ND | | | |
| C4-Chrysenes | ND | | | | ND | | | |
| Benzo[b]fluoranthene | 5540 | 5250 | 5.52 | | 5600 | 5250 | 5.9 | |
| Benzo[k]fluoranthene | 5760 | 5570 | 3.41 | | 5400 | 5570 | -1.97 | |
| Benzo[e]pyrene | 5930 | 5620 | 5.52 | | 5700 | 5620 | 1.78 | |
| Benzo[a]pyrene | 6760 | 6790 | -0.442 | | 6700 | 6790 | -1.18 | |
| Perylene | 7230 | 7120 | 1.54 | | 6900 | 7120 | -2.53 | |
| Indeno[1,2,3-c,d]pyrene | 6350 | 6290 | 0.954 | | 6200 | 6290 | -0.795 | |
| Dibenzo[a,h]anthracene | 5570 | 5180 | 7.53 | | 5500 | 5180 | 6.56 | |
| Benzo[g,h,i]perylene | 5440 | 5290 | 2.84 | | 5200 | 5290 | -0.945 | |
| d8-Naphthalene | 94 | | | | 97 | | | |
| d10-Acenaphthene | 94 | | | | 97 | | | |
| d10-Phenanthrene | 94 | | | | 97 | | | |
| d12-Benzo[a]pyrene | 87 | | | | 94 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference | | | | Oil Reference | | | |
|--|---------------|------|-------|---|---------------|------|--------|---|
| Sample Type | Standard | | | | Standard | | | |
| Matrix | ORS | | | | ORS | | | |
| Sample Size | OIL | | | | OIL | | | |
| Weight Basis | 5.1 mg | | | | 5.1 mg | | | |
| Associated Blank | OIL | | | | OIL | | | |
| Field Date | NA | | | | NA | | | |
| Extract Date | 04/23/02 | | | | 04/23/02 | | | |
| Analysis Date | 04/23/02 | | | | 04/23/02 | | | |
| Date Received | 10/27/02 | | | | 11/01/02 | | | |
| Percent Solids | 04/23/02 | | | | 04/23/02 | | | |
| Dilution Factor | NA | | | | NA | | | |
| Percent Lipids | 1 | | | | 1 | | | |
| Min Reporting Limit | NA | | | | NA | | | |
| Units | 4.9 | | | | 4.9 | | | |
| | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | |
| Naphthalene | 838 | 710 | 18 | | 844 | 710 | 18.9 | |
| C1-Naphthalenes | 1490 | 1600 | -6.88 | | 1590 | 1600 | -0.625 | |
| C2-Naphthalenes | 1920 | 2300 | -16.5 | | 2100 | 2300 | -8.7 | |
| C3-Naphthalenes | 1410 | 1960 | -28.1 | | 1420 | 1960 | -27.6 | |
| C4-Naphthalenes | 794 | 1180 | -32.7 | | 828 | 1180 | -29.8 | |
| Acenaphthylene | ND | | | | ND | | | |
| Acenaphthene | ND | | | | ND | | | |
| Biphenyl | 231 | 214 | 7.94 | | 232 | 214 | 8.41 | |
| Fluorene | 106 | 95.2 | 11.3 | | 102 | 95.2 | 7.14 | |
| C1-Fluorenes | 249 | 239 | 4.18 | | 248 | 239 | 3.76 | |
| C2-Fluorenes | 342 | 356 | -3.93 | | 346 | 356 | -2.81 | |
| C3-Fluorenes | 318 | 396 | -19.7 | | 324 | 396 | -18.2 | |
| Anthracene | ND | | | | ND | | | |
| Phenanthrene | 288 | 260 | 10.8 | | 282 | 260 | 8.46 | |
| C1-Phenanthrenes/anthracenes | 555 | 612 | -9.31 | | 582 | 612 | -4.9 | |
| C2-Phenanthrenes/anthracenes | 599 | 752 | -20.3 | | 600 | 752 | -20.2 | |
| C3-Phenanthrenes/anthracenes | 445 | 534 | -16.7 | | 440 | 534 | -17.6 | |
| C4-Phenanthrenes/anthracenes | 267 | 308 | -13.3 | | 276 | 308 | -10.4 | |
| Dibenzothiophene | 256 | 222 | 15.3 | | 254 | 222 | 14.4 | |
| C1-Dibenzothiophenes | 470 | 484 | -2.89 | | 490 | 484 | 1.24 | |
| C2-Dibenzothiophenes | 624 | 658 | -5.17 | | 613 | 658 | -6.84 | |
| C3-Dibenzothiophenes | 514 | 574 | -10.4 | | 532 | 574 | -7.32 | |
| Fluoranthene | ND | | | | ND | | | |
| Pyrene | 15.4 | 13.4 | 14.9 | | 14.9 | 13.4 | 11.2 | |
| C1-Fluoranthenes/pyrenes | 84.4 | 83.9 | 0.596 | | 83.3 | 83.9 | -0.715 | |
| C2-Fluoranthenes/pyrenes | 142 | 142 | 0 | | 141 | 142 | -0.704 | |
| C3-Fluoranthenes/pyrenes | 144 | 158 | -8.86 | | 144 | 158 | -8.86 | |
| Benzo[a]anthracene | ND | | | | ND | | | |
| Chrysene | 51.5 | 49.2 | 4.67 | | 51.5 | 49.2 | 4.67 | |
| C1-Chrysenes | 80.3 | 81.5 | -1.47 | | 78 | 81.5 | -4.29 | |
| C2-Chrysenes | 92.1 | 102 | -9.7 | | 100 | 102 | -1.96 | |
| C3-Chrysenes | 79.6 | 79.6 | 0 | | 65.7 | 79.6 | -17.5 | |
| C4-Chrysenes | 55.6 | 64 | -13.1 | | 58.5 | 64 | -8.59 | |
| Benzo[b]fluoranthene | 8.44 | 7.62 | 10.8 | | 6.33 | 7.62 | -16.9 | |
| Benzo[k]fluoranthene | ND | | | | ND | | | |
| Benzo[e]pyrene | 11.6 | 12.4 | -6.45 | | 11.4 | 12.4 | -8.06 | |
| Benzo[a]pyrene | ND | | | | ND | | | |
| Perylene | ND | | | | ND | | | |
| Indeno[1,2,3-c,d]pyrene | ND | | | | ND | | | |
| Dibenzo[a,h]anthracene | 1.13 J | | | | 1.24 J | | | |
| Benzo[g,h,i]perylene | 3 J | 3.18 | -5.66 | | 3.04 J | 3.18 | -4.4 | |
| d8-Naphthalene | 88 | | | | 96 | | | |
| d10-Acenaphthene | 95 | | | | 99 | | | |
| d10-Phenanthrene | 99 | | | | 100 | | | |
| d12-Benzo[a]pyrene | 111 | | | | 105 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | |
|-----------------------------------|------------------------|------|--------|---|------------------------|------|-------|---|--|
| Sample Type | ORS | | | | ORS | | | | |
| Matrix | OIL | | | | OIL | | | | |
| Sample Size | 5.1 mg | | | | 5.1 mg | | | | |
| Weight Basis | OIL | | | | OIL | | | | |
| Associated Blank | NA | | | | NA | | | | |
| Field Date | 04/23/02 | | | | 04/23/02 | | | | |
| Extract Date | 04/23/02 | | | | 04/23/02 | | | | |
| Analysis Date | 11/05/02 | | | | 10/29/02 | | | | |
| Date Received | 04/23/02 | | | | 04/23/02 | | | | |
| Percent Solids | NA | | | | NA | | | | |
| Dilution Factor | 1 | | | | 1 | | | | |
| Percent Lipids | NA | | | | NA | | | | |
| Min Reporting Limit | 4.9 | | | | 4.9 | | | | |
| Units | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q | |
| Polynuclear Aromatic Hydro | | | | | | | | | |
| Naphthalene | 825 | 710 | 16.2 | | 760 | 710 | 7.18 | | |
| C1-Naphthalenes | 1560 | 1600 | -2.5 | | 1400 | 1600 | -9.38 | | |
| C2-Naphthalenes | 2090 | 2300 | -9.13 | | 2000 | 2300 | -10.9 | | |
| C3-Naphthalenes | 1560 | 1960 | -20.4 | | 1700 | 1960 | -13.8 | | |
| C4-Naphthalenes | 897 | 1180 | -24 | | 950 | 1180 | -19.5 | | |
| Acenaphthylene | ND | | | | ND | | | | |
| Acenaphthene | ND | | | | ND | | | | |
| Biphenyl | 230 | 214 | 7.48 | | 220 | 214 | 4.2 | | |
| Fluorene | 101 | 95.2 | 6.09 | | 100 | 95.2 | 7.14 | | |
| C1-Fluorenes | 251 | 239 | 5.02 | | 240 | 239 | 0.837 | | |
| C2-Fluorenes | 346 | 356 | -2.81 | | 340 | 356 | -3.93 | | |
| C3-Fluorenes | 349 | 396 | -11.9 | | 330 | 396 | -16.2 | | |
| Anthracene | ND | | | | ND | | | | |
| Phenanthrene | 280 | 260 | 7.69 | | 280 | 260 | 6.54 | | |
| C1-Phenanthrenes/anthracenes | 550 | 612 | -10.1 | | 600 | 612 | -1.14 | | |
| C2-Phenanthrenes/anthracenes | 606 | 752 | -19.4 | | 690 | 752 | -8.64 | | |
| C3-Phenanthrenes/anthracenes | 444 | 534 | -16.8 | | 510 | 534 | -4.31 | | |
| C4-Phenanthrenes/anthracenes | 275 | 308 | -10.7 | | 290 | 308 | -4.54 | | |
| Dibenzothiophene | 253 | 222 | 14 | | 250 | 222 | 13.1 | | |
| C1-Dibenzothiophenes | 488 | 484 | 0.826 | | 490 | 484 | 2.27 | | |
| C2-Dibenzothiophenes | 625 | 658 | -5.02 | | 690 | 658 | 5.32 | | |
| C3-Dibenzothiophenes | 514 | 574 | -10.4 | | 560 | 574 | -2.26 | | |
| Fluoranthene | ND | | | | ND | | | | |
| Pyrene | 14.1 | 13.4 | 5.22 | | 17 | 13.4 | 28.4 | | |
| C1-Fluoranthenes/pyrenes | 78.9 | 83.9 | -5.96 | | 88 | 83.9 | 4.77 | | |
| C2-Fluoranthenes/pyrenes | 143 | 142 | 0.704 | | 150 | 142 | 5.63 | | |
| C3-Fluoranthenes/pyrenes | 144 | 158 | -8.86 | | 170 | 158 | 6.96 | | |
| Benzo[a]anthracene | ND | | | | ND | | | | |
| Chrysene | 52.8 | 49.2 | 7.32 | | 54 | 49.2 | 10.6 | | |
| C1-Chrysenes | 81.6 | 81.5 | 0.123 | | 90 | 81.5 | 10.2 | | |
| C2-Chrysenes | 89.8 | 102 | -12 | | 110 | 102 | 3.92 | | |
| C3-Chrysenes | 77.4 | 79.6 | -2.76 | | 100 | 79.6 | 25.6 | | |
| C4-Chrysenes | 57 | 64 | -10.9 | | 72 | 64 | 12.2 | | |
| Benzo[b]fluoranthene | 7.58 | 7.62 | -0.525 | | 7 | 7.62 | -7.87 | | |
| Benzo[k]fluoranthene | ND | | | | ND | | | | |
| Benzo[e]pyrene | 12.1 | 12.4 | -2.42 | | 12 | 12.4 | -1.61 | | |
| Benzo[a]pyrene | ND | | | | ND | | | | |
| Perylene | ND | | | | ND | | | | |
| Indeno[1,2,3,-c,d]pyrene | ND | | | | ND | | | | |
| Dibenzo[a,h]anthracene | 1.21 J | | | | 1.5 J | | | | |
| Benzo[g,h,i]perylene | 2.9 J | 3.18 | -8.8 | | 3.4 J | 3.18 | 5.66 | | |
| d8-Naphthalene | 92 | | | | 89 | | | | |
| d10-Acenaphthene | 96 | | | | 95 | | | | |
| d10-Phenanthrene | 97 | | | | 96 | | | | |
| d12-Benzo[a]pyrene | 104 | | | | 106 | | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 1004084

Data Table: BS-BSD - Surrogate Corrected

| | |
|---------------------|------------------|
| Field ID | Procedural Blank |
| Sample Type | PB |
| Matrix | TISSUE |
| Sample Size | 10 g |
| Weight Basis | WET |
| Associated Blank | NA |
| Field Date | 10/16/02 |
| Extract Date | 10/16/02 |
| Analysis Date | 11/02/02 |
| Date Received | 10/16/02 |
| Percent Solids | 100 |
| Dilution Factor | 1 |
| Percent Lipids | NA |
| Min Reporting Limit | 2.5 |
| Units | ug/Kg |

Sterane-Triterpane Biomarkers

| | |
|----------------------------|----|
| T4-C23Diterpane | ND |
| S4-Diacholestane | ND |
| S5-Diacholestane | ND |
| T9-C29Tricyclictriterpane | ND |
| T10-C29Tricyclictriterpane | ND |
| T11-Trisnorhopane(TS) | ND |
| T12-Trisnorhopane(TM) | ND |
| S24-Methylcholestane | ND |
| S25-Ethylcholestane | ND |
| S28-Ethylcholestane | ND |
| T15-Norhopane | ND |
| T18-Oleanane | ND |
| T19-Hopane | ND |
| T21-Homohopane | ND |
| T22-Homohopane | ND |

| | |
|---------------|----|
| 5B(H)-Cholane | 50 |
|---------------|----|

Project Title : MMS - AMINIDA - PHASE II

Data Package: 1004084

Data Table: BS-BSD - Surrogate Corrected

| | |
|---------------------|------------------|
| Field ID | Procedural Blank |
| Sample Type | PB |
| Matrix | TISSUE |
| Sample Size | 10 g |
| Weight Basis | WET |
| Associated Blank | NA |
| Field Date | 10/21/02 |
| Extract Date | 10/21/02 |
| Analysis Date | 11/02/02 |
| Date Received | 10/21/02 |
| Percent Solids | 100 |
| Dilution Factor | 1 |
| Percent Lipids | NA |
| Min Reporting Limit | 1.2 |
| Units | ug/Kg |

Sterane-Triterpane Biomarkers

| | |
|----------------------------|----|
| T4-C23Diterpane | ND |
| S4-Diacholestane | ND |
| S5-Diacholestane | ND |
| T9-C29Tricyclictriterpane | ND |
| T10-C29Tricyclictriterpane | ND |
| T11-Trisnorhopane(TS) | ND |
| T12-Trisnorhopane(TM) | ND |
| S24-Methylcholestane | ND |
| S25-Ethylcholestane | ND |
| S28-Ethylcholestane | ND |
| T15-Norhopane | ND |
| T18-Oleanane | ND |
| T19-Hopane | ND |
| T21-Homohopane | ND |
| T22-Homohopane | ND |

5B(H)-Cholane

53

Project Title : MMS - AMINIDA - PHASE II
Data Package: 1004084
Data Table: DUP - Surrogate Corrected

| | | | | |
|---------------------|-------------------|-----------------------|-----|---|
| Field ID | 02-4A-02-PHC-T-AN | 02-4A-02-PHC-T-AN DUP | | |
| Sample Type | N | DUP | | |
| Matrix | TISSUE | TISSUE | | |
| Sample Size | 10.06 g | 10.03 g | | |
| Weight Basis | WET | WET | | |
| Associated Blank | DY-S-72PB | DY-S-72PB | | |
| Field Date | 08/20/02 | 08/20/02 | | |
| Extract Date | 10/16/02 | 10/16/02 | | |
| Analysis Date | 11/04/02 | 11/04/02 | | |
| Date Received | 08/23/02 | 08/23/02 | | |
| Percent Solids | 26.9 | 26.9 | | |
| Dilution Factor | 1 | 1 | | |
| Percent Lipids | 0.209 | 0.197 | | |
| Min Reporting Limit | 1.2 | 1.2 | | |
| Units | ug/Kg | ug/Kg | RPD | Q |

| Sterane-Triterpane Biomarkers | | | | |
|-------------------------------|---------|---------|-----|--|
| T4-C23Diterpane | 0.066 J | 0.072 J | 8.7 | |
| S4-Diacholestane | 0.12 J | 0.1 J | 18 | |
| S5-Diacholestane | 0.14 J | 0.14 J | 0 | |
| T9-C29Tricyclictriterpane | ND | ND | | |
| T10-C29Tricyclictriterpane | ND | ND | | |
| T11-Trisnorhopane(TS) | 0.072 J | 0.087 J | 19 | |
| T12-Trisnorhopane(TM) | 0.16 J | 0.15 J | 6.4 | |
| S24-Methylcholestane | 0.1 J | 0.078 J | 25 | |
| S25-Ethylcholestane | ND | ND | | |
| S28-Ethylcholestane | 0.34 J | 0.32 J | 6.1 | |
| T15-Norhopane | 0.33 J | 0.33 J | 0 | |
| T18-Oleanane | ND | ND | | |
| T19-Hopane | 0.39 J | 0.38 J | 2.6 | |
| T21-Homohopane | 0.15 J | 0.14 J | 6.9 | |
| T22-Homohopane | 0.2 J | 0.22 J | 9.5 | |
| 5B(H)-Cholane | 65 | 71 | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 1004084
Data Table: ORS - Surrogate Corrected

| | | | | |
|---------------------|---------------|---|----|---|
| Field ID | Oil Reference | | | |
| Sample Type | Standard | | | |
| Matrix | ORS | | | |
| Sample Size | OIL | | | |
| Weight Basis | 5.1 mg | | | |
| Associated Blank | OIL | | | |
| Field Date | NA | | | |
| Extract Date | 04/23/02 | | | |
| Analysis Date | 04/23/02 | | | |
| Date Received | 10/29/02 | | | |
| Percent Solids | 04/23/02 | | | |
| Dilution Factor | NA | | | |
| Percent Lipids | 1 | | | |
| Min Reporting Limit | NA | | | |
| Units | 4.9 | | | |
| | mg/Kg | T | %D | Q |

Sterane-Triterpane Biomarkers

| | | | |
|---------------------------|------|------|-------|
| T4-C23Diterpane | 56.8 | 58.9 | -3.56 |
| S4-Diacholestane | 40.3 | 46.8 | -13.9 |
| S5-Diacholestane | 25.2 | 26.1 | -3.45 |
| T9-C29Tricyclitriterpane | 14.3 | 15.7 | -8.92 |
| T10-C29Tricyclitriterpane | 13.2 | 15 | -12 |
| T11-Trisnorhopane(TS) | 22.3 | 24.8 | -10.1 |
| T12-Trisnorhopane(TM) | 26.2 | 31 | -15.5 |
| S24-Methylcholestane | 27.3 | 26.2 | 4.2 |
| S25-Ethylcholestane | 46.6 | 39.8 | 17.1 |
| S28-Ethylcholestane | 36.1 | 33.9 | 6.49 |
| T15-Norhopane | 81.7 | 83.8 | -2.5 |
| T18-Oleanane | ND | | |
| T19-Hopane | 122 | 113 | 7.96 |
| T21-Homohopane | 52.4 | 46.1 | 13.7 |
| T22-Homohopane | 40.7 | 35.2 | 15.6 |

5B(H)-Cholane 112

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control SRM

| Reference Material | | T | %D | Q |
|---------------------|--------------|---|----|---|
| Field ID | 1974a | | | |
| Lab ID | DH-S-66SRMF1 | | | |
| Sample Type | SRM | | | |
| Matrix | TISSUE | | | |
| Sample Size | 16.83 g | | | |
| Weight Basis | WET | | | |
| Associated Blank | DH-S-64PBF1 | | | |
| Field Date | 03/28/01 | | | |
| Extract Date | 03/28/01 | | | |
| Analysis Date | 04/11/01 | | | |
| Date Received | 03/28/01 | | | |
| Percent Solids | 11.4 | | | |
| Percent Lipids | NA | | | |
| Min Reporting Limit | 0.743 | | | |
| Units | ug/Kg | | | |

Sterane-Triterpane Biomarkers - Wet

| | |
|----------------------------|---------|
| T4-C23Diterpane | 1.84 |
| S4-Diacholestane | 1.59 |
| S5-Diacholestane | 0.921 |
| T9-C29Tricyclictriterpane | 0.366 J |
| T10-C29Tricyclictriterpane | 0.429 J |
| T11-Trisnorhopane(TS) | 2.07 |
| T12-Trisnorhopane(TM) | 1.88 |
| S24-Methylcholestane | 2.07 |
| S25-Ethylcholestane | 1.16 |
| S28-Ethylcholestane | 4.38 |
| T15-Norhopane | 6.58 |
| T18-Oleanane | 1 |
| T19-Hopane | 7.76 |
| T21-Homohopane | 2.09 |
| T22-Homohopane | 1.57 |
| 5B(H)-Cholane | 72 |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control DUP

| | | | | |
|---------------------|-------------------------|---------------------------|-----|---|
| | 00-N13-01-PHC-T- | 00-N13-01-PHC-T-AN | | |
| Field ID | AN | DUP | | |
| Lab ID | 20A3483F1 | 20A3483DUPF1 | | |
| Sample Type | N | DUP | | |
| Matrix | TISSUE | TISSUE | | |
| Sample Size | 9.86 g | 10.12 g | | |
| Weight Basis | WET | WET | | |
| Associated Blank | DH-S-64PBF1 | DH-S-64PBF1 | | |
| Field Date | 08/19/00 | 08/19/00 | | |
| Extract Date | 03/28/01 | 03/28/01 | | |
| Analysis Date | 04/12/01 | 04/12/01 | | |
| Date Received | 08/30/00 | 08/30/00 | | |
| Percent Solids | 23.3 | 23.3 | | |
| Percent Lipids | 0.987 | 0.775 | | |
| Min Reporting Limit | 1.3 | 1.2 | | |
| Units | ug/Kg | ug/Kg | RPD | Q |

| Sterane-Triterpane Biomarkers - Wet | | | | |
|-------------------------------------|---------|---------|-----|---|
| T4-C23Diterpane | 0.23 J | 0.22 J | 4.4 | |
| S4-Diacholestane | 0.21 J | 0.24 J | 13 | |
| S5-Diacholestane | 0.15 J | 0.15 J | 0 | |
| T9-C29Tricyclitriterpane | 0.07 J | 0.042 J | 50 | & |
| T10-C29Tricyclitriterpane | 0.047 J | 0.047 J | 0 | |
| T11-Trisnorhopane(TS) | 0.22 J | 0.22 J | 0 | |
| T12-Trisnorhopane(TM) | 0.18 J | 0.16 J | 12 | |
| S24-Methylcholestane | 0.13 J | 0.14 J | 7.4 | |
| S25-Ethylcholestane | 0.13 J | 0.096 J | 30 | |
| S28-Ethylcholestane | 0.46 J | 0.48 J | 4.2 | |
| T15-Norhopane | 0.61 J | 0.6 J | 1.6 | |
| T18-Oleanane | 0.54 J | 0.57 J | 5.4 | |
| T19-Hopane | 0.59 J | 0.64 J | 8.1 | |
| T21-Homohopane | 0.26 J | 0.32 J | 21 | |
| T22-Homohopane | 0.31 J | 0.3 J | 3.3 | |
| 5B(H)-Cholane | 70 | 74 | | |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control BS-BSD

| | | | | | |
|---------------------|------------------|-------------|---|----|---|
| Field ID | Procedural Blank | Blank Spike | | | |
| Lab ID | DH-S-64PBF1 | DH-S-65BSF1 | | | |
| Sample Type | PB | BS | | | |
| Matrix | TISSUE | TISSUE | | | |
| Sample Size | 10 g | 10 g | | | |
| Weight Basis | WET | WET | | | |
| Associated Blank | NA | DH-S-64PBF1 | | | |
| Field Date | 03/28/01 | 03/28/01 | | | |
| Extract Date | 03/28/01 | 03/28/01 | | | |
| Analysis Date | 04/11/01 | 04/11/01 | | | |
| Date Received | 03/28/01 | 03/28/01 | | | |
| Percent Solids | 100 | 100 | | | |
| Percent Lipids | NA | NA | | | |
| Min Reporting Limit | 1.2 | 1.2 | | | |
| Units | ug/Kg | ug/Kg | T | %R | Q |

Sterane-Triterpane Biomarkers - Wet

| | | |
|---------------------------|----|----|
| T4-C23Diterpane | ND | ND |
| S4-Diacholestane | ND | ND |
| S5-Diacholestane | ND | ND |
| T9-C29Tricyclitriterpane | ND | ND |
| T10-C29Tricyclitriterpane | ND | ND |
| T11-Trisnorhopane(TS) | ND | ND |
| T12-Trisnorhopane(TM) | ND | ND |
| S24-Methylcholestane | ND | ND |
| S25-Ethylcholestane | ND | ND |
| S28-Ethylcholestane | ND | ND |
| T15-Norhopane | ND | ND |
| T18-Oleanane | ND | ND |
| T19-Hopane | ND | ND |
| T21-Homohopane | ND | ND |
| T22-Homohopane | ND | ND |

| | | |
|---------------|----|----|
| 5B(H)-Cholane | 80 | 88 |
|---------------|----|----|

Project Title : MMS - AMINIDA - PHASE II

Data Package: 1004080

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | |
|---------------------|---------------------------|------|--------|---|---------------------------|------|-------|---|---------------------------|------|--------|---|
| Sample Type | ORS | | | | ORS | | | | ORS | | | |
| Matrix | OIL | | | | OIL | | | | OIL | | | |
| Sample Size | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | |
| Weight Basis | OIL | | | | OIL | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | |
| Field Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Extract Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Analysis Date | 10/31/02 | | | | 10/31/02 | | | | 11/04/02 | | | |
| Date Received | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 0.199 | | | | 0.199 | | | | 0.199 | | | |
| Units | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | | | | | |
| n-Nonane | 5.16 | 4.8 | 7.5 | | 5.23 | 4.8 | 8.96 | | 5.14 | 4.8 | 7.08 | |
| n-Decane | 4.32 | 4.2 | 2.86 | | 4.3 | 4.2 | 2.38 | | 4.32 | 4.2 | 2.86 | |
| n-Undecane | 4.18 | 4.3 | -2.79 | | 4.33 | 4.3 | 0.698 | | 4.18 | 4.3 | -2.79 | |
| n-Dodecane | 4.09 | 4 | 2.25 | | 4.25 | 4 | 6.25 | | 4.14 | 4 | 3.5 | |
| n-Tridecane | 3.79 | 4 | -5.25 | | 3.85 | 4 | -3.75 | | 3.66 | 4 | -8.5 | |
| Isoprenoid RRT 1380 | 1.29 | 1 | 29 | | 1.34 | 1 | 34 | | 1.26 | 1 | 26 | |
| n-Tetradecane | 4.65 | 4.2 | 10.7 | | 4.63 | 4.2 | 10.2 | | 4.35 | 4.2 | 3.57 | |
| Isoprenoid RRT 1470 | 1.52 | 1.4 | 8.57 | | 1.48 | 1.4 | 5.71 | | 1.46 | 1.4 | 4.28 | |
| n-Pentadecane | 3.44 | 3.7 | -7.03 | | 3.6 | 3.7 | -2.7 | | 3.61 | 3.7 | -2.43 | |
| n-Hexadecane | 3.44 | 3.2 | 7.5 | | 3.43 | 3.2 | 7.19 | | 3.35 | 3.2 | 4.69 | |
| Isoprenoid RRT 1650 | 1.57 | 1.5 | 4.67 | | 1.76 | 1.5 | 17.3 | | 1.47 | 1.5 | -2 | |
| n-Heptadecane | 2.84 | 3.2 | -11.2 | | 2.88 | 3.2 | -10 | | 2.76 | 3.2 | -13.8 | |
| Pristane | 2.01 | 2.2 | -8.64 | | 2.08 | 2.2 | -5.45 | | 2.03 | 2.2 | -7.73 | |
| n-Octadecane | 2.45 | 2.9 | -15.5 | | 2.42 | 2.9 | -16.6 | | 2.47 | 2.9 | -14.8 | |
| Phytane | 1.41 | 1.6 | -11.9 | | 1.46 | 1.6 | -8.75 | | 1.43 | 1.6 | -10.6 | |
| n-Nonadecane | 2.25 | 2.6 | -13.5 | | 2.56 | 2.6 | -1.54 | | 2.37 | 2.6 | -8.85 | |
| n-Eicosane | 2.37 | 2.7 | -12.2 | | 2.4 | 2.7 | -11.1 | | 2.42 | 2.7 | -10.4 | |
| n-Heneicosane | 2.28 | 2.4 | -5 | | 2.28 | 2.4 | -5 | | 2.36 | 2.4 | -1.67 | |
| n-Docosane | 2.28 | 2.2 | 3.64 | | 2.28 | 2.2 | 3.64 | | 2.33 | 2.2 | 5.91 | |
| n-Tricosane | 2.06 | 2 | 3 | | 2.06 | 2 | 3 | | 2.07 | 2 | 3.5 | |
| n-Tetracosane | 1.88 | 2 | -6 | | 1.84 | 2 | -8 | | 1.92 | 2 | -4 | |
| n-Pentacosane | 1.76 | 1.7 | 3.53 | | 1.66 | 1.7 | -2.35 | | 1.74 | 1.7 | 2.35 | |
| n-Hexacosane | 1.52 | 1.5 | 1.33 | | 1.5 | 1.5 | 0 | | 1.55 | 1.5 | 3.33 | |
| n-Heptacosane | 1.1 | 1.2 | -8.33 | | 1.16 | 1.2 | -3.33 | | 1.08 | 1.2 | -10 | |
| n-Octacosane | 0.937 | 0.88 | 6.48 | | 0.946 | 0.88 | 7.5 | | 0.924 | 0.88 | 5 | |
| n-Nonacosane | 0.753 | 0.81 | -7.04 | | 0.839 | 0.81 | 3.58 | | 0.728 | 0.81 | -10.1 | |
| n-Triacontane | 0.649 | 0.65 | -0.154 | | 0.673 | 0.65 | 3.54 | | 0.672 | 0.65 | 3.38 | |
| n-Hentriacontane | 0.59 | 0.58 | 1.72 | | 0.748 | 0.58 | 29 | | 0.591 | 0.58 | 1.9 | |
| n-Dotriacontane | 0.418 | 0.44 | -5 | | 0.431 | 0.44 | -2.04 | | 0.422 | 0.44 | -4.09 | |
| n-Tritriacontane | 0.389 | 0.4 | -2.75 | | 0.35 | 0.4 | -12.5 | | 0.35 | 0.4 | -12.5 | |
| n-Tettratriacontane | 0.379 | 0.35 | 8.28 | | 0.352 | 0.35 | 0.571 | | 0.34 | 0.35 | -2.86 | |
| n-Pentatriacontane | 0.428 | 0.35 | 22.3 | | 0.421 | 0.35 | 20.3 | | 0.418 | 0.35 | 19.4 | |
| n-Hexatriacontane | 0.245 | 0.23 | 6.52 | | 0.302 | 0.23 | 31.3 | | 0.235 | 0.23 | 2.17 | |
| n-Heptatriacontane | 0.255 | 0.23 | 10.9 | | 0.232 | 0.23 | 0.87 | | 0.23 | 0.23 | 0 | |
| n-Octatriacontane | 0.244 | 0.22 | 10.9 | | 0.236 | 0.22 | 7.27 | | 0.219 | 0.22 | -0.454 | |
| n-Tetracontane | 0.185 J | 0.19 | -2.63 | | 0.204 | 0.19 | 7.37 | | 0.161 J | 0.19 | -15.3 | |
| TPH (RES) | 186 | 220 | -15.4 | | 172 | 220 | -21.8 | | 183 | 220 | -16.8 | |
| TPH | 644 | 660 | -2.42 | | 645 | 660 | -2.27 | | 621 | 660 | -5.91 | |
| %ortho-terphenyl | 98 | | | | 96 | | | | 100 | | | |
| %5A-androstane | 97 | | | | 100 | | | | 98 | | | |
| %d50-tetracosane | 102 | | | | 100 | | | | 103 | | | |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| Field ID | Oil Reference | | | | Oil Reference | | | | Oil Reference | | | |
|----------------------|---------------|------|------|---|---------------|------|-------|---|---------------|------|------|---|
| Lab ID | Standard | | | | Standard | | | | Standard | | | |
| Sample Type | BU82ORS-1 | | | | BU82ORS-2 | | | | BU82ORS-3 | | | |
| Matrix | ORS | | | | ORS | | | | ORS | | | |
| Sample Size | OIL | | | | OIL | | | | OIL | | | |
| Weight Basis | 5.04 mg | | | | 5.04 mg | | | | 5.04 mg | | | |
| Associated Blank | OIL | | | | OIL | | | | OIL | | | |
| Field Date | NA | | | | NA | | | | NA | | | |
| Extract Date | 05/19/00 | | | | 05/19/00 | | | | 05/19/00 | | | |
| Analysis Date | 05/19/00 | | | | 05/19/00 | | | | 05/19/00 | | | |
| Date Received | 04/06/01 | | | | 04/06/01 | | | | 04/18/01 | | | |
| Percent Solids | 05/19/00 | | | | 05/19/00 | | | | 05/19/00 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | NA | | | | NA | | | | NA | | | |
| Units | 0.198 | | | | 0.198 | | | | 0.198 | | | |
| | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH - Wet | | | | | | | | | | | | |
| n-Octane | 4.57 | 4.7 | -2.8 | | 4.92 | 4.7 | 4.68 | | 4.98 | 4.7 | 5.96 | |
| n-Nonane | 5.24 | 4.8 | 9.17 | | 4.85 | 4.8 | 1.04 | | 4.91 | 4.8 | 2.29 | |
| n-Decane | 4.14 | 4.2 | -1.4 | | 4.18 | 4.2 | -0.48 | | 3.83 | 4.2 | -8.8 | |
| n-Undecane | 4.17 | 4.3 | -3 | | 3.87 | 4.3 | -10 | | 3.83 | 4.3 | -11 | |
| n-Dodecane | 3.93 | 4 | -1.8 | | 3.61 | 4 | -9.75 | | 3.64 | 4 | -9 | |
| n-Tridecane | 3.71 | 4 | -7.3 | | 3.46 | 4 | -13.5 | | 3.47 | 4 | -13 | |
| Isoprenoid RRT 1380 | 1.27 | 1 | 27 | | 1.04 | 1 | 4 | | 0.979 | 1 | -2.1 | |
| n-Tetradecane | 4.51 | 4.2 | 7.38 | | 4.32 | 4.2 | 2.86 | | 4.22 | 4.2 | 0.48 | |
| Isoprenoid RRT 1470 | 1.4 | 1.4 | 0 | | 1.2 | 1.4 | -14.3 | | 1.21 | 1.4 | -14 | |
| n-Pentadecane | 3.53 | 3.7 | -4.6 | | 3.37 | 3.7 | -8.92 | | 3.4 | 3.7 | -8.1 | |
| n-Hexadecane | 3.18 | 3.2 | -0.6 | | 3.03 | 3.2 | -5.31 | | 2.92 | 3.2 | -8.8 | |
| Isoprenoid RRT 1650 | 1.62 | 1.5 | 8 | | 1.72 | 1.5 | 14.7 | | 1.49 | 1.5 | -0.7 | |
| n-Heptadecane | 3 | 3.2 | -6.3 | | 3.01 | 3.2 | -5.94 | | 3.01 | 3.2 | -5.9 | |
| Pristane | 1.89 | 2.2 | -14 | | 2.14 | 2.2 | -2.73 | | 2.04 | 2.2 | -7.3 | |
| n-Octadecane | 2.33 | 2.9 | -20 | | 2.68 | 2.9 | -7.59 | | 2.59 | 2.9 | -11 | |
| Phytane | 1.27 | 1.6 | -21 | | 1.4 | 1.6 | -12.5 | | 1.28 | 1.6 | -20 | |
| n-Nonadecane | 2.3 | 2.6 | -12 | | 2.76 | 2.6 | 6.15 | | 2.42 | 2.6 | -6.9 | |
| n-Eicosane | 2.35 | 2.7 | -13 | | 2.61 | 2.7 | -3.33 | | 2.56 | 2.7 | -5.2 | |
| n-Heneicosane | 2.25 | 2.4 | -6.3 | | 2.41 | 2.4 | 0.417 | | 2.33 | 2.4 | -2.9 | |
| n-Docosane | 2.08 | 2.2 | -5.5 | | 2.16 | 2.2 | -1.82 | | 2.12 | 2.2 | -3.6 | |
| n-Tricosane | 2.06 | 2 | 3 | | 2.07 | 2 | 3.5 | | 1.99 | 2 | -0.5 | |
| n-Tetracosane | 1.82 | 2 | -9 | | 1.75 | 2 | -12.5 | | 1.76 | 2 | -12 | |
| n-Pentacosane | 1.64 | 1.7 | -3.5 | | 1.64 | 1.7 | -3.53 | | 1.6 | 1.7 | -5.9 | |
| n-Hexacosane | 1.43 | 1.5 | -4.7 | | 1.43 | 1.5 | -4.67 | | 1.44 | 1.5 | -4 | |
| n-Heptacosane | 1.16 | 1.2 | -3.3 | | 1.1 | 1.2 | -8.33 | | 1.11 | 1.2 | -7.5 | |
| n-Octacosane | 0.86 | 0.88 | -2.3 | | 0.87 | 0.88 | -1.14 | | 0.865 | 0.88 | -1.7 | |
| n-Nonacosane | 0.776 | 0.81 | -4.2 | | 0.752 | 0.81 | -7.16 | | 0.794 | 0.81 | -2 | |
| n-Triacontane | 0.675 | 0.65 | 3.85 | | 0.642 | 0.65 | -1.23 | | 0.719 | 0.65 | 10.6 | |
| n-Hentriacontane | 0.749 | 0.58 | 29.1 | | 0.713 | 0.58 | 22.9 | | 0.758 | 0.58 | 30.7 | |
| n-Dotriacontane | 0.525 | 0.44 | 19.3 | | 0.514 | 0.44 | 16.8 | | 0.508 | 0.44 | 15.4 | |
| n-Tritriacontane | 0.379 | 0.4 | -5.3 | | 0.38 | 0.4 | -5 | | 0.385 | 0.4 | -3.8 | |
| n-Tettratriacontane | 0.338 | 0.35 | -3.4 | | 0.315 | 0.35 | -10 | | 0.341 | 0.35 | -2.6 | |
| n-Pentatriacontane | 0.419 | 0.35 | 19.7 | | 0.368 | 0.35 | 5.14 | | 0.383 | 0.35 | 9.43 | |
| n-Hexatriacontane | 0.282 | 0.23 | 22.6 | | 0.273 | 0.23 | 18.7 | | 0.276 | 0.23 | 20 | |
| n-Heptatriacontane | 0.247 | 0.23 | 7.39 | | 0.21 | 0.23 | -8.7 | | 0.228 | 0.23 | -0.9 | |
| n-Octatriacontane | 0.243 | 0.22 | 10.4 | | 0.208 | 0.22 | -5.45 | | 0.222 | 0.22 | 0.91 | |
| n-Nonatriacontane | 0.159 J | 0.18 | -12 | | 0.128 J | 0.18 | -28.9 | | 0.152 J | 0.18 | -16 | |
| n-Tetracontane | 0.198 | 0.19 | 4.21 | | 0.168 J | 0.19 | -11.6 | | 0.202 | 0.19 | 6.32 | |
| TPH (RES) | 185 | 220 | -16 | | 178 | 220 | -19.1 | | 174 | 220 | -21 | |
| TPH | 637 | | | | 623 | | | | 621 | | | |
| 5A-androstane | 93 | | | | 104 | | | | 98 | | | |
| d50-tetracosane | 98 | | | | 100 | | | | 99 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 1004080

Data Table: DUP - Surrogate Corrected

| | 02-4A-02-PHC-T-AN | 02-4A-02-PHC-T-AN | | |
|---------------------|-------------------|-------------------|-----|---|
| Field ID | | DUP | | |
| Sample Type | N | DUP | | |
| Matrix | TISSUE | TISSUE | | |
| Sample Size | 10.06 g | 10.03 g | | |
| Weight Basis | WET | WET | | |
| Associated Blank | DY-S-72PB | DY-S-72PB | | |
| Field Date | 08/20/02 | 08/20/02 | | |
| Extract Date | 10/16/02 | 10/16/02 | | |
| Analysis Date | 11/01/02 | 11/01/02 | | |
| Date Received | 08/23/02 | 08/23/02 | | |
| Percent Solids | 26.9 | 26.9 | | |
| Dilution Factor | 5 | 5 | | |
| Percent Lipids | 0.209 | 0.197 | | |
| Min Reporting Limit | 0.05 | 0.05 | | |
| Units | mg/Kg | mg/Kg | RPD | Q |
| SHC/TPH | | | | |
| n-Nonane | ND | ND | | |
| n-Decane | 0.004 J | 0.0035 J | 13 | |
| n-Undecane | ND | ND | | |
| n-Dodecane | ND | 0.0021 J | | |
| n-Tridecane | 0.0028 J | 0.0031 J | 10 | |
| Isoprenoid RRT 1380 | ND | ND | | |
| n-Tetradecane | 0.0036 J | 0.0036 J | 0 | |
| Isoprenoid RRT 1470 | 0.005 J | 0.0052 J | 3.9 | |
| n-Pentadecane | 0.037 J | 0.028 J | 28 | |
| n-Hexadecane | 0.0053 J | 0.0048 J | 9.9 | |
| Isoprenoid RRT 1650 | ND | 0.0034 J | | |
| n-Heptadecane | 0.063 | 0.057 | 10 | |
| Pristane | 24 D | 24 D | 0 | |
| n-Octadecane | 0.0071 J | 0.0067 J | 5.8 | |
| Phytane | 0.0025 J | 0.0023 J | 8.3 | |
| n-Nonadecane | 0.0086 J | 0.0063 J | 31 | |
| n-Eicosane | 0.0049 J | 0.0044 J | 11 | |
| n-Heneicosane | 0.012 J | 0.011 J | 8.7 | |
| n-Docosane | 0.015 J | 0.019 J | 24 | |
| n-Tricosane | 0.04 JB | 0.049 JB | 20 | |
| n-Tetracosane | 0.044 JB | 0.055 B | 22 | |
| n-Pentacosane | 0.073 B | 0.086 B | 16 | |
| n-Hexacosane | 0.074 B | 0.087 B | 16 | |
| n-Heptacosane | 0.097 B | 0.11 B | 12 | |
| n-Octacosane | 0.08 B | 0.091 B | 13 | |
| n-Nonacosane | 0.082 B | 0.095 B | 15 | |
| n-Triacontane | 0.061 B | 0.07 B | 14 | |
| n-Hentriacontane | 0.058 B | 0.064 B | 9.8 | |
| n-Dotriacontane | 0.031 JB | 0.036 JB | 15 | |
| n-Tritriacontane | 0.02 JB | 0.024 JB | 18 | |
| n-Tetratriacontane | 0.011 JB | 0.01 JB | 9.5 | |
| n-Pentatriacontane | 0.0058 J | 0.0053 J | 9 | |
| n-Hexatriacontane | 0.0024 J | 0.0024 J | 0 | |
| n-Heptatriacontane | ND | ND | | |
| n-Octatriacontane | ND | ND | | |
| n-Tetracontane | ND | ND | | |
| TPH (RES) | 20 | 19 | 5.1 | |
| TPH | 20 | 19 | 5.1 | |
| %ortho-terphenyl | NA | NA | | |
| %5A-androstane | 74 | 81 | | |
| %d50-tetracosane | 79 | 86 | | |

Arthur D. Little
Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control DUP

| | 00-N13-01-PHC-T- | 00-N13-01-PHC-T-AN | | |
|----------------------|------------------|--------------------|-----|---|
| Field ID | AN | DUP | | |
| Lab ID | 20A3483 | 20A3483DUP | | |
| Sample Type | N | DUP | | |
| Matrix | TISSUE | TISSUE | | |
| Sample Size | 9.86 g | 10.12 g | | |
| Weight Basis | WET | WET | | |
| Associated Blank | DH-S-64PB | DH-S-64PB | | |
| Field Date | 08/19/00 | 08/19/00 | | |
| Extract Date | 03/28/01 | 03/28/01 | | |
| Analysis Date | 04/07/01 | 04/07/01 | | |
| Date Received | 08/30/00 | 08/30/00 | | |
| Percent Solids | 23.3 | 23.3 | | |
| Percent Lipids | NA | NA | | |
| Min Reporting Limit | 0.051 | 0.049 | | |
| Units | mg/Kg | mg/Kg | RPD | Q |
| SHC/TPH - Wet | | | | |
| n-Octane | ND | ND | | |
| n-Nonane | ND | ND | | |
| n-Decane | 0.002 J | 0.0017 J | 16 | |
| n-Undecane | ND | ND | | |
| n-Dodecane | ND | 0.0019 J | | |
| n-Tridecane | 0.0041 J | 0.0042 J | 2.4 | |
| Isoprenoid RRT 1380 | 0.0087 J | 0.0076 J | 13 | |
| n-Tetradecane | 0.0039 J | 0.0041 J | 5 | |
| Isoprenoid RRT 1470 | 0.017 J | 0.016 J | 6.1 | |
| n-Pentadecane | 0.023 J | 0.024 J | 4.2 | |
| n-Hexadecane | 0.0046 JB | 0.005 JB | 8.3 | |
| Isoprenoid RRT 1650 | 0.0046 J | 0.0045 J | 2.2 | |
| n-Heptadecane | 0.038 JB | 0.044 JB | 15 | |
| Pristane | 9 | 9.8 | 8.5 | |
| n-Octadecane | 0.0063 JB | 0.0069 JB | 9.1 | |
| Phytane | 0.0096 J | 0.01 J | 4.1 | |
| n-Nonadecane | 0.0058 J | 0.0059 J | 1.7 | |
| n-Eicosane | 0.0051 J | 0.0066 J | 26 | |
| n-Heneicosane | 0.046 JB | 0.041 JB | 11 | |
| n-Docosane | 0.023 JB | 0.024 JB | 4.2 | |
| n-Tricosane | 0.076 B | 0.08 B | 5.1 | |
| n-Tetracosane | 0.023 JB | 0.028 JB | 20 | |
| n-Pentacosane | 0.044 JB | 0.052 B | 17 | |
| n-Hexacosane | 0.03 JB | 0.042 JB | 33 | |
| n-Heptacosane | 0.047 JB | 0.064 B | 31 | |
| n-Octacosane | 0.034 JB | 0.052 B | 42 | & |
| n-Nonacosane | 0.042 JB | 0.059 B | 34 | |
| n-Triacontane | 0.026 JB | 0.046 JB | 56 | & |
| n-Hentriacontane | 0.027 JB | 0.04 JB | 39 | & |
| n-Dotriacontane | 0.016 JB | 0.025 JB | 44 | & |
| n-Tritriacontane | 0.0097 JB | 0.017 JB | 55 | & |
| n-Tetratriacontane | 0.006 JB | 0.0088 JB | 38 | & |
| n-Pentatriacontane | 0.0061 JB | 0.0074 JB | 19 | |
| n-Hexatriacontane | 0.0026 J | 0.0035 J | 30 | |
| n-Heptatriacontane | ND | 0.002 J | | |
| n-Octatriacontane | 0.0089 J | ND | | |
| n-Nonatriacontane | ND | ND | | |
| n-Tetracontane | ND | ND | | |
| TPH (RES) | 10 B | 11 B | 9.5 | |
| TPH | 14 | 15 | 6.9 | |
| 5A-androstane | 52 | 54 | | |
| d50-tetracosane | 56 | 58 | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 1004080
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | Blank Spike | Procedural Blank | | | |
|---------------------|------------------|-------------|------------------|----|----|---|
| Sample Type | PB | BS | PB | | | |
| Matrix | TISSUE | TISSUE | TISSUE | | | |
| Sample Size | 10 g | 10 g | 10 g | | | |
| Weight Basis | WET | WET | WET | | | |
| Associated Blank | NA | DY-S-72PB | NA | | | |
| Field Date | 10/16/02 | 10/16/02 | 10/21/02 | | | |
| Extract Date | 10/16/02 | 10/16/02 | 10/21/02 | | | |
| Analysis Date | 10/31/02 | 10/31/02 | 10/31/02 | | | |
| Date Received | 10/16/02 | 10/16/02 | 10/21/02 | | | |
| Percent Solids | 100 | 100 | 100 | | | |
| Dilution Factor | 1 | 1 | 1 | | | |
| Percent Lipids | NA | NA | NA | | | |
| Min Reporting Limit | 0.1 | 0.05 | 0.05 | | | |
| Units | mg/Kg | mg/Kg | mg/Kg | T | %R | Q |
| SHC/TPH | | | | | | |
| n-Nonane | ND | ND | ND | | | |
| n-Decane | ND | 1.2 | 2.5 | 48 | | |
| n-Undecane | ND | ND | | | | |
| n-Dodecane | ND | ND | | | | |
| n-Tridecane | ND | ND | | | | |
| Isoprenoid RRT 1380 | ND | ND | | | | |
| n-Tetradecane | ND | 0.0064 J | | | | |
| Isoprenoid RRT 1470 | ND | ND | | | | |
| n-Pentadecane | ND | 1.7 | 2.5 | 68 | | |
| n-Hexadecane | ND | 0.0033 J | | | | |
| Isoprenoid RRT 1650 | ND | ND | | | | |
| n-Heptadecane | ND | 0.003 J | | | | |
| Pristane | ND | 2.1 | 2.5 | 84 | | |
| n-Octadecane | ND | 0.0027 J | | | | |
| Phytane | ND | 0.012 J | | | | |
| n-Nonadecane | ND | ND | | | | |
| n-Eicosane | ND | 2.3 | 2.5 | 92 | | |
| n-Heneicosane | ND | 0.0045 J | | | | |
| n-Docosane | ND | 0.011 J | | | | |
| n-Tricosane | 0.014 J | 0.028 JB | 0.0043 J | | | |
| n-Tetracosane | 0.022 J | 0.051 B | 0.013 J | | | |
| n-Pentacosane | 0.037 J | 2.4 | 2.5 | 95 | | |
| n-Hexacosane | 0.047 J | 0.11 B | 0.034 J | | | |
| n-Heptacosane | 0.057 J | 0.13 B | 0.043 J | | | |
| n-Octacosane | 0.056 J | 0.12 B | 0.051 | | | |
| n-Nonacosane | 0.055 J | 0.12 B | 0.049 J | | | |
| n-Triacontane | 0.042 J | 2.4 | 2.5 | 94 | | |
| n-Hentriacontane | 0.037 J | 0.088 B | 0.048 J | | | |
| n-Dotriacontane | 0.021 J | 0.066 B | 0.037 J | | | |
| n-Tritriacontane | 0.014 J | 0.037 JB | 0.033 J | | | |
| n-Tetratriacontane | 0.0071 J | 2.3 | 2.5 | 92 | | |
| n-Pentatriacontane | ND | 0.014 J | 0.0057 J | | | |
| n-Hexatriacontane | ND | 2.2 | 2.5 | 88 | | |
| n-Heptatriacontane | ND | 0.0038 J | | | | |
| n-Octatriacontane | ND | 0.0058 J | | | | |
| n-Tetracontane | ND | 0.0034 J | | | | |
| TPH (RES) | 1.2 J | 18 | 0.0028 J | | | |
| TPH | 1.2 J | 18 | 0.83 J | | | |
| %ortho-terphenyl | NA | NA | NA | | | |
| %5A-androstane | 53 | 72 | 54 | | | |
| %d50-tetracosane | 65 | 85 | 70 | | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control BS-BSD

| Field ID | Procedural Blank | Blank Spike | | | |
|----------------------|------------------|-------------|------|-----|---|
| Lab ID | DH-S-64PB | DH-S-65BS | | | |
| Sample Type | PB | BS | | | |
| Matrix | TISSUE | TISSUE | | | |
| Sample Size | 1.5 g | 1.5 g | | | |
| Weight Basis | WET | WET | | | |
| Associated Blank | NA | DH-S-64PB | | | |
| Field Date | 03/28/01 | 03/28/01 | | | |
| Extract Date | 03/28/01 | 03/28/01 | | | |
| Analysis Date | 04/07/01 | 04/07/01 | | | |
| Date Received | 03/28/01 | 03/28/01 | | | |
| Percent Solids | 100 | 100 | | | |
| Percent Lipids | NA | NA | | | |
| Min Reporting Limit | 0.33 | 0.33 | | | |
| Units | mg/Kg | mg/Kg | T | %R | Q |
| SHC/TPH - Wet | | | | | |
| n-Octane | ND | ND | | | |
| n-Nonane | ND | ND | | | |
| n-Decane | ND | 0.9 | 16.7 | 5.4 | & |
| n-Undecane | ND | ND | | | |
| n-Dodecane | ND | ND | | | |
| n-Tridecane | ND | ND | | | |
| Isoprenoid RRT 1380 | ND | ND | | | |
| n-Tetradecane | ND | 0.015 J | | | |
| Isoprenoid RRT 1470 | ND | ND | | | |
| n-Pentadecane | ND | 6.5 | 16.7 | 39 | & |
| n-Hexadecane | 0.013 J | 0.011 JB | | | |
| Isoprenoid RRT 1650 | ND | ND | | | |
| n-Heptadecane | 0.01 J | 0.012 JB | | | |
| Pristane | ND | 11 | 16.7 | 66 | |
| n-Octadecane | 0.016 J | 0.012 JB | | | |
| Phytane | ND | 0.057 J | | | |
| n-Nonadecane | ND | ND | | | |
| n-Eicosane | ND | 13 | 16.7 | 78 | |
| n-Heneicosane | 0.02 J | 0.023 JB | | | |
| n-Docosane | 0.029 J | 0.036 JB | | | |
| n-Tricosane | 0.064 J | 0.095 JB | | | |
| n-Tetracosane | 0.082 J | 0.19 JB | | | |
| n-Pentacosane | 0.15 J | 14 | 16.7 | 83 | |
| n-Hexacosane | 0.19 J | 0.54 B | | | |
| n-Heptacosane | 0.25 J | 0.69 B | | | |
| n-Octacosane | 0.23 J | 0.66 B | | | |
| n-Nonacosane | 0.23 J | 0.68 B | | | |
| n-Triacontane | 0.17 J | 14 | 16.7 | 83 | |
| n-Hentriacontane | 0.15 J | 0.44 B | | | |
| n-Dotriacontane | 0.09 J | 0.32 JB | | | |
| n-Tritriacontane | 0.059 J | 0.19 JB | | | |
| n-Tetratriacontane | 0.033 J | 13 | 16.7 | 78 | |
| n-Pentatriacontane | 0.02 J | 0.074 JB | | | |
| n-Hexatriacontane | ND | 14 | 16.7 | 84 | |
| n-Heptatriacontane | ND | 0.019 J | | | |
| n-Octatriacontane | ND | 0.029 J | | | |
| n-Nonatriacontane | ND | ND | | | |
| n-Tetracontane | ND | 0.022 J | | | |
| TPH (RES) | 4.7 | 93 | | | |
| TPH | ND | ND | | | |
| 5A-androstane | 56 | 55 | | | |
| d50-tetracosane | 69 | 66 | | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| | | | | |
|---------------------|----------------------|----------|-----------|----------|
| | Oil Reference | | | |
| Field ID | Standard | | | |
| Lab ID | BY32ORS | | | |
| Sample Type | ORS | | | |
| Matrix | OIL | | | |
| Sample Size | 5.12 mg | | | |
| Weight Basis | OIL | | | |
| Associated Blank | NA | | | |
| Field Date | 03/21/01 | | | |
| Extract Date | 03/21/01 | | | |
| Analysis Date | 04/10/01 | | | |
| Date Received | 03/21/01 | | | |
| Percent Solids | NA | | | |
| Percent Lipids | NA | | | |
| Min Reporting Limit | 4.88 | | | |
| Units | mg/Kg | T | %D | Q |

| Polynuclear Aromatic Hydrocarbons - Wet | | | | |
|--|--------|------|------|--|
| Naphthalene | 768 | 710 | 8.17 | |
| C1-Naphthalenes | 1580 | 1600 | -1.3 | |
| C2-Naphthalenes | 2210 | 2300 | -3.9 | |
| C3-Naphthalenes | 1660 | 1960 | -15 | |
| C4-Naphthalenes | 983 | 1180 | -17 | |
| Acenaphthylene | ND | | | |
| Acenaphthene | ND | | | |
| Biphenyl | 229 | 214 | 7.01 | |
| Fluorene | 102 | 95.2 | 7.14 | |
| C1-Fluorenes | 242 | 239 | 1.26 | |
| C2-Fluorenes | 324 | 356 | -9 | |
| C3-Fluorenes | 344 | 396 | -13 | |
| Anthracene | ND | | | |
| Phenanthrene | 293 | 260 | 12.7 | |
| C1-Phenanthrenes/anthracenes | 612 | 612 | 0 | |
| C2-Phenanthrenes/anthracenes | 696 | 752 | -7.5 | |
| C3-Phenanthrenes/anthracenes | 518 | 534 | -3 | |
| C4-Phenanthrenes/anthracenes | 272 | 308 | -12 | |
| Dibenzothiophene | 240 | 222 | 8.11 | |
| C1-Dibenzothiophenes | 506 | 484 | 4.54 | |
| C2-Dibenzothiophenes | 682 | 658 | 3.65 | |
| C3-Dibenzothiophenes | 537 | 574 | -6.4 | |
| Fluoranthene | ND | | | |
| Pyrene | 15.2 | 13.4 | 13.4 | |
| C1-Fluoranthenes/pyrenes | 83 | 83.9 | -1.1 | |
| C2-Fluoranthenes/pyrenes | 143 | 142 | 0.7 | |
| C3-Fluoranthenes/pyrenes | 147 | 158 | -7 | |
| Benzo[a]anthracene | ND | | | |
| Chrysene | 55 | 49.2 | 11.8 | |
| C1-Chrysenes | 84.2 | 81.5 | 3.31 | |
| C2-Chrysenes | 110 | 102 | 7.84 | |
| C3-Chrysenes | 87.2 | 79.6 | 9.55 | |
| C4-Chrysenes | 61.6 | 64 | -3.8 | |
| Benzo[b]fluoranthene | 6.96 | 7.62 | -8.7 | |
| Benzo[k]fluoranthene | ND | | | |
| Benzo[e]pyrene | 12.4 | 12.4 | 0 | |
| Benzo[a]pyrene | ND | | | |
| Perylene | ND | | | |
| Indeno[1,2,3-c,d]pyrene | ND | | | |
| Dibenzo[a,h]anthracene | 1.47 J | | | |
| Benzo[g,h,i]perylene | 2.94 J | 3.18 | -7.6 | |
| d8-Naphthalene | 97 | | | |
| d10-Acenaphthene | 97 | | | |
| d10-Phenanthrene | 95 | | | |
| d12-Benzo[a]pyrene | 99 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 1004084
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | Blank Spike | | | |
|---------------------|------------------|-------------|---|----|---|
| Sample Type | PB | BS | | | |
| Matrix | TISSUE | TISSUE | | | |
| Sample Size | 10 g | 10 g | | | |
| Weight Basis | WET | WET | | | |
| Associated Blank | NA | DY-S-72PB | | | |
| Field Date | 10/16/02 | 10/16/02 | | | |
| Extract Date | 10/16/02 | 10/16/02 | | | |
| Analysis Date | 11/01/02 | 11/01/02 | | | |
| Date Received | 10/16/02 | 10/16/02 | | | |
| Percent Solids | 100 | 100 | | | |
| Dilution Factor | 1 | 1 | | | |
| Percent Lipids | NA | NA | | | |
| Min Reporting Limit | 2.5 | 1.2 | | | |
| Units | ug/Kg | ug/Kg | T | %R | Q |

Polynuclear Aromatic Hydrocarbons

| | | | | |
|------------------------------|---------|---------|-----|-----|
| Naphthalene | 1.9 J | 99 | 100 | 89 |
| C1-Naphthalenes | 0.48 J | 0.81 JB | | |
| C2-Naphthalenes | 0.41 J | 0.5 JB | | |
| C3-Naphthalenes | ND | ND | | |
| C4-Naphthalenes | ND | ND | | |
| Acenaphthylene | ND | 93 | 100 | 93 |
| Acenaphthene | 0.066 J | 99 | 100 | 99 |
| Biphenyl | 1.3 J | 0.41 JB | | |
| Fluorene | 0.21 J | 100 | 100 | 99 |
| C1-Fluorenes | ND | ND | | |
| C2-Fluorenes | ND | ND | | |
| C3-Fluorenes | ND | ND | | |
| Anthracene | 0.04 J | 75 | 100 | 75 |
| Phenanthrene | 1.1 J | 99 | 100 | 94 |
| C1-Phenanthrenes/anthracenes | 0.23 J | 0.52 JB | | |
| C2-Phenanthrenes/anthracenes | ND | ND | | |
| C3-Phenanthrenes/anthracenes | ND | ND | | |
| C4-Phenanthrenes/anthracenes | ND | ND | | |
| Dibenzothiophene | ND | ND | | |
| C1-Dibenzothiophenes | ND | ND | | |
| C2-Dibenzothiophenes | ND | ND | | |
| C3-Dibenzothiophenes | ND | ND | | |
| Fluoranthene | 0.14 J | 120 | 100 | 119 |
| Pyrene | 0.097 J | 110 | 100 | 110 |
| C1-Fluoranthenes/pyrenes | ND | 0.22 J | | |
| C2-Fluoranthenes/pyrenes | ND | ND | | |
| C3-Fluoranthenes/pyrenes | ND | ND | | |
| Benzo[a]anthracene | ND | 99 | 100 | 99 |
| Chrysene | ND | 110 | 100 | 110 |
| C1-Chrysenes | ND | ND | | |
| C2-Chrysenes | ND | ND | | |
| C3-Chrysenes | ND | ND | | |
| C4-Chrysenes | ND | ND | | |
| Benzo[b]fluoranthene | ND | 120 | 100 | 120 |
| Benzo[k]fluoranthene | ND | 120 | 100 | 120 |
| Benzo[e]pyrene | ND | ND | | |
| Benzo[a]pyrene | ND | 110 | 100 | 110 |
| Perylene | ND | ND | | |
| Indeno[1,2,3,-c,d]pyrene | ND | 100 | 100 | 100 |
| Dibenzo[a,h]anthracene | ND | 110 | 100 | 110 |
| Benzo[g,h,i]perylene | ND | 110 | 100 | 110 |

| | | |
|--------------------|------|----|
| d8-Naphthalene | 20 & | 49 |
| d10-Acenaphthene | 34 & | 56 |
| d10-Phenanthrene | 44 & | 64 |
| d12-Benzo[a]pyrene | 46 | 58 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 1004084
Data Table: BS-BSD - Surrogate Corrected

| | |
|---------------------|----------|
| Field ID | Blank |
| Sample Type | PB |
| Matrix | TISSUE |
| Sample Size | 10 g |
| Weight Basis | WET |
| Associated Blank | NA |
| Field Date | 10/21/02 |
| Extract Date | 10/21/01 |
| Analysis Date | 11/09/02 |
| Date Received | 10/21/02 |
| Percent Solids | 100 |
| Dilution Factor | 1 |
| Percent Lipids | NA |
| Min Reporting Limit | 6.2 |
| Units | ug/Kg |

Polynuclear Aromatic Hydr

| | |
|------------------------------|---------|
| Naphthalene | 1.4 |
| C1-Naphthalenes | 0.43 J |
| C2-Naphthalenes | 0.47 J |
| C3-Naphthalenes | ND |
| C4-Naphthalenes | ND |
| Acenaphthylene | ND |
| Acenaphthene | 0.086 J |
| Biphenyl | 0.42 J |
| Fluorene | 0.25 J |
| C1-Fluorenes | ND |
| C2-Fluorenes | ND |
| C3-Fluorenes | ND |
| Anthracene | 0.062 J |
| Phenanthrene | 1.4 |
| C1-Phenanthrenes/anthracenes | 0.44 J |
| C2-Phenanthrenes/anthracenes | ND |
| C3-Phenanthrenes/anthracenes | ND |
| C4-Phenanthrenes/anthracenes | ND |
| Dibenzothiophene | ND |
| C1-Dibenzothiophenes | ND |
| C2-Dibenzothiophenes | ND |
| C3-Dibenzothiophenes | ND |
| Fluoranthene | 0.21 J |
| Pyrene | 0.13 J |
| C1-Fluoranthenes/pyrenes | ND |
| C2-Fluoranthenes/pyrenes | ND |
| C3-Fluoranthenes/pyrenes | ND |
| Benzo[a]anthracene | ND |
| Chrysene | ND |
| C1-Chrysenes | ND |
| C2-Chrysenes | ND |
| C3-Chrysenes | ND |
| C4-Chrysenes | ND |
| Benzo[b]fluoranthene | ND |
| Benzo[k]fluoranthene | ND |
| Benzo[e]pyrene | ND |
| Benzo[a]pyrene | ND |
| Perylene | ND |
| Indeno[1,2,3,-c,d]pyrene | ND |
| Dibenzo[a,h]anthracene | ND |
| Benzo[g,h,i]perylene | ND |

| | |
|--------------------|----|
| d8-Naphthalene | 40 |
| d10-Acenaphthene | 51 |
| d10-Phenanthrene | 56 |
| d12-Benzo[a]pyrene | 51 |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 1004084

Data Table: DUP - Surrogate Corrected

02-4A-02-PHC-T-AN

| Field ID | 02-4A-02-PHC-T-AN | DUP | | |
|---------------------|-------------------|-----------|-----|---|
| Sample Type | N | DUP | | |
| Matrix | TISSUE | TISSUE | | |
| Sample Size | 10.06 g | 10.03 g | | |
| Weight Basis | WET | WET | | |
| Associated Blank | DY-S-72PB | DY-S-72PB | | |
| Field Date | 08/20/02 | 08/20/02 | | |
| Extract Date | 10/16/02 | 10/16/02 | | |
| Analysis Date | 11/02/02 | 11/02/02 | | |
| Date Received | 08/23/02 | 08/23/02 | | |
| Percent Solids | 26.9 | 26.9 | | |
| Dilution Factor | 1 | 1 | | |
| Percent Lipids | 0.209 | 0.197 | | |
| Min Reporting Limit | 1.2 | 1.2 | | |
| Units | ug/Kg | ug/Kg | RPD | Q |

Polynuclear Aromatic Hydrocarbons

| | | | | |
|------------------------------|---------|----------|-----|---|
| Naphthalene | 1.5 B | 1.6 B | 6.4 | |
| C1-Naphthalenes | 1 JB | 1 JB | 0 | |
| C2-Naphthalenes | 3.6 | 1.9 B | 62 | & |
| C3-Naphthalenes | 1 J | 0.96 J | 4.1 | |
| C4-Naphthalenes | ND | ND | | |
| Acenaphthylene | 0.028 J | 0.021 J | 28 | |
| Acenaphthene | 0.15 JB | 0.086 JB | 54 | & |
| Biphenyl | 0.61 JB | 0.58 JB | 5 | |
| Fluorene | 0.54 JB | 0.29 JB | 60 | & |
| C1-Fluorenes | ND | ND | | |
| C2-Fluorenes | ND | ND | | |
| C3-Fluorenes | ND | ND | | |
| Anthracene | 0.24 J | 0.06 JB | 120 | & |
| Phenanthrene | 1.6 B | 1.5 B | 6.4 | |
| C1-Phenanthrenes/anthracenes | 1.1 JB | 1.1 JB | 0 | |
| C2-Phenanthrenes/anthracenes | 1.3 | 1.2 | 8 | |
| C3-Phenanthrenes/anthracenes | 0.68 J | 0.74 J | 8.4 | |
| C4-Phenanthrenes/anthracenes | ND | ND | | |
| Dibenzothiophene | 0.16 J | 0.17 J | 6.1 | |
| C1-Dibenzothiophenes | 0.25 J | 0.27 J | 7.7 | |
| C2-Dibenzothiophenes | 0.57 J | 0.57 J | 0 | |
| C3-Dibenzothiophenes | 0.41 J | 0.48 J | 16 | |
| Fluoranthene | 0.34 JB | 0.35 JB | 2.9 | |
| Pyrene | 0.26 JB | 0.25 JB | 3.9 | |
| C1-Fluoranthenes/pyrenes | 0.29 J | 0.32 J | 9.8 | |
| C2-Fluoranthenes/pyrenes | ND | ND | | |
| C3-Fluoranthenes/pyrenes | ND | ND | | |
| Benzo[a]anthracene | ND | ND | | |
| Chrysene | 0.24 J | 0.21 J | 13 | |
| C1-Chrysenes | 0.35 J | 0.37 J | 5.6 | |
| C2-Chrysenes | ND | ND | | |
| C3-Chrysenes | ND | ND | | |
| C4-Chrysenes | ND | ND | | |
| Benzo[b]fluoranthene | 0.19 J | 0.23 J | 19 | |
| Benzo[k]fluoranthene | 0.05 J | 0.057 J | 13 | |
| Benzo[e]pyrene | ND | ND | | |
| Benzo[a]pyrene | ND | ND | | |
| Perylene | 0.96 J | 0.98 J | 2.1 | |
| Indeno[1,2,3,-c,d]pyrene | 0.037 J | 0.037 J | 0 | |
| Dibenzo[a,h]anthracene | ND | ND | | |
| Benzo[g,h,i]perylene | 0.12 J | 0.11 J | 8.7 | |

| | | |
|--------------------|----|----|
| d8-Naphthalene | 52 | 56 |
| d10-Acenaphthene | 60 | 65 |
| d10-Phenanthrene | 72 | 75 |
| d12-Benzo[a]pyrene | 64 | 67 |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 1004084

Data Table: SRM - Surrogates, Standards and Reference

| | |
|---------------------|-----------------|
| Field ID | Material - 2978 |
| Sample Type | SRM |
| Matrix | TISSUE |
| Sample Size | 2.36 g |
| Weight Basis | DRY |
| Associated Blank | DY-S-72PB |
| Field Date | 10/16/02 |
| Extract Date | 10/16/02 |
| Analysis Date | 11/01/02 |
| Date Received | 10/16/02 |
| Percent Solids | 100 |
| Dilution Factor | 1 |
| Percent Lipids | NA |
| Min Reporting Limit | 5.3 |
| Units | ug/Kg |
| | T %D Q |

Polynuclear Aromatic Hydrocarbons

| | | | | |
|------------------------------|--------|------|-------|---|
| Naphthalene | 236 | 31 | 661 | & |
| C1-Naphthalenes | 187 | | | |
| C2-Naphthalenes | 308 | | | |
| C3-Naphthalenes | 486 | | | |
| C4-Naphthalenes | 182 | | | |
| Acenaphthylene | 16 | 4 | 300 | & |
| Acenaphthene | 50 | 6 | 733 | & |
| Biphenyl | 10.8 | 8 | 35 | |
| Fluorene | 50.7 | 7 | 624 | & |
| C1-Fluorenes | 113 | | | |
| C2-Fluorenes | 63.4 | | | |
| C3-Fluorenes | ND | | | |
| Anthracene | 20.8 | 5.4 | 285 | & |
| Phenanthrene | 313 | 74 | 323 | & |
| C1-Phenanthrenes/anthracenes | 153 | | | |
| C2-Phenanthrenes/anthracenes | 151 | | | |
| C3-Phenanthrenes/anthracenes | 104 | | | |
| C4-Phenanthrenes/anthracenes | 81.7 | | | |
| Dibenzothiophene | 40 | | | |
| C1-Dibenzothiophenes | 77.6 | | | |
| C2-Dibenzothiophenes | 123 | | | |
| C3-Dibenzothiophenes | 126 | | | |
| Fluoranthene | 247 | 166 | 48.8 | & |
| Pyrene | 436 | 256 | 70.3 | & |
| C1-Fluoranthenes/pyrenes | 169 | | | |
| C2-Fluoranthenes/pyrenes | 68.9 | | | |
| C3-Fluoranthenes/pyrenes | 23.7 | | | |
| Benzo[a]anthracene | 37.7 | 25 | 50.8 | & |
| Chrysene | 116 | 59 | 96.6 | & |
| C1-Chrysenes | 49.2 | | | |
| C2-Chrysenes | 19.5 | | | |
| C3-Chrysenes | ND | | | |
| C4-Chrysenes | ND | | | |
| Benzo[b]fluoranthene | 85.6 | 81 | 5.68 | |
| Benzo[k]fluoranthene | 28.5 | 24.1 | 18.2 | |
| Benzo[e]pyrene | 117 | 89.3 | 31 | |
| Benzo[a]pyrene | 7.24 | 7 | 3.43 | |
| Perylene | 5.58 | 4.09 | 36.4 | & |
| Indeno[1,2,3,-c,d]pyrene | 9.76 | 12.2 | -20 | |
| Dibenzo[a,h]anthracene | 2.42 J | 3.5 | -30.8 | |
| Benzo[g,h,i]perylene | 24.5 | 19.7 | 24.4 | |

| | |
|--------------------|------|
| d8-Naphthalene | 39 |
| d10-Acenaphthene | 42 & |
| d10-Phenanthrene | 50 |
| d12-Benzo[a]pyrene | 40 |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 1004084

Data Table: IRM - Surrogate-Corrected Reference

Instrument Reference

| Field ID | Standard | | | | Standard | | | |
|---------------------|----------|---|----|---|----------|---|----|---|
| Sample Type | IRM | | | | IRM | | | |
| Matrix | IRM | | | | IRM | | | |
| Sample Size | 0.1 mL | | | | 0.1 mL | | | |
| Weight Basis | WET | | | | WET | | | |
| Associated Blank | NA | | | | NA | | | |
| Field Date | 10/15/02 | | | | 10/15/02 | | | |
| Extract Date | 10/15/02 | | | | 10/15/02 | | | |
| Analysis Date | 11/09/02 | | | | 10/29/02 | | | |
| Date Received | 10/15/02 | | | | 10/15/02 | | | |
| Percent Solids | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | 250 | | | | 250 | | | |
| Units | ug/L | T | %D | Q | ug/L | T | %D | Q |

Polynuclear Aromatic Hydrocarbons

| | | | | | | | | |
|------------------------------|------|------|-------|--|------|------|--------|--|
| Naphthalene | 6760 | 6890 | -1.89 | | 6710 | 6890 | -2.61 | |
| C1-Naphthalenes | ND | | | | ND | | | |
| C2-Naphthalenes | ND | | | | ND | | | |
| C3-Naphthalenes | ND | | | | ND | | | |
| C4-Naphthalenes | ND | | | | ND | | | |
| Acenaphthylene | 6610 | 6960 | -5.03 | | 6450 | 6960 | -7.33 | |
| Acenaphthene | 6600 | 7280 | -9.34 | | 6400 | 7280 | -12.1 | |
| Biphenyl | 7080 | 7000 | 1.14 | | 6900 | 7000 | -1.43 | |
| Fluorene | 6210 | 7270 | -14.6 | | 6200 | 7270 | -14.7 | |
| C1-Fluorenes | ND | | | | ND | | | |
| C2-Fluorenes | ND | | | | ND | | | |
| C3-Fluorenes | ND | | | | ND | | | |
| Anthracene | 7160 | 7820 | -8.44 | | 6960 | 7820 | -11 | |
| Phenanthrene | 6710 | 7010 | -4.28 | | 6750 | 7010 | -3.71 | |
| C1-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| Dibenzothiophene | ND | | | | ND | | | |
| C1-Dibenzothiophenes | ND | | | | ND | | | |
| C2-Dibenzothiophenes | ND | | | | ND | | | |
| C3-Dibenzothiophenes | ND | | | | ND | | | |
| Fluoranthene | 6080 | 5910 | 2.88 | | 5990 | 5910 | 1.35 | |
| Pyrene | 5960 | 5890 | 1.19 | | 5850 | 5890 | -0.679 | |
| C1-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| Benzo[a]anthracene | 3620 | 3590 | 0.836 | | 3400 | 3590 | -5.29 | |
| Chrysene | 7070 | 7030 | 0.569 | | 7040 | 7030 | 0.142 | |
| C1-Chrysenes | ND | | | | ND | | | |
| C2-Chrysenes | ND | | | | ND | | | |
| C3-Chrysenes | ND | | | | ND | | | |
| C4-Chrysenes | ND | | | | ND | | | |
| Benzo[b]fluoranthene | 5260 | 5250 | 0.19 | | 5560 | 5250 | 5.9 | |
| Benzo[k]fluoranthene | 5710 | 5570 | 2.51 | | 5460 | 5570 | -1.97 | |
| Benzo[e]pyrene | 5670 | 5620 | 0.89 | | 5720 | 5620 | 1.78 | |
| Benzo[a]pyrene | 6610 | 6790 | -2.65 | | 6710 | 6790 | -1.18 | |
| Perylene | 7030 | 7120 | -1.26 | | 6940 | 7120 | -2.53 | |
| Indeno[1,2,3,-c,d]pyrene | 6200 | 6290 | -1.43 | | 6240 | 6290 | -0.795 | |
| Dibenzo[a,h]anthracene | 5540 | 5180 | 6.95 | | 5520 | 5180 | 6.56 | |
| Benzo[g,h,i]perylene | 5230 | 5290 | -1.13 | | 5240 | 5290 | -0.945 | |

| | | | | | | | | |
|--------------------|----|--|--|--|----|--|--|--|
| d8-Naphthalene | 96 | | | | 97 | | | |
| d10-Acenaphthene | 95 | | | | 97 | | | |
| d10-Phenanthrene | 95 | | | | 97 | | | |
| d12-Benzo[a]pyrene | 94 | | | | 94 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 1004084

Data Table: ORS - Surrogate Correction Reference

Oil Reference

| Field ID | Standard | | | | Standard | | | |
|---------------------|----------|---|----|---|----------|---|----|---|
| Sample Type | ORS | | | | ORS | | | |
| Matrix | OIL | | | | OIL | | | |
| Sample Size | 5.1 mg | | | | 5.1 mg | | | |
| Weight Basis | OIL | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | |
| Field Date | 04/23/02 | | | | 04/23/02 | | | |
| Extract Date | 04/23/02 | | | | 04/23/02 | | | |
| Analysis Date | 11/09/02 | | | | 10/29/02 | | | |
| Date Received | 04/23/02 | | | | 04/23/02 | | | |
| Percent Solids | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | 4.9 | | | | 4.9 | | | |
| Units | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q |

Polynuclear Aromatic Hydrocarbons

| | | | | | | | | |
|------------------------------|--------|------|-------|--|--------|------|-------|--|
| Naphthalene | 826 | 710 | 16.3 | | 761 | 710 | 7.18 | |
| C1-Naphthalenes | 1570 | 1600 | -1.88 | | 1450 | 1600 | -9.38 | |
| C2-Naphthalenes | 2080 | 2300 | -9.56 | | 2050 | 2300 | -10.9 | |
| C3-Naphthalenes | 1420 | 1960 | -27.6 | | 1690 | 1960 | -13.8 | |
| C4-Naphthalenes | 788 | 1180 | -33.2 | | 950 | 1180 | -19.5 | |
| Acenaphthylene | ND | | | | ND | | | |
| Acenaphthene | ND | | | | ND | | | |
| Biphenyl | 229 | 214 | 7.01 | | 223 | 214 | 4.2 | |
| Fluorene | 97.6 | 95.2 | 2.52 | | 102 | 95.2 | 7.14 | |
| C1-Fluorenes | 253 | 239 | 5.86 | | 241 | 239 | 0.837 | |
| C2-Fluorenes | 337 | 356 | -5.34 | | 342 | 356 | -3.93 | |
| C3-Fluorenes | 333 | 396 | -15.9 | | 332 | 396 | -16.2 | |
| Anthracene | ND | | | | ND | | | |
| Phenanthrene | 288 | 260 | 10.8 | | 277 | 260 | 6.54 | |
| C1-Phenanthrenes/anthracenes | 566 | 612 | -7.52 | | 605 | 612 | -1.14 | |
| C2-Phenanthrenes/anthracenes | 596 | 752 | -20.7 | | 687 | 752 | -8.64 | |
| C3-Phenanthrenes/anthracenes | 460 | 534 | -13.8 | | 511 | 534 | -4.31 | |
| C4-Phenanthrenes/anthracenes | 282 | 308 | -8.44 | | 294 | 308 | -4.54 | |
| Dibenzothiophene | 254 | 222 | 14.4 | | 251 | 222 | 13.1 | |
| C1-Dibenzothiophenes | 486 | 484 | 0.413 | | 495 | 484 | 2.27 | |
| C2-Dibenzothiophenes | 633 | 658 | -3.8 | | 693 | 658 | 5.32 | |
| C3-Dibenzothiophenes | 567 | 574 | -1.22 | | 561 | 574 | -2.26 | |
| Fluoranthene | ND | | | | ND | | | |
| Pyrene | 15 | 13.4 | 11.9 | | 17.2 | 13.4 | 28.4 | |
| C1-Fluoranthenes/pyrenes | 79.9 | 83.9 | -4.77 | | 87.9 | 83.9 | 4.77 | |
| C2-Fluoranthenes/pyrenes | 136 | 142 | -4.22 | | 150 | 142 | 5.63 | |
| C3-Fluoranthenes/pyrenes | 144 | 158 | -8.86 | | 169 | 158 | 6.96 | |
| Benzo[a]anthracene | ND | | | | ND | | | |
| Chrysene | 50.9 | 49.2 | 3.46 | | 54.4 | 49.2 | 10.6 | |
| C1-Chrysenes | 83 | 81.5 | 1.84 | | 89.8 | 81.5 | 10.2 | |
| C2-Chrysenes | 107 | 102 | 4.9 | | 106 | 102 | 3.92 | |
| C3-Chrysenes | 72.9 | 79.6 | -8.42 | | 100 | 79.6 | 25.6 | |
| C4-Chrysenes | 56.4 | 64 | -11.9 | | 71.8 | 64 | 12.2 | |
| Benzo[b]fluoranthene | 7.92 | 7.62 | 3.94 | | 7.02 | 7.62 | -7.87 | |
| Benzo[k]fluoranthene | ND | | | | ND | | | |
| Benzo[e]pyrene | 11.7 | 12.4 | -5.64 | | 12.2 | 12.4 | -1.61 | |
| Benzo[a]pyrene | ND | | | | ND | | | |
| Perylene | ND | | | | ND | | | |
| Indeno[1,2,3,-c,d]pyrene | ND | | | | ND | | | |
| Dibenzo[a,h]anthracene | 1.27 J | | | | 1.49 J | | | |
| Benzo[g,h,i]perylene | 3.21 J | 3.18 | 0.943 | | 3.36 J | 3.18 | 5.66 | |

| | | | | | | | | |
|--------------------|-----|--|--|--|-----|--|--|--|
| d8-Naphthalene | 94 | | | | 89 | | | |
| d10-Acenaphthene | 98 | | | | 95 | | | |
| d10-Phenanthrene | 97 | | | | 96 | | | |
| d12-Benzo[a]pyrene | 105 | | | | 106 | | | |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control IRM

| | | | | |
|---------------------|------------|---|----|---|
| Field ID | Instrument | | | |
| Lab ID | Reference | | | |
| Sample Type | BY42IRM | | | |
| Matrix | IRM | | | |
| Sample Size | IRM | | | |
| Weight Basis | 0.1 mL | | | |
| Associated Blank | WET | | | |
| Field Date | NA | | | |
| Extract Date | 03/28/01 | | | |
| Analysis Date | 03/28/01 | | | |
| Date Received | 04/10/01 | | | |
| Percent Solids | 03/28/01 | | | |
| Percent Lipids | NA | | | |
| Min Reporting Limit | NA | | | |
| Units | 250 | | | |
| | ug/L | T | %D | Q |

| Polynuclear Aromatic Hydrocarbons - Wet | | | | |
|---|------|------|------|--|
| Naphthalene | 6730 | 6890 | -2.3 | |
| C1-Naphthalenes | ND | | | |
| C2-Naphthalenes | ND | | | |
| C3-Naphthalenes | ND | | | |
| C4-Naphthalenes | ND | | | |
| Acenaphthylene | 6520 | 6960 | -6.3 | |
| Acenaphthene | 6720 | 7280 | -7.7 | |
| Biphenyl | 7230 | 7000 | 3.28 | |
| Fluorene | 6610 | 7270 | -9.1 | |
| C1-Fluorenes | ND | | | |
| C2-Fluorenes | ND | | | |
| C3-Fluorenes | ND | | | |
| Anthracene | 7120 | 7820 | -9 | |
| Phenanthrene | 7180 | 7010 | 2.42 | |
| C1-Phenanthrenes/anthracenes | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | | | |
| Dibenzothiophene | ND | | | |
| C1-Dibenzothiophenes | ND | | | |
| C2-Dibenzothiophenes | ND | | | |
| C3-Dibenzothiophenes | ND | | | |
| Fluoranthene | 5930 | 5910 | 0.34 | |
| Pyrene | 5940 | 5890 | 0.85 | |
| C1-Fluoranthenes/pyrenes | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | | | |
| Benzo[a]anthracene | 3400 | 3590 | -5.3 | |
| Chrysene | 7370 | 7030 | 4.84 | |
| C1-Chrysenes | ND | | | |
| C2-Chrysenes | ND | | | |
| C3-Chrysenes | ND | | | |
| C4-Chrysenes | ND | | | |
| Benzo[b]fluoranthene | 4990 | 5250 | -5 | |
| Benzo[k]fluoranthene | 6100 | 5570 | 9.52 | |
| Benzo[e]pyrene | 5950 | 5620 | 5.87 | |
| Benzo[a]pyrene | 6770 | 6790 | -0.3 | |
| Perylene | 7750 | 7120 | 8.85 | |
| Indeno[1,2,3,-c,d]pyrene | 5870 | 6290 | -6.7 | |
| Dibenzo[a,h]anthracene | 5420 | 5180 | 4.63 | |
| Benzo[g,h,i]perylene | 5180 | 5290 | -2.1 | |
| d8-Naphthalene | 100 | | | |
| d10-Acenaphthene | 96 | | | |
| d10-Phenanthrene | 97 | | | |
| d12-Benzo[a]pyrene | 92 | | | |

ND - Not Detected

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control SRM

| | | | | |
|---------------------|--------------------|---|----|---|
| Field ID | Standard | | | |
| Lab ID | Reference Material | | | |
| Sample Type | DH-S-66SRMF2 | | | |
| Matrix | SRM | | | |
| Sample Size | TISSUE | | | |
| Weight Basis | 16.83 g | | | |
| Associated Blank | WET | | | |
| Field Date | DH-S-64PBF2 | | | |
| Extract Date | 03/28/01 | | | |
| Analysis Date | 03/28/01 | | | |
| Date Received | 04/12/01 | | | |
| Percent Solids | 03/28/01 | | | |
| Percent Lipids | 11.4 | | | |
| Min Reporting Limit | NA | | | |
| Units | 6.51 | | | |
| | ug/Kg | T | %D | Q |

| Polynuclear Aromatic Hydrocarbons - Wet | | | | |
|---|----------|------|------|---|
| Naphthalene | 12.7 | 2.68 | 374 | & |
| C1-Naphthalenes | 1.36 B | | | |
| C2-Naphthalenes | 0.992 B | | | |
| C3-Naphthalenes | 1.86 | | | |
| C4-Naphthalenes | 5.01 | | | |
| Acenaphthylene | 1.1 | | | |
| Acenaphthene | 0.29 JB | | | |
| Biphenyl | 0.268 JB | | | |
| Fluorene | 0.362 JB | | | |
| C1-Fluorenes | ND | | | |
| C2-Fluorenes | 4.76 | | | |
| C3-Fluorenes | 10.6 | | | |
| Anthracene | 2.32 | 0.69 | 236 | & |
| Phenanthrene | 2.51 B | 2.53 | -0.8 | |
| C1-Phenanthrenes/anthracenes | 5.36 | | | |
| C2-Phenanthrenes/anthracenes | 14.6 | | | |
| C3-Phenanthrenes/anthracenes | 18 | | | |
| C4-Phenanthrenes/anthracenes | 13.4 | | | |
| Dibenzothiophene | 0.301 J | | | |
| C1-Dibenzothiophenes | 1.66 | | | |
| C2-Dibenzothiophenes | 9.85 | | | |
| C3-Dibenzothiophenes | 12.4 | | | |
| Fluoranthene | 21.1 | 18.6 | 13.4 | |
| Pyrene | 19.9 | 17.3 | 15 | |
| C1-Fluoranthenes/pyrenes | 12.3 | | | |
| C2-Fluoranthenes/pyrenes | 8.32 | | | |
| C3-Fluoranthenes/pyrenes | 4.2 | | | |
| Benzo[a]anthracene | 4.34 | 3.71 | 17 | |
| Chrysene | 10.6 | 10.8 | -1.9 | |
| C1-Chrysenes | 5.23 | | | |
| C2-Chrysenes | 3.79 | | | |
| C3-Chrysenes | 1.69 | | | |
| C4-Chrysenes | ND | | | |
| Benzo[b]fluoranthene | 7.22 | 5.28 | 36.7 | & |
| Benzo[k]fluoranthene | 2.06 | 2.3 | -10 | |
| Benzo[e]pyrene | 10.3 | 9.56 | 7.74 | |
| Benzo[a]pyrene | 1.96 | 1.78 | 10.1 | |
| Perylene | 0.943 | 0.87 | 7.89 | |
| Indeno[1,2,3,-c,d]pyrene | 1.53 | 1.62 | -5.6 | |
| Dibenzo[a,h]anthracene | 0.37 J | | | |
| Benzo[g,h,i]perylene | 2.44 | 2.5 | -2.4 | |
| d8-Naphthalene | 53 | | | |
| d10-Acenaphthene | 68 | | | |
| d10-Phenanthrene | 77 | | | |
| d12-Benzo[a]pyrene | 74 | | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control DUP

| | 00-N13-01-PHC-T-AN | 00-N13-01-PHC-T-AN | | |
|---------------------|--------------------|--------------------|-----|---|
| Field ID | | DUP | | |
| Lab ID | 20A3483F2 | 20A3483DUPF2 | | |
| Sample Type | N | DUP | | |
| Matrix | TISSUE | TISSUE | | |
| Sample Size | 9.86 g | 10.12 g | | |
| Weight Basis | WET | WET | | |
| Associated Blank | DH-S-64PBF2 | DH-S-64PBF2 | | |
| Field Date | 08/19/00 | 08/19/00 | | |
| Extract Date | 03/28/01 | 03/28/01 | | |
| Analysis Date | 04/12/01 | 04/12/01 | | |
| Date Received | 08/30/00 | 08/30/00 | | |
| Percent Solids | 23.3 | 23.3 | | |
| Percent Lipids | 0.987 | 0.775 | | |
| Min Reporting Limit | 1.3 | 1.2 | | |
| Units | ug/Kg | ug/Kg | RPD | Q |

| Polynuclear Aromatic Hydrocarbons - Wet | | | | |
|---|----------|----------|-----|---|
| Naphthalene | 0.94 JB | 0.99 JB | 5.2 | |
| C1-Naphthalenes | 0.72 JB | 0.85 JB | 16 | |
| C2-Naphthalenes | 3.7 | 3.6 | 2.7 | |
| C3-Naphthalenes | 0.82 J | 0.94 J | 14 | |
| C4-Naphthalenes | ND | ND | | |
| Acenaphthylene | ND | ND | | |
| Acenaphthene | 0.083 JB | 0.1 JB | 18 | |
| Biphenyl | 0.25 JB | 0.25 JB | 0 | |
| Fluorene | 0.25 JB | 0.27 JB | 7.7 | |
| C1-Fluorenes | 0.4 J | 0.4 J | 0 | |
| C2-Fluorenes | ND | ND | | |
| C3-Fluorenes | ND | ND | | |
| Anthracene | 0.091 JB | 0.077 JB | 17 | |
| Phenanthrene | 1.1 JB | 1.6 B | 37 | & |
| C1-Phenanthrenes/anthracenes | 0.64 JB | 0.74 JB | 14 | |
| C2-Phenanthrenes/anthracenes | 0.77 JB | 0.85 JB | 9.9 | |
| C3-Phenanthrenes/anthracenes | 0.79 JB | 0.82 JB | 3.7 | |
| C4-Phenanthrenes/anthracenes | 0.89 J | 0.91 J | 2.2 | |
| Dibenzothiophene | 0.099 JB | 0.13 JB | 27 | |
| C1-Dibenzothiophenes | 0.2 JB | 0.21 JB | 4.9 | |
| C2-Dibenzothiophenes | 0.39 JB | 0.43 JB | 9.8 | |
| C3-Dibenzothiophenes | 0.4 J | 0.44 J | 9.5 | |
| Fluoranthene | 0.28 JB | 0.47 JB | 51 | & |
| Pyrene | 0.28 JB | 0.32 JB | 13 | |
| C1-Fluoranthenes/pyrenes | 0.32 J | 0.36 J | 12 | |
| C2-Fluoranthenes/pyrenes | ND | ND | | |
| C3-Fluoranthenes/pyrenes | ND | ND | | |
| Benzo[a]anthracene | ND | ND | | |
| Chrysene | ND | ND | | |
| C1-Chrysenes | ND | ND | | |
| C2-Chrysenes | ND | ND | | |
| C3-Chrysenes | ND | ND | | |
| C4-Chrysenes | ND | ND | | |
| Benzo[b]fluoranthene | 0.19 J | 0.21 J | 10 | |
| Benzo[k]fluoranthene | 0.033 J | 0.052 J | 45 | & |
| Benzo[e]pyrene | ND | ND | | |
| Benzo[a]pyrene | ND | ND | | |
| Perylene | ND | ND | | |
| Indeno[1,2,3,-c,d]pyrene | ND | ND | | |
| Dibenzo[a,h]anthracene | ND | ND | | |
| Benzo[g,h,i]perylene | 0.058 J | 0.082 J | 34 | |
| d8-Naphthalene | 47 | 51 | | |
| d10-Acenaphthene | 59 | 63 | | |
| d10-Phenanthrene | 65 | 68 | | |
| d12-Benzo[a]pyrene | 64 | 67 | | |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control BS-BSD

| Field ID | Procedural Blank | Blank Spike | | | |
|--|------------------|-------------|-----|-----|---|
| Lab ID | DH-S-64PBF2 | DH-S-65BSF2 | | | |
| Sample Type | PB | BS | | | |
| Matrix | TISSUE | TISSUE | | | |
| Sample Size | 10 g | 10 g | | | |
| Weight Basis | WET | WET | | | |
| Associated Blank | NA | DH-S-64PBF2 | | | |
| Field Date | 03/28/01 | 03/28/01 | | | |
| Extract Date | 03/28/01 | 03/28/01 | | | |
| Analysis Date | 04/11/01 | 04/12/01 | | | |
| Date Received | 03/28/01 | 03/28/01 | | | |
| Percent Solids | 100 | 100 | | | |
| Percent Lipids | NA | NA | | | |
| Min Reporting Limit | 1.2 | 1.2 | | | |
| Units | ug/Kg | ug/Kg | T | %R | Q |
| Polynuclear Aromatic Hydrocarbons - Wet | | | | | |
| Naphthalene | 1.9 | 110 | 100 | 97 | |
| C1-Naphthalenes | 0.5 J | 0.43 JB | | | |
| C2-Naphthalenes | 0.65 J | 0.48 JB | | | |
| C3-Naphthalenes | ND | ND | | | |
| C4-Naphthalenes | ND | ND | | | |
| Acenaphthylene | ND | 92 | 100 | 92 | |
| Acenaphthene | 0.1 J | 100 | 100 | 99 | |
| Biphenyl | 0.26 J | 0.21 JB | | | |
| Fluorene | 0.29 J | 130 | 100 | 128 | & |
| C1-Fluorenes | ND | ND | | | |
| C2-Fluorenes | ND | ND | | | |
| C3-Fluorenes | ND | ND | | | |
| Anthracene | 0.07 J | 94 | 100 | 94 | |
| Phenanthrene | 1 J | 100 | 100 | 93 | |
| C1-Phenanthrenes/anthracenes | 0.46 J | 0.24 JB | | | |
| C2-Phenanthrenes/anthracenes | 0.4 J | 0.25 JB | | | |
| C3-Phenanthrenes/anthracenes | 0.29 J | 0.11 JB | | | |
| C4-Phenanthrenes/anthracenes | ND | ND | | | |
| Dibenzothiophene | 0.051 J | 0.47 J | | | |
| C1-Dibenzothiophenes | 0.068 J | ND | | | |
| C2-Dibenzothiophenes | 0.17 J | ND | | | |
| C3-Dibenzothiophenes | ND | ND | | | |
| Fluoranthene | 0.31 J | 150 | 100 | 148 | & |
| Pyrene | 0.15 J | 150 | 100 | 149 | & |
| C1-Fluoranthenes/pyrenes | ND | 0.17 J | | | |
| C2-Fluoranthenes/pyrenes | ND | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | ND | | | |
| Benzo[a]anthracene | ND | 150 | 100 | 150 | & |
| Chrysene | ND | 150 | 100 | 150 | & |
| C1-Chrysenes | ND | ND | | | |
| C2-Chrysenes | ND | ND | | | |
| C3-Chrysenes | ND | ND | | | |
| C4-Chrysenes | ND | ND | | | |
| Benzo[b]fluoranthene | ND | 100 | 100 | 100 | |
| Benzo[k]fluoranthene | ND | 95 | 100 | 95 | |
| Benzo[e]pyrene | ND | ND | | | |
| Benzo[a]pyrene | ND | 110 | 100 | 110 | |
| Perylene | ND | ND | | | |
| Indeno[1,2,3,-c,d]pyrene | ND | 84 | 100 | 84 | |
| Dibenzo[a,h]anthracene | ND | 68 | 100 | 68 | |
| Benzo[g,h,i]perylene | ND | 85 | 100 | 85 | |
| d8-Naphthalene | 12 & | 16 & | | | |
| d10-Acenaphthene | 30 & | 30 & | | | |
| d10-Phenanthrene | 55 | 55 | | | |
| d12-Benzo[a]pyrene | 83 | 72 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4104
Data Table: ORS - Surrogate Corrected

| | | | | |
|---------------------|---------------|---|----|---|
| Field ID | Oil Reference | | | |
| Sample Type | Standard | | | |
| Matrix | ORS | | | |
| Sample Size | OIL | | | |
| Weight Basis | 5.1 mg | | | |
| Associated Blank | OIL | | | |
| Field Date | NA | | | |
| Extract Date | 04/23/02 | | | |
| Analysis Date | 04/23/02 | | | |
| Date Received | 11/26/02 | | | |
| Percent Solids | 04/23/02 | | | |
| Dilution Factor | NA | | | |
| Percent Lipids | 1 | | | |
| Min Reporting Limit | NA | | | |
| Units | 4.9 | | | |
| | mg/Kg | T | %D | Q |

| Polynuclear Aromatic Hydrocarbons | | | | |
|-----------------------------------|--------|------|--------|--|
| Naphthalene | 823 | 710 | 15.9 | |
| C1-Naphthalenes | 1550 | 1600 | -3.12 | |
| C2-Naphthalenes | 2080 | 2300 | -9.56 | |
| C3-Naphthalenes | 1580 | 1960 | -19.4 | |
| C4-Naphthalenes | 954 | 1180 | -19.2 | |
| Acenaphthylene | ND | | | |
| Acenaphthene | ND | | | |
| Biphenyl | 233 | 214 | 8.88 | |
| Fluorene | 101 | 95.2 | 6.09 | |
| C1-Fluorenes | 249 | 239 | 4.18 | |
| C2-Fluorenes | 348 | 356 | -2.25 | |
| C3-Fluorenes | 343 | 396 | -13.4 | |
| Anthracene | ND | | | |
| Phenanthrene | 286 | 260 | 10 | |
| C1-Phenanthrenes/anthracenes | 577 | 612 | -5.72 | |
| C2-Phenanthrenes/anthracenes | 622 | 752 | -17.3 | |
| C3-Phenanthrenes/anthracenes | 476 | 534 | -10.9 | |
| C4-Phenanthrenes/anthracenes | 261 | 308 | -15.2 | |
| Dibenzothiophene | 249 | 222 | 12.2 | |
| C1-Dibenzothiophenes | 473 | 484 | -2.27 | |
| C2-Dibenzothiophenes | 627 | 658 | -4.71 | |
| C3-Dibenzothiophenes | 543 | 574 | -5.4 | |
| Fluoranthene | ND | | | |
| Pyrene | 13.4 | 13.4 | 0 | |
| C1-Fluoranthenes/pyrenes | 76.9 | 83.9 | -8.34 | |
| C2-Fluoranthenes/pyrenes | 146 | 142 | 2.82 | |
| C3-Fluoranthenes/pyrenes | 150 | 158 | -5.06 | |
| Benzo[a]anthracene | ND | | | |
| Chrysene | 51.1 | 49.2 | 3.86 | |
| C1-Chrysenes | 80.7 | 81.5 | -0.982 | |
| C2-Chrysenes | 89.4 | 102 | -12.4 | |
| C3-Chrysenes | 75.1 | 79.6 | -5.65 | |
| C4-Chrysenes | 59.3 | 64 | -7.34 | |
| Benzo[b]fluoranthene | 7.17 | 7.62 | -5.9 | |
| Benzo[k]fluoranthene | ND | | | |
| Benzo[e]pyrene | 11.6 | 12.4 | -6.45 | |
| Benzo[a]pyrene | ND | | | |
| Perylene | ND | | | |
| Indeno[1,2,3-c,d]pyrene | ND | | | |
| Dibenzo[a,h]anthracene | 1.36 J | | | |
| Benzo[g,h,i]perylene | 2.95 J | 3.18 | -7.23 | |
| d8-Naphthalene | 91 | | | |
| d10-Acenaphthene | 97 | | | |
| d10-Phenanthrene | 98 | | | |
| d12-Benzo[a]pyrene | 115 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4104

Data Table: IRM - Surrogate Corrected

| Field ID | Instrument Reference | Standard | | | |
|---------------------|----------------------|----------|---|----|---|
| Sample Type | | IRM | | | |
| Matrix | | IRM | | | |
| Sample Size | | 0.1 mL | | | |
| Weight Basis | | WET | | | |
| Associated Blank | | NA | | | |
| Field Date | | 10/15/02 | | | |
| Extract Date | | 10/15/02 | | | |
| Analysis Date | | 11/26/02 | | | |
| Date Received | | 10/15/02 | | | |
| Percent Solids | | NA | | | |
| Dilution Factor | | 1 | | | |
| Percent Lipids | | NA | | | |
| Min Reporting Limit | | 250 | | | |
| Units | | ug/L | T | %D | Q |

| Polynuclear Aromatic Hydrocarbons | | | | | |
|-----------------------------------|------|------|--------|--|--|
| Naphthalene | 6900 | 6890 | 0.145 | | |
| C1-Naphthalenes | ND | | | | |
| C2-Naphthalenes | ND | | | | |
| C3-Naphthalenes | ND | | | | |
| C4-Naphthalenes | ND | | | | |
| Acenaphthylene | 6690 | 6960 | -3.88 | | |
| Acenaphthene | 6740 | 7280 | -7.42 | | |
| Biphenyl | 7280 | 7000 | 4 | | |
| Fluorene | 6420 | 7270 | -11.7 | | |
| C1-Fluorenes | ND | | | | |
| C2-Fluorenes | ND | | | | |
| C3-Fluorenes | ND | | | | |
| Anthracene | 7390 | 7820 | -5.5 | | |
| Phenanthrene | 7150 | 7010 | 2 | | |
| C1-Phenanthrenes/anthracenes | ND | | | | |
| C2-Phenanthrenes/anthracenes | ND | | | | |
| C3-Phenanthrenes/anthracenes | ND | | | | |
| C4-Phenanthrenes/anthracenes | ND | | | | |
| Dibenzothiophene | ND | | | | |
| C1-Dibenzothiophenes | ND | | | | |
| C2-Dibenzothiophenes | ND | | | | |
| C3-Dibenzothiophenes | ND | | | | |
| Fluoranthene | 6170 | 5910 | 4.4 | | |
| Pyrene | 6150 | 5890 | 4.41 | | |
| C1-Fluoranthenes/pyrenes | ND | | | | |
| C2-Fluoranthenes/pyrenes | ND | | | | |
| C3-Fluoranthenes/pyrenes | ND | | | | |
| Benzo[a]anthracene | 3560 | 3590 | -0.836 | | |
| Chrysene | 7210 | 7030 | 2.56 | | |
| C1-Chrysenes | ND | | | | |
| C2-Chrysenes | ND | | | | |
| C3-Chrysenes | ND | | | | |
| C4-Chrysenes | ND | | | | |
| Benzo[b]fluoranthene | 5530 | 5250 | 5.33 | | |
| Benzo[k]fluoranthene | 5790 | 5570 | 3.95 | | |
| Benzo[e]pyrene | 5990 | 5620 | 6.58 | | |
| Benzo[a]pyrene | 6790 | 6790 | 0 | | |
| Perylene | 7320 | 7120 | 2.81 | | |
| Indeno[1,2,3-c,d]pyrene | 6470 | 6290 | 2.86 | | |
| Dibenzo[a,h]anthracene | 5680 | 5180 | 9.65 | | |
| Benzo[g,h,i]perylene | 5360 | 5290 | 1.32 | | |
| d8-Naphthalene | 95 | | | | |
| d10-Acenaphthene | 93 | | | | |
| d10-Phenanthrene | 92 | | | | |
| d12-Benzo[a]pyrene | 92 | | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4104
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | Blank Spike | | | |
|---------------------|------------------|-------------|---|----|---|
| Sample Type | PB | BS | | | |
| Matrix | SPMD | SPMD | | | |
| Sample Size | 1 | 1 | | | |
| Weight Basis | NA | NA | | | |
| Associated Blank | NA | DZ-S-49PB | | | |
| Field Date | 11/11/02 | 11/11/02 | | | |
| Extract Date | 11/11/02 | 11/11/02 | | | |
| Analysis Date | 11/27/02 | 11/27/02 | | | |
| Date Received | 11/11/02 | 11/11/02 | | | |
| Percent Solids | NA | NA | | | |
| Dilution Factor | 1 | 1 | | | |
| Percent Lipids | NA | NA | | | |
| Min Reporting Limit | 26 | 25 | | | |
| Units | ng | ng | T | %R | Q |

Polynuclear Aromatic Hydrocarbons

| | | | | | |
|------------------------------|--------|--------|------|-----|---|
| Naphthalene | 24 J | 990 | 1000 | 97 | |
| C1-Naphthalenes | 3.6 J | 5.8 JB | | | |
| C2-Naphthalenes | ND | 5.4 J | | | |
| C3-Naphthalenes | ND | ND | | | |
| C4-Naphthalenes | ND | ND | | | |
| Acenaphthylene | ND | 960 | 1000 | 96 | |
| Acenaphthene | ND | 960 | 1000 | 96 | |
| Biphenyl | 27 | 32 B | | | |
| Fluorene | 0.86 J | 990 | 1000 | 99 | |
| C1-Fluorenes | ND | ND | | | |
| C2-Fluorenes | ND | ND | | | |
| C3-Fluorenes | ND | ND | | | |
| Anthracene | ND | 700 | 1000 | 70 | |
| Phenanthrene | 13 J | 960 | 1000 | 95 | |
| C1-Phenanthrenes/anthracenes | 2.2 J | 4.6 JB | | | |
| C2-Phenanthrenes/anthracenes | ND | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | ND | | | |
| Dibenzothiophene | ND | ND | | | |
| C1-Dibenzothiophenes | ND | ND | | | |
| C2-Dibenzothiophenes | ND | ND | | | |
| C3-Dibenzothiophenes | ND | ND | | | |
| Fluoranthene | 2 J | 1100 | 1000 | 110 | |
| Pyrene | 1.4 J | 1000 | 1000 | 100 | |
| C1-Fluoranthenes/pyrenes | ND | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | ND | | | |
| Benzo[a]anthracene | ND | 970 | 1000 | 97 | |
| Chrysene | ND | 980 | 1000 | 98 | |
| C1-Chrysenes | ND | ND | | | |
| C2-Chrysenes | ND | ND | | | |
| C3-Chrysenes | ND | ND | | | |
| C4-Chrysenes | ND | ND | | | |
| Benzo[b]fluoranthene | ND | 1400 | 1000 | 140 | & |
| Benzo[k]fluoranthene | ND | 1100 | 1000 | 110 | |
| Benzo[e]pyrene | ND | ND | | | |
| Benzo[a]pyrene | ND | 1100 | 1000 | 110 | |
| Perylene | ND | ND | | | |
| Indeno[1,2,3-c,d]pyrene | ND | 1200 | 1000 | 120 | |
| Dibenzo[a,h]anthracene | ND | 1300 | 1000 | 130 | & |
| Benzo[g,h,i]perylene | 1.6 J | 1200 | 1000 | 120 | |
| d8-Naphthalene | 64 | 66 | | | |
| d10-Acenaphthene | 68 | 69 | | | |
| d10-Phenanthrene | 77 | 76 | | | |
| d12-Benzo[a]pyrene | 64 | 63 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4079
Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | |
|-------------------------------|---------------------------|------|-------|---|---------------------------|------|-------|---|---------------------------|------|-------|---|
| Sample Type | ORS | | | | ORS | | | | ORS | | | |
| Matrix | OIL | | | | OIL | | | | OIL | | | |
| Sample Size | 5.1 mg | | | | 5.1 mg | | | | 5.1 mg | | | |
| Weight Basis | OIL | | | | OIL | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | |
| Field Date | 04/23/02 | | | | 04/23/02 | | | | 04/23/02 | | | |
| Extract Date | 04/23/02 | | | | 04/23/02 | | | | 04/23/02 | | | |
| Analysis Date | 10/27/02 | | | | 10/23/02 | | | | 10/29/02 | | | |
| Date Received | 04/23/02 | | | | 04/23/02 | | | | 04/23/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 4.9 | | | | 4.9 | | | | 4.9 | | | |
| Units | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q |
| Sterane-Triterpane Biomarkers | | | | | | | | | | | | |
| T4-C23Diterpane | 53 | 58.9 | -10 | | 48.9 | 58.9 | -17 | | 56.8 | 58.9 | -3.56 | |
| S4-Diacholestane | 43 | 46.8 | -8.12 | | 41.8 | 46.8 | -10.7 | | 40.3 | 46.8 | -13.9 | |
| S5-Diacholestane | 28.2 | 26.1 | 8.04 | | 20.4 | 26.1 | -21.8 | | 25.2 | 26.1 | -3.45 | |
| T9-C29Tricyclitriterpane | 13.3 | 15.7 | -15.3 | | 13.9 | 15.7 | -11.5 | | 14.3 | 15.7 | -8.92 | |
| T10-C29Tricyclitriterpane | 13.2 | 15 | -12 | | 13.8 | 15 | -8 | | 13.2 | 15 | -12 | |
| T11-Trisnorhopane(TS) | 20.2 | 24.8 | -18.5 | | 23 | 24.8 | -7.26 | | 22.3 | 24.8 | -10.1 | |
| T12-Trisnorhopane(TM) | 24.2 | 31 | -21.9 | | 25.6 | 31 | -17.4 | | 26.2 | 31 | -15.5 | |
| S24-Methylcholestane | 25.9 | 26.2 | -1.14 | | 26.8 | 26.2 | 2.29 | | 27.3 | 26.2 | 4.2 | |
| S25-Ethylcholestane | 42.8 | 39.8 | 7.54 | | 42 | 39.8 | 5.53 | | 46.6 | 39.8 | 17.1 | |
| S28-Ethylcholestane | 34.6 | 33.9 | 2.06 | | 34.3 | 33.9 | 1.18 | | 36.1 | 33.9 | 6.49 | |
| T15-Norhopane | 79.8 | 83.8 | -4.77 | | 81 | 83.8 | -3.34 | | 81.7 | 83.8 | -2.5 | |
| T18-Oleanane | ND | | | | ND | | | | ND | | | |
| T19-Hopane | 116 | 113 | 2.65 | | 118 | 113 | 4.42 | | 122 | 113 | 7.96 | |
| T21-Homohopane | 49.7 | 46.1 | 7.81 | | 52.5 | 46.1 | 13.9 | | 52.4 | 46.1 | 13.7 | |
| T22-Homohopane | 33.8 | 35.2 | -3.98 | | 41.8 | 35.2 | 18.7 | | 40.7 | 35.2 | 15.6 | |
| 5B(H)-Cholane | 119 | | | | 117 | | | | 112 | | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control NSC

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | | Oil Reference Standard | | | | | Oil Reference Standard | | | | |
|-------------------------------|---------------------------|------|--------|---|---------------------------|------|--------|---|--|---------------------------|------|-------|---|--|---------------------------|------|--------|---|--|
| Lab ID | BY32ORS | | | | BX28ORS | | | | | BX28ORS-1 | | | | | BX28ORS-2 | | | | |
| Sample Type | ORS | | | | ORS | | | | | ORS | | | | | ORS | | | | |
| Matrix | OIL | | | | OIL | | | | | OIL | | | | | OIL | | | | |
| Sample Size | 5.12 mg | | | | 5.04 mg | | | | | 5.04 mg | | | | | 5.04 mg | | | | |
| Weight Basis | OIL | | | | OIL | | | | | OIL | | | | | OIL | | | | |
| Associated Blank | NA | | | | NA | | | | | DH-S-58PB PCA | | | | | DH-S-58PB PCA | | | | |
| Field Date | 03/21/01 | | | | 12/19/00 | | | | | 12/19/00 | | | | | 12/19/00 | | | | |
| Extract Date | 03/21/01 | | | | 12/19/00 | | | | | 12/19/00 | | | | | 12/19/00 | | | | |
| Analysis Date | 03/27/01 | | | | 03/20/01 | | | | | 03/12/01 | | | | | 03/20/01 | | | | |
| Date Received | 03/21/01 | | | | 12/19/00 | | | | | 12/19/00 | | | | | 12/19/00 | | | | |
| Percent Solids | NA | | | | NA | | | | | NA | | | | | NA | | | | |
| Percent Lipids | NA | | | | NA | | | | | NA | | | | | NA | | | | |
| Min Reporting Limit | 4.88 | | | | 4.96 | | | | | 4.96 | | | | | 4.96 | | | | |
| Units | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q | | mg/Kg | T | %D | Q | | mg/Kg | T | %D | Q | |
| Sterane-Triterpane Biomarkers | | | | | | | | | | | | | | | | | | | |
| T4-C23Diterpane | 49.2 | 58.9 | -16.5 | | 52.9 | 58.9 | -10.2 | | | 54.8 | 58.9 | -6.96 | | | 52.9 | 58.9 | -10.2 | | |
| S4-Diacholestane | 35.2 | 46.8 | -24.8 | | 45.2 | 46.8 | -3.42 | | | 44.4 | 46.8 | -5.13 | | | 45.2 | 46.8 | -3.42 | | |
| S5-Diacholestane | 21 | 26.1 | -19.5 | | 20.3 | 26.1 | -22.2 | | | 23.2 | 26.1 | -11.1 | | | 20.3 | 26.1 | -22.2 | | |
| T9-C29Tricyclitriterpane | 15.5 | 15.7 | -1.27 | | 18.8 | 15.7 | 19.7 | | | 15.9 | 15.7 | 1.27 | | | 18.8 | 15.7 | 19.7 | | |
| T10-C29Tricyclitriterpane | 14.7 | 15 | -2 | | 15.2 | 15 | 1.33 | | | 15.2 | 15 | 1.33 | | | 15.2 | 15 | 1.33 | | |
| T11-Trisnorhopane(TS) | 21.1 | 24.8 | -14.9 | | 20.9 | 24.8 | -15.7 | | | 21.9 | 24.8 | -11.7 | | | 20.9 | 24.8 | -15.7 | | |
| T12-Trisnorhopane(TM) | 23.6 | 31 | -23.9 | | 24.1 | 31 | -22.2 | | | 24.8 | 31 | -20 | | | 24.1 | 31 | -22.2 | | |
| S24-Methylcholestane | 26.7 | 26.2 | 1.91 | | 24.8 | 26.2 | -5.34 | | | 28.5 | 26.2 | 8.78 | | | 24.8 | 26.2 | -5.34 | | |
| S25-Ethylcholestane | 43.6 | 39.8 | 9.55 | | 43 | 39.8 | 8.04 | | | 43.1 | 39.8 | 8.29 | | | 43 | 39.8 | 8.04 | | |
| S28-Ethylcholestane | 33.7 | 33.9 | -0.59 | | 33.2 | 33.9 | -2.06 | | | 34.9 | 33.9 | 2.95 | | | 33.2 | 33.9 | -2.06 | | |
| T15-Norhopane | 79.5 | 83.8 | -5.13 | | 83 | 83.8 | -0.955 | | | 80.6 | 83.8 | -3.82 | | | 83 | 83.8 | -0.955 | | |
| T18-Oleanane | ND | | | | ND | | | | | ND | | | | | ND | | | | |
| T19-Hopane | 113 | 113 | 0 | | 123 | 113 | 8.85 | | | 116 | 113 | 2.65 | | | 123 | 113 | 8.85 | | |
| T21-Homohopane | 47.5 | 46.1 | 3.04 | | 51.5 | 46.1 | 11.7 | | | 46.7 | 46.1 | 1.3 | | | 51.5 | 46.1 | 11.7 | | |
| T22-Homohopane | 35 | 35.2 | -0.568 | | 38.3 | 35.2 | 8.81 | | | 33.2 | 35.2 | -5.68 | | | 38.3 | 35.2 | 8.81 | | |
| 5B(H)-Cholane | 110 | | | | 111 | | | | | 111 | | | | | 111 | | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4079
Data Table: DUP - Surrogate Corrected

| Field ID | 02-N10-01-PHC-S | 02-N10-01-PHC-S DUP | | | 02-N23-01-PHC-S | 02-N23-01-PHC-S DUP | | | 02-SAG-01-PHC-S | 02-SAG-01-PHC-S DUP | | |
|-------------------------------|-----------------|---------------------|-----|---|-----------------|---------------------|-----|---|-----------------|---------------------|-----|---|
| Sample Type | N | DUP | | | N | DUP | | | N | DUP | | |
| Matrix | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT | | |
| Sample Size | 17.49 g | 17.46 g | | | 20.88 g | 20.97 g | | | 15.41 g | 15.2 g | | |
| Weight Basis | DRY | DRY | | | DRY | DRY | | | DRY | DRY | | |
| Associated Blank | DY-S-66PB | DY-S-66PB | | | DY-S-63PB | DY-S-63PB | | | DY-S-69PB | DY-S-69PB | | |
| Field Date | 08/02/02 | 08/02/02 | | | 08/05/02 | 08/05/02 | | | 08/14/02 | 08/14/02 | | |
| Extract Date | 10/16/02 | 10/16/02 | | | 10/15/02 | 10/15/02 | | | 10/17/02 | 10/17/02 | | |
| Analysis Date | 10/30/02 | 10/30/02 | | | 10/26/02 | 10/26/02 | | | 10/31/02 | 11/01/02 | | |
| Date Received | 08/15/02 | 08/15/02 | | | 08/15/02 | 08/15/02 | | | 08/23/02 | 08/23/02 | | |
| Percent Solids | 57.2 | 57.2 | | | 68.5 | 68.5 | | | 50.4 | 50.4 | | |
| Dilution Factor | 1 | 1 | | | 1 | 1 | | | 1 | 1 | | |
| Percent Lipids | NA | NA | | | NA | NA | | | NA | NA | | |
| Min Reporting Limit | 0.71 | 0.72 | | | 0.6 | 1.2 | | | 0.81 | 0.82 | | |
| Units | ug/Kg | ug/Kg | RPD | Q | ug/Kg | ug/Kg | RPD | Q | ug/Kg | ug/Kg | RPD | Q |
| Sterane-Triterpane Biomarkers | | | | | | | | | | | | |
| T4-C23Diterpane | 0.77 | 0.8 | 3.8 | | 0.89 | 0.91 J | 2.2 | | 0.68 J | 0.73 J | 7.1 | |
| S4-Diacholestane | 1.1 | 1.1 | 0 | | 1.4 | 1.3 | 7.4 | | 1.5 | 1.5 | 0 | |
| S5-Diacholestane | 0.67 J | 0.65 J | 3 | | 0.67 | 0.81 J | 19 | | 1.1 | 0.89 | 21 | |
| T9-C29Tricyclitriterpane | 0.17 J | 0.22 J | 26 | | 0.26 J | 0.26 J | 0 | | 0.33 J | 0.24 J | 32 | |
| T10-C29Tricyclitriterpane | 0.16 J | 0.16 J | 0 | | 0.25 J | 0.24 J | 4.1 | | 0.26 J | 0.26 J | 0 | |
| T11-Trisnorhopane(TS) | 1.1 | 1.1 | 0 | | 1.2 | 1.2 | 0 | | 1.4 | 1.4 | 0 | |
| T12-Trisnorhopane(TM) | 3.5 | 3.5 | 0 | | 3.3 | 3.4 | 3 | | 3.4 | 3.4 | 0 | |
| S24-Methylcholestane | 3 | 2.9 | 3.4 | | 2.7 | 2.9 | 7.1 | | 2.4 | 2.5 | 4.1 | |
| S25-Ethylcholestane | 0.62 J | 0.63 J | 1.6 | | 0.93 | 0.86 J | 7.8 | | 0.98 | 1 | 2 | |
| S28-Ethylcholestane | 18 | 19 | 5.4 | | 13 | 14 | 7.4 | | 13 | 14 | 7.4 | |
| T15-Norhopane | 7.3 | 7.2 | 1.4 | | 7.9 | 7.7 | 2.6 | | 6 | 6 | 0 | |
| T18-Oleanane | ND | ND | | | ND | ND | | | ND | ND | | |
| T19-Hopane | 8 | 7.9 | 1.2 | | 8.3 | 8.3 | 0 | | 8.9 | 9.2 | 3.3 | |
| T21-Homohopane | 3 | 3.1 | 3.3 | | 3.3 | 3.6 | 8.7 | | 2.8 | 2.8 | 0 | |
| T22-Homohopane | 8 | 7.7 | 3.8 | | 6.8 | 6.4 | 6.1 | | 22 | 21 | 4.6 | |
| 5B(H)-Cholane | 92 | 87 | | | 75 | 71 | | | 69 | 81 | | |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control DUP

| | | | | | | | | | |
|---------------------|-----------------|---------------------|-------|-----------------|-----------------|-------|-----------------|---------------------|-------|
| Field ID | 00-N06-01-PHC-S | 00-N06-01-PHC-S DUP | | 00-N09-01-PHC-S | 00-N09-01-PHC-S | | 00-C0L-01-PHC-S | 00-C0L-01-PHC-S DUP | |
| Lab ID | 20A3468 REF F1 | 20A3468DUP REF F1 | | 20A3528 F1 | 20A3528DUP F1 | | 20A3500 F1 | 20A3500DUP F1 | |
| Sample Type | N | DUP | | N | DUP | | N | DUP | |
| Matrix | SEDIMENT | SEDIMENT | | SEDIMENT | SEDIMENT | | SEDIMENT | SEDIMENT | |
| Sample Size | 19.64 g | 19.2 g | | 19.82 g | 19.96 g | | 24.52 g | 24.52 g | |
| Weight Basis | DRY | DRY | | DRY | DRY | | DRY | DRY | |
| Associated Blank | DH-S-55PB F1 | DH-S-55PB F1 | | DH-S-61PB F1 | DH-S-61PB F1 | | DH-S-58PB PCA | DH-S-58PB PCA | |
| Field Date | 08/17/00 | 08/17/00 | | 08/18/00 | 08/18/00 | | 08/24/00 | 08/24/00 | |
| Extract Date | 02/20/01 | 02/20/01 | | 03/08/01 | 03/08/01 | | 03/07/01 | 03/07/01 | |
| Analysis Date | 03/27/01 | 03/27/01 | | 03/20/01 | 03/20/01 | | 03/15/01 | 03/15/01 | |
| Date Received | 08/30/00 | 08/30/00 | | 08/30/00 | 08/30/00 | | 08/30/00 | 08/30/00 | |
| Percent Solids | 63.8 | 63.8 | | 65.8 | 65.8 | | 79.7 | 79.7 | |
| Percent Lipids | NA | NA | | NA | NA | | NA | NA | |
| Min Reporting Limit | 0.64 | 0.65 | | 0.63 | 0.63 | | 0.51 | 0.51 | |
| Units | ug/Kg | ug/Kg | RPD Q | ug/Kg | ug/Kg | RPD Q | ug/Kg | ug/Kg | RPD Q |

| Sterane-Triterpane Biomarkers | | | | | | | | | |
|-------------------------------|---------|--------|------|--------|---------|------|--------|--------|-----|
| T4-C23Diterpane | 0.73 | 0.62 J | 16 | 0.28 J | 0.28 J | 0 | 0.5 J | 0.57 | 13 |
| S4-Diacholestane | 0.97 | 0.82 | 17 | 0.39 J | 0.38 J | 2.6 | 0.4 J | 0.44 J | 9.5 |
| S5-Diacholestane | 0.49 J | 0.5 J | 2 | 0.26 J | 0.24 J | 8 | 0.27 J | 0.32 J | 17 |
| T9-C29Tricyclitriterpane | 0.48 J | 0.18 J | 91 & | 0.17 J | 0.075 J | 78 & | 0.12 J | 0.13 J | 8 |
| T10-C29Tricyclitriterpane | 0.17 J | 0.17 J | 0 | 0.21 J | 0.078 J | 92 & | 0.11 J | 0.13 J | 17 |
| T11-Trisnorhopane(TS) | 0.91 | 0.82 | 10 | 0.38 J | 0.43 J | 12 | 0.43 J | 0.49 J | 13 |
| T12-Trisnorhopane(TM) | 2.3 | 2.3 | 0 | 1.1 | 1.2 | 8.7 | 1.8 | 1.8 | 0 |
| S24-Methylcholestane | 2.4 | 2.4 | 0 | 1.1 | 1.1 | 0 | 2 | 2.7 | 30 |
| S25-Ethylcholestane | 0.54 J | 0.57 J | 5.4 | 0.31 J | 0.29 J | 6.7 | 0.46 J | 0.4 J | 14 |
| S28-Ethylcholestane | 9.7 | 10 | 3 | 5.1 | 5 | 2 | 6.7 | 8.7 | 26 |
| T15-Norhopane | 5.7 | 5.6 | 1.8 | 3.2 | 2.7 | 17 | 3.3 | 3.4 | 3 |
| T18-Oleanane | 0.098 J | 0.1 J | 2 | ND | ND | | ND | ND | |
| T19-Hopane | 6.5 | 6.3 | 3.1 | 2.9 | 3.2 | 9.8 | 4.2 | 4.6 | 9.1 |
| T21-Homohopane | 2.4 | 2.7 | 12 | 1.4 | 1.2 | 15 | 1.4 | 1.4 | 0 |
| T22-Homohopane | 5.1 | 5.1 | 0 | 2.9 | 2.7 | 7.1 | 4.9 | 5.8 | 17 |

| | | | | | | | | | |
|---------------|----|----|--|----|----|--|----|----|--|
| 5B(H)-Cholane | 77 | 75 | | 83 | 77 | | 93 | 94 | |
|---------------|----|----|--|----|----|--|----|----|--|

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4079
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | Procedural Blank | Procedural Blank |
|---------------------|------------------|------------------|------------------|
| Sample Type | PB | PB | PB |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Size | 20 g | 20 g | 20 g |
| Weight Basis | DRY | DRY | DRY |
| Associated Blank | NA | NA | NA |
| Field Date | 10/16/02 | 10/15/02 | 10/17/02 |
| Extract Date | 10/16/02 | 10/15/02 | 10/17/02 |
| Analysis Date | 10/28/02 | 10/24/02 | 10/29/02 |
| Date Received | 10/16/02 | 10/15/02 | 10/17/02 |
| Percent Solids | 100 | 100 | 100 |
| Dilution Factor | 1 | 1 | 1 |
| Percent Lipids | NA | NA | NA |
| Min Reporting Limit | 0.62 | 0.62 | 0.62 |
| Units | ug/Kg | ug/Kg | ug/Kg |

Sterane-Triterpane Biomarkers

| | | | |
|---------------------------|----|----|----|
| T4-C23Diterpane | ND | ND | ND |
| S4-Diacholestane | ND | ND | ND |
| S5-Diacholestane | ND | ND | ND |
| T9-C29Tricyclitriterpane | ND | ND | ND |
| T10-C29Tricyclitriterpane | ND | ND | ND |
| T11-Trisnorhopane(TS) | ND | ND | ND |
| T12-Trisnorhopane(TM) | ND | ND | ND |
| S24-Methylcholestane | ND | ND | ND |
| S25-Ethylcholestane | ND | ND | ND |
| S28-Ethylcholestane | ND | ND | ND |
| T15-Norhopane | ND | ND | ND |
| T18-Oleanane | ND | ND | ND |
| T19-Hopane | ND | ND | ND |
| T21-Homohopane | ND | ND | ND |
| T22-Homohopane | ND | ND | ND |

| | | | |
|---------------|----|----|----|
| 5B(H)-Cholane | 87 | 71 | 84 |
|---------------|----|----|----|

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control BS-BSD

| | | | |
|---------------------|------------------|------------------|------------------|
| Field ID | Procedural Blank | Procedural Blank | Procedural Blank |
| Lab ID | DH-S-55PB F1 | DH-S-61PB F1 | DH-S-58PB PCA |
| Sample Type | PB | PB | PB |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Size | 20 g | 20 g | 20 g |
| Weight Basis | DRY | DRY | DRY |
| Associated Blank | NA | NA | DH-S-58PB PCA |
| Field Date | 02/20/01 | 03/08/01 | 03/07/01 |
| Extract Date | 02/20/01 | 03/08/01 | 03/07/01 |
| Analysis Date | 03/27/01 | 03/20/01 | 03/20/01 |
| Date Received | 02/20/01 | 03/08/01 | 03/07/01 |
| Percent Solids | 100 | 100 | 100 |
| Percent Lipids | NA | NA | NA |
| Min Reporting Limit | 1.2 | 0.62 | 0.62 |
| Units | ug/Kg | ug/Kg | ug/Kg |

| Sterane-Triterpane Biomarkers | | | |
|-------------------------------|----|----|----|
| T4-C23Diterpane | ND | ND | ND |
| S4-Diacholestane | ND | ND | ND |
| S5-Diacholestane | ND | ND | ND |
| T9-C29Tricyclitriterpane | ND | ND | ND |
| T10-C29Tricyclitriterpane | ND | ND | ND |
| T11-Trisnorhopane(TS) | ND | ND | ND |
| T12-Trisnorhopane(TM) | ND | ND | ND |
| S24-Methylcholestane | ND | ND | ND |
| S25-Ethylcholestane | ND | ND | ND |
| S28-Ethylcholestane | ND | ND | ND |
| T15-Norhopane | ND | ND | ND |
| T18-Oleanane | ND | ND | ND |
| T19-Hopane | ND | ND | ND |
| T21-Homohopane | ND | ND | ND |
| T22-Homohopane | ND | ND | ND |
| 5B(H)-Cholane | 85 | 75 | 85 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | Blank Spike | Procedural Blank | Blank Spike |
|---------------------|------------------|-------------|------------------|-------------|
| Sample Type | PB | BS | PB | BS |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Size | 20 g | 20 g | 20 g | 20 g |
| Weight Basis | DRY | DRY | DRY | DRY |
| Associated Blank | NA | EB-S-63PB | NA | DY-S-66PB |
| Field Date | 02/21/03 | 02/21/03 | 10/16/02 | 10/16/02 |
| Extract Date | 02/21/03 | 02/21/03 | 10/16/02 | 10/16/02 |
| Analysis Date | 02/28/03 | 03/01/03 | 10/25/02 | 10/25/02 |
| Date Received | 02/21/03 | 02/21/03 | 10/16/02 | 10/16/02 |
| Percent Solids | 100 | 100 | 100 | 100 |
| Dilution Factor | 1 | 1 | 1 | 1 |
| Percent Lipids | NA | NA | NA | NA |
| Min Reporting Limit | 0.025 | 0.025 | 0.025 | 0.025 |
| Units | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| T %R Q | | | | |
| SHC/TPH | | | | |
| n-Nonane | ND | ND | ND | ND |
| n-Decane | ND | 0.71 | 1.25 | 57 |
| n-Undecane | ND | ND | 0.0015 J | 1.2 |
| n-Dodecane | ND | ND | ND | 0.0011 J |
| n-Tridecane | ND | ND | 0.0016 J | 0.002 JB |
| Isoprenoid RRT 1380 | ND | ND | ND | 0.0012 J |
| n-Tetradecane | ND | 0.003 J | ND | ND |
| Isoprenoid RRT 1470 | ND | ND | 0.002 J | 0.0075 JB |
| n-Pentadecane | ND | 1 | 1.25 | 80 |
| n-Hexadecane | ND | 0.0013 J | ND | 0.0014 J |
| Isoprenoid RRT 1650 | ND | ND | ND | 1.9 |
| n-Heptadecane | ND | ND | 0.016 J | 0.015 JB |
| Pristane | ND | 1.1 | 1.25 | 88 |
| n-Octadecane | ND | 0.0011 J | ND | 0.0014 J |
| Phytane | ND | 0.006 J | 0.00086 J | 0.0022 JB |
| n-Nonadecane | ND | ND | ND | 2.3 |
| n-Eicosane | ND | 1.2 | 1.25 | 96 |
| n-Heneicosane | ND | 0.00086 J | ND | 0.003 JB |
| n-Docosane | 0.0012 J | 0.0015 JB | 0.0012 J | 0.0039 JB |
| n-Tricosane | 0.0045 J | 0.004 JB | 0.0014 J | 0.0047 JB |
| n-Tetracosane | 0.0034 J | 0.0054 JB | 0.0021 J | 0.0083 JB |
| n-Pentacosane | 0.0068 J | 1.3 | 0.005 J | 0.016 JB |
| n-Hexacosane | 0.0079 J | 0.013 JB | 0.0086 J | 2.4 |
| n-Heptacosane | 0.011 J | 0.011 JB | 0.0098 J | 0.036 B |
| n-Octacosane | 0.0085 J | 0.011 JB | 0.012 J | 0.036 B |
| n-Nonacosane | 0.0082 J | 0.012 JB | 0.011 J | 0.038 B |
| n-Triacontane | 0.0072 J | 1.2 | 0.011 J | 0.041 B |
| n-Hentriacontane | 0.0061 J | 0.0072 JB | 0.0081 J | 2.3 |
| n-Dotriacontane | 0.0031 J | 0.0095 JB | 0.0076 J | 0.029 B |
| n-Tritriacontane | 0.0034 J | 0.004 JB | 0.004 J | 0.027 |
| n-Tetratriacontane | 0.0035 J | 1.1 | 0.0027 J | 0.012 JB |
| n-Pentatriacontane | 0.0013 J | 0.0034 JB | 0.0012 J | 2.3 |
| n-Hexatriacontane | 0.002 J | 1 | ND | 0.0078 J |
| n-Heptatriacontane | ND | ND | ND | 2.2 |
| n-Octatriacontane | ND | ND | ND | 0.016 J |
| n-Tetracontane | ND | ND | ND | 0.0036 J |
| TPH (RES) | 0.4 J | 9.6 | ND | 0.0025 J |
| TPH | 0.4 J | 9.6 | 0.35 J | 17 |
| %ortho-terphenyl | NA | NA | 0.35 J | 17 |
| %5A-androstane | 75 | 74 | NA | NA |
| %d50-tetracosane | 86 | 83 | 86 | 93 |
| | | | 102 | 106 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | | | Blank Spike | | | Procedural Blank | | |
|---------------------|------------------|----|---|-------------|-----------|-----|------------------|-----------|--|
| Sample Type | PB | | | BS | | | PB | | |
| Matrix | SEDIMENT | | | SEDIMENT | | | SEDIMENT | | |
| Sample Size | 20 g | | | 20 g | | | 20 g | | |
| Weight Basis | DRY | | | DRY | | | DRY | | |
| Associated Blank | NA | | | DZ-S-03PB | | | NA | | |
| Field Date | 10/28/02 | | | 10/28/02 | | | 10/30/02 | | |
| Extract Date | 10/28/02 | | | 10/28/02 | | | 10/30/02 | | |
| Analysis Date | 11/04/02 | | | 11/05/02 | | | 11/07/02 | | |
| Date Received | 10/28/02 | | | 10/28/02 | | | 10/30/02 | | |
| Percent Solids | 100 | | | 100 | | | 100 | | |
| Dilution Factor | 1 | | | 1 | | | 1 | | |
| Percent Lipids | NA | | | NA | | | NA | | |
| Min Reporting Limit | 0.025 | | | 0.025 | | | 0.025 | | |
| Units | T | %R | Q | mg/Kg | T | %R | Q | mg/Kg | |
| SHC/TPH | | | | | | | | | |
| n-Nonane | | | | ND | | | | ND | |
| n-Decane | 2.5 | 48 | | 0.0017 J | 1.2 | 2.5 | 48 | 0.0013 J | |
| n-Undecane | | | | 0.0013 J | 0.0014 JB | | | 0.00083 J | |
| n-Dodecane | | | | 0.0032 J | 0.0041 JB | | | 0.0019 J | |
| n-Tridecane | | | | 0.0017 J | 0.0016 JB | | | 0.00092 J | |
| Isoprenoid RRT 1380 | | | | ND | ND | | | ND | |
| n-Tetradecane | | | | 0.0037 J | 0.0086 JB | | | 0.0028 J | |
| Isoprenoid RRT 1470 | | | | ND | 0.0018 J | | | ND | |
| n-Pentadecane | 2.5 | 76 | | 0.0011 J | 1.7 | 2.5 | 68 | 0.00084 J | |
| n-Hexadecane | | | | 0.0035 J | 0.021 J | | | 0.0053 J | |
| Isoprenoid RRT 1650 | | | | 0.0012 J | 0.0013 JB | | | 0.001 J | |
| n-Heptadecane | | | | 0.0018 J | ND | | | 0.0011 J | |
| Pristane | 2.5 | 92 | | ND | 2 | 2.5 | 80 | ND | |
| n-Octadecane | | | | 0.0035 J | 0.004 JB | | | 0.0019 J | |
| Phytane | | | | ND | 0.0098 J | | | ND | |
| n-Nonadecane | | | | 0.0019 J | 0.0024 JB | | | 0.0012 J | |
| n-Eicosane | 2.5 | 96 | | 0.0037 J | 2.3 | 2.5 | 92 | 0.005 J | |
| n-Heneicosane | | | | 0.0052 J | 0.0025 JB | | | 0.0081 J | |
| n-Docosane | | | | 0.007 J | 0.0038 JB | | | 0.0079 J | |
| n-Tricosane | | | | 0.012 J | 0.0087 JB | | | 0.012 J | |
| n-Tetracosane | | | | 0.016 J | 0.016 JB | | | 0.015 J | |
| n-Pentacosane | 2.5 | 96 | | 0.023 J | 2.3 | 2.5 | 91 | 0.02 J | |
| n-Hexacosane | | | | 0.026 | 0.03 B | | | 0.023 J | |
| n-Heptacosane | | | | 0.031 | 0.026 B | | | 0.028 | |
| n-Octacosane | | | | 0.028 | 0.025 B | | | 0.026 | |
| n-Nonacosane | | | | 0.027 | 0.027 B | | | 0.025 | |
| n-Triacontane | 2.5 | 92 | | 0.021 J | 2.3 | 2.5 | 91 | 0.019 J | |
| n-Hentriacontane | | | | 0.018 J | 0.017 JB | | | 0.017 J | |
| n-Dotriacontane | | | | 0.011 J | 0.02 JB | | | 0.01 J | |
| n-Tritriacontane | | | | 0.0066 J | 0.0075 JB | | | 0.0062 J | |
| n-Tetratriacontane | 2.5 | 92 | | 0.0034 J | 2.2 | 2.5 | 88 | 0.0029 J | |
| n-Pentatriacontane | | | | 0.0018 J | 0.0064 JB | | | 0.0016 J | |
| n-Hexatriacontane | 2.5 | 88 | | 0.00081 J | 2.1 | 2.5 | 84 | ND | |
| n-Heptatriacontane | | | | ND | 0.0011 J | | | ND | |
| n-Octatriacontane | | | | ND | 0.003 J | | | ND | |
| n-Tetracontane | | | | ND | 0.0021 J | | | ND | |
| TPH (RES) | | | | 0.52 J | 17 | | | 0.35 J | |
| TPH | | | | 0.52 J | 17 | | | 0.35 J | |
| %ortho-terphenyl | | | | NA | NA | | | NA | |
| %5A-androstane | | | | 82 | 83 | | | 80 | |
| %d50-tetracosane | | | | 108 | 96 | | | 108 | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Blank Spike | | | | Procedural Blank | | | | Blank Spike |
|---------------------|-------------|-----|----|---|------------------|---|----|---|-------------|
| Sample Type | BS | | | | PB | | | | BS |
| Matrix | SEDIMENT | | | | SEDIMENT | | | | SEDIMENT |
| Sample Size | 20 g | | | | 25 g | | | | 25 g |
| Weight Basis | DRY | | | | DRY | | | | DRY |
| Associated Blank | DZ-S-29PB | | | | NA | | | | DZ-S-65PB |
| Field Date | 10/30/02 | | | | 11/20/02 | | | | 11/20/02 |
| Extract Date | 10/30/02 | | | | 11/20/02 | | | | 11/20/02 |
| Analysis Date | 11/07/02 | | | | 11/26/02 | | | | 11/26/02 |
| Date Received | 10/30/02 | | | | 11/20/02 | | | | 11/20/02 |
| Percent Solids | 100 | | | | 100 | | | | 100 |
| Dilution Factor | 1 | | | | 1 | | | | 1 |
| Percent Lipids | NA | | | | NA | | | | NA |
| Min Reporting Limit | 0.025 | | | | 0.02 | | | | 0.02 |
| Units | mg/Kg | T | %R | Q | mg/Kg | | | | mg/Kg |
| | | | | | | T | %R | Q | |
| SHC/TPH | | | | | | | | | |
| n-Nonane | ND | | | | ND | | | | ND |
| n-Decane | 0.98 | 2.5 | 39 | | 0.0026 J | | | 2 | 55 |
| n-Undecane | ND | | | | 0.0013 J | | | | 0.001 JB |
| n-Dodecane | 0.0017 JB | | | | 0.0033 J | | | | 0.0023 JB |
| n-Tridecane | 0.00089 JB | | | | 0.0014 J | | | | 0.0012 JB |
| Isoprenoid RRT 1380 | ND | | | | ND | | | | ND |
| n-Tetradecane | 0.0057 JB | | | | 0.0045 J | | | | 0.0068 JB |
| Isoprenoid RRT 1470 | 0.00093 J | | | | ND | | | | 0.0011 J |
| n-Pentadecane | 1.5 | 2.5 | 60 | | 0.0012 J | | | 2 | 80 |
| n-Hexadecane | 0.0026 JB | | | | 0.0068 J | | | | 0.018 JB |
| Isoprenoid RRT 1650 | ND | | | | ND | | | | 0.00088 J |
| n-Heptadecane | 0.0018 JB | | | | 0.0015 J | | | | ND |
| Pristane | 2 | 2.5 | 80 | | ND | | | 2 | 95 |
| n-Octadecane | 0.0029 JB | | | | 0.0026 J | | | | 0.0031 JB |
| Phytane | 0.011 J | | | | ND | | | | 0.0098 J |
| n-Nonadecane | 0.0018 JB | | | | 0.0012 J | | | | 0.0018 JB |
| n-Eicosane | 2.2 | 2.5 | 88 | | 0.0023 J | | | 2 | 100 |
| n-Heneicosane | 0.0035 JB | | | | 0.0021 J | | | | 0.0064 JB |
| n-Docosane | 0.0049 JB | | | | 0.0045 J | | | | 0.0068 JB |
| n-Tricosane | 0.0087 JB | | | | 0.012 J | | | | 0.011 JB |
| n-Tetracosane | 0.014 JB | | | | 0.019 J | | | | 0.02 B |
| n-Pentacosane | 2.2 | 2.5 | 87 | | 0.031 | | | 2 | 98 |
| n-Hexacosane | 0.022 JB | | | | 0.037 | | | | 0.038 B |
| n-Heptacosane | 0.016 JB | | | | 0.045 | | | | 0.038 B |
| n-Octacosane | 0.015 JB | | | | 0.042 | | | | 0.037 B |
| n-Nonacosane | 0.017 JB | | | | 0.039 | | | | 0.039 B |
| n-Triacontane | 2.2 | 2.5 | 87 | | 0.031 | | | 2 | 98 |
| n-Hentriacontane | 0.01 JB | | | | 0.026 | | | | 0.024 B |
| n-Dotriacontane | 0.016 JB | | | | 0.016 J | | | | 0.023 B |
| n-Tritriacontane | 0.005 JB | | | | 0.01 J | | | | 0.0098 JB |
| n-Tetratriacontane | 2.1 | 2.5 | 84 | | 0.0054 J | | | 2 | 95 |
| n-Pentatriacontane | 0.0059 JB | | | | 0.0026 J | | | | 0.0071 JB |
| n-Hexatriacontane | 2 | 2.5 | 80 | | 0.0012 J | | | 2 | 90 |
| n-Heptatriacontane | 0.0012 J | | | | 0.0007 J | | | | 0.0017 JB |
| n-Octatriacontane | 0.003 J | | | | ND | | | | 0.0033 J |
| n-Tetracontane | 0.002 J | | | | ND | | | | 0.0024 J |
| TPH (RES) | 15 | | | | 1.3 | | | | 15 |
| TPH | 15 | | | | 1.3 | | | | 15 |
| %ortho-terphenyl | NA | | | | NA | | | | NA |
| %5A-androstane | 84 | | | | 84 | | | | 92 |
| %d50-tetracosane | 104 | | | | 102 | | | | 108 |

| | 02-L01-01-PHC-S | 02-L01-01-PHC-S | | | 02-N10-01-PHC-S | 02-N10-01-PHC-S | | | 02-N23-01-PHC-S | 02-N23-01-PHC-S | | | 02-SAG-01-PHC-S |
|---------------------|-----------------|-----------------|-----|---|-----------------|-----------------|-----|---|-----------------|-----------------|-----|---|-----------------|
| Field ID | 02-L01-01-PHC-S | DUP | | | 02-N10-01-PHC-S | DUP | | | 02-N23-01-PHC-S | DUP | | | 02-SAG-01-PHC-S |
| Sample Type | N | DUP | | | N | DUP | | | N | DUP | | | N |
| Matrix | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT | | | SEDIMENT |
| Sample Size | 23.63 g | 23.63 g | | | 17.49 g | 17.46 g | | | 20.6 g | 20.65 g | | | 15.32 g |
| Weight Basis | DRY | DRY | | | DRY | DRY | | | DRY | DRY | | | DRY |
| Associated Blank | EB-S-63PB | EB-S-63PB | | | DY-S-66PB | DY-S-66PB | | | DZ-S-03PB | DZ-S-03PB | | | DZ-S-29PB |
| Field Date | 07/31/02 | 07/31/02 | | | 08/02/02 | 08/02/02 | | | 08/05/02 | 08/05/02 | | | 08/14/02 |
| Extract Date | 02/21/03 | 02/21/03 | | | 10/16/02 | 10/16/02 | | | 10/28/02 | 10/28/02 | | | 10/30/02 |
| Analysis Date | 03/03/03 | 03/03/03 | | | 10/25/02 | 10/25/02 | | | 11/06/02 | 11/06/02 | | | 11/07/02 |
| Date Received | 08/15/02 | 08/15/02 | | | 08/15/02 | 08/15/02 | | | 08/15/02 | 08/15/02 | | | 08/23/02 |
| Percent Solids | 78.6 | 78.6 | | | 57.2 | 57.2 | | | 68.5 | 68.5 | | | 50.4 |
| Dilution Factor | 1 | 1 | | | 1 | 1 | | | 1 | 1 | | | 1 |
| Percent Lipids | NA | NA | | | NA | NA | | | NA | NA | | | NA |
| Min Reporting Limit | 0.021 | 0.021 | | | 0.028 | 0.029 | | | 0.024 | 0.024 | | | 0.033 |
| Units | mg/Kg | mg/Kg | RPD | Q | mg/Kg | mg/Kg | RPD | Q | mg/Kg | mg/Kg | RPD | Q | mg/Kg |
| SHC/TPH | | | | | | | | | | | | | |
| n-Nonane | ND | ND | | | 0.007 J | 0.0062 J | 12 | | 0.0043 J | 0.0041 J | 4.8 | | 0.0034 J |
| n-Decane | 0.0023 J | 0.002 J | 14 | | 0.016 J | 0.014 J | 13 | | 0.0094 J | 0.011 J | 16 | | 0.0098 J |
| n-Undecane | 0.0019 J | 0.0022 J | 15 | | 0.022 J | 0.019 J | 15 | | 0.012 J | 0.014 J | 15 | | 0.017 J |
| n-Dodecane | 0.0051 J | 0.0036 J | 34 | | 0.03 J | 0.025 J | 18 | | 0.02 J | 0.022 J | 9.5 | | 0.03 J |
| n-Tridecane | 0.005 J | 0.0045 J | 10 | | 0.038 | 0.034 | 11 | | 0.029 | 0.03 | 3.4 | | 0.047 |
| Isoprenoid RRT 1380 | 0.002 J | 0.0015 J | 28 | | 0.012 J | 0.01 J | 18 | | 0.0084 J | 0.0086 J | 2.4 | | 0.014 J |
| n-Tetradecane | 0.0052 J | 0.005 J | 3.9 | | 0.045 | 0.043 | 4.5 | | 0.035 | 0.034 | 2.9 | | 0.06 |
| Isoprenoid RRT 1470 | 0.0038 J | 0.0033 J | 14 | | 0.029 | 0.026 J | 11 | | 0.02 J | 0.02 J | 0 | | 0.039 |
| n-Pentadecane | 0.0076 J | 0.0069 J | 9.6 | | 0.062 | 0.059 | 5 | | 0.049 | 0.048 | 2.1 | | 0.13 |
| n-Hexadecane | 0.01 J | 0.0098 J | 2 | | 0.059 B | 0.055 B | 7 | | 0.047 | 0.047 | 0 | | 0.1 |
| Isoprenoid RRT 1650 | 0.0038 J | 0.0027 J | 34 | | 0.028 | 0.025 J | 11 | | 0.023 J | 0.021 J | 9.1 | | 0.029 J |
| n-Heptadecane | 0.015 J | 0.014 J | 6.9 | | 0.096 | 0.091 | 5.3 | | 0.068 | 0.065 | 4.5 | | 0.22 |
| Pristane | 0.0086 J | 0.0078 J | 9.8 | | 0.069 | 0.064 | 7.5 | | 0.056 | 0.056 | 0 | | 0.081 |
| n-Octadecane | 0.012 J | 0.011 J | 8.7 | | 0.068 | 0.063 | 7.6 | | 0.051 | 0.053 | 3.8 | | 0.086 |
| Phytane | 0.0055 J | 0.004 J | 32 | | 0.028 | 0.026 J | 7.4 | | 0.028 | 0.026 | 7.4 | | 0.027 J |
| n-Nonadecane | 0.015 J | 0.013 J | 14 | | 0.11 | 0.11 | 0 | | 0.083 | 0.081 | 2.4 | | 0.16 |
| n-Eicosane | 0.016 J | 0.014 J | 13 | | 0.1 | 0.096 | 4.1 | | 0.081 | 0.076 | 6.4 | | 0.14 |
| n-Heneicosane | 0.022 | 0.02 J | 9.5 | | 0.19 | 0.19 | 5.4 | | 0.14 | 0.15 | 6.9 | | 0.29 |
| n-Docosane | 0.019 J | 0.018 J | 5.4 | | 0.15 | 0.14 | 6.9 | | 0.12 | 0.12 | 8.7 | | 0.22 |
| n-Tricosane | 0.039 | 0.039 | 0 | | 0.39 | 0.37 | 5.3 | | 0.25 | 0.26 | 3.9 | | 0.58 |
| n-Tetracosane | 0.022 | 0.02 J | 9.5 | | 0.14 | 0.14 | 0 | | 0.11 | 0.11 | 0 | | 0.19 |
| n-Pentacosane | 0.046 | 0.047 | 2.2 | | 0.39 | 0.38 | 2.6 | | 0.29 | 0.29 | 0 | | 0.67 |
| n-Hexacosane | 0.024 B | 0.022 B | 8.7 | | 0.11 | 0.13 | 17 | | 0.094 B | 0.096 B | 2.1 | | 0.15 |
| n-Heptacosane | 0.066 | 0.067 | 1.5 | | 0.53 | 0.53 | 0 | | 0.44 | 0.44 | 0 | | 0.96 |
| n-Octacosane | 0.022 B | 0.02 JB | 9.5 | | 0.091 | 0.11 | 19 | | 0.084 B | 0.086 B | 2.4 | | 0.12 B |
| n-Nonacosane | 0.054 | 0.057 | 5.4 | | 0.41 | 0.41 | 0 | | 0.42 | 0.41 | 2.4 | | 0.7 |
| n-Triacontane | 0.015 JB | 0.012 JB | 22 | | 0.28 | 0.31 | 10 | | 0.05 B | 0.054 B | 7.7 | | 0.24 |
| n-Hentriacontane | 0.045 | 0.041 | 9.3 | | 0.35 | 0.35 | 0 | | 0.36 | 0.35 | 2.8 | | 0.59 |
| n-Dotriacontane | 0.011 JB | 0.0097 JB | 12 | | 0.027 J | 0.036 | 28 | | 0.03 B | 0.031 B | 3.3 | | 0.045 B |
| n-Tritriacontane | 0.016 JB | 0.012 JB | 28 | | 0.1 | 0.1 | 0 | | 0.11 | 0.11 | 0 | | 0.18 |
| n-Tetracontane | 0.0051 JB | 0.003 JB | 52 | & | 0.012 J | 0.014 J | 15 | | 0.011 JB | 0.012 JB | 8.7 | | 0.018 J |
| n-Pentatriacontane | 0.0053 JB | 0.003 JB | 55 | & | 0.02 J | 0.02 J | 0 | | 0.021 J | 0.021 J | 0 | | 0.051 |
| n-Hexatriacontane | 0.0031 JB | ND | | | 0.005 J | 0.0048 J | 4.1 | | 0.0048 J | 0.0049 J | 2.1 | | 0.008 J |
| n-Heptatriacontane | 0.0026 J | ND | | | 0.0049 J | 0.0047 J | 4.2 | | 0.0056 J | 0.0056 J | 0 | | 0.0086 J |
| n-Octatriacontane | 0.0024 J | ND | | | 0.0035 J | 0.0035 J | 0 | | 0.0042 J | 0.004 J | 4.9 | | 0.0068 J |
| n-Tetracontane | ND | ND | | | 0.0027 J | 0.0023 J | 16 | | 0.0026 J | 0.0029 J | 11 | | 0.0046 J |
| TPH (RES) | 1 B | 0.96 B | 4.1 | | 6.1 | 5.9 | 3.3 | | 5.1 | 4.9 | 4 | | 8.5 |
| TPH | 2.9 | 4.7 | 47 | & | 11 | 9.8 | 12 | | 9.6 | 8.9 | 7.6 | | 18 |
| %ortho-terphenyl | NA | NA | | | NA | NA | | | NA | NA | | | NA |
| %5A-androstane | 76 | 79 | | | 93 | 96 | | | 95 | 94 | | | 97 |
| %d50-tetracosane | 79 | 81 | | | 96 | 99 | | | 105 | 106 | | | 103 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: DUP - Surrogate Corrected

| | 02-SAG-01-PHC-S | | | 02-L09-01-PHC-S | | | 02-L09-01-PHC-S | | |
|---------------------|-----------------|-----|---|-----------------|--|--|-----------------|-----|---|
| Field ID | DUP | | | DUP | | | DUP | | |
| Sample Type | DUP | | | N | | | DUP | | |
| Matrix | SEDIMENT | | | SEDIMENT | | | SEDIMENT | | |
| Sample Size | 15.33 g | | | 23.63 g | | | 23.63 g | | |
| Weight Basis | DRY | | | DRY | | | DRY | | |
| Associated Blank | DZ-S-29PB | | | DZ-S-65PB | | | DZ-S-65PB | | |
| Field Date | 08/14/02 | | | 07/30/02 | | | 07/30/02 | | |
| Extract Date | 10/30/02 | | | 11/20/02 | | | 11/20/02 | | |
| Analysis Date | 11/07/02 | | | 11/26/02 | | | 11/27/02 | | |
| Date Received | 08/23/02 | | | 08/15/02 | | | 08/15/02 | | |
| Percent Solids | 50.4 | | | 78.7 | | | 78.7 | | |
| Dilution Factor | 1 | | | 1 | | | 1 | | |
| Percent Lipids | NA | | | NA | | | NA | | |
| Min Reporting Limit | 0.033 | | | 0.021 | | | 0.021 | | |
| Units | mg/Kg | RPD | Q | mg/Kg | | | mg/Kg | RPD | Q |
| SHC/TPH | | | | | | | | | |
| n-Nonane | 0.0035 J | 2.9 | | 0.0012 J | | | 0.0014 J | 15 | |
| n-Decane | 0.0083 J | 16 | | 0.0036 JB | | | 0.0036 JB | 0 | |
| n-Undecane | 0.017 J | 0 | | 0.0032 JB | | | 0.0038 JB | 17 | |
| n-Dodecane | 0.029 J | 3.4 | | 0.0049 JB | | | 0.0062 JB | 23 | |
| n-Tridecane | 0.046 | 2.2 | | 0.006 JB | | | 0.0069 JB | 14 | |
| Isoprenoid RRT 1380 | 0.014 J | 0 | | 0.0022 J | | | 0.0024 J | 8.7 | |
| n-Tetradecane | 0.059 | 1.7 | | 0.0086 JB | | | 0.0091 JB | 5.6 | |
| Isoprenoid RRT 1470 | 0.039 | 0 | | 0.0056 J | | | 0.0057 J | 1.8 | |
| n-Pentadecane | 0.13 | 0 | | 0.011 J | | | 0.011 J | 0 | |
| n-Hexadecane | 0.083 | 18 | | 0.032 B | | | 0.023 B | 33 | |
| Isoprenoid RRT 1650 | 0.03 J | 3.4 | | 0.0065 J | | | 0.0068 J | 4.5 | |
| n-Heptadecane | 0.21 | 4.6 | | 0.016 J | | | 0.016 J | 0 | |
| Pristane | 0.086 | 6 | | 0.014 J | | | 0.012 J | 15 | |
| n-Octadecane | 0.083 | 3.6 | | 0.013 J | | | 0.013 J | 0 | |
| Phytane | 0.026 J | 3.8 | | 0.0055 J | | | 0.005 J | 9.5 | |
| n-Nonadecane | 0.16 | 0 | | 0.019 J | | | 0.02 J | 5.1 | |
| n-Eicosane | 0.14 | 0 | | 0.03 | | | 0.042 | 33 | |
| n-Heneicosane | 0.29 | 0 | | 0.03 | | | 0.053 | 55 | & |
| n-Docosane | 0.21 | 4.6 | | 0.026 | | | 0.042 | 47 | & |
| n-Tricosane | 0.61 | 5 | | 0.055 B | | | 0.064 | 15 | |
| n-Tetracosane | 0.21 | 10 | | 0.032 B | | | 0.044 B | 32 | |
| n-Pentacosane | 0.87 | 26 | | 0.072 B | | | 0.085 B | 16 | |
| n-Hexacosane | 0.19 | 24 | | 0.044 B | | | 0.058 B | 27 | |
| n-Heptacosane | 1.2 | 22 | | 0.1 B | | | 0.12 B | 18 | |
| n-Octacosane | 0.15 | 22 | | 0.048 B | | | 0.064 B | 28 | |
| n-Nonacosane | 0.78 | 11 | | 0.083 B | | | 0.1 B | 18 | |
| n-Triacotane | 0.25 | 4.1 | | 0.055 B | | | 0.066 B | 18 | |
| n-Hentriacotane | 0.63 | 6.6 | | 0.066 B | | | 0.076 B | 14 | |
| n-Dotriacotane | 0.053 | 16 | | 0.017 JB | | | 0.026 B | 42 | & |
| n-Tritriacotane | 0.19 | 5.4 | | 0.019 JB | | | 0.024 B | 23 | |
| n-Tetatriacotane | 0.019 J | 5.4 | | 0.0054 JB | | | 0.007 JB | 26 | |
| n-Pentatriacotane | 0.053 | 3.8 | | 0.0047 JB | | | 0.0055 JB | 16 | |
| n-Hexatriacotane | 0.0086 J | 7.2 | | 0.0018 JB | | | 0.0018 JB | 0 | |
| n-Heptatriacotane | 0.0086 J | 0 | | 0.0013 JB | | | 0.0012 JB | 8 | |
| n-Octatriacotane | 0.0061 J | 11 | | ND | | | ND | | |
| n-Tetracontane | 0.005 J | 8.3 | | ND | | | ND | | |
| TPH (RES) | 10 | 5.1 | | 1.5 B | | | 1.6 B | 6.4 | |
| TPH | 18 | 0 | | 2 B | | | 2 B | 0 | |
| %ortho-terphenyl | NA | | | NA | | | NA | | |
| %5A-androstane | 100 | | | 75 | | | 71 | | |
| %d50-tetracosane | 109 | | | 80 | | | 76 | | |

| Field ID | Oil Reference Standard ORS | | | | Oil Reference Standard ORS | | | | Oil Reference Standard ORS | | | | Oil Reference Standard ORS | | | | Oil Reference Standard ORS | | | |
|---------------------|----------------------------------|-----|--------|---|----------------------------------|-----|--------|---|----------------------------------|-----|-------|---|----------------------------------|-----|-------|---|----------------------------------|-----|--------|---|
| Sample Type | OIL | | | | OIL | | | | OIL | | | | OIL | | | | OIL | | | |
| Sample Size | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | |
| Weight Basis | OIL | | | | WET | | | | OIL | | | | OIL | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | | NA | | | | NA | | | |
| Field Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Extract Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Analysis Date | 02/26/03 | | | | 03/03/03 | | | | 10/24/02 | | | | 10/24/02 | | | | 11/04/02 | | | |
| Date Received | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 0.199 | | | | 0.199 | | | | 0.199 | | | | 0.199 | | | | 0.199 | | | |
| Units | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | | | | | | | | | | | | | |
| n-Nonane | 5.62 | 4.8 | 17.1 | | 5.18 | 4.8 | 7.92 | | 5.23 | 4.8 | 8.96 | | 5.18 | 4.8 | 7.92 | | 5.14 | 4.8 | 7.08 | |
| n-Decane | 4.51 | 4.2 | 7.38 | | 4.37 | 4.2 | 4.05 | | 4.41 | 4.2 | 5 | | 4.26 | 4.2 | 1.43 | | 4.32 | 4.2 | 2.86 | |
| n-Undecane | 4.77 | 4.3 | 10.9 | | 4.66 | 4.3 | 8.37 | | 4.24 | 4.3 | -1.4 | | 4.3 | 4.3 | 0 | | 4.18 | 4.3 | -2.79 | |
| n-Dodecane | 4.27 | 4 | 6.75 | | 4.07 | 4 | 1.75 | | 4.13 | 4 | 3.25 | | 4.14 | 4 | 3.5 | | 4.14 | 4 | 3.5 | |
| n-Tridecane | 4.31 | 4 | 7.75 | | 3.9 | 4 | -2.5 | | 3.64 | 4 | -9 | | 3.79 | 4 | -5.25 | | 3.66 | 4 | -8.5 | |
| n-Tetradecane | 1.04 | 1 | 4 | | 1.1 | 1 | 10 | | 1.3 | 1 | 30 | | 1.3 | 1 | 30 | | 1.26 | 1 | 26 | |
| Isoprenoid RRT 1380 | 4.78 | 4.2 | 13.8 | | 4.78 | 4.2 | 13.8 | | 4.69 | 4.2 | 11.7 | | 4.6 | 4.2 | 9.52 | | 4.35 | 4.2 | 3.57 | |
| Isoprenoid RRT 1470 | 1.58 | 1.4 | 12.8 | | 1.47 | 1.4 | 5 | | 1.53 | 1.4 | 9.28 | | 1.52 | 1.4 | 8.57 | | 1.46 | 1.4 | 4.28 | |
| n-Pentadecane | 4.14 | 3.7 | 11.9 | | 4.09 | 3.7 | 10.5 | | 3.53 | 3.7 | -4.59 | | 3.54 | 3.7 | -4.32 | | 3.61 | 3.7 | -2.43 | |
| n-Hexadecane | 3.52 | 3.2 | 10 | | 3.24 | 3.2 | 1.25 | | 3.38 | 3.2 | 5.62 | | 3.39 | 3.2 | 5.94 | | 3.35 | 3.2 | 4.69 | |
| Isoprenoid RRT 1650 | 1.6 | 1.5 | 6.67 | | 1.39 | 1.5 | -7.33 | | 1.5 | 1.5 | 0 | | 1.68 | 1.5 | 12 | | 1.47 | 1.5 | -2 | |
| n-Heptadecane | 3.48 | 3.2 | 8.75 | | 3.5 | 3.2 | 9.37 | | 3 | 3.2 | -6.25 | | 2.86 | 3.2 | -10.6 | | 2.76 | 3.2 | -13.8 | |
| Pristane | 2.14 | 2.2 | -2.73 | | 2.26 | 2.2 | 2.73 | | 2.33 | 2.2 | 5.91 | | 2.05 | 2.2 | -6.82 | | 2.03 | 2.2 | -7.73 | |
| n-Octadecane | 2.8 | 2.9 | -3.45 | | 2.83 | 2.9 | -2.41 | | 2.43 | 2.9 | -16.2 | | 2.76 | 2.9 | -4.83 | | 2.47 | 2.9 | -14.8 | |
| Phytane | 1.51 | 1.6 | -5.62 | | 1.55 | 1.6 | -3.12 | | 1.41 | 1.6 | -11.9 | | 1.36 | 1.6 | -15 | | 1.43 | 1.6 | -10.6 | |
| n-Nonadecane | 2.46 | 2.6 | -5.38 | | 2.41 | 2.6 | -7.31 | | 2.28 | 2.6 | -12.3 | | 2.43 | 2.6 | -6.54 | | 2.37 | 2.6 | -8.85 | |
| n-Eicosane | 2.56 | 2.7 | -5.18 | | 2.54 | 2.7 | -5.92 | | 2.37 | 2.7 | -12.2 | | 2.59 | 2.7 | -4.07 | | 2.42 | 2.7 | -10.4 | |
| n-Heneicosane | 2.31 | 2.4 | -3.75 | | 2.24 | 2.4 | -6.67 | | 2.21 | 2.4 | -7.82 | | 2.22 | 2.4 | -7.5 | | 2.36 | 2.4 | -1.67 | |
| n-Docosane | 2.24 | 2.2 | 1.82 | | 2.19 | 2.2 | -0.454 | | 2.33 | 2.2 | 5.91 | | 2.2 | 2.2 | 0 | | 2.33 | 2.2 | 5.91 | |
| n-Tricosane | 2.15 | 2 | 7.5 | | 2.09 | 2 | 4.5 | | 2.05 | 2 | 2.5 | | 2.05 | 2 | 2.5 | | 2.07 | 2 | 3.5 | |
| n-Tetracosane | 1.96 | 2 | -2 | | 1.9 | 2 | -5 | | 1.88 | 2 | -6 | | 1.89 | 2 | -5.5 | | 1.92 | 2 | -4 | |
| n-Pentacosane | 1.69 | 1.7 | -0.588 | | 1.66 | 1.7 | -2.35 | | 1.73 | 1.7 | 1.76 | | 1.62 | 1.7 | -4.7 | | 1.74 | 1.7 | 2.35 | |
| n-Hexacosane | 1.51 | 1.5 | 0.667 | | 1.47 | 1.5 | -2 | | 1.53 | 1.5 | 2 | | 1.46 | 1.5 | -2.67 | | 1.55 | 1.5 | 3.33 | |
| n-Heptacosane | 1.25 | 1.2 | 4.17 | | 1.22 | 1.2 | 1.67 | | 1.1 | 1.2 | -8.33 | | 1.09 | 1.2 | -9.17 | | 1.08 | 1.2 | -10 | |
| n-Octacosane | 0.967 | 0.9 | 9.89 | | 0.918 | 0.9 | 4.32 | | 0.94 | 0.9 | 6.82 | | 0.922 | 0.9 | 4.77 | | 0.924 | 0.9 | 5 | |
| n-Nonacosane | 0.842 | 0.8 | 3.95 | | 0.834 | 0.8 | 2.96 | | 0.732 | 0.8 | -9.63 | | 0.758 | 0.8 | -6.42 | | 0.728 | 0.8 | -10.1 | |
| n-Triacotane | 0.663 | 0.7 | 2 | | 0.66 | 0.7 | 1.54 | | 0.641 | 0.7 | -1.38 | | 0.671 | 0.7 | 3.23 | | 0.672 | 0.7 | 3.38 | |
| n-Hentriacotane | 0.589 | 0.6 | 1.55 | | 0.569 | 0.6 | -1.9 | | 0.58 | 0.6 | 0 | | 0.748 | 0.6 | 29 | | 0.591 | 0.6 | 1.9 | |
| n-Dotriacotane | 0.448 | 0.4 | 1.82 | | 0.448 | 0.4 | 1.82 | | 0.408 | 0.4 | -7.27 | | 0.427 | 0.4 | -2.95 | | 0.422 | 0.4 | -4.09 | |
| n-Tritriacotane | 0.368 | 0.4 | -8 | | 0.36 | 0.4 | -10 | | 0.383 | 0.4 | -4.25 | | 0.375 | 0.4 | -6.25 | | 0.35 | 0.4 | -12.5 | |
| n-Tetraiaacotane | 0.369 | 0.4 | 5.43 | | 0.374 | 0.4 | 6.86 | | 0.342 | 0.4 | -2.28 | | 0.365 | 0.4 | 4.28 | | 0.34 | 0.4 | -2.86 | |
| n-Pentatriacontane | 0.35 | 0.4 | 0 | | 0.327 | 0.4 | -6.57 | | 0.441 | 0.4 | 26 | | 0.377 | 0.4 | 7.71 | | 0.418 | 0.4 | 19.4 | |
| n-Hexatriacontane | 0.198 J | 0.2 | -13.9 | | 0.216 | 0.2 | -6.09 | | 0.233 | 0.2 | 1.3 | | 0.28 | 0.2 | 21.7 | | 0.235 | 0.2 | 2.17 | |
| n-Heptatriacontane | 0.23 | 0.2 | 0 | | 0.257 | 0.2 | 11.7 | | 0.234 | 0.2 | 1.74 | | 0.24 | 0.2 | 4.35 | | 0.23 | 0.2 | 0 | |
| n-Octatriacontane | 0.225 | 0.2 | 2.27 | | 0.215 | 0.2 | -2.27 | | 0.23 | 0.2 | 4.54 | | 0.226 | 0.2 | 2.73 | | 0.219 | 0.2 | -0.454 | |
| n-Tetracontane | 0.18 J | 0.2 | -5.26 | | 0.187 J | 0.2 | -1.58 | | 0.177 J | 0.2 | -6.84 | | 0.18 J | 0.2 | -5.26 | | 0.161 J | 0.2 | -15.3 | |
| TPH (RES) | 198 | 220 | -10 | | 195 | 220 | -11.4 | | 184 | 220 | -16.4 | | 171 | 220 | -22.3 | | 183 | 220 | -16.8 | |
| TPH | 661 | 660 | 0.152 | | 634 | 660 | -3.94 | | 632 | 660 | -4.24 | | 628 | 660 | -4.85 | | 621 | 660 | -5.91 | |
| %ortho-terphenyl | 104 | | | | 105 | | | | 97 | | | | 97 | | | | 100 | | | |
| %5A-androstane | 104 | | | | 105 | | | | 96 | | | | 98 | | | | 98 | | | |
| %d50-tetracosane | 102 | | | | 104 | | | | 101 | | | | 102 | | | | 103 | | | |

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | |
|---------------------|------------------------|-----|--------|--|------------------------|-----|--------|--|------------------------|-----|--------|--|------------------------|-----|-------|--|------------------------|-----|-------|--|
| Sample Type | ORS | | | | ORS | | | | ORS | | | | ORS | | | | ORS | | | |
| Matrix | OIL | | | | OIL | | | | OIL | | | | OIL | | | | OIL | | | |
| Sample Size | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | |
| Weight Basis | OIL | | | | OIL | | | | OIL | | | | OIL | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | | NA | | | | NA | | | |
| Field Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Extract Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Analysis Date | 11/04/02 | | | | 11/06/02 | | | | 11/06/02 | | | | 11/25/02 | | | | 11/25/02 | | | |
| Date Received | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 0.199 | | | | 0.199 | | | | 0.199 | | | | 0.199 | | | | 0.199 | | | |
| Units | ug/mg | | | | ug/mg | | | | ug/mg | | | | ug/mg | | | | ug/mg | | | |
| | T | %D | Q | | T | %D | Q | | T | %D | Q | | T | %D | Q | | T | %D | Q | |
| SHC/TPH | | | | | | | | | | | | | | | | | | | | |
| n-Nonane | 5.24 | 4.8 | 9.17 | | 5.08 | 4.8 | 5.83 | | 5.12 | 4.8 | 6.67 | | 5.11 | 4.8 | 6.46 | | 5.29 | 4.8 | 10.2 | |
| n-Decane | 4.31 | 4.2 | 2.62 | | 4.34 | 4.2 | 3.33 | | 4.38 | 4.2 | 4.28 | | 4.27 | 4.2 | 1.67 | | 4.35 | 4.2 | 3.57 | |
| n-Undecane | 4.31 | 4.3 | 0.232 | | 4.15 | 4.3 | -3.49 | | 4.23 | 4.3 | -1.63 | | 4.19 | 4.3 | -2.56 | | 4.32 | 4.3 | 0.47 | |
| n-Dodecane | 4.23 | 4 | 5.75 | | 4.14 | 4 | 3.5 | | 4.16 | 4 | 4 | | 4.16 | 4 | 4 | | 4.24 | 4 | 6 | |
| n-Tridecane | 3.89 | 4 | -2.75 | | 3.64 | 4 | -9 | | 3.8 | 4 | -5 | | 3.8 | 4 | -5 | | 3.8 | 4 | -5 | |
| n-Tetradecane | 1.27 | 1 | 27 | | 1.25 | 1 | 25 | | 1.26 | 1 | 26 | | 1.19 | 1 | 19 | | 1.34 | 1 | 34 | |
| Isoprenoid RRT 1380 | 4.58 | 4.2 | 9.05 | | 4.62 | 4.2 | 10 | | 4.51 | 4.2 | 7.38 | | 4.36 | 4.2 | 3.81 | | 4.58 | 4.2 | 9.05 | |
| Isoprenoid RRT 1470 | 1.47 | 1.4 | 5 | | 1.35 | 1.4 | -3.57 | | 1.45 | 1.4 | 3.57 | | 1.5 | 1.4 | 7.14 | | 1.49 | 1.4 | 6.43 | |
| n-Pentadecane | 3.48 | 3.7 | -5.94 | | 3.6 | 3.7 | -2.7 | | 3.52 | 3.7 | -4.86 | | 3.62 | 3.7 | -2.16 | | 3.53 | 3.7 | -4.59 | |
| n-Hexadecane | 3.42 | 3.2 | 6.87 | | 3.34 | 3.2 | 4.37 | | 3.46 | 3.2 | 8.12 | | 3.35 | 3.2 | 4.69 | | 3.5 | 3.2 | 9.37 | |
| Isoprenoid RRT 1650 | 1.66 | 1.5 | 10.7 | | 1.48 | 1.5 | -1.33 | | 1.65 | 1.5 | 10 | | 1.53 | 1.5 | 2 | | 1.71 | 1.5 | 14 | |
| n-Heptadecane | 2.92 | 3.2 | -8.75 | | 2.79 | 3.2 | -12.8 | | 2.85 | 3.2 | -10.9 | | 2.72 | 3.2 | -15 | | 2.76 | 3.2 | -13.8 | |
| Pristane | 2.09 | 2.2 | -5 | | 2.29 | 2.2 | 4.09 | | 1.98 | 2.2 | -10 | | 1.99 | 2.2 | -9.54 | | 2.01 | 2.2 | -8.64 | |
| n-Octadecane | 2.61 | 2.9 | -10 | | 2.43 | 2.9 | -16.2 | | 2.56 | 2.9 | -11.7 | | 2.41 | 2.9 | -16.9 | | 2.36 | 2.9 | -18.6 | |
| Phytane | 1.37 | 1.6 | -14.4 | | 1.43 | 1.6 | -10.6 | | 1.33 | 1.6 | -16.9 | | 1.45 | 1.6 | -9.38 | | 1.22 | 1.6 | -23.8 | |
| n-Nonadecane | 2.4 | 2.6 | -7.69 | | 2.31 | 2.6 | -11.2 | | 2.39 | 2.6 | -8.08 | | 2.24 | 2.6 | -13.8 | | 2.44 | 2.6 | -6.15 | |
| n-Eicosane | 2.35 | 2.7 | -13 | | 2.39 | 2.7 | -11.5 | | 2.51 | 2.7 | -7.04 | | 2.34 | 2.7 | -13.3 | | 2.39 | 2.7 | -11.5 | |
| n-Heneicosane | 2.2 | 2.4 | -8.33 | | 2.24 | 2.4 | -6.67 | | 2.22 | 2.4 | -7.5 | | 2.26 | 2.4 | -5.83 | | 2.23 | 2.4 | -7.08 | |
| n-Docosane | 2.22 | 2.2 | 0.909 | | 2.31 | 2.2 | 5 | | 2.2 | 2.2 | 0 | | 2.31 | 2.2 | 5 | | 2.28 | 2.2 | 3.64 | |
| n-Tricosane | 2.02 | 2 | 1 | | 2.1 | 2 | 5 | | 2.02 | 2 | 1 | | 2.04 | 2 | 2 | | 2.09 | 2 | 4.5 | |
| n-Tetracosane | 1.84 | 2 | -8 | | 1.89 | 2 | -5.5 | | 1.88 | 2 | -6 | | 1.89 | 2 | -5.5 | | 1.92 | 2 | -4 | |
| n-Pentacosane | 1.63 | 1.7 | -4.12 | | 1.75 | 1.7 | 2.94 | | 1.62 | 1.7 | -4.7 | | 1.76 | 1.7 | 3.53 | | 1.64 | 1.7 | -3.53 | |
| n-Hexacosane | 1.45 | 1.5 | -3.33 | | 1.54 | 1.5 | 2.67 | | 1.46 | 1.5 | -2.67 | | 1.53 | 1.5 | 2 | | 1.48 | 1.5 | -1.33 | |
| n-Heptacosane | 1.08 | 1.2 | -10 | | 1.08 | 1.2 | -10 | | 1.08 | 1.2 | -10 | | 1.09 | 1.2 | -9.17 | | 1.14 | 1.2 | -5 | |
| n-Octacosane | 0.901 | 0.9 | 2.39 | | 0.934 | 0.9 | 6.14 | | 0.893 | 0.9 | 1.48 | | 0.938 | 0.9 | 6.59 | | 0.936 | 0.9 | 6.36 | |
| n-Nonacosane | 0.773 | 0.8 | -4.57 | | 0.716 | 0.8 | -11.6 | | 0.773 | 0.8 | -4.57 | | 0.746 | 0.8 | -7.9 | | 0.781 | 0.8 | -3.58 | |
| n-Triacontane | 0.662 | 0.7 | 1.85 | | 0.64 | 0.7 | -1.54 | | 0.685 | 0.7 | 5.38 | | 0.641 | 0.7 | -1.38 | | 0.675 | 0.7 | 3.85 | |
| n-Hentriacontane | 0.76 | 0.6 | 31 | | 0.581 | 0.6 | 0.172 | | 0.747 | 0.6 | 28.8 | | 0.602 | 0.6 | 3.79 | | 0.753 | 0.6 | 29.8 | |
| n-Dotriacontane | 0.429 | 0.4 | -2.5 | | 0.417 | 0.4 | -5.23 | | 0.415 | 0.4 | -5.68 | | 0.412 | 0.4 | -6.36 | | 0.418 | 0.4 | -5 | |
| n-Tritriacontane | 0.38 | 0.4 | -5 | | 0.394 | 0.4 | -1.5 | | 0.348 | 0.4 | -13 | | 0.371 | 0.4 | -7.25 | | 0.358 | 0.4 | -10.5 | |
| n-Tetraatriacontane | 0.318 | 0.4 | -8.14 | | 0.377 | 0.4 | 7.71 | | 0.35 | 0.4 | 0 | | 0.353 | 0.4 | 0.86 | | 0.384 | 0.4 | 9.71 | |
| n-Pentatriacontane | 0.398 | 0.4 | 13.7 | | 0.44 | 0.4 | 25.7 | | 0.392 | 0.4 | 12 | | 0.47 | 0.4 | 34.3 | | 0.415 | 0.4 | 18.6 | |
| n-Hexatriacontane | 0.285 | 0.2 | 23.9 | | 0.225 | 0.2 | -2.17 | | 0.27 | 0.2 | 17.4 | | 0.233 | 0.2 | 1.3 | | 0.285 | 0.2 | 23.9 | |
| n-Heptatriacontane | 0.229 | 0.2 | -0.435 | | 0.23 | 0.2 | 0 | | 0.229 | 0.2 | -0.435 | | 0.257 | 0.2 | 11.7 | | 0.244 | 0.2 | 6.09 | |
| n-Octatriacontane | 0.216 | 0.2 | -1.82 | | 0.218 | 0.2 | -0.909 | | 0.225 | 0.2 | 2.27 | | 0.235 | 0.2 | 6.82 | | 0.246 | 0.2 | 11.8 | |
| n-Tetracontane | 0.195 J | 0.2 | 2.63 | | 0.15 J | 0.2 | -21 | | 0.192 J | 0.2 | 1.05 | | 0.192 J | 0.2 | 1.05 | | 0.193 J | 0.2 | 1.58 | |
| TPH (RES) | 172 | 220 | -21.8 | | 182 | 220 | -17.3 | | 171 | 220 | -22.3 | | 185 | 220 | -15.9 | | 173 | 220 | -21.4 | |
| TPH | 632 | 660 | -4.24 | | 538 | 660 | -18.5 | | 621 | 660 | -5.91 | | 634 | 660 | -3.94 | | 633 | 660 | -4.09 | |
| %ortho-terphenyl | 95 | | | | 99 | | | | 96 | | | | 98 | | | | 97 | | | |
| %5A-androstane | 99 | | | | 97 | | | | 95 | | | | 96 | | | | 102 | | | |
| %d50-tetracosane | 101 | | | | 103 | | | | 101 | | | | 102 | | | | 101 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: ORS - Surrogate Corrected

| | | | | |
|---------------------|---------------|-----|-------|---|
| Field ID | Oil Reference | | | |
| Sample Type | Standard | | | |
| Matrix | ORS | | | |
| Sample Size | OIL | | | |
| Weight Basis | 5.02 mg | | | |
| Associated Blank | OIL | | | |
| Field Date | NA | | | |
| Extract Date | 05/16/02 | | | |
| Analysis Date | 05/16/02 | | | |
| Date Received | 12/10/02 | | | |
| Percent Solids | 05/16/02 | | | |
| Dilution Factor | NA | | | |
| Percent Lipids | 1 | | | |
| Min Reporting Limit | NA | | | |
| Units | 0.199 | T | %D | Q |
| | ug/mg | | | |
| SHC/TPH | | | | |
| n-Nonane | 5.19 | 4.8 | 8.12 | |
| n-Decane | 4.23 | 4.2 | 0.71 | |
| n-Undecane | 4.2 | 4.3 | -2.32 | |
| n-Dodecane | 4.1 | 4 | 2.5 | |
| n-Tridecane | 3.6 | 4 | -10 | |
| Isoprenoid RRT 1380 | 1.26 | 1 | 26 | |
| n-Tetradecane | 4.5 | 4.2 | 7.14 | |
| Isoprenoid RRT 1470 | 1.42 | 1.4 | 1.43 | |
| n-Pentadecane | 3.5 | 3.7 | -5.4 | |
| n-Hexadecane | 3.39 | 3.2 | 5.94 | |
| Isoprenoid RRT 1650 | 1.5 | 1.5 | 0 | |
| n-Heptadecane | 3 | 3.2 | -6.25 | |
| Pristane | 2.24 | 2.2 | 1.82 | |
| n-Octadecane | 2.47 | 2.9 | -14.8 | |
| Phytane | 1.41 | 1.6 | -11.9 | |
| n-Nonadecane | 2.28 | 2.6 | -12.3 | |
| n-Eicosane | 2.25 | 2.7 | -16.7 | |
| n-Heneicosane | 2.22 | 2.4 | -7.5 | |
| n-Docosane | 2.29 | 2.2 | 4.09 | |
| n-Tricosane | 2.07 | 2 | 3.5 | |
| n-Tetracosane | 1.94 | 2 | -3 | |
| n-Pentacosane | 1.79 | 1.7 | 5.29 | |
| n-Hexacosane | 1.52 | 1.5 | 1.33 | |
| n-Heptacosane | 1.12 | 1.2 | -6.67 | |
| n-Octacosane | 0.94 | 0.9 | 6.82 | |
| n-Nonacosane | 0.774 | 0.8 | -4.44 | |
| n-Triacontane | 0.675 | 0.7 | 3.85 | |
| n-Hentriacontane | 0.59 | 0.6 | 1.72 | |
| n-Dotriacontane | 0.426 | 0.4 | -3.18 | |
| n-Tritriacontane | 0.392 | 0.4 | -2 | |
| n-Tetatriacontane | 0.359 | 0.4 | 2.57 | |
| n-Pentatriacontane | 0.406 | 0.4 | 16 | |
| n-Hexatriacontane | 0.238 | 0.2 | 3.48 | |
| n-Heptatriacontane | 0.228 | 0.2 | -0.87 | |
| n-Octatriacontane | 0.217 | 0.2 | -1.36 | |
| n-Tetracontane | 0.178 J | 0.2 | -6.32 | |
| TPH (RES) | 204 | 220 | -7.27 | |
| TPH | 630 | 660 | -4.54 | |
| %ortho-terphenyl | 98 | | | |
| %5A-androstane | 98 | | | |
| %d50-tetracosane | 102 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4175

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | |
|---------------------|---------------------------|------|--------|---|---------------------------|------|--------|---|---------------------------|------|-------|---|
| Sample Type | ORS | | | | ORS | | | | ORS | | | |
| Matrix | OIL | | | | OIL | | | | OIL | | | |
| Sample Size | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | |
| Weight Basis | OIL | | | | WET | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | |
| Field Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Extract Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Analysis Date | 02/26/03 | | | | 03/03/03 | | | | 10/24/02 | | | |
| Date Received | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 0.199 | | | | 0.199 | | | | 0.199 | | | |
| Units | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | | | | | |
| n-Nonane | 5.62 | 4.8 | 17.1 | | 5.18 | 4.8 | 7.92 | | 5.23 | 4.8 | 8.96 | |
| n-Decane | 4.51 | 4.2 | 7.38 | | 4.37 | 4.2 | 4.05 | | 4.41 | 4.2 | 5 | |
| n-Undecane | 4.77 | 4.3 | 10.9 | | 4.66 | 4.3 | 8.37 | | 4.24 | 4.3 | -1.4 | |
| n-Dodecane | 4.27 | 4 | 6.75 | | 4.07 | 4 | 1.75 | | 4.13 | 4 | 3.25 | |
| n-Tridecane | 4.31 | 4 | 7.75 | | 3.9 | 4 | -2.5 | | 3.64 | 4 | -9 | |
| Isoprenoid RRT 1380 | 1.04 | 1 | 4 | | 1.1 | 1 | 10 | | 1.3 | 1 | 30 | |
| n-Tetradecane | 4.78 | 4.2 | 13.8 | | 4.78 | 4.2 | 13.8 | | 4.69 | 4.2 | 11.7 | |
| Isoprenoid RRT 1470 | 1.58 | 1.4 | 12.8 | | 1.47 | 1.4 | 5 | | 1.53 | 1.4 | 9.28 | |
| n-Pentadecane | 4.14 | 3.7 | 11.9 | | 4.09 | 3.7 | 10.5 | | 3.53 | 3.7 | -4.59 | |
| n-Hexadecane | 3.52 | 3.2 | 10 | | 3.24 | 3.2 | 1.25 | | 3.38 | 3.2 | 5.62 | |
| Isoprenoid RRT 1650 | 1.6 | 1.5 | 6.67 | | 1.39 | 1.5 | -7.33 | | 1.5 | 1.5 | 0 | |
| n-Heptadecane | 3.48 | 3.2 | 8.75 | | 3.5 | 3.2 | 9.37 | | 3 | 3.2 | -6.25 | |
| Pristane | 2.14 | 2.2 | -2.73 | | 2.26 | 2.2 | 2.73 | | 2.33 | 2.2 | 5.91 | |
| n-Octadecane | 2.8 | 2.9 | -3.45 | | 2.83 | 2.9 | -2.41 | | 2.43 | 2.9 | -16.2 | |
| Phytane | 1.51 | 1.6 | -5.62 | | 1.55 | 1.6 | -3.12 | | 1.41 | 1.6 | -11.9 | |
| n-Nonadecane | 2.46 | 2.6 | -5.38 | | 2.41 | 2.6 | -7.31 | | 2.28 | 2.6 | -12.3 | |
| n-Eicosane | 2.56 | 2.7 | -5.18 | | 2.54 | 2.7 | -5.92 | | 2.37 | 2.7 | -12.2 | |
| n-Heneicosane | 2.31 | 2.4 | -3.75 | | 2.24 | 2.4 | -6.67 | | 2.21 | 2.4 | -7.92 | |
| n-Docosane | 2.24 | 2.2 | 1.82 | | 2.19 | 2.2 | -0.454 | | 2.33 | 2.2 | 5.91 | |
| n-Tricosane | 2.15 | 2 | 7.5 | | 2.09 | 2 | 4.5 | | 2.05 | 2 | 2.5 | |
| n-Tetracosane | 1.96 | 2 | -2 | | 1.9 | 2 | -5 | | 1.88 | 2 | -6 | |
| n-Pentacosane | 1.69 | 1.7 | -0.588 | | 1.66 | 1.7 | -2.35 | | 1.73 | 1.7 | 1.76 | |
| n-Hexacosane | 1.51 | 1.5 | 0.667 | | 1.47 | 1.5 | -2 | | 1.53 | 1.5 | 2 | |
| n-Heptacosane | 1.25 | 1.2 | 4.17 | | 1.22 | 1.2 | 1.67 | | 1.1 | 1.2 | -8.33 | |
| n-Octacosane | 0.967 | 0.88 | 9.89 | | 0.918 | 0.88 | 4.32 | | 0.94 | 0.88 | 6.82 | |
| n-Nonacosane | 0.842 | 0.81 | 3.95 | | 0.834 | 0.81 | 2.96 | | 0.732 | 0.81 | -9.63 | |
| n-Triacontane | 0.663 | 0.65 | 2 | | 0.66 | 0.65 | 1.54 | | 0.641 | 0.65 | -1.38 | |
| n-Hentriacontane | 0.589 | 0.58 | 1.55 | | 0.569 | 0.58 | -1.9 | | 0.58 | 0.58 | 0 | |
| n-Dotriacontane | 0.448 | 0.44 | 1.82 | | 0.448 | 0.44 | 1.82 | | 0.408 | 0.44 | -7.27 | |
| n-Tritriacontane | 0.368 | 0.4 | -8 | | 0.36 | 0.4 | -10 | | 0.383 | 0.4 | -4.25 | |
| n-Tetratriacontane | 0.369 | 0.35 | 5.43 | | 0.374 | 0.35 | 6.86 | | 0.342 | 0.35 | -2.28 | |
| n-Pentatriacontane | 0.35 | 0.35 | 0 | | 0.327 | 0.35 | -6.57 | | 0.441 | 0.35 | 26 | |
| n-Hexatriacontane | 0.198 J | 0.23 | -13.9 | | 0.216 | 0.23 | -6.09 | | 0.233 | 0.23 | 1.3 | |
| n-Heptatriacontane | 0.23 | 0.23 | 0 | | 0.257 | 0.23 | 11.7 | | 0.234 | 0.23 | 1.74 | |
| n-Octatriacontane | 0.225 | 0.22 | 2.27 | | 0.215 | 0.22 | -2.27 | | 0.23 | 0.22 | 4.54 | |
| n-Tetracontane | 0.18 J | 0.19 | -5.26 | | 0.187 J | 0.19 | -1.58 | | 0.177 J | 0.19 | -6.84 | |
| TPH (RES) | 198 | 220 | -10 | | 195 | 220 | -11.4 | | 184 | 220 | -16.4 | |
| TPH | 661 | 660 | 0.152 | | 634 | 660 | -3.94 | | 632 | 660 | -4.24 | |
| %ortho-terphenyl | 104 | | | | 105 | | | | 97 | | | |
| %5A-androstane | 104 | | | | 105 | | | | 96 | | | |
| %d50-tetracosane | 102 | | | | 104 | | | | 101 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4175

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | |
|---------------------|---------------------------|------|-------|---|---------------------------|------|--------|---|---------------------------|------|--------|---|
| Sample Type | ORS | | | | ORS | | | | ORS | | | |
| Matrix | OIL | | | | OIL | | | | OIL | | | |
| Sample Size | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | |
| Weight Basis | OIL | | | | OIL | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | |
| Field Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Extract Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Analysis Date | 10/24/02 | | | | 11/04/02 | | | | 11/04/02 | | | |
| Date Received | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 0.199 | | | | 0.199 | | | | 0.199 | | | |
| Units | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | | | | | |
| n-Nonane | 5.18 | 4.8 | 7.92 | | 5.14 | 4.8 | 7.08 | | 5.24 | 4.8 | 9.17 | |
| n-Decane | 4.26 | 4.2 | 1.43 | | 4.32 | 4.2 | 2.86 | | 4.31 | 4.2 | 2.62 | |
| n-Undecane | 4.3 | 4.3 | 0 | | 4.18 | 4.3 | -2.79 | | 4.31 | 4.3 | 0.232 | |
| n-Dodecane | 4.14 | 4 | 3.5 | | 4.14 | 4 | 3.5 | | 4.23 | 4 | 5.75 | |
| n-Tridecane | 3.79 | 4 | -5.25 | | 3.66 | 4 | -8.5 | | 3.89 | 4 | -2.75 | |
| Isoprenoid RRT 1380 | 1.3 | 1 | 30 | | 1.26 | 1 | 26 | | 1.27 | 1 | 27 | |
| n-Tetradecane | 4.6 | 4.2 | 9.52 | | 4.35 | 4.2 | 3.57 | | 4.58 | 4.2 | 9.05 | |
| Isoprenoid RRT 1470 | 1.52 | 1.4 | 8.57 | | 1.46 | 1.4 | 4.28 | | 1.47 | 1.4 | 5 | |
| n-Pentadecane | 3.54 | 3.7 | -4.32 | | 3.61 | 3.7 | -2.43 | | 3.48 | 3.7 | -5.94 | |
| n-Hexadecane | 3.39 | 3.2 | 5.94 | | 3.35 | 3.2 | 4.69 | | 3.42 | 3.2 | 6.87 | |
| Isoprenoid RRT 1650 | 1.68 | 1.5 | 12 | | 1.47 | 1.5 | -2 | | 1.66 | 1.5 | 10.7 | |
| n-Heptadecane | 2.86 | 3.2 | -10.6 | | 2.76 | 3.2 | -13.8 | | 2.92 | 3.2 | -8.75 | |
| Pristane | 2.05 | 2.2 | -6.82 | | 2.03 | 2.2 | -7.73 | | 2.09 | 2.2 | -5 | |
| n-Octadecane | 2.76 | 2.9 | -4.83 | | 2.47 | 2.9 | -14.8 | | 2.61 | 2.9 | -10 | |
| Phytane | 1.36 | 1.6 | -15 | | 1.43 | 1.6 | -10.6 | | 1.37 | 1.6 | -14.4 | |
| n-Nonadecane | 2.43 | 2.6 | -6.54 | | 2.37 | 2.6 | -8.85 | | 2.4 | 2.6 | -7.69 | |
| n-Eicosane | 2.59 | 2.7 | -4.07 | | 2.42 | 2.7 | -10.4 | | 2.35 | 2.7 | -13 | |
| n-Heneicosane | 2.22 | 2.4 | -7.5 | | 2.36 | 2.4 | -1.67 | | 2.2 | 2.4 | -8.33 | |
| n-Docosane | 2.2 | 2.2 | 0 | | 2.33 | 2.2 | 5.91 | | 2.22 | 2.2 | 0.909 | |
| n-Tricosane | 2.05 | 2 | 2.5 | | 2.07 | 2 | 3.5 | | 2.02 | 2 | 1 | |
| n-Tetracosane | 1.89 | 2 | -5.5 | | 1.92 | 2 | -4 | | 1.84 | 2 | -8 | |
| n-Pentacosane | 1.62 | 1.7 | -4.7 | | 1.74 | 1.7 | 2.35 | | 1.63 | 1.7 | -4.12 | |
| n-Hexacosane | 1.46 | 1.5 | -2.67 | | 1.55 | 1.5 | 3.33 | | 1.45 | 1.5 | -3.33 | |
| n-Heptacosane | 1.09 | 1.2 | -9.17 | | 1.08 | 1.2 | -10 | | 1.08 | 1.2 | -10 | |
| n-Octacosane | 0.922 | 0.88 | 4.77 | | 0.924 | 0.88 | 5 | | 0.901 | 0.88 | 2.39 | |
| n-Nonacosane | 0.758 | 0.81 | -6.42 | | 0.728 | 0.81 | -10.1 | | 0.773 | 0.81 | -4.57 | |
| n-Triacontane | 0.671 | 0.65 | 3.23 | | 0.672 | 0.65 | 3.38 | | 0.662 | 0.65 | 1.85 | |
| n-Hentriacontane | 0.748 | 0.58 | 29 | | 0.591 | 0.58 | 1.9 | | 0.76 | 0.58 | 31 | |
| n-Dotriacontane | 0.427 | 0.44 | -2.95 | | 0.422 | 0.44 | -4.09 | | 0.429 | 0.44 | -2.5 | |
| n-Tritriacontane | 0.375 | 0.4 | -6.25 | | 0.35 | 0.4 | -12.5 | | 0.38 | 0.4 | -5 | |
| n-Tetraatriacontane | 0.365 | 0.35 | 4.28 | | 0.34 | 0.35 | -2.86 | | 0.318 | 0.35 | -9.14 | |
| n-Pentatriacontane | 0.377 | 0.35 | 7.71 | | 0.418 | 0.35 | 19.4 | | 0.398 | 0.35 | 13.7 | |
| n-Hexatriacontane | 0.28 | 0.23 | 21.7 | | 0.235 | 0.23 | 2.17 | | 0.285 | 0.23 | 23.9 | |
| n-Heptatriacontane | 0.24 | 0.23 | 4.35 | | 0.23 | 0.23 | 0 | | 0.229 | 0.23 | -0.435 | |
| n-Octatriacontane | 0.226 | 0.22 | 2.73 | | 0.219 | 0.22 | -0.454 | | 0.216 | 0.22 | -1.82 | |
| n-Tetracontane | 0.18 J | 0.19 | -5.26 | | 0.161 J | 0.19 | -15.3 | | 0.195 J | 0.19 | 2.63 | |
| TPH (RES) | 171 | 220 | -22.3 | | 183 | 220 | -16.8 | | 172 | 220 | -21.8 | |
| TPH | 628 | 660 | -4.85 | | 621 | 660 | -5.91 | | 632 | 660 | -4.24 | |
| %ortho-terphenyl | 97 | | | | 100 | | | | 95 | | | |
| %5A-androstane | 98 | | | | 98 | | | | 99 | | | |
| %d50-tetracosane | 102 | | | | 103 | | | | 101 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4175

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | |
|---------------------|---------------------------|------|--------|---|---------------------------|------|--------|---|---------------------------|------|-------|---|
| Sample Type | ORS | | | | ORS | | | | ORS | | | |
| Matrix | OIL | | | | OIL | | | | OIL | | | |
| Sample Size | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | |
| Weight Basis | OIL | | | | OIL | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | |
| Field Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Extract Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Analysis Date | 11/06/02 | | | | 11/06/02 | | | | 11/25/02 | | | |
| Date Received | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 0.199 | | | | 0.199 | | | | 0.199 | | | |
| Units | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | | | | | |
| n-Nonane | 5.08 | 4.8 | 5.83 | | 5.12 | 4.8 | 6.67 | | 5.11 | 4.8 | 6.46 | |
| n-Decane | 4.34 | 4.2 | 3.33 | | 4.38 | 4.2 | 4.28 | | 4.27 | 4.2 | 1.67 | |
| n-Undecane | 4.15 | 4.3 | -3.49 | | 4.23 | 4.3 | -1.63 | | 4.19 | 4.3 | -2.56 | |
| n-Dodecane | 4.14 | 4 | 3.5 | | 4.16 | 4 | 4 | | 4.16 | 4 | 4 | |
| n-Tridecane | 3.64 | 4 | -9 | | 3.8 | 4 | -5 | | 3.8 | 4 | -5 | |
| Isoprenoid RRT 1380 | 1.25 | 1 | 25 | | 1.26 | 1 | 26 | | 1.19 | 1 | 19 | |
| n-Tetradecane | 4.62 | 4.2 | 10 | | 4.51 | 4.2 | 7.38 | | 4.36 | 4.2 | 3.81 | |
| Isoprenoid RRT 1470 | 1.35 | 1.4 | -3.57 | | 1.45 | 1.4 | 3.57 | | 1.5 | 1.4 | 7.14 | |
| n-Pentadecane | 3.6 | 3.7 | -2.7 | | 3.52 | 3.7 | -4.86 | | 3.62 | 3.7 | -2.16 | |
| n-Hexadecane | 3.34 | 3.2 | 4.37 | | 3.46 | 3.2 | 8.12 | | 3.35 | 3.2 | 4.69 | |
| Isoprenoid RRT 1650 | 1.48 | 1.5 | -1.33 | | 1.65 | 1.5 | 10 | | 1.53 | 1.5 | 2 | |
| n-Heptadecane | 2.79 | 3.2 | -12.8 | | 2.85 | 3.2 | -10.9 | | 2.72 | 3.2 | -15 | |
| Pristane | 2.29 | 2.2 | 4.09 | | 1.98 | 2.2 | -10 | | 1.99 | 2.2 | -9.54 | |
| n-Octadecane | 2.43 | 2.9 | -16.2 | | 2.56 | 2.9 | -11.7 | | 2.41 | 2.9 | -16.9 | |
| Phytane | 1.43 | 1.6 | -10.6 | | 1.33 | 1.6 | -16.9 | | 1.45 | 1.6 | -9.38 | |
| n-Nonadecane | 2.31 | 2.6 | -11.2 | | 2.39 | 2.6 | -8.08 | | 2.24 | 2.6 | -13.8 | |
| n-Eicosane | 2.39 | 2.7 | -11.5 | | 2.51 | 2.7 | -7.04 | | 2.34 | 2.7 | -13.3 | |
| n-Heneicosane | 2.24 | 2.4 | -6.67 | | 2.22 | 2.4 | -7.5 | | 2.26 | 2.4 | -5.83 | |
| n-Docosane | 2.31 | 2.2 | 5 | | 2.2 | 2.2 | 0 | | 2.31 | 2.2 | 5 | |
| n-Tricosane | 2.1 | 2 | 5 | | 2.02 | 2 | 1 | | 2.04 | 2 | 2 | |
| n-Tetracosane | 1.89 | 2 | -5.5 | | 1.88 | 2 | -6 | | 1.89 | 2 | -5.5 | |
| n-Pentacosane | 1.75 | 1.7 | 2.94 | | 1.62 | 1.7 | -4.7 | | 1.76 | 1.7 | 3.53 | |
| n-Hexacosane | 1.54 | 1.5 | 2.67 | | 1.46 | 1.5 | -2.67 | | 1.53 | 1.5 | 2 | |
| n-Heptacosane | 1.08 | 1.2 | -10 | | 1.08 | 1.2 | -10 | | 1.09 | 1.2 | -9.17 | |
| n-Octacosane | 0.934 | 0.88 | 6.14 | | 0.893 | 0.88 | 1.48 | | 0.938 | 0.88 | 6.59 | |
| n-Nonacosane | 0.716 | 0.81 | -11.6 | | 0.773 | 0.81 | -4.57 | | 0.746 | 0.81 | -7.9 | |
| n-Triacontane | 0.64 | 0.65 | -1.54 | | 0.685 | 0.65 | 5.38 | | 0.641 | 0.65 | -1.38 | |
| n-Hentriacontane | 0.581 | 0.58 | 0.172 | | 0.747 | 0.58 | 28.8 | | 0.602 | 0.58 | 3.79 | |
| n-Dotriacontane | 0.417 | 0.44 | -5.23 | | 0.415 | 0.44 | -5.68 | | 0.412 | 0.44 | -6.36 | |
| n-Tritriacontane | 0.394 | 0.4 | -1.5 | | 0.348 | 0.4 | -13 | | 0.371 | 0.4 | -7.25 | |
| n-Tetratriacontane | 0.377 | 0.35 | 7.71 | | 0.35 | 0.35 | 0 | | 0.353 | 0.35 | 0.857 | |
| n-Pentatriacontane | 0.44 | 0.35 | 25.7 | | 0.392 | 0.35 | 12 | | 0.47 | 0.35 | 34.3 | |
| n-Hexatriacontane | 0.225 | 0.23 | -2.17 | | 0.27 | 0.23 | 17.4 | | 0.233 | 0.23 | 1.3 | |
| n-Heptatriacontane | 0.23 | 0.23 | 0 | | 0.229 | 0.23 | -0.435 | | 0.257 | 0.23 | 11.7 | |
| n-Octatriacontane | 0.218 | 0.22 | -0.909 | | 0.225 | 0.22 | 2.27 | | 0.235 | 0.22 | 6.82 | |
| n-Tetracontane | 0.15 J | 0.19 | -21 | | 0.192 J | 0.19 | 1.05 | | 0.192 J | 0.19 | 1.05 | |
| TPH (RES) | 182 | 220 | -17.3 | | 171 | 220 | -22.3 | | 185 | 220 | -15.9 | |
| TPH | 538 | 660 | -18.5 | | 621 | 660 | -5.91 | | 634 | 660 | -3.94 | |
| %ortho-terphenyl | 99 | | | | 96 | | | | 98 | | | |
| %5A-androstane | 97 | | | | 95 | | | | 96 | | | |
| %d50-tetracosane | 103 | | | | 101 | | | | 102 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4175

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference | | | | Oil Reference | | | |
|---------------------|---------------|------|-------|---|---------------|------|-------|---|
| Sample Type | Standard | | | | Standard | | | |
| Matrix | ORS | | | | ORS | | | |
| Sample Size | OIL | | | | OIL | | | |
| Weight Basis | 5.02 mg | | | | 5.02 mg | | | |
| Associated Blank | OIL | | | | OIL | | | |
| Field Date | NA | | | | NA | | | |
| Extract Date | 05/16/02 | | | | 05/16/02 | | | |
| Analysis Date | 05/16/02 | | | | 05/16/02 | | | |
| Date Received | 11/25/02 | | | | 12/10/02 | | | |
| Percent Solids | 05/16/02 | | | | 05/16/02 | | | |
| Dilution Factor | NA | | | | NA | | | |
| Percent Lipids | 1 | | | | 1 | | | |
| Min Reporting Limit | NA | | | | NA | | | |
| Units | 0.199 | | | | 0.199 | | | |
| | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | |
| n-Nonane | 5.29 | 4.8 | 10.2 | | 5.19 | 4.8 | 8.12 | |
| n-Decane | 4.35 | 4.2 | 3.57 | | 4.23 | 4.2 | 0.714 | |
| n-Undecane | 4.32 | 4.3 | 0.465 | | 4.2 | 4.3 | -2.32 | |
| n-Dodecane | 4.24 | 4 | 6 | | 4.1 | 4 | 2.5 | |
| n-Tridecane | 3.8 | 4 | -5 | | 3.6 | 4 | -10 | |
| Isoprenoid RRT 1380 | 1.34 | 1 | 34 | | 1.26 | 1 | 26 | |
| n-Tetradecane | 4.58 | 4.2 | 9.05 | | 4.5 | 4.2 | 7.14 | |
| Isoprenoid RRT 1470 | 1.49 | 1.4 | 6.43 | | 1.42 | 1.4 | 1.43 | |
| n-Pentadecane | 3.53 | 3.7 | -4.59 | | 3.5 | 3.7 | -5.4 | |
| n-Hexadecane | 3.5 | 3.2 | 9.37 | | 3.39 | 3.2 | 5.94 | |
| Isoprenoid RRT 1650 | 1.71 | 1.5 | 14 | | 1.5 | 1.5 | 0 | |
| n-Heptadecane | 2.76 | 3.2 | -13.8 | | 3 | 3.2 | -6.25 | |
| Pristane | 2.01 | 2.2 | -8.64 | | 2.24 | 2.2 | 1.82 | |
| n-Octadecane | 2.36 | 2.9 | -18.6 | | 2.47 | 2.9 | -14.8 | |
| Phytane | 1.22 | 1.6 | -23.8 | | 1.41 | 1.6 | -11.9 | |
| n-Nonadecane | 2.44 | 2.6 | -6.15 | | 2.28 | 2.6 | -12.3 | |
| n-Eicosane | 2.39 | 2.7 | -11.5 | | 2.25 | 2.7 | -16.7 | |
| n-Heneicosane | 2.23 | 2.4 | -7.08 | | 2.22 | 2.4 | -7.5 | |
| n-Docosane | 2.28 | 2.2 | 3.64 | | 2.29 | 2.2 | 4.09 | |
| n-Tricosane | 2.09 | 2 | 4.5 | | 2.07 | 2 | 3.5 | |
| n-Tetracosane | 1.92 | 2 | -4 | | 1.94 | 2 | -3 | |
| n-Pentacosane | 1.64 | 1.7 | -3.53 | | 1.79 | 1.7 | 5.29 | |
| n-Hexacosane | 1.48 | 1.5 | -1.33 | | 1.52 | 1.5 | 1.33 | |
| n-Heptacosane | 1.14 | 1.2 | -5 | | 1.12 | 1.2 | -6.67 | |
| n-Octacosane | 0.936 | 0.88 | 6.36 | | 0.94 | 0.88 | 6.82 | |
| n-Nonacosane | 0.781 | 0.81 | -3.58 | | 0.774 | 0.81 | -4.44 | |
| n-Triacontane | 0.675 | 0.65 | 3.85 | | 0.675 | 0.65 | 3.85 | |
| n-Hentriacontane | 0.753 | 0.58 | 29.8 | | 0.59 | 0.58 | 1.72 | |
| n-Dotriacontane | 0.418 | 0.44 | -5 | | 0.426 | 0.44 | -3.18 | |
| n-Tritriacontane | 0.358 | 0.4 | -10.5 | | 0.392 | 0.4 | -2 | |
| n-Tetratriacontane | 0.384 | 0.35 | 9.71 | | 0.359 | 0.35 | 2.57 | |
| n-Pentatriacontane | 0.415 | 0.35 | 18.6 | | 0.406 | 0.35 | 16 | |
| n-Hexatriacontane | 0.285 | 0.23 | 23.9 | | 0.238 | 0.23 | 3.48 | |
| n-Heptatriacontane | 0.244 | 0.23 | 6.09 | | 0.228 | 0.23 | -0.87 | |
| n-Octatriacontane | 0.246 | 0.22 | 11.8 | | 0.217 | 0.22 | -1.36 | |
| n-Tetracontane | 0.193 J | 0.19 | 1.58 | | 0.178 J | 0.19 | -6.32 | |
| TPH (RES) | 173 | 220 | -21.4 | | 204 | 220 | -7.27 | |
| TPH | 633 | 660 | -4.09 | | 630 | 660 | -4.54 | |
| %ortho-terphenyl | 97 | | | | 98 | | | |
| %5A-androstane | 102 | | | | 98 | | | |
| %d50-tetracosane | 101 | | | | 102 | | | |

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| Field ID | Oil Reference | | | | Oil Reference | | | |
|---------------------|---------------|------|-------|---|---------------|------|-------|---|
| Lab ID | Standard | | | | Standard | | | |
| Sample Type | BU82ORS-1 | | | | BU82ORS-2 | | | |
| Matrix | ORS | | | | ORS | | | |
| Sample Size | OIL | | | | OIL | | | |
| Weight Basis | 5.04 mg | | | | 5.04 mg | | | |
| Associated Blank | OIL | | | | OIL | | | |
| Field Date | NA | | | | NA | | | |
| Extract Date | 05/19/00 | | | | 05/19/00 | | | |
| Analysis Date | 05/19/00 | | | | 05/19/00 | | | |
| Date Received | 03/16/01 | | | | 03/16/01 | | | |
| Percent Solids | 05/19/00 | | | | 05/19/00 | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | NA | | | | NA | | | |
| Units | 0.198 | | | | 0.198 | | | |
| | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | |
| n-Nonane | 5.07 | 4.8 | 5.62 | | 4.73 | 4.8 | -1.46 | |
| n-Decane | 4.18 | 4.2 | -0.48 | | 4.05 | 4.2 | -3.57 | |
| n-Undecane | 4.01 | 4.3 | -6.74 | | 3.76 | 4.3 | -12.6 | |
| n-Dodecane | 3.83 | 4 | -4.25 | | 3.59 | 4 | -10.2 | |
| n-Tridecane | 3.64 | 4 | -9 | | 3.46 | 4 | -13.5 | |
| Isoprenoid RRT 1380 | 1.26 | 1 | 26 | | 1.02 | 1 | 2 | |
| n-Tetradecane | 4.28 | 4.2 | 1.9 | | 4.28 | 4.2 | 1.9 | |
| Isoprenoid RRT 1470 | 1.34 | 1.4 | -4.28 | | 1.25 | 1.4 | -10.7 | |
| n-Pentadecane | 3.44 | 3.7 | -7.03 | | 3.28 | 3.7 | -11.4 | |
| n-Hexadecane | 3.24 | 3.2 | 1.25 | | 2.93 | 3.2 | -8.44 | |
| Isoprenoid RRT 1650 | 1.8 | 1.5 | 20 | | 1.74 | 1.5 | 16 | |
| n-Heptadecane | 2.96 | 3.2 | -7.5 | | 2.81 | 3.2 | -12.2 | |
| Pristane | 1.99 | 2.2 | -9.54 | | 1.94 | 2.2 | -11.8 | |
| n-Octadecane | 2.68 | 2.9 | -7.59 | | 2.62 | 2.9 | -9.66 | |
| Phytane | 1.18 | 1.6 | -26.2 | | 1.25 | 1.6 | -21.9 | |
| n-Nonadecane | 2.51 | 2.6 | -3.46 | | 2.63 | 2.6 | 1.15 | |
| n-Eicosane | 2.77 | 2.7 | 2.59 | | 2.49 | 2.7 | -7.78 | |
| n-Heneicosane | 2.36 | 2.4 | -1.67 | | 2.37 | 2.4 | -1.25 | |
| n-Docosane | 2.16 | 2.2 | -1.82 | | 2.12 | 2.2 | -3.64 | |
| n-Tricosane | 2.04 | 2 | 2 | | 1.94 | 2 | -3 | |
| n-Tetracosane | 1.82 | 2 | -9 | | 1.7 | 2 | -15 | |
| n-Pentacosane | 1.66 | 1.7 | -2.35 | | 1.63 | 1.7 | -4.12 | |
| n-Hexacosane | 1.4 | 1.5 | -6.67 | | 1.42 | 1.5 | -5.33 | |
| n-Heptacosane | 1.11 | 1.2 | -7.5 | | 1.14 | 1.2 | -5 | |
| n-Octacosane | 0.864 | 0.88 | -1.82 | | 0.821 | 0.88 | -6.7 | |
| n-Nonacosane | 0.764 | 0.81 | -5.68 | | 0.789 | 0.81 | -2.59 | |
| n-Triacontane | 0.639 | 0.65 | -1.69 | | 0.636 | 0.65 | -2.15 | |
| n-Hentriacontane | 0.745 | 0.58 | 28.4 | | 0.682 | 0.58 | 17.6 | |
| n-Dotriacontane | 0.504 | 0.44 | 14.5 | | 0.506 | 0.44 | 15 | |
| n-Tritriacontane | 0.346 | 0.4 | -13.5 | | 0.376 | 0.4 | -6 | |
| n-Tettratriacontane | 0.362 | 0.35 | 3.43 | | 0.33 | 0.35 | -5.71 | |
| n-Pentatriacontane | 0.403 | 0.35 | 15.1 | | 0.385 | 0.35 | 10 | |
| n-Hexatriacontane | 0.274 | 0.23 | 19.1 | | 0.27 | 0.23 | 17.4 | |
| n-Heptatriacontane | 0.221 | 0.23 | -3.91 | | 0.207 | 0.23 | -10 | |
| n-Octatriacontane | 0.211 | 0.22 | -4.09 | | 0.233 | 0.22 | 5.91 | |
| n-Nonatriacontane | 0.133 J | 0.18 | -26.1 | | 0.151 J | 0.18 | -16.1 | |
| n-Tetracontane | 0.177 J | 0.19 | -6.84 | | 0.183 J | 0.19 | -3.68 | |
| TPH (RES) | 184 | 220 | -16.4 | | 173 | 220 | -21.4 | |
| TPH | 607 | 660 | -8.03 | | 602 | 660 | -8.79 | |
| %ortho-terphenyl | 97 | | | | 103 | | | |
| %5A-androstane | 100 | | | | 104 | | | |
| %d50-tetracosane | 100 | | | | 102 | | | |

Arthur D. Little
Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| Field ID | Oil Reference | | | | Oil Reference | | | |
|---------------------|---------------|------|-------|---|---------------|------|-------|---|
| Lab ID | Standard | | | | Standard | | | |
| Sample Type | BU82ORS-1 | | | | BU82ORS-2 | | | |
| Matrix | ORS | | | | ORS | | | |
| Sample Size | OIL | | | | OIL | | | |
| Weight Basis | 5.04 mg | | | | 5.04 mg | | | |
| Associated Blank | OIL | | | | OIL | | | |
| Field Date | NA | | | | NA | | | |
| Extract Date | 05/19/00 | | | | 05/19/00 | | | |
| Analysis Date | 05/19/00 | | | | 05/19/00 | | | |
| Date Received | 03/13/01 | | | | 03/13/01 | | | |
| Percent Solids | 05/19/00 | | | | 05/19/00 | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | NA | | | | NA | | | |
| Units | 0.198 | | | | 0.198 | | | |
| | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | |
| n-Nonane | 5.09 | 4.8 | 6.04 | | 4.76 | 4.8 | -0.83 | |
| n-Decane | 3.92 | 4.2 | -6.67 | | 3.92 | 4.2 | -6.67 | |
| n-Undecane | 4.13 | 4.3 | -3.95 | | 3.82 | 4.3 | -11.2 | |
| n-Dodecane | 3.83 | 4 | -4.25 | | 3.59 | 4 | -10.2 | |
| n-Tridecane | 3.67 | 4 | -8.25 | | 3.39 | 4 | -15.2 | |
| Isoprenoid RRT 1380 | 1.25 | 1 | 25 | | 1.23 | 1 | 23 | |
| n-Tetradecane | 4.3 | 4.2 | 2.38 | | 4.23 | 4.2 | 0.714 | |
| Isoprenoid RRT 1470 | 1.43 | 1.4 | 2.14 | | 1.32 | 1.4 | -5.71 | |
| n-Pentadecane | 3.45 | 3.7 | -6.76 | | 3.41 | 3.7 | -7.84 | |
| n-Hexadecane | 3.26 | 3.2 | 1.87 | | 2.95 | 3.2 | -7.81 | |
| Isoprenoid RRT 1650 | 1.71 | 1.5 | 14 | | 1.68 | 1.5 | 12 | |
| n-Heptadecane | 2.95 | 3.2 | -7.81 | | 2.86 | 3.2 | -10.6 | |
| Pristane | 1.93 | 2.2 | -12.3 | | 1.99 | 2.2 | -9.54 | |
| n-Octadecane | 2.76 | 2.9 | -4.83 | | 2.55 | 2.9 | -12.1 | |
| Phytane | 1.29 | 1.6 | -19.4 | | 1.26 | 1.6 | -21.2 | |
| n-Nonadecane | 2.48 | 2.6 | -4.62 | | 2.54 | 2.6 | -2.31 | |
| n-Eicosane | 2.64 | 2.7 | -2.22 | | 2.5 | 2.7 | -7.41 | |
| n-Heneicosane | 2.29 | 2.4 | -4.58 | | 2.38 | 2.4 | -0.83 | |
| n-Docosane | 2.11 | 2.2 | -4.09 | | 2.12 | 2.2 | -3.64 | |
| n-Tricosane | 1.98 | 2 | -1 | | 1.99 | 2 | -0.5 | |
| n-Tetracosane | 1.8 | 2 | -10 | | 1.73 | 2 | -13.5 | |
| n-Pentacosane | 1.61 | 1.7 | -5.29 | | 1.59 | 1.7 | -6.47 | |
| n-Hexacosane | 1.42 | 1.5 | -5.33 | | 1.39 | 1.5 | -7.33 | |
| n-Heptacosane | 1.1 | 1.2 | -8.33 | | 1.04 | 1.2 | -13.3 | |
| n-Octacosane | 0.85 | 0.88 | -3.41 | | 0.842 | 0.88 | -4.32 | |
| n-Nonacosane | 0.769 | 0.81 | -5.06 | | 0.729 | 0.81 | -10 | |
| n-Triacontane | 0.673 | 0.65 | 3.54 | | 0.608 | 0.65 | -6.46 | |
| n-Hentriacontane | 0.722 | 0.58 | 24.5 | | 0.691 | 0.58 | 19.1 | |
| n-Dotriacontane | 0.418 | 0.44 | -5 | | 0.482 | 0.44 | 9.54 | |
| n-Tritriacontane | 0.358 | 0.4 | -10.5 | | 0.37 | 0.4 | -7.5 | |
| n-Tetratriacontane | 0.349 | 0.35 | -0.29 | | 0.307 | 0.35 | -12.3 | |
| n-Pentatriacontane | 0.378 | 0.35 | 8 | | 0.372 | 0.35 | 6.28 | |
| n-Hexatriacontane | 0.269 | 0.23 | 17 | | 0.242 | 0.23 | 5.22 | |
| n-Heptatriacontane | 0.208 | 0.23 | -9.56 | | 0.216 | 0.23 | -6.09 | |
| n-Octatriacontane | 0.22 | 0.22 | 0 | | 0.223 | 0.22 | 1.36 | |
| n-Nonatriacontane | 0.146 J | 0.18 | -18.9 | | 0.136 J | 0.18 | -24.4 | |
| n-Tetracontane | 0.171 J | 0.19 | -10 | | 0.172 J | 0.19 | -9.47 | |
| TPH (RES) | 184 | 220 | -16.4 | | 171 | 220 | -22.3 | |
| TPH | 628 | 660 | -4.85 | | 611 | 660 | -7.42 | |
| %ortho-terphenyl | 96 | | | | 100 | | | |
| %5A-androstane | 98 | | | | 102 | | | |
| %d50-tetracosane | 100 | | | | 100 | | | |

Arthur D. Little
Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| Field ID | Oil Reference | | | | Oil Reference | | | |
|---------------------|---------------|------|-------|---|---------------|------|-------|---|
| Lab ID | Standard | | | | Standard | | | |
| Sample Type | BU82-1ORS | | | | BU82-2ORS | | | |
| Matrix | ORS | | | | ORS | | | |
| Sample Size | OIL | | | | OIL | | | |
| Weight Basis | 5.04 mg | | | | 5.04 mg | | | |
| Associated Blank | OIL | | | | OIL | | | |
| Field Date | NA | | | | NA | | | |
| Extract Date | 05/19/00 | | | | 05/19/00 | | | |
| Analysis Date | 05/19/00 | | | | 05/19/00 | | | |
| Date Received | 03/02/01 | | | | 03/07/01 | | | |
| Percent Solids | 05/19/00 | | | | 05/19/00 | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | NA | | | | NA | | | |
| Units | 0.198 | | | | 0.198 | | | |
| | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | |
| n-Nonane | 4.74 | 4.8 | -1.25 | | 5.11 | 4.8 | 6.46 | |
| n-Decane | 3.92 | 4.2 | -6.67 | | 4.08 | 4.2 | -2.86 | |
| n-Undecane | 3.84 | 4.3 | -10.7 | | 4.13 | 4.3 | -3.95 | |
| n-Dodecane | 3.55 | 4 | -11.2 | | 3.92 | 4 | -2 | |
| n-Tridecane | 3.41 | 4 | -14.7 | | 3.64 | 4 | -9 | |
| Isoprenoid RRT 1380 | 1.21 | 1 | 21 | | 1.21 | 1 | 21 | |
| n-Tetradecane | 4.17 | 4.2 | -0.71 | | 4.27 | 4.2 | 1.67 | |
| Isoprenoid RRT 1470 | 1.27 | 1.4 | -9.28 | | 1.42 | 1.4 | 1.43 | |
| n-Pentadecane | 3.35 | 3.7 | -9.46 | | 3.38 | 3.7 | -8.65 | |
| n-Hexadecane | 3.11 | 3.2 | -2.81 | | 3.23 | 3.2 | 0.937 | |
| Isoprenoid RRT 1650 | 1.71 | 1.5 | 14 | | 1.79 | 1.5 | 19.3 | |
| n-Heptadecane | 2.89 | 3.2 | -9.69 | | 2.98 | 3.2 | -6.88 | |
| Pristane | 1.97 | 2.2 | -10.4 | | 2.01 | 2.2 | -8.64 | |
| n-Octadecane | 2.49 | 2.9 | -14.1 | | 2.61 | 2.9 | -10 | |
| Phytane | 1.28 | 1.6 | -20 | | 1.28 | 1.6 | -20 | |
| n-Nonadecane | 2.46 | 2.6 | -5.38 | | 2.47 | 2.6 | -5 | |
| n-Eicosane | 2.6 | 2.7 | -3.7 | | 2.46 | 2.7 | -8.89 | |
| n-Heneicosane | 2.36 | 2.4 | -1.67 | | 2.33 | 2.4 | -2.92 | |
| n-Docosane | 2.12 | 2.2 | -3.64 | | 2.1 | 2.2 | -4.54 | |
| n-Tricosane | 1.97 | 2 | -1.5 | | 1.97 | 2 | -1.5 | |
| n-Tetracosane | 1.69 | 2 | -15.5 | | 1.8 | 2 | -10 | |
| n-Pentacosane | 1.62 | 1.7 | -4.7 | | 1.68 | 1.7 | -1.18 | |
| n-Hexacosane | 1.4 | 1.5 | -6.67 | | 1.39 | 1.5 | -7.33 | |
| n-Heptacosane | 1.06 | 1.2 | -11.7 | | 1.11 | 1.2 | -7.5 | |
| n-Octacosane | 0.856 | 0.88 | -2.73 | | 0.854 | 0.88 | -2.95 | |
| n-Nonacosane | 0.745 | 0.81 | -8.02 | | 0.801 | 0.81 | -1.11 | |
| n-Triacontane | 0.594 | 0.65 | -8.62 | | 0.651 | 0.65 | 0.154 | |
| n-Hentriacontane | 0.708 | 0.58 | 22.1 | | 0.727 | 0.58 | 25.3 | |
| n-Dotriacontane | 0.442 | 0.44 | 0.454 | | 0.414 | 0.44 | -5.91 | |
| n-Tritriacontane | 0.283 | 0.4 | -29.2 | | 0.366 | 0.4 | -8.5 | |
| n-Tetratriacontane | 0.258 | 0.35 | -26.3 | | 0.335 | 0.35 | -4.28 | |
| n-Pentatriacontane | 0.342 | 0.35 | -2.28 | | 0.412 | 0.35 | 17.7 | |
| n-Hexatriacontane | 0.244 | 0.23 | 6.09 | | 0.275 | 0.23 | 19.6 | |
| n-Heptatriacontane | 0.187 J | 0.23 | -18.7 | | 0.216 | 0.23 | -6.09 | |
| n-Octatriacontane | 0.197 J | 0.22 | -10.4 | | 0.222 | 0.22 | 0.909 | |
| n-Nonatriacontane | 0.133 J | 0.18 | -26.1 | | 0.155 J | 0.18 | -13.9 | |
| n-Tetracontane | 0.15 J | 0.19 | -21 | | 0.176 J | 0.19 | -7.37 | |
| TPH (RES) | 176 | 220 | -20 | | 185 | 220 | -15.9 | |
| TPH | 608 | 660 | -7.88 | | 624 | 660 | -5.45 | |
| %ortho-terphenyl | 97 | | | | 97 | | | |
| %5A-androstane | 100 | | | | 100 | | | |
| %d50-tetracosane | 100 | | | | 100 | | | |

Arthur D. Little
Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.
Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| | | | | |
|---------------------|---------------|---|----|---|
| Field ID | Oil Reference | | | |
| Lab ID | Standard | | | |
| Sample Type | BU82-3ORS | | | |
| Matrix | ORS | | | |
| Sample Size | OIL | | | |
| Weight Basis | 5.04 mg | | | |
| Associated Blank | OIL | | | |
| Field Date | NA | | | |
| Extract Date | 05/19/00 | | | |
| Analysis Date | 05/19/00 | | | |
| Date Received | 03/07/01 | | | |
| Percent Solids | 05/19/00 | | | |
| Percent Lipids | NA | | | |
| Min Reporting Limit | NA | | | |
| Units | 0.198 | | | |
| | ug/mg | T | %D | Q |

| SHC/TPH | | | | |
|---------------------|---------|------|-------|--|
| n-Nonane | 4.86 | 4.8 | 1.25 | |
| n-Decane | 4.11 | 4.2 | -2.14 | |
| n-Undecane | 3.76 | 4.3 | -12.6 | |
| n-Dodecane | 3.58 | 4 | -10.5 | |
| n-Tridecane | 3.4 | 4 | -15 | |
| Isoprenoid RRT 1380 | 1.27 | 1 | 27 | |
| n-Tetradecane | 4.35 | 4.2 | 3.57 | |
| Isoprenoid RRT 1470 | 1.29 | 1.4 | -7.86 | |
| n-Pentadecane | 3.3 | 3.7 | -10.8 | |
| n-Hexadecane | 3.09 | 3.2 | -3.44 | |
| Isoprenoid RRT 1650 | 1.68 | 1.5 | 12 | |
| n-Heptadecane | 2.82 | 3.2 | -11.9 | |
| Pristane | 1.97 | 2.2 | -10.4 | |
| n-Octadecane | 2.5 | 2.9 | -13.8 | |
| Phytane | 1.29 | 1.6 | -19.4 | |
| n-Nonadecane | 2.59 | 2.6 | -0.39 | |
| n-Eicosane | 2.74 | 2.7 | 1.48 | |
| n-Heneicosane | 2.37 | 2.4 | -1.25 | |
| n-Docosane | 2.09 | 2.2 | -5 | |
| n-Tricosane | 1.96 | 2 | -2 | |
| n-Tetracosane | 1.7 | 2 | -15 | |
| n-Pentacosane | 1.6 | 1.7 | -5.88 | |
| n-Hexacosane | 1.38 | 1.5 | -8 | |
| n-Heptacosane | 1.08 | 1.2 | -10 | |
| n-Octacosane | 0.827 | 0.88 | -6.02 | |
| n-Nonacosane | 0.725 | 0.81 | -10.5 | |
| n-Triacontane | 0.609 | 0.65 | -6.31 | |
| n-Hentriacontane | 0.7 | 0.58 | 20.7 | |
| n-Dotriacontane | 0.48 | 0.44 | 9.09 | |
| n-Tritriacontane | 0.369 | 0.4 | -7.75 | |
| n-Tetratriacontane | 0.296 | 0.35 | -15.4 | |
| n-Pentatriacontane | 0.378 | 0.35 | 8 | |
| n-Hexatriacontane | 0.265 | 0.23 | 15.2 | |
| n-Heptatriacontane | 0.213 | 0.23 | -7.39 | |
| n-Octatriacontane | 0.197 J | 0.22 | -10.4 | |
| n-Nonatriacontane | 0.13 J | 0.18 | -27.8 | |
| n-Tetracontane | 0.164 J | 0.19 | -13.7 | |
| TPH (RES) | 177 | 220 | -19.5 | |
| TPH | 616 | 660 | -6.67 | |
| %ortho-terphenyl | 101 | | | |
| %5A-androstane | 102 | | | |
| %d50-tetracosane | 102 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: DUP - Surrogate Corrected

| Field ID | 02-L01-01-PHC-S | 02-L01-01-PHC-S DUP | | | 02-N10-01-PHC-S | 02-N10-01-PHC-S DUP |
|---------------------|-----------------|---------------------|-----|---|-----------------|---------------------|
| Sample Type | N | DUP | | | N | DUP |
| Matrix | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT |
| Sample Size | 23.63 g | 23.65 g | | | 17.49 g | 17.46 g |
| Weight Basis | DRY | DRY | | | DRY | DRY |
| Associated Blank | EB-S-63PB | EB-S-63PB | | | DY-S-66PB | DY-S-66PB |
| Field Date | 07/31/02 | 07/31/02 | | | 08/02/02 | 08/02/02 |
| Extract Date | 02/21/03 | 02/21/03 | | | 10/16/02 | 10/16/02 |
| Analysis Date | 03/03/03 | 03/03/03 | | | 10/25/02 | 10/25/02 |
| Date Received | 08/15/02 | 08/15/02 | | | 08/15/02 | 08/15/02 |
| Percent Solids | 78.6 | 78.6 | | | 57.2 | 57.2 |
| Dilution Factor | 1 | 1 | | | 1 | 1 |
| Percent Lipids | NA | NA | | | NA | NA |
| Min Reporting Limit | 0.021 | 0.021 | | | 0.028 | 0.029 |
| Units | mg/Kg | mg/Kg | RPD | Q | mg/Kg | mg/Kg |
| SHC/TPH | | | | | | |
| n-Nonane | ND | ND | | | 0.007 J | 0.0062 J |
| n-Decane | 0.0023 J | 0.002 J | 14 | | 0.016 J | 0.014 J |
| n-Undecane | 0.0019 J | 0.0022 J | 15 | | 0.022 J | 0.019 J |
| n-Dodecane | 0.0051 J | 0.0036 J | 34 | | 0.03 | 0.025 J |
| n-Tridecane | 0.005 J | 0.0045 J | 10 | | 0.038 | 0.034 |
| Isoprenoid RRT 1380 | 0.002 J | 0.0015 J | 28 | | 0.012 J | 0.01 J |
| n-Tetradecane | 0.0052 J | 0.005 J | 3.9 | | 0.045 | 0.043 |
| Isoprenoid RRT 1470 | 0.0038 J | 0.0033 J | 14 | | 0.029 | 0.026 J |
| n-Pentadecane | 0.0076 J | 0.0069 J | 9.6 | | 0.062 | 0.059 |
| n-Hexadecane | 0.01 J | 0.0098 J | 2 | | 0.059 B | 0.055 B |
| Isoprenoid RRT 1650 | 0.0038 J | 0.0027 J | 34 | | 0.028 | 0.025 J |
| n-Heptadecane | 0.015 J | 0.014 J | 6.9 | | 0.096 | 0.091 |
| Pristane | 0.0086 J | 0.0078 J | 9.8 | | 0.069 | 0.064 |
| n-Octadecane | 0.012 J | 0.011 J | 8.7 | | 0.068 | 0.063 |
| Phytane | 0.0055 J | 0.004 J | 32 | | 0.028 | 0.026 J |
| n-Nonadecane | 0.015 J | 0.013 J | 14 | | 0.11 | 0.11 |
| n-Eicosane | 0.016 J | 0.014 J | 13 | | 0.1 | 0.096 |
| n-Heneicosane | 0.022 | 0.02 J | 9.5 | | 0.19 | 0.18 |
| n-Docosane | 0.019 J | 0.018 J | 5.4 | | 0.15 | 0.14 |
| n-Tricosane | 0.039 | 0.039 | 0 | | 0.39 | 0.37 |
| n-Tetracosane | 0.022 | 0.02 J | 9.5 | | 0.14 | 0.14 |
| n-Pentacosane | 0.046 | 0.047 | 2.2 | | 0.39 | 0.38 |
| n-Hexacosane | 0.024 B | 0.022 B | 8.7 | | 0.11 | 0.13 |
| n-Heptacosane | 0.066 | 0.067 | 1.5 | | 0.53 | 0.53 |
| n-Octacosane | 0.022 B | 0.02 JB | 9.5 | | 0.091 | 0.11 |
| n-Nonacosane | 0.054 | 0.057 | 5.4 | | 0.41 | 0.41 |
| n-Triacontane | 0.015 JB | 0.012 JB | 22 | | 0.28 | 0.31 |
| n-Hentriacontane | 0.045 | 0.041 | 9.3 | | 0.35 | 0.35 |
| n-Dotriacontane | 0.011 JB | 0.0097 JB | 12 | | 0.027 J | 0.036 |
| n-Tritriacontane | 0.016 JB | 0.012 JB | 28 | | 0.1 | 0.1 |
| n-Tetratriacontane | 0.0051 JB | 0.003 JB | 52 | & | 0.012 J | 0.014 J |
| n-Pentatriacontane | 0.0053 JB | 0.003 JB | 55 | & | 0.02 J | 0.02 J |
| n-Hexatriacontane | 0.0031 JB | ND | | | 0.005 J | 0.0048 J |
| n-Heptatriacontane | 0.0026 J | ND | | | 0.0049 J | 0.0047 J |
| n-Octatriacontane | 0.0024 J | ND | | | 0.0035 J | 0.0035 J |
| n-Tetracontane | ND | ND | | | 0.0027 J | 0.0023 J |
| TPH (RES) | 1 B | 0.96 B | 4.1 | | 6.1 | 5.9 |
| TPH | 2.9 | 4.7 | 47 | & | 11 | 9.8 |
| %ortho-terphenyl | NA | NA | | | NA | NA |
| %5A-androstane | 76 | 79 | | | 93 | 96 |
| %d50-tetracosane | 79 | 81 | | | 96 | 99 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: DUP - Surrogate Corrected

| Field ID | 02-N23-01-PHC-S | | 02-N23-01-PHC-S DUP | | 02-SAG-01-PHC-S | |
|---------------------|-----------------|---|---------------------|-----|-----------------|-------|
| Sample Type | N | | DUP | | N | |
| Matrix | SEDIMENT | | SEDIMENT | | SEDIMENT | |
| Sample Size | 20.6 g | | 20.65 g | | 15.32 g | |
| Weight Basis | DRY | | DRY | | DRY | |
| Associated Blank | DZ-S-03PB | | DZ-S-03PB | | DZ-S-29PB | |
| Field Date | 08/05/02 | | 08/05/02 | | 08/14/02 | |
| Extract Date | 10/28/02 | | 10/28/02 | | 10/30/02 | |
| Analysis Date | 11/06/02 | | 11/06/02 | | 11/07/02 | |
| Date Received | 08/15/02 | | 08/15/02 | | 08/23/02 | |
| Percent Solids | 68.5 | | 68.5 | | 50.4 | |
| Dilution Factor | 1 | | 1 | | 1 | |
| Percent Lipids | NA | | NA | | NA | |
| Min Reporting Limit | 0.024 | | 0.024 | | 0.033 | |
| Units | RPD | Q | mg/Kg | RPD | Q | mg/Kg |

| SHC/TPH | | | | | | |
|---------------------|-----|--|----------|----------|-----|----------|
| n-Nonane | 12 | | 0.0043 J | 0.0041 J | 4.8 | 0.0034 J |
| n-Decane | 13 | | 0.0094 J | 0.011 J | 16 | 0.0098 J |
| n-Undecane | 15 | | 0.012 J | 0.014 J | 15 | 0.017 J |
| n-Dodecane | 18 | | 0.02 J | 0.022 J | 9.5 | 0.03 J |
| n-Tridecane | 11 | | 0.029 | 0.03 | 3.4 | 0.047 |
| Isoprenoid RRT 1380 | 18 | | 0.0084 J | 0.0086 J | 2.4 | 0.014 J |
| n-Tetradecane | 4.5 | | 0.035 | 0.034 | 2.9 | 0.06 |
| Isoprenoid RRT 1470 | 11 | | 0.02 J | 0.02 J | 0 | 0.039 |
| n-Pentadecane | 5 | | 0.049 | 0.048 | 2.1 | 0.13 |
| n-Hexadecane | 7 | | 0.047 | 0.047 | 0 | 0.1 |
| Isoprenoid RRT 1650 | 11 | | 0.023 J | 0.021 J | 9.1 | 0.029 J |
| n-Heptadecane | 5.3 | | 0.068 | 0.065 | 4.5 | 0.22 |
| Pristane | 7.5 | | 0.056 | 0.056 | 0 | 0.081 |
| n-Octadecane | 7.6 | | 0.051 | 0.053 | 3.8 | 0.086 |
| Phytane | 7.4 | | 0.028 | 0.026 | 7.4 | 0.027 J |
| n-Nonadecane | 0 | | 0.083 | 0.081 | 2.4 | 0.16 |
| n-Eicosane | 4.1 | | 0.081 | 0.076 | 6.4 | 0.14 |
| n-Heneicosane | 5.4 | | 0.14 | 0.15 | 6.9 | 0.29 |
| n-Docosane | 6.9 | | 0.11 | 0.12 | 8.7 | 0.22 |
| n-Tricosane | 5.3 | | 0.25 | 0.26 | 3.9 | 0.58 |
| n-Tetracosane | 0 | | 0.11 | 0.11 | 0 | 0.19 |
| n-Pentacosane | 2.6 | | 0.29 | 0.29 | 0 | 0.67 |
| n-Hexacosane | 17 | | 0.094 B | 0.096 B | 2.1 | 0.15 |
| n-Heptacosane | 0 | | 0.44 | 0.44 | 0 | 0.96 |
| n-Octacosane | 19 | | 0.084 B | 0.086 B | 2.4 | 0.12 B |
| n-Nonacosane | 0 | | 0.42 | 0.41 | 2.4 | 0.7 |
| n-Triacontane | 10 | | 0.05 B | 0.054 B | 7.7 | 0.24 |
| n-Hentriacontane | 0 | | 0.36 | 0.35 | 2.8 | 0.59 |
| n-Dotriacontane | 28 | | 0.03 B | 0.031 B | 3.3 | 0.045 B |
| n-Tritriacontane | 0 | | 0.11 | 0.11 | 0 | 0.18 |
| n-Tetratriacontane | 15 | | 0.011 JB | 0.012 JB | 8.7 | 0.018 J |
| n-Pentatriacontane | 0 | | 0.021 J | 0.021 J | 0 | 0.051 |
| n-Hexatriacontane | 4.1 | | 0.0048 J | 0.0049 J | 2.1 | 0.008 J |
| n-Heptatriacontane | 4.2 | | 0.0056 J | 0.0056 J | 0 | 0.0086 J |
| n-Octatriacontane | 0 | | 0.0042 J | 0.004 J | 4.9 | 0.0068 J |
| n-Tetracontane | 16 | | 0.0026 J | 0.0029 J | 11 | 0.0046 J |
| TPH (RES) | 3.3 | | 5.1 | 4.9 | 4 | 9.5 |
| TPH | 12 | | 9.6 | 8.9 | 7.6 | 18 |
| %ortho-terphenyl | | | NA | NA | | NA |
| %5A-androstane | | | 95 | 94 | | 97 |
| %d50-tetracosane | | | 105 | 106 | | 103 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: DUP - Surrogate Corrected

| 02-SAG-01-PHC-S | | | | | | | |
|---------------------|-----------|-----|---|-----------------|--|-----------------|-------|
| Field ID | DUP | | | 02-L09-01-PHC-S | | 02-L09-01-PHC-S | DUP |
| Sample Type | DUP | | | N | | DUP | |
| Matrix | SEDIMENT | | | SEDIMENT | | SEDIMENT | |
| Sample Size | 15.33 g | | | 23.63 g | | 23.63 g | |
| Weight Basis | DRY | | | DRY | | DRY | |
| Associated Blank | DZ-S-29PB | | | DZ-S-65PB | | DZ-S-65PB | |
| Field Date | 08/14/02 | | | 07/30/02 | | 07/30/02 | |
| Extract Date | 10/30/02 | | | 11/20/02 | | 11/20/02 | |
| Analysis Date | 11/07/02 | | | 11/26/02 | | 11/27/02 | |
| Date Received | 08/23/02 | | | 08/15/02 | | 08/15/02 | |
| Percent Solids | 50.4 | | | 78.7 | | 78.7 | |
| Dilution Factor | 1 | | | 1 | | 1 | |
| Percent Lipids | NA | | | NA | | NA | |
| Min Reporting Limit | 0.033 | | | 0.021 | | 0.021 | |
| Units | mg/Kg | RPD | Q | mg/Kg | | mg/Kg | RPD Q |
| SHC/TPH | | | | | | | |
| n-Nonane | 0.0035 J | 2.9 | | 0.0012 J | | 0.0014 J | 15 |
| n-Decane | 0.0083 J | 16 | | 0.0036 JB | | 0.0036 JB | 0 |
| n-Undecane | 0.017 J | 0 | | 0.0032 JB | | 0.0038 JB | 17 |
| n-Dodecane | 0.029 J | 3.4 | | 0.0049 JB | | 0.0062 JB | 23 |
| n-Tridecane | 0.046 | 2.2 | | 0.006 JB | | 0.0069 JB | 14 |
| Isoprenoid RRT 1380 | 0.014 J | 0 | | 0.0022 J | | 0.0024 J | 8.7 |
| n-Tetradecane | 0.059 | 1.7 | | 0.0086 JB | | 0.0091 JB | 5.6 |
| Isoprenoid RRT 1470 | 0.039 | 0 | | 0.0056 J | | 0.0057 J | 1.8 |
| n-Pentadecane | 0.13 | 0 | | 0.011 J | | 0.011 J | 0 |
| n-Hexadecane | 0.083 | 18 | | 0.032 B | | 0.023 B | 33 |
| Isoprenoid RRT 1650 | 0.03 J | 3.4 | | 0.0065 J | | 0.0068 J | 4.5 |
| n-Heptadecane | 0.21 | 4.6 | | 0.016 J | | 0.016 J | 0 |
| Pristane | 0.086 | 6 | | 0.014 J | | 0.012 J | 15 |
| n-Octadecane | 0.083 | 3.6 | | 0.013 J | | 0.013 J | 0 |
| Phytane | 0.026 J | 3.8 | | 0.0055 J | | 0.005 J | 9.5 |
| n-Nonadecane | 0.16 | 0 | | 0.019 J | | 0.02 J | 5.1 |
| n-Eicosane | 0.14 | 0 | | 0.03 | | 0.042 | 33 |
| n-Heneicosane | 0.29 | 0 | | 0.03 | | 0.053 | 55 & |
| n-Docosane | 0.21 | 4.6 | | 0.026 | | 0.042 | 47 & |
| n-Tricosane | 0.61 | 5 | | 0.055 B | | 0.064 | 15 |
| n-Tetracosane | 0.21 | 10 | | 0.032 B | | 0.044 B | 32 |
| n-Pentacosane | 0.87 | 26 | | 0.072 B | | 0.085 B | 16 |
| n-Hexacosane | 0.19 | 24 | | 0.044 B | | 0.058 B | 27 |
| n-Heptacosane | 1.2 | 22 | | 0.1 B | | 0.12 B | 18 |
| n-Octacosane | 0.15 | 22 | | 0.048 B | | 0.064 B | 28 |
| n-Nonacosane | 0.78 | 11 | | 0.083 B | | 0.1 B | 18 |
| n-Triacontane | 0.25 | 4.1 | | 0.055 B | | 0.066 B | 18 |
| n-Hentriacontane | 0.63 | 6.6 | | 0.066 B | | 0.076 B | 14 |
| n-Dotriacontane | 0.053 | 16 | | 0.017 JB | | 0.026 B | 42 & |
| n-Tritriacontane | 0.19 | 5.4 | | 0.019 JB | | 0.024 B | 23 |
| n-Tetratriacontane | 0.019 J | 5.4 | | 0.0054 JB | | 0.007 JB | 26 |
| n-Pentatriacontane | 0.053 | 3.8 | | 0.0047 JB | | 0.0055 JB | 16 |
| n-Hexatriacontane | 0.0086 J | 7.2 | | 0.0018 JB | | 0.0018 JB | 0 |
| n-Heptatriacontane | 0.0086 J | 0 | | 0.0013 JB | | 0.0012 JB | 8 |
| n-Octatriacontane | 0.0061 J | 11 | | ND | | ND | |
| n-Tetracontane | 0.005 J | 8.3 | | ND | | ND | |
| TPH (RES) | 10 | 5.1 | | 1.5 B | | 1.6 B | 6.4 |
| TPH | 18 | 0 | | 2 B | | 2 B | 0 |
| %ortho-terphenyl | NA | | | NA | | NA | |
| %5A-androstane | 100 | | | 75 | | 71 | |
| %d50-tetracosane | 109 | | | 80 | | 76 | |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control DUP

| Field ID | 00-N09-01-PHC-S | 00-N09-01-PHC-S | | | 00-C0L-01-PHC-S | 00-C0L-01-PHC-S | | | | 00-N06-01-PHC-S | 00-N06-01-PHC-S | | | |
|---------------------|-----------------|-----------------|-----|---|-----------------|-----------------|-----|---|--|-----------------|-----------------|-----|---|--|
| Lab ID | 20A3528 | 20A3528DUP | | | 20A3500 | 20A3500DUP | | | | 20A3468 | 20A3468DUP | | | |
| Sample Type | N | DUP | | | N | DUP | | | | N | DUP | | | |
| Matrix | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT | | | | SEDIMENT | SEDIMENT | | | |
| Sample Size | 19.82 g | 19.96 g | | | 24.52 g | 24.52 g | | | | 19.64 g | 19.2 g | | | |
| Weight Basis | DRY | DRY | | | DRY | DRY | | | | DRY | DRY | | | |
| Associated Blank | DH-S-61PB | DH-S-61PB | | | DH-S-58PB | DH-S-58PB | | | | DH-S-55PB | DH-S-55PB | | | |
| Field Date | 08/18/00 | 08/18/00 | | | 08/24/00 | 08/24/00 | | | | 08/17/00 | 08/17/00 | | | |
| Extract Date | 03/08/01 | 03/08/01 | | | 03/07/01 | 03/07/01 | | | | 02/20/01 | 02/20/01 | | | |
| Analysis Date | 03/17/01 | 03/17/01 | | | 03/14/01 | 03/14/01 | | | | 03/02/01 | 03/02/01 | | | |
| Date Received | 08/30/00 | 08/30/00 | | | 08/30/00 | 08/30/00 | | | | 08/30/00 | 08/30/00 | | | |
| Percent Solids | 65.8 | 65.8 | | | 79.7 | 79.7 | | | | 63.8 | 63.8 | | | |
| Percent Lipids | NA | NA | | | NA | NA | | | | NA | NA | | | |
| Min Reporting Limit | 0.025 | 0.025 | | | 0.02 | 0.02 | | | | 0.025 | 0.026 | | | |
| Units | mg/Kg | mg/Kg | RPD | Q | mg/Kg | mg/Kg | RPD | Q | | mg/Kg | mg/Kg | RPD | Q | |
| SHC/TPH | | | | | | | | | | | | | | |
| n-Nonane | 0.0029 J | 0.0028 J | 3.5 | | 0.00095 J | 0.00084 J | 12 | | | 0.0074 J | 0.0058 J | 24 | | |
| n-Decane | 0.0055 J | 0.0048 J | 14 | | 0.0026 J | 0.0021 J | 21 | | | 0.012 J | 0.01 J | 18 | | |
| n-Undecane | 0.0075 J | 0.0071 J | 5.5 | | 0.0044 J | 0.0033 J | 28 | | | 0.015 J | 0.012 J | 22 | | |
| n-Dodecane | 0.0084 J | 0.0078 J | 7.4 | | 0.0053 J | 0.0039 J | 30 | | | 0.016 J | 0.013 J | 21 | | |
| n-Tridecane | 0.011 J | 0.011 J | 0 | | 0.0074 J | 0.0057 J | 26 | | | 0.022 J | 0.018 J | 20 | | |
| Isoprenoid RRT 1380 | 0.0041 J | 0.0037 J | 10 | | 0.0032 J | 0.0028 J | 13 | | | 0.0074 J | 0.0056 J | 28 | | |
| n-Tetradecane | 0.014 J | 0.012 J | 15 | | 0.0093 J | 0.0079 J | 16 | | | 0.027 | 0.02 J | 30 | | |
| Isoprenoid RRT 1470 | 0.0096 J | 0.0089 J | 7.6 | | 0.0078 J | 0.0072 J | 8 | | | 0.018 J | 0.013 J | 32 | & | |
| n-Pentadecane | 0.019 J | 0.017 J | 11 | | 0.018 J | 0.017 J | 5.7 | | | 0.038 | 0.03 | 24 | | |
| n-Hexadecane | 0.019 J | 0.017 J | 11 | | 0.013 J | 0.013 J | 0 | | | 0.039 | 0.034 | 14 | | |
| Isoprenoid RRT 1650 | 0.0093 J | 0.0089 J | 4.4 | | 0.0076 J | 0.0073 J | 4 | | | 0.02 J | 0.017 J | 16 | | |
| n-Heptadecane | 0.028 | 0.026 | 7.4 | | 0.031 | 0.031 | 0 | | | 0.059 | 0.055 | 7 | | |
| Pristane | 0.022 J | 0.021 J | 4.6 | | 0.016 J | 0.015 J | 6.4 | | | 0.043 | 0.041 | 4.8 | | |
| n-Octadecane | 0.024 J | 0.022 J | 8.7 | | 0.018 J | 0.018 J | 0 | | | 0.048 | 0.044 | 8.7 | | |
| Phytane | 0.0094 J | 0.0099 J | 5.2 | | 0.0079 J | 0.0074 J | 6.5 | | | 0.019 J | 0.018 J | 5.4 | | |
| n-Nonadecane | 0.034 | 0.033 | 3 | | 0.028 | 0.028 | 0 | | | 0.07 | 0.068 | 2.9 | | |
| n-Eicosane | 0.03 | 0.032 | 6.4 | | 0.027 | 0.029 | 7.1 | | | 0.059 | 0.056 | 5.2 | | |
| n-Heneicosane | 0.059 | 0.059 | 0 | | 0.058 | 0.063 | 8.3 | | | 0.12 | 0.12 | 0 | | |
| n-Docosane | 0.043 | 0.044 | 2.3 | | 0.042 | 0.044 | 4.6 | | | 0.089 | 0.086 | 3.4 | | |
| n-Tricosane | 0.12 | 0.13 | 8 | | 0.17 | 0.18 | 5.7 | | | 0.25 | 0.24 | 4.1 | | |
| n-Tetracosane | 0.042 | 0.05 | 17 | | 0.046 | 0.044 | 4.4 | | | 0.074 | 0.07 | 5.6 | | |
| n-Pentacosane | 0.12 | 0.13 | 8 | | 0.13 | 0.14 | 7.4 | | | 0.23 | 0.22 | 4.4 | | |
| n-Hexacosane | 0.044 B | 0.063 B | 36 | & | 0.037 | 0.038 | 2.7 | | | 0.071 | 0.06 | 17 | | |
| n-Heptacosane | 0.16 B | 0.18 B | 12 | | 0.14 | 0.15 | 6.9 | | | 0.32 | 0.29 | 9.8 | | |
| n-Octacosane | 0.039 B | 0.061 B | 44 | & | 0.031 B | 0.033 B | 6.2 | | | 0.053 | 0.044 | 18 | | |
| n-Nonacosane | 0.13 B | 0.15 B | 14 | | 0.098 | 0.1 | 2 | | | 0.23 | 0.21 | 9.1 | | |
| n-Triacontane | 0.048 B | 0.067 B | 33 | & | 0.025 B | 0.024 B | 4.1 | | | 0.082 | 0.083 | 1.2 | | |
| n-Hentriacontane | 0.1 B | 0.12 | 18 | | 0.07 | 0.072 | 2.8 | | | 0.2 | 0.18 | 10 | | |
| n-Dotriacontane | 0.014 JB | 0.025 B | 56 | & | 0.01 JB | 0.011 JB | 9.5 | | | 0.038 | 0.038 | 0 | | |
| n-Tritriacontane | 0.034 B | 0.039 B | 14 | | 0.029 | 0.03 | 3.4 | | | 0.052 | 0.047 | 10 | | |
| n-Tetratriacontane | 0.0046 JB | 0.0084 JB | 58 | & | 0.0052 JB | 0.0052 JB | 0 | | | 0.006 J | 0.0052 J | 14 | | |
| n-Pentatriacontane | 0.0071 JB | 0.0093 JB | 27 | | 0.0086 J | 0.0088 J | 2.3 | | | 0.01 J | 0.0098 J | 2 | | |
| n-Hexatriacontane | 0.0023 JB | 0.0038 JB | 49 | & | 0.0028 JB | 0.0029 JB | 3.5 | | | 0.0035 J | 0.0031 J | 12 | | |
| n-Heptatriacontane | 0.0027 JB | 0.0029 JB | 7.1 | | 0.0024 J | 0.0023 J | 4.2 | | | 0.0028 J | 0.0025 J | 11 | | |
| n-Octatriacontane | 0.0024 J | 0.0021 J | 13 | | 0.0019 JB | 0.002 JB | 5.1 | | | 0.0021 J | 0.002 J | 4.9 | | |
| n-Nonatriacontane | ND | 0.0012 J | | | 0.0016 J | 0.0013 J | 21 | | | 0.0017 J | 0.0013 J | 27 | | |
| n-Tetracontane | ND | 0.0012 J | | | 0.0017 J | 0.0016 J | 6.1 | | | 0.002 J | 0.0013 J | 42 | & | |
| TPH (RES) | 1.9 B | 2 B | 5.1 | | 1.7 | 1.7 | 0 | | | 3.4 | 3.1 | 9.2 | | |
| TPH | 4.1 | 3.7 | 10 | | 4.3 | 3.3 | 26 | | | 7.1 | 6.4 | 10 | | |
| %ortho-terphenyl | 0 & | 0 & | | | 0 & | 0 & | | | | 0 & | 0 & | | | |
| %5A-androstane | 69 | 66 | | | 82 | 83 | | | | 84 | 78 | | | |
| %d50-tetracosane | 75 | 73 | | | 89 | 89 | | | | 88 | 83 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | Blank Spike | Procedural Blank | Blank Spike |
|---------------------|------------------|-------------|------------------|-------------|
| Sample Type | PB | BS | PB | BS |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Size | 20 g | 20 g | 20 g | 20 g |
| Weight Basis | DRY | DRY | DRY | DRY |
| Associated Blank | NA | EB-S-63PB | NA | DY-S-66PB |
| Field Date | 02/21/03 | 02/21/03 | 10/16/02 | 10/16/02 |
| Extract Date | 02/21/03 | 02/21/03 | 10/16/02 | 10/16/02 |
| Analysis Date | 02/28/03 | 03/01/03 | 10/25/02 | 10/25/02 |
| Date Received | 02/21/03 | 02/21/03 | 10/16/02 | 10/16/02 |
| Percent Solids | 100 | 100 | 100 | 100 |
| Dilution Factor | 1 | 1 | 1 | 1 |
| Percent Lipids | NA | NA | NA | NA |
| Min Reporting Limit | 0.025 | 0.025 | 0.025 | 0.025 |
| Units | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| T %R Q | | | | |
| SHC/TPH | | | | |
| n-Nonane | ND | ND | ND | ND |
| n-Decane | ND | 0.71 | 1.25 | 57 |
| n-Undecane | ND | ND | 0.0015 J | 1.2 |
| n-Dodecane | ND | ND | ND | 0.0011 J |
| n-Tridecane | ND | ND | 0.0016 J | 0.002 JB |
| Isoprenoid RRT 1380 | ND | ND | ND | 0.0012 J |
| n-Tetradecane | ND | 0.003 J | ND | ND |
| Isoprenoid RRT 1470 | ND | ND | 0.002 J | 0.0075 JB |
| n-Pentadecane | ND | 1 | 1.25 | 80 |
| n-Hexadecane | ND | 0.0013 J | ND | 0.0014 J |
| Isoprenoid RRT 1650 | ND | ND | ND | 1.9 |
| n-Heptadecane | ND | ND | 0.016 J | 0.015 JB |
| Pristane | ND | 1.1 | 1.25 | 88 |
| n-Octadecane | ND | 0.0011 J | ND | 0.0014 J |
| Phytane | ND | 0.006 J | 0.00086 J | 0.0022 JB |
| n-Nonadecane | ND | ND | ND | 2.3 |
| n-Eicosane | ND | 1.2 | 1.25 | 96 |
| n-Heneicosane | ND | 0.00086 J | ND | 0.003 JB |
| n-Docosane | 0.0012 J | 0.0015 JB | 0.0015 J | 0.003 JB |
| n-Tricosane | 0.0045 J | 0.004 JB | 0.0021 J | 0.012 J |
| n-Tetracosane | 0.0034 J | 0.0054 JB | 0.005 J | 0.0022 J |
| n-Pentacosane | 0.0068 J | 1.3 | 1.25 | 103 |
| n-Hexacosane | 0.0079 J | 0.013 JB | 0.0012 J | 2.4 |
| n-Heptacosane | 0.011 J | 0.011 JB | 0.0086 J | 0.036 B |
| n-Octacosane | 0.0085 J | 0.011 JB | 0.0098 J | 0.036 B |
| n-Nonacosane | 0.0082 J | 0.012 JB | 0.012 J | 0.038 B |
| n-Triacontane | 0.0072 J | 1.2 | 1.25 | 95 |
| n-Hentriacontane | 0.0061 J | 0.0072 JB | 0.011 J | 0.041 B |
| n-Dotriacontane | 0.0031 J | 0.0095 JB | 0.0081 J | 2.3 |
| n-Tritriacontane | 0.0034 J | 0.004 JB | 0.0076 J | 0.029 B |
| n-Tetratriacontane | 0.0035 J | 1.1 | 1.25 | 88 |
| n-Pentatriacontane | 0.0013 J | 0.0034 JB | 0.004 J | 0.027 |
| n-Hexatriacontane | 0.002 J | 1 | 1.25 | 80 |
| n-Heptatriacontane | ND | ND | 0.0027 J | 0.012 JB |
| n-Octatriacontane | ND | ND | 0.0012 J | 2.3 |
| n-Tetracontane | ND | ND | ND | 0.0078 J |
| TPH (RES) | 0.4 J | 9.6 | ND | 2.2 |
| TPH | 0.4 J | 9.6 | ND | 0.016 J |
| %ortho-terphenyl | NA | NA | ND | 0.0036 J |
| %5A-androstane | 75 | 74 | ND | 0.0025 J |
| %d50-tetracosane | 86 | 83 | 0.35 J | 17 |
| | | | 0.35 J | 17 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Procedural Blank | | | Blank Spike | | | Procedural Blank | | |
|---------------------|------------------|----|---|-------------|-----------|-----|------------------|-----------|--|
| Sample Type | PB | | | BS | | | PB | | |
| Matrix | SEDIMENT | | | SEDIMENT | | | SEDIMENT | | |
| Sample Size | 20 g | | | 20 g | | | 20 g | | |
| Weight Basis | DRY | | | DRY | | | DRY | | |
| Associated Blank | NA | | | DZ-S-03PB | | | NA | | |
| Field Date | 10/28/02 | | | 10/28/02 | | | 10/30/02 | | |
| Extract Date | 10/28/02 | | | 10/28/02 | | | 10/30/02 | | |
| Analysis Date | 11/04/02 | | | 11/05/02 | | | 11/07/02 | | |
| Date Received | 10/28/02 | | | 10/28/02 | | | 10/30/02 | | |
| Percent Solids | 100 | | | 100 | | | 100 | | |
| Dilution Factor | 1 | | | 1 | | | 1 | | |
| Percent Lipids | NA | | | NA | | | NA | | |
| Min Reporting Limit | 0.025 | | | 0.025 | | | 0.025 | | |
| Units | T | %R | Q | mg/Kg | T | %R | Q | mg/Kg | |
| SHC/TPH | | | | | | | | | |
| n-Nonane | | | | ND | | | | ND | |
| n-Decane | 2.5 | 48 | | 0.0017 J | 1.2 | 2.5 | 48 | 0.0013 J | |
| n-Undecane | | | | 0.0013 J | 0.0014 JB | | | 0.00083 J | |
| n-Dodecane | | | | 0.0032 J | 0.0041 JB | | | 0.0019 J | |
| n-Tridecane | | | | 0.0017 J | 0.0016 JB | | | 0.00092 J | |
| Isoprenoid RRT 1380 | | | | ND | ND | | | ND | |
| n-Tetradecane | | | | 0.0037 J | 0.0086 JB | | | 0.0028 J | |
| Isoprenoid RRT 1470 | | | | ND | 0.0018 J | | | ND | |
| n-Pentadecane | 2.5 | 76 | | 0.0011 J | 1.7 | 2.5 | 68 | 0.00084 J | |
| n-Hexadecane | | | | 0.0035 J | 0.021 J | | | 0.0053 J | |
| Isoprenoid RRT 1650 | | | | 0.0012 J | 0.0013 JB | | | 0.001 J | |
| n-Heptadecane | | | | 0.0018 J | ND | | | 0.0011 J | |
| Pristane | 2.5 | 92 | | ND | 2 | 2.5 | 80 | ND | |
| n-Octadecane | | | | 0.0035 J | 0.004 JB | | | 0.0019 J | |
| Phytane | | | | ND | 0.0098 J | | | ND | |
| n-Nonadecane | | | | 0.0019 J | 0.0024 JB | | | 0.0012 J | |
| n-Eicosane | 2.5 | 96 | | 0.0037 J | 2.3 | 2.5 | 92 | 0.005 J | |
| n-Heneicosane | | | | 0.0052 J | 0.0025 JB | | | 0.0081 J | |
| n-Docosane | | | | 0.007 J | 0.0038 JB | | | 0.0079 J | |
| n-Tricosane | | | | 0.012 J | 0.0087 JB | | | 0.012 J | |
| n-Tetracosane | | | | 0.016 J | 0.016 JB | | | 0.015 J | |
| n-Pentacosane | 2.5 | 96 | | 0.023 J | 2.3 | 2.5 | 91 | 0.02 J | |
| n-Hexacosane | | | | 0.026 | 0.03 B | | | 0.023 J | |
| n-Heptacosane | | | | 0.031 | 0.026 B | | | 0.028 | |
| n-Octacosane | | | | 0.028 | 0.025 B | | | 0.026 | |
| n-Nonacosane | | | | 0.027 | 0.027 B | | | 0.025 | |
| n-Triacontane | 2.5 | 92 | | 0.021 J | 2.3 | 2.5 | 91 | 0.019 J | |
| n-Hentriacontane | | | | 0.018 J | 0.017 JB | | | 0.017 J | |
| n-Dotriacontane | | | | 0.011 J | 0.02 JB | | | 0.01 J | |
| n-Tritriacontane | | | | 0.0066 J | 0.0075 JB | | | 0.0062 J | |
| n-Tetratriacontane | 2.5 | 92 | | 0.0034 J | 2.2 | 2.5 | 88 | 0.0029 J | |
| n-Pentatriacontane | | | | 0.0018 J | 0.0064 JB | | | 0.0016 J | |
| n-Hexatriacontane | 2.5 | 88 | | 0.00081 J | 2.1 | 2.5 | 84 | ND | |
| n-Heptatriacontane | | | | ND | 0.0011 J | | | ND | |
| n-Octatriacontane | | | | ND | 0.003 J | | | ND | |
| n-Tetracontane | | | | ND | 0.0021 J | | | ND | |
| TPH (RES) | | | | 0.52 J | 17 | | | 0.35 J | |
| TPH | | | | 0.52 J | 17 | | | 0.35 J | |
| %ortho-terphenyl | | | | NA | NA | | | NA | |
| %5A-androstane | | | | 82 | 83 | | | 80 | |
| %d50-tetracosane | | | | 108 | 96 | | | 108 | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: BS-BSD - Surrogate Corrected

| Field ID | Blank Spike | | | | Procedural Blank | | | | Blank Spike |
|---------------------|-------------|-----|----|---|------------------|---|----|---|-------------|
| Sample Type | BS | | | | PB | | | | BS |
| Matrix | SEDIMENT | | | | SEDIMENT | | | | SEDIMENT |
| Sample Size | 20 g | | | | 25 g | | | | 25 g |
| Weight Basis | DRY | | | | DRY | | | | DRY |
| Associated Blank | DZ-S-29PB | | | | NA | | | | DZ-S-65PB |
| Field Date | 10/30/02 | | | | 11/20/02 | | | | 11/20/02 |
| Extract Date | 10/30/02 | | | | 11/20/02 | | | | 11/20/02 |
| Analysis Date | 11/07/02 | | | | 11/26/02 | | | | 11/26/02 |
| Date Received | 10/30/02 | | | | 11/20/02 | | | | 11/20/02 |
| Percent Solids | 100 | | | | 100 | | | | 100 |
| Dilution Factor | 1 | | | | 1 | | | | 1 |
| Percent Lipids | NA | | | | NA | | | | NA |
| Min Reporting Limit | 0.025 | | | | 0.02 | | | | 0.02 |
| Units | mg/Kg | T | %R | Q | mg/Kg | | | | mg/Kg |
| | | | | | | T | %R | Q | |
| SHC/TPH | | | | | | | | | |
| n-Nonane | ND | | | | ND | | | | ND |
| n-Decane | 0.98 | 2.5 | 39 | | 0.0026 J | | | 2 | 55 |
| n-Undecane | ND | | | | 0.0013 J | | | | 0.001 JB |
| n-Dodecane | 0.0017 JB | | | | 0.0033 J | | | | 0.0023 JB |
| n-Tridecane | 0.00089 JB | | | | 0.0014 J | | | | 0.0012 JB |
| Isoprenoid RRT 1380 | ND | | | | ND | | | | ND |
| n-Tetradecane | 0.0057 JB | | | | 0.0045 J | | | | 0.0068 JB |
| Isoprenoid RRT 1470 | 0.00093 J | | | | ND | | | | 0.0011 J |
| n-Pentadecane | 1.5 | 2.5 | 60 | | 0.0012 J | | | 2 | 80 |
| n-Hexadecane | 0.0026 JB | | | | 0.0068 J | | | | 0.018 JB |
| Isoprenoid RRT 1650 | ND | | | | ND | | | | 0.00088 J |
| n-Heptadecane | 0.0018 JB | | | | 0.0015 J | | | | ND |
| Pristane | 2 | 2.5 | 80 | | ND | | | 2 | 95 |
| n-Octadecane | 0.0029 JB | | | | 0.0026 J | | | | 0.0031 JB |
| Phytane | 0.011 J | | | | ND | | | | 0.0098 J |
| n-Nonadecane | 0.0018 JB | | | | 0.0012 J | | | | 0.0018 JB |
| n-Eicosane | 2.2 | 2.5 | 88 | | 0.0023 J | | | 2 | 100 |
| n-Heneicosane | 0.0035 JB | | | | 0.0021 J | | | | 0.0064 JB |
| n-Docosane | 0.0049 JB | | | | 0.0045 J | | | | 0.0068 JB |
| n-Tricosane | 0.0087 JB | | | | 0.012 J | | | | 0.011 JB |
| n-Tetracosane | 0.014 JB | | | | 0.019 J | | | | 0.02 B |
| n-Pentacosane | 2.2 | 2.5 | 87 | | 0.031 | | | 2 | 98 |
| n-Hexacosane | 0.022 JB | | | | 0.037 | | | | 0.038 B |
| n-Heptacosane | 0.016 JB | | | | 0.045 | | | | 0.038 B |
| n-Octacosane | 0.015 JB | | | | 0.042 | | | | 0.037 B |
| n-Nonacosane | 0.017 JB | | | | 0.039 | | | | 0.039 B |
| n-Triacontane | 2.2 | 2.5 | 87 | | 0.031 | | | 2 | 98 |
| n-Hentriacontane | 0.01 JB | | | | 0.026 | | | | 0.024 B |
| n-Dotriacontane | 0.016 JB | | | | 0.016 J | | | | 0.023 B |
| n-Tritriacontane | 0.005 JB | | | | 0.01 J | | | | 0.0098 JB |
| n-Tetratriacontane | 2.1 | 2.5 | 84 | | 0.0054 J | | | 2 | 95 |
| n-Pentatriacontane | 0.0059 JB | | | | 0.0026 J | | | | 0.0071 JB |
| n-Hexatriacontane | 2 | 2.5 | 80 | | 0.0012 J | | | 2 | 90 |
| n-Heptatriacontane | 0.0012 J | | | | 0.0007 J | | | | 0.0017 JB |
| n-Octatriacontane | 0.003 J | | | | ND | | | | 0.0033 J |
| n-Tetracontane | 0.002 J | | | | ND | | | | 0.0024 J |
| TPH (RES) | 15 | | | | 1.3 | | | | 15 |
| TPH | 15 | | | | 1.3 | | | | 15 |
| %ortho-terphenyl | NA | | | | NA | | | | NA |
| %5A-androstane | 84 | | | | 84 | | | | 92 |
| %d50-tetracosane | 104 | | | | 102 | | | | 108 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: DUP - Surrogate Corrected

| Field ID | 02-L01-01-PHC-S | 02-L01-01-PHC-S DUP | | | 02-N10-01-PHC-S | 02-N10-01-PHC-S DUP | | |
|---------------------|-----------------|---------------------|-----|---|-----------------|---------------------|-----|--|
| Sample Type | N | DUP | | | N | DUP | | |
| Matrix | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT | | |
| Sample Size | 23.63 g | 23.65 g | | | 17.49 g | 17.46 g | | |
| Weight Basis | DRY | DRY | | | DRY | DRY | | |
| Associated Blank | EB-S-63PB | EB-S-63PB | | | DY-S-66PB | DY-S-66PB | | |
| Field Date | 07/31/02 | 07/31/02 | | | 08/02/02 | 08/02/02 | | |
| Extract Date | 02/21/03 | 02/21/03 | | | 10/16/02 | 10/16/02 | | |
| Analysis Date | 03/03/03 | 03/03/03 | | | 10/25/02 | 10/25/02 | | |
| Date Received | 08/15/02 | 08/15/02 | | | 08/15/02 | 08/15/02 | | |
| Percent Solids | 78.6 | 78.6 | | | 57.2 | 57.2 | | |
| Dilution Factor | 1 | 1 | | | 1 | 1 | | |
| Percent Lipids | NA | NA | | | NA | NA | | |
| Min Reporting Limit | 0.021 | 0.021 | | | 0.028 | 0.029 | | |
| Units | mg/Kg | mg/Kg | RPD | Q | mg/Kg | mg/Kg | RPD | |
| SHC/TPH | | | | | | | | |
| n-Nonane | ND | ND | | | 0.007 J | 0.0062 J | 12 | |
| n-Decane | 0.0023 J | 0.002 J | 14 | | 0.016 J | 0.014 J | 13 | |
| n-Undecane | 0.0019 J | 0.0022 J | 15 | | 0.022 J | 0.019 J | 15 | |
| n-Dodecane | 0.0051 J | 0.0036 J | 34 | | 0.03 | 0.025 J | 18 | |
| n-Tridecane | 0.005 J | 0.0045 J | 10 | | 0.038 | 0.034 | 11 | |
| Isoprenoid RRT 1380 | 0.002 J | 0.0015 J | 28 | | 0.012 J | 0.01 J | 18 | |
| n-Tetradecane | 0.0052 J | 0.005 J | 3.9 | | 0.045 | 0.043 | 4.5 | |
| Isoprenoid RRT 1470 | 0.0038 J | 0.0033 J | 14 | | 0.029 | 0.026 J | 11 | |
| n-Pentadecane | 0.0076 J | 0.0069 J | 9.6 | | 0.062 | 0.059 | 5 | |
| n-Hexadecane | 0.01 J | 0.0098 J | 2 | | 0.059 B | 0.055 B | 7 | |
| Isoprenoid RRT 1650 | 0.0038 J | 0.0027 J | 34 | | 0.028 | 0.025 J | 11 | |
| n-Heptadecane | 0.015 J | 0.014 J | 6.9 | | 0.096 | 0.091 | 5.3 | |
| Pristane | 0.0086 J | 0.0078 J | 9.8 | | 0.069 | 0.064 | 7.5 | |
| n-Octadecane | 0.012 J | 0.011 J | 8.7 | | 0.068 | 0.063 | 7.6 | |
| Phytane | 0.0055 J | 0.004 J | 32 | | 0.028 | 0.026 J | 7.4 | |
| n-Nonadecane | 0.015 J | 0.013 J | 14 | | 0.11 | 0.11 | 0 | |
| n-Eicosane | 0.016 J | 0.014 J | 13 | | 0.1 | 0.096 | 4.1 | |
| n-Heneicosane | 0.022 | 0.02 J | 9.5 | | 0.19 | 0.18 | 5.4 | |
| n-Docosane | 0.019 J | 0.018 J | 5.4 | | 0.15 | 0.14 | 6.9 | |
| n-Tricosane | 0.039 | 0.039 | 0 | | 0.39 | 0.37 | 5.3 | |
| n-Tetracosane | 0.022 | 0.02 J | 9.5 | | 0.14 | 0.14 | 0 | |
| n-Pentacosane | 0.046 | 0.047 | 2.2 | | 0.39 | 0.38 | 2.6 | |
| n-Hexacosane | 0.024 B | 0.022 B | 8.7 | | 0.11 | 0.13 | 17 | |
| n-Heptacosane | 0.066 | 0.067 | 1.5 | | 0.53 | 0.53 | 0 | |
| n-Octacosane | 0.022 B | 0.02 JB | 9.5 | | 0.091 | 0.11 | 19 | |
| n-Nonacosane | 0.054 | 0.057 | 5.4 | | 0.41 | 0.41 | 0 | |
| n-Triacontane | 0.015 JB | 0.012 JB | 22 | | 0.28 | 0.31 | 10 | |
| n-Hentriacontane | 0.045 | 0.041 | 9.3 | | 0.35 | 0.35 | 0 | |
| n-Dotriacontane | 0.011 JB | 0.0097 JB | 12 | | 0.027 J | 0.036 | 28 | |
| n-Tritriacontane | 0.016 JB | 0.012 JB | 28 | | 0.1 | 0.1 | 0 | |
| n-Tetratriacontane | 0.0051 JB | 0.003 JB | 52 | & | 0.012 J | 0.014 J | 15 | |
| n-Pentatriacontane | 0.0053 JB | 0.003 JB | 55 | & | 0.02 J | 0.02 J | 0 | |
| n-Hexatriacontane | 0.0031 JB | ND | | | 0.005 J | 0.0048 J | 4.1 | |
| n-Heptatriacontane | 0.0026 J | ND | | | 0.0049 J | 0.0047 J | 4.2 | |
| n-Octatriacontane | 0.0024 J | ND | | | 0.0035 J | 0.0035 J | 0 | |
| n-Tetracontane | ND | ND | | | 0.0027 J | 0.0023 J | 16 | |
| TPH (RES) | 1 B | 0.96 B | 4.1 | | 6.1 | 5.9 | 3.3 | |
| TPH | 2.9 | 4.7 | 47 | & | 11 | 9.8 | 12 | |
| %ortho-terphenyl | NA | NA | | | NA | NA | | |
| %5A-androstane | 76 | 79 | | | 93 | 96 | | |
| %d50-tetracosane | 79 | 81 | | | 96 | 99 | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: DUP - Surrogate Corrected

| Field ID | 02-N23-01-PHC-S | 02-N23-01-PHC-S DUP | | | 02-SAG-01-PHC-S | 02-SAG-01-PHC-S |
|---------------------|-----------------|---------------------|-----|---|-----------------|-----------------|
| Sample Type | N | DUP | | | N | DUP |
| Matrix | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT |
| Sample Size | 20.6 g | 20.65 g | | | 15.32 g | 15.33 g |
| Weight Basis | DRY | DRY | | | DRY | DRY |
| Associated Blank | DZ-S-03PB | DZ-S-03PB | | | DZ-S-29PB | DZ-S-29PB |
| Field Date | 08/05/02 | 08/05/02 | | | 08/14/02 | 08/14/02 |
| Extract Date | 10/28/02 | 10/28/02 | | | 10/30/02 | 10/30/02 |
| Analysis Date | 11/06/02 | 11/06/02 | | | 11/07/02 | 11/07/02 |
| Date Received | 08/15/02 | 08/15/02 | | | 08/23/02 | 08/23/02 |
| Percent Solids | 68.5 | 68.5 | | | 50.4 | 50.4 |
| Dilution Factor | 1 | 1 | | | 1 | 1 |
| Percent Lipids | NA | NA | | | NA | NA |
| Min Reporting Limit | 0.024 | 0.024 | | | 0.033 | 0.033 |
| Units | Q | mg/Kg | RPD | Q | mg/Kg | mg/Kg |
| SHC/TPH | | | | | | |
| n-Nonane | 0.0043 J | 0.0041 J | 4.8 | | 0.0034 J | 0.0035 J |
| n-Decane | 0.0094 J | 0.011 J | 16 | | 0.0098 J | 0.0083 J |
| n-Undecane | 0.012 J | 0.014 J | 15 | | 0.017 J | 0.017 J |
| n-Dodecane | 0.02 J | 0.022 J | 9.5 | | 0.03 J | 0.029 J |
| n-Tridecane | 0.029 | 0.03 | 3.4 | | 0.047 | 0.046 |
| Isoprenoid RRT 1380 | 0.0084 J | 0.0086 J | 2.4 | | 0.014 J | 0.014 J |
| n-Tetradecane | 0.035 | 0.034 | 2.9 | | 0.06 | 0.059 |
| Isoprenoid RRT 1470 | 0.02 J | 0.02 J | 0 | | 0.039 | 0.039 |
| n-Pentadecane | 0.049 | 0.048 | 2.1 | | 0.13 | 0.13 |
| n-Hexadecane | 0.047 | 0.047 | 0 | | 0.1 | 0.083 |
| Isoprenoid RRT 1650 | 0.023 J | 0.021 J | 9.1 | | 0.029 J | 0.03 J |
| n-Heptadecane | 0.068 | 0.065 | 4.5 | | 0.22 | 0.21 |
| Pristane | 0.056 | 0.056 | 0 | | 0.081 | 0.086 |
| n-Octadecane | 0.051 | 0.053 | 3.8 | | 0.086 | 0.083 |
| Phytane | 0.028 | 0.026 | 7.4 | | 0.027 J | 0.026 J |
| n-Nonadecane | 0.083 | 0.081 | 2.4 | | 0.16 | 0.16 |
| n-Eicosane | 0.081 | 0.076 | 6.4 | | 0.14 | 0.14 |
| n-Heneicosane | 0.14 | 0.15 | 6.9 | | 0.29 | 0.29 |
| n-Docosane | 0.11 | 0.12 | 8.7 | | 0.22 | 0.21 |
| n-Tricosane | 0.25 | 0.26 | 3.9 | | 0.58 | 0.61 |
| n-Tetracosane | 0.11 | 0.11 | 0 | | 0.19 | 0.21 |
| n-Pentacosane | 0.29 | 0.29 | 0 | | 0.67 | 0.87 |
| n-Hexacosane | 0.094 B | 0.096 B | 2.1 | | 0.15 | 0.19 |
| n-Heptacosane | 0.44 | 0.44 | 0 | | 0.96 | 1.2 |
| n-Octacosane | 0.084 B | 0.086 B | 2.4 | | 0.12 B | 0.15 |
| n-Nonacosane | 0.42 | 0.41 | 2.4 | | 0.7 | 0.78 |
| n-Triacontane | 0.05 B | 0.054 B | 7.7 | | 0.24 | 0.25 |
| n-Hentriacontane | 0.36 | 0.35 | 2.8 | | 0.59 | 0.63 |
| n-Dotriacontane | 0.03 B | 0.031 B | 3.3 | | 0.045 B | 0.053 |
| n-Tritriacontane | 0.11 | 0.11 | 0 | | 0.18 | 0.19 |
| n-Tetratriacontane | 0.011 JB | 0.012 JB | 8.7 | | 0.018 J | 0.019 J |
| n-Pentatriacontane | 0.021 J | 0.021 J | 0 | | 0.051 | 0.053 |
| n-Hexatriacontane | 0.0048 J | 0.0049 J | 2.1 | | 0.008 J | 0.0086 J |
| n-Heptatriacontane | 0.0056 J | 0.0056 J | 0 | | 0.0086 J | 0.0086 J |
| n-Octatriacontane | 0.0042 J | 0.004 J | 4.9 | | 0.0068 J | 0.0061 J |
| n-Tetracontane | 0.0026 J | 0.0029 J | 11 | | 0.0046 J | 0.005 J |
| TPH (RES) | 5.1 | 4.9 | 4 | | 9.5 | 10 |
| TPH | 9.6 | 8.9 | 7.6 | | 18 | 18 |
| %ortho-terphenyl | NA | NA | | | NA | NA |
| %5A-androstane | 95 | 94 | | | 97 | 100 |
| %d50-tetracosane | 105 | 106 | | | 103 | 109 |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: DUP - Surrogate Corrected

| Field ID | | 02-L09-01-PHC-S | 02-L09-01-PHC-S DUP | | |
|---------------------|-------|-----------------|---------------------|-------|---|
| Sample Type | | N | DUP | | |
| Matrix | | SEDIMENT | SEDIMENT | | |
| Sample Size | | 23.63 g | 23.63 g | | |
| Weight Basis | | DRY | DRY | | |
| Associated Blank | | DZ-S-65PB | DZ-S-65PB | | |
| Field Date | | 07/30/02 | 07/30/02 | | |
| Extract Date | | 11/20/02 | 11/20/02 | | |
| Analysis Date | | 11/26/02 | 11/27/02 | | |
| Date Received | | 08/15/02 | 08/15/02 | | |
| Percent Solids | | 78.7 | 78.7 | | |
| Dilution Factor | | 1 | 1 | | |
| Percent Lipids | | NA | NA | | |
| Min Reporting Limit | | 0.021 | 0.021 | | |
| Units | RPD Q | mg/Kg | mg/Kg | RPD Q | |
| SHC/TPH | | | | | |
| n-Nonane | 2.9 | 0.0012 J | 0.0014 J | 15 | |
| n-Decane | 16 | 0.0036 JB | 0.0036 JB | 0 | |
| n-Undecane | 0 | 0.0032 JB | 0.0038 JB | 17 | |
| n-Dodecane | 3.4 | 0.0049 JB | 0.0062 JB | 23 | |
| n-Tridecane | 2.2 | 0.006 JB | 0.0069 JB | 14 | |
| Isoprenoid RRT 1380 | 0 | 0.0022 J | 0.0024 J | 8.7 | |
| n-Tetradecane | 1.7 | 0.0086 JB | 0.0091 JB | 5.6 | |
| Isoprenoid RRT 1470 | 0 | 0.0056 J | 0.0057 J | 1.8 | |
| n-Pentadecane | 0 | 0.011 J | 0.011 J | 0 | |
| n-Hexadecane | 18 | 0.032 B | 0.023 B | 33 | |
| Isoprenoid RRT 1650 | 3.4 | 0.0065 J | 0.0068 J | 4.5 | |
| n-Heptadecane | 4.6 | 0.016 J | 0.016 J | 0 | |
| Pristane | 6 | 0.014 J | 0.012 J | 15 | |
| n-Octadecane | 3.6 | 0.013 J | 0.013 J | 0 | |
| Phytane | 3.8 | 0.0055 J | 0.005 J | 9.5 | |
| n-Nonadecane | 0 | 0.019 J | 0.02 J | 5.1 | |
| n-Eicosane | 0 | 0.03 | 0.042 | 33 | |
| n-Heneicosane | 0 | 0.03 | 0.053 | 55 | & |
| n-Docosane | 4.6 | 0.026 | 0.042 | 47 | & |
| n-Tricosane | 5 | 0.055 B | 0.064 | 15 | |
| n-Tetracosane | 10 | 0.032 B | 0.044 B | 32 | |
| n-Pentacosane | 26 | 0.072 B | 0.085 B | 16 | |
| n-Hexacosane | 24 | 0.044 B | 0.058 B | 27 | |
| n-Heptacosane | 22 | 0.1 B | 0.12 B | 18 | |
| n-Octacosane | 22 | 0.048 B | 0.064 B | 28 | |
| n-Nonacosane | 11 | 0.083 B | 0.1 B | 18 | |
| n-Triacontane | 4.1 | 0.055 B | 0.066 B | 18 | |
| n-Hentriacontane | 6.6 | 0.066 B | 0.076 B | 14 | |
| n-Dotriacontane | 16 | 0.017 JB | 0.026 B | 42 | & |
| n-Tritriacontane | 5.4 | 0.019 JB | 0.024 B | 23 | |
| n-Tetratriacontane | 5.4 | 0.0054 JB | 0.007 JB | 26 | |
| n-Pentatriacontane | 3.8 | 0.0047 JB | 0.0055 JB | 16 | |
| n-Hexatriacontane | 7.2 | 0.0018 JB | 0.0018 JB | 0 | |
| n-Heptatriacontane | 0 | 0.0013 JB | 0.0012 JB | 8 | |
| n-Octatriacontane | 11 | ND | ND | | |
| n-Tetracontane | 8.3 | ND | ND | | |
| TPH (RES) | 5.1 | 1.5 B | 1.6 B | 6.4 | |
| TPH | 0 | 2 B | 2 B | 0 | |
| %ortho-terphenyl | | NA | NA | | |
| %5A-androstane | | 75 | 71 | | |
| %d50-tetracosane | | 80 | 76 | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | |
|---------------------|---------------------------|------|--------|---|---------------------------|------|--------|---|---------------------------|------|
| Sample Type | ORS | | | | ORS | | | | ORS | |
| Matrix | OIL | | | | OIL | | | | OIL | |
| Sample Size | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | |
| Weight Basis | OIL | | | | WET | | | | OIL | |
| Associated Blank | NA | | | | NA | | | | NA | |
| Field Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | |
| Extract Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | |
| Analysis Date | 02/26/03 | | | | 03/03/03 | | | | 10/24/02 | |
| Date Received | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | |
| Percent Solids | NA | | | | NA | | | | NA | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | |
| Percent Lipids | NA | | | | NA | | | | NA | |
| Min Reporting Limit | 0.199 | | | | 0.199 | | | | 0.199 | |
| Units | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T |
| SHC/TPH | | | | | | | | | | |
| n-Nonane | 5.62 | 4.8 | 17.1 | | 5.18 | 4.8 | 7.92 | | 5.23 | 4.8 |
| n-Decane | 4.51 | 4.2 | 7.38 | | 4.37 | 4.2 | 4.05 | | 4.41 | 4.2 |
| n-Undecane | 4.77 | 4.3 | 10.9 | | 4.66 | 4.3 | 8.37 | | 4.24 | 4.3 |
| n-Dodecane | 4.27 | 4 | 6.75 | | 4.07 | 4 | 1.75 | | 4.13 | 4 |
| n-Tridecane | 4.31 | 4 | 7.75 | | 3.9 | 4 | -2.5 | | 3.64 | 4 |
| Isoprenoid RRT 1380 | 1.04 | 1 | 4 | | 1.1 | 1 | 10 | | 1.3 | 1 |
| n-Tetradecane | 4.78 | 4.2 | 13.8 | | 4.78 | 4.2 | 13.8 | | 4.69 | 4.2 |
| Isoprenoid RRT 1470 | 1.58 | 1.4 | 12.8 | | 1.47 | 1.4 | 5 | | 1.53 | 1.4 |
| n-Pentadecane | 4.14 | 3.7 | 11.9 | | 4.09 | 3.7 | 10.5 | | 3.53 | 3.7 |
| n-Hexadecane | 3.52 | 3.2 | 10 | | 3.24 | 3.2 | 1.25 | | 3.38 | 3.2 |
| Isoprenoid RRT 1650 | 1.6 | 1.5 | 6.67 | | 1.39 | 1.5 | -7.33 | | 1.5 | 1.5 |
| n-Heptadecane | 3.48 | 3.2 | 8.75 | | 3.5 | 3.2 | 9.37 | | 3 | 3.2 |
| Pristane | 2.14 | 2.2 | -2.73 | | 2.26 | 2.2 | 2.73 | | 2.33 | 2.2 |
| n-Octadecane | 2.8 | 2.9 | -3.45 | | 2.83 | 2.9 | -2.41 | | 2.43 | 2.9 |
| Phytane | 1.51 | 1.6 | -5.62 | | 1.55 | 1.6 | -3.12 | | 1.41 | 1.6 |
| n-Nonadecane | 2.46 | 2.6 | -5.38 | | 2.41 | 2.6 | -7.31 | | 2.28 | 2.6 |
| n-Eicosane | 2.56 | 2.7 | -5.18 | | 2.54 | 2.7 | -5.92 | | 2.37 | 2.7 |
| n-Heneicosane | 2.31 | 2.4 | -3.75 | | 2.24 | 2.4 | -6.67 | | 2.21 | 2.4 |
| n-Docosane | 2.24 | 2.2 | 1.82 | | 2.19 | 2.2 | -0.454 | | 2.33 | 2.2 |
| n-Tricosane | 2.15 | 2 | 7.5 | | 2.09 | 2 | 4.5 | | 2.05 | 2 |
| n-Tetracosane | 1.96 | 2 | -2 | | 1.9 | 2 | -5 | | 1.88 | 2 |
| n-Pentacosane | 1.69 | 1.7 | -0.588 | | 1.66 | 1.7 | -2.35 | | 1.73 | 1.7 |
| n-Hexacosane | 1.51 | 1.5 | 0.667 | | 1.47 | 1.5 | -2 | | 1.53 | 1.5 |
| n-Heptacosane | 1.25 | 1.2 | 4.17 | | 1.22 | 1.2 | 1.67 | | 1.1 | 1.2 |
| n-Octacosane | 0.967 | 0.88 | 9.89 | | 0.918 | 0.88 | 4.32 | | 0.94 | 0.88 |
| n-Nonacosane | 0.842 | 0.81 | 3.95 | | 0.834 | 0.81 | 2.96 | | 0.732 | 0.81 |
| n-Triacontane | 0.663 | 0.65 | 2 | | 0.66 | 0.65 | 1.54 | | 0.641 | 0.65 |
| n-Hentriacontane | 0.589 | 0.58 | 1.55 | | 0.569 | 0.58 | -1.9 | | 0.58 | 0.58 |
| n-Dotriacontane | 0.448 | 0.44 | 1.82 | | 0.448 | 0.44 | 1.82 | | 0.408 | 0.44 |
| n-Tritriacontane | 0.368 | 0.4 | -8 | | 0.36 | 0.4 | -10 | | 0.383 | 0.4 |
| n-Tetratriacontane | 0.369 | 0.35 | 5.43 | | 0.374 | 0.35 | 6.86 | | 0.342 | 0.35 |
| n-Pentatriacontane | 0.35 | 0.35 | 0 | | 0.327 | 0.35 | -6.57 | | 0.441 | 0.35 |
| n-Hexatriacontane | 0.198 J | 0.23 | -13.9 | | 0.216 | 0.23 | -6.09 | | 0.233 | 0.23 |
| n-Heptatriacontane | 0.23 | 0.23 | 0 | | 0.257 | 0.23 | 11.7 | | 0.234 | 0.23 |
| n-Octatriacontane | 0.225 | 0.22 | 2.27 | | 0.215 | 0.22 | -2.27 | | 0.23 | 0.22 |
| n-Tetracontane | 0.18 J | 0.19 | -5.26 | | 0.187 J | 0.19 | -1.58 | | 0.177 J | 0.19 |
| TPH (RES) | 198 | 220 | -10 | | 195 | 220 | -11.4 | | 184 | 220 |
| TPH | 661 | 660 | 0.152 | | 634 | 660 | -3.94 | | 632 | 660 |
| %ortho-terphenyl | 104 | | | | 105 | | | | 97 | |
| %5A-androstane | 104 | | | | 105 | | | | 96 | |
| %d50-tetracosane | 102 | | | | 104 | | | | 101 | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: ORS - Surrogate Corrected

| | | | Oil Reference | | | | | | | | Oil Reference | | | | |
|---------------------|-------|---|---------------|----------|------|-------|---|--|---------|------|---------------|----------|--|-------|--|
| Field ID | | | | Standard | | | | | | | | Standard | | | |
| Sample Type | | | | ORS | | | | | | | | ORS | | | |
| Matrix | | | | OIL | | | | | | | | OIL | | | |
| Sample Size | | | | 5.02 mg | | | | | | | | 5.02 mg | | | |
| Weight Basis | | | | OIL | | | | | | | | OIL | | | |
| Associated Blank | | | | NA | | | | | | | | NA | | | |
| Field Date | | | | 05/16/02 | | | | | | | | 05/16/02 | | | |
| Extract Date | | | | 05/16/02 | | | | | | | | 05/16/02 | | | |
| Analysis Date | | | | 10/24/02 | | | | | | | | 11/04/02 | | | |
| Date Received | | | | 05/16/02 | | | | | | | | 05/16/02 | | | |
| Percent Solids | | | | NA | | | | | | | | NA | | | |
| Dilution Factor | | | | 1 | | | | | | | | 1 | | | |
| Percent Lipids | | | | NA | | | | | | | | NA | | | |
| Min Reporting Limit | | | | 0.199 | | | | | | | | 0.199 | | | |
| Units | %D | Q | | ug/mg | T | %D | Q | | ug/mg | T | %D | Q | | ug/mg | |
| SHC/TPH | | | | | | | | | | | | | | | |
| n-Nonane | 8.96 | | | 5.18 | 4.8 | 7.92 | | | 5.14 | 4.8 | 7.08 | | | 5.24 | |
| n-Decane | 5 | | | 4.26 | 4.2 | 1.43 | | | 4.32 | 4.2 | 2.86 | | | 4.31 | |
| n-Undecane | -1.4 | | | 4.3 | 4.3 | 0 | | | 4.18 | 4.3 | -2.79 | | | 4.31 | |
| n-Dodecane | 3.25 | | | 4.14 | 4 | 3.5 | | | 4.14 | 4 | 3.5 | | | 4.23 | |
| n-Tridecane | -9 | | | 3.79 | 4 | -5.25 | | | 3.66 | 4 | -8.5 | | | 3.89 | |
| Isoprenoid RRT 1380 | 30 | | | 1.3 | 1 | 30 | | | 1.26 | 1 | 26 | | | 1.27 | |
| n-Tetradecane | 11.7 | | | 4.6 | 4.2 | 9.52 | | | 4.35 | 4.2 | 3.57 | | | 4.58 | |
| Isoprenoid RRT 1470 | 9.28 | | | 1.52 | 1.4 | 8.57 | | | 1.46 | 1.4 | 4.28 | | | 1.47 | |
| n-Pentadecane | -4.59 | | | 3.54 | 3.7 | -4.32 | | | 3.61 | 3.7 | -2.43 | | | 3.48 | |
| n-Hexadecane | 5.62 | | | 3.39 | 3.2 | 5.94 | | | 3.35 | 3.2 | 4.69 | | | 3.42 | |
| Isoprenoid RRT 1650 | 0 | | | 1.68 | 1.5 | 12 | | | 1.47 | 1.5 | -2 | | | 1.66 | |
| n-Heptadecane | -6.25 | | | 2.86 | 3.2 | -10.6 | | | 2.76 | 3.2 | -13.8 | | | 2.92 | |
| Pristane | 5.91 | | | 2.05 | 2.2 | -6.82 | | | 2.03 | 2.2 | -7.73 | | | 2.09 | |
| n-Octadecane | -16.2 | | | 2.76 | 2.9 | -4.83 | | | 2.47 | 2.9 | -14.8 | | | 2.61 | |
| Phytane | -11.9 | | | 1.36 | 1.6 | -15 | | | 1.43 | 1.6 | -10.6 | | | 1.37 | |
| n-Nonadecane | -12.3 | | | 2.43 | 2.6 | -6.54 | | | 2.37 | 2.6 | -8.85 | | | 2.4 | |
| n-Eicosane | -12.2 | | | 2.59 | 2.7 | -4.07 | | | 2.42 | 2.7 | -10.4 | | | 2.35 | |
| n-Heneicosane | -7.92 | | | 2.22 | 2.4 | -7.5 | | | 2.36 | 2.4 | -1.67 | | | 2.2 | |
| n-Docosane | 5.91 | | | 2.2 | 2.2 | 0 | | | 2.33 | 2.2 | 5.91 | | | 2.22 | |
| n-Tricosane | 2.5 | | | 2.05 | 2 | 2.5 | | | 2.07 | 2 | 3.5 | | | 2.02 | |
| n-Tetracosane | -6 | | | 1.89 | 2 | -5.5 | | | 1.92 | 2 | -4 | | | 1.84 | |
| n-Pentacosane | 1.76 | | | 1.62 | 1.7 | -4.7 | | | 1.74 | 1.7 | 2.35 | | | 1.63 | |
| n-Hexacosane | 2 | | | 1.46 | 1.5 | -2.67 | | | 1.55 | 1.5 | 3.33 | | | 1.45 | |
| n-Heptacosane | -8.33 | | | 1.09 | 1.2 | -9.17 | | | 1.08 | 1.2 | -10 | | | 1.08 | |
| n-Octacosane | 6.82 | | | 0.922 | 0.88 | 4.77 | | | 0.924 | 0.88 | 5 | | | 0.901 | |
| n-Nonacosane | -9.63 | | | 0.758 | 0.81 | -6.42 | | | 0.728 | 0.81 | -10.1 | | | 0.773 | |
| n-Triacontane | -1.38 | | | 0.671 | 0.65 | 3.23 | | | 0.672 | 0.65 | 3.38 | | | 0.662 | |
| n-Hentriacontane | 0 | | | 0.748 | 0.58 | 29 | | | 0.591 | 0.58 | 1.9 | | | 0.76 | |
| n-Dotriacontane | -7.27 | | | 0.427 | 0.44 | -2.95 | | | 0.422 | 0.44 | -4.09 | | | 0.429 | |
| n-Tritriacontane | -4.25 | | | 0.375 | 0.4 | -6.25 | | | 0.35 | 0.4 | -12.5 | | | 0.38 | |
| n-Tetraatriacontane | -2.28 | | | 0.365 | 0.35 | 4.28 | | | 0.34 | 0.35 | -2.86 | | | 0.318 | |
| n-Pentatriacontane | 26 | | | 0.377 | 0.35 | 7.71 | | | 0.418 | 0.35 | 19.4 | | | 0.398 | |
| n-Hexatriacontane | 1.3 | | | 0.28 | 0.23 | 21.7 | | | 0.235 | 0.23 | 2.17 | | | 0.285 | |
| n-Heptatriacontane | 1.74 | | | 0.24 | 0.23 | 4.35 | | | 0.23 | 0.23 | 0 | | | 0.229 | |
| n-Octatriacontane | 4.54 | | | 0.226 | 0.22 | 2.73 | | | 0.219 | 0.22 | -0.454 | | | 0.216 | |
| n-Tetracontane | -6.84 | | | 0.18 J | 0.19 | -5.26 | | | 0.161 J | 0.19 | -15.3 | | | 0.195 | |
| TPH (RES) | -16.4 | | | 171 | 220 | -22.3 | | | 183 | 220 | -16.8 | | | 172 | |
| TPH | -4.24 | | | 628 | 660 | -4.85 | | | 621 | 660 | -5.91 | | | 632 | |
| | | | | 97 | | | | | 100 | | | | | 95 | |
| %ortho-terphenyl | | | | 98 | | | | | 98 | | | | | 99 | |
| %5A-androstane | | | | 102 | | | | | 103 | | | | | 101 | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: ORS - Surrogate Corrected

| | | | | Oil Reference | | | | Oil Reference | | | |
|---------------------|--------|--------|---|---------------|------|--------|---|---------------|------|--------|---|
| Field ID | | | | Standard | | | | Standard | | | |
| Sample Type | | | | ORS | | | | ORS | | | |
| Matrix | | | | OIL | | | | OIL | | | |
| Sample Size | mg | | | 5.02 mg | | | | 5.02 mg | | | |
| Weight Basis | | | | OIL | | | | OIL | | | |
| Associated Blank | | | | NA | | | | NA | | | |
| Field Date | | | | 05/16/02 | | | | 05/16/02 | | | |
| Extract Date | | | | 05/16/02 | | | | 05/16/02 | | | |
| Analysis Date | | | | 11/06/02 | | | | 11/06/02 | | | |
| Date Received | | | | 05/16/02 | | | | 05/16/02 | | | |
| Percent Solids | | | | NA | | | | NA | | | |
| Dilution Factor | | | | 1 | | | | 1 | | | |
| Percent Lipids | | | | NA | | | | NA | | | |
| Min Reporting Limit | | | | 0.199 | | | | 0.199 | | | |
| Units | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | Q |
| SHC/TPH | | | | | | | | | | | |
| n-Nonane | 4.8 | 9.17 | | 5.08 | 4.8 | 5.83 | | 5.12 | 4.8 | 6.67 | |
| n-Decane | 4.2 | 2.62 | | 4.34 | 4.2 | 3.33 | | 4.38 | 4.2 | 4.28 | |
| n-Undecane | 4.3 | 0.232 | | 4.15 | 4.3 | -3.49 | | 4.23 | 4.3 | -1.63 | |
| n-Dodecane | 4 | 5.75 | | 4.14 | 4 | 3.5 | | 4.16 | 4 | 4 | |
| n-Tridecane | 4 | -2.75 | | 3.64 | 4 | -9 | | 3.8 | 4 | -5 | |
| Isoprenoid RRT 1380 | 1 | 27 | | 1.25 | 1 | 25 | | 1.26 | 1 | 26 | |
| n-Tetradecane | 4.2 | 9.05 | | 4.62 | 4.2 | 10 | | 4.51 | 4.2 | 7.38 | |
| Isoprenoid RRT 1470 | 1.4 | 5 | | 1.35 | 1.4 | -3.57 | | 1.45 | 1.4 | 3.57 | |
| n-Pentadecane | 3.7 | -5.94 | | 3.6 | 3.7 | -2.7 | | 3.52 | 3.7 | -4.86 | |
| n-Hexadecane | 3.2 | 6.87 | | 3.34 | 3.2 | 4.37 | | 3.46 | 3.2 | 8.12 | |
| Isoprenoid RRT 1650 | 1.5 | 10.7 | | 1.48 | 1.5 | -1.33 | | 1.65 | 1.5 | 10 | |
| n-Heptadecane | 3.2 | -8.75 | | 2.79 | 3.2 | -12.8 | | 2.85 | 3.2 | -10.9 | |
| Pristane | 2.2 | -5 | | 2.29 | 2.2 | 4.09 | | 1.98 | 2.2 | -10 | |
| n-Octadecane | 2.9 | -10 | | 2.43 | 2.9 | -16.2 | | 2.56 | 2.9 | -11.7 | |
| Phytane | 1.6 | -14.4 | | 1.43 | 1.6 | -10.6 | | 1.33 | 1.6 | -16.9 | |
| n-Nonadecane | 2.6 | -7.69 | | 2.31 | 2.6 | -11.2 | | 2.39 | 2.6 | -8.08 | |
| n-Eicosane | 2.7 | -13 | | 2.39 | 2.7 | -11.5 | | 2.51 | 2.7 | -7.04 | |
| n-Heneicosane | 2.4 | -8.33 | | 2.24 | 2.4 | -6.67 | | 2.22 | 2.4 | -7.5 | |
| n-Docosane | 2.2 | 0.909 | | 2.31 | 2.2 | 5 | | 2.2 | 2.2 | 0 | |
| n-Tricosane | 2 | 1 | | 2.1 | 2 | 5 | | 2.02 | 2 | 1 | |
| n-Tetracosane | 2 | -8 | | 1.89 | 2 | -5.5 | | 1.88 | 2 | -6 | |
| n-Pentacosane | 1.7 | -4.12 | | 1.75 | 1.7 | 2.94 | | 1.62 | 1.7 | -4.7 | |
| n-Hexacosane | 1.5 | -3.33 | | 1.54 | 1.5 | 2.67 | | 1.46 | 1.5 | -2.67 | |
| n-Heptacosane | 1.2 | -10 | | 1.08 | 1.2 | -10 | | 1.08 | 1.2 | -10 | |
| n-Octacosane | 0.88 | 2.39 | | 0.934 | 0.88 | 6.14 | | 0.893 | 0.88 | 1.48 | |
| n-Nonacosane | 0.81 | -4.57 | | 0.716 | 0.81 | -11.6 | | 0.773 | 0.81 | -4.57 | |
| n-Triacontane | 0.65 | 1.85 | | 0.64 | 0.65 | -1.54 | | 0.685 | 0.65 | 5.38 | |
| n-Hentriacontane | 0.58 | 31 | | 0.581 | 0.58 | 0.172 | | 0.747 | 0.58 | 28.8 | |
| n-Dotriacontane | 0.44 | -2.5 | | 0.417 | 0.44 | -5.23 | | 0.415 | 0.44 | -5.68 | |
| n-Tritriacontane | 0.4 | -5 | | 0.394 | 0.4 | -1.5 | | 0.348 | 0.4 | -13 | |
| n-Tetratriacontane | 0.35 | -9.14 | | 0.377 | 0.35 | 7.71 | | 0.35 | 0.35 | 0 | |
| n-Pentatriacontane | 0.35 | 13.7 | | 0.44 | 0.35 | 25.7 | | 0.392 | 0.35 | 12 | |
| n-Hexatriacontane | 0.23 | 23.9 | | 0.225 | 0.23 | -2.17 | | 0.27 | 0.23 | 17.4 | |
| n-Heptatriacontane | 0.23 | -0.435 | | 0.23 | 0.23 | 0 | | 0.229 | 0.23 | -0.435 | |
| n-Octatriacontane | 0.22 | -1.82 | | 0.218 | 0.22 | -0.909 | | 0.225 | 0.22 | 2.27 | |
| n-Tetracontane | J 0.19 | 2.63 | | 0.15 J | 0.19 | -21 | | 0.192 J | 0.19 | 1.05 | |
| TPH (RES) | 220 | -21.8 | | 182 | 220 | -17.3 | | 171 | 220 | -22.3 | |
| TPH | 660 | -4.24 | | 538 | 660 | -18.5 | | 621 | 660 | -5.91 | |
| | | | | 99 | | | | 96 | | | |
| %ortho-terphenyl | | | | 97 | | | | 95 | | | |
| %5A-androstane | | | | 103 | | | | 101 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | Oil Reference Standard | | | |
|---------------------|---------------------------|------|-------|---|---------------------------|------|-------|---|---------------------------|------|-------|--|
| Sample Type | ORS | | | | ORS | | | | ORS | | | |
| Matrix | OIL | | | | OIL | | | | OIL | | | |
| Sample Size | 5.02 mg | | | | 5.02 mg | | | | 5.02 mg | | | |
| Weight Basis | OIL | | | | OIL | | | | OIL | | | |
| Associated Blank | NA | | | | NA | | | | NA | | | |
| Field Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Extract Date | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Analysis Date | 11/25/02 | | | | 11/25/02 | | | | 12/10/02 | | | |
| Date Received | 05/16/02 | | | | 05/16/02 | | | | 05/16/02 | | | |
| Percent Solids | NA | | | | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 0.199 | | | | 0.199 | | | | 0.199 | | | |
| Units | ug/mg | T | %D | Q | ug/mg | T | %D | Q | ug/mg | T | %D | |
| SHC/TPH | | | | | | | | | | | | |
| n-Nonane | 5.11 | 4.8 | 6.46 | | 5.29 | 4.8 | 10.2 | | 5.19 | 4.8 | 8.12 | |
| n-Decane | 4.27 | 4.2 | 1.67 | | 4.35 | 4.2 | 3.57 | | 4.23 | 4.2 | 0.714 | |
| n-Undecane | 4.19 | 4.3 | -2.56 | | 4.32 | 4.3 | 0.465 | | 4.2 | 4.3 | -2.32 | |
| n-Dodecane | 4.16 | 4 | 4 | | 4.24 | 4 | 6 | | 4.1 | 4 | 2.5 | |
| n-Tridecane | 3.8 | 4 | -5 | | 3.8 | 4 | -5 | | 3.6 | 4 | -10 | |
| Isoprenoid RRT 1380 | 1.19 | 1 | 19 | | 1.34 | 1 | 34 | | 1.26 | 1 | 26 | |
| n-Tetradecane | 4.36 | 4.2 | 3.81 | | 4.58 | 4.2 | 9.05 | | 4.5 | 4.2 | 7.14 | |
| Isoprenoid RRT 1470 | 1.5 | 1.4 | 7.14 | | 1.49 | 1.4 | 6.43 | | 1.42 | 1.4 | 1.43 | |
| n-Pentadecane | 3.62 | 3.7 | -2.16 | | 3.53 | 3.7 | -4.59 | | 3.5 | 3.7 | -5.4 | |
| n-Hexadecane | 3.35 | 3.2 | 4.69 | | 3.5 | 3.2 | 9.37 | | 3.39 | 3.2 | 5.94 | |
| Isoprenoid RRT 1650 | 1.53 | 1.5 | 2 | | 1.71 | 1.5 | 14 | | 1.5 | 1.5 | 0 | |
| n-Heptadecane | 2.72 | 3.2 | -15 | | 2.76 | 3.2 | -13.8 | | 3 | 3.2 | -6.25 | |
| Pristane | 1.99 | 2.2 | -9.54 | | 2.01 | 2.2 | -8.64 | | 2.24 | 2.2 | 1.82 | |
| n-Octadecane | 2.41 | 2.9 | -16.9 | | 2.36 | 2.9 | -18.6 | | 2.47 | 2.9 | -14.8 | |
| Phytane | 1.45 | 1.6 | -9.38 | | 1.22 | 1.6 | -23.8 | | 1.41 | 1.6 | -11.9 | |
| n-Nonadecane | 2.24 | 2.6 | -13.8 | | 2.44 | 2.6 | -6.15 | | 2.28 | 2.6 | -12.3 | |
| n-Eicosane | 2.34 | 2.7 | -13.3 | | 2.39 | 2.7 | -11.5 | | 2.25 | 2.7 | -16.7 | |
| n-Heneicosane | 2.26 | 2.4 | -5.83 | | 2.23 | 2.4 | -7.08 | | 2.22 | 2.4 | -7.5 | |
| n-Docosane | 2.31 | 2.2 | 5 | | 2.28 | 2.2 | 3.64 | | 2.29 | 2.2 | 4.09 | |
| n-Tricosane | 2.04 | 2 | 2 | | 2.09 | 2 | 4.5 | | 2.07 | 2 | 3.5 | |
| n-Tetracosane | 1.89 | 2 | -5.5 | | 1.92 | 2 | -4 | | 1.94 | 2 | -3 | |
| n-Pentacosane | 1.76 | 1.7 | 3.53 | | 1.64 | 1.7 | -3.53 | | 1.79 | 1.7 | 5.29 | |
| n-Hexacosane | 1.53 | 1.5 | 2 | | 1.48 | 1.5 | -1.33 | | 1.52 | 1.5 | 1.33 | |
| n-Heptacosane | 1.09 | 1.2 | -9.17 | | 1.14 | 1.2 | -5 | | 1.12 | 1.2 | -6.67 | |
| n-Octacosane | 0.938 | 0.88 | 6.59 | | 0.936 | 0.88 | 6.36 | | 0.94 | 0.88 | 6.82 | |
| n-Nonacosane | 0.746 | 0.81 | -7.9 | | 0.781 | 0.81 | -3.58 | | 0.774 | 0.81 | -4.44 | |
| n-Triacontane | 0.641 | 0.65 | -1.38 | | 0.675 | 0.65 | 3.85 | | 0.675 | 0.65 | 3.85 | |
| n-Hentriacontane | 0.602 | 0.58 | 3.79 | | 0.753 | 0.58 | 29.8 | | 0.59 | 0.58 | 1.72 | |
| n-Dotriacontane | 0.412 | 0.44 | -6.36 | | 0.418 | 0.44 | -5 | | 0.426 | 0.44 | -3.18 | |
| n-Tritriacontane | 0.371 | 0.4 | -7.25 | | 0.358 | 0.4 | -10.5 | | 0.392 | 0.4 | -2 | |
| n-Tetratriacontane | 0.353 | 0.35 | 0.857 | | 0.384 | 0.35 | 9.71 | | 0.359 | 0.35 | 2.57 | |
| n-Pentatriacontane | 0.47 | 0.35 | 34.3 | | 0.415 | 0.35 | 18.6 | | 0.406 | 0.35 | 16 | |
| n-Hexatriacontane | 0.233 | 0.23 | 1.3 | | 0.285 | 0.23 | 23.9 | | 0.238 | 0.23 | 3.48 | |
| n-Heptatriacontane | 0.257 | 0.23 | 11.7 | | 0.244 | 0.23 | 6.09 | | 0.228 | 0.23 | -0.87 | |
| n-Octatriacontane | 0.235 | 0.22 | 6.82 | | 0.246 | 0.22 | 11.8 | | 0.217 | 0.22 | -1.36 | |
| n-Tetracontane | 0.192 J | 0.19 | 1.05 | | 0.193 J | 0.19 | 1.58 | | 0.178 J | 0.19 | -6.32 | |
| TPH (RES) | 185 | 220 | -15.9 | | 173 | 220 | -21.4 | | 204 | 220 | -7.27 | |
| TPH | 634 | 660 | -3.94 | | 633 | 660 | -4.09 | | 630 | 660 | -4.54 | |
| %ortho-terphenyl | 98 | | | | 97 | | | | 98 | | | |
| %5A-androstane | 96 | | | | 102 | | | | 98 | | | |
| %d50-tetracosane | 102 | | | | 101 | | | | 102 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4175
Data Table: ORS - Surrogate Corrected

Field ID
Sample Type
Matrix
Sample Size
Weight Basis
Associated Blank
Field Date
Extract Date
Analysis Date
Date Received
Percent Solids
Dilution Factor
Percent Lipids
Min Reporting Limit
Units Q

| SHC/TPH |
|---------------------|
| n-Nonane |
| n-Decane |
| n-Undecane |
| n-Dodecane |
| n-Tridecane |
| Isoprenoid RRT 1380 |
| n-Tetradecane |
| Isoprenoid RRT 1470 |
| n-Pentadecane |
| n-Hexadecane |
| Isoprenoid RRT 1650 |
| n-Heptadecane |
| Pristane |
| n-Octadecane |
| Phytane |
| n-Nonadecane |
| n-Eicosane |
| n-Heneicosane |
| n-Docosane |
| n-Tricosane |
| n-Tetracosane |
| n-Pentacosane |
| n-Hexacosane |
| n-Heptacosane |
| n-Octacosane |
| n-Nonacosane |
| n-Triacontane |
| n-Hentriacontane |
| n-Dotriacontane |
| n-Tritriacontane |
| n-Tetratriacontane |
| n-Pentatriacontane |
| n-Hexatriacontane |
| n-Heptatriacontane |
| n-Octatriacontane |
| n-Tetracontane |
| TPH (RES) |
| TPH |

%ortho-terphenyl
%5A-androstane
%d50-tetracosane

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control BS-BSD

| Field ID | Procedural Blank | Blank Spike | Procedural Blank | Blank Spike | Procedural Blank | Blank Spike |
|---------------------|------------------|-------------|------------------|-------------|------------------|-------------|
| Lab ID | DH-S-61PB | DH-S-62BS | DH-S-58PB | DH-S-59BS | DH-S-55PB | DH-S-56BS |
| Sample Type | PB | BS | PB | BS | PB | BS |
| Matrix | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Size | 20 g | 20 g | 20 g | 20 g | 20 g | 20 g |
| Weight Basis | DRY | DRY | DRY | DRY | DRY | DRY |
| Associated Blank | NA | DH-S-61PB | NA | DH-S-58PB | NA | DH-S-55PB |
| Field Date | 03/08/01 | 03/08/01 | 03/07/01 | 03/07/01 | 02/20/01 | 02/20/01 |
| Extract Date | 03/08/01 | 03/08/01 | 03/07/01 | 03/07/01 | 02/20/01 | 02/20/01 |
| Analysis Date | 03/16/01 | 03/17/01 | 03/14/01 | 03/14/01 | 03/02/01 | 03/02/01 |
| Date Received | 03/08/01 | 03/08/01 | 03/07/01 | 03/07/01 | 02/20/01 | 02/20/01 |
| Percent Solids | 100 | 100 | 100 | 100 | 100 | 100 |
| Percent Lipids | NA | NA | NA | NA | NA | NA |
| Min Reporting Limit | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 |
| Units | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| | | | T %R Q | | | T %R Q |
| SHC/TPH | | | | | | |
| n-Nonane | ND | ND | ND | ND | ND | ND |
| n-Decane | ND | 0.64 | 1.25 51 | ND | 0.54 | 1.25 43 & |
| n-Undecane | ND | ND | ND | ND | ND | ND |
| n-Dodecane | ND | ND | ND | ND | ND | ND |
| n-Tridecane | ND | ND | ND | ND | ND | ND |
| Isoprenoid RRT 1380 | ND | ND | ND | ND | ND | ND |
| n-Tetradecane | ND | ND | ND | 0.0017 J | ND | 0.0027 J |
| Isoprenoid RRT 1470 | ND | ND | ND | ND | ND | ND |
| n-Pentadecane | ND | 0.8 | 1.25 64 | ND | 0.75 | 1.25 60 |
| n-Hexadecane | ND | ND | ND | 0.00084 J | ND | 0.0012 J |
| Isoprenoid RRT 1650 | ND | ND | ND | ND | ND | ND |
| n-Heptadecane | ND | ND | ND | 0.00076 J | ND | ND |
| Pristane | ND | 0.94 | 1.25 75 | ND | 0.86 | 1.25 69 |
| n-Octadecane | ND | ND | ND | ND | ND | 0.0008 J |
| Phytane | ND | ND | ND | 0.0042 J | ND | 0.0088 J |
| n-Nonadecane | ND | ND | ND | ND | ND | 0.00093 J |
| n-Eicosane | ND | 1 | 1.25 80 | ND | 0.95 | 1.25 76 |
| n-Heneicosane | 0.001 J | ND | ND | 0.0012 J | 0.00092 JB | ND |
| n-Docosane | 0.0015 J | ND | ND | 0.0011 J | 0.00099 JB | 0.00098 J |
| n-Tricosane | 0.0048 J | 0.055 | ND | 0.0033 J | 0.0024 JB | 0.0025 J |
| n-Tetracosane | 0.0084 J | 0.18 | ND | 0.0027 J | 0.0039 JB | 0.0024 J |
| n-Pentacosane | 0.02 J | 1.7 | 1.25 134 & | 0.005 J | 0.98 | 1.25 78 |
| n-Hexacosane | 0.031 | 0.78 | ND | 0.0069 J | 0.0091 JB | 0.0052 J |
| n-Heptacosane | 0.042 | 1.1 | ND | 0.0092 J | 0.0076 JB | 0.0072 J |
| n-Octacosane | 0.04 | 1.1 | ND | 0.009 J | 0.0074 JB | 0.0072 J |
| n-Nonacosane | 0.039 | 1.1 | ND | 0.0094 J | 0.0094 JB | 0.0056 J |
| n-Triacontane | 0.029 | 1.9 | 1.25 150 & | 0.0059 J | 0.95 | 1.25 76 |
| n-Hentriacontane | 0.024 J | 0.66 | ND | 0.0063 J | 0.0061 JB | 0.0049 J |
| n-Dotriacontane | 0.015 J | 0.4 | ND | 0.0032 J | 0.0076 JB | 0.0049 J |
| n-Tritriacontane | 0.0093 J | 0.25 | ND | 0.002 J | 0.003 JB | 0.0015 J |
| n-Tetatriacontane | 0.0052 J | 1.3 | 1.25 104 | 0.0013 J | 0.96 | 1.25 77 |
| n-Pentatriacontane | 0.0033 J | 0.086 | ND | 0.00093 J | 0.0023 JB | ND |
| n-Hexatriacontane | 0.0018 J | 1.2 | 1.25 96 | 0.00072 J | 0.95 | 1.25 76 |
| n-Heptatriacontane | 0.0012 J | 0.028 | ND | ND | 0.00081 J | ND |
| n-Octatriacontane | ND | 0.053 | 0.00099 J | 0.00099 J | 0.0015 JB | ND |
| n-Nonatriacontane | ND | ND | ND | ND | ND | ND |
| n-Tetracontane | ND | ND | ND | ND | 0.0019 J | ND |
| TPH (RES) | 0.57 J | 18 | 0.27 J | 7.2 | 0.31 J | 14 |
| TPH | 0.57 J | 18 | 0.27 J | 7.2 | 0.31 J | 14 |
| %ortho-terphenyl | 0 & | 0 & | 0 & | 0 & | 0 & | 0 & |
| %5A-androstane | 58 | 3 & | 84 | 76 | 63 | 76 |
| %d50-tetracosane | 69 | 3 & | 108 | 86 | 84 | 85 |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference | | | | Oil Reference | | | |
|--|---------------|------|-------|---|---------------|------|--------|---|
| Sample Type | Standard | | | | Standard | | | |
| Matrix | ORS | | | | ORS | | | |
| Sample Size | OIL | | | | OIL | | | |
| Weight Basis | 5.1 mg | | | | 5.1 mg | | | |
| Associated Blank | OIL | | | | OIL | | | |
| Field Date | NA | | | | NA | | | |
| Extract Date | 04/23/02 | | | | 04/23/02 | | | |
| Analysis Date | 04/23/02 | | | | 04/23/02 | | | |
| Date Received | 10/27/02 | | | | 11/01/02 | | | |
| Percent Solids | 04/23/02 | | | | 04/23/02 | | | |
| Dilution Factor | NA | | | | NA | | | |
| Percent Lipids | 1 | | | | 1 | | | |
| Min Reporting Limit | NA | | | | NA | | | |
| Units | 4.9 | | | | 4.9 | | | |
| | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | |
| Naphthalene | 838 | 710 | 18 | | 844 | 710 | 18.9 | |
| C1-Naphthalenes | 1490 | 1600 | -6.88 | | 1590 | 1600 | -0.625 | |
| C2-Naphthalenes | 1920 | 2300 | -16.5 | | 2100 | 2300 | -8.7 | |
| C3-Naphthalenes | 1410 | 1960 | -28.1 | | 1420 | 1960 | -27.6 | |
| C4-Naphthalenes | 794 | 1180 | -32.7 | | 828 | 1180 | -29.8 | |
| Acenaphthylene | ND | | | | ND | | | |
| Acenaphthene | ND | | | | ND | | | |
| Biphenyl | 231 | 214 | 7.94 | | 232 | 214 | 8.41 | |
| Fluorene | 106 | 95.2 | 11.3 | | 102 | 95.2 | 7.14 | |
| C1-Fluorenes | 249 | 239 | 4.18 | | 248 | 239 | 3.76 | |
| C2-Fluorenes | 342 | 356 | -3.93 | | 346 | 356 | -2.81 | |
| C3-Fluorenes | 318 | 396 | -19.7 | | 324 | 396 | -18.2 | |
| Anthracene | ND | | | | ND | | | |
| Phenanthrene | 288 | 260 | 10.8 | | 282 | 260 | 8.46 | |
| C1-Phenanthrenes/anthracenes | 555 | 612 | -9.31 | | 582 | 612 | -4.9 | |
| C2-Phenanthrenes/anthracenes | 599 | 752 | -20.3 | | 600 | 752 | -20.2 | |
| C3-Phenanthrenes/anthracenes | 445 | 534 | -16.7 | | 440 | 534 | -17.6 | |
| C4-Phenanthrenes/anthracenes | 267 | 308 | -13.3 | | 276 | 308 | -10.4 | |
| Dibenzothiophene | 256 | 222 | 15.3 | | 254 | 222 | 14.4 | |
| C1-Dibenzothiophenes | 470 | 484 | -2.89 | | 490 | 484 | 1.24 | |
| C2-Dibenzothiophenes | 624 | 658 | -5.17 | | 613 | 658 | -6.84 | |
| C3-Dibenzothiophenes | 514 | 574 | -10.4 | | 532 | 574 | -7.32 | |
| Fluoranthene | ND | | | | ND | | | |
| Pyrene | 15.4 | 13.4 | 14.9 | | 14.9 | 13.4 | 11.2 | |
| C1-Fluoranthenes/pyrenes | 84.4 | 83.9 | 0.596 | | 83.3 | 83.9 | -0.715 | |
| C2-Fluoranthenes/pyrenes | 142 | 142 | 0 | | 141 | 142 | -0.704 | |
| C3-Fluoranthenes/pyrenes | 144 | 158 | -8.86 | | 144 | 158 | -8.86 | |
| Benzo[a]anthracene | ND | | | | ND | | | |
| Chrysene | 51.5 | 49.2 | 4.67 | | 51.5 | 49.2 | 4.67 | |
| C1-Chrysenes | 80.3 | 81.5 | -1.47 | | 78 | 81.5 | -4.29 | |
| C2-Chrysenes | 92.1 | 102 | -9.7 | | 100 | 102 | -1.96 | |
| C3-Chrysenes | 79.6 | 79.6 | 0 | | 65.7 | 79.6 | -17.5 | |
| C4-Chrysenes | 55.6 | 64 | -13.1 | | 58.5 | 64 | -8.59 | |
| Benzo[b]fluoranthene | 8.44 | 7.62 | 10.8 | | 6.33 | 7.62 | -16.9 | |
| Benzo[k]fluoranthene | ND | | | | ND | | | |
| Benzo[e]pyrene | 11.6 | 12.4 | -6.45 | | 11.4 | 12.4 | -8.06 | |
| Benzo[a]pyrene | ND | | | | ND | | | |
| Perylene | ND | | | | ND | | | |
| Indeno[1,2,3-c,d]pyrene | ND | | | | ND | | | |
| Dibenzo[a,h]anthracene | 1.13 J | | | | 1.24 J | | | |
| Benzo[g,h,i]perylene | 3 J | 3.18 | -5.66 | | 3.04 J | 3.18 | -4.4 | |
| d8-Naphthalene | 88 | | | | 96 | | | |
| d10-Acenaphthene | 95 | | | | 99 | | | |
| d10-Phenanthrene | 99 | | | | 100 | | | |
| d12-Benzo[a]pyrene | 111 | | | | 105 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: ORS - Surrogate Corrected

| Field ID | Oil Reference Standard | | | | Oil Reference Standard | | | | |
|-----------------------------------|------------------------|------|--------|---|------------------------|------|-------|---|--|
| Sample Type | ORS | | | | ORS | | | | |
| Matrix | OIL | | | | OIL | | | | |
| Sample Size | 5.1 mg | | | | 5.1 mg | | | | |
| Weight Basis | OIL | | | | OIL | | | | |
| Associated Blank | NA | | | | NA | | | | |
| Field Date | 04/23/02 | | | | 04/23/02 | | | | |
| Extract Date | 04/23/02 | | | | 04/23/02 | | | | |
| Analysis Date | 11/05/02 | | | | 10/29/02 | | | | |
| Date Received | 04/23/02 | | | | 04/23/02 | | | | |
| Percent Solids | NA | | | | NA | | | | |
| Dilution Factor | 1 | | | | 1 | | | | |
| Percent Lipids | NA | | | | NA | | | | |
| Min Reporting Limit | 4.9 | | | | 4.9 | | | | |
| Units | mg/Kg | T | %D | Q | mg/Kg | T | %D | Q | |
| Polynuclear Aromatic Hydro | | | | | | | | | |
| Naphthalene | 825 | 710 | 16.2 | | 760 | 710 | 7.18 | | |
| C1-Naphthalenes | 1560 | 1600 | -2.5 | | 1400 | 1600 | -9.38 | | |
| C2-Naphthalenes | 2090 | 2300 | -9.13 | | 2000 | 2300 | -10.9 | | |
| C3-Naphthalenes | 1560 | 1960 | -20.4 | | 1700 | 1960 | -13.8 | | |
| C4-Naphthalenes | 897 | 1180 | -24 | | 950 | 1180 | -19.5 | | |
| Acenaphthylene | ND | | | | ND | | | | |
| Acenaphthene | ND | | | | ND | | | | |
| Biphenyl | 230 | 214 | 7.48 | | 220 | 214 | 4.2 | | |
| Fluorene | 101 | 95.2 | 6.09 | | 100 | 95.2 | 7.14 | | |
| C1-Fluorenes | 251 | 239 | 5.02 | | 240 | 239 | 0.837 | | |
| C2-Fluorenes | 346 | 356 | -2.81 | | 340 | 356 | -3.93 | | |
| C3-Fluorenes | 349 | 396 | -11.9 | | 330 | 396 | -16.2 | | |
| Anthracene | ND | | | | ND | | | | |
| Phenanthrene | 280 | 260 | 7.69 | | 280 | 260 | 6.54 | | |
| C1-Phenanthrenes/anthracenes | 550 | 612 | -10.1 | | 600 | 612 | -1.14 | | |
| C2-Phenanthrenes/anthracenes | 606 | 752 | -19.4 | | 690 | 752 | -8.64 | | |
| C3-Phenanthrenes/anthracenes | 444 | 534 | -16.8 | | 510 | 534 | -4.31 | | |
| C4-Phenanthrenes/anthracenes | 275 | 308 | -10.7 | | 290 | 308 | -4.54 | | |
| Dibenzothiophene | 253 | 222 | 14 | | 250 | 222 | 13.1 | | |
| C1-Dibenzothiophenes | 488 | 484 | 0.826 | | 490 | 484 | 2.27 | | |
| C2-Dibenzothiophenes | 625 | 658 | -5.02 | | 690 | 658 | 5.32 | | |
| C3-Dibenzothiophenes | 514 | 574 | -10.4 | | 560 | 574 | -2.26 | | |
| Fluoranthene | ND | | | | ND | | | | |
| Pyrene | 14.1 | 13.4 | 5.22 | | 17 | 13.4 | 28.4 | | |
| C1-Fluoranthenes/pyrenes | 78.9 | 83.9 | -5.96 | | 88 | 83.9 | 4.77 | | |
| C2-Fluoranthenes/pyrenes | 143 | 142 | 0.704 | | 150 | 142 | 5.63 | | |
| C3-Fluoranthenes/pyrenes | 144 | 158 | -8.86 | | 170 | 158 | 6.96 | | |
| Benzo[a]anthracene | ND | | | | ND | | | | |
| Chrysene | 52.8 | 49.2 | 7.32 | | 54 | 49.2 | 10.6 | | |
| C1-Chrysenes | 81.6 | 81.5 | 0.123 | | 90 | 81.5 | 10.2 | | |
| C2-Chrysenes | 89.8 | 102 | -12 | | 110 | 102 | 3.92 | | |
| C3-Chrysenes | 77.4 | 79.6 | -2.76 | | 100 | 79.6 | 25.6 | | |
| C4-Chrysenes | 57 | 64 | -10.9 | | 72 | 64 | 12.2 | | |
| Benzo[b]fluoranthene | 7.58 | 7.62 | -0.525 | | 7 | 7.62 | -7.87 | | |
| Benzo[k]fluoranthene | ND | | | | ND | | | | |
| Benzo[e]pyrene | 12.1 | 12.4 | -2.42 | | 12 | 12.4 | -1.61 | | |
| Benzo[a]pyrene | ND | | | | ND | | | | |
| Perylene | ND | | | | ND | | | | |
| Indeno[1,2,3-c,d]pyrene | ND | | | | ND | | | | |
| Dibenzo[a,h]anthracene | 1.21 J | | | | 1.5 J | | | | |
| Benzo[g,h,i]perylene | 2.9 J | 3.18 | -8.8 | | 3.4 J | 3.18 | 5.66 | | |
| d8-Naphthalene | 92 | | | | 89 | | | | |
| d10-Acenaphthene | 96 | | | | 95 | | | | |
| d10-Phenanthrene | 97 | | | | 96 | | | | |
| d12-Benzo[a]pyrene | 104 | | | | 106 | | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: IRM - Surrogate Corrected

| Field ID | Instrument Reference | | | | Instrument Reference | | | |
|--|----------------------|------|-------|---|----------------------|------|-------|---|
| | Standard | | | | Standard | | | |
| Sample Type | IRM | | | | IRM | | | |
| Matrix | IRM | | | | IRM | | | |
| Sample Size | 0.1 mL | | | | 0.1 mL | | | |
| Weight Basis | WET | | | | WET | | | |
| Associated Blank | NA | | | | NA | | | |
| Field Date | 10/15/02 | | | | 10/15/02 | | | |
| Extract Date | 10/15/02 | | | | 10/15/02 | | | |
| Analysis Date | 10/27/02 | | | | 11/01/02 | | | |
| Date Received | 10/15/02 | | | | 10/15/02 | | | |
| Percent Solids | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | 250 | | | | 250 | | | |
| Units | ug/L | T | %D | Q | ug/L | T | %D | Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | |
| Naphthalene | 6940 | 6890 | 0.726 | | 6990 | 6890 | 1.45 | |
| C1-Naphthalenes | ND | | | | ND | | | |
| C2-Naphthalenes | ND | | | | ND | | | |
| C3-Naphthalenes | ND | | | | ND | | | |
| C4-Naphthalenes | ND | | | | ND | | | |
| Acenaphthylene | 6770 | 6960 | -2.73 | | 6550 | 6960 | -5.89 | |
| Acenaphthene | 6550 | 7280 | -10 | | 6560 | 7280 | -9.89 | |
| Biphenyl | 7180 | 7000 | 2.57 | | 7170 | 7000 | 2.43 | |
| Fluorene | 6320 | 7270 | -13.1 | | 6210 | 7270 | -14.6 | |
| C1-Fluorenes | ND | | | | ND | | | |
| C2-Fluorenes | ND | | | | ND | | | |
| C3-Fluorenes | ND | | | | ND | | | |
| Anthracene | 7300 | 7820 | -6.65 | | 7160 | 7820 | -8.44 | |
| Phenanthrene | 7040 | 7010 | 0.428 | | 6830 | 7010 | -2.57 | |
| C1-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C2-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C3-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| C4-Phenanthrenes/anthracenes | ND | | | | ND | | | |
| Dibenzothiophene | ND | | | | ND | | | |
| C1-Dibenzothiophenes | ND | | | | ND | | | |
| C2-Dibenzothiophenes | ND | | | | ND | | | |
| C3-Dibenzothiophenes | ND | | | | ND | | | |
| Fluoranthene | 6080 | 5910 | 2.88 | | 6080 | 5910 | 2.88 | |
| Pyrene | 5990 | 5890 | 1.7 | | 6000 | 5890 | 1.87 | |
| C1-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C2-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| C3-Fluoranthenes/pyrenes | ND | | | | ND | | | |
| Benzo[a]anthracene | 3450 | 3590 | -3.9 | | 3440 | 3590 | -4.18 | |
| Chrysene | 7460 | 7030 | 6.12 | | 7310 | 7030 | 3.98 | |
| C1-Chrysenes | ND | | | | ND | | | |
| C2-Chrysenes | ND | | | | ND | | | |
| C3-Chrysenes | ND | | | | ND | | | |
| C4-Chrysenes | ND | | | | ND | | | |
| Benzo[b]fluoranthene | 5490 | 5250 | 4.57 | | 5600 | 5250 | 6.67 | |
| Benzo[k]fluoranthene | 5920 | 5570 | 6.28 | | 5590 | 5570 | 0.359 | |
| Benzo[e]pyrene | 6050 | 5620 | 7.65 | | 5790 | 5620 | 3.02 | |
| Benzo[a]pyrene | 7000 | 6790 | 3.09 | | 6830 | 6790 | 0.589 | |
| Perylene | 7360 | 7120 | 3.37 | | 7020 | 7120 | -1.4 | |
| Indeno[1,2,3-c,d]pyrene | 6380 | 6290 | 1.43 | | 6210 | 6290 | -1.27 | |
| Dibenzo[a,h]anthracene | 5660 | 5180 | 9.27 | | 5570 | 5180 | 7.53 | |
| Benzo[g,h,i]perylene | 5400 | 5290 | 2.08 | | 5340 | 5290 | 0.945 | |
| d8-Naphthalene | 94 | | | | 94 | | | |
| d10-Acenaphthene | 94 | | | | 94 | | | |
| d10-Phenanthrene | 92 | | | | 92 | | | |
| d12-Benzo[a]pyrene | 90 | | | | 90 | | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: IRM - Surrogate Corrected

| | Instrument Reference | | | | Instrument Reference | | | |
|---------------------|----------------------|---|----|---|----------------------|---|----|---|
| Field ID | Standard | | | | Standard | | | |
| Sample Type | IRM | | | | IRM | | | |
| Matrix | IRM | | | | IRM | | | |
| Sample Size | 0.1 mL | | | | 0.1 mL | | | |
| Weight Basis | WET | | | | WET | | | |
| Associated Blank | NA | | | | NA | | | |
| Field Date | 10/15/02 | | | | 10/15/02 | | | |
| Extract Date | 10/15/02 | | | | 10/15/02 | | | |
| Analysis Date | 11/05/02 | | | | 10/29/02 | | | |
| Date Received | 10/15/02 | | | | 10/15/02 | | | |
| Percent Solids | NA | | | | NA | | | |
| Dilution Factor | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | |
| Min Reporting Limit | 250 | | | | 250 | | | |
| Units | ug/L | T | %D | Q | ug/L | T | %D | Q |

Polynuclear Aromatic Hydro

| | | | | | | | |
|------------------------------|------|------|--------|--|------|------|--------|
| Naphthalene | 7050 | 6890 | 2.32 | | 6700 | 6890 | -2.61 |
| C1-Naphthalenes | ND | | | | ND | | |
| C2-Naphthalenes | ND | | | | ND | | |
| C3-Naphthalenes | ND | | | | ND | | |
| C4-Naphthalenes | ND | | | | ND | | |
| Acenaphthylene | 6520 | 6960 | -6.32 | | 6400 | 6960 | -7.33 |
| Acenaphthene | 6570 | 7280 | -9.75 | | 6400 | 7280 | -12.1 |
| Biphenyl | 7160 | 7000 | 2.28 | | 6900 | 7000 | -1.43 |
| Fluorene | 6370 | 7270 | -12.4 | | 6200 | 7270 | -14.7 |
| C1-Fluorenes | ND | | | | ND | | |
| C2-Fluorenes | ND | | | | ND | | |
| C3-Fluorenes | ND | | | | ND | | |
| Anthracene | 7140 | 7820 | -8.7 | | 7000 | 7820 | -11 |
| Phenanthrene | 6820 | 7010 | -2.71 | | 6800 | 7010 | -3.71 |
| C1-Phenanthrenes/anthracenes | ND | | | | ND | | |
| C2-Phenanthrenes/anthracenes | ND | | | | ND | | |
| C3-Phenanthrenes/anthracenes | ND | | | | ND | | |
| C4-Phenanthrenes/anthracenes | ND | | | | ND | | |
| Dibenzothiophene | ND | | | | ND | | |
| C1-Dibenzothiophenes | ND | | | | ND | | |
| C2-Dibenzothiophenes | ND | | | | ND | | |
| C3-Dibenzothiophenes | ND | | | | ND | | |
| Fluoranthene | 6030 | 5910 | 2.03 | | 6000 | 5910 | 1.35 |
| Pyrene | 5860 | 5890 | -0.509 | | 5800 | 5890 | -0.679 |
| C1-Fluoranthenes/pyrenes | ND | | | | ND | | |
| C2-Fluoranthenes/pyrenes | ND | | | | ND | | |
| C3-Fluoranthenes/pyrenes | ND | | | | ND | | |
| Benzo[a]anthracene | 3400 | 3590 | -5.29 | | 3400 | 3590 | -5.29 |
| Chrysene | 7140 | 7030 | 1.56 | | 7000 | 7030 | 0.142 |
| C1-Chrysenes | ND | | | | ND | | |
| C2-Chrysenes | ND | | | | ND | | |
| C3-Chrysenes | ND | | | | ND | | |
| C4-Chrysenes | ND | | | | ND | | |
| Benzo[b]fluoranthene | 5540 | 5250 | 5.52 | | 5600 | 5250 | 5.9 |
| Benzo[k]fluoranthene | 5760 | 5570 | 3.41 | | 5400 | 5570 | -1.97 |
| Benzo[e]pyrene | 5930 | 5620 | 5.52 | | 5700 | 5620 | 1.78 |
| Benzo[a]pyrene | 6760 | 6790 | -0.442 | | 6700 | 6790 | -1.18 |
| Perylene | 7230 | 7120 | 1.54 | | 6900 | 7120 | -2.53 |
| Indeno[1,2,3-c,d]pyrene | 6350 | 6290 | 0.954 | | 6200 | 6290 | -0.795 |
| Dibenzo[a,h]anthracene | 5570 | 5180 | 7.53 | | 5500 | 5180 | 6.56 |
| Benzo[g,h,i]perylene | 5440 | 5290 | 2.84 | | 5200 | 5290 | -0.945 |
| d8-Naphthalene | 94 | | | | 97 | | |
| d10-Acenaphthene | 94 | | | | 97 | | |
| d10-Phenanthrene | 94 | | | | 97 | | |
| d12-Benzo[a]pyrene | 87 | | | | 94 | | |

Project Title : MMS - AMINIDA - PHASE II

Data Package: 4079

Data Table: SRM - Surrogate Corrected

| Field ID | Standard Reference Material - 1944 | | | | Standard Reference Material - 1944 | | | | Standard Reference Material - 1944 | | | |
|--|---------------------------------------|------|-------|---|---------------------------------------|------|-------|---|---------------------------------------|------|-------|---|
| Sample Type | SRM | | | | SRM | | | | SRM | | | |
| Matrix | SEDIMENT | | | | SEDIMENT | | | | SEDIMENT | | | |
| Sample Size | 1.01 g | | | | 1.01 g | | | | 1.02 g | | | |
| Weight Basis | DRY | | | | DRY | | | | DRY | | | |
| Associated Blank | DY-S-66PB | | | | DZ-S-03PB | | | | DY-S-69PB | | | |
| Field Date | 10/16/02 | | | | 10/28/02 | | | | 10/17/02 | | | |
| Extract Date | 10/16/02 | | | | 10/28/02 | | | | 10/17/02 | | | |
| Analysis Date | 10/27/02 | | | | 11/05/02 | | | | 10/29/02 | | | |
| Date Received | 10/16/02 | | | | 10/28/02 | | | | 10/17/02 | | | |
| Percent Solids | 98.8 | | | | 98.8 | | | | 98.8 | | | |
| Dilution Factor | 2 | | | | 1 | | | | 1 | | | |
| Percent Lipids | NA | | | | NA | | | | NA | | | |
| Min Reporting Limit | 49.5 | | | | 99 | | | | 49 | | | |
| Units | ug/Kg | T | %D | Q | ug/Kg | T | %D | Q | ug/Kg | T | %D | Q |
| Polynuclear Aromatic Hydrocarbons | | | | | | | | | | | | |
| Naphthalene | 935 | 1650 | -43.3 | & | 762 | 1650 | -53.8 | & | 694 | 1650 | -57.9 | & |
| C1-Naphthalenes | 459 | | | | 374 | | | | 379 | | | |
| C2-Naphthalenes | 1380 | | | | 1170 | | | | 1230 | | | |
| C3-Naphthalenes | 1790 | | | | 1620 | | | | 1820 | | | |
| C4-Naphthalenes | 1980 | | | | 2270 | | | | 2140 | | | |
| Acenaphthylene | 1060 | | | | 903 | | | | 894 | | | |
| Acenaphthene | 452 | | | | 358 | 570 | -37.2 | & | 391 | | | |
| Biphenyl | 157 | | | | 123 | 320 | -61.6 | & | 116 | | | |
| Fluorene | 699 | | | | 592 | 850 | -30.4 | | 625 | | | |
| C1-Fluorenes | 837 | | | | 716 | | | | 718 | | | |
| C2-Fluorenes | 1290 | | | | 1150 | | | | 1040 | | | |
| C3-Fluorenes | 1520 | | | | 1420 | | | | 1300 | | | |
| Anthracene | 1680 | 1770 | -5.08 | | 1380 | 1770 | -22 | | 1370 | 1770 | -22.6 | |
| Phenanthrene | 5780 | 5270 | 9.68 | | 4670 | 5270 | -11.4 | | 4430 | 5270 | -15.9 | |
| C1-Phenanthrenes/anthracenes | 6140 | | | | 4950 | | | | 5200 | | | |
| C2-Phenanthrenes/anthracenes | 6480 | | | | 5100 | | | | 5740 | | | |
| C3-Phenanthrenes/anthracenes | 4310 | | | | 3610 | | | | 3700 | | | |
| C4-Phenanthrenes/anthracenes | 3710 | | | | 2870 | | | | 3100 | | | |
| Dibenzothiophene | 862 | | | | 685 | 620 | 10.5 | | 731 | | | |
| C1-Dibenzothiophenes | 2040 | | | | 1580 | | | | 1660 | | | |
| C2-Dibenzothiophenes | 3120 | | | | 2560 | | | | 2950 | | | |
| C3-Dibenzothiophenes | 2850 | | | | 2270 | | | | 2380 | | | |
| Fluoranthene | 10200 D | 8920 | 14.3 | | 8990 | 8920 | 0.785 | | 7940 | 8920 | -11 | |
| Pyrene | 10400 D | 9700 | 7.22 | | 9290 | 9700 | -4.23 | | 8120 | 9700 | -16.3 | |
| C1-Fluoranthenes/pyrenes | 8950 | | | | 6550 | | | | 6860 | | | |
| C2-Fluoranthenes/pyrenes | 4450 | | | | 3060 | | | | 2940 | | | |
| C3-Fluoranthenes/pyrenes | 1760 | | | | 1340 | | | | 1570 | | | |
| Benzo[a]anthracene | 5880 | 4720 | 24.6 | | 4590 | 4720 | -2.75 | | 4320 | 4720 | -8.47 | |
| Chrysene | 7050 | 4860 | 45.1 | & | 5190 | 5900 | -12 | | 5010 | 5900 | -15.1 | |
| C1-Chrysenes | 4560 | | | | 3420 | | | | 3730 | | | |
| C2-Chrysenes | 2740 | | | | 2050 | | | | 2120 | | | |
| C3-Chrysenes | 1290 | | | | 910 | | | | 1140 | | | |
| C4-Chrysenes | 474 | | | | 406 | | | | 752 | | | |
| Benzo[b]fluoranthene | 7760 | 5960 | 30.2 | | 5840 | 5960 | -2.01 | | 5220 | 5960 | -12.4 | |
| Benzo[k]fluoranthene | 2200 | 2300 | -4.35 | | 1980 | 2300 | -13.9 | | 1680 | 2300 | -27 | |
| Benzo[e]pyrene | 4400 | 3280 | 34.1 | | 3420 | 3280 | 4.27 | | 3140 | 3280 | -4.27 | |
| Benzo[a]pyrene | 5400 | 4300 | 25.6 | | 3890 | 4300 | -9.53 | | 3750 | 4300 | -12.8 | |
| Perylene | 1330 | 1170 | 13.7 | | 1020 | 1170 | -12.8 | | 1050 | 1170 | -10.2 | |
| Indeno[1,2,3-c,d]pyrene | 3860 | 2780 | 38.8 | & | 2810 | 2780 | 1.08 | | 2690 | 2780 | -3.24 | |
| Dibenzo[a,h]anthracene | 1000 | 759 | 31.8 | | 657 | 759 | -13.4 | | 786 | 759 | 3.56 | |
| Benzo[g,h,i]perylene | 3610 | 2840 | 27.1 | | 2680 | 2840 | -5.63 | | 2580 | 2840 | -9.15 | |
| d8-Naphthalene | 52 | | | | 44 | | | | 45 | | | |
| d10-Acenaphthene | 76 | | | | 72 | | | | 75 | | | |
| d10-Phenanthrene | 98 | | | | 98 | | | | 97 | | | |
| d12-Benzo[a]pyrene | 98 | | | | 92 | | | | 95 | | | |

Project Title : MMS - AMINIDA - PHASE II
Data Package: 4079
Data Table: DUP - Surrogate Corrected

| Field ID | 02-N10-01-PHC-S | 02-N10-01-PHC-S DUP | | | 02-N23-01-PHC-S | 02-N23-01-PHC-S DUP | | | 02-SAG-01-PHC-S | 02-SAG-01-PHC-S | | |
|---------------------|-----------------|---------------------|-----|---|-----------------|---------------------|-----|---|-----------------|-----------------|-----|---|
| Sample Type | N | DUP | | | N | DUP | | | N | DUP | | |
| Matrix | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT | | | SEDIMENT | SEDIMENT | | |
| Sample Size | 17.49 g | 17.46 g | | | 20.6 g | 20.65 g | | | 15.41 g | 15.2 g | | |
| Weight Basis | DRY | DRY | | | DRY | DRY | | | DRY | DRY | | |
| Associated Blank | DY-S-66PB | DY-S-66PB | | | DZ-S-03PB | DZ-S-03PB | | | DY-S-69PB | DY-S-69PB | | |
| Field Date | 08/02/02 | 08/02/02 | | | 08/05/02 | 08/05/02 | | | 08/14/02 | 08/14/02 | | |
| Extract Date | 10/16/02 | 10/16/02 | | | 10/28/02 | 10/28/02 | | | 10/17/02 | 10/17/02 | | |
| Analysis Date | 10/28/02 | 10/28/02 | | | 11/06/02 | 11/06/02 | | | 10/30/02 | 10/30/02 | | |
| Date Received | 08/15/02 | 08/15/02 | | | 08/15/02 | 08/15/02 | | | 08/23/02 | 08/23/02 | | |
| Percent Solids | 57.2 | 57.2 | | | 68.5 | 68.5 | | | 50.4 | 50.4 | | |
| Dilution Factor | 1 | 1 | | | 1 | 1 | | | 1 | 1 | | |
| Percent Lipids | NA | NA | | | NA | NA | | | NA | NA | | |
| Min Reporting Limit | 0.71 | 0.72 | | | 0.61 | 0.6 | | | 0.81 | 0.82 | | |
| Units | ug/Kg | ug/Kg | RPD | Q | ug/Kg | ug/Kg | RPD | Q | ug/Kg | ug/Kg | RPD | Q |

Polynuclear Aromatic Hydrocarbons

| | | | | | | | | | | | |
|------------------------------|---------|---------|-----|---|----------|----------|-----|--|---------|---------|-----|
| Naphthalene | 12 | 11 | 8.7 | | 7.4 | 7.2 | 2.7 | | 6.9 | 7.4 | 7 |
| C1-Naphthalenes | 25 | 24 | 4.1 | | 16 | 17 | 6.1 | | 17 | 15 | 12 |
| C2-Naphthalenes | 41 | 40 | 2.5 | | 29 | 30 | 3.4 | | 35 | 34 | 2.9 |
| C3-Naphthalenes | 28 | 29 | 3.5 | | 22 | 22 | 0 | | 41 | 38 | 7.6 |
| C4-Naphthalenes | 14 | 15 | 6.9 | | 15 | 15 | 0 | | 25 | 24 | 4.1 |
| Acenaphthylene | 0.039 J | 0.085 J | 74 | & | 0.048 JB | 0.046 JB | 4.2 | | 0.084 J | 0.097 J | 14 |
| Acenaphthene | 1 | 1 | 0 | | 0.89 | 0.89 | 0 | | 0.81 | 0.78 J | 3.8 |
| Biphenyl | 6.4 | 6.2 | 3.2 | | 5.2 | 5.2 | 0 | | 6.1 | 5.8 | 5 |
| Fluorene | 5.4 | 5.5 | 1.8 | | 4 | 3.9 | 2.5 | | 5.5 | 5.3 | 3.7 |
| C1-Fluorenes | 9.4 | 9.6 | 2.1 | | 7.1 | 6.7 | 5.8 | | 7.3 | 7.2 | 1.4 |
| C2-Fluorenes | 13 | 13 | 0 | | 9.6 | 9.5 | 1 | | 12 | 11 | 8.7 |
| C3-Fluorenes | 11 | 12 | 8.7 | | 8.6 | 9.2 | 6.7 | | 12 | 12 | 0 |
| Anthracene | 0.66 J | 0.6 J | 9.5 | | 0.61 | 0.58 J | 5 | | 0.83 | 0.81 J | 2.4 |
| Phenanthrene | 27 | 26 | 3.8 | | 19 | 19 | 0 | | 26 | 25 | 3.9 |
| C1-Phenanthrenes/anthracenes | 39 | 39 | 0 | | 30 | 30 | 0 | | 47 | 45 | 4.3 |
| C2-Phenanthrenes/anthracenes | 32 | 33 | 3.1 | | 26 | 26 | 0 | | 44 | 44 | 0 |
| C3-Phenanthrenes/anthracenes | 22 | 22 | 0 | | 17 | 18 | 5.7 | | 29 | 29 | 0 |
| C4-Phenanthrenes/anthracenes | 10 | 9.6 | 4.1 | | 8.8 | 8.8 | 0 | | 14 | 13 | 7.4 |
| Dibenzothiophene | 4.1 | 4 | 2.5 | | 2.9 | 3 | 3.4 | | 4.1 | 4.1 | 0 |
| C1-Dibenzothiophenes | 8.8 | 8.7 | 1.1 | | 6.3 | 6.4 | 1.6 | | 21 | 19 | 10 |
| C2-Dibenzothiophenes | 11 | 11 | 0 | | 8.4 | 7.9 | 6.1 | | 25 | 25 | 0 |
| C3-Dibenzothiophenes | 8.4 | 8.6 | 2.4 | | 6.5 | 6.1 | 6.3 | | 16 | 18 | 12 |
| Fluoranthene | 6.2 | 5.7 | 8.4 | | 4.2 | 4.3 | 2.4 | | 6.9 | 6.8 | 1.4 |
| Pyrene | 7.8 | 7.7 | 1.3 | | 6.1 | 6.2 | 1.6 | | 8.6 | 8.6 | 0 |
| C1-Fluoranthenes/pyrenes | 20 | 20 | 0 | | 15 | 15 | 0 | | 23 | 23 | 0 |
| C2-Fluoranthenes/pyrenes | 20 | 19 | 5.1 | | 14 | 14 | 0 | | 20 | 20 | 0 |
| C3-Fluoranthenes/pyrenes | 12 | 12 | 0 | | 9.3 | 9 | 3.3 | | 15 | 14 | 6.9 |
| Benzo[a]anthracene | 1.7 | 1.8 | 5.7 | | 1.6 | 1.6 | 0 | | 2.3 | 2.6 | 12 |
| Chrysene | 12 | 12 | 0 | | 10 | 10 | 0 | | 13 | 13 | 0 |
| C1-Chrysenes | 13 | 12 | 8 | | 11 | 12 | 8.7 | | 16 | 17 | 6.1 |
| C2-Chrysenes | 12 | 12 | 0 | | 9.9 | 10 | 1 | | 20 | 15 | 28 |
| C3-Chrysenes | 6 | 6.1 | 1.6 | | 4.4 | 4.5 | 2.2 | | 9.5 | 10 | 5.1 |
| C4-Chrysenes | 3.2 | 3 | 6.4 | | 3.6 | 3.1 | 15 | | 6 | 7 | 15 |
| Benzo[b]fluoranthene | 7.2 | 7.1 | 1.4 | | 6.5 | 6.3 | 3.1 | | 9.5 | 9.4 | 1 |
| Benzo[k]fluoranthene | 0.6 J | 0.85 | 34 | & | 0.47 J | 0.48 J | 2.1 | | 0.96 | 0.93 | 3.2 |
| Benzo[e]pyrene | 8.7 | 8.8 | 1.1 | | 8.2 | 8 | 2.5 | | 8.8 | 9.1 | 3.4 |
| Benzo[a]pyrene | 2.2 | 2.2 | 0 | | 1.6 | 1.7 | 6.1 | | 4.4 | 3.9 | 12 |
| Perylene | 59 | 57 | 3.4 | | 56 | 56 | 0 | | 100 | 97 | 3 |
| Indeno[1,2,3-c,d]pyrene | 1.7 | 1.7 | 0 | | 1.3 | 1.4 | 7.4 | | 2.5 | 2.4 | 4.1 |
| Dibenzo[a,h]anthracene | 0.89 | 0.85 | 4.6 | | 0.75 | 0.83 | 10 | | 1.1 | 1 | 9.5 |
| Benzo[g,h,i]perylene | 6.1 | 6 | 1.6 | | 5.4 | 5.8 | 7.1 | | 6 | 5.9 | 1.7 |
| d8-Naphthalene | 54 | 46 | | | 50 | 56 | | | 44 | 51 | |
| d10-Acenaphthene | 77 | 73 | | | 75 | 76 | | | 66 | 81 | |
| d10-Phenanthrene | 95 | 95 | | | 92 | 93 | | | 78 | 93 | |
| d12-Benzo[a]pyrene | 97 | 95 | | | 83 | 90 | | | 74 | 90 | |

Arthur D. Little

Environmental Monitoring and Analysis

Minerals Management Service - Animida Phase I.

Summer 1999 Final Data (Surrogate Corrected) - Lab Quality Control ORS

| | | | | |
|---------------------|---------------|---|----|---|
| | Oil Reference | | | |
| Field ID | Standard | | | |
| Lab ID | BY32ORS | | | |
| Sample Type | ORS | | | |
| Matrix | OIL | | | |
| Sample Size | 5.12 mg | | | |
| Weight Basis | OIL | | | |
| Associated Blank | NA | | | |
| Field Date | 03/21/01 | | | |
| Extract Date | 03/21/01 | | | |
| Analysis Date | 04/10/01 | | | |
| Date Received | 03/21/01 | | | |
| Percent Solids | NA | | | |
| Percent Lipids | NA | | | |
| Min Reporting Limit | 4.88 | | | |
| Units | mg/Kg | T | %D | Q |

Sterane-Triterpane Biomarkers - Wet

| | | | |
|----------------------------|------|------|------|
| T4-C23Diterpane | 51.3 | 58.9 | -13 |
| S4-Diacholestane | 42.8 | 46.8 | -8.6 |
| S5-Diacholestane | 28.7 | 26.1 | 9.96 |
| T9-C29Tricyclictriterpane | 13.3 | 15.7 | -15 |
| T10-C29Tricyclictriterpane | 17 | 15 | 13.3 |
| T11-Trisnorhopane(TS) | 19 | 24.8 | -23 |
| T12-Trisnorhopane(TM) | 23 | 31 | -26 |
| S24-Methylcholestane | 27.6 | 26.2 | 5.34 |
| S25-Ethylcholestane | 46.6 | 39.8 | 17.1 |
| S28-Ethylcholestane | 35.1 | 33.9 | 3.54 |
| T15-Norhopane | 75.1 | 83.8 | -10 |
| T18-Oleanane | ND | | |
| T19-Hopane | 110 | 113 | -2.7 |
| T21-Homohopane | 47.3 | 46.1 | 2.6 |
| T22-Homohopane | 32.8 | 35.2 | -6.8 |

5B(H)-Cholane 112

MMS Beaufort Sea ANIMDA Project: Summer 2000 Sampling

Last Revised 3/21/01

Station Data for Trace Metal Organism Samples

| Sample Identification | Station Identification | Station Grouping | Collection Date | Organism Type | Comments |
|-----------------------|------------------------|------------------|-----------------|------------------|------------|
| 00-N03-01-PHC-T-AN | N03 | Northstar | 8/17/2000 | Anonyx amphipods | Gwydyr Bay |
| 00-N12-01-PHC-T-AN | N12 | Northstar | 8/19/2000 | Anonyx amphipods | |
| 00-N13-01-PHC-T-AN | N13 | Northstar | 8/19/2000 | Anonyx amphipods | |
| 00-N18-01-PHC-T-AN | N18 | Northstar | 8/22/2000 | Anonyx amphipods | |
| 00-L08-01-PHC-T-AS | L08 | Liberty | 8/21/2000 | Astarte clams | |
| 00-L09-01-PHC-T-AS | L09 | Liberty | 8/21/2000 | Astarte clams | |
| 00-3A-01-PHC-T-AS | 3A | Liberty | 8/20/2000 | Astarte clams | |
| 00-4A-01-PHC-T-AN | 43 | Liberty | 8/21/2000 | Anonyx amphipods | |
| 00-5F-01-PHC-T-CY | 5F | Northstar | 8/19/2000 | Cyrtodaria clams | |
| 00-5H-01-PHC-T-AS | 5H | In Between N & L | 8/22/2000 | Astarte clams | |
| 00-5(0)-01-PHC-T-AN | 5(0) | In Between N & L | 8/22/2000 | Anonyx amphipods | |

MMS Beaufort Sea ANIMDA Project: Summer 2000 Sampling

Quality Assurance and Quality Control Data for Sediment Metal Analyses.

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Results for the Marine Sediment Standard Reference Material (SRM) MESS-2 certified by the National Research Council of Canada (NRC).

| Standard Reference Material | Ag (µg/g) | Al (%) | As (µg/g) | Ba (µg/g) | Be (µg/g) | Cd (µg/g) | Co (µg/g) | Cr (µg/g) | Cu (µg/g) | Fe (%) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) |
|------------------------------------|----------------|----------------|---------------|--------------|----------------|----------------|---------------|--------------|---------------|----------------|------------------|--------------|---------------|---------------|----------------|--------------|-------------|--------------|
| SRM MESS-2 This Study | 0.19 | 8.60 | 21.4 | 966 | 2.41 | 0.25 | 13.5 | 107 | 37.7 | 4.20 | 0.089 | 354 | 44.5 | 21.9 | 1.24 | 1.01 | 247 | 157 |
| | 0.16 | 8.52 | 20.6 | 986 | 2.41 | 0.25 | 13.5 | 104 | 38.4 | 4.17 | 0.089 | 353 | 44.8 | 21.7 | 1.22 | 0.99 | 246 | 158 |
| | 0.16 | 8.65 | 21.5 | 1060 | 2.41 | 0.25 | 14.5 | 104 | 37.5 | 4.16 | 0.093 | 353 | 48.5 | 22.4 | 1.18 | 1.04 | 253 | 165 |
| | 0.16 | 8.71 | 20.9 | 1040 | 2.38 | 0.24 | 14.0 | 108 | 39.4 | 4.17 | 0.087 | 352 | 47.8 | 22.4 | 1.21 | 1.03 | 259 | 159 |
| | | 8.86 | | | | | | 106 | 39.3 | 4.20 | 0.098 | 363 | | | | | 250 | 167 |
| | | 8.68 | | | | | | 101 | 38.4 | 4.26 | 0.092 | 356 | | | | | 259 | 159 |
| SRM MESS-2 NRC Certified Values | 0.18 ± 0.02 | 8.57 ± 0.26 | 20.7 ± 0.8 | - - | 2.32 ± 0.12 | 0.24 ± 0.01 | 13.8 ± 1.4 | 106 ± 8 | 39.3 ± 2.0 | 4.35 ± 0.22 | 0.092 ± 0.009 | 365 ± 21 | 49.3 ± 1.8 | 21.9 ± 1.2 | 1.09 ± 0.13 | 0.98* - | 252 ± 10 | 172 ± 16 |

* Reference Value, not Certified.

** Total Carbon (Inorganic plus Organic).

Method Detection Limits (MDLs).

| | Ag (µg/g) | Al (%) | As (µg/g) | Ba (µg/g) | Be (µg/g) | Cd (µg/g) | Co (µg/g) | Cr (µg/g) | Cu (µg/g) | Fe (%) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) |
|------------------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|
| Method Detection Limit | 0.01 | 0.01 | 0.2 | 1 | 0.2 | 0.02 | 0.3 | 4 | 2 | 0.01 | 0.001 | 3 | 0.5 | 0.2 | 0.04 | 0.04 | 10 | 2 |

MMS Beaufort Sea ANIMDA Project: Summer 2000 Sampling

Quality Assurance and Quality Control Data for Sediment Metal Analyses.

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Percent Spike Recovery.

| | Ag | Al | As | Ba | Be | Cd | Co | Cr | Cu | Fe | Hg*** | Mn | Ni | Pb | Sb | Tl | V** | Zn |
|--------------------|------|-------|-------|------|------|------|-------|-------|-------|------|-------|-------|------|------|-------|-------|-------|------|
| Mean | 93.1 | 105.5 | 105.9 | 98.5 | 96.3 | 98.8 | 101.8 | 109.7 | 103.3 | 97.1 | 84.4 | 102.1 | 94.1 | 99.0 | 100.7 | 101.3 | 117.3 | 97.4 |
| Standard Deviation | 3.1 | 5.1 | 2.4 | 4.6 | 4.9 | 3.3 | 5.2 | 13.4 | 6.4 | 3.9 | 6.2 | 7.7 | .7 | 6.3 | 3.3 | 3.6 | 3.4 | 1.8 |
| (n =) | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 13 | 3 | 3 | 4 | 4 | 4 | 3 | 3 |

***Final concentrations are corrected for percent spike recovery.

Estimate of Precision as Percent Relative Standard Deviation (RSD) of Lab Duplicates.

| | Ag | Al | As | Ba | Be | Cd | Co | Cr | Cu | Fe | Hg | Mn | Ni | Pb | Sb | Tl | V | Zn |
|-------------------|------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 00-N06-01-MET-S | 15.7 | 0.4 | 3.4 | 2.1 | 11.8 | 9.0 | 3.8 | 2.6 | 3.1 | 4.4 | 2.4 | 1.2 | 0.9 | 1.8 | 1.5 | 0.0 | 0.8 | 2.1 |
| 00-N09-01-MET-S | 12.9 | 1.2 | 2.3 | 3.8 | 0.0 | 4.9 | 3.4 | 3.7 | 2.2 | 3.8 | 3.4 | 2.7 | 5.8 | 5.0 | 2.7 | 6.1 | 6.4 | 2.8 |
| 00-5(10)-01-MET-S | - | - | - | - | - | - | - | - | - | - | 0.0 | - | - | - | - | - | - | - |
| 00-KUP-02-MET-S | 4.9 | 1.6 | 3.2 | 1.6 | 0.0 | 2.3 | 1.8 | 0.4 | 2.2 | 0.7 | - | 1.5 | 1.3 | 1.4 | 3.9 | 4.0 | 5.6 | 1.8 |

RSD = (standard deviation / mean) X 100

Table 4. Quality Assurance and Quality Control Data for Organism Metal Analyses.

Results for the Standard Reference Material (SRM) Mussel Tissue #2976 certified by the National Institute of Standards and Technology (NIST), Certified Reference Material (CRM) Dogfish Muscle DORM-2 certified by the National Research Council of Canada (NRC), and the SRM Trace Elements in Water #1643d certified by NIST.

| Standard Reference Material | Ag (µg/g) | Al (µg/g) | As (µg/g) | Ba (µg/g) | Be (µg/g) | Cd (µg/g) | Co (µg/g) | Cr (µg/g) | Cu (µg/g) | Fe (µg/g) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) |
|-------------------------------------|-------------------|---------------|---------------|-----------------|-----------------|------------------|------------------|-----------------|----------------|----------------|-------------------|----------------|-----------------|------------------|----------------|----------------|----------------|---------------|
| SRM #2976 This Study | 0.009 | 158 | 12.6 | 0.71 | 0.005 | 0.77 | 0.61 | 0.57 | 4.0 | 175 | 0.059 | 33.4 | 0.87 | 1.13 | 0.014 | 0.002 | 0.88 | 145 |
| SRM #2976 NIST Certified Values | 0.011* ± 0.005 | 134* ± 34 | 13.3 ± 1.8 | - - | - - | 0.82 ± 0.16 | 0.61* ± 0.02 | 0.50* ± 0.16 | 4.02 ± 0.33 | 171.0 ± 4.9 | 0.061 ± 0.0036 | 33* ± 2 | 0.93* ± 0.12 | 1.19 ± 0.18 | - - | 0.001** - | - - | 137 ± 13 |
| CRM DORM-2 This Study | 0.039 | 10.6 | 17.9 | 2.53 | 0.006 | 0.049 | 0.172 | 32.2 | 2.3 | 149 | 4.64 | 3.4 | 17.5 | 0.069 | 0.027 | 0.004 | 0.19 | 24.3 |
| CRM DORM-2 NRC Certified Values | 0.041 ± 0.013 | 10.9 ± 1.7 | 18.0 ± 1.1 | - - | - - | 0.043 ± 0.008 | 0.182 ± 0.031 | 34.7 ± 5.5 | 2.34 ± 0.16 | 142 ± 10 | 4.64 ± 0.26 | 3.66 ± 0.34 | 19.4 ± 3.1 | 0.065 ± 0.007 | - - | 0.004** - | - - | 25.6 ± 2.3 |
| SRM #1643d This Study | - | - | - | (µg/L) 506.3 | (µg/L) 12.66 | - | - | - | - | - | - | - | - | - | (µg/L) 54.5 | (µg/L) 7.07 | (µg/L) 35.8 | - |
| SRM #1643d NIST Certified Values | - - | - - | - - | 506.5 ± 8.9 | 12.53 ± 0.28 | - - | - - | - - | - - | - - | - - | - - | - - | - - | 54.1 ± 1.1 | 7.28 ± 0.25 | 35.1 ± 1.4 | - - |

* Reference Value, not Certified.

** Information Value, not Certified.

Method Detection Limits (MDLs).

| | Ag (µg/g) | Al (µg/g) | As (µg/g) | Ba (µg/g) | Be (µg/g) | Cd (µg/g) | Co (µg/g) | Cr (µg/g) | Cu (µg/g) | Fe (µg/g) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) |
|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|
| Method Detection Limit | 0.004 | 2.3 | 0.03 | 0.01 | 0.001 | 0.001 | 0.003 | 0.01 | 0.7 | 2.5 | 0.001 | 1.1 | 0.01 | 0.003 | 0.001 | 0.001 | 0.01 | 0.4 |

Table 4. Quality Assurance and Quality Control Data for Organism Metal Analyses.

Percent Spike Recovery.

| | Ag | Al | As | Ba | Be | Cd | Co | Cr | Cu | Fe | Hg*** | Mn | Ni | Pb | Sb | Tl | V | Zn |
|--------------------|-------|------|------|------|-------|------|-------|------|-------|------|-------|-------|------|------|------|-------|------|------|
| Mean | 100.3 | 96.9 | 96.0 | 98.1 | 106.9 | 97.9 | 104.7 | 95.7 | 101.9 | 95.7 | 70.2 | 103.3 | 95.1 | 98.8 | 91.7 | 104.7 | 91.7 | 99.1 |
| Standard Deviation | 1.2 | 0.3 | 4.1 | 3.2 | 3.2 | 0.8 | 0.3 | 1.3 | 3.5 | 3.4 | 4.5 | 5.8 | 1.3 | 8.2 | 0.0 | 2.7 | 1.2 | 3.0 |
| (n =) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

***Final concentrations are corrected for percent spike recovery.

Estimate of Precision as Percent Relative Standard Deviation (RSD) of Lab Duplicates.

| | Ag | Al | As | Ba | Be | Cd | Co | Cr | Cu | Fe | Hg | Mn | Ni | Pb | Sb | Tl | V | Zn |
|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 02-N12-01-PHC-T-AN | 1.0 | 1.0 | 0.1 | 1.1 | 0.0 | 0.0 | 1.4 | 4.2 | 0.0 | 2.7 | 3.6 | 1.5 | 3.5 | 0.0 | 3.1 | 0.0 | 3.4 | 0.0 |

Percent RSD = (standard deviation / mean) X 100

Station Data for Trace Metal Sediment Samples.

| Sample Identification | Station Identification | Station Grouping | Collection Date | Comments |
|-----------------------------|------------------------|------------------|-----------------|-------------------------------|
| 02-N01-01-MET-S | N01 | Northstar | 8/3/2002 | |
| 02-N02-01-MET-S | N02 | Northstar | 8/3/2002 | |
| 02-N03-01-MET-S | N03 | Northstar | 8/5/2002 | Field Triplicate |
| 02-N03-02-MET-S | N03 | Northstar | 8/5/2002 | Field Triplicate |
| 02-N03-03-MET-S | N03 | Northstar | 8/5/2002 | Field Triplicate |
| 02-N04-01-MET-S | N04 | Northstar | 8/3/2002 | |
| 02-N05-01-MET-S | N05 | Northstar | 8/3/2002 | |
| 02-N06-01-MET-S | N06 | Northstar | 8/2/2002 | |
| 02-N07-01-MET-S | N07 | Northstar | 8/5/2002 | |
| 02-N08-01-MET-S | N08 | Northstar | 8/5/2002 | |
| 02-N09-01-MET-S | N09 | Northstar | 8/5/2002 | |
| 02-N10-01-MET-S | N10 | Northstar | 8/2/2002 | |
| 02-N11-01-MET-S | N11 | Northstar | 8/2/2002 | |
| 02-N12-01-MET-S | N12 | Northstar | 8/2/2002 | |
| 02-N13-01-MET-S | N13 | Northstar | 8/4/2002 | |
| 02-N14-01-MET-S | N14 | Northstar | 8/5/2002 | |
| 02-N15-01-MET-S | N15 | Northstar | 8/7/2002 | |
| 02-N16-01-MET-S | N16 | Northstar | 8/5/2002 | |
| 02-N17-01-MET-S | N17 | Northstar | 8/5/2002 | |
| 02-N17-01-MET-S(subsurface) | N17 | Northstar | 8/5/2002 | Clay Layer |
| 02-N18-01-MET-S | N18 | Northstar | 8/2/2002 | |
| 02-N19-01-MET-S | N19 | Northstar | 8/2/2002 | |
| 02-N20-01-MET-S | N20 | Northstar | 8/2/2002 | |
| 02-N21-01-MET-S | N21 | Northstar | 8/2/2002 | |
| 02-N23-01-MET-S | N23 | Northstar | 8/5/2002 | |
| 02-L01-01-MET-S | L01 | Liberty | 7/31/2002 | |
| 02-L04-01-MET-S | L04 | Liberty | 7/29/2002 | |
| 02-L06-01-MET-S | L06 | Liberty | 7/30/2002 | |
| 02-L07-01-MET-S | L07 | Liberty | 7/30/2002 | |
| 02-L08-01-MET-S | L08 | Liberty | 7/30/2002 | No Clams |
| 02-L08-02-MET-S | L08 | Liberty | 7/30/2002 | Clams |
| 02-L09-01-MET-S | L09 | Liberty | 7/30/2002 | |
| 02-3A-01-MET-S | 3A | Liberty | 7/29/2002 | |
| 02-3B-01-MET-S | 3B | Liberty | 7/29/2002 | Near Pole Island |
| 02-4A-01-MET-S | 4A | Liberty | 7/31/2002 | |
| 02-4B-01-MET-S | 4B | Liberty | 7/31/2002 | Boulder Patch |
| 02-4C-01-MET-S | 4C | In Between N & L | 7/31/2002 | |
| 02-5A-01-MET-S | 5A | Northstar | 8/3/2002 | |
| 02-5B-01-MET-S | 5B | Northstar | 8/3/2002 | |
| 02-5D-01-MET-S | 5D | Northstar | 8/5/2002 | Lee of STP/West Dock, F.Trip. |
| 02-5D-02-MET-S | 5D | Northstar | 8/5/2002 | Field Triplicate |
| 02-5D-03-MET-S | 5D | Northstar | 8/5/2002 | Field Triplicate |
| 02-5E-01-MET-S | 5E | Northstar | 8/4/2002 | |
| 02-5F-01-MET-S | 5F | Northstar | 8/7/2002 | Gwydyr Bay |
| 02-5H-01-MET-S | 5H | In Between N & L | 8/1/2002 | |
| 02-5(0)-01-MET-S | 5(0) | In Between N & L | 8/1/2002 | |
| 02-5(1)-01-MET-S | 5(1) | In Between N & L | 8/1/2002 | |
| 02-5(5)-01-MET-S | 5(5) | Northstar | 8/1/2002 | |
| 02-5(10)-01-MET-S | 5(10) | Northstar | 8/1/2002 | |
| 02-CAN-01-MET-S | Canning River | Source | 8/9/2002 | |
| 02-KUPB-01-MET-S | Kuparuk | Source | 8/7/2002 | Borrow Pit |

| Sample Identification | Ag (µg/g) | Al (%) | As (µg/g) | Ba (µg/g) | Be (µg/g) | Cd (µg/g) | Co (µg/g) | Cr (µg/g) | Cu (µg/g) | Fe (%) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) | Comments |
|-----------------------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|------------------|
| 02-N01-01-MET-S | 0.06 | 1.73 | 7.4 | 212 | 0.9 | 0.05 | 6.5 | 28.6 | 5.4 | 1.21 | 0.009 | 189 | 11.1 | 6.5 | 0.27 | 0.20 | 28.4 | 29.8 | Field Triplicate |
| 02-N02-01-MET-S | 0.08 | 4.51 | 12.7 | 501 | 1.1 | 0.13 | 16.2 | 67.5 | 19.4 | 2.64 | 0.044 | 424 | 26.9 | 13.8 | 0.48 | 0.47 | 112 | 79.9 | |
| 02-N03-01-MET-S | 0.09 | 5.17 | 12.7 | 511 | 1.2 | 0.15 | 11.2 | 73.1 | 21.8 | 2.88 | 0.046 | 471 | 29.9 | 13.9 | 0.53 | 0.52 | 137 | 90.9 | |
| 02-N03-02-MET-S | 0.08 | 5.36 | 14.3 | 545 | 1.5 | 0.18 | 11.0 | 78.4 | 23.8 | 2.90 | 0.049 | 219 | 35.8 | 11.5 | 0.54 | 0.59 | 133 | 88.9 | Field Triplicate |
| 02-N03-03-MET-S | 0.09 | 5.72 | 13.9 | 554 | 1.3 | 0.18 | 12.7 | 78.6 | 24.5 | 3.11 | 0.071 | 459 | 35.3 | 17.1 | 0.60 | 0.58 | 137 | 98.2 | Field Triplicate |
| 02-N04-01-MET-S | 0.06 | 4.13 | 7.9 | 422 | 0.8 | 0.14 | 9.1 | 59.4 | 16.2 | 2.26 | 0.048 | 369 | 26.6 | 10.3 | 0.44 | 0.41 | 103 | 77.3 | Lab Duplicate |
| 02-N05-01-MET-S #1 | 0.10 | 5.78 | 13.7 | 578 | 1.5 | 0.18 | 12.4 | 81.2 | 25.8 | 3.27 | 0.053 | 645 | 38.3 | 12.3 | 0.58 | 0.59 | 137 | 91.8 | |
| 02-N05-01-MET-S #2 | 0.10 | 5.87 | 13.7 | 584 | 1.5 | 0.18 | 12.5 | 82.2 | 25.6 | 3.29 | 0.057 | 653 | 38.7 | 12.1 | 0.58 | 0.58 | 139 | 93.1 | |
| 02-N06-01-MET-S | 0.08 | 4.85 | 10.4 | 503 | 0.9 | 0.12 | 10.8 | 69.0 | 20.1 | 2.66 | 0.046 | 456 | 29.3 | 12.8 | 0.49 | 0.47 | 123 | 83.7 | Lab Duplicate |
| 02-N07-01-MET-S | 0.05 | 3.26 | 7.5 | 364 | 0.9 | 0.17 | 7.4 | 49.4 | 13.2 | 1.88 | 0.036 | 292 | 25.5 | 6.2 | 0.37 | 0.42 | 75.2 | 53.0 | |
| 02-N08-01-MET-S | 0.06 | 4.45 | 10.1 | 469 | 1.2 | 0.17 | 9.7 | 64.5 | 19.8 | 2.53 | 0.045 | 398 | 30.8 | 9.3 | 0.47 | 0.51 | 111 | 73.6 | |
| 02-N09-01-MET-S | 0.04 | 3.71 | 7.9 | 402 | 1.0 | 0.16 | 8.7 | 53.6 | 14.3 | 1.91 | 0.036 | 517 | 27.3 | 7.3 | 0.39 | 0.44 | 91.4 | 60.6 | Lab Duplicate |
| 02-N10-01-MET-S | 0.07 | 4.49 | 11.3 | 473 | 1.1 | 0.19 | 10.6 | 65.1 | 20.3 | 2.69 | 0.046 | 533 | 32.3 | 9.5 | 0.50 | 0.50 | 114 | 79.0 | |
| 02-N11-01-MET-S | 0.07 | 2.73 | 6.7 | 293 | 1.1 | 0.11 | 7.3 | 54.9 | 10.8 | 1.75 | 0.023 | 294 | 18.3 | 8.9 | 0.37 | 0.30 | 71.6 | 53.1 | |
| 02-N12-01-MET-S | 0.10 | 4.86 | 9.2 | 478 | 1.1 | 0.21 | 10.6 | 68.3 | 21.8 | 2.73 | 0.047 | 411 | 36.3 | 10.1 | 0.51 | 0.52 | 115 | 85.5 | Lab Duplicate |
| 02-N13-01-MET-S | 0.12 | 5.58 | 10.6 | 514 | 1.2 | 0.22 | 12.6 | 82.9 | 25.5 | 3.18 | 0.061 | 648 | 36.6 | 15.3 | 0.60 | 0.53 | 130 | 107 | |
| 02-N14-01-MET-S | 0.10 | 5.72 | 11.6 | 545 | 1.6 | 0.21 | 13.7 | 82.1 | 26.3 | 3.21 | 0.059 | 789 | 42.9 | 11.6 | 0.59 | 0.55 | 136 | 102 | |
| 02-N15-01-MET-S | 0.11 | 1.65 | 6.3 | 302 | 1.0 | 0.11 | 5.2 | 22.4 | 6.4 | 1.14 | 0.015 | 177 | 10.9 | 6.1 | 0.28 | 0.20 | 41.0 | 29.3 | Lab Duplicate |
| 02-N16-01-MET-S | 0.09 | 5.86 | 14.1 | 550 | 1.4 | 0.20 | 10.7 | 79.5 | 23.6 | 3.20 | 0.051 | 563 | 31.8 | 14.3 | 0.57 | 0.56 | 146 | 96.4 | |
| 02-N17-01-MET-S | 0.09 | 5.27 | 13.7 | 518 | 1.1 | 0.21 | 11.6 | 75.5 | 23.5 | 2.94 | 0.057 | 443 | 30.5 | 13.8 | 0.59 | 0.55 | 131 | 94.8 | |
| 02-N17-01-MET-S(subsurface) | 0.10 | 5.92 | 9.7 | 582 | 1.4 | 0.19 | 15.1 | 83.4 | 26.1 | 3.17 | 0.056 | 363 | 41.3 | 12.3 | 0.59 | 0.59 | 146 | 98.4 | Clay Layer |
| 02-N18-01-MET-S | 0.05 | 4.50 | 11.4 | 476 | 1.1 | 0.19 | 10.3 | 66.8 | 18.5 | 2.49 | 0.045 | 393 | 32.7 | 9.1 | 0.45 | 0.49 | 107 | 71.9 | |
| 02-N19-01-MET-S | 0.07 | 4.60 | 12.0 | 478 | 1.2 | 0.18 | 10.4 | 65.8 | 20.5 | 2.57 | 0.051 | 448 | 33.0 | 9.7 | 0.49 | 0.51 | 115 | 77.2 | |
| 02-N20-01-MET-S | 0.10 | 1.65 | 4.2 | 291 | 0.9 | 0.07 | 5.2 | 23.8 | 5.8 | 0.89 | 0.011 | 143 | 8.1 | 5.1 | 0.25 | 0.21 | 35.8 | 27.6 | Clay Layer |
| 02-N21-01-MET-S | 0.31 | 4.43 | 8.5 | 423 | 0.9 | 0.21 | 9.4 | 69.5 | 19.6 | 2.48 | 0.048 | 460 | 25.8 | 11.3 | 0.51 | 0.41 | 108 | 88.4 | |
| 02-N23-01-MET-S | 0.08 | 4.82 | 9.3 | 575 | 1.2 | 0.27 | 9.7 | 66.9 | 21.0 | 2.45 | 0.047 | 286 | 33.6 | 10.4 | 0.50 | 0.55 | 118 | 82.0 | |
| 02-L01-01-MET-S | 0.07 | 2.59 | 7.6 | 259 | 0.6 | 0.10 | 5.5 | 38.0 | 8.8 | 1.37 | 0.021 | 197 | 10.5 | 7.2 | 0.31 | 0.29 | 58.0 | 42.8 | Clay Layer |
| 02-L04-01-MET-S | 0.09 | 3.78 | 10.2 | 385 | 0.7 | 0.16 | 8.3 | 55.6 | 15.6 | 2.11 | 0.036 | 314 | 20.3 | 11.6 | 0.52 | 0.44 | 95.9 | 72.1 | |
| 02-L06-01-MET-S | 0.05 | 4.58 | 10.0 | 486 | 1.2 | 0.19 | 9.6 | 68.3 | 18.5 | 2.43 | 0.044 | 335 | 32.6 | 9.3 | 0.50 | 0.49 | 110 | 77.7 | |
| 02-L07-01-MET-S | 0.05 | 4.07 | 8.7 | 437 | 1.0 | 0.19 | 8.4 | 60.3 | 17.6 | 2.15 | 0.041 | 282 | 29.7 | 8.0 | 0.47 | 0.46 | 102 | 69.7 | Clay Layer |
| 02-L08-01-MET-S | 0.26 | 1.64 | 6.8 | 415 | 0.6 | 0.08 | 3.8 | 31.7 | 7.1 | 0.99 | 0.012 | 167 | 8.5 | 7.2 | 0.34 | 0.21 | 37.5 | 30.5 | |
| 02-L08-02-MET-S | 0.07 | 3.43 | 9.0 | 534 | 0.9 | 0.17 | 7.3 | 54.5 | 14.5 | 1.97 | 0.033 | 249 | 26.3 | 7.4 | 0.42 | 0.43 | 85.4 | 61.2 | |
| 02-L09-01-MET-S | 0.08 | 2.23 | 11.0 | 243 | 0.8 | 0.10 | 6.2 | 38.8 | 6.9 | 1.70 | 0.019 | 216 | 11.9 | 9.5 | 0.39 | 0.26 | 52.4 | 50.6 | Clay Layer |
| 02-3A-01-MET-S | 0.07 | 4.71 | 13.7 | 512 | 0.8 | 0.17 | 8.5 | 65.6 | 21.4 | 2.75 | 0.061 | 372 | 27.5 | 12.9 | 0.54 | 0.52 | 109 | 83.8 | |
| 02-3B-01-MET-S | 0.07 | 5.03 | 12.7 | 518 | 0.9 | 0.23 | 8.8 | 71.3 | 22.1 | 2.81 | 0.058 | 361 | 28.3 | 14.1 | 0.54 | 0.51 | 115 | 89.1 | |
| 02-4A-01-MET-S | 0.08 | 4.28 | 8.9 | 535 | 0.6 | 0.31 | 9.5 | 66.0 | 21.5 | 2.44 | 0.042 | 430 | 29.7 | 11.6 | 0.56 | 0.50 | 99.3 | 88.2 | Clay Layer |
| 02-4B-01-MET-S | 0.05 | 2.02 | 4.9 | 221 | 0.5 | 0.17 | 5.5 | 28.7 | 8.2 | 1.27 | 0.016 | 208 | 13.8 | 5.4 | 0.29 | 0.22 | 48.6 | 44.7 | |
| 02-4C-01-MET-S | 0.01 | 1.56 | 4.3 | 165 | 0.3 | 0.05 | 4.0 | 23.3 | 4.2 | 1.16 | 0.007 | 196 | 11.9 | 4.1 | 0.19 | 0.18 | 44.8 | 23.9 | |
| 02-5A-01-MET-S | 0.07 | 5.42 | 11.3 | 538 | 1.3 | 0.19 | 11.4 | 72.8 | 21.5 | 2.82 | 0.049 | 533 | 37.1 | 11.0 | 0.52 | 0.55 | 131 | 87.2 | Clay Layer |
| 02-5B-01-MET-S | 0.05 | 1.72 | 6.9 | 221 | 0.7 | 0.05 | 4.6 | 19.7 | 4.8 | 1.03 | 0.008 | 149 | 11.3 | 5.9 | 0.20 | 0.21 | 38.0 | 21.5 | |
| 02-5D-01-MET-S | 0.03 | 3.36 | 7.3 | 341 | 0.5 | 0.19 | 7.0 | 54.5 | 11.2 | 1.92 | 0.024 | 321 | 24.1 | 6.3 | 0.39 | 0.30 | 71.1 | 68.9 | |
| 02-5D-02-MET-S | 0.07 | 3.74 | 7.4 | 372 | 0.6 | 0.18 | 8.3 | 58.3 | 13.9 | 2.13 | 0.032 | 386 | 27.5 | 8.2 | 0.41 | 0.35 | 90.9 | 76.4 | Clay Layer |
| 02-5D-03-MET-S | 0.05 | 3.82 | 7.3 | 401 | 0.9 | 0.23 | 9.3 | 55.5 | 13.7 | 2.05 | 0.030 | 340 | 32.2 | 6.2 | 0.40 | 0.42 | 89.0 | 69.6 | |

| Sample Identification | Ag (µg/g) | Al (%) | As (µg/g) | Ba (µg/g) | Be (µg/g) | Cd (µg/g) | Co (µg/g) | Cr (µg/g) | Cu (µg/g) | Fe (%) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) | Comments |
|-----------------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|---------------|
| 02-5E-01-MET-S | 0.06 | 1.65 | 8.2 | 203 | 0.5 | 0.06 | 4.0 | 19.2 | 4.3 | 0.78 | 0.009 | 178 | 8.6 | 5.1 | 0.25 | 0.20 | 36.2 | 24.1 | |
| 02-5F-01-MET-S | 0.07 | 4.38 | 8.0 | 455 | 1.0 | 0.18 | 10.6 | 67.4 | 19.3 | 2.04 | 0.043 | 467 | 34.3 | 8.6 | 0.49 | 0.46 | 101 | 78.2 | |
| 02-5H-01-MET-S | 0.06 | 2.85 | 8.0 | 313 | 0.6 | 0.14 | 6.1 | 50.5 | 11.3 | 1.75 | 0.026 | 219 | 19.6 | 8.4 | 0.35 | 0.29 | 65.8 | 60.5 | |
| 02-5(0)-01-MET-S | 0.05 | 3.12 | 7.4 | 363 | 0.8 | 0.21 | 8.1 | 50.3 | 12.6 | 1.84 | 0.025 | 345 | 27.9 | 6.1 | 0.37 | 0.39 | 74.9 | 59.5 | |
| 02-5(1)-01-MET-S | 0.05 | 1.72 | 7.5 | 223 | 0.6 | 0.07 | 4.3 | 20.9 | 4.4 | 1.11 | 0.006 | 149 | 11.0 | 5.3 | 0.25 | 0.33 | 40.2 | 26.7 | |
| 02-5(5)-01-MET-S | 0.05 | 3.47 | 8.0 | 357 | 0.5 | 0.13 | 7.3 | 49.6 | 13.6 | 2.01 | 0.060 | 296 | 21.6 | 8.6 | 0.41 | 0.35 | 91.8 | 64.7 | |
| 02-5(10)-01-MET-S #1 | 0.07 | 2.62 | 8.5 | 271 | 0.5 | 0.12 | 6.1 | 39.9 | 10.2 | 1.52 | 0.021 | 234 | 17.7 | 7.3 | 0.33 | 0.26 | 71.0 | 55.7 | Lab Duplicate |
| 02-5(10)-01-MET-S #2 | 0.06 | 2.56 | 8.2 | 271 | 0.5 | 0.12 | 6.0 | 39.3 | 9.6 | 1.48 | 0.020 | 234 | 17.9 | 7.2 | 0.33 | 0.26 | 71.0 | 55.2 | Lab Duplicate |
| 02-CAN-01-MET-S | 0.11 | 3.54 | 4.5 | 439 | 0.9 | 0.59 | 10.2 | 64.2 | 26.9 | 2.09 | 0.077 | 329 | 45.2 | 8.2 | 0.86 | 0.48 | 133 | 100 | |
| 02-KUPB-01-MET-S | 0.17 | 3.70 | 13.0 | 589 | 1.4 | 0.28 | 14.5 | 64.4 | 34.1 | 3.03 | 0.066 | 1240 | 39.1 | 18.4 | 0.70 | 0.34 | 82.5 | 96.3 | Borrow Pit |

MMS Beaufort Sea ANIMDA Project: Summer 2002 Sampling

Statistics for Trace Metal Concentrations and Total Organic Carbon (TOC) Content in Sediment Samples (dry weight). Field Triplicates and Lab Duplicate have been averaged prior to statistical analysis.

| Station Grouping | Statistic | Ag (µg/g) | Al (%) | As (µg/g) | Ba (µg/g) | Be (µg/g) | Cd (µg/g) | Co (µg/g) | Cr (µg/g) | Cu (µg/g) | Fe (%) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) |
|-------------------------------|-----------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|
| Northstar Stations N01-N21 | Mean | 0.09 | 4.35 | 10.0 | 456 | 1.1 | 0.17 | 10.2 | 63.4 | 18.6 | 2.44 | 0.043 | 419 | 28.9 | 10.4 | 0.47 | 0.46 | 106 | 75.5 |
| | Std. Dev. | 0.05 | 1.33 | 2.7 | 103 | 0.2 | 0.05 | 2.8 | 17.9 | 6.4 | 0.69 | 0.015 | 156 | 9.2 | 2.9 | 0.11 | 0.12 | 34.0 | 23.1 |
| | n | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| | Maximum | 0.31 | 5.92 | 14.1 | 582 | 1.6 | 0.27 | 16.2 | 83.4 | 26.3 | 3.28 | 0.061 | 789 | 42.9 | 15.3 | 0.60 | 0.59 | 146 | 107 |
| | Minimum | 0.04 | 1.65 | 4.2 | 212 | 0.8 | 0.05 | 5.2 | 22.4 | 5.4 | 0.89 | 0.009 | 143 | 8.1 | 5.1 | 0.25 | 0.2 | 28.4 | 27.6 |
| Liberty Stations L01-L09 | Mean | 0.10 | 3.19 | 9.0 | 394 | 0.8 | 0.14 | 7.0 | 49.6 | 12.7 | 1.82 | 0.029 | 251 | 20.0 | 8.6 | 0.42 | 0.37 | 77.3 | 57.8 |
| | Std. Dev. | 0.07 | 1.06 | 1.5 | 109 | 0.2 | 0.05 | 2.0 | 13.5 | 5.0 | 0.50 | 0.012 | 62.2 | 9.8 | 1.6 | 0.08 | 0.11 | 27.9 | 17.2 |
| | n | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | Maximum | 0.26 | 4.58 | 11 | 534 | 1.2 | 0.19 | 9.6 | 68.3 | 18.5 | 2.43 | 0.044 | 335 | 32.6 | 11.6 | 0.52 | 0.49 | 110 | 77.7 |
| | Minimum | 0.05 | 1.64 | 6.8 | 243 | 0.6 | 0.08 | 3.8 | 31.7 | 6.9 | 0.99 | 0.012 | 167 | 8.5 | 7.2 | 0.31 | 0.21 | 37.5 | 30.5 |
| BSMP Stations 3A-5(10) | Mean | 0.06 | 3.21 | 8.4 | 351 | 0.7 | 0.15 | 7.1 | 46.7 | 12.8 | 1.82 | 0.031 | 299 | 21.9 | 8.1 | 0.38 | 0.36 | 76.7 | 58.6 |
| | Std. Dev. | 0.02 | 1.33 | 2.5 | 133 | 0.2 | 0.07 | 2.4 | 20.1 | 6.9 | 0.68 | 0.020 | 120 | 9.2 | 3.1 | 0.13 | 0.13 | 30.8 | 25.1 |
| | n | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | Maximum | 0.08 | 5.42 | 13.7 | 538 | 1.3 | 0.31 | 11.4 | 72.8 | 22.1 | 2.82 | 0.061 | 533 | 37.1 | 14.1 | 0.56 | 0.55 | 131 | 89.1 |
| | Minimum | 0.01 | 1.56 | 4.3 | 165 | 0.3 | 0.05 | 4 | 19.2 | 4.2 | 0.78 | 0.006 | 149 | 8.6 | 4.1 | 0.19 | 0.18 | 36.2 | 21.5 |
| Cumulative* | Mean | 0.08 | 3.79 | 9.3 | 411 | 0.9 | 0.16 | 8.7 | 55.7 | 15.7 | 2.14 | 0.037 | 353 | 25.2 | 9.4 | 0.43 | 0.41 | 91.6 | 67.1 |
| | Std. Dev. | 0.05 | 1.39 | 2.6 | 122 | 0.3 | 0.06 | 3.0 | 19.4 | 6.9 | 0.72 | 0.017 | 149 | 9.9 | 3.0 | 0.12 | 0.13 | 34.6 | 24.2 |
| | n | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| | Maximum | 0.31 | 5.92 | 14.1 | 582 | 1.6 | 0.31 | 16.2 | 83.4 | 26.3 | 3.28 | 0.061 | 789 | 42.9 | 15.3 | 0.60 | 0.59 | 146 | 107 |
| | Minimum | 0.01 | 1.56 | 4.2 | 165 | 0.3 | 0.05 | 3.8 | 19.2 | 4.2 | 0.78 | 0.006 | 143 | 8.1 | 4.1 | 0.19 | 0.18 | 28.4 | 21.5 |

* Excluding CAN and KUPB sediment samples.

Results for the Marine Sediment Certified Reference Materials (CRMs) MESS-2 and MESS-3 certified by the National Research Council of Canada (NRC) and Standard Reference Material (SRM) Trace Elements in Water #1643d certified by the National Institute of Standards and Technology (NIST).

| Reference Material | Ag (µg/g) | Al (%) | As (µg/g) | Ba (µg/g) | Be (µg/g) | Cd (µg/g) | Co (µg/g) | Cr (µg/g) | Cu (µg/g) | Fe (%) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) |
|-----------------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|
| CRM MESS-2 | 0.18 | 8.54 | 21.2 | 1060 | 2.3 | 0.25 | 14.5 | 109 | 37.5 | 4.29 | 0.088 | 369 | 48.0 | 20.8 | 1.09 | 0.97 | 257 | 170 |
| This Study | 0.18 | 8.51 | 21.4 | 1020 | 2.2 | 0.24 | 14.1 | 106 | 37.8 | 4.23 | 0.094 | 370 | 48.2 | 21.1 | 1.07 | 0.96 | 255 | 170 |
| | 0.17 | 8.65 | 21.2 | 987 | 2.3 | 0.25 | 13.8 | 104 | 38.2 | 4.21 | - | 354 | 48.2 | 22.9 | 1.13 | 1.03 | 249 | 165 |
| | 0.20 | 8.66 | 21.3 | 1000 | 2.2 | 0.24 | 14.1 | 105 | 38.0 | 4.20 | - | 357 | 49.6 | 22.7 | 1.11 | 1.03 | 250 | 166 |
| CRM MESS-2 | 0.18 | 8.57 | 20.7 | - | 2.32 | 0.24 | 13.8 | 106 | 39.3 | 4.35 | 0.092 | 365 | 49.3 | 21.9 | 1.09 | 0.98* | 252 | 172 |
| NRC Certified Values | ± 0.02 | ± 0.26 | ± 0.8 | - | ± 0.12 | ± 0.01 | ± 1.4 | ± 8 | ± 2.0 | ± 0.22 | ± 0.009 | ± 21 | ± 1.8 | ± 1.2 | ± 0.13 | - | ± 10 | ± 16 |
| CRM MESS-3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| This Study | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CRM MESS-3 | 0.18 | 8.59 | 21.2 | - | 2.30 | 0.24 | 14.4 | 105 | 33.9 | 4.34 | 0.091 | 324 | 46.9 | 21.1 | 1.02 | 0.90 | 243 | 159 |
| NRC Certified Values | ± 0.02 | ± 0.23 | ± 1.1 | - | ± 0.12 | ± 0.01 | ± 2.0 | ± 4 | ± 1.6 | ± 0.11 | ± 0.009 | ± 12 | ± 2.2 | ± 0.7 | ± 0.09 | ± 0.06 | ± 10 | ± 8 |
| | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) | (ng/L) |
| SRM #1643d | - | - | - | 509.2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| This Study | - | - | - | 507.6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SRM #1643d | 1.270 | 127.6 | 56.02 | 506.5 | 12.53 | 6.47 | 25.00 | 18.53 | 20.5 | 91.2 | - | 37.66 | 58.1 | 18.15 | 54.1 | 7.28 | 35.1 | 72.48 |
| NIST Certified Values | ± 0.057 | ± 3.5 | ± 0.73 | ± 8.9 | ± 0.28 | ± 0.37 | ± 0.59 | ± 0.20 | ± 3.8 | ± 3.9 | - | ± 0.83 | ± 2.7 | ± 0.64 | ± 1.1 | ± 0.25 | ± 1.4 | ± 0.65 |

* Reference Value, not Certified.

** Total Carbon (Inorganic plus Organic).

Method Detection Limits (MDLs).

| | Ag (µg/g) | Al (%) | As (µg/g) | Ba (µg/g) | Be (µg/g) | Cd (µg/g) | Co (µg/g) | Cr (µg/g) | Cu (µg/g) | Fe (%) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) |
|------------------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|
| Method Detection Limit | 0.007 | 0.01 | 0.2 | 1 | 0.1 | 0.02 | 0.3 | 1 | 1.7 | 0.01 | 0.001 | 3 | 0.5 | 0.2 | 0.04 | 0.04 | 10 | 2 |

Percent Spike Recovery.

| | Ag | Al | As | Ba | Be | Cd | Co | Cr | Cu | Fe | Hg | Mn | Ni | Pb | Sb | Tl | V*** | Zn |
|--------------------|------|-------|------|-------|------|------|------|------|------|------|------|-------|------|------|------|------|-------|------|
| Mean | 92.9 | 102.0 | 98.6 | 102.9 | 93.5 | 93.3 | 98.5 | 98.5 | 98.3 | 95.1 | 93.2 | 100.3 | 96.5 | 96.9 | 96.5 | 96.9 | 116.7 | 97.8 |
| Standard Deviation | 2.5 | 2.8 | 5.7 | 4.7 | 1.8 | 1.4 | 5.3 | 4.9 | 2.3 | 4.7 | 5.8 | 1.6 | 0.4 | 3.2 | 3.1 | 4.9 | 2.5 | 3.7 |
| (n =) | 4 | 2 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 9 | 2 | 2 | 4 | 4 | 4 | 2 | 2 |

***Final concentrations are corrected for percent spike recovery.

Estimate of Precision as Percent Relative Standard Deviation (RSD) of Lab Duplicates.

| | Ag | Al | As | Ba | Be | Cd | Co | Cr | Cu | Fe | Hg | Mn | Ni | Pb | Sb | Tl | V | Zn |
|-------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 02-N05-01-MET-S | 0.0 | 1.1 | 0.0 | 0.6 | 0.0 | 0.0 | 0.6 | 0.9 | 0.5 | 0.4 | 5.1 | 0.9 | 0.2 | 1.1 | 0.0 | 1.2 | 1.0 | 1.0 |
| 02-5(10)-01-MET-S | 10.9 | 1.6 | 2.5 | 0.0 | 0.0 | 0.0 | 1.2 | 1.1 | 4.3 | 1.9 | 3.4 | 0.0 | 0.8 | 1.0 | 0.0 | 0.0 | 0.0 | 0.6 |

RSD = (standard deviation / mean) X 100

**Cruise Report for the
2000 Summer
Minerals
Management Service
Field Survey**

Arctic Nearshore
Impact Monitoring in
the Development Area
(ANIMIDA)

Report to
Minerals Management Service

April 30, 2001

Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts
02140-2390 U.S.A.

Reference 72105

Proprietary Information

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of the proposal or quotation.

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List of Tables

Table 1: 2000 MMS ANIMIDA Stations Sampled

List of Attachments

Attachment 1: 2000 Chart of the ANIMIDA Study Area
Attachment 2: 2000 Station Logs
Attachment 3: 2000 Collection Permit

1.0 Introduction

As part of the Minerals Management Service (MMS) program entitled “Arctic Nearshore Impact Monitoring in the Development Area”(ANIMIDA), the second summer season field survey of the program was conducted from August 12 to August 28, 2000. The scientific crew, on board the MMS Vessel 1273, collected samples for chemical and other analyses from the program study area. This cruise report summarizes the activities and samples collected during the 2000 summer field survey.

During the 2000 ANIMIDA summer sampling survey, the following components were successfully completed:

- Collected sediment samples at 42 stations: 15 historic Beaufort Sea Monitoring Program (BSMP) stations, 16 Northstar stations, 6 Liberty stations, and 5 Northstar Pipeline route stations
- Collected a total of 44 surface sediment samples (0 to 1 cm) for hydrocarbon and metals chemistry (triplicates at 2 stations)
- Collected 10 bivalve/amphipod samples
- Collected 5 source sediment/peat samples (4 river stations)
- Collected current and turbidity profiles along 6 transect lines around Northstar (10 total profiles)
- Collected 30 suspended sediment samples at 10 stations (corresponding to current and turbidity profile stations)
- Collected fish samples in three areas: Northstar, Liberty, and Cross Island (background)
- Delivered field samples to analytical laboratories for appropriate analyses

2.0 Schedule

The 2000 cruise was conducted from August 15 to August 28, 2000, and coincided with a period of expected favorable ice conditions in the program study area. Members of the field team arrived in Prudhoe Bay, Alaska between August 15 and 18, 2000. Initial “check-out” of the MMS Vessel 1273 was performed between August 12 and 15 by ship’s captain Mark Mertz (TEG Ocean Services). Field sampling personnel from Arthur D. Little, Inc. (ADL), Florida Institute of Technology (FIT), and Applied Marine Sciences (AMS) participated in the survey. The scientific team and ship’s captain

conducted the work on an 18 hour-a-day basis depending on favorable operating conditions.

3.0 Cruise Operations and Samples Collected

The MMS Vessel 1273 served as the survey platform for the summer 2000 field work. The MMS Vessel 1273 was delivered to Prudhoe Bay, Alaska by MMS prior to the survey and launched after inspection by MMS and ADL representatives. The MMS Vessel 1273 was also used to deploy current meters for the MMS University of Alaska CMI program after the ANIMIDA survey. The ANIMIDA field survey was performed in four phases largely controlled by mobilization and logistical considerations. A complete list of the sampling stations that were targeted and sampled in the study area is included in Table 1. Table 1 also provides the station type, latitude and longitude, depth, date and time of sampling, and the type of chemical analysis for each sample. Attachment 1, the chart of the ANIMIDA study area, shows the locations of the 2000 sampling stations. Additional daily survey and sampling station information is included in the 2000 Station Logs (Attachment 2). The following narrative summarizes each phase of the field survey.

Phase 1: Mobilization

August 12

Ship's Captain (Mark Mertz) arrives Deadhorse, AK, inspects MMS Vessel 1273, and takes custody of the vessel after inspection.

August 12 - 15

Vessel 1273 shakedown in Prudhoe Bay, including implementation of necessary repairs/modifications (Mark Mertz). August 15 - ANIMIDA field team (John Brown – ADL, Jordan Gold – AMS, Bob Trocine – FIT, and Rob Rember – FIT) arrive in Deadhorse, AK – PBOC (ARCO).

August 16

Mobilization of Vessel 1273 by ANIMIDA field team.

Phase 2: Northstar Area Sampling

August 17

Field team completes first survey leg to the northwest of Northstar. Jordan Gold remains onshore to prep nets for fishing the following day. Additionally, Jordan Gold contacts Fred Bue from Alaska Department of Fish and Game (ADF&G) to get permission to use a gill net, as the fyke net could not be deployed in the deeper waters around Northstar. Field team encounters heavy ice to NW of Northstar Island at stations 5B & 5E and then samples 10 Northstar stations.

August 18

Gill net is deployed at three locations around Northstar during the day. No fish are caught at any location. Between sets, the field team samples 6 stations in the vicinity of Northstar Island. Jack Huntress – ADL and John Trefry – FIT arrive at PBOC.

August 19

Field team completes the sampling of stations around Northstar including those along the pipeline route. Jordan Gold remains onshore to work on fish permits and Bob Trocine works at West Dock Seawater Treatment Plant (STP) to filter water samples.

Phase 3: Liberty Area Sampling

August 20 – 22

Having received permission to anchor the 1273 overnight in the lee of Endicott, the field team fuels the 1273 and heads for the Liberty Prospect area. The next three days involve sampling eastern BSMP and Liberty stations during the day and driving back to PBOC at night. Captain Mark Mertz remains on the boat at night to keep watch. Field team is shuttled back and forth from shore with the Zodiac.

On August 22 the final sediment sampling station is completed (station 5D near Stump Island). The field team visits Stump Island and finds several tar “patties” (5 to 20 cm in diameter) on the Gywydr Bay side of the island. Two tar patties are collected for possible analysis.

During this time arrangements are finalized for a helicopter flight to the Colville River for sediment sampling.

Phase 4: Turbidity/Suspended Sediment, Fish and Source Sampling

August 23

The MMS Vessel 1273 spends the day around Northstar performing turbidity tows, fishing, and water (suspended sediment) sampling. In all, ten transect lines (turbidity tows) are completed covering the four sides of the island (see Attachment 1). After two preliminary tows it is apparent (due to turbidity changes with depth) that it will be necessary to perform a shallow tow along a transect line and then go back along the same line with the instrument at a greater depth. Water samples are taken at four locations around Northstar, corresponding to the turbidity tows, for suspended sediment analysis.

In between transects, Jordan Gold sets a longline (50 hooks spaced evenly over ~70feet) and gill net. Both are retrieved without fish at the end of the day and then reset.

August 24

BP/ARCO helicopter takes team to two locations on the Colville River for sediment and water sampling. Peat is not found at either location. John Trefry comments that the bank at the southern Colville sampling location has eroded significantly since last year. On return, the team samples Kugaruk River sediment at the end of the access road, where it is also possible to obtain a sample of peat.

Team splits up in afternoon. FIT personnel work at the lab at the STP to filter water samples; other team members, including Michael Stewman – BP/ARCO, head out to Northstar to retrieve gill net and longline. No fish are caught.

John Brown – ADL departs from Deadhorse late in the morning.

August 25

John Trefry – FIT, Jack Huntress – ADL, and Rob Rember – FIT leave PBOC to sample the Sagavanirktok River near mile marker 401 on the Dalton Highway. FIT personnel head back to STP to finish filtering and begin demobilization.

Field team takes trawl to Northstar and completes one 30-minute trawl around western side of island approximately 0.3NM from shore. The following fauna are captured in the first trawl: isopods, snailfish, snails, shrimp, sculpin, anemone, amphipods, baby arctic cod, brachiopods, and kelp. The sculpin, although a target species, is released due to its small size. All of the other specimens captured are also released alive. Field team heads back to West Dock to discuss options.

John Trefry – FIT departs from Deadhorse in morning.

August 26

It is decided that baby arctic cod (<3") in sum could be used for analysis, so field team heads back to Northstar to trawl for cod. When captured, cod are broken up into three groups: rinsed, unrinsed, and formalin-preserved. Each sample contains 10 to 15 cod. The same trawl and sampling procedure is followed at Cross Island.

Kathleen Gannon from University of Alaska Fairbanks arrives on night shuttle.

August 27

Sampling team, including Kathleen Gannon – UAF, heads to Liberty to follow trawling procedures performed at Northstar and Cross Island. Cod are obtained with two trawls and are preserved. One large sculpin is caught and preserved for organic analysis.

Upon return to West Dock, equipment, supplies, and samples are prepared for shipment from Deadhorse, AK.

Rob Rember and Bob Trocine – FIT depart Deadhorse in afternoon.

August 28

Jack Huntress – ADL and Kathleen Gannon – UAF depart Deadhorse in morning.

Jordan Gold – AMS prepares gear for shipment and departs the morning of the 29th from Deadhorse.

Mark Mertz – TEG remains to captain boat for University of Alaska CMI program.

Source Sample Collection

As noted previously, several source samples were collected as part of the summer survey. The source samples collected included water for suspended particulate analysis, and sediment for organic and inorganic analysis, from the Sagavanirktok, Kuparuk, and Colville Rivers. A peat sample was obtained from the bank of the Kuparuk River. Six samples of Prudhoe Bay field oils were also taken (provided by the BP/ARCO oil lab at PBOC) as potential source samples for hydrocarbons.

4.0 Sampling Procedures

Standard sampling procedures were followed at each sampling station according to the Field Logistics and Sampling Plan for the 2000 Minerals Management Service Field Survey (ADL, 2000).

Typical sampling procedures included: deployment of amphipod traps (as required); conductivity, temperature, and depth (CTD) and current measurements with the CTD/Doppler current meter (at suspended sediment stations); and surface sediment grab sample collection using a modified Van-Veen Grab (for sediments and bivalves – as appropriate).

Photodocumentation, station logs, and field notes were recorded during the field survey. The station logs for each sampling station are included in Attachment 2. Each station log includes a description of the sampling location, observations, number and type(s) of samples collected, and comments.

5.0 Technical Issues

The most significant technical difficulty during this survey was capturing fish suitable for chemical and biological analysis. Initially it was realized that a fyke net would not be suitable for use around Northstar Island. Fred Bue of the ADF&G was contacted to extend the collection permit for gill net and longline use. After several daily sets and some overnight attempts, it was clear that the gill net was not going to capture the fish necessary. Similarly, the longline did not produce any results.

After trying these passive methods, it was apparent that a more active pursuit of fish needed to be employed. Jordan Gold contacted the ADF&G once more to get permission to use an otter trawl. Although the otter trawl did not capture many of the target species, it was more successful. It is recommended that future fishing operations apply similar methods, or be modified to establish areas where fyke nets can be deployed.

6.0 References

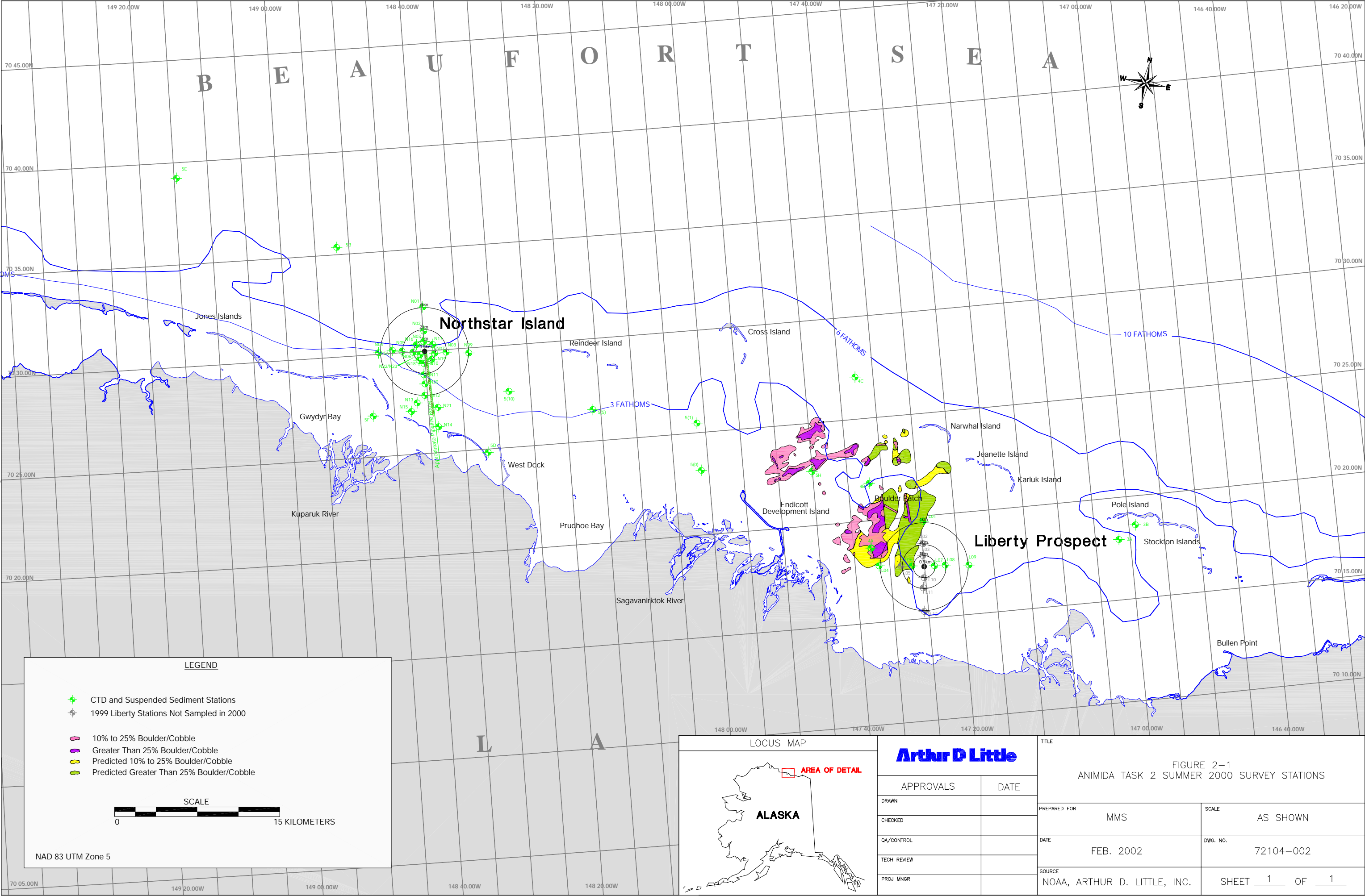
Arthur D. Little, Inc. 2000. *2000 Field Sampling and Logistics Plan for the Minerals Management Service ANIMIDA Field Survey*. Prepared for Minerals Management Service. August.

Table 1: 2000 MMS Animida Stations Sampled

| Station ID | Station Type | Sample Type | Latitude | Longitude | Water Depth (ft) | Date | Time | Analysis/Replicates | | | | | | | | | | QC | Comments |
|------------|--------------|------------------|------------|-------------|------------------|-----------|------------|---------------------|--------|--------|-----------------|--------|--------------------|-----|-----------------|-----|----|--|----------|
| | | | | | | | | Organics | Metals | GS/TOC | 13C & Methyl Hg | Tissue | Suspended Sediment | ODB | Doppler Current | CTD | | | |
| 3A | BSMP | Sed.-Grab/Tissue | 70°16.988 | 147°05.470 | 22 | 8/20/2000 | 1615-1715 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | NA | (Astarte) | |
| 3B | BSMP | Sed. Grab | 70°17.917 | 147°02.549 | 15 | 8/20/2000 | 1735-1745 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| 4A | BSMP | Sed.-Grab/Tissue | 70°18.460 | 147°40.289 | 16 | 8/21/2000 | 1010-1030 | 1 | 1 | 1 | 1 | 10 | NA | 1 | NA | NA | NA | (Annovx,Fish) | |
| 4B | BSMP | Sed. Grab | 70°21.034 | 147°40.007 | 23 | 8/21/2000 | 1705-1750 | 1 | 1 | 1 | 1 | NA | 3 | 1 | 1 | 1 | NA | | |
| 4C | BSMP | Sed. Grab | 70°26.144 | 147°42.957 | 30 | 8/21/2000 | 1840-1850 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| 5(0) | BSMP | Sed.-Grab/Tissue | 70°22.210 | 147°47.744 | 18 | 8/22/2000 | 0915-1230 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | NA | (Annonvx) | |
| 5(1) | BSMP | Sed. Grab | 70°25.024 | 148°03.569 | 21 | 8/22/2000 | 1255-1256 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| 5(10) | BSMP | Sed. Grab | 70°27.323 | 148°29.980 | 26 | 8/22/2000 | 1420-1430 | 1 | 1 | 1 | 1 | 1 | NA | 1 | NA | NA | NA | attempted biota sampling | |
| 5(5) | BSMP | Sed. Grab | 70°26.106 | 147°18.127 | 23 | 8/22/2000 | 1340-1347 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| 5A | BSMP | Sed. Grab | 70°29.704 | 148°46.103 | 39 | 8/18/2000 | 1713-1722 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| 5B | BSMP | Sed. Grab | 70°34.890 | 148°55.040 | 47 | 8/17/2000 | 1120-1140 | 1 | 1 | 1 | 1 | 1 | NA | 1 | NA | NA | NA | "water spiking range finder" | |
| 5D | BSMP | Sed. Grab | 70°24.488 | 148°33.605 | 7 | 8/22/2000 | 1459-1505 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| 5E | BSMP | Sed. Grab | 70°38.392 | 149°16.577 | 63 | 8/17/2000 | 1250-1305 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| 5F | BSMP | Sed.-Grab/Tissue | 70°26.486 | 148°49.550 | 6 | 8/19/1900 | 1330-1430 | 1 | 1 | 1 | 1 | 1 | NA | 1 | NA | NA | NA | (Cyrtodaria) | |
| 5H | BSMP | Sed.-Grab/Tissue | 70°22.210 | 147°47.744 | 23 | 8/22/2000 | 1020-1110 | 1 | 1 | 1 | 1 | 1 | NA | 1 | NA | NA | NA | (Astarte) | |
| L01 | Liberty | Sed. Grab | 70°18.930 | 147°27.130 | 23 | 8/21/2000 | 1505-1512 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| L04 | Liberty | Sed. Grab | 70°17.032 | 147°39.897 | 17 | 8/20/2000 | 1400-1415 | 1 | 1 | 1 | 1 | 1 | NA | 1 | NA | NA | NA | attempted biota sampling | |
| L06 | Liberty | Sed. Grab | 70°16.881 | 147°33.978 | 23 | 8/21/2000 | 1055-1105 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| L07 | Liberty | Sed. Grab | 70°16.789 | 147°31.966 | 22 | 8/21/2000 | 1120-1130 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| L08 | Liberty | Sed.-Grab/Tissue | 70°16.701 | 147°30.298 | 21 | 8/21/2000 | 1140-1325 | 3 | 3 | 3 | 3 | 1 | 5 | 3 | 1 | 1 | NA | (Astarte) | |
| L09 | Liberty | Sed.-Grab/Tissue | 70°16.568 | 147°27.130 | 22 | 8/21/2000 | 1350-1420 | 1 | 1 | 1 | 1 | 1 | NA | 1 | NA | NA | NA | (Astarte) | |
| N01 | Northstar | Sed. Grab | 70°31.644 | 148°41.411 | 43 | 8/17/2000 | 1600-1615 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | 1 | | |
| N02 | Northstar | Sed. Grab | 70°30.525 | 148°41.411 | 46 | 8/17/2000 | 1540-1550 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| N03 | Northstar | Sed.-Grab/Tissue | 70°30.005 | 148°41.575 | 43 | 8/17/2000 | 1520-1530 | 1 | 1 | 1 | 1 | 1 | NA | 1 | NA | NA | NA | (Annonvx) | |
| N04 | Northstar | Sed. Grab | 70°29.674 | 148°48.148 | 34 | 8/18/2000 | 1740-1750 | 2 | 2 | 2 | 2 | NA | NA | 2 | NA | NA | NA | | |
| N05 | Northstar | Sed. Grab | 70°29.662 | 148°44.699 | 41 | 8/18/2000 | 1605-1615 | 1 | 1 | 1 | 1 | NA | 3 | 1 | 1 | 1 | NA | attempted biota sampling | |
| N06 | Northstar | Sed. Grab | 70°29.537 | 148°43.194 | 37 | 8/17/2000 | 1837-1846 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| N07 | Northstar | Sed. Grab | 70°29.544 | 148°40.140 | 40 | 8/17/2000 | 1740-1750 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| N08 | Northstar | Sed. Grab | 70°29.407 | 148°38.429 | 38 | 8/18/2000 | 1305-1345 | 1 | 1 | 1 | 1 | NA | 3 | 1 | 1 | 1 | NA | | |
| N09 | Northstar | Sed. Grab | 70°29.323 | 148°35.214 | 35 | 8/18/2000 | 1900-1910 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| N10 | Northstar | Sed. Grab | 70°28.997 | 148°41.742 | 37 | 8/17/2000 | 1810-1817 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| N11 | Northstar | Sed. Grab | 70°28.424 | 148°41.904 | 30 | 8/18/2000 | 1430-1535 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | attempted biota sampling | |
| N12 | Northstar | Sed.-Grab/Tissue | 70°27.321 | 148°42.078 | 21 | 8/19/2000 | 1010-1020 | 1 | 1 | 1 | 1 | 1 | NA | 1 | NA | NA | NA | (Annonvx) | |
| N13 | Northstar | Sed.-Grab/Tissue | 70°27.004 | 148°43.552 | 15 | 8/19/2000 | 1030-1150 | 3 | 3 | 3 | 3 | 1 | 5 | 3 | 1 | 1 | NA | (Annonvx) | |
| N14 | Northstar | Sed. Grab | 70°25.978 | 148°40.459 | 12 | 8/19/2000 | 1540-1615 | 1 | 1 | 1 | 1 | NA | 2 | 1 | 1 | 1 | NA | | |
| N15 | Northstar | Sed. Grab | 70°26.710 | 148°44.570 | 8 | 8/19/2000 | 1205-1230 | 1 | 1 | 1 | 1 | NA | 2 | 1 | 1 | 1 | NA | | |
| N16 | Northstar | Sed. Grab | 70°29.910 | 148°42.558 | 41 | 8/17/2000 | 1850-1901 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| N17 | Northstar | Sed. Grab | 70°29.829 | 148°40.379 | 42 | 8/17/2000 | 1648-1735 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | | |
| N18 | Northstar | Sed.-Grab/Tissue | 70°29.082 | 148°42.151 | 37 | 8/17/2000 | 1825-1832 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | (Annonvx) | |
| N19 | Northstar | Sed. Grab | 70°29.097 | 148°40.554 | 37 | 8/17/2000 | 1755-1805 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | attempted biota sampling | |
| N20 | Northstar | Sed. Grab | 70°27.951 | 148°41.687 | 25 | 8/18/2000 | 1517-1525 | 2 | 2 | 2 | 2 | NA | NA | 2 | NA | NA | NA | | |
| N21 | Northstar | Sed. Grab | 70°26.819 | 148°40.587 | 18 | 8/19/2000 | 1654-1730 | 1 | 1 | 1 | 1 | NA | 3 | 1 | 1 | 1 | NA | | |
| N22 | Northstar | Sed. Grab | 70°29.340 | 148°41.868 | 28 | 8/23/2000 | 1425-1435 | 1 | 1 | 1 | NS | NA | NA | 1 | NA | NA | NA | gravel from pipline "cover" | |
| N23 | Northstar | Sed. Grab | 70°29.340 | 148°41.868 | 36 | 8/23/2000 | 1435-1445 | 1 | 1 | 1 | 1 | NA | NA | 1 | NA | NA | NA | 15 feet off pipeline | |
| SAG-01 | Source | Sed. Grab | 70°01.680 | 148°33.770 | NA | 8/25/2000 | 0800-0810 | 1 | 1 | NS | NS | NA | 1 | 1 | NA | NA | NA | Sagavanirktok River @ ~0.5 mi. S of Mile 401 | |
| KUP-02 | Source | Peat | 70°17.700 | 148°53.370 | NA | 8/24/2000 | 1255-1305 | 1 | 1 | NS | NS | NA | 1 | 1 | NA | NA | NA | Kuparuk River ~2 mi. S. of bridge crossing | |
| KUP-01 | Source | Sed. | 70°17.700 | 148°59.370 | NA | 8/24/2000 | 1255-1305 | 1 | 1 | NS | NS | NA | 1 | 1 | NA | NA | NA | Kuparuk River at bridge crossing | |
| COL-01 | Source | Sed. | 70°15.960 | 150°49.290 | NA | 8/24/2000 | 1100-1110 | 1 | 1 | NS | NS | NA | 1 | 1 | NA | NA | NA | Colville River N. of Nuiqsut | |
| COL-02 | Source | Sed. | 70°11.360 | 150°52.120 | NA | 8/24/2000 | 1130-1140 | 1 | 1 | NS | NS | NA | 1 | 1 | NA | NA | NA | Colville River S. of Nuiqsut (sed. and peat) | |
| L00 | Liberty | Tissue | ~70°23.424 | ~147°46.907 | ~22 | 8/27/2000 | 1430-1500 | 1 | NS | NS | NS | 3 | NA | NS | NA | NA | NA | Otter trawl | |
| B00 | BSMP | Tissue | ~70°26.144 | ~148°03.569 | ~20 | 8/26/2000 | 1730-1800 | 1 | NS | NS | NS | 3 | NA | NS | NA | NA | NA | Otter trawl | |
| N00 | Northstar | Tissue/Sed. | ~70°36.674 | ~148°30.212 | ~35 | 8/26/2000 | 13110-1340 | 1 | NS | NS | NS | 3 | NA | NS | NA | NA | NA | Otter trawl - sed. from net | |

Notes:
NA = Not applicable
NS = Not sampled
Trawl sample locations are approximate

Attachment 1: 2000 Chart of the ANIMIDA Study Area



Attachment 2: 2000 Station Logs

Station Log
 Date: 2000
 Cruise No. 2000-01

Station Name: 2000-01

Station Type: 2000-01

Station Location: 2000-01

Station Data: 2000-01

Station Data: 2000-01

Station Data: 2000-01

Station Data: 2000-01

Station Data: 2000-01

Arthur D Little**Station Log**Station ID 3ADate 8/20/00Client MMSTime 1615 - 1715Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 3ALatitude 70° 16.958**Station Type**BSMP Northstar/Liberty/AlternateLongitude 148 147° 05.470**Field Observations and Measurements**Wind Speed 15 kt Wind Direction NESeas/Ice ~2 ft. seas, no iceWater Depth 22 ft.Conductivity, Temperature, Depth (CTD) ✓CTD Depth(s) ~20 ft.Doppler Current ✓Turbidity ✓**Acoustics:** Air Water Other **Comments:****Samples Collected****Surface Sediments:** Van Veen Grab ✓ No. of Replicates 1 (+ ~19 for clams)

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|--------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>DDBC1</u> |

Sediment Texture (check all that apply):>50% silt/clay ✓ Fine ✓ Coarse Sand Gravel Shell Hatch Mixed Indications of Anoxia: Yes No ✓ H₂S Odor: Yes No ✓Comments: Clay w/ ~1-2 cm overlying hard.**Suspended Sediments:**Surface 1m Mid-Water 3m Bottom 5m Other **Comments:****Biota:** (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin Safron Cod Arctic Cod Char Cisco Flounder Whitefish **Clams** Astarte ✓ Cyrtodaria Macoma Portlandia Comments: Gill net in @ 1615 Gill net in @ 1815 No fish some kelp pieces.**Quality Control Samples**Field Blank Equipment Blank Other **Overall Comments:**~20 grabs yielded 250 mL jar of large (2-3 cm)
Astarte 3 macoma (2 cm) also found (not collected)Field Personnel: JB, BI, RR, JH, JG, MMSignature: Date: 8/20/00

Arthur D Little**Station Log**Station ID 3BDate 8/20/00Client MMSTime 1735-1745Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 3B**Station Type**BSMP Northstar/Liberty/AlternateLatitude 70°17.917Longitude 147°02.549**Field Observations and Measurements**Wind Speed 5 KTS Wind Direction ENE Seas/Ice 1-2 ft. seas no iceWater Depth 15 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples CollectedSurface Sediments: Van Veen Grab ☒ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------------|
| <u>/</u> | <u>/</u> | <u>/</u> | <u>/</u> | | <u>/</u> | <u>ODBG</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: Mud on surface w/ many amphipod? tubes.**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Calmer in the lee of Pele Is.Field Personnel: JB, BT, RR, JH, JG, MMSignature: [Signature] Date: 8/20/00

| | | | | | |
|---|----------|---|---|--|-------------------|
| Arthur D Little | | Station Log | | Station ID <u>4A</u> Client MMS Project 2000 ANIMIDA Case No. 68533 | |
| Date <u>8/21/2000</u> Time <u>1010 - 1030</u> | | | | | |
| Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA) | | | | | |
| Sampling Location <u>JB 34/00</u> Station Number <u>70°18'46.0" 4A</u> Latitude <u>70°18'46.0"</u> Longitude <u>147°40'28.9"</u> | | | | Station Type <u>BSMP/Northstar/Liberty/Alternate</u> | |
| Field Observations and Measurements | | | | | |
| Wind Speed <u>12 KT</u> | | Wind Direction <u>NNE</u> | | Seas/Ice <u>2-3 ft. no ice</u> | |
| Water Depth <u>16 ft.</u> | | Conductivity, Temperature, Depth (CTD) _____ | | | |
| CTD Depth(s) _____ | | Doppler Current _____ | | Turbidity _____ | |
| Acoustics: Air _____ | | Water _____ | | Other _____ | |
| Comments: _____ | | | | | |
| Samples Collected | | | | | |
| Surface Sediments: Van Veen Grab <input checked="" type="checkbox"/> No. of Replicates <u>1</u> (<u>2 grabs, 1st not good</u>) | | | | | |
| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg |
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>ODB(1)</u> |
| Sediment Texture (check all that apply): | | | | | |
| >50% silt/clay <input checked="" type="checkbox"/> | | Fine _____ | Coarse Sand <input checked="" type="checkbox"/> | Gravel _____ | Shell Hatch _____ |
| Indications of Anoxia: Yes _____ No <input checked="" type="checkbox"/> | | H ₂ S Odor: Yes _____ No <input checked="" type="checkbox"/> | | Mixed _____ | |
| Comments: <u>stiff clay mixed w/ coarse sand particles & small gravel only ~4cm penetration</u> | | | | | |
| Suspended Sediments: | | | | | |
| Surface _____ | | Mid-Water _____ | | Bottom _____ | |
| | | | | Other _____ | |
| Comments: _____ | | | | | |
| Biota: (circle species collected for analysis) | | | | | |
| Amphipods Annonyx _____ | | | | | |
| Fish: Sculpin _____ Safron Cod _____ Arctic Cod <u>1</u> Char _____ Cisco <u>3</u> Flounder _____ Whitefish _____ | | | | | |
| Clams Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____ | | | | | |
| Comments: <u>Amphipod Trap in @ 1010, Gill net in @ 1020</u> | | | | | |
| Quality Control Samples | | | | | |
| Field Blank _____ | | Equipment Blank _____ | | Other _____ | |
| Overall Comments: <u>Amphipod Trap in @ 1550 enough for small sample ~ 20ml</u> <u>Gill net in @ 1555 but caught in prop.</u> <u>10 Cisco and 1 Dollyarden in gill net. 2 Cisco Released because they were "mangled" by the gill net.</u> | | | | | |
| Field Personnel: <u>JB, JJ, JH, RR, JE, MM</u> | | | | | |
| Signature: <u>Alan J. Pin</u> | | | | Date: <u>8/21/2000</u> | |

Arthur D Little**Station Log**

Station ID

4A

Date 8-21-00

Time 1630

Client MMS

Project 2000 ANIMIDA

Case No. 68533

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**

Station Number

4A

Latitude 70° 18.460

Longitude 17° 40.289

Station Type

BSMP/Northstar/Liberty/Alternate

Field Observations and Measurements

Wind Speed 10 knots

Wind Direction

NE

Seas/Ice

2 foot no ice

Water Depth 16 ft.

Conductivity, Temperature, Depth (CTD)

CTD Depth(s)

Doppler Current

Turbidity

Acoustics: Air

Water

Other

Comments:

Samples Collected**Surface Sediments:**

Van Veen Grab

No. of Replicates

3

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay

Fine

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

(circle species collected for analysis)

Amphipods Annonyx**Fish:** Sculpin

Safron Cod

Arctic Cod

Char

Cisco

Flounder

Whitefish

Clams Astarte

Cyrtodaria

Macoma

Portlandia

Comments:

Livers for organics

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

Eight Cisco labeled C1-C8 and one Dolly labeled D01 had livers taken for organic analysis sample IDs are as follows

00-4A-C1-PHC-T-F 00-4A-C8-PHC-T-F and 00-4A-D01-PHC-T-F

Field Personnel:

JB, JT, JH, MM, BT, RR

Signature:

Date:

8-21-00

Arthur D Little

Station Log

Station ID 4BDate 8/21/00
Time 1705-1750Client MMS
Project 2000 ANIMIDA
Case No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 4BLatitude 70° 21.034Longitude 147° 40.007**Station Type**BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 12 kts Wind Direction ENE Seas/Ice 2 ft.Water Depth 23 ft. Conductivity, Temperature, Depth (CTD) ☒CTD Depth(s) ~ 22 ft. Doppler Current ☒ Turbidity ☒

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples CollectedSurface Sediments: Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODB (i)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: mud w/ clay underneath, Dead Astarte shells & some pebbles.**Suspended Sediments:**Surface 1 m Mid-Water 3 m Bottom 6 m Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

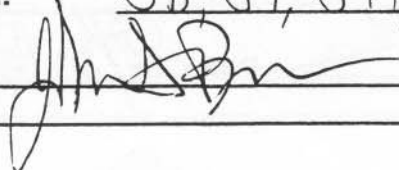
Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, JT, JH, RR, JG, MM

Signature:



Date:

8/21/2000

Arthur D Little**Station Log**Station ID 4CDate 8/21/00Client MMSTime 1840-1850Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 4C**Station Type**BSMB/Northstar/Liberty/AlternateLatitude 70° 26.144Longitude 147° 42.957**Field Observations and Measurements**Wind Speed 10 kt Wind Direction NNE Seas/Ice 1 ftWater Depth 30 ft Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|-------------|--------------|------------|----------|-----------------|-----------|---------------|
| <u>✓(1)</u> | <u>(1) ✓</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODB(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel ☒ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: 1-2 cm fine mud overlying "pea sized" gravel. Shallow grab ~ 6 cm**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

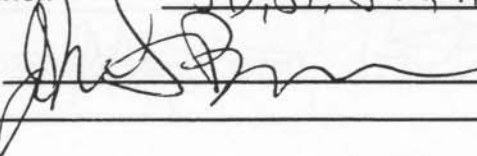
Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, JT, JH, RR, JG, MM

Signature:

Date: 8/21/00

Arthur D Little**Station Log**Station ID 5(0)Date 8/22/00
Time 0915-1230Client MMS
Project 2000 ANIMIDA
Case No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 5(0)Latitude 70° 22' 21.0"
70° 22' 46.8"Longitude 147° 47' 7.44"
148° 00.380**Station Type**BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 12-15 kts Wind Direction ENE Seas/Ice 2 ft.Water Depth 18 ft Conductivity, Temperature, Depth (CTD) ☒CTD Depth(s) ☒ ~17 ft. Doppler Current ☒ Turbidity ☒Acoustics: Air ☐ Water ☐ Other ☐Comments: 1205-1230**Samples Collected**Surface Sediments: Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>008(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand ☐ Gravel ☐ Shell Hatch ☐ Mixed ☐Indications of Anoxia: Yes ☐ No ☐ H₂S Odor: Yes ☐ No ☐Comments: Fine sand w/ 2-3 mm surface of mud**Suspended Sediments:**Surface 1 m Mid-Water 3 m Bottom 5 m Other ☐

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin ☐ Safron Cod ☐ Arctic Cod ☐ Char ☐ Cisco ☐ Flounder ☐ Whitefish ☐**Clams** Astarte Cyrtodaria Macoma PortlandiaComments: Amphipod traps in @ 0915 (2 traps) traps in @ 1205 ~ 100 mL Anonyx**Quality Control Samples**Field Blank ☐ Equipment Blank ☐ Other ☐

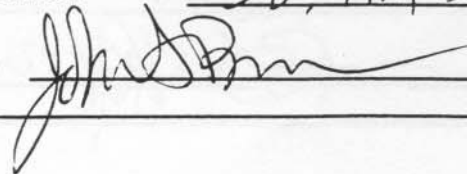
Overall Comments:

good Amphipod sample!

Field Personnel:

JB, RR, BT, JH, MM

Signature:



Date:

8/22/00

Arthur D Little**Station Log**Station ID 5(1)Date 8/22/00Client MMSTime 1255-1256Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 5(1)**Station Type**BSMB/Northstar/Liberty/AlternateLatitude 70° 25.024Longitude 148° 03.569'**Field Observations and Measurements**Wind Speed 12-15 kt Wind Direction ENE Seas/Ice 22 ft. no iceWater Depth 21 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples CollectedSurface Sediments: Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>ODS (1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: Fine sand mixed w/ mud**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

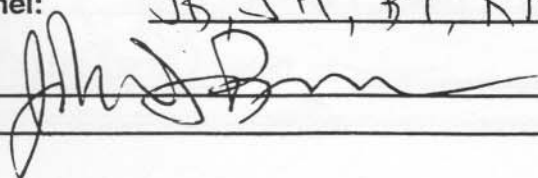
Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, JH, BT, RB, MM

Signature:

Date: 8/22/00

Arthur D Little**Station Log**Station ID 5(5)Client MMS
Project 2000 ANIMIDA
Case No. 68533Date 8/22/00Time 1340-1347**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location 5(5)
Station Number 5(5)

Station Type

BSMP/Northstar/Liberty/AlternateLatitude 70° 26' 10.6Longitude 148° 18' 12.770° 26' 10.6 JSD**Field Observations and Measurements**Wind Speed 12-15 Kts Wind Direction ENE Seas/Ice ~2 ft. no iceWater Depth 23 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments: Still cold & gray ~33 °F**Samples Collected**Surface Sediments: Van Veen Grab ☒ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|-------------|-------------|-------------|-------------|-----------------|-----------|---------------|
| <u>✓(1)</u> | <u>✓(1)</u> | <u>✓(1)</u> | <u>✓(1)</u> | | <u>1</u> | <u>QDB(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: Fine sand w/mud mixed in.**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Only 2 more sed stations for the survey!Field Personnel: JB, JH, BT, RR, MMSignature: [Signature]Date: 8/22/00

Arthur D Little**Station Log**Station ID 5(10)Date 8/22/00Client MMSTime 1420-1430Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 5(10)**Station Type**BSMP Northstar/Liberty/AlternateLatitude 70° 27.323'Longitude 148° 29.980'**Field Observations and Measurements**Wind Speed 12-15 kts Wind Direction ENE Seas/Ice 2-3 ft. no iceWater Depth 26 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:**Samples Collected**Surface Sediments: Van Veen Grab ☒ No. of Replicates _____

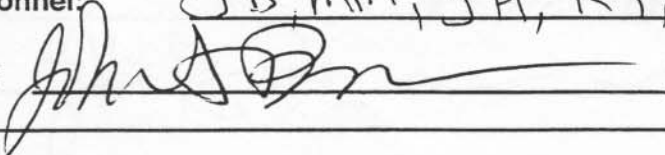
| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODB(1)</u> |

Sediment Texture (check all that apply):>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: fine sand w/ some mud mixed in.**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:**Biota:** (circle species collected for analysis)**Amphipods** Annonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: Amphipod Traps (2) in @ 1420 - traps in @ ~1600 2 amphipods - no sample**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:After Amphipod Traps we have finished.
also 1 shrimp in the traps.**Field Personnel:**JB, MM, JH, RT, RR**Signature:****Date:**8/22/00

Arthur D Little**Station Log**Station ID 5AClient MMSProject 2000 ANIMIDACase No. 68533Date 8/18/00Time 17:22 173-1722

514° Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling LocationStation Number 5ALatitude 70° 29.704Longitude 148° 46.103**Station Type**BSMP Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 5-8 kt. Wind Direction WSeas/Ice light chop - <5% ice bergsWater Depth 39 ft.

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____

Water _____

Other _____

Comments:

Samples Collected**Surface Sediments:**Van Veen Grab ☒No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODB(i)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____Comments: Possible candidate for core in future ~5-6 cm mud. overlying clay.**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Good mud in grab

Field Personnel:

JB, BT, JE, KR, MM

Signature:

[Signature]

Date:

8/18/00

Arthur D Little

Station Log

Station ID 5BClient MMSProject 2000 ANIMIDACase No. 68533Date 8/17/00Time 1120-1140**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 5BLatitude 70° 34.890'Longitude 148° 55.040'**Station Type**BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed None Wind Direction NA Seas/Ice Calm 30-40% ice coverWater Depth 4749 ft Conductivity, Temperature, Depth (CTD) _____CTD Depth(s) BB 91700 Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples CollectedSurface Sediments: Van Veen Grab ☒ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|------------|------------|------------|------------|-----------------|-----------|----------------|
| <u>1</u> ✓ | <u>1</u> ✓ | <u>1</u> ✓ | <u>1</u> ✓ | | | <u>ODB (1)</u> |

(3 samples from 1 grab)

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____Comments: Fine Sand mixed w/ coarse sand ~ 1mm clay flake on surface**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis) Too much ice to Deploy Amphipod Traps.**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

R. Bomber & B. Trough collected 2, 2-L H₂O samples from the Zojiak ~ 25' from vessel (upwind) for Task 7 water "spiking range finder"

Field Personnel:

TB, BT, RR, M. MertzSignature: Arthur D LittleDate: 8/17/2000

Arthur D Little**Station Log**Station ID 5DClient MMSProject 2000 ANIMIDACase No. 68533Date 8/22/00Time 1459-1505**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 5DLatitude 70°24.488Longitude 148° 33.605'**Station Type**BSMP Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 10-12 kt. Wind Direction ENESeas/Ice 1 ft. no iceWater Depth 7 ft.

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____ Turbidity _____

Acoustics: Air _____

Water _____ Other _____

Comments: in the lee of STP/first Dock**Samples Collected**Surface Sediments: Van Veen Grab ☒

No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODBC(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: mud w/ some fine sand and black particles (peat??)**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Last sediment station of the survey !!!

Field Personnel:

JB, RR, JH, MM, BT

Signature:

[Signature]

Date:

8/22/00

Arthur D Little**Station Log**Station ID 5EDate 8/17/2000Client MMSTime 1250 - 1305Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 5E**Station Type**Latitude 70° 38.932'Longitude 149° 16.557'BSMB/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 5-7 kt. Wind Direction SW Seas/Ice Calm ~ 30% large ice bergsWater Depth 63 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples CollectedSurface Sediments: Van Veen Grab ✓ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODB(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ✓ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes ? No ✓ H₂S Odor: Yes _____ No ✓ Black streaks in underComments: fine-med sand overlying gray clay - many ~50-100 Comacrids in grab**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis) Too much ice for Amphipeds.

Amphipods Annonyx _____

Fish: Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____

Clams Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

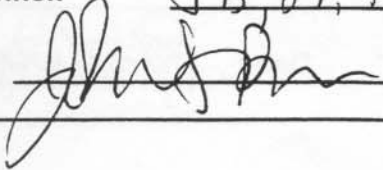
Overall Comments:

Drizzle & Rain. wind picking up.

Field Personnel:

JB, BT, RR, mm

Signature:



Date:

8/17/2000

Arthur D Little

Station Log

Station ID 5FDate 8/19/2000
Time ~1330-1430Client MMS
Project 2000 ANIMIDA
Case No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number 5F
Latitude 70°26.486Longitude 148°49.550' **Station Type** BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 2-3 kt. Wind Direction NE Seas/Ice calm / none
Water Depth 6 ft. Conductivity, Temperature, Depth (CTD) _____
CTD Depth(s) _____ Doppler Current _____ Turbidity _____
Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab ☒ No. of Replicates (1)

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|-----|-----------------|-----------|-----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | | | <u>1</u> | <u>0.05 (1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: fine sand mixed w/ mud some amphipod tubes**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria ☒ Macoma _____ Portlandia _____Comments: ~35 grabs yielded ~175 mL of cyrtodaria clams**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

Field Personnel:

JB, JT, RR, JH, MMSignature: John A. BrownDate: 8/19/2000

Arthur D Little**Station Log**

Station ID

5H

Date

8/22/00

Time

1020-1110

Client

MMS

Project

2000 ANIMIDA

Case No.

68533

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**

Station Number

5H

Station Type

BSMP Northstar/Liberty/Alternate

Latitude 70° 22.210'Longitude 147° 47.744'**Field Observations and Measurements**Wind Speed 15 ktWind Direction ENESeas/Ice 2-3 ft. seas in horizonWater Depth 23 ft.

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____

Water _____

Other _____

Comments:

Samples Collected**Surface Sediments:**Van Veen Grab ☒

No. of Replicates

1

(30 for clam)

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|--------|
| 1 | 1 | 1 | 1 | | 1 | ODB(1) |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel ☒ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: Fine Sand, w/ mud and gravel mixed in clam shells.**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota:

(circle species collected for analysis)

Amphipods Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte ☒ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: ~30 grabs yielded ~175 mL Astarte 1cm - 2cm.**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Cold and windy '1' ~33°F

Field Personnel:

BBT, JH, RR, MM

Signature:

[Signature]

Date:

8/22/00

Arthur D Little**Station Log**Station ID L01Client MMSProject 2000 ANIMIDACase No. 68533Date 8/21/00Time 1505-1512**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location L01Station Number L01Latitude 70° 18.930Longitude 147° 27.130

Station Type

BSMP/Northstar/Liberty/Alternate

Field Observations and MeasurementsWind Speed 10 kts Wind Direction ENE Seas/Ice 2-3 ft. no iceWater Depth 23 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples CollectedSurface Sediments: Van Veen Grab 1 No. of Replicates 1 1st grab washed out, 2nd OK

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>ODB(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ☒ Coarse Sand _____ Gravel ☒ Shell Hatch _____ Mixed ☒Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: Mixed sed fine mud on surface (2cm) gravel & mud/clay underneath.**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, JT, RR, JH, JG, MMSignature: [Signature]Date: 8/21/00

Arthur D Little**Station Log**Station ID L04Date 8/20/00Time 1400 - 1415

Client MMS

Project 2000 ANIMIDA

Case No. 68533

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**Station Number L04Latitude 70°17.032Longitude 147°39.897**Station Type**BSMP/Northstar Liberty Alternate**Field Observations and Measurements**Wind Speed 15 KTS Wind Direction NE Seas/Ice 2-4 ft. No iceWater Depth 17 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODS(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: mud/sand mix**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: Amphipod traps (2) in @ 1400 Retrieved @ 1955 No amphipods.**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

only ~ 15 amphipods in Traps and ~ 12 Isopods
not enough for a sample.Heading to Endicott for
night Anchorage!!

Field Personnel:

JB, BT, RP, JH, JG, mm

Signature:

[Signature]

Date:

8/20/00

Arthur D Little

Station Log

Station ID L06Client MMSProject 2000 ANIMIDACase No. 68533Date 8/21/2000Time 1055-1105**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number L06Latitude 70°16.881Longitude 147°33.978**Station Type**BSMP/Northstar Liberty Alternate**Field Observations and Measurements**Wind Speed 10-12 Kts Wind Direction NNE Seas/Ice 2-3 ft. seas no iceWater Depth 23 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples CollectedSurface Sediments: Van Veen Grab ☒ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODBL</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: mud and clay fine black organic particles on surface post??**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

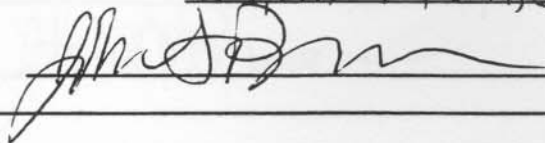
Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, JJ, BR, JH, JG,

Signature:



Date:

8/21/00

Arthur D Little**Station Log**Station ID L07Date 8/21/00Client MMSTime 1130-1130Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number L07**Station Type**

BSMP/Northstar/Liberty/Alternate

Latitude 70° 16.789Longitude 147° 31.966**Field Observations and Measurements**Wind Speed 12 Kts Wind Direction NNE Seas/Ice 2-3 ft. no iceWater Depth 22 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments: still ~33 °F but no snow. Cold & gray.**Samples Collected**Surface Sediments: Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODBC</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: clay/mud/some fine sand - black particles on surface red??**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

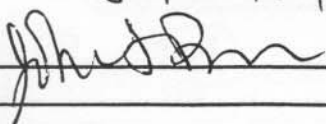
Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, JT, JH, RR, JG, mm

Signature:

Date: 8/21/00

Arthur D Little**Station Log**Station ID L08Date 8/21/00Time 1140-1325Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number L08Latitude 70° 16.701Longitude 147° 30.298**Station Type**

BSMP/Northstar/Liberty/Alternate

Field Observations and MeasurementsWind Speed 12-14 kt Wind Direction NNE Seas/Ice 2-3 ft. no iceWater Depth 21 ft. Conductivity, Temperature, Depth (CTD) ✓CTD Depth(s) ~20 ft. Doppler Current ✓ Turbidity ✓

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples CollectedSurface Sediments: Van Veen Grab ✓ No. of Replicates 3 (~20 grabs for clams)

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>3</u> | <u>3</u> | <u>3</u> | <u>3</u> | | <u>3</u> | <u>ODB(3)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ✓ Fine ✓ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ✓ H₂S Odor: Yes _____ No ✓Comments: mud/fine sand/gravel**Suspended Sediments:**Surface 1m (3) Mid-Water 3m Bottom 5m Other _____Comments: TriPLICATE @ 1m depth.**Biota:** (circle species collected for analysis)**Amphipods** Annonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte ✓ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: Amphipod Traps in @ 1140 Amphipod Traps in @ 1430 ~20 Annonyx (no sample taken)**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: ~20 grabs yielded ~200 mL Astarte clams
2-3cm in diameter.Field Personnel: JB, JT, JH, RB, JG, MMSignature: [Signature]Date: 8/21/00

Arthur D Little

Station Log

Station ID L09Date 8/21/00Time 1350 - 1420Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number L09Latitude 70° 16.568Longitude 147° 27.130**Station Type**BSMP/Northstar Liberty Alternate**Field Observations and Measurements**Wind Speed 12 kts Wind Direction NNE Seas/Ice 2-3 ft. no iceWater Depth 23 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____Comments: Cold 33°F, Cloudy, gray 4-5 mi visibility.**Samples Collected****Surface Sediments:** Van Veen Grab ☒ No. of Replicates 1 (~10 for clams)

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>ODB(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed ☒Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: Fine Sand, some surface "flock" patches.**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte ☒ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: 110 grabs yielded ~200 mL of 2-3 cm diameter Astarte.**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Ecodiag w/ J. Trefry & R. Rember deployed to collect 2L water sample from surface @ 1350

Field Personnel:

JB, JT, RR, JH, JG, MM

Signature:

John J. Rember

Date:

8/21/2000

Arthur D Little**Station Log**Station ID N01Date 8/17/00Time 1600-1615Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N01Latitude 70° 31.644Longitude 148° 41.411**Station Type**BSMR Northstar Liberty/Alternate**Field Observations and Measurements**Wind Speed 5-7 Kt. Wind Direction SE Seas/Ice ~10% ice Light chop.Water Depth 43 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments: Some large bergs in area.**Samples Collected**Surface Sediments: Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODD (1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____Comments: Fine Sand**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control SamplesField Blank _____ Equipment Blank ☒ (1) Other _____Overall Comments: One Equip. Blank for metals & organics.DE water rinsed through grab after Decon.Field Personnel: JB, BT, RR, MMSignature: Arthur D LittleDate: 8/17/2000

Arthur D Little**Station Log**

Station ID N02
Client MMS
Project 2000 ANIMIDA
Case No. 68533

Date 8/17/00
Time 1540 - 1550

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**Station Number N02Latitude 70° 30.525Longitude 148° 41.411**Station Type**BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 5-7 kt. Wind Direction SW Seas/Ice <5% bergs light chop.Water Depth 46 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected

Surface Sediments: Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODBC</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____Comments: Compact clay w/ overlying fine fleck**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: 1 amphipod observed in grab.Field Personnel: JB, BT, RR, mmSignature: [Signature]Date: 8/17/00

Arthur D Little

Station Log

Station ID N03Client MMSProject 2000 ANIMIDACase No. 68533Date 8/17/2000Time 1520-1530**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N03Latitude 70° 30.005Longitude 148° 41.575**Station Type**BSMP Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 5-7kt Wind Direction SESeas/Ice >5% bergs, light chopWater Depth 43 ft

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____

Water _____

Other _____

Comments:**Samples Collected****Surface Sediments:**Van Veen Grab ☒No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|---|----------|------------|----------|-----------------|-----------|----------------|
| <input checked="" type="checkbox"/> (1) | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODB (1)</u> |

Sediment Texture (check all that apply):>50% silt/clay ☒

Fine _____

Coarse Sand _____

Gravel _____

Shell Hatch _____

Mixed _____

Indications of Anoxia: ? Yes _____

No _____

H₂S Odor: Yes _____

No _____

Comments: gray clay w/ light layer 1-2 cm of brown flock on surface**Suspended Sediments:**

Surface _____

Mid-Water _____

Bottom _____

Other _____

Comments:**Biota:**

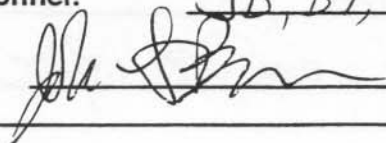
(circle species collected for analysis)

Amphipod trap in @ 1520 Retrieved @ 1915**Amphipods** Anonyx ☒**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: Small sample ~ 7-10 gm**Quality Control Samples**

Field Blank _____

Equipment Blank _____

Other _____

Overall Comments:37 small (1 inch) shrimp discardedUsed 2 Amphipod Traps baited w/ sardines**Field Personnel:**JB, BT, RR, MM**Signature:****Date:**8/17/2000

| Arthur D Little | Station Log | Station ID <u>N04</u> Client MMS Project 2000 ANIMIDA Case No. 68533 | | | | | | | | | | | | | | |
|---|--------------------|---|----------|-----------------|------------|----------------|-----------------|-----------|-------|----------|----------|----------|----------|--|--|----------------|
| Date <u>8/18/2000</u> Time <u>1740 - 1750</u> | | | | | | | | | | | | | | | | |
| Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA) | | | | | | | | | | | | | | | | |
| Sampling Location Station Number <u>N04</u> Latitude <u>70° 29.674</u> Longitude <u>148° 48.148</u> | | Station Type <u>BSMR</u> Northstar/Liberty/Alternate | | | | | | | | | | | | | | |
| Field Observations and Measurements Wind Speed <u>5-7 Kk</u> Wind Direction <u>N</u> Seas/Ice <u>Light chop 2-4% ice</u> Water Depth <u>34'</u> Conductivity, Temperature, Depth (CTD) _____ CTD Depth(s) _____ Doppler Current _____ Turbidity _____ Acoustics: Air _____ Water _____ Other _____ | | | | | | | | | | | | | | | | |
| Comments: | | | | | | | | | | | | | | | | |
| Samples Collected Surface Sediments: Van Veen Grab <input checked="" type="checkbox"/> No. of Replicates <u>2</u> | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr> <th>Organics</th> <th>Metals</th> <th>Grain Size</th> <th>TOC</th> <th>¹³C</th> <th>Methyl Hg</th> <th>Other</th> </tr> <tr> <td><u>1</u></td> <td><u>1</u></td> <td><u>1</u></td> <td><u>1</u></td> <td></td> <td></td> <td><u>ODB (1)</u></td> </tr> </table> | | | Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other | <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>ODB (1)</u> |
| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other | | | | | | | | | | |
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>ODB (1)</u> | | | | | | | | | | |
| Sediment Texture (check all that apply): >50% silt/clay <input checked="" type="checkbox"/> Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____ Indications of Anoxia: Yes _____ No <input checked="" type="checkbox"/> H ₂ S Odor: Yes _____ No _____ Comments: <u>1st grab washed out. soft mud underlying clay in 2nd grab</u> | | | | | | | | | | | | | | | | |
| Suspended Sediments: Surface _____ Mid-Water _____ Bottom _____ Other _____ | | | | | | | | | | | | | | | | |
| Comments: | | | | | | | | | | | | | | | | |
| Biota: (circle species collected for analysis) Amphipods Annonyx _____ Fish: Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____ Clams Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____ Comments: | | | | | | | | | | | | | | | | |
| Quality Control Samples Field Blank _____ Equipment Blank _____ Other _____ | | | | | | | | | | | | | | | | |
| Overall Comments: <u>Red/orange "layer" (1 mm thick) in the mud/clay under the surface - photo taken.</u> _____ _____ _____ | | | | | | | | | | | | | | | | |
| Field Personnel: <u>JB, BT, JG, RR, mm</u> | | | | | | | | | | | | | | | | |
| Signature: <u>[Signature]</u> | | Date: <u>8/18/00</u> | | | | | | | | | | | | | | |

Arthur D Little

Station Log

Station ID

N05

Date

8/18/2000

Time

1605-1650

Client

MMS

Project

2000 ANIMIDA

Case No.

68533

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**

Station Number

N05

Latitude 70 29.622

Longitude 148 44.699

Station Type

BSMP Northstar Liberty/Alternate

Field Observations and Measurements

Wind Speed 8-10 kt. Wind Direction W

Seas/Ice 1 ft. waves ~4% ice bergs

Water Depth 41 ft.

Conductivity, Temperature, Depth (CTD) ✓

CTD Depth(s) ~36 ft.

Doppler Current ✓

Turbidity ✓

Acoustics: Air

Water

Other

Comments:

Samples Collected**Surface Sediments:**

Van Veen Grab ✓

No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|---------|
| 1 | 1 | 1 | 1 | 1 | 1 | ODB (1) |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:

Surface 1 m Mid-Water 5 m Bottom 10 m Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Set gill net 200' @ 1605. Net under ice berg when out of ice checked net @ 1650 no fish. ~1810 Net on board no fish only 2-3 isopods.

Field Personnel:

JB, BI, JE, BR, MM

Signature:

John A. Brown

Date:

8/18/2000

Arthur D Little

Station Log

Station ID N06Client MMSProject 2000 ANIMIDACase No. 68533Date 8/17/2000Time 1837-1846**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N06

Latitude _____

Longitude _____

Station TypeBSMP Northstar Liberty/Altern**Field Observations and Measurements**Wind Speed 7 Kts Wind Direction SSeas/Ice light chop. < 1% ice bergs

Water Depth _____

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____Comments: Drizzle light fog**Samples Collected****Surface Sediments:** Van Veen Grab ☒ No. of Replicates ☒

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|----------------|
| | | | | | | <u>ODBC(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____Comments: Hard clay w/ fine sand mix**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

Field Personnel:

JB, BI, RR, MMSignature: [Signature]Date: 8/17/2000

Arthur D Little**Station Log**Station ID N07Date 8/17/00

Client MMS

Time 1740-1750

Project 2000 ANIMIDA

Case No. 68533

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**Station Number N07**Station Type**BSMP Northstar Liberty/AlternateLatitude 70°29.544Longitude 148°40.140**Field Observations and Measurements**Wind Speed 5 kt. Wind Direction SSE Seas/Ice light chop no ice within 0.5 mi.Water Depth 40 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____**Comments:****Samples Collected****Surface Sediments:** Van Veen Grab ☒ No. of Replicates 1

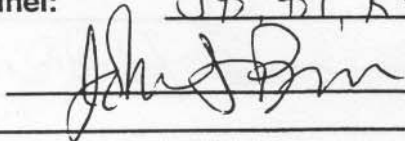
| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>ODB(1)</u> |

Sediment Texture (check all that apply):>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____Comments: Grab full right to doors. Side w/ least disturbed surface sampled**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:**Biota:** (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____**Comments:****Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:**Field Personnel:**JB, BT, RR, mm**Signature:**Date: 8/17/2000

Arthur D Little

Station Log

Station ID N08Date 8/15/00Client MMSTime 1305 - 1345Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N08Latitude 70°29.402'Longitude 148°38.429'**Station Type**BSMP Northstar Liberty/Alternate**Field Observations and Measurements**Wind Speed 15-20 mph Wind Direction W Seas/Ice 2-3 ft. waves. Some large Brgs ~1%Water Depth 38 ft. Conductivity, Temperature, Depth (CTD) ✓CTD Depth(s) 34 ft. Doppler Current ✓ Turbidity ✓Acoustics: Air Water Other

Comments: Heavy ice ~ 1mi to the N and NW.

Samples CollectedSurface Sediments: Van Veen Grab ✓ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------------------|
| <u> </u> | <u> </u> | <u> </u> | <u> </u> | <u> </u> | <u> </u> | <u>ODB (v) (only 2 vials)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ✓ Fine ✓ Coarse Sand Gravel Shell Hatch Mixed Indications of Anoxia: Yes No H₂S Odor: Yes No

Comments: Very fine sand w/ ~2-4 mm mud on surface

Suspended Sediments:Surface ✓ Mid-Water ✓ Bottom ✓ Other

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin Safron Cod Arctic Cod Char Cisco Flounder Whitefish **Clams** Astarte Cyrtodaria Macoma Portlandia

Comments:

Quality Control SamplesField Blank Equipment Blank Other

Overall Comments:

Field Personnel:

JB, BT, JG^{Jordan}, RR, MMSignature: Date: 8/18/2000

| Arthur D Little | <h1 style="margin: 0;">Station Log</h1> | Station ID <u>N09</u> Client <u>MMS</u> Project <u>2000 ANIMIDA</u> Case No. <u>68533</u> | | | | | | | | | | | | | | |
|---|--|--|----------|-----------------|------------|---------|-----------------|-----------|-------|---|---|---|---|--|--|---------|
| Date <u>8/18/2000</u> Time <u>1908 - 1910</u> | | | | | | | | | | | | | | | | |
| Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA) | | | | | | | | | | | | | | | | |
| Sampling Location Station Number <u>N09</u> Latitude <u>70° 24.323</u> | Station Type BSMP <u>Northstar</u> / Liberty / Alternate | | | | | | | | | | | | | | | |
| Longitude <u>148° 35.214</u> | | | | | | | | | | | | | | | | |
| Field Observations and Measurements Wind Speed <u>NONE</u> Wind Direction <u>NA</u> Seas/Ice <u>calm</u> <u>10-20% Berqs</u> Water Depth <u>35 ft.</u> Conductivity, Temperature, Depth (CTD) _____ CTD Depth(s) _____ Doppler Current _____ Turbidity _____ Acoustics: Air _____ Water _____ Other _____ | | | | | | | | | | | | | | | | |
| Comments: | | | | | | | | | | | | | | | | |
| Samples Collected Surface Sediments: Van Veen Grab <input checked="" type="checkbox"/> No. of Replicates <u>1</u> | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th style="padding: 2px;">Organics</th> <th style="padding: 2px;">Metals</th> <th style="padding: 2px;">Grain Size</th> <th style="padding: 2px;">TOC</th> <th style="padding: 2px;">¹³C</th> <th style="padding: 2px;">Methyl Hg</th> <th style="padding: 2px;">Other</th> </tr> <tr> <td style="padding: 2px;">1</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> <td style="padding: 2px;">ODBC(1)</td> </tr> </table> | | | Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other | 1 | 1 | 1 | 1 | | | ODBC(1) |
| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other | | | | | | | | | | |
| 1 | 1 | 1 | 1 | | | ODBC(1) | | | | | | | | | | |
| Sediment Texture (check all that apply): >50% silt/clay <u>7</u> Fine <input checked="" type="checkbox"/> Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____ Indications of Anoxia: Yes _____ No _____ H ₂ S Odor: Yes _____ No _____ Comments: <u>Fine Sand ~ 1mm flak on surface - Shallow grab ~ 6 cm deep</u> | | | | | | | | | | | | | | | | |
| Suspended Sediments: Surface _____ Mid-Water _____ Bottom _____ Other _____ | | | | | | | | | | | | | | | | |
| Comments: | | | | | | | | | | | | | | | | |
| Biota: (circle species collected for analysis) Amphipods <u>Annonyx</u> Fish: Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____ Clams <u>Astarte</u> _____ Cyrtodaria _____ Macoma _____ Portlandia _____ Comments: | | | | | | | | | | | | | | | | |
| Quality Control Samples Field Blank _____ Equipment Blank _____ Other _____ | | | | | | | | | | | | | | | | |
| Overall Comments: <u>Heading to West Dock !!</u> _____ _____ _____ _____ | | | | | | | | | | | | | | | | |
| Field Personnel: <u>JB, BT, JG, RR, mm</u> | | | | | | | | | | | | | | | | |
| Signature: <u>[Signature]</u> | | Date: <u>8/18/00</u> | | | | | | | | | | | | | | |

Arthur D Little**Station Log**

Station ID N10
Client MMS
Project 2000 ANIMIDA
Case No. 68533

Date 8/17/00
Time 1810 - 1817

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**

Station Number N10
Latitude 70° 28.997'

Longitude 148° 41.742

Station Type

BSMP/Northstar/Liberty/Alternat

Field Observations and Measurements

Wind Speed 7.10 kt Wind Direction S Seas/Ice light chop, nice
Water Depth 37 ft. Conductivity, Temperature, Depth (CTD) _____
CTD Depth(s) _____ Doppler Current _____ Turbidity _____
Acoustics: Air _____ Water _____ Other _____

Comments: Drizzle and gray

Samples Collected

Surface Sediments: Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>ODB(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____
Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____

Comments: soft clay w/ surface "fleck" some black streaks in clay

Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)

Amphipods Anonyx _____

Fish: Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____

Clams Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

Signature:

Date:

TB, BT, RR, mm

8/17/2000

Arthur D Little

Station Log

Station ID N11Date 8/18/00Time 1430 - 1535Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N11Latitude 70° 28' 42" NLongitude 148° 41.904' W**Station Type**BSMP Northstar / Liberty / Alternate**Field Observations and Measurements**Wind Speed 15 kt Wind Direction WSeas/Ice 2 ft. waves ~1% bergsWater Depth 30 ft

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____

Water _____

Other _____

Comments:

Samples Collected**Surface Sediments:**

Van Veen Grab _____

No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>ODB (1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒Fine ☒

Coarse Sand _____

Gravel _____

Shell Hatch _____

Mixed _____

Indications of Anoxia: Yes _____

No _____

H₂S Odor: Yes _____

No _____

Comments: clay and mud w/ some fine sand**Suspended Sediments:**

Surface _____

Mid-Water _____

Bottom _____

Other _____

Comments:

Biota:

(circle species collected for analysis)

Amphipods Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: 2 Traps Deployed @ 1445**Quality Control Samples**

Field Blank _____

Equipment Blank _____

Other _____

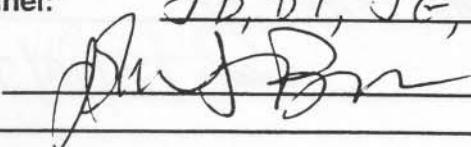
Overall Comments:

Deployed Amphipod traps (2) and gill net ~200 ft at 1445. 1535 gill net on board No fish several 6-8 Isopods.

Field Personnel:

JB, BI, JG, RR, MM

Signature:



Date:

8/18/2000

Arthur D Little**Station Log**

Station ID N12
Client MMS
Project 2000 ANIMIDA
Case No. 68533

Date 8/19/2000Time 1010 - 1020**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N12Latitude 70.27.321Longitude 148° 42.078**Station Type**

BSMP/Northstar/Liberty/Altern

Field Observations and MeasurementsWind Speed 1-2 kt. Wind Direction NE Seas/Ice Calm Rare small bergWater Depth 21 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:**Samples Collected**Surface Sediments: Van Veen Grab ☒ No. of Replicates 1

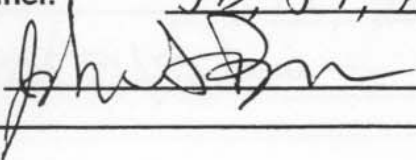
| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>OPB (2)</u> |

Sediment Texture (check all that apply):>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel ☒ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: ~2 cm mud overlying "pea size gravel"**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:**Biota:** (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: 2 Amphipod traps @ 1010 retrieval @ 1735 2 traps yielded ~ 70 ml Anonyx**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Baited Amphipod traps w/ Sardines in mustard sauce**Field Personnel:**JB, JT, RR, JH, ^{ack. untres} MM**Signature:**Date: 8/19/2000

Arthur D Little

Station Log

Station ID N13Date 8/19/2000Time 1030 - 1150Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N13Latitude 70° 27.004Longitude 148° 43.552**Station Type**

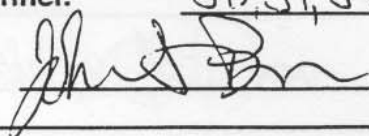
BSMP/Northstar/Liberty/Alternate

Field Observations and MeasurementsWind Speed 0-2 kt Wind Direction NESeas/Ice calm no ice within 1/2 mileWater Depth 15 ft.Conductivity, Temperature, Depth (CTD) ✓CTD Depth(s) ~ 14 ft.Doppler Current ✓Turbidity ✓**Acoustics:**Air Water Other **Comments:****Samples Collected****Surface Sediments:**Van Veen Grab ✓No. of Replicates 3

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>3</u> | <u>3</u> | <u>3</u> | <u>3</u> | | <u>3</u> | <u>ODB(3)</u> |

Sediment Texture (check all that apply):>50% silt/clay ✓Fine Coarse Sand Gravel ✓Shell Hatch Mixed Indications of Anoxia: Yes No ✓H₂S Odor: Yes No ✓Comments: 2-3 cm mud overlying gravel 1-2 cm**Suspended Sediments:**Surface 3 (triplicate)Mid-Water 1Bottom 1Other **Comments:****Biota:**

(circle species collected for analysis)

Amphipods Anonyx**Fish:** Sculpin Safron Cod Arctic Cod Char Cisco Flounder Whitefish **Clams** Astarte Cyrtodaria Macoma Portlandia Comments: Amphipod Trap in @ 1150 Retrieved @ 1745**Quality Control Samples**Field Blank ✓Equipment Blank Other **Overall Comments:**1 Field blank - deck exposure for ~10 mins. collected.Deployed 1 amphipod Trap - yielded ~175 mL Anonyx sp. amphipodBaited w/ sardines in mustard sauceHome to west Dock.**Field Personnel:**JB, JT, JH, RR, MM**Signature:****Date:**8/19/2000

| Arthur D Little | <h1 style="margin: 0;">Station Log</h1> | Station ID <u>N14</u> Client <u>MMS</u> Project <u>2000 ANIMIDA</u> Case No. <u>68533</u> | | | | | | | | | | | | | | |
|--|---|--|----------|-----------------|------------|---------|-----------------|-----------|-------|---|---|---|---|--|---|---------|
| Date <u>8/19/00</u> Time <u>1540 - 1615</u> | | | | | | | | | | | | | | | | |
| Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA) | | | | | | | | | | | | | | | | |
| Sampling Location Station Number <u>N14</u> Latitude <u>70°25.978</u> | Longitude <u>148° 40.459'</u> | Station Type <u>BSMP/Northstar</u> Liberty/Alternate | | | | | | | | | | | | | | |
| Field Observations and Measurements Wind Speed <u>6 Kts</u> Wind Direction <u>NE</u> Seas/Ice <u>light chop none within 1/2 mi.</u> Water Depth <u>12 ft.</u> Conductivity, Temperature, Depth (CTD) <input checked="" type="checkbox"/> CTD Depth(s) _____ Doppler Current <input checked="" type="checkbox"/> Turbidity <input checked="" type="checkbox"/> Acoustics: Air _____ Water _____ Other _____ | | | | | | | | | | | | | | | | |
| Comments: _____ | | | | | | | | | | | | | | | | |
| Samples Collected Surface Sediments: Van Veen Grab <input checked="" type="checkbox"/> No. of Replicates <u>2 grabs (1st over full, 2nd OK)</u> | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th style="padding: 5px;">Organics</th> <th style="padding: 5px;">Metals</th> <th style="padding: 5px;">Grain Size</th> <th style="padding: 5px;">TOC</th> <th style="padding: 5px;">¹³C</th> <th style="padding: 5px;">Methyl Hg</th> <th style="padding: 5px;">Other</th> </tr> <tr> <td style="padding: 5px;">1</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;"></td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">ODB (1)</td> </tr> </table> | | | Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other | 1 | 1 | 1 | 1 | | 1 | ODB (1) |
| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other | | | | | | | | | | |
| 1 | 1 | 1 | 1 | | 1 | ODB (1) | | | | | | | | | | |
| Sediment Texture (check all that apply): >50% silt/clay <input checked="" type="checkbox"/> Fine <input checked="" type="checkbox"/> Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____ Indications of Anoxia: Yes _____ No _____ H ₂ S Odor: Yes _____ No _____ Comments: <u>Deep mud filled grab. ~16 cm deep.</u> | | | | | | | | | | | | | | | | |
| Suspended Sediments: Surface <input checked="" type="checkbox"/> (1m) Mid-Water _____ Bottom <input checked="" type="checkbox"/> (2.5m) Other _____ Comments: _____ | | | | | | | | | | | | | | | | |
| Biota: (circle species collected for analysis) Amphipods Annonyx _____ Fish: Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____ Clams Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____ Comments: _____ | | | | | | | | | | | | | | | | |
| Quality Control Samples Field Blank _____ Equipment Blank _____ Other _____ | | | | | | | | | | | | | | | | |
| Overall Comments: <u>Additional (3rd) grab taken by B. Rember to collect core sample for Age dating (~15cm core depth)</u> _____ _____ _____ | | | | | | | | | | | | | | | | |
| Field Personnel: <u>JB, JT, JH, RR, MM</u> Signature: _____ Date: <u>8/19/2000</u> | | | | | | | | | | | | | | | | |

Arthur D Little**Station Log**

Station ID

N15

Client

MMS

Project

2000 ANIMIDA

Case No.

68533

Date

8/19/2000

Time

1205 - 1230

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**

Station Number

N15

Latitude 70° 26.710Longitude 148° 44.570**Station Type**BSMP Northstar Liberty/Alternate**Field Observations and Measurements**Wind Speed 1-2 ktsWind Direction NESeas/Ice ^{calm seas} No ice in sight ~ 1/4 mi. (foggy)Water Depth 8 ft.

Conductivity, Temperature, Depth (CTD)

CTD Depth(s)

Doppler Current

Turbidity

Acoustics: Air

Water

Other

Comments: Light drizzle and light fog**Samples Collected****Surface Sediments:**Van Veen Grab ☒

No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay

Fine ☒

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No ☒H₂S Odor: YesNo ☒

Comments:

Fine Sand**Suspended Sediments:**Surface 1mMid-Water ~2m

Bottom

Other

Comments:

at anchor.**Biota:**

(circle species collected for analysis)

Amphipods

Annonyx

Fish:

Sculpin

Safron Cod

Arctic Cod

Char

Cisco

Flounder

Whitefish

Clams

Astarte

Cyrtodaria

Macoma

Portlandia

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

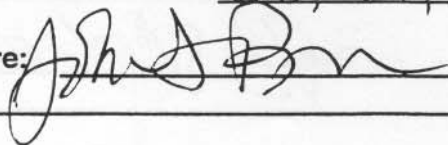
Overall Comments:

Lunch after station

Field Personnel:

JB, JT, JH, RB, mm

Signature:



Date:

8/19/00

Arthur D Little**Station Log**Station ID N16Date 8/17/2000
Time 1850-1901Client MMS
Project 2000 ANIMIDA
Case No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N16
Latitude 70° 29.910'Longitude 148° 42.558**Station Type**

BSMP/Northstar/Liberty/Alternate

Field Observations and MeasurementsWind Speed 7kt. Wind Direction S Seas/Ice light chop - no ice
Water Depth 41 ft. Conductivity, Temperature, Depth (CTD) _____
CTD Depth(s) _____ Doppler Current _____ Turbidity _____
Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODD (1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____
Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: Hard clay w soft mud on surface**Suspended Sediments**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Heading to NO3 to pick up Amphipod Traps. Then
back to West Dock.Field Personnel: TB, BT, RR, MMSignature: [Signature]Date: 8/17/2000

Arthur D Little

Station Log

Station ID N17Client MMSProject 2000 ANIMIDACase No. 68533Date 8/17/00Time 1048 - 1735**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N17Latitude 70° 29.829'Longitude 148° 40.379'**Station Type**BSMP Northstar / Liberty / Alternate**Field Observations and Measurements**Wind Speed 5 kt Wind Direction SSESeas/Ice < 1% bergs. Light chopWater Depth 42 ft.Conductivity, Temperature, Depth (CTD) ✓CTD Depth(s) ~40 ft.Doppler Current ✓Turbidity ✓**Acoustics:** Air Water Other

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab ✓No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>QDB(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ✓ Fine Coarse Sand Gravel Shell Hatch Mixed Indications of Anoxia: Yes ✓? No ✓? H₂S Odor: Yes No Comments: Hard clay w/ some fine sand mixed in. ~0.5 cm surface "flock". Underlying clay appeared w/ black streaks.**Suspended Sediments:**Surface Mid-Water Bottom Other

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin Safron Cod Arctic Cod Char Cisco Flounder Whitefish **Clams** Astarte Cyrtodaria Macoma Portlandia

Comments:

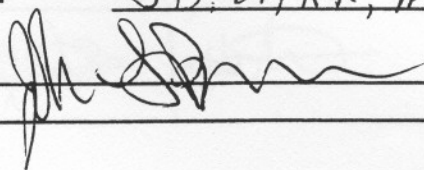
Quality Control SamplesField Blank Equipment Blank Other

Overall Comments:

Field Personnel:

JB, Bi, RR, MM

Signature:



Date:

8/17/2000

Arthur D Little

Station Log

Station ID N18Date 8/17/2000Time 1825-1832Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N18Latitude 70° 29.082Longitude 148° 42.151'**Station Type**BSMP Northstar Liberty/Alternate**Field Observations and Measurements**Wind Speed 7-10 kt Wind Direction S Seas/Ice Light chop in iceWater Depth 37 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____Comments: Drizzle**Samples Collected****Surface Sediments:** Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODBG</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____Comments: Hard clay w/ some fine sand.**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

_____Field Personnel: JB, BT, RR, mmSignature: [Signature]Date: 8/17/2000

Arthur D Little**Station Log**

Station ID N18
Client MMS
Project 2000 ANIMIDA
Case No. 68533

Date 8-23-00Time 1450**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N18Latitude 70° 29.032'Longitude 148° 42.151'**Station Type**BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 13-15 knots Wind Direction NE Seas/Ice 2 foot seas no iceWater Depth 36' Conductivity, Temperature, Depth (CTD) X

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples CollectedSurface Sediments: Van Veen Grab X No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------------|
| | | | | | | <u>ODBC</u> |

Sediment Texture (check all that apply):

>50% silt/clay X Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No X H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx X**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: 2 traps set @ 0945 and retrieved at 1450**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Only samples taken for U of A AnchorageField Personnel: JH, JT, RR, JG, MMSignature: [Signature] Date: 8-23-00

Arthur D Little

Station Log

Station ID N19Date 8/17/2000Client MMSTime 1755-1805Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N19Latitude 70° 29.097'Longitude 148° 40.554'**Station Type**BSMP Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 5 kt. Wind Direction SSE Seas/Ice no iceWater Depth 37 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODB (1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____Comments: clay and some fine sand mixed in, surface "flock" - full grab.**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

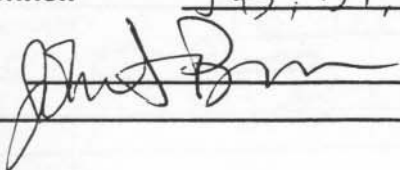
Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, BT, RR, MM

Signature:

Date: 8/17/2000

Arthur D Little

Station Log

Station ID N19Date 8/18/2000Time 1140 - 1405Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N19Latitude 70° 29.052'Longitude 148° 40.321'**Station Type**BSMP/ Northstar /Liberty/Alternate**Field Observations and Measurements**Wind Speed 25 mph Wind Direction W Seas/Ice 2-3 ft. wavesWater Depth 38 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: Gill net in @ 1145**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Used 200 ft. gill net deployed on bottom, 4 meter height
2" mesh size (stretched). Net checked @ 1245 BB 1215 - no fish
~ 20 Isopods. 1405 - Recovered gill net, was dragged by iceberg.
No fish - only isopods.Field Personnel: JB, BT, JG, RR, MMSignature: [Signature]Date: 8/18/2000

Arthur D Little**Station Log**Station ID N20Client MMSProject 2000 ANIMIDACase No. 68533Date 8/18/2000Time 1517 - 1525**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N20Latitude 70° 27.951148° 41.687Longitude 148° 41.687 BB error
8/18/00**Station Type**BSMP Northstar Liberty/Alternate**Field Observations and Measurements**Wind Speed 12-15 kt Wind Direction W Seas/Ice 2 ft. waves - some bergs ~1%Water Depth 25 ft. Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab 1 No. of Replicates 2

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>i</u> | <u>i</u> | <u>i</u> | <u>i</u> | | <u>i</u> | <u>ODBC(i)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel ☒ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____Comments: 1st grab washed out. ~2cm mud overlying gravel (0.5 cm diam - 1cm)**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Gravel in 1st grab caused wash-out.
2nd grab was good w/ gravel & overlying mud.

Field Personnel:

JB, BT, JG, RR, mm

Signature:

[Signature]Date: 8/18/2000

Arthur D Little**Station Log**Station ID N21Date 8/19/2000
Time 1654-1730Client MMS
Project 2000 ANIMIDA
Case No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N21Latitude 70° 26.819'Longitude 148° 40.587'**Station Type**BSMP Northstar Liberty/Alternate**Field Observations and Measurements**Wind Speed 5 kt. Wind Direction NE Seas/Ice Light chopWater Depth 18 ft. Conductivity, Temperature, Depth (CTD) ☒CTD Depth(s) ~17 ft. Doppler Current ☒ Turbidity ☒**Acoustics:** Air _____ Water _____ Other _____

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab ☒ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>003(i)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒

Comments:

Suspended Sediments:Surface 1m Mid-Water 3m Bottom 4.5m Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, JT, JH, RR, MM

Signature:

Date:

8/19/2000

Arthur D Little**Station Log**

Station ID N22
Client MMS
Project 2000 ANIMIDA
Case No. 68533

Date 8/23/00
Time 1425

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**

Station Number N22
Latitude 70° 29.340

Longitude 148° 41.868

Station Type

BSMP/Northstar/Liberty/Alternate

Field Observations and Measurements

Wind Speed 13-15 kts Wind Direction NE Seas/Ice 2 foot seas no ice
Water Depth 28' Conductivity, Temperature, Depth (CTD) _____
CTD Depth(s) 28' Doppler Current _____ Turbidity _____
Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected

Surface Sediments: Van Veen Grab X No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>ODB(i)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel X Shell Hatch _____ Mixed _____
Indications of Anoxia: Yes _____ No X H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)

Amphipods Anonyx _____

Fish: Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____

Clams Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

On pipeline cover from Northstar to land
only a trace of fine grained material but taken
as an example of what is covering pipe.

Field Personnel:

JH, JT, RR, JG, MM

Signature:

[Signature]

Date: 8-23-00

Arthur D Little**Station Log**Station ID N23Client MMSProject 2000 ANIMIDACase No. 68533Date 8-23-00Time 1435**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N23Latitude 70° 29.340Longitude 148° 41.868**Station Type**BSMP/Northstar Liberty/Alternate**Field Observations and Measurements**Wind Speed 13-15 knots Wind ~~Direction~~ NESeas/Ice 2 foot seas no iceWater Depth 36'

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____

Water _____

Other _____

Comments:

Samples Collected**Surface Sediments:**Van Veen Grab ☒No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|--------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | <u>1</u> | <u>ODBCi</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒

Fine _____

Coarse Sand _____

Gravel _____

Shell Hatch _____

Mixed _____

Indications of Anoxia: Yes ☒

No _____

H₂S Odor: Yes _____No ☒

Comments:

Suspended Sediments:

Surface _____

Mid-Water _____

Bottom _____

Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____

Equipment Blank _____

Other _____

Overall Comments:

Position 15' off N23 to SW (downwind)
achieved by letting out anchor line

Field Personnel:

JH, JT, RR, JG, MM

Signature:

[Signature]Date: 8-23-00

Arthur D Little

Station Log

Station ID NW1
Client MMS
Project 2000 ANIMIDA
Case No. 68533

Date 8-23-00Time 1145**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number NW1Latitude 70° 29.445Longitude 148° 142.349**Station Type**BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 10-15 knots Wind Direction NE Seas/Ice 2 foot seas no iceWater Depth 34' Conductivity, Temperature, Depth (CTD) X

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected**Surface Sediments:** Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:Surface X 1m Mid-Water X 4m Bottom 10m Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

First water station as part of Task 5 near N18

Field Personnel:

JH, JT, RR, JG, MM

Signature:

[Signature]Date: 8-23-00

Arthur D Little**Station Log**Station ID NWZDate 8-23-00Time 1240Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number NWZLatitude 70° 29.366Longitude 148° 42.107**Station Type**BSMP ~~Northstar~~ / Liberty / Alternate**Field Observations and Measurements**Wind Speed 10-15 knots Wind Direction NESeas/Ice 2 foot seas no iceWater Depth 33'Conductivity, Temperature, Depth (CTD) X

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____

Water _____

Other _____

Comments:

Samples Collected**Surface Sediments:**

Van Veen Grab _____

No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:Surface 1mMid-Water 4mBottom 10 m

Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____


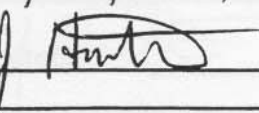
Overall Comments:

Sample taken on south side of island on
line 4

Field Personnel:

JH, JT, RR, JG, MM

Signature:

 Date: 8-23-00

Arthur D Little**Station Log**Station ID NW3
Client MMS
Project 2000 ANIMIDA
Case No. 68533Date 8-23-00Time 1705**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number NW3Latitude 70° 29.594Longitude 148° 42.001**Station Type**BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 10.5 knots Wind Direction NE Seas/Ice 2 foot seas no iceWater Depth 34'Conductivity, Temperature, Depth (CTD) X

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____

Water _____

Other _____

Comments:

Samples Collected**Surface Sediments:**

Van Veen Grab _____

No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:Surface 1mMid-Water 4mBottom 10m

Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

Field Personnel:

JH, JT, RR, MM, JG

Signature:

[Signature]

Date:

8-23-00

Arthur D Little

Station Log

Station ID

NW4

Date 8-23-00

Time 1800

Client

MMS

Project

2000 ANIMIDA

Case No.

68533

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Sampling Location**

Station Number

NW4

Latitude 70° 29.469

Longitude 148° 41.558

Station Type

BSMP/Northstar/Liberty/Alternate

Field Observations and Measurements

Wind Speed 15 knots Wind Direction NE

Seas/Ice 2 foot seas no ice

Water Depth 36 feet

Conductivity, Temperature, Depth (CTD) X

CTD Depth(s)

Doppler Current

Turbidity

Acoustics: Air

Water Other

Comments:

Samples Collected**Surface Sediments:**

Van Veen Grab

No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay Fine Coarse Sand Gravel Shell Hatch Mixed

Indications of Anoxia: Yes No H₂S Odor: Yes No

Comments:

Suspended Sediments:

Surface 1m

Mid-Water 4m

Bottom 10m

Other

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx**Fish:** Sculpin Safron Cod Arctic Cod Char Cisco Flounder Whitefish**Clams** Astarte Cyrtodaria Macoma Portlandia

Comments:

Quality Control Samples

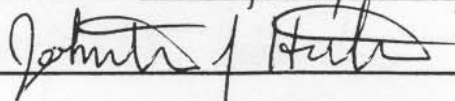
Field Blank Equipment Blank Other

Overall Comments:

Field Personnel:

JH, JT, JO, MM, ER

Signature:



Date:

8-23-00

Arthur D Little

Station Log

Station ID COL-01Date 8-24-00Time 1100Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number COL-01 (North)Latitude 70° 15' 96"Longitude 150° 49' 29"Station Type Coleville River

BSMP/Northstar/Liberty/Alternate

Field Observations and MeasurementsWind Speed 10 knots Wind Direction NE Seas/Ice NA

Water Depth _____ Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments: Coleville River North station**Samples Collected**Surface Sediments: Van Veen Grab _____ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>X</u> | <u>X</u> | <u>JH</u> | <u>X</u> | | | <u>ODS(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine X Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes X No X H₂S Odor: Yes _____ No _____Comments: JH**Suspended Sediments:**Surface X Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

No peat found
very little silt/mud on banks. mainly fine sand

Field Personnel:

JH, JT, RR

Signature:

[Signature]Date: 8-24-00

Arthur D Little**Station Log**Station ID COL-02Date 8-24-06Time 1130Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number COL-02 (south)Latitude 70° 11.36Longitude 150° 52.12Station Type Coleville River

BSMP/Northstar/Liberty/Alternate

Field Observations and MeasurementsWind Speed 10 knots Wind Direction NE Seas/Ice NA

Water Depth _____ Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments: Coleville River ~~North~~ ^{South} Station**Samples Collected**Surface Sediments: Van Veen Grab _____ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------------|----------|-----------------|-----------|----------------|
| <u>X</u> | <u>X</u> | <u>fine silt</u> | <u>X</u> | | | <u>ODR (1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine X Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No X H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:Surface X Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: unable to sample west side of river due to steep bank.
Helicopter would have had to land on tundra
Decision was made to land on east bank however
no part was able to be obtained

Field Personnel: JH, JT, RRSignature: [Signature]Date: 8/24/00

Arthur D Little**Station Log**Station ID KUP-01Date 8-24-00Client MMSTime 1255Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number KUP-01Station Type Kuparuk River

BSMP/Northstar/Liberty/Alternate

Latitude 70° 17.70Longitude 148° 59.37**Field Observations and Measurements**Wind Speed 10 knots Wind Direction NESeas/Ice NA

Water Depth _____

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____ Turbidity _____

Acoustics: Air _____

Water _____ Other _____

Comments: Kuparuk River at end of access road**Samples Collected**Surface Sediments: Van Veen Grab _____ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>X</u> | <u>X</u> | <u>35H</u> | <u>X</u> | | | <u>ODR(1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine X Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No X H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:Surface X Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

_____Field Personnel: JH, JT, RRSignature: Johnston J HuntressDate: 8-24-00

Arthur D Little**Station Log**Station ID KUP-02Date 8-24-00Client MMSTime 1255Project 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number KUP-02Latitude 70° 17.70Longitude 148° 59.37Station Type Kuparuk River
BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 10 knots Wind Direction NE Seas/Ice NA

Water Depth _____ Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments: Kuparuk River at end of Access Road**Samples Collected**Surface Sediments: Van Veen Grab _____ No. of Replicates 2

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>X</u> | <u>X</u> | <u>JH</u> | <u>X</u> | | | <u>δDB (1)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: PEAT**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JH, JT, RR

Signature:

Johnston / Hunter

Date:

8-24-00

Arthur D Little

Station Log

Station ID SAG-01
Client MMS
Project 2000 ANIMIDA
Case No. 68533

Date 8-25-00Time 0800**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number SAG-01Latitude 70° 01.68Longitude 148° 33 77

Station Type Sag River
BSMP/Northstar/Liberty/Alternate

Field Observations and MeasurementsWind Speed 5-10 knots Wind Direction NE Seas/Ice NA

Water Depth _____ Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments: Sample taken at end of access road from mile marker 401**Samples Collected**Surface Sediments: Van Veen Grab _____ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|--------------|
| <u>X</u> | <u>X</u> | <u>SSH</u> | <u>X</u> | | | <u>ODBCI</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine X Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No X H₂S Odor: Yes _____ No _____Comments: Bank is steep and eroded, small pockets of fine grained sediment here and there**Suspended Sediments:**Surface X Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Water is flowing well, John makes comment that river is higher than last yearField Personnel: JH, JT, RRSignature: Johnston / HunterDate: 8-24-00

Arthur D Little**Station Log**Station ID B00Client MMSProject 2000 ANIMIDACase No. 68533Date 8-26-00Time 1800**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Arctic cod from area around Cross Island**Sampling Location**Station Number B00Latitude NALongitude NA**Station Type**BSMP Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 10-12 knots Wind Direction NESeas/Ice 1-2 foot seas few icebergs

Water Depth _____

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____

Water _____

Other _____

Comments:

Samples Collected~~Surface Sediments~~

Van Veen Grab _____

No. of Replicates 3

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------------|
| <u>X</u> | | | | | | <u>P450</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:

Surface _____

Mid-Water _____

Bottom _____

Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod X Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: Fish taken from 2 trawls (~30min each) from around Cross Island**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

DI water bottle freezing during fish processingSample IDs 00-B00-01-PHC-T-F 15 fish from net00-B00-02-PHC-T-F 15 fish rinsed w/ DITaken by JG → 00-B00-02-PHC-T-F 15 fish informal in01 replicate taken straight from net, no salt water rinsing

Field Personnel:

JH, JG, MM, RR

Signature:

Johnston / HunterDate: 8-26-00

Arthur D Little**Station Log**Station ID L00Date 8-27-00Time 1500Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**Liberty Fish samples, see notes for trawl start-stop points**Sampling Location**Station Number L00Latitude NALongitude NA**Station Type**BSMP/Northstar Liberty / Alterna**Field Observations and Measurements**Wind Speed 10 knots Wind Direction ENESeas/Ice 2 ft seas, couple of icebergsWater Depth 22 ft

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____

Water _____

Other _____

Comments: Visibility is low due to fog banks**Samples Collected**~~Surface Sediment~~

Van Veen Grab _____

No. of Replicates 3

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|-------------------------------------|--------|------------|-----|-----------------|-----------|-------------|
| <input checked="" type="checkbox"/> | | | | | | <u>P450</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: Fish taken from 3, 40m trawls around proposed Liberty Prospect**Suspended Sediments:**

Surface _____

Mid-Water _____

Bottom _____

Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx _____**Fish:** Sculpin 2 Safron Cod _____ Arctic Cod 1 Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

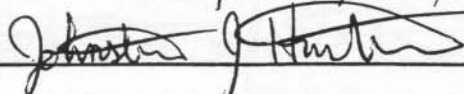
Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Three trawls produced only two Arctic cod, and two sculpin for analysis.1 sculpin 00-L00-01-P450-T-F BTLK for biomarker1 sculpin 00-L00-02-PHC-T-F whole sculpin for organics2 gm. cod 00-L00-03-PHC-T-F 2 gm. cod for organics

Field Personnel:

JH, MM, JG, KG

Signature:

Date: 8-27-00

Arthur D Little

Station Log

Station ID N00Client MMSProject 2000 ANIMIDACase No. 68533Date 8-26-00Time 1340**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)****Sampling Location**Station Number N00Latitude NALongitude NA**Station Type**BSMP Northstar Liberty/Alternate**Field Observations and Measurements**Wind Speed 7-10 knots Wind Direction NNE Seas/Ice 1 ft seas few icebergsWater Depth ~35'

Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____

Doppler Current _____

Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments:

Samples Collected~~Sediment~~

Van Veen Grab _____

No. of Replicates 3

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------------|
| <u>X</u> | | | | | | <u>P450</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Annonyx _____**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod X Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____Comments: Approx. 30 fish in otter trawl along with mud and bottom organisms**Quality Control Samples**

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Fish from around NorthstarSample IDs 00-N00-01-PHC-T-F 10 fish unwashed00-N00-02-PHC-T-F 13 fish rinsed w/ DETaken by JG → 00-N00-03-P450-T-F 15 fish in formalin01 replicate taken straight from net - no saltwater rinsing

Field Personnel:

JH, JG, MM, RR

Signature:

John H. Little / HunterDate: 8-26-00

Arthur D Little**Station Log**Station ID N00Date 8-26-00Time 1340Client MMSProject 2000 ANIMIDACase No. 68533**Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)**From trawl around Northstar Island**Sampling Location**Station Number N00Latitude NALongitude NA**Station Type**BSMP/Northstar/Liberty/Alternate**Field Observations and Measurements**Wind Speed 7-10 knots Wind Direction NNE Seas/Ice 1 ft⁺ seas few icebergsWater Depth ~35' Conductivity, Temperature, Depth (CTD) _____

CTD Depth(s) _____ Doppler Current _____ Turbidity _____

Acoustics: Air _____ Water _____ Other _____

Comments: Trawl was made from south around west and up to north**Samples Collected**Surface Sediments: Van Veen Grab _____ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| <u>X</u> | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay X Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No X H₂S Odor: Yes _____ No _____Comments: Sediment from a 0.2 nautical mile radius with trawl**Suspended Sediments:**

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota: (circle species collected for analysis)**Amphipods** Anonyx**Fish:** Sculpin _____ Safron Cod _____ Arctic Cod _____ Char _____ Cisco _____ Flounder _____ Whitefish _____**Clams** Astarte _____ Cyrtodaria _____ Macoma _____ Portlandia _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Trawl stayed ~ 0.2 NM from Northstar Island
00-N00-01-PHC-SField Personnel: JH, JE, MM, RRSignature: [Signature]Date: 8-26-00

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
NOME, ALASKA

Attachment 3: 2000 Collection Permit

FISH AND GAME PERMIT

This permit is issued to NOVA SCOTIA AQUARIUM INC.
for the purpose of collecting and/or displaying FISH AND GAME in the State of Alaska.
This permit is valid for the period of 12 MONTHS from the date of issuance.

The permit holder is required to comply with all applicable laws and regulations of the State of Alaska, including but not limited to, the Alaska Fish and Game Code, and the Alaska Wildlife Trophies Act. The permit holder is also required to maintain accurate records of all collections and displays, and to provide copies of these records to the Department of Fish and Game upon request.

The permit holder is also required to provide a copy of this permit to the local law enforcement agency in the area where the collection or display is taking place.

This permit is issued for the purpose of COLLECTING AND/OR DISPLAYING and is not valid for the purpose of SELLING or TRAFFICKING fish and game.

The permit holder is required to pay the applicable fee for this permit.

The permit holder is required to sign and return this permit to the Department of Fish and Game upon completion of the collection or display.

ISSUED BY: JOHN J. HARRIS, Director, Department of Fish and Game

DATE: January 27, 2000

The permit holder is required to comply with all applicable laws and regulations of the State of Alaska, including but not limited to, the Alaska Fish and Game Code, and the Alaska Wildlife Trophies Act. The permit holder is also required to maintain accurate records of all collections and displays, and to provide copies of these records to the Department of Fish and Game upon request.

The permit holder is also required to provide a copy of this permit to the local law enforcement agency in the area where the collection or display is taking place.

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The permit holder is required to pay the applicable fee for this permit.

The permit holder is required to sign and return this permit to the Department of Fish and Game upon completion of the collection or display.

ISSUED BY: JOHN J. HARRIS, Director, Department of Fish and Game

DATE: January 27, 2000

The permit holder is required to comply with all applicable laws and regulations of the State of Alaska, including but not limited to, the Alaska Fish and Game Code, and the Alaska Wildlife Trophies Act. The permit holder is also required to maintain accurate records of all collections and displays, and to provide copies of these records to the Department of Fish and Game upon request.



**STATE OF ALASKA
DEPARTMENT OF FISH AND GAME
JUNEAU, ALASKA**

Permit No. CF-00-044Expires 12/31/00

FISH RESOURCE PERMIT

This permit authorizes John Brown, Arthur D. Little, Inc.

(person, agency or organization)

at 20 Acorn Park, Cambridge, MA 02440, to conduct the following activities from August 9, to September 15, 2000, in accordance with AS 16.05.930 and AS 16.05.340(b)

under contract to the Department of Interior, Minerals Management Service, permittee will collect 50 each of the following finfish: Saffron cod, Arctic cod, cisco, Dolly Varden, broad whitefish, four horned sculpin, and Arctic flounder. The fish will be collected from the Jones Island (east) to the Stockton Islands (west) of the nearshore Beaufort Sea. The fish will be captured with Fyke net or rod and reel. If the Fyke net is not successful, a gill net may be used (See page 2). Fish that are surplus to the sampling needs will be released unharmed at the capture site.

PURPOSE: To determine the potential exposure of the target fish to petroleum hydrocarbons and other persistent organic pollutants (POPs - pesticides and PCBs) through immunological techniques (e.g. CYP1A). These measurements will serve as baseline contaminant data and will be used to evaluate potential changes related to the Northstar and Liberty Island developments.

FINAL DISPOSITION: After the tissues of interest have been removed in the field, the remainder of the organisms (if any) will be discarded (i.e., in some cases the whole organism may be preserved).

AUTHORIZED PERSONNEL: John Brown, Jordan Gold, Bob Trocine, Rob Rember, Craig Smith, Mark Mertz, John Trefry.

PERMIT CONDITIONS: The following ADF&G employee must be notified prior to collection activities: Fred Bue (907-443-5167), Division of Commercial Fisheries, Nome office; or Russ Holder (907-459-7288), DCF, Fairbanks office.


(Continued on the next page)

REPORT DUE January 31, 2001. The report shall include species; numbers; dates and locations of collection and disposition; sex, age and breeding condition; lengths and weights of fish; what was achieved; other information as required. (See page 2).

GENERAL CONDITIONS, EXCEPTIONS AND RESTRICTIONS

1. This permit must be carried by the person(s) specified during approved activities who shall show it on request to persons authorized to enforce Alaska's fish and game laws. This permit is nontransferable and will be revoked or renewal denied by the Commissioner of Fish and Game if the permittee violates any of its conditions, exceptions or restrictions. No redelegation of authority may be allowed under this permit unless specifically noted.
2. Specimens taken under authority hereof may not be sold or bartered. Subpermittees shall not retain possession of live animals or specimens.
3. The permittee shall keep records of all activities conducted under authority of this permit, available for inspection at all reasonable hours upon request of any authorized state enforcement officer.
4. Permits will not be renewed until detailed reports, as specified above, have been received by the Department.
5. UNLESS SPECIFICALLY STATED HEREIN THIS PERMIT DOES NOT AUTHORIZE the exportation of specimens; or the taking of specimens in areas otherwise closed to fishing without appropriate licenses required by State regulations; or during closed seasons; or in any manner, by any means, at any time not permitted by those regulations.


Division of Commercial Fisheries


Deputy Director, Division of Commercial Fisheries
Alaska Department of Fish and Game

Page 2 of 2 pages

Permit Number CF-00-044

NOTE:

A copy of this permit must accompany the collected specimens and collection activities and be available if a Department of Fish and Game or Department of Public Safety employee wishes to examine it. Specimens may not be transferred or released.

If a gill net must be used it must be properly marked and physically attended at all times. The gill net must be checked at least every 30 minutes to minimize the mortality of untargeted species. Fish not required for the sample should carefully be released unharmed at the capture site.

REPORTING: A report of the number of each specimen collected, dates, specific location (latitude and longitude or other general description), and type of gear used is required at the end of the calendar year.

ADDITIONAL PERMITS MAY BE REQUIRED. Halibut may not be collected or retained under the authority of this permit. Please contact the International Pacific Halibut Commission at (206) 634-1838, P.O. Box 95009, Seattle, WA 98145-2009 to obtain permission for halibut collection.

Collected fish, shellfish, or aquatic plant specimens may not be sold, bartered, or used as food, and may be used only for the purposes specified in the permit.

Permits will indicate the number of specimens that may be taken, by species and life stage. Sampling or collecting activities must stop when the maximum allowable number of specimens is obtained. All live fish, shellfish, and aquatic plants collected in excess of the number specified on the permit must be released immediately and unharmed at the capture location, unless otherwise specified in the permit.

All fish traps, nets or similar capture devices must be labeled with the collector's name and permit number. A valid sport fishing license must be in the possession of each person collecting fish with a hook and line or clams with a shovel.

Use of explosives or chemicals, especially poisons other than chemical baits or lures for collecting purposes is prohibited. Any chemical anesthetics used must be approved for human consumption by the Food and Drug Administration if fish treated with such chemicals are susceptible to human consumption within 14 days after exposure.

Marking or tagging of fish is closely regulated by the state and must not conflict with other programs. Specific approval is required for any marking or tagging project. The number of each species to be marked and location and type of mark or tag to be used must be specified.

Use of electroshocking devices will be closely regulated because such devices can cause substantial injury to fish. In general, electroshocking will not be allowed if large rainbow trout or any species of fish in spawning condition are present.

NO PERSON MAY TRANSPORT, POSSESS, EXPORT FROM THE STATE, OR RELEASE INTO THE WATERS OF THE STATE, ANY LIVE FISH UNLESS THE PERSON HOLDS A VALID FISH TRANSPORT PERMIT (FTP), AND THE PERSON IS IN COMPLIANCE WITH ALL CONDITIONS OF THE PERMIT AND THE PROVISIONS OF 5 AAC 41. A FISH TRANSPORT PERMIT MAY BE ISSUED BY THE COMMISSIONER. PLEASE CONTACT MS. JERI MUSETH AT (907) 465-6149 FOR ADDITIONAL INFORMATION PERTAINING TO 5 AAC 41.005. A Fish Transport Permit (FTP) must be obtained prior to any exportation of non-preserved specimens. Please contact Ms. Jeri Museth, (907) 465-6149.

The Alaska Department of Fish and Game requires copies of any reports or analyzes derived from collection activities under the authority of this permit. A completion report detailing the results and findings of any data analysis for the project, if not submitted with the collection report, must be submitted to the department within six months of the expiration of the permit. Data from such reports are considered public information.



Cruise Report for the Summer 2002 Minerals Management Service Field Survey

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Report to

Minerals Management Service, Anchorage, Alaska

October 23, 2002

Report by

John S. Brown
Battelle
255 Bear Hill Road
Waltham, MA 02415

for

Environmental Chemistry and Forensics
ICF Consulting (formerly Arthur D. Little, Inc.)
Acorn Park
Cambridge, MA 02140-2390

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Attachment 1: 2002 Station Logs

Attachment 2: 2002 Collection Permit and Fish Transfer Permit

1.0 Introduction

As part of the Minerals Management Service (MMS) program entitled “Arctic Nearshore Impact Monitoring in the Development Area” (ANIMIDA), the fourth summer-season field survey of the program was conducted from July 27, 2002 to August 22, 2002. The scientific crew, on board the MMS Vessel 1273, collected samples for chemical analyses, and deployed and retrieved moorings, from the program study area. This cruise report summarizes the activities and samples collected during the 2002 summer field survey.

The following components were successfully completed during the 2002 ANIMIDA summer sampling survey.:

- Collected sediment samples at 43 offshore stations: 15 historic Beaufort Sea Monitoring Program (BSMP) stations, 22 Northstar and Northstar pipeline stations, and 6 Liberty stations
- Collected a total of 48 surface sediment samples (0 to 1 cm) for hydrocarbon and metals chemistry (triplicates at 2 stations)
- Deployed and retrieved 6 moorings, 3 adjacent to Northstar and 3 in a reference location, each with paired mussel cages and semi-permeable membrane devices (SPMDs)
- Collected 13 bivalve/amphipod samples
- Collected 11 source sediment/peat samples (5 river stations)
- Collected 34 suspended sediment samples and current and turbidity profiles at 11 stations (corresponding to two onshore - offshore transects at Northstar and Liberty)
- Delivered field samples to analytical laboratories for appropriate analyses

2.0 Schedule

The summer 2002 cruise was conducted from July 27 to August 22, 2002, and coincided with a period of expected favorable ice conditions in the program study area. Members of the field team arrived in Prudhoe Bay, Alaska between July 25 and 29. Initial “check-out” of the MMS Vessel 1273 was performed on July 25 and 26 by ship’s captain Mark Mertz (TEG Ocean Services). Field sampling personnel from Battelle, Florida Institute of Technology (FIT), and Kinnetic Laboratories (KLI) participated in the survey. The scientific team and ship’s captain conducted the work on a 12- to 20-hour-a-day basis, depending on favorable operating conditions.

3.0 Cruise Operations and Samples Collected

The MMS Vessel 1273 served as the survey platform for the summer 2002 field work. The MMS Vessel 1273 was delivered to Prudhoe Bay, Alaska by MMS prior to the survey and launched after inspection by MMS and TEG representatives. The MMS Vessel 1273 was also used to retrieve current meters for the MMS University of Alaska Coastal Marine Institute (CMI) program at the end of the ANIMIDA survey. The ANIMIDA field survey was performed in three phases, largely controlled by mobilization and logistical considerations. A complete list of the sampling stations that were targeted and sampled in the study area is included in Table 1. Table 1 also provides the station type, latitude and longitude, depth, date and time of sampling, and the type of chemical analysis for each sample. Figure 1, the chart of the ANIMIDA study area, shows the locations of the 2002 sampling stations. Additional daily survey and sampling station information is included in the 2002 Station Logs (Attachment 1). The following narrative summarizes each phase of the field survey.

Phase 1: Mobilization and Mooring Deployment

July 25

Ship's Captain (Mark Mertz) arrives Deadhorse, AK, inspects MMS Vessel 1273, and takes custody of the vessel after inspection.

July 26 - 27

Vessel 1273 maintenance and shakedown in Prudhoe Bay, including implementation of necessary repairs/modifications (Mark Mertz) and mobilization of field gear on the vessel. July 26 - ANIMIDA field team (John Brown – Battelle, Bob Trocine – FIT) arrive in Deadhorse, AK – Endicott Facility.

July 28

Deployment of a cluster of three subsurface moorings ~1.5 Km west of Northstar Island. Each mooring includes a mussel cage with ~40 mussels total in 2 Nitex envelopes, and 5 SPMDs in a deployment cage. A schematic of the mooring string is shown in Figure 2.

July 29

Deployment of a cluster of three subsurface reference moorings ~4 Km southwest of Pole Island. Each mooring includes a mussel cage with ~40 mussels total in 2 Nitex envelopes and 5 SPMDs in a deployment cage (Figure 2). The remaining mussels (~55) are taken as pre-deployment mussel reference samples. Sediment and bivalves are collected at eastern stations 3A and 3B. John Trefry (FIT) arrives Deadhorse, AK – Endicott Facility.

Phase 2: Liberty and Northstar Area Sampling

July 30 – August 1

Field team completes sediment, biota, and water sampling at Liberty Prospect area stations and BSMP stations in the eastern study area. The vessel is anchored nightly in the lee of Endicott Island. The weather conditions are generally favorable, but heavy ice is encountered from North Steffanson Sound to Cross Island. Deb Woodall (FIT) arrives Deadhorse, AK - Endicott Facility (August 1).

August 2 – 5

Field team completes sediment, biota and water sampling at Northstar area stations and BSMP stations in the western study area. Amphipod collections are successful, possibly due to the abundance of ice in the area. The vessel is anchored or docked at West Dock during this period. Once again, the weather conditions are generally favorable (moderate winds, fog, and cool temperatures), but heavy ice is encountered as close as 1 Km from shore (depending on wind direction).

August 6

Gusty winds do not allow offshore sampling; the vessel is re-fueled and re-supplied at West Dock. Source sediment and peat samples are collected from the Kuparuk River south of the Spine Road river crossing. Alex Mansfield (Battelle) arrives Deadhorse, AK – Endicott Facility.

August 7

Source sediment and peat samples are collected from the Northstar Island “Borrow Pit” in the Kuparuk River delta. Transport to the “Borrow Pit” is via a Phillips Petroleum helicopter, from the Kuparuk Heliport. Sediment samples are collected at final Northstar and BSMP stations in the Gwydyr Bay/Stump Island Area.

August 8

J. Brown, J. Trefry, R. Trocine, and D. Woodall depart Deadhorse with some of the sampling gear and samples. M. Mertz and A. Mansfield remain to complete source sampling and mooring retrieval.

Phase 3: Mooring Retrieval and Source Sampling

August 9 – 14

River source sampling is completed at the Canning River, Colville River, and Sagavanirktok River (Sag River). The Canning River sediment sample is collected after transport to the river via floatplane (Golden Plover Air – Jim Helmricks). A suspended sediment sample (for inorganics only) and a biogenic sheen/sediment from a nearby tundra pond are also collected. Source sediment and peat samples are collected from the Colville River via a Phillips Petroleum helicopter, from the Kuparuk Heliport. The Sag River sediment and peat are collected via haul road access south of Deadhorse.

August 15 – 17

Bad weather (winds to 35 knots) does not allow offshore sampling. Heavy rains and high water flows in the rivers threaten river crossings and West Dock. The vessel inflatable is washed away due to high water (August 15). University of Alaska Fairbanks (UAF) current meter mooring retrieval crew arrives – Prudhoe Bay Operations Center (PBOC) (August 16). Access road to Endicott washes out just east of Sag River bridge (August 16). Bad weather on August 17; field team is stranded on Endicott.

August 18 – 20

Weather calms somewhat; the inflatable is retrieved from Niakuk shoals in good condition. Proceed to Northstar and recover three Northstar moorings. All moorings are in good condition, and the mussel cages and SPMDs are intact. All the mussels are alive and exhibit extensive abyssal thread growth. Gary Lawley (KLI) arrives Deadhorse, AK – PBOC (August 18).

All four UAF current meters are retrieved in light snow and light winds on August 19. Divers are necessary at all retrievals, as acoustic releases do not function. One instrument is damaged (crushed into the bottom by ice), but data logger is intact.

Overcast and windy on August 20; retrieve the three Pole Island reference moorings. The mussel cages and SPMDs are intact and in good condition. A total of 2 dead mussels are found in Moorings 3M2 and 3M3; all other mussels are alive and exhibit extensive abyssal thread growth. Amphipods are also collected at station 4A. An unsuccessful search effort is made for the KLI current meter mooring that was deployed offshore of the Sag River delta in May 2002. The mooring pinger/release does not respond to queries. UAF crew departs Deadhorse.

August 21 - 22

Gear and samples are mobilized for shipment. A. Mansfield departs Deadhorse with samples. Another search is made for the KLI mooring in a larger search area. The mooring still cannot be located. The search is suspended under the assumption that the mooring was destroyed or dragged far afield by ice.

The Vessel 1273 is pulled from the water at West Dock on August 22. The remaining field team members (Mertz and Lawley) depart Deadhorse.

Source Sample Collection

As noted previously, several source samples were collected as part of the summer survey. The source samples collected included sediment and peat for organic and inorganic analysis from the Sagavanirktok, Kuparuk, Canning, and Colville Rivers. In addition, a water sample was collected for suspended sediment (inorganics only) from the Canning

River, and a sheen sample from an adjacent tundra pond (possibly biogenic in origin) was also collected as a potential source sample for hydrocarbons.

4.0 Sampling Procedures

Standard sampling procedures were followed at each sampling station, according to the Summer 2002 Field Logistics and Sampling Plan for the Minerals Management Service ANIMIDA Program (MMS, 2002).

Typical sampling procedures included:

- deployment of amphipod traps (as required)
- conductivity, temperature, and depth (CTD) measurements
- current measurements with the CTD/Doppler current meter
- water sample collection (at suspended sediment stations)
- surface sediment grab sample collection using a modified Van-Veen grab (for sediments and bivalves – as appropriate)
- retrieval of amphipod traps

Photodocumentation, station logs, and field notes were recorded during the field survey. The station logs for each sampling station are included in Attachment 1. Each station log includes a description of the sampling location, observations, number and type(s) of samples collected, and comments.

5.0 Technical Issues

The most significant technical difficulty during this survey was obtaining the mussels for the mussel cage/SPMD mooring deployment. Since the deployment of mussels required the collection and transport of mussels from one part of the state to the other, a Collection Permit and a Fish Transport Permit were required by Alaska Department of Fish & Game (ADF&G) (Attachment 2). During the permit application process, it was determined by ADF&G that a population of mussels in Port Chatham, AK (Kenai Peninsula) was the only feasible source of mussels for the program. A separate collection trip to Port Chatham (via floatplane) was arranged to meet this requirement of the permit. On July 26, 2002, approximately 300 mussels (~4 to 5 cm in length) were collected from the Port Chatham shoreline by G. Lawley of KLI (Latitude 59° 12.940 N, Longitude 151° 45.414 W). The mussel collection was planned to coincide closely with the mooring deployments to limit stress and potential mortality of the mussels. The mussels were stored on ice and shipped by airfreight to Deadhorse within 24 hours of collection. The mussels were in very good condition upon arrival in Deadhorse, and were slowly acclimatized with Beaufort Sea water (collected from the end of West Dock) over the next 24 hours. Only two mussels died prior to deployment and their good condition both before and after deployment is indicative of the overall technical success of the mussel cage/SPMD effort.

6.0 References

Minerals Management Service. 2002. Summer 2002 Field Sampling and Logistics Plan. July.

Table 1: 2002 MMS Animida Stations

| Station ID | Station Type | Sample Type | Latitude | Longitude | Depth (ft) | Date | Time | Analysis/Samples | | | | | |
|------------|--------------|------------------|-----------|------------|------------|------------------|------|------------------|--------|--------|--------|-------------------------------|---|
| | | | | | | | | Sediment | | | Tissue | Suspended Sed/ Current/CTD | Comments |
| | | | | | | | | Organics | Metals | GS/TOC | | | |
| 3A | BSMP | Sed.-Grab/Tissue | 70°16.933 | 147°05.489 | 20 | 07/29/02 | 1915 | 1 | 1 | 1 | 1 | NA | (Astarte) |
| 3B | BSMP | Sed. Grab | 70°17.918 | 147°02.508 | 13 | 07/29/02 | 1830 | 1 | 1 | 1 | NA | NA | |
| 4A | BSMP | Sed.-Grab/Tissue | 70°18.444 | 147°40.229 | 15 | 7/31 & 8/20/02 | 1000 | 1 | 1 | 1 | 2 | 3 | (Anonyx collected on 7/31 and 8/20) |
| 4B | BSMP | Sed. Grab | 70°21.021 | 147°40.012 | 21 | 07/31/02 | 1335 | 1 | 1 | 1 | NA | 3 | |
| 4C | BSMP | Sed. Grab | 70°26.085 | 147°42.961 | 27 | 07/31/02 | 1518 | 1 | 1 | 1 | NA | 3 | |
| 5(0) | BSMP | Sed.-Grab/Tissue | 70°22.735 | 148°00.363 | 18 | 08/01/02 | 0915 | 1 | 1 | 1 | 1 | NA | (Anonyx) |
| 5(1) | BSMP | Sed. Grab | 70°25.027 | 148°03.510 | 19.5 | 08/01/02 | 1234 | 1 | 1 | 1 | NA | 3 | |
| 5(10) | BSMP | Sed. Grab | 70°27.312 | 148°30.026 | 25.5 | 08/01/02 | 1512 | 1 | 1 | 1 | NA | NA | |
| 5(5) | BSMP | Sed. Grab | 70°26.095 | 147°18.125 | 22 | 08/01/02 | 1645 | 1 | 1 | 1 | NA | 3 | |
| 5A | BSMP | Sed. Grab | 70°29.680 | 148°46.053 | 37.5 | 08/03/02 | 1532 | 1 | 1 | 1 | NA | NA | |
| 5B | BSMP | Sed. Grab | 70°34.884 | 148°55.005 | 44 | 08/03/02 | 1333 | 1 | 1 | 1 | NA | 3 | |
| 5D | BSMP | Sed. Grab | 70°24.489 | 148°33.598 | 8 | 08/07/02 | 1500 | 3 | 3 | 3 | NA | NA | |
| 5E | BSMP | Sed. Grab | 70°38.347 | 149°16.376 | 61 | 08/04/02 | 1307 | 1 | 1 | 1 | NA | 3 | |
| 5F | BSMP | Sed.-Grab/Tissue | 70°26.497 | 148°49.555 | 7.2 | 08/07/02 | 1153 | 1 | 1 | 1 | 1 | NA | (Cyrtodaria) |
| 5H | BSMP | Sed.-Grab/Tissue | 70°22.221 | 147°47.792 | 23 | 08/01/02 | 1017 | 1 | 1 | 1 | 1 | NA | (Astarte) |
| L01 | Liberty | Sed. Grab | 70°18.933 | 147°27.082 | 20 | 07/31/02 | 1230 | 1 | 1 | 1 | NA | NA | |
| L04 | Liberty | Sed. Grab | 70°17.068 | 147°40.040 | 17 | 07/30/02 | 1718 | 1 | 1 | 1 | NA | NA | |
| L06 | Liberty | Sed. Grab | 70°16.923 | 147°34.064 | 22 | 07/30/02 | 1303 | 1 | 1 | 1 | NA | NA | (Attempted Anonyx collection) |
| L07 | Liberty | Sed. Grab | 70°16.784 | 147°31.990 | 21 | 07/30/02 | 1335 | 1 | 1 | 1 | NA | NA | |
| L08 | Liberty | Sed.-Grab/Tissue | 70°16.700 | 147°30.223 | 20 | 07/30/02 | 1351 | 2 | 2 | 2 | 2 | NA | (Astarte) Grab rep 02 for analysis, hold rep 01 |
| L09 | Liberty | Sed.-Grab/Tissue | 70°16.586 | 147°27.152 | 21 | 07/30/02 | 1552 | 1 | 1 | 1 | 1 | NA | (Astarte) |
| N01 | Northstar | Sed. Grab | 70°31.657 | 148°41.443 | 41 | 08/03/02 | 1101 | 1 | 1 | 1 | NA | 3 | |
| N02 | Northstar | Sed. Grab | 70°30.512 | 148°41.376 | 44 | 08/03/02 | 1218 | 1 | 1 | 1 | NA | NA | |
| N03 | Northstar | Sed.-Grab/Tissue | 70°30.005 | 148°41.477 | 43 | 8/5 & 8/10/2002 | 1122 | 3 | 3 | 3 | 1 | NA | (Anonyx collected on 8/10) |
| N04 | Northstar | Sed. Grab | 70°29.676 | 148°48.092 | 33 | 8/3 & 8/11/2002 | 1516 | 1 | 1 | 1 | 1 | NA | (Anonyx collected on 8/11) |
| N05 | Northstar | Sed. Grab | 70°29.631 | 148°44.704 | 38.5 | 08/03/02 | 1548 | 1 | 1 | 1 | NA | NA | |
| N06 | Northstar | Sed. Grab | 70°29.526 | 148°43.230 | 38.5 | 08/02/02 | 1558 | 1 | 1 | 1 | NA | NA | |
| N07 | Northstar | Sed. Grab | 70°29.573 | 148°40.084 | 40 | 08/05/02 | 1319 | 1 | 1 | 1 | NA | NA | |
| N08 | Northstar | Sed. Grab | 70°29.424 | 148°38.322 | 39 | 08/05/02 | 1335 | 1 | 1 | 1 | NA | NA | |
| N09 | Northstar | Sed. Grab | 70°29.343 | 148°35.180 | 35 | 08/05/02 | 1352 | 1 | 1 | 1 | NA | NA | |
| N10 | Northstar | Sed. Grab | 70°28.997 | 148°41.780 | 34 | 08/02/02 | 1130 | 1 | 1 | 1 | NA | 3 | |
| N11 | Northstar | Sed. Grab | 70°28.421 | 148°41.912 | 26 | 08/02/02 | 1508 | 1 | 1 | 1 | NA | NA | |
| N12 | Northstar | Sed.-Grab/Tissue | 70°27.319 | 148°42.037 | 18.5 | 8/2 & 8/3/2002 | 1300 | 1 | 1 | 1 | 1 | 3 | (Anonyx collected on 8/3) |
| N13 | Northstar | Sed.-Grab/Tissue | 70°26.982 | 148°43.594 | 14 | 08/04/02 | 1015 | 3 | 3 | 3 | 1 | NA | (Anonyx) |
| N14 | Northstar | Sed. Grab | 70°26.006 | 148°40.429 | 12 | 08/07/02 | 1405 | 1 | 1 | 1 | NA | NA | |
| N15 | Northstar | Sed. Grab | 70°26.707 | 148°44.618 | 8 | 08/07/02 | 1105 | 1 | 1 | 1 | NA | NA | |
| N16 | Northstar | Sed. Grab | 70°29.902 | 148°42.395 | 42.5 | 08/05/02 | 1055 | 1 | 1 | 1 | NA | NA | |
| N17 | Northstar | Sed. Grab | 70°29.833 | 148°40.345 | 42.5 | 08/05/02 | 1245 | 1 | 1 | 1 | NA | NA | |
| N18 | Northstar | Sed.-Grab/Tissue | 70°29.080 | 148°42.228 | 34 | 08/02/02 | 1613 | 1 | 1 | 1 | 1 | NA | (Anonyx) |
| N19 | Northstar | Sed. Grab | 70°29.088 | 148°40.557 | 36 | 08/02/02 | 1531 | 1 | 1 | 1 | NA | NA | |
| N20 | Northstar | Sed. Grab | 70°27.957 | 148°41.687 | 25 | 08/02/02 | 1455 | 1 | 1 | 1 | NA | NA | |
| N21 | Northstar | Sed. Grab | 70°26.806 | 148°41.738 | 21 | 08/02/02 | 1419 | 1 | 1 | 1 | NA | 3 | |
| N22 | Northstar | Sed. Grab | 70°29.340 | 148°41.868 | 28 | NA | NA | NA | NA | NA | NA | NA | Not Sampled |
| N23 | Northstar | Sed. Grab | 70°29.330 | 148°41.864 | 37 | 08/05/02 | 1426 | 1 | 1 | 1 | NA | 1 | ~150 feet South of Northstar |
| 3M1 | Reference | Mussel/SPMD | 70°16.982 | 147°08.880 | 25 | 7/29 - 8/20/2002 | 1620 | NA | NA | NA | 6 | NA | 1 Mussel Cage (n=40) and 5 SPMDs |
| 3M2 | Reference | Mussel/SPMD | 70°16.835 | 147°09.409 | 25 | 7/29 - 8/20/2002 | 1648 | NA | NA | NA | 6 | NA | 1 Mussel Cage (n=40) and 5 SPMDs |
| 3M3 | Reference | Mussel/SPMD | 70°16.922 | 147°09.398 | 25 | 7/29 - 8/20/2002 | 1715 | NA | NA | NA | 6 | NA | 1 Mussel Cage (n=40) and 5 SPMDs |
| NM1 | Northstar | Mussel/SPMD | 70°29.597 | 148°44.199 | 38 | 7/28 - 8/18/2002 | 2045 | NA | NA | NA | 6 | NA | 1 Mussel Cage (n=40) and 5 SPMDs |
| NM2 | Northstar | Mussel/SPMD | 70°29.687 | 148°44.868 | 38 | 7/28 - 8/18/2002 | 2112 | NA | NA | NA | 6 | NA | 1 Mussel Cage (n=40) and 5 SPMDs |
| NM3 | Northstar | Mussel/SPMD | 70°29.618 | 148°44.315 | 39 | 7/28 - 8/18/2002 | 2200 | NA | NA | NA | 6 | NA | 1 Mussel Cage (n=40) and 5 SPMDs |
| SAG-01 | Source | Sed/Peat | 70°01.680 | 148°33.770 | NA | 08/14/02 | 1130 | 2 | NA | 1 | NA | NA | Sagavanirktok River @ ~0.5 mi. S of Mile 401 |
| KUP-01 | Source | Sed/Peat | 70°17.700 | 148°53.370 | NA | 08/06/02 | 1010 | 2 | 1 | NA | NA | NA | Kuparuk River S. of E bridge crossing |
| KUP-03 | Source | Sed. | 70°22.910 | 148°51.550 | NA | 08/07/02 | 0815 | 2 | 2 | NA | NA | NA | Kuparuk River "Borrow Pit" sediment |
| COL-01 | Source | Sed/Peat | 70°15.960 | 150°49.290 | NA | 08/13/02 | 1030 | 2 | NA | NA | NA | NA | 1 sediment and 1 peat sample |
| CAN-01 | Source | Sed. | 70°07.199 | 145°53.099 | NA | 08/09/02 | 1415 | 1 | 1 | 1 | NA | 1 | Canning River sediment and water |
| CAN-02 | Source | Peat | 70°07.199 | 145°53.099 | NA | 08/09/02 | 1415 | 1 | NA | NA | NA | NA | Canning River Peat |
| CAN-03 | Source | Sed/Sheen | 70°07.199 | 145°53.099 | NA | 08/09/02 | 1415 | 1 | NA | NA | NA | NA | Canning River pond sheen |

Notes:

NA = Not applicable

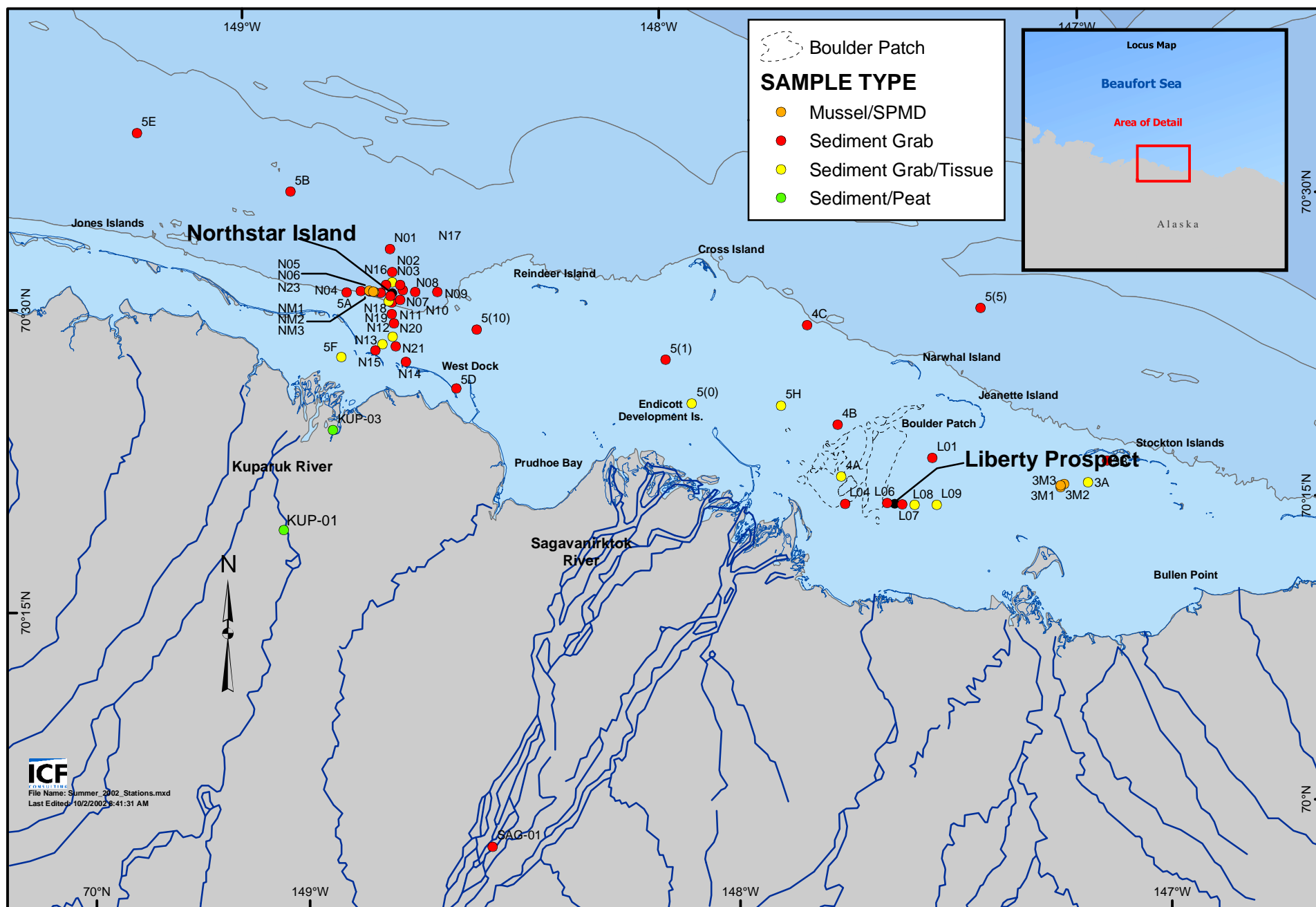


Figure 1 - Summer 2002 Sampling Stations

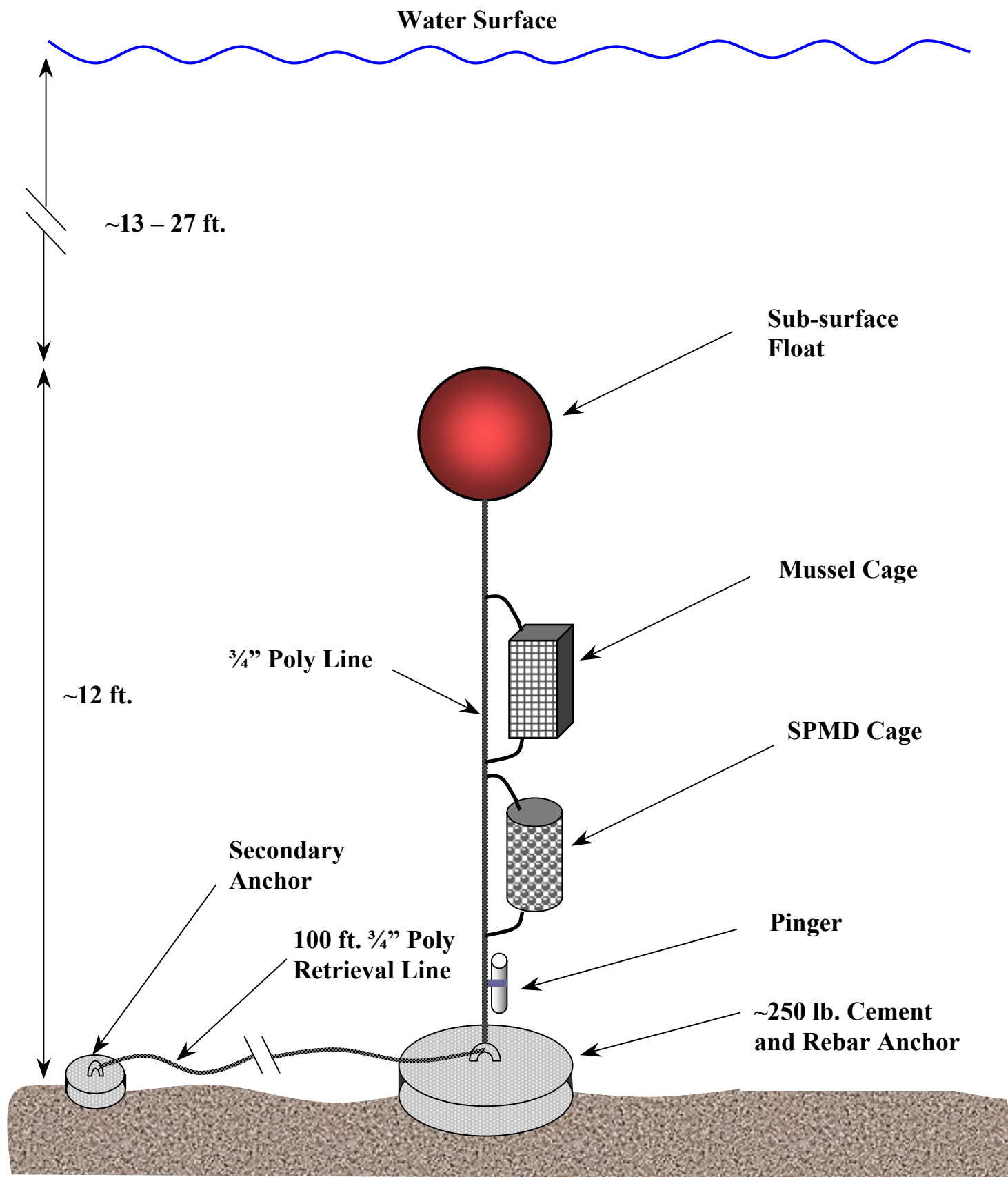


Figure 2. Schematic of the Mussel Cage and SPMD Mooring String

Attachment 1: 2002 Station Logs

MMS

Summer 2002 Station Log

Station ID 3ADate: 7/29/02Time: 1915 - 2015

Client MMS

Project 2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 3ALatitude 70°16.933Longitude 147°05.489

Station Type (circle one)

☒ BSMP ☐ Northstar ☐ Liberty ☐ Other

Field Observations and Measurements

Wind Speed 5 Kts Wind Direction NESeas/Ice Light chopWater Depth 20 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒Fine ☒

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No ☒H₂S Odor: YesNo ☒Comments: Fine silt ~ 2-3 cm Then stiff clay.

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs ~ 20Astarte ☒

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments: 3/4 of 250 mL jar w/ large (2-3 cm) Astarte clams

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

heading back to Endicott for the night.

Field Personnel:

JB, BT, Mm

Signature:

Date:

7/29/02

MMS

Summer 2002 Station Log

Station ID 3BDate: 7/29/02Time: 1830-1855Client MMS
Project 2002 ANIMIDA
Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 3BLatitude 70° 17.918Longitude 147° 02.508Station Type (circle one)
BSMP Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 5-10 kt Wind Direction NE Seas/Ice Light chop <5% iceWater Depth 13 ft Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: Sunny but chilly ~36°F

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____

Comments:

many Amphipod tubes at surface and at depth in grab.

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

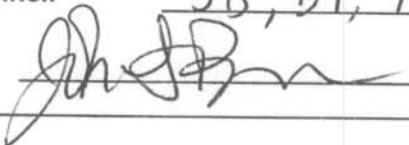
Overall Comments:

Nice evening!! Large ice floes on N side of R/Vs.

Field Personnel:

JB, BT, mm.

Signature:

Date: 7/29/02

MMS

Summer 2002 Station Log

Station ID

4A

Date: 7/31/02

Client

MMS

Time: 1000 - 1135

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number

4A

Latitude 70° 18.444

70° 18.224457

Longitude 147° 40.229

147° 40.353 - sediment position @ Anchor

Station Type (circle one)

BSMP Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 20 kt.

Wind Direction E

Seas/Ice 2 ft chop Rare small berg

Water Depth 15 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab

No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|---------|
| 1 | 1 | 1 | 1 | | | 1 (VAF) |

Sediment Texture (check all that apply):

>50% silt/clay

Fine

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

Grab ~ 1/3 full some gravel, but fine silt w/ sand/clay underneath

Water/Suspended Sediments:

Surface 1

Mid-Water 1

Bottom 1

Other

Comments:

Biota:

Amphipods: Traps Deployed 1 @ 1000

Traps Retrieved @ 1800

Anonyx Sample 1

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

~ 10-15 gram Anonyx in 1 Trap 20 or 30 Isopods Released just enough for a sample.

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

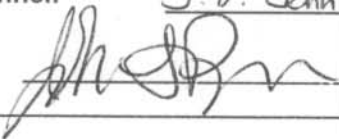
worked out the "kinks" of the water sampling. 3 Grab attempts necessary. Stiff clay w/ cobbles mixed in.

1805 Heading to Endicott for dinner.

Field Personnel:

J.B. John Treby (JT), BT, Deb Wadsworth (DW)

Signature:



Date:

7/31/02

MMS

Summer 2002 Station Log

Station ID

4A

Date: 8/20/02

Time: 09:00

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 4A

Latitude 70° 18.457'

Longitude 140° 40.090'

Station Typ (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 15-20 Kts Wind Direction SW Seas/Ice ~2' NO ICE

Water Depth 17' Conductivity, Temperature, Depth (CTD)

Doppler Current Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab

No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay Fine Coarse Sand Gravel Shell Hatch Mixed

Indications of Anoxia: Yes No H₂S Odor: Yes No

Comments:

Water/Suspended Sediments:

Surface Mid-Water Bottom Other

Comments:

Biota:

Amphipods: Traps Deployed 0900 Traps Retrieved 1400 Anonyx Sample 1 sample

Clams: Number of Grabs Astarte Cyrtodaria

Mussels/SPMD: Deployed/Retrieved Caged Mussels SPMD

Comments:

Quality Control Samples

Field Blank Equipment Blank Other

Overall Comments:

1/2 Jar of Anonyx from 2 Traps. ~25 isopods
caught in traps (released)
02-4A-02-PHC-T (raped) collected 7/31/02

Field Personnel:

A. Mansfield, M. Mertz, G. Lowley

Signature:

[Signature]

Date:

8/20/02

MMS

Summer 2002 Station Log

Station ID 4BClient MMS
Project 2002 ANIMIDA
Project No.Date: 7/31/02
Time: 1335 - 1425

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 4B
Latitude 70° 21.021Longitude 147° 40.012Station Type (circle one)
BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 20 kt. Wind Direction E Seas/Ice 2-3 ft. waves open water, heavy ice
Water Depth 21 ft. Conductivity, Temperature, Depth (CTD) _____ ~ 1 mi to NE
Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments:

Samples Collected

Sediments:

Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>1 (VAE)</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: Fine Sand w/ some silt - gravel found deeper in grab - ~1/3 full.

Water/Suspended Sediments:

Surface 2 Mid-Water 2 Bottom 2 Other _____

Comments:

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Heading for 4C - towards the heavy ice.Field Personnel: JB, JT, BT, MM, DWSignature: [Signature]Date: 7/31 7/31/02
TSB

MMS

Summer 2002 Station Log

Station ID

4C

Date: 7/31/02

Time: 1518-1615

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

4C

Station Number

70°26'

Latitude

70°26.085

Longitude

147°42.961

Station Type (circle one)

☒ BSMT ☐ Northstar ☐ Liberty ☐ Other

Field Observations and Measurements

Wind Speed 15 Kts

Wind Direction E

Seas/Ice 90% Ice ripples in leads

Water Depth 27 ft.

Conductivity, Temperature, Depth (CTD) ☒Doppler Current ☒Turbidity ☒Instrument Tow ☐

Comments:

Samples Collected

Sediments:

Van Veen Grab

No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| 1 | 1 | 1 | 1 | | | |

Sediment Texture (check all that apply):

>50% silt/clay

Fine ☒

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments: Fine Sand grab ~ 1/3 full some silt mixed in

Water/Suspended Sediments:

Surface 1

Mid-Water 1

Bottom 1

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

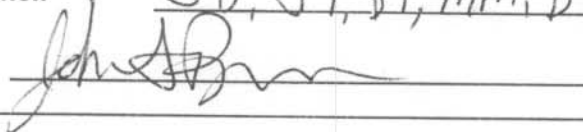
Overall Comments:

In small lead to station 0.05 NM to S of station. Very thick ice - quick walk on the ice - Transit back to 4A to pick up the Amphipod trap.

Field Personnel:

JB, JT, BT, MM, DW

Signature:



Date:

7/31/02

MMS

Summer 2002 Station Log

Station ID

5(0)

Date: 8/1/02

Client

MMS

Project

2002 ANIMIDA

Time: 0915-0935

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location BB

Station Number 70°22.735 5(0)

Latitude 70°22.735

Longitude 148°00.363

Station Type (circle one)

BSME/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed calm

Wind Direction NA

Seas/Ice calm Flat No ice

Water Depth 18 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments: Starting to drizzle

Samples Collected

Sediments:

Van Veen Grab

No. of Replicates 2

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|---------|
| 1 | 1 | 1 | 1 | | | 1 (VAF) |

Sediment Texture (check all that apply):

>50% silt/clay

Fine

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

Fine sand w/ some mud and pebbles underneath

Water/Suspended Sediments

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed 0915 (2 traps)

Traps Retrieved 1404

Anonyx Sample 1

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments: Traps baited w/ sardines w/ mustard sauce.

~75 mL of Anonyx in 2 Traps.

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

Field Personnel:

J.R., J.T., MM, DW

Signature:

Date:

8/01/02

MMS

Summer 2002 Station Log

Station ID

5 (1)

Date:

8/1/02

Time:

1234 - 1341

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number

5(1)

Latitude

70°25.027

Longitude

148°03.510

148°

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed

calm

Wind Direction

NA

Seas/Ice

Flat calm

Water Depth

19.5

Conductivity, Temperature, Depth (CTD)

✓

Doppler Current

✓

Turbidity

✓

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab

✓

No. of Replicates

1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| 1 | 1 | 1 | 1 | | | |

Sediment Texture (check all that apply):

>50% silt/clay

Fine

✓

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

Fine sand

Water/Suspended Sediments:

Surface

1

Mid-Water

3.0m

Bottom

5m

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

Hydraulic Sheen noted on deck

Field Personnel:

JB, JT, MM, DW

Signature:

Date:

8/01/02

MMS

Summer 2002 Station Log

Station ID 5(5)
Client MMS
Project 2002 ANIMIDA
Project No.

Date: 8/01/02
Time: 1512-1608

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 5(5)
Latitude 70° 26.095'

Station Type (circle one)
BSMR/Northstar/Liberty/Other

Longitude 148° 18.125'

Field Observations and Measurements

Wind Speed 5 kts Wind Direction NW Seas/Ice Ripples - no ice
Water Depth 22 ft Conductivity, Temperature, Depth (CTD) ✓
Doppler Current ✓ Turbidity ✓ Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ✓ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>1(UAF)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ✓ Fine ✓ Coarse Sand Gravel Shell Hatch Mixed
Indications of Anoxia: Yes No H₂S Odor: Yes No

Comments:

Fine mud

Water/Suspended Sediments:

Surface ✓ Mid-Water 3m Bottom 5m Other

Comments:

Biota:

Amphipods: Traps Deployed Traps Retrieved Anonyx Sample

Clams: Number of Grabs Astarte Cyrtodaria

Mussels/SPMD: Deployed/Retrieved Caged Mussels SPMD

Comments:

Quality Control Samples

Field Blank ✓ Equipment Blank Other

Overall Comments:

Deck exposure blank collected during Grab deployment.

Field Personnel: JB, JT, mm, DW

Signature:

Date: 8/1/02

MMS

Summer 2002 Station Log

Station ID 5(10)Client MMS
Project 2002 ANIMIDA
Project No.Date: 8/1/02
Time: 1645-1655

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 5(10)Latitude 70° 27.312Longitude 148° 30.026Station Type (circle one)
BSMB/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 45 Kts. Wind Direction NE Seas/Ice Ripples No iceWater Depth 25.5 ft Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: fine sand some silt mixed in

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Heading Back to West Dock for Anchorage.Field Personnel: JB, JT, mm, DWSignature: John [Signature]Date: 8/1/02

MMS

Summer 2002 Station Log

Station ID 5A

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/3/02Time: 1532-1542

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 5ALatitude 70°29.680Longitude 148°46.053

Station Type (circle one)

BSMP Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 8 Kts Wind Direction WSeas/Ice Ripples ~10% iceWater Depth 37.5 ft.

Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____

Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab ☒No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒

Fine _____

Coarse Sand _____

Gravel _____

Shell Hatch _____

Mixed _____

Indications of Anoxia: Yes ☒

No _____

H₂S Odor: Yes _____No ☒

Comments: _____

Fine soft silt (~3cm) over coarse sand (dark sand)

Water/Suspended Sediments:

Surface _____

Mid-Water _____

Bottom _____

Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____

Traps Retrieved _____

Anonyx Sample _____

Clams: Number of Grabs _____

Astarte _____

Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____

Caged Mussels _____

SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____

Equipment Blank _____

Other _____

Overall Comments: _____

Field Personnel: JB, JT, MM, DWSignature: [Signature]Date: 8/3/02

MMS

Summer 2002 Station Log

Station ID 5B

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/3/02Time: 1333 - 1425

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 5BLatitude 70° 34.884Longitude 148° 55.005

Station Type (circle one)

BSMP Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 10 kt Wind Direction SWSeas/Ice Ripples - 60% iceWater Depth ✓ 44 ft Conductivity, Temperature, Depth (CTD) ✓Doppler Current ✓ Turbidity ✓ Instrument Tow ✓Comments: Sunny w/ some fog - lots of ice

Samples Collected

Sediments:

Van Veen Grab ✓No. of Replicates 7

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ✓ Fine ✓ Coarse Sand ✓ Gravel ✓ Shell Hatch ✓ Mixed ✓Indications of Anoxia: Yes ✓ No ✓ H₂S Odor: Yes ✓ No ✓

Comments:

Fine sand w/ ~2 mm silt on surface (Anenoma in grab)

Water/Suspended Sediments:

Surface ✓ Mid-Water 3 m Bottom 6 m Other ✓

Comments:

Biota:

Amphipods: Traps Deployed ✓ Traps Retrieved ✓ Anonyx Sample ✓Clams: Number of Grabs ✓ Astarte ✓ Cyrtodaria ✓Mussels/SPMD: Deployed/Retrieved ✓ Caged Mussels ✓ SPMD ✓

Comments:

Quality Control Samples

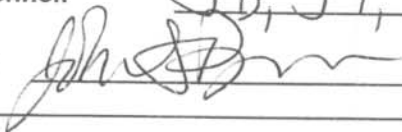
Field Blank ✓ Equipment Blank ✓ Other ✓

Overall Comments:

Field Personnel:

JB, JT, MM, DW

Signature:

Date: 8/3/02

MMS

Summer 2002 Station Log

Station ID 5DDate: 8/7/02Client MMSTime: 1500-1517Project 2002 ANIMIDA

Project No. _____

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 5D

Station Type (circle one)

Latitude 8 ft. 70°24.489 Longitude 148 33.598BSMI/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 15 kt Wind Direction W Seas/Ice 2 ft. no iceWater Depth 8 ft. Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 5

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>3</u> | <u>3</u> | <u>3</u> | <u>3</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed ☒Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: Sandy silt. w/ some detritus on surface.Triplicate grabs at anchor 1st 2 grabs under penetration last 3 ~ 1/3 full "OK"

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Replicate 3 (02-5D-03-PHC-0) had peat and
detritus (black) under surface "flock"
let out ~10 ft. of anchor line between Replicates.
Last Sld Station !!

Field Personnel: JB, AM, MM, DWSignature: [Signature]Date: 8/7/02

MMS

Summer 2002 Station Log

Station ID

5E

Date: 8/4/02

Time: 1307-1415

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 5E

Latitude 70° 38.347

Longitude 149° 16.376

Station Type (circle one)

BSMP Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 20 kt. Wind Direction W

Seas/Ice 2-4 ft. Stray berg.

Water Depth 61 ft.

Conductivity, Temperature, Depth (CTD) ✓

Doppler Current ✓

Turbidity ✓

Instrument Tow

Comments: Foggy & windy ~400 F

Samples Collected

Sediments:

Van Veen Grab ✓

No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| 1 | 1 | 1 | 1 | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ✓ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: Fine sand w/ 1-2 mm surface "flock"

Water/Suspended Sediments:

Surface ✓

Mid-Water 2m

Bottom 4m

Other _____

Comments:

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, BT, MM, DW

Signature:

Date: 8/4/02

MMS

Summer 2002 Station Log

Station ID 5F

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/7/02
Time: 1153-1320

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 5FLatitude 70°26.497Longitude 148°49.555

Station Type (circle one)

BSM/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 10 Kts. Wind Direction WSeas/Ice 1 ft. chop. No ice in Gwydir BayWater Depth 7.2 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒Fine ☒

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

Fine & sand mix over clay

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs ~24

Astarte

Cyrtodaria ☒

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

~140 mL of Cyrtodaria collected (~10 per grab)

Quality Control Samples

Field Blank

Equipment Blank 1

Other

Overall Comments:

Equipment Blank: DP H₂O Rinse of Grab & Scap.

Field Personnel:

JB, AM, MM, DW

Signature:

[Signature]

Date:

8/7/02

MMS

Summer 2002 Station Log

Station ID

5H

Date:

8/01/02

Time:

1017-1140

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number

5H

Latitude 70° 22.221

Longitude 147° 47.792

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed Calm

Wind Direction NA

Seas/Ice Calm - stray berg - Flat

Water Depth 23

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments: Brief Rain Shower

Samples Collected

Sediments:

Van Veen Grab ☒

No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|--------|
| 1 | 1 | 1 | 1 | | | 1(VAF) |

Sediment Texture (check all that apply):

>50% silt/clay

Fine ☒

Coarse Sand

Gravel

Shell Hatch

Mixed ☒

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

Fine sand mixed with silt. (some gravel)

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs ~32

Astarte 1 sample

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

~175 mL of Astarte of ~2-3 cm size (Ave. 1 per grab)

Quality Control Samples

Field Blank

Equipment Blank

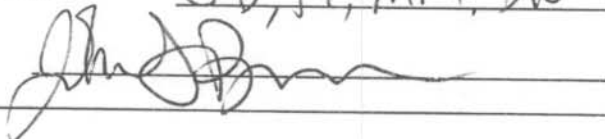
Other

Overall Comments:

Field Personnel:

JB, JT, mm, DW

Signature:



Date:

8/1/02

MMS

Summer 2002 Station Log

Station ID L01Client MMS
Project 2002 ANIMIDA

Project No.

Date: 7/31/02Time: 1230-1240

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number L01Latitude 70° 18.933Longitude 147° 27.082Station Type (circle one)
BSMP/Northstar Liberty/Other

Field Observations and Measurements

Wind Speed 18 kts Wind Direction ESeas/Ice 1 ft chop heavy ice to NE ~ 1 mi butWater Depth 20 ftConductivity, Temperature, Depth (CTD) in openDoppler Current _____Turbidity _____ Instrument Tow _____water.Comments: _____

Samples Collected

Sediments:

Van Veen Grab ✓ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------|
| <u>✓</u> | <u>✓</u> | <u>✓</u> | <u>✓</u> | <u>✓</u> | <u>✓</u> | <u>✓</u> |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ✓ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ✓ H₂S Odor: Yes _____ No ✓Comments: Fine sand w/ some silt grab only ~ 1/3 full but stiff sand.

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____Overall Comments: _____

_____Field Personnel: JB, JT, BT, MM, DWSignature: Date: 7/31/02

MMS

Summer 2002 Station Log

Station ID L04

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 7/30/02Time: 1718-1730

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling LocationStation Number L04Latitude 70° 17.000Longitude 147° 40.040

Station Type (circle one)

BSMP/Northstar/Liberty/Other**Field Observations and Measurements**Wind Speed 15 kts Wind Direction NESeas/Ice 2 ft. seas < 5% ice 1 mi NEWater Depth 17 ft.

Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____

Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected**Sediments:**Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>1 (KAF)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Heading back to EndicottField Personnel: JB, BT, mmSignature: JH & BTDate: 7/30/02

MMS

Summer 2002 Station Log

Station ID LO6
Client MMS
Project 2002 ANIMIDA
Project No.

Date: 7/30/02
Time: 1303-1320

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number LO6
Latitude 70°16.923

Longitude 147°34.064

Station Type (circle one)
BSMP/Northstar Liberty Other

Field Observations and Measurements

Wind Speed 10 kt Wind Direction NE Seas/Ice shaggy bergs - little ice light chop
Water Depth 22 ft. Conductivity, Temperature, Depth (CTD) _____
Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab ☒

No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|---------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>1(UAF)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____
Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒

Comments: grab ~ 1/2 full but good surface - underlying clay - stiff

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed 1 @ 1303 Traps Retrieved 1700 Anonyx Sample No

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: Non Anonyx in Trap. (used sardines w/ mustard sauce.)

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

Field Personnel: JB, BT, MM

Signature: [Signature]

Date: 7/30/02

MMS

Summer 2002 Station Log

Station ID

L07

Date: 7/30/02

Time: 1335-1342

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number L07

Latitude 70° 16.784

Longitude 147° 31.990

Station Type (circle one)

BSMP/Northstar Liberty/Other

Field Observations and Measurements

Wind Speed 10-12 kt. Wind Direction NE

Seas/Ice 1-2 ft. chop. Ice to NE ~1 mi but clear

Water Depth 21 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒

No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| 1 | 1 | 1 | 1 | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand Gravel Shell Hatch MixedIndications of Anoxia: Yes No ☒ H₂S Odor: Yes No ☒

Comments: fine silt w/ underlying clay - grab ~ 1/2 full

Water/Suspended Sediments:

Surface Mid-Water Bottom Other

Comments:

Biota:

Amphipods: Traps Deployed Traps Retrieved Anonyx Sample

Clams: Number of Grabs Astarte Cyrtodaria

Mussels/SPMD: Deployed/Retrieved Caged Mussels SPMD

Comments:

Quality Control Samples

Field Blank Equipment Blank Other

Overall Comments:

Field Personnel:

JB, BT, mm.

Signature:

Date:

7/30/02

MMS

Summer 2002 Station Log

Station ID L08

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 7/30/02Time: 1351-1454

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number L08Latitude 70° 16.70070° 16.701Longitude 147° 30.223 - Rep 1147° 30.342 - Rep 2

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 10-12 kt Wind Direction NE Seas/Ice 10% ice Light chop.Water Depth 20

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒No. of Replicates 2

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>2</u> | <u>2</u> | <u>2</u> | <u>2</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay Rep 2 Fine ☒ Rep 1 Coarse Sand ☒ Rep 2 Gravel ☐ Shell Hatch ☐ Mixed ☒Indications of Anoxia: Yes ☒ No ☐ H₂S Odor: Yes ☐ No ☒Comments: Replicate 1 had Fine and coarse sand w/ some fine material
Replicate 2 had Fine silt w/ clay and some fine sand

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed Traps Retrieved Anonyx Sample

Clams: Number of Grabs 15* Astarte ☒ Cyrtodaria

Mussels/SPMD: Deployed/Retrieved Caged Mussels SPMD

Comments: ~10 grabs at Rep 1 position yielded ~30 Astarte shells all empty some black.
moved to East to new position - very different substrate with live clams.

Quality Control Samples

Field Blank ☒Equipment Blank ☒Grab Rinse ☒

Other

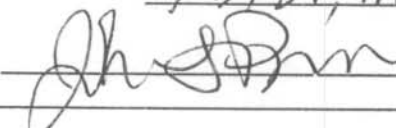
Overall Comments:

*15 grabs yielded ~200 mL of 2-3 cm Astarte at the
second position of L08. Sediment Replicate 2 was also
collected here02-L08-01-PHC-5 collected as Rep 102-L08-02-PHC-5 collected from Rep 2 location.

Field Personnel:

TB, BT, MM

Signature:

Date: 7/30/02

MMS

Summer 2002 Station Log

Station ID L09Client MMS
Project 2002 ANIMIDA

Project No.

Date: 7/30/02Time: 1552-1625

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number L09Latitude 70° 16.586Longitude 147° 27.152Station Type (circle one)
BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 21 ktsWind Direction NESeas/Ice Ripples 20% iceWater Depth 21 ft

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>1 (VAF)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: fine sand w/ silt/clay

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs 6 Astarte ☒ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: ~200 mL 2-3 cm Astarte

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Heading back to pick up Amphipod Traps at Log.Field Personnel: JB, BT, mmSignature: [Signature]Date: 7/30/02

MMS

Summer 2002 Station Log

Station ID N01Client MMS
Project 2002 ANIMIDA

Project No.

Date: 8/3/02
Time: 1101-1201

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N01Latitude 70°31.657Longitude 148°41.443

Station Type (circle one)

BSMP Northstar Liberty/Other

Field Observations and Measurements

Wind Speed 10 kts Wind Direction SW Seas/Ice Bubbles ~ 30% iceWater Depth ✓ 41 ft Conductivity, Temperature, Depth (CTD) ✓Doppler Current ✓ Turbidity ✓ Instrument Tow ✓

Comments:

Samples Collected

Sediments:

Van Veen Grab ✓ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ✓ Fine ✓ Coarse Sand ✓ Gravel ✓ Shell Hatch ✓ Mixed ✓Indications of Anoxia: Yes ✓ No ✓ H₂S Odor: Yes ✓ No ✓

Comments:

Fine sand w/ ~2 mm floc/silt on surface.

Water/Suspended Sediments:

Surface ✓ Mid-Water 3 m Bottom 6.5 m Other ✓

Comments:

Biota:

Amphipods: Traps Deployed ✓ Traps Retrieved ✓ Anonyx Sample ✓Clams: Number of Grabs ✓ Astarte ✓ Cyrtodaria ✓Mussels/SPMD: Deployed/Retrieved ✓ Caged Mussels ✓ SPMD ✓

Comments:

Quality Control Samples

Field Blank ✓ Equipment Blank ✓ Other ✓

Overall Comments:

Field Personnel:

JB, JT, MM, DW

Signature:

[Signature]

Date:

8/3/02

MMS

Summer 2002 Station Log

Station ID N02Client MMS
Project 2002 ANIMIDA

Project No.

Date: 8/3/02Time: 1218-1228

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N02Latitude 70° 30.512GB 70° 30.512Longitude 148° 41.376Station Type (circle one)
BSMP Northstar Liberty/Other

Field Observations and Measurements

Wind Speed calm Wind Direction NA Seas/Ice ripples 40% ice bergsWater Depth 44 ft. Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: Fog at surface blue sky above.

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>1 (VAF)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

~2cm Fine Silt w/ clay underneath

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

Field Personnel:

JB, JT, mm, DWSignature: [Signature]Date: 8/3/02

MMS

Summer 2002 Station Log

Station ID

N03

Date: 8/5/02

Time: 1122-1205

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N03

Latitude 70°30.005

Longitude 148°41.477

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 15 kts Wind Direction W

Seas/Ice 2-3 ft. Heavy ice 250m North

Water Depth 43 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒

No. of Replicates 3

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| 3 | 3 | 3 | 3 | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☐ Coarse Sand ☐ Gravel ☐ Shell Hatch ☐ Mixed ☐Indications of Anoxia: Yes ☒ No ☐ H₂S Odor: Yes ☐ No ☒

Comments:

~3cm silt/mud over stiff black gray mud

Water/Suspended Sediments:

Surface ☐ Mid-Water ☐ Bottom ☐ Other ☐

Comments:

Biota:

Amphipods: Traps Deployed 2 @ 1122 Traps Retrieved None - lost. Anonyx Sample

Clams: Number of Grabs ☐ Astarte ☐ Cyrtodaria ☐Mussels/SPMD: Deployed/Retrieved Caged Mussels ☐ SPMD ☐

Comments:

Quality Control Samples

Field Blank ☐ Equipment Blank ☐ Other ☐

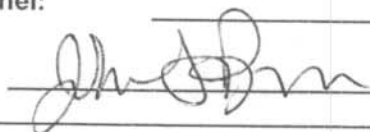
Overall Comments:

Cannot see Amphipod traps. Zodiac line caught in screw and cut off.

Could Not Find amphipod trap bag. Searched site twice.

Field Personnel:

Signature:



Date:

8/5/02

MMS

Summer 2002 Station Log

Station ID N03Date: 8/10/02Time: 10:50 - 14:10

Client MMS

Project 2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N03Latitude 70° 29.972' NLongitude 148° 41.430' W

Station Type (circle one)

BSMP/Northstar Liberty/Other

Field Observations and Measurements

Wind Speed 45 KTS Wind Direction WSeas/Ice Calm ~15% ice coverWater Depth 40'

Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____

Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab _____

No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____

Mid-Water _____

Bottom _____

Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed 1050Traps Retrieved 14:10Anonyx Sample ☒

Clams: Number of Grabs _____

Astarte _____

Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____

Caged Mussels _____

SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____

Equipment Blank _____

Other _____

Overall Comments:

2 ANONYX Traps Deployed on 1 Line. One Trap contained ~95% of collected sample. Both had Sardines in waterSample ID 02-N03-01-PHC-AN

Field Personnel:

Alex Mansfield, Mark MertzSignature: [Signature]Date: 8/10/02

MMS

Summer 2002 Station Log

Station ID

N04

Date:

8/3/02

Time:

1516-1524

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number

N04

Latitude 70° 29.676

Longitude 148° 48.092

Station Type (circle one)

BSMP (Northstar) Liberty/Other

Field Observations and Measurements

Wind Speed 8 KB

Wind Direction W

Seas/Ice Ripples

25% ice bergs

Water Depth 33 Ft

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab



No. of Replicates

1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|---------|
| 1 | 1 | 1 | 1 | | | 1 (U4F) |

Sediment Texture (check all that apply):

>50% silt/clay

Fine

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

Fine silt

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods:

Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

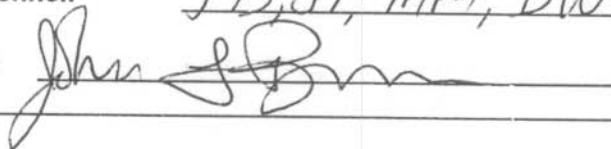
Other

Overall Comments:

Field Personnel:

JB, JT, MM, DW

Signature:



Date:

8/3/03

MMS

Summer 2002 Station Log

Station ID N04Client MMS
Project 2002 ANIMIDA

Project No.

Date: 8/11/02Time: 10:30 - 13:15

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N04Latitude 70° 29.683'Longitude 148° 47.650'Station Type (circle one)
BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 10 Kts NWind Direction NSeas/Ice Chop ~5% iceWater Depth 32'

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab

No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay

Fine

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor:

Yes

No

Comments:

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed 10:30Traps Retrieved 13:15Anonyx Sample ☒

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

2 Anonyx Traps deployed on 1 line. ~ equal sample
from each. Sediment in water. Jar ~ 3/8 fullSample ID 02-N04-01-PHC-AN

Field Personnel:

Alex Mansfield, Mark Mertz

Signature:

Alex M - G. Cal

Date:

8/11/02

MMS

Summer 2002 Station Log

Station ID N05

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/3/02Time: 1548-1557

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N05Latitude 70°29.631Longitude 148°44.704

Station Type (circle one)

BSMP Northstar Liberty/Other

Field Observations and Measurements

Wind Speed 10 Kts Wind Direction WSeas/Ice light chop. <10% iceWater Depth 38.5

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☐ Coarse Sand ☐ Gravel ☐ Shell Hatch ☐ Mixed ☐Indications of Anoxia: Yes ☒ No ☐ H₂S Odor: Yes ☐ No ☒

Comments:

Fine silt ~ 3 cm over stiff clay (black)

Water/Suspended Sediments:

Surface ☐ Mid-Water ☐ Bottom ☐ Other ☐

Comments:

Biota:

Amphipods: Traps Deployed ☐ Traps Retrieved ☐ Anonyx Sample ☐Clams: Number of Grabs ☐ Astarte ☐ Cyrtodaria ☐Mussels/SPMD: Deployed/Retrieved ☐ Caged Mussels ☐ SPMD ☐

Comments:

Quality Control Samples

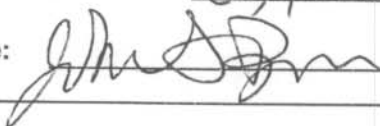
Field Blank ☐ Equipment Blank ☐ Other ☐

Overall Comments:

Field Personnel:

JB, JT, MM, DW

Signature:

Date: 8/3/02

MMS

Summer 2002 Station Log

Station ID

N06

Date:

8/2/02

Time:

1558-1607

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number

N06

Latitude 70° 29.526

Longitude 148° 43.230

Station Type (circle one)

BSMP/Northstar Liberty/Other

Field Observations and Measurements

Wind Speed

Calm

Wind Direction

NA

Seas/Ice

Ripples - ice thick ~ 1/2 mi North

Water Depth

38.5

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

(clear at station)

Samples Collected

Sediments:

Van Veen Grab

☒

No. of Replicates

1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| 1 | 1 | 1 | 1 | | | |

Sediment Texture (check all that apply):

>50% silt/clay

☒

Fine

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

☒H₂S Odor: Yes

No

☒

Comments:

fine soft silt ~ 1cm over stiff fine sand/clay mix

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

Field Personnel:

JB, BT, mm, DW

Signature:

Date:

8/2/02

MMS

Summer 2002 Station Log

Station ID N07

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/5/02Time: 1319-1327

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N07Latitude 70° 29.573Longitude 148° 40.084Station Type (circle one)
BSMP/N Northstar Liberty/Other

Field Observations and Measurements

Wind Speed 12 KTS Wind Direction WWater Depth 40Seas/Ice 2-3 ft. no ice @ station

Doppler Current _____

Conductivity, Temperature, Depth (CTD) _____

Turbidity _____ Instrument Tow _____

Comments: _____

Large Flow
NIMIN.

Samples Collected

Sediments:

Van Veen Grab ☒No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒Fine ☒

Coarse Sand _____

Gravel _____

Shell Hatch _____

Mixed _____

Indications of Anoxia: Yes _____ No _____

H₂S Odor: Yes _____ No _____

Comments: _____

fine silt some fine sand mixed in @ ~1cm.

Water/Suspended Sediments:

Surface _____

Mid-Water _____

Bottom _____

Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____

Traps Retrieved _____

Anonyx Sample _____

Clams: Number of Grabs _____

Astarte _____

Cyrtodaria _____

Mussels/SPMD:

Deployed/Retrieved _____

Caged Mussels _____

SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____

Equipment Blank _____

Other _____

Overall Comments: _____

Field Personnel: JB, JT, MM, DWSignature: John SmithDate: 8/5/02

MMS

Summer 2002 Station Log

Station ID

FB
~~N08~~ N08

Client

MMS

Project

2002 ANIMIDA

Project No.

Date:

8/5/02

Time:

1335-1343

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number

N08

Latitude

70° 29.424

Longitude

148° 38.322

Station Type (circle one)

BSMP/Northstar Liberty/Other

Field Observations and Measurements

Wind Speed

12 kt.

Wind Direction

W

Seas/Ice

2-3 ft.

no ice, bergs to N

Water Depth

39 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab

☒

No. of Replicates

1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| / | / | / | / | | | |

Sediment Texture (check all that apply):

>50% silt/clay

☒

Fine

☒

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

Fine silt mixed with fine sand under 1-2 cm

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

Field Personnel:

JB, JT, mm, DW

Signature:



Date:

8/5/02

MMS

Summer 2002 Station Log

Station ID N09Date: 8/5/02
Time: 1352-1401Client MMS
Project 2002 ANIMIDA
Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N09
Latitude 70°29.342Longitude 148°35.180Station Type (circle one)
BSMP/ Northstar / Liberty / Other

Field Observations and Measurements

Wind Speed 10 Kts Wind Direction W Seas/Ice Light chop. 25% ice bergs.
Water Depth 35 ft. Conductivity, Temperature, Depth (CTD) _____
Doppler Current _____ Turbidity _____ Instrument Tow _____
Comments: Light Snow - cold

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____
Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

Silt w/ fine sand mixed below w/ mud.

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

_____Field Personnel: JB, JT, mm, DWSignature: [Signature]Date: 8/5/02

MMS

Summer 2002 Station Log

Station ID N10

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/2/02Time: 1130 - 1235

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N10Latitude 70° 28.997Longitude 148° 41.780

Station Type (circle one)

BSMP Northstar Liberty/Other

Field Observations and Measurements

Wind Speed 2-5 kt. Wind Direction ESeas/Ice open water Rippled Heavy ice N. of NorthstarWater Depth 34 ft.Conductivity, Temperature, Depth (CTD) ✓Doppler Current ✓Turbidity ✓

Instrument Tow

Comments: Tried to go to SB # N01 but very heavy ice ~ 2 km N. of Northstar.

Samples Collected

Sediments:

Van Veen Grab ✓No. of Replicates 2

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>1 (UAF)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ✓

Fine

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No ✓H₂S Odor: YesNo ✓

Comments:

Fine silt very soft 1st grab over-full lowered feet 2" 2nd grab "OK"

Water/Suspended Sediments:

Surface 1Mid-Water 1Bottom 1

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams: Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

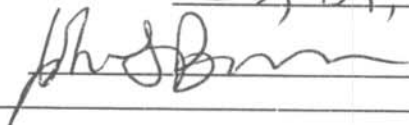
Overall Comments:

Soft silt - Taken at Anchor
Sunny - nice day!

Field Personnel:

JB, BT, MM, DW

Signature:



Date:

8/2/02

MMS

Summer 2002 Station Log

Station ID N11Client MMS
Project 2002 ANIMIDA

Project No.

Date: 8/2/02
Time: 1508-1518

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N11Latitude 70° 28.421Longitude 148° 41.912

Station Type (circle one)

BSMP Northstar Liberty/Other

Field Observations and Measurements

Wind Speed Cal/m Wind Direction NA Seas/Ice Ripples No IceWater Depth 26ft Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: Still Sunny and Warm (~50°F!!)

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____Comments: Very Fine Sand mixed w/ silt.

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

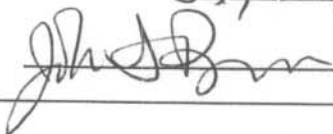
Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Field Personnel:

JB, BT, mm, DW

Signature:

Date: 8/2/02

MMS

Summer 2002 Station Log

Station ID N12Date: 8/2/02Time: 1300-1405

Client MMS

Project 2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N12Latitude 70° 27.319Longitude 148° 42.037

Station Type (circle one)

BSMP Northstar / Liberty / Other

Field Observations and Measurements

Wind Speed CalmWind Direction NASeas/Ice Flat - No iceWater Depth 18.5 ftConductivity, Temperature, Depth (CTD) ✓Doppler Current ✓Turbidity ✓Instrument Tow ✓

Comments:

Samples Collected

Sediments:

Van Veen Grab ✓No. of Replicates 2

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ✓Fine ✓Coarse Sand ✓Gravel ✓Shell Hatch ✓Mixed ✓

Indications of Anoxia:

Yes ✓No ✓H₂S Odor: Yes ✓No ✓

Comments:

Fine silt ~ 3-4 mm over stiff clay

Water/Suspended Sediments:

Surface ✓Mid-Water 2 mBottom 5 mOther ✓

Comments:

Biota:

Amphipods: Traps Deployed ✓Traps Retrieved ✓Anonyx Sample ✓Clams: Number of Grabs ✓Astarte ✓Cyrtodaria ✓Mussels/SPMD: Deployed/Retrieved ✓Caged Mussels ✓SPMD ✓

Comments:

Quality Control Samples

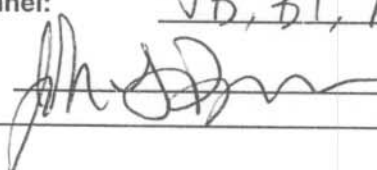
Field Blank ✓Equipment Blank ✓Other ✓

Overall Comments:

Field Personnel:

JB, BT, MM, DW

Signature:



Date:

8/2/02

MMS

Summer 2002 Station Log

Station ID N12

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/3/02Time: 1015 - 1620

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N12Latitude 70°27'32"Longitude 148°42'11"

Station Type (circle one)

BSMP Northstar / Liberty / Other

Field Observations and Measurements

Wind Speed 10 Kts Wind Direction SWSeas/Ice No ice / RipplesWater Depth 18 ft

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay Fine Coarse Sand Gravel Shell Hatch Mixed

Indications of Anoxia: Yes No H₂S Odor: Yes No

Comments:

Water/Suspended Sediments:

Surface Mid-Water Bottom Other

Comments:

Biota:

Amphipods: Traps Deployed 2 @ 1015 Traps Retrieved @ 1620 Anonyx Sample 1

Clams: Number of Grabs Astarte Cyrtodaria

Mussels/SPMD: Deployed/Retrieved Caged Mussels SPMD

Comments: ~500ml Anonyx in 2 traps ~225 ml collected - Remainder Released.

Quality Control Samples

Field Blank Equipment Blank Other

Overall Comments:

Field Personnel:

JB, JT, MM, DW

Signature:



Date:

8/3/02

MMS

Summer 2002 Station Log

Station ID JB N013 N13
Client MMS
Project 2002 ANIMIDA
Project No.

Date: 8/4/02
Time: 1015 - 1705

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N13
Latitude 70°26.982
70°27.016

Station Type (circle one)
BSMP/Northstar/Liberty/Other

Longitude 148°43.594 - Amphipods
148°43.561 - Sediment Sample

Field Observations and Measurements

Wind Speed 20 Kts Wind Direction W Seas/Ice 2-3 ft. seas stray berg
Water Depth 14 ft. Conductivity, Temperature, Depth (CTD) _____
Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel ☒ Shell Hatch _____ Mixed ☒
Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

~ 3cm of fine silt clay over gravel/sand mix grab @ 1657

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota:

Amphipods: Traps Deployed 2 @ 1015 Traps Retrieved 1639 Anonyx Sample 1

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: Baited w/ sardines w/ mustard sauce.

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Reading back to West Deck.

Field Personnel:

JB, BT, MM, DW

Signature:

[Signature]

Date:

8/4/02

MMS

Summer 2002 Station Log

Station ID N14

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/7/02Time: 1405-1417

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N14Latitude 70°26.006Longitude 148°40.429

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 12-15 kts Wind Direction WSeas/Ice 2 ft. large (400m) berg ~ 100 m. awayWater Depth 12 ft.

Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____

Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab ☒No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: Fine silt - soft - grab full almost to doors.

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

_____Field Personnel: JB, Am, mm, DWSignature: [Signature]Date: 8/7/02

MMS

Summer 2002 Station Log

Station ID N15Client MMS
Project 2002 ANIMIDA

Project No. _____

Date: 8/7/02Time: 1105-1115

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N15Latitude 70°26.707Longitude 148°44.618Station Type (circle one)
BSMP Northstar Liberty/Other

Field Observations and Measurements

Wind Speed 12 kts. Wind Direction WSWSeas/Ice 2-2 ft. Chop. berqs ~ 1/4 mi N.Water Depth 8 ft.

Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____

Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab ☒No. of Replicates 2

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| / | / | / | / | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine ☒ Coarse Sand ☒ Gravel ☒ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

1st grab washed out. 2nd grab Fine sand w/ some silt on surface, gravel/sand below

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

Field Personnel: _____

JB, Alex Mansfield (Am), MM, DW

Signature: _____

Date: 8/7/02

MMS

Summer 2002 Station Log

Station ID

N16

Date: 8/5/02

Time: 1053-1105

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N16

Latitude 70° 29.902

Longitude 148° 42.395

Station Type (circle one)

BSMP/Northstar Liberty/Other

Field Observations and Measurements

Wind Speed 15 Kts Wind Direction W

Seas/Ice 2-3 ft. No ice - strong eq.

Water Depth 42.5

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments: ice ~ 1/2 mi to north.

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 2

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|---------|
| 1 | 1 | 1 | 1 | | | 1 (VAF) |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☐ Coarse Sand ☐ Gravel ☐ Shell Hatch ☐ Mixed ☐Indications of Anoxia: Yes ☐ No ☒ H₂S Odor: Yes ☐ No ☒

Comments: 1st grab we had drifted off station - 2nd grab soft mud w/ clay at ~5m deep.

Water/Suspended Sediments:

Surface ☐ Mid-Water ☐ Bottom ☐ Other ☐

Comments:

Biota:

Amphipods: Traps Deployed ☐ Traps Retrieved ☐ Anonyx Sample ☐Clams: Number of Grabs ☐ Astarte ☐ Cyrtodaria ☐Mussels/SPMD: Deployed/Retrieved ☐ Caged Mussels ☐ SPMD ☐

Comments:

Quality Control Samples

Field Blank ☐ Equipment Blank ☐ Other ☐Overall Comments: gray/black clay under the surface mud layer.
Snow Flurries!!

Field Personnel: JB, JT, MM, DW

Signature: [Signature]

Date: 8/5/02

MMS

Summer 2002 Station Log

Station ID

N17

Date:

8/5/02

Time:

12:45-1305

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number

N17

Latitude

70° 29.833 N

Longitude

148° 40.345 W

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed

12 Kts

Wind Direction

W

Seas/Ice

2-3 ft. ice heavy ~1/2 mi. North

Water Depth

42.5

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab

☒

No. of Replicates

1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| 1 | 1 | 1 | 1 | | | |

Sediment Texture (check all that apply):

>50% silt/clay

☒

Fine

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

☒

No

H₂S Odor:

Yes

No

Comments:

12cm fine silt over sticky black clay

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods:

Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

Field Personnel:

JB, JT, mm, DW

Signature:



Date:

8/5/02

MMS

Summer 2002 Station Log

Station ID JB N18 N18
Client MMS
Project 2002 ANIMIDA
Project No.

Date: 8/2/02

Time: 1613 - 1621 1631

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N018 N18

Latitude 70° 29.080

70° 29.082

Longitude 148° 42.228 - Amphipod Trap

148° 42.100 - Sediment Grab

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 5-10 kt Wind Direction ~E

Seas/Ice 1/2 ft. chop - Calm on Retrieval

Water Depth 34 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

of Traps and
sediment.

Samples Collected

Sediments:

Van Veen Grab ☒

No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒

Fine

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia: Yes

No

H₂S Odor: Yes

No

Comments:

~ 1 cm silt w/ Fine sand/clay underneath

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed 2 @ 1020

Traps Retrieved 1625

Anonyx Sample 1

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

2 Traps deployed - ~ 225 mL Anonyx collected ~ 50 mL Released
Traps baited w/ "Regular sardines"

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

Field Personnel:

JB, BT, MM, DW

Signature:

John Smith

Date:

8/2/02

MMS

Summer 2002 Station Log

Station ID N19

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/2/02Time: 1531-1541

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N19Latitude 70°29.088Longitude 148°40.557

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed Calm Wind Direction NASeas/Ice Ripples No ice within 1 mileWater Depth 36 ft.

Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____

Turbidity _____ Instrument Tow _____

Comments: Sunny & nice

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: Fine silt "pudding" ~ 3cm w/ stiff fine sand underneath

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

Field Personnel:

JB, BT, MM, DWSignature: [Signature]Date: 8/2/02

MMS

Summer 2002 Station Log

Station ID N20
Client MMS
Project 2002 ANIMIDA
Project No.

Date: 8/2/02
Time: 1455-1503

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N20

Latitude 70° 27.957

Longitude 148° 41.738

Station Type (circle one)
BSMP Northstar Liberty/Other

Field Observations and Measurements

Wind Speed Calm Wind Direction NA Seas/Ice Ripples. No ice

Water Depth 21 ft. Conductivity, Temperature, Depth (CTD)

Doppler Current Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 2

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|-------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | |

Sediment Texture (check all that apply):

>50% silt/clay Fine ☒ Coarse Sand Gravel Shell Hatch Mixed

Indications of Anoxia: Yes No H₂S Odor: Yes No

Comments: Fine Sand in 2nd grab. 1st grab washed out w/ gravel/mud

Water/Suspended Sediments:

Surface Mid-Water Bottom Other

Comments:

Biota:

Amphipods: Traps Deployed Traps Retrieved Anonyx Sample

Clams: Number of Grabs Astarte Cyrtodaria

Mussels/SPMD: Deployed/Retrieved Caged Mussels SPMD

Comments:

Quality Control Samples

Field Blank Equipment Blank Other

Overall Comments:

Field Personnel:

JB, BT, MM, DW.

Signature:

[Signature]

Date:

8/2/02

MMS

Summer 2002 Station Log

Station ID N21Client MMS
Project 2002 ANIMIDA
Project No.Date: 8/2/02
Time: 1419-1430

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number N21
Latitude 70°26.806Longitude 148°40.588Station Type (circle one)
BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed Calm Wind Direction NA Seas/Ice Calm No ice
Water Depth 17 ft. Conductivity, Temperature, Depth (CTD) _____
Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab ☒ No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|----------|-----------------|-----------|----------------|
| <u>1</u> | <u>1</u> | <u>1</u> | <u>1</u> | | | <u>1 (VAF)</u> |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____
Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No ☒Comments: fine silt ~ 2-3mm over stiff clay w/ some sand

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

_____Field Personnel: JB, BT, mm, DWSignature: [Signature]Date: 8/2/02

MMS

Summer 2002 Station Log

Station ID

N23

Date:

8/5/02

Time:

1420 - 1452

Client

MMS

Project

2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number

N23

Latitude 70° 29.330

Longitude 148° 41.864

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 15 kts. Wind Direction W

Seas/Ice No ice Just S. of Northstar

Water Depth 37 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab ☒

No. of Replicates 1

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| 1 | 1 | 1 | 1 | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒Fine ☒

Coarse Sand

Gravel ☒

Shell Hatch

Mixed ☒

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

mixed silt/clay w/ some gravel & sand (from pipeline cover?)

Water/Suspended Sediments:

Surface ☒

Mid-Water

Bottom

Other

Comments:

Surface H₂O collected ~ 150 ft. South of Northstar.

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams:

Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

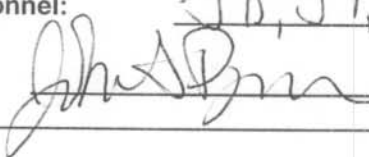
Overall Comments:

Station ~ 100 m South of Northstar on pipeline route

Field Personnel:

JB, JT, MM, DW

Signature:



Date:

8/5/02

MMS

Summer 2002 Station Log

Station ID 3M1Client MMS
Project 2002 ANIMIDA
Project No.Date: 1020-1637Time: 7/29/02

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 3M1Latitude 70°16.982Longitude 147°08.880Station Type (circle one)
BSMP/Northstar/Liberty Other

Field Observations and Measurements

Wind Speed 5-7 kts Wind Direction NESeas/Ice Light chop ~10% ice coverWater Depth 25 ft.

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay Fine Coarse Sand Gravel Shell Hatch Mixed

Indications of Anoxia: Yes No H₂S Odor: Yes No

Comments:

Water/Suspended Sediments:

Surface Mid-Water Bottom Other

Comments:

Biota:

Amphipods: Traps Deployed Traps Retrieved Anonyx Sample

Clams: Number of Grabs Astarte Cyrtodaria

Mussels/SPMD: Deployed Retrieved Caged Mussels 1 cage SPMD 1 (w/ 5 SPMD's)Comments: 40 mussels in cage, 5 SPMD's in device 32 kHz pinger on mooring

Quality Control Samples

Field Blank ☒ Equipment Blank Other

Overall Comments:

Field Personnel:

J. Brown, M. Mertz, B. Tracine

Signature:

Date: 7/29/02

MMS

Summer 2002 Station Log

Station ID 3M1Date: 8/20/02Time: 11:00

Client MMS

Project 2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 3M1Latitude 70° 16.982'Longitude 147° 08.880'

Station Type (circle one)

BSMP/Northstar/Liberty/Other Other

Field Observations and Measurements

Wind Speed 15-20knts Wind Direction SWSeas/Ice 3' + NO ICEWater Depth 25'

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab

No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments:

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams: Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD: Deployed/Retrieved

Caged Mussels 1 cageSPMD 1 (w/5)Comments: All mussels look alive + OK. extensive visceral threads

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

mussels in 2 jars : 02-3M1-01-PHC-TSPMDs in 2 cans 02-3M1-02-PHC-T

Field Personnel:

A. Mansfield, M. Martz, G. Lawley

Signature:

A. Mansfield

Date:

8/20/02

MMS

Summer 2002 Station Log

Station ID 3m2
Client MMS
Project 2002 ANIMIDA
Project No.

Date: 7/29/02
Time: 1648-1703

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 3m2
Latitude 70°16.835

Longitude 147°09.409

Station Type (circle one)
BSMP/Northstar/Liberty/Other Other

Field Observations and Measurements

Wind Speed 5-10 kt Wind Direction NE Seas/Ice 1 ft chop < 10% ice
Water Depth 25 ft Conductivity, Temperature, Depth (CTD) _____
Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels 1 cage SPMD 1 (5 SPMD's)

Comments: 40 mussels in cage, 5 SPMD's in device, 37 kHz pinger on mooring

Quality Control Samples

Field Blank ☒ Equipment Blank _____ Other _____

Overall Comments: _____

Field Personnel: JB, BT, mm

Signature: [Signature]

Date: 7/29/02

MMS

Summer 2002 Station Log

Station ID 3M2Date: 8/20/02Time: 11:30Client MMS
Project 2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 3M2Latitude 70° 16.835'Longitude 147° 09.409'Station Type (circle one)
BSMP/Northstar/Liberty/Other Other

Field Observations and Measurements

Wind Speed 15-20 KNTS Wind Direction SW Seas/Ice 3' + , No iceWater Depth 25' Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels 1 cage SPMD 1(w/5)Comments: 1 dead mussel, all others look alive + OK, ex Tenwire visual Threads

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

MUSSELS in 2 Jars: 02-3M2-01-PHC-TSPMDS in 2 Jars: 02-3M2-02-PHC-T

Field Personnel:

A. Mansfield, M. Mertz, G. Lawley

Signature:

A. MansfieldDate: 8/20/02

MMS

Summer 2002 Station Log

Station ID 3m3Client MMS
Project 2002 ANIMIDA

Project No.

Date: 7/29/02Time: 1715-1727

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 3m3Latitude 70°16.922Longitude 147°09.398Station Type (circle one)
BSMP/Northstar/Liberty/Other Other

Field Observations and Measurements

Wind Speed 5-10 kt Wind Direction NE Seas/Ice 1 ft. chop <10% iceWater Depth 25 ft. Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed Retrieved _____ Caged Mussels 1 cage SPMD 1 (w/ 5 SPMDs)Comments: 40 mussels in cage, 5 SPMDs in SPMD device, 15 kHz pinger on mooring

Quality Control Samples

Field Blank ☒ Equipment Blank _____ Other _____Overall Comments: Cumulative Field Blank exposed during deployment.Field Personnel: JB, BJ, MMSignature: [Signature]Date: 7/29/02

| | |
|---|---|
| <div style="text-align: center; font-size: 2em; font-weight: bold;">MMS</div> <div style="font-size: 1.5em; font-weight: bold;">Summer 2002 Station Log</div> | <div style="border-bottom: 1px solid black; padding-bottom: 5px;">Station ID <u>3M3</u></div> <div style="border-bottom: 1px solid black; padding-bottom: 5px;">Client MMS</div> <div style="border-bottom: 1px solid black; padding-bottom: 5px;">Project 2002 ANIMIDA</div> <div style="border-bottom: 1px solid black; padding-bottom: 5px;">Project No.</div> |
|---|---|

Date: 8/20/02 8/18/02 WIDN 9 AM 8/20

Time: 12:10

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number 3M3

Latitude 70° 16.922

Station Type (circle one)

BSMP/Northstar/Liberty/Other Other

Longitude 147° 09.398

Field Observations and Measurements

Wind Speed 15-20 KNTS Wind Direction SW Seas/Ice 3' + , NO ice

Water Depth 25' Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: 1 dead mussel, all others look alive + OK. extensive visceral threads

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

MUSSELS in 2 JARS: 02-3M3-01-PHC-T

SPMDs in 2 CANS: 02-3M3-02-PHC-T

Field Personnel: A. Massfeld, M. Metz, G. Lawley

Signature: [Signature] **Date:** 8/20/02

| | | |
|--|------------------------------------|--|
| deployed MMS ^{retrieved} Date: <u>7/29/02 - 8/18/02</u> Time: <u>14:40</u> | Summer 2002 Station Log | Station ID <u>NM1</u> Client <u>MMS</u> Project <u>2002 ANIMIDA</u> Project No. _____ |
|--|------------------------------------|--|

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location
 Station Number NM1
 Latitude 70° 29.597' Longitude 148° 44.199'

Station Type (circle one)
BSMP / Northstar / Liberty / Other

Field Observations and Measurements
 Wind Speed ~15 KNTS Wind Direction W Seas/Ice ~1' very little ice
 Water Depth 38' Conductivity, Temperature, Depth (CTD) _____
 Doppler Current _____ Turbidity _____ Instrument Tow _____
 Comments: _____

Samples Collected
Sediments:

Van Veen Grab _____

No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

 Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:
Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed Retrieved Caged Mussels 1 cage SPMD 1 (w/5)

 Comments: All mussels looked Alive + OK. extensive visceral threads
Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

SAMPLE IDS:
Mussels 2 Jars: 02-NM1-01-PHC-T
SPMDs (5 IN 2 CANS) 02-NM1-02-PHC-T

Field Personnel:

A. Mansfield, M. Metz, S. O'Riordan, S. Jewitt, E. Brown

Signature:

A. Mansfield

 Date: 8/18/02

MMS

Summer 2002 Station Log

Station ID NM1
Client MMS
Project 2002 ANIMIDA
Project No.

Date: 7/29/02
Time: 2045 - 2110

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number NM1
Latitude 70° 29.597

Longitude 148° 44.199

Station Type (circle one)
BSMP Northstar / Liberty / Other

Field Observations and Measurements

Wind Speed 15 kts Wind Direction NE Seas/Ice Ripples ~15% ice cover
Water Depth 38 ft Conductivity, Temperature, Depth (CTD) _____
Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed Retrieved Caged Mussels 1 cage SPMD 1 (w/ 5 SPMD's)
Comments: Bevy "1N" 40 mussels (20 per Nitex envelope)

Quality Control Samples

Field Blank ✓ Equipment Blank _____ Other _____

Overall Comments:

Deck exposure SPMD in can used at all SPMD stations
i.e. cumulative. 5 SPMD spider cages in the 1 deployment cage.
25 kts pinger on mooring below SPMD; mussel cage above
SPMD ~ 8 ft from bottom. SPMD ~ 6 ft from bottom. Drag
line at ~100 ft to secondary anchor.

Field Personnel: J. Brown, B. Tracine, M. Mertz

Signature: Jh Brown

Date: 7/29/02



MMS

Summer 2002 Station Log

Station ID NM2
Client MMS
Project 2002 ANIMIDA
Project No. _____

Date: 7/29/02

Time: 2112-2143

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number NM2

Latitude 70° 29.687

Longitude 148° 44.686

Station Type (circle one)
BSMP Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 15 kt Wind Direction NE Seas/Ice ~15% ice Ripples

Water Depth 38 ft. Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels 1 cage SPMD 1 w/ 5 SPMD

Comments: Booy "2N" 40 mussels - 20 per Nitex "envelope"

Quality Control Samples

Field Blank ☒ Equipment Blank _____ Other _____

Overall Comments: SPMD Field blank opened during deployment (contaminated from NM1). Mooring deployment the same as NM1

34 kHz pinger on mooring

Field Personnel: J. Brown, M. Nix, B. Tracing

Signature: [Signature] Date: 7/29/02

MMS

Summer 2002 Station Log

Station ID NM2Client MMSProject 2002 ANIMIDA

Project No. _____

Date: 8/18/02Time: 15:20

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number NM2Latitude 70° 29.687'Longitude 148° 44.686'

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed ~15 KNTWind Direction WSeas/Ice ~1', very little iceWater Depth 38

Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____

Turbidity _____

Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab _____

No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____

Fine _____

Coarse Sand _____

Gravel _____

Shell Hatch _____

Mixed _____

Indications of Anoxia: Yes _____ No _____

Yes _____

No _____

H₂S Odor: Yes _____ No _____

Yes _____

No _____

Comments: _____

Water/Suspended Sediments:

Surface _____

Mid-Water _____

Bottom _____

Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____

Traps Retrieved _____

Anonyx Sample _____

Clams:

Number of Grabs _____

Astarte _____

Cyrtodaria _____

Mussels/SPMD:

Deployed/Retrieved _____

Caged Mussels 1 cageSPMD 1 (w/5)Comments: All mussels appear alive + OK. extensive visual threads

Quality Control Samples

Field Blank _____

Equipment Blank _____

Other _____

Overall Comments: _____

Sample IDs:MUSSELS (2 jars): 02-NM2-01-PHC-TSPMDs (5 in 2 cans): 02-NM2-02-PHC-T

Field Personnel: _____

A. Mansfield, M. Mertz, S. Oakenon, S. Jewitt, E. Brown

Signature: _____

A. MansfieldDate: 8/18/02

MMS

Summer 2002 Station Log

Station ID NM3

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 7/29/02Time: 2200-2217

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location NM3

Station Number

Latitude 70°29.618Longitude 148°44.315

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed ~5 kt Wind Direction NESeas/Ice Ripples ~15% iceWater Depth 39 ft

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay Fine Coarse Sand Gravel Shell Hatch Mixed

Indications of Anoxia: Yes No H₂S Odor: Yes No

Comments:

Water/Suspended Sediments:

Surface Mid-Water Bottom Other

Comments:

Biota:

Amphipods: Traps Deployed Traps Retrieved Anonyx Sample

Clams: Number of Grabs Astarte Cyrtodaria

Mussels/SPMD: Deployed/Retrieved Caged Mussels 1 cage SPMD 1 w/ 5 SPMDComments: Box "3N" 40 mussels deployed - 20 per Nix envelope

Quality Control Samples

Field Blank ☒ Equipment Blank Other

Overall Comments:

Dark exposure SPMD can opened during deployment (Field Blank)
cumulative from NM1 & NM2. Measuring the same as NM1
and NM2.40 kHz pinger on mooringField Personnel: J. Brown, B. Traube, M. MertzSignature: [Signature]Date: 7/29/02

MMS

Summer 2002 Station Log

Station ID NM3Date: 8/18/02Client MMSTime: 15:45Project 2002 ANIMIDA

Project No. _____

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number NM3Latitude 70° 29.618Longitude 148° 44.315'

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed ~15 KNT Wind Direction WSeas/Ice ~1' vary 1.7T/2 iceWater Depth 39'

Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____

Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels 1 cage SPMD 1 (w/5)Comments: All mussels took alive + OK. Extensive visceral threads

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: _____

Field Personnel:

A. Mansfield, M. Martz, S. Oakenen, S. Jewitt, E. Brown

Signature: _____

Date: 8/18/02

MMS

Summer 2002 Station Log

Station ID SAGDate: 8/14/02

Client MMS

Time: 11:30

Project 2002 ANIMIDA

Project No.

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling LocationStation Number SAG

Station Type (circle one)

Latitude See NOTE below Longitude _____BSMP/Northstar/Liberty/Other (Other)**Field Observations and Measurements**Wind Speed ~20 KTS Wind Direction SW Seas/Ice NAWater Depth ~3-6" Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected**Sediments:**

Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| <u>2</u> | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine ☒ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Sample location: ~1/2-1 mile South of
mile marker 401 ON Haul Rd. Road Sig N°135 AMS 15"
nominal coordinates 70°01.680' 148°33.770'.
took one fine grain / silt sample in river 02-SAG01-PHC-S
and one peat sample from bank 02-SAG01-PHC-P

Field Personnel:

Alex Mansfield, Mark Martz

Signature:

Alex MansfieldDate: 8/14/02

MMS

Summer 2002 Station Log

Station ID KUP-01

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/6/02Time: -1000

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number KUP-01Latitude 70°17'00" N Longitude 148°53'70" WNominal position @ Kuparuk River crossing & Spine Rd.

Station Type (circle one)

BSMP/Northstar/Liberty/Other (Other)

Field Observations and Measurements

Wind Speed ~5-10kts Wind Direction —Seas/Ice NAWater Depth —Conductivity, Temperature, Depth (CTD) —Doppler Current —Turbidity —Instrument Tow —Comments: —

Samples Collected

Sediments:

Van Veen Grab —No. of Replicates —

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|-----|-----------------|-----------|-------|
| <u>2</u> | <u>1</u> | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay —Fine ✓Coarse Sand —Gravel —Shell Hatch —Mixed —Indications of Anoxia: Yes — No —H₂S Odor: Yes — No —Comments: 1 Peat sample & 1 sediment for organics - sediment only for metals

Water/Suspended Sediments:

Surface —Mid-Water —Bottom —Other —Comments: —

Biota:

Amphipods: Traps Deployed —Traps Retrieved —Anonyx Sample —Clams: Number of Grabs —Astarte —Cyrtodaria —Mussels/SPMD: Deployed/Retrieved —Caged Mussels —SPMD —Comments: —

Quality Control Samples

Field Blank —Equipment Blank —Other —Overall Comments: Collected samples by hand (jar and clean scoop)Samples collected from the dry area of the Kuparuk River channel - silty/sandy deposits. Samples taken from eastern most channel or "braid" of the River from Access Rd. going to South.
Peat collected from large "mat" in the dry channel.Field Personnel: JB JT DWSignature: [Signature]Date: 8/6/02

MMS

Summer 2002 Station Log

Station ID KUP-03
Client MMS
Project 2002 ANIMIDA
Project No.

Date: 8/7/02
Time: 0800 - 0815

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number KUP-03
Latitude 70°22' - 916

Longitude 148°51.550

Station Typ (circle one)

BSMP/Northstar/Liberty/Other (Other)

Field Observations and Measurements

Wind Speed ~5 kts Wind Direction Var. Seas/Ice N/A
Water Depth N/A Conductivity, Temperature, Depth (CTD) _____
Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: Helicopter from Kuparuk Heliport - Foggy all the way to landing

Samples Collected

Sediments:

Van Veen Grab

No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|----------|------------|-----|-----------------|-----------|-------|
| <u>2</u> | <u>2</u> | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay _____ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____

Indications of Anoxia: Yes _____ No _____ H₂S Odor: Yes _____ No _____

Comments: 2 sed for organics - both surface silt/sand from edge of River.

2 Sed for metals: 1 silt/sand from edge, 1 gravel (~2 L) for severe analysis - then chemistry

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments:

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments:

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments:

Sampling at the Kuparuk Borrow Pit - the source of gravel for Northstar Island. The "pit" has now completely filled in and is just a "pool" in the Kuparuk River delta - and was difficult to locate even with position coordinates. - cold foggy day -

Field Personnel:

JB, JT, AM

Signature:

[Signature]

Date:

8/7/02

MMS

Summer 2002 Station Log

Station ID COL

Client MMS

Project 2002 ANIMIDA

Project No.

Date: 8/13/02Time: 10:30

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number COLLatitude 70° 15.960'

Nominal (Landing Zone)

Longitude 150° 49.290'

Station Type (circle one)

BSMP/Northstar/Liberty/Other

Field Observations and Measurements

Wind Speed 10 KntsWind Direction SWSeas/Ice NAWater Depth ~3-6"

Conductivity, Temperature, Depth (CTD)

Doppler Current

Turbidity

Instrument Tow

Comments:

Samples Collected

Sediments:

Van Veen Grab

No. of Replicates

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|----------|--------|------------|-----|-----------------|-----------|-------|
| <u>2</u> | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒Fine ☒

Coarse Sand

Gravel

Shell Hatch

Mixed

Indications of Anoxia:

Yes

No

H₂S Odor: Yes

No

Comments:

Water/Suspended Sediments:

Surface

Mid-Water

Bottom

Other

Comments:

Biota:

Amphipods: Traps Deployed

Traps Retrieved

Anonyx Sample

Clams: Number of Grabs

Astarte

Cyrtodaria

Mussels/SPMD:

Deployed/Retrieved

Caged Mussels

SPMD

Comments:

Quality Control Samples

Field Blank

Equipment Blank

Other

Overall Comments:

Landed @ coordinate listed above, walked ~50 yds West to river. TOOK fine grain/silt sample in shallow water 02-COL-01-PHC-S. Collect Peat sample from the eroded bank 02-COL-01-PHC-P

Field Personnel:

Alex Manfield, Mark Martz

Signature:

Alex Manfield

Date:

8/13/02

MMS

Summer 2002 Station Log

Station ID CANDate: 8/9/02Time: 14:15Client MMS
Project 2002 ANIMIDA
Project No. _____

Arctic Nearshore Impact Monitoring in the Development Area (ANIMIDA)

Sampling Location

Station Number CAR (Canning River)Latitude 70° 07.199 NLongitude 145° 53.099 WStation Type (circle one)
BSMP/Northstar/Liberty/Other Other

Field Observations and Measurements

Wind Speed 5-10 Knts Wind Direction N Seas/Ice NA

Water Depth _____ Conductivity, Temperature, Depth (CTD) _____

Doppler Current _____ Turbidity _____ Instrument Tow _____

Comments: _____

Samples Collected

Sediments:

Van Veen Grab _____ No. of Replicates _____

| Organics | Metals | Grain Size | TOC | ¹³ C | Methyl Hg | Other |
|-------------------------------------|--------|------------|-----|-----------------|-----------|-------|
| <input checked="" type="checkbox"/> | | | | | | |

Sediment Texture (check all that apply):

>50% silt/clay ☒ Fine _____ Coarse Sand _____ Gravel _____ Shell Hatch _____ Mixed _____Indications of Anoxia: Yes _____ No ☒ H₂S Odor: Yes _____ No _____

Comments: _____

Water/Suspended Sediments:

Surface _____ Mid-Water _____ Bottom _____ Other _____

Comments: _____

Biota:

Amphipods: Traps Deployed _____ Traps Retrieved _____ Anonyx Sample _____

Clams: Number of Grabs _____ Astarte _____ Cyrtodaria _____

Mussels/SPMD: Deployed/Retrieved _____ Caged Mussels _____ SPMD _____

Comments: _____

Quality Control Samples

Field Blank _____ Equipment Blank _____ Other _____

Overall Comments: Collected Samples by hand (Teff Kynar coated scoop)1 sample of fines taken in river 02-CAN-01-PHC-S1 sample of peat taken on the bank 02-CAN-02-PHC-S1 sample of oil sheen taken from nearby pool 02-CAN-03-PHC-SAlso took: water, G-S, and metals for TrefferField Personnel: Alex Mansfield, MARK MERTZSignature: Alex MansfieldDate: 8/9/02

Attachment 2: 2002 Collection Permit and Fish Transfer Permit



**STATE OF ALASKA
DEPARTMENT OF FISH AND GAME**

P.O. Box 25526
JUNEAU, ALASKA 99802-5526

Permit No. CF-02-064

Expires 12/31/2002

FISH RESOURCE PERMIT
(For Scientific/Educational Purposes)

This permit authorizes John S. Brown (whose signature is required on page 2 for permit validation)

person
of Battelle Memorial Institute at 255 Bear Hill Rd., Waltham, MA 02451
agency or organization address

to conduct the following activities from July 24, 2002 to August 30, 2002 in accordance with AS 16.05.930 and AS 16.05.340(b).

Purpose: To collect target species of shellfish and amphipods for tissue analysis of petroleum hydrocarbons in order to evaluate concentration levels of hydrocarbons in the near-shore biota of the Beaufort Sea; to examine the potential bioaccumulation of organic compounds in the water column by deploying caged mussels and SPMDs, and analyzing them for organics; to collect current profiles and suspended particulate samples to evaluate the potential effects of Northstar Production Island on the sediment transport regime in the study area.

Location: Nearshore Beaufort Sea: 12 to 16 stations from Stockton Islands to Jones Islands, concentrating around the Northstar Production Island and Liberty Prospect oil developments.

Species Collected: 300 *Astarta* clams, 600 *Cyrtodaria* clams, 500 *Anonyx* spp. amphipods.

300 blue mussels *Mytilus trossulus*, to be collected from Port Chatham on Kenai Peninsula (see Contingencies section).

Method of Capture: Modified Van Veen grabs and modified minnow traps.

-Continued on Back-

REPORT DUE January 31, 2003. The report shall include species, numbers, dates, and locations of collection and disposition, and if applicable, sex, age, and breeding condition, and lengths and weights of fish. The report shall also include other information as may be required under the contingencies section.

GENERAL CONDITIONS, EXCEPTIONS AND RESTRICTIONS

1. This permit must be carried by person(s) specified during approved activities who shall show it on request to persons authorized to enforce Alaska's fish and game laws. This permit is nontransferable and will be revoked or renewal denied by the Commissioner of Fish and Game if the permittee violates any of its conditions, exceptions or restrictions. No redelegation of authority may be allowed under this permit unless specifically noted.
2. No specimens taken under authority hereof may be sold or bartered. All specimens must be deposited in a public museum or a public scientific or educational institution unless otherwise stated herein. Subpermittees shall not retain possession of live animals or other specimens.
3. The permittee shall keep records of all activities conducted under authority of this permit, available for inspection at all reasonable hours upon request of any authorized state enforcement officer.
4. Permits will not be renewed until detailed reports, as specified above, have been received by the department.
5. UNLESS SPECIFICALLY STATED HEREIN, THIS PERMIT DOES NOT AUTHORIZE the exportation of specimens or the taking of specimens in areas otherwise closed to hunting and fishing; without appropriate licenses required by state regulations; during closed seasons; or in any manner, by any means, at any time not permitted by those regulations.


Division of Commercial Fisheries


Deputy Director
Division of Commercial Fisheries

Alaska Department of Fish and Game

CF-02-064 continued (page 2 of 2)

Authorized Personnel: The following personnel may participate in collecting activities under terms of this permit:
 John Brown; Alex Mansfield; John Trefry; Deb Woodall; Bob Trocine; Mark Mertz; Dick Prentki; staff members of
 Kinnetic Laboratories, Inc., Anchorage.

Contingencies:

- 1) **Bonnie Borba** (Division of Commercial Fisheries, Fairbanks (907)459-2760) must be contacted prior to you engaging in collecting activities. ADF&G Area Management Biologists have the right to specify methods for collecting, as well as limiting the collections of any species, and the number of specimens collected by time and area.
- 2) All unattended collecting gear must be labeled with the permittee's name, telephone number, and permit number.
- 3) Specimens will be sacrificed upon capture and frozen for later laboratory analysis. Unused portions of biota sampled will be archived (frozen or in formalin) for a period of one year.
- 4) **Blue mussels (*Mytilus edulus/trossulus*) will be collected by hand from Port Chatham, AK (July 25 or 26, 2002), and will be transported to the Beaufort Sea (Prudhoe Bay area) for deployment in cages in nearshore waters. The caged mussels and corresponding semi permeable membrane devices (SPMDs) will be deployed from six subsurface moorings in the nearshore Beaufort Sea for a period of 3 weeks (starting on approximately July 27, 2002). Three of the moorings will be deployed in a cluster approximately 1 Km to the West of Northstar Production Island, and three of the moorings will be deployed in a reference area cluster ~4 Km South East of Pole Island. The mussels (and SPMDs) will be deployed in water depths of approximately 10 – 15 meters, and suspended ~1.5 meters from the bottom and mooring anchor, by a subsurface float. The mussel cages will be constructed of plastic coated heavy gauge steel mesh, and the mussels will be held in each cage by Nyltex screen "envelopes". There will be no surface floats on the moorings to minimize ice entanglement, and each mooring string will have an acoustic pinger and secondary anchor with a drag line, to aid in retrieval. Upon retrieval (~3 weeks from deployment) the mussels (and SPMDs) will be frozen and transported to Cambridge, MA for chemical analysis of polynuclear aromatic hydrocarbons.**
- 5) Permits will indicate the number of specimens that may be taken, by species and life stage. Sampling or collecting activities must stop when the maximum allowable number of specimens is obtained. All live fish, shellfish, and aquatic plants collected in excess of the number specified on the permit must be released immediately and unharmed at the capture location, unless otherwise specified in the permit.
- 6) No fish may be transported live without a valid Fish Transport Permit (FTP) obtained from the Alaska Department of Fish and Game.
- 7) *A copy of this permit, including any amendments, must be made available at all field collection sites and project sites for inspection upon request by a representative of the department or a law enforcement officer.*
- 8) Issuance of this permit does not absolve the permittee from compliance in full with any and all other applicable federal, state, or local laws regulations, or ordinances.
- 9) **A report of collecting activities, referenced to this fish resource permit number, must be submitted to the Alaska Department of Fish and Game, Division of Commercial Fish, PO Box 25526, Juneau, AK 99802-5526, attention Jamie Barlow(465-6149; Jamie_Barlow@fishgame.state.ak.us), within 30 days after the expiration of this permit. This report must summarize the number of fish captured by location and by species, and the fate of those fish. A report is required whether or not collecting activities were undertaken. A report must also be sent to the Biologist(s) listed under number 1 in this Contingencies section.**
- 10) **PERMIT VALIDATION requires permittee's signature agreeing to abide by permit conditions before beginning collecting activities:**

 Signature of Permittee

cc: Gene Sandone
 Bonnie Borba
 CF Division files
 Ted Meyers

FISH TRANSPORT PERMIT

Applicant
John S. Brown

Organization
Battelle Memorial Institute

Mailing Address
255 Bear Hill Road
Waltham, MA 02451

Phone
781-895-4847

Species
Blue Mussel
Mytilus
edulus/trossulus

Stock Origin/Original Donor Stock
Port Chatham, AK

Proposed Stocking Location
NA

Project summary- Summary statement of precisely what is being proposed. Blue mussels (*Mytilus edulus/trossulus*) will be collected by hand from Port Chatham, AK (July 25 or 26, 2002), and will be transported to the Beaufort Sea (Prudhoe Bay area) for deployment in cages in nearshore waters. The caged mussels and corresponding semi permeable membrane devices (SPMDs) will be deployed from six subsurface moorings in the nearshore Beaufort Sea for a period of 3 weeks (starting on approximately July 27, 2002). Three of the moorings will be deployed in a cluster approximately 1 Km to the West of Northstar Production Island, and three of the moorings will be deployed in a reference area cluster ~4 Km South East of Pole Island. The mussels (and SPMDs) will be deployed in water depths of approximately 10 – 15 meters, and suspended ~1.5 meters from the bottom and mooring anchor, by a subsurface float. The mussel cages will be constructed of plastic coated heavy gauge steel mesh, and the mussels will be held in each cage by Nytex screen “envelopes”. There will be no surface floats on the moorings to minimize ice entanglement, and each mooring string will have an acoustic pinger and secondary anchor with a drag line, to aid in retrieval. Upon retrieval (~3 weeks from deployment) the mussels (and SPMDs) will be frozen and transported to Cambridge, MA for chemical analysis of polynuclear aromatic hydrocarbons.

Permit # CF-02-064

| | | For Department Use Only | |
|---|------|-------------------------|----------|
| <u>State Fish Transport Permit</u> | | FTP Number | 02A-0046 |
| Consistent with facility/project plans | Yes | | No |
| <u>Private Nonprofit Hatchery Fish Transport Permit</u> | | | |
| Consistent with PNP permit | Yes | | No |
| Requires Permit Alteration prior to review | Yes | | No |
| Continuation of project | Yes | | No |
| New Project | Yes | | No |
| <input checked="" type="checkbox"/> Other - FRP | Yes | X | No |
| <u>Status</u> | | | |
| Forms Complete | Yes | No | Date |
| Disease History Complete | Yes | No | Date |
| In review process | DATE | 7/16/2002 | 7/18/02 |
| Returned to applicant | DATE | 8/01/2002 | |

5 AAC 41.005. PERMIT REQUIRED. (a) No person may transport, possess, export from the state, or release into the waters of the state, any live fish unless the person holds a fish transport permit issued by the Commissioner or his authorized designee. The Fish Transport Permit (FTP) is the single document, approved by the Commissioner of Alaska Department of Fish and Game (ADF&G), that allows for movements of fish and eggs on an interstate and intrastate basis.

SIGNATURE PAGE

Comments

| | Signature | <u>Agree</u> | <u>Disagree</u> | <u>Date</u> | <u>Comments Provided</u> | |
|---|--|-----------------------------|--------------------|------------------------------|--------------------------|----|
| | | | | | Yes | No |
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Trace metals in sediments near offshore oil exploration and production sites in the Alaskan Arctic

John H. Trefry · Robert D. Rember · Robert P. Trocine · John S. Brown

Abstract Increased offshore development in the Alaskan Arctic has stimulated interest in assessing potential impacts to the environment before the onset of any adverse effects. Concentrations of trace metals in sediments are used in this paper to provide one sensitive indicator of anthropogenic inputs from offshore activity over the past several decades. Sediments in coastal waters of the western Beaufort Sea are patchy with respect to sediment granulometry, organic carbon content, and concentrations of trace metals. However, results for surface sediments and age-dated cores show that nearly all samples contain natural concentrations of Ag, Ba, Be, Co, Cr, Cu, Hg, Ni, Pb, Sb, Tl, V and Zn, with metal/Al ratios that have been constant for many decades. Metal concentrations for incoming river-suspended matter compare well with sediment metal values and, along with vertical distributions in sediments, show no discernible diagenetic impacts that distort the sedimentary record for metals, except for Mn, As and possibly Cd. Slightly elevated concentrations of Ba, Hg, Ag, Sb and Zn were observed in a total of eight instances or in only 0.7% of the 1,222 data points for metals in surface sediments.

Keywords Sediment · Trace metals · Offshore oil · Beaufort Sea, Alaska

Introduction

As oil development in the Alaskan Arctic continues to move offshore into the coastal Beaufort Sea, a variety of studies are being carried out to identify, perhaps even predict, where subtle perturbations in the natural system may occur before the onset of deleterious environmental effects. Such assessments are best formulated from studies of spatial and temporal trends for selected indicators. Concentrations of trace metals in surface sediments and in age-dated cores, along with sediment granulometry and total organic carbon, are used in this paper to help evaluate the cumulative impacts of industrial activity in the coastal Beaufort Sea.

The first major discovery of oil near Prudhoe Bay, Alaska, (Fig. 1) in 1968 followed more than 20 years of exploration (Strohmeyer 1997). To date, more than 5,000 wells have been drilled on the Northslope of Alaska and more than 13 billion barrels of oil have been carried along the ~1,300-km route of the Trans-Alaskan Pipeline System to Valdez since 1977 (Alaska Department of Natural Resources 2002). Most (>90%) of the oil recovered to date from the Alaskan Arctic has come from onshore sites (Alaska Department of Natural Resources 2002).

Offshore activities during the 1970s led to the discovery of the Endicott, Point McIntyre and other reservoirs. Production from the Endicott Field began in 1987, following construction of two gravel islands and an 8-km-long causeway to the mainland. To date, about 30 offshore exploratory wells have been drilled in the Beaufort Sea. During 2000, a gravel island was constructed ~10 km offshore with a subseafloor pipeline to bring the Northstar Prospect into production during 2002. The coastal Beaufort Sea continues to be a dynamic area for oil development, seasonal barge and supply boat traffic, as well as the completion of thousands of kilometers of seismic lines.

Trace metals can be useful indicators of impacts from industrial activity because they are commonly enriched in raw and finished materials used by modern industry. For example, barite (BaSO_4) is a major component of fluids used during petroleum drilling operations, and concentrations of Ba in these fluids are often at levels of >100,000 $\mu\text{g/g}$ of solids (Trefry and others 1985) relative to typical Ba levels of 200 to 700 $\mu\text{g/g}$ in Beaufort Sea sediments (Crecelius and others 1991). Other metals from

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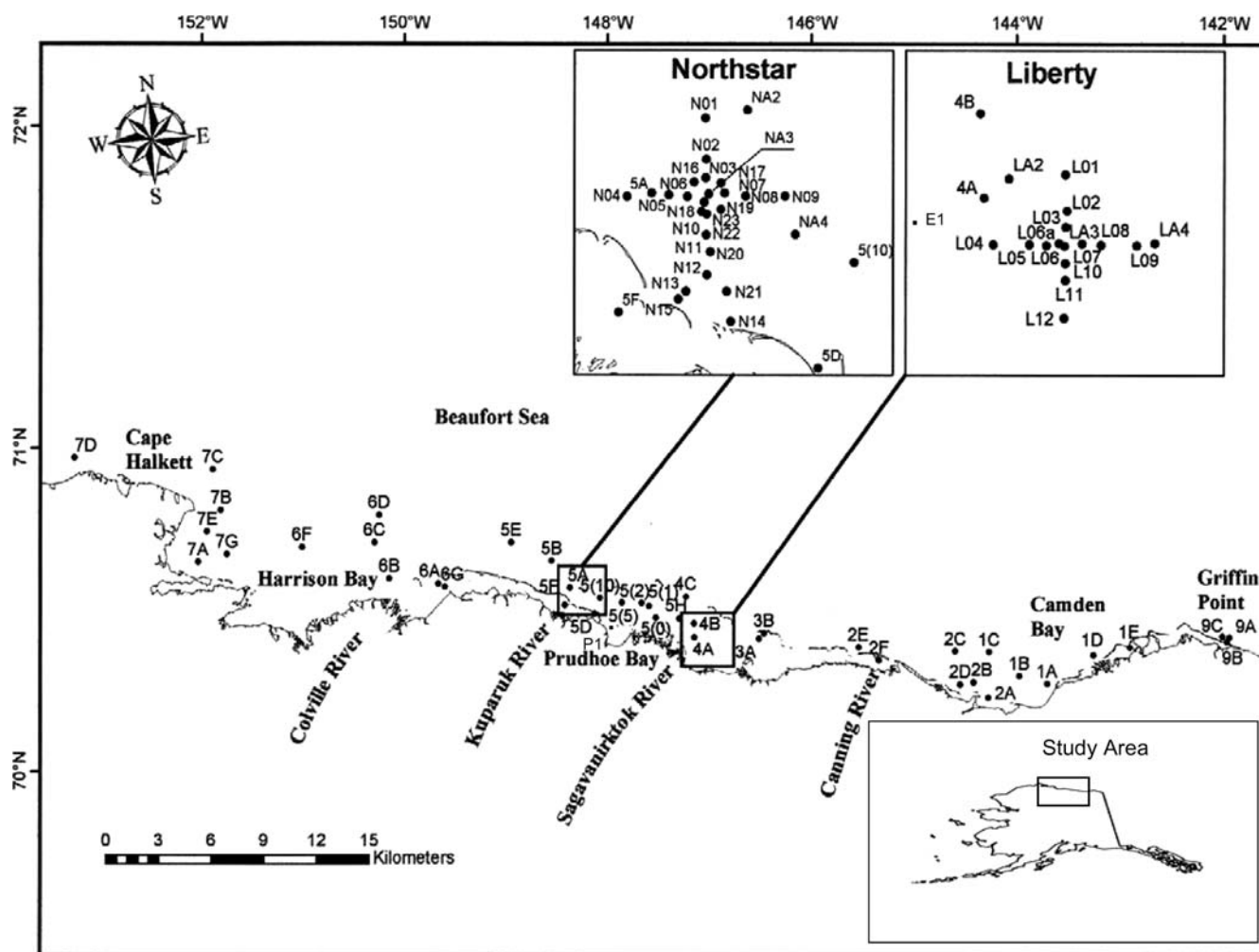


Fig. 1

Map showing study area along the western portion of the coastal Beaufort Sea with inset maps of Alaska, the oil production site at Northstar Island and the proposed future drilling site at Liberty Prospect. Diversity in schemes for station identification results from reusing the numbering system from the 1989 Beaufort Sea Monitoring Program for some stations (Boehm and others 1990; *number-letter* and *number-number*) and introducing a new station identification system for study of impacts at Northstar Island (N) and Liberty Prospect (L)

industrial activities also can be concentrated in bottom sediments where they are often sensitive indicators of cumulative inputs from a variety of anthropogenic sources.

Previous studies of trace metals in sediments from the coastal Beaufort Sea have shown that metal concentrations are highly variable, but generally at natural levels with minimal localized inputs from development (Sweeney and Naidu 1989; Snyder-Conn and others 1990; Crecelius and others 1991; Naidu and others 1997, 2001; Valette-Silver and others 1999). Snyder-Conn and others (1990) identified elevated levels of Ba, Cr, Pb and Zn in areas adjacent to one or more disposal sites for drilling effluent. Crecelius and others (1991) found elevated levels of Ba at a few sites in western Harrison Bay and Cr near the mouth of the

Canning River, with no other indications of metal contamination.

A spatial patchwork of metal concentrations, such as observed in sediments from the coastal Beaufort Sea (Creclius and others 1991; Macdonald and Thomas 1991), can result from natural variations, anthropogenic inputs or diagenetic impacts. Identifying differences in metal concentrations that result from natural variations in grain size and mineralogy often can be carried out by normalizing (ratioing) concentrations of metals to Al or Fe (Moore 1963; Bruland and others 1974). Normalization to Al and Fe also can be used to help identify instances of metal contamination in sediments (Trefry and Presley 1976; Schropp and others 1990). Finally, the impacts of chemical diagenesis on concentrations of metals in sediments often can be identified by examining vertical profiles for metals in sediments (Ridgway and Price 1987; Shaw and others 1990; Gobeil and others 1997) or by comparing concentrations of metals in sediments with source-suspended material from rivers (Trefry and Presley 1982). All the considerations mentioned above are used in this manuscript to help resolve the complex trends observed for metals in sediments from the study area. Sediment samples for this study were collected during 1999 ($n=44$ surface samples), 2000 ($n=44$ surface samples) and 2001 ($n=104$ samples from six cores) at 51 different

sites that extended from west of Prudhoe Bay (~150°W) to Pole Island (~146°W) and included intensive sampling from areas near the Northstar Island before and during construction of this offshore island for oil development (Fig. 1). Intensive sampling was also carried out in an area identified as Liberty Prospect (Fig. 1) where development may occur in the future. Concentrations of Ag, Al, As, Ba, Be, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Sb, Se, Tl, V and Zn were determined for surface sediment (0–2 cm) and sediments from cores that were age-dated using vertical profiles for ^{137}Cs and excess ^{210}Pb .

Study area

The geology of the region has been summarized by Payne and others (1951) and Mull and Adams (1989). In the Brooks Range (100 to 150 km south of the Beaufort Sea), shales from Triassic to Pennsylvanian age are widespread as are the Lisburne limestone and dolomite group from the Pennsylvanian and Mississippian ages. The Gubik formation (Quaternary riverine and marine sediments) underlies the coastal plain. In addition to Quaternary sediments, older Cretaceous and Tertiary sandstones, conglomerates, and siltstones are exposed in the foothills province. Sediments from these formations are carried seaward from the Brooks Range and Northslope by several rivers including the Colville River, the largest in northern Alaska with a drainage basin of ~50,000 km² and an annual sediment load of 5 to 10 million metric tons (Arnborg and others 1967; Naidu and Mowatt 1974).

The depositional environment of the inner shelf of the Beaufort Sea grades gently from the shoreline to a water depth of 30 m and is interrupted by low deltaic mudflats, sandbars, and narrow gravel and sand barrier islands. Clay-size (<2 µm) sediments make up an average of 13±9% of the sediments on the inner shelf (Crecelius and others 1991). The sand- and silt-rich sediment on the shelf is generally <5 m thick (Reimnitz and Barnes 1974). Sediment deposition is patchy (Weiss and Naidu 1986; Naidu and others 2001) and Reimnitz and Wolf (1998) suggest that the entire area is a net erosional environment during the Holocene. Coastal waters are characterized by nine to 11 months of nearly complete sea ice cover. Sea ice generally begins to form during late September to October and break-up is usually complete by the beginning of August. The presence and movement of ice along the shelf can greatly influence sediment transport, deposition, and reworking.

Methods

Surface sediments (0–2 cm) were collected using a modified-ponar grab sampler. Sediment cores were collected using a 10-cm-diameter, 1-m-long, gravity corer. Sediments were removed from the sampler or cores using Teflon spatulas, then placed into 75-ml plastic vials and

kept cold until they were returned to the laboratory, where they were stored frozen. Sediment cores were subsectioned in 0.5-cm intervals from 0 to 5 cm and in 1.0-cm intervals at depths of >5 cm. Samples for grain size analysis were wrapped in plastic bags and stored at 4 °C. River water samples were collected directly in acid-washed, low-density polyethylene bottles and filtered through acid-washed, 0.4-µm polycarbonate membrane filters to obtain suspended sediments (Rember and Trefry 2003).

Prior to analysis for trace metals, 0.4 g of freeze-dried, homogenized sediment and a certified reference material (CRM) were totally digested in Teflon beakers using concentrated, high-purity HF-HNO₃-HClO₄ as described in Trefry and Metz (1984). Sediment samples to be analyzed for Hg were digested separately by heating 2 to 4 g of wet sediment in acid-washed, sealed, polypropylene centrifuge tubes with 4 ml HNO₃ and 2 ml H₂SO₄ following the method of Adeloju and others (1994). Filters containing 1 to 15 mg of suspended sediment were digested using the method described by Trefry and Trocine (1991). Briefly, the filters bearing suspended sediments were placed in stoppered, 15-ml Teflon test tubes and the sediments were completely decomposed and dissolved using Ultrex II HNO₃, HF and HCl.

Labware used for sample preparation was acid washed with hot, 8 N HNO₃ and rinsed three times with distilled, deionized water (DDW). Two procedural blanks, two duplicate samples and two CRMs were prepared with each set of 40 samples. The CRM used was the marine sediment MESS-2 issued by the National Research Council of Canada (NRC).

Bottom sediment samples, CRMs, and procedural and reagent blanks were analyzed as follows: (1) Al, Cr, Cu, Fe, Mn, Ni, V and Zn by flame atomic absorption spectrometry (FAAS) using a Perkin-Elmer (PE) Model 4000 instrument, (2) Ag and As by Zeeman graphite furnace atomic absorption spectrometry (GFAAS) using a PE Model 5100 instrument, (3) Ba, Be, Cd, Co, Pb, Sb, and Tl by inductively coupled plasma-mass spectrometry (ICP-MS) using a PE Model ELAN 5000 instrument, and (4) total Hg by cold vapor atomic absorption spectrometry (CVAAS) using a Laboratory Data Control Model 1235 Mercury Monitor. The above methods are similar to methods described by the United States Environmental Protection Agency (EPA) for Series 7000 FAAS and GFAAS, Series 7470 CVAAS and Series 6010A ICP-MS (United States Environmental Protection Agency 1991). Analytical precision (coefficient of variation, CV), based on replicate analysis of 15 sediment samples, averaged ≤ 2% for Al, Ba, Co, Cu, Mn, Ni and Zn; ≤ 3% for Cd, Cr, Fe, Pb, Sb, Tl, and V; ≤ 5% for As, Be and Hg and 6% for Ag. Concentrations of Al, As, Ba, Cr, Cu, Fe, Pb and Zn in suspended sediments from rivers were determined by similar techniques, as described in Rember and Trefry (2003).

The total organic carbon (TOC) content of the sediments was determined following treatment with H₃PO₄ to remove inorganic carbon. Then, 200 to 400 mg of carbonate-free sediment were combusted, after the addition of powdered vanadium pentoxide, at 900 °C in a Shimadzu TOC-5050A

instrument linked to a solid sampling module (SSM-5000A). A calibration curve was constructed with pure sucrose and checked at every 10 samples by analyzing the CRM MESS-2. Final concentrations of TOC were corrected to account for the increase in sediment mass following the H_3PO_4 treatment; precision averaged 2.4%. Grain size was determined by the wet sieving and pipette methods of Folk (1974).

Sediment geochronology was determined using excess ^{210}Pb and ^{137}Cs following methods described by Kang and others (2000). Vials containing about 10 g of freeze-dried sediments were counted for 2 to 3 days until peak areas were sufficient to provide <10% counting error for total ^{210}Pb . The activities of ^{210}Pb , ^{214}Pb , ^{214}Bi and ^{137}Cs were determined using a well-type, intrinsic germanium detector (WiGe, Princeton Gamma Tech). Detector efficiency was determined using the following: NBS 4350B, river sediment and NBS 4354, freshwater lake sediment from National Institute of Standards and Technology (NIST) and RGU-1 and RGTh-1 from the International Atomic Energy Agency. The specific activity (dpm/g) of each sediment sample was calculated from the detector efficiency, gamma intensity, geometry factor, and sample weight (Kang and others 2000). All values were decay-corrected to the date of coring. Errors are shown on the basis of 1- σ counting statistics.

Quality assurance and quality control during this work included analysis of procedural blanks, spiked and replicate sample, as well as CRMs. Results for concentrations of metals and TOC in the CRMs agreed within the 95% confidence interval of certified concentrations.

Results and discussion

Normalizing sediment metal concentrations

Considerable variability was found for concentrations of all 18 metals and TOC in surface and subsurface sediments from the study area as suggested by the ranges of values in Table 1. Crecelius and others (1991) showed that sediment grain size was a primary variable controlling concentrations of metals in surface sediments from the study area. Levels of silt plus clay from the present study ranged from 1 to 98.8% (Table 1). Granulometry data from the present study show no simple distribution patterns for sand, silt and clay throughout the study area. Furthermore, the fractional amounts of sand, silt and clay found at some

nearshore sites vary from year to year. Samples from the sediment cores contained a greater fraction of silt + clay (Table 1) because a concerted effort was made to sample finer-grained sediments during the coring effort.

To help resolve observed variability, sediment metal values from this study were initially normalized to concentrations of Al. Natural levels of Al and many trace metals vary collectively as a function of sediment grain size, organic carbon content and mineralogy, with higher metal levels in fine-grained aluminosilicates (clays) and lower metal levels in coarse-grained quartz sand and carbonate shell fragments. Normalization is a useful precursor to more detailed evaluation of spatial and historical trends as well as possible diagenetic effects on metal concentrations, as discussed below.

In sediments from this study, positive linear relationships are observed for Al versus percent silt+clay ($r=0.89$; Fig. 2a), percent clay ($r=0.75$) and TOC ($r=0.74$). Aluminum concentrations also correlate well with levels of Fe ($r=0.94$; Fig. 2b) throughout the study area. Aluminum and Fe are present at percent levels in the sediment, relative to concentrations in parts per million ($\mu g/g$) for trace metals; and, Al and Fe are not commonly introduced to marine sediments in sizeable amounts by anthropogenic processes. Therefore, any fractional changes in concentrations of Al and Fe are expected to be small relative to possible shifts in concentrations of trace metals due to anthropogenic or diagenetic influences. Concentrations of Fe can be altered during early chemical diagenesis; however, the net effect on solid-phase concentrations of Fe is generally small (e.g., <10% change in Fe/Al ratio; Trefry and Presley 1982).

Mean concentrations of Al and Fe in suspended sediments collected during 2000 and 2001 from the Sagavanirktok and Colville Rivers that supply sediments to the study area plot within the 99% prediction interval developed for bottom sediments (Fig. 2b). Furthermore, concentrations of Al and Fe in the river-suspended sediments plot at the higher end of the continuum in Fig. 2b due to a greater fraction of clay-rich particles suspended in the rivers. Suspended sediments from the Kuparuk River had higher levels of Fe during part of the summer when concentrations of suspended solids were low (~4 mg/l; Rember and Trefry 2003), thereby shifting the average value in Fig. 2b above the upper prediction interval.

Under natural conditions, concentrations of selected trace metals in sediments will commonly follow a strong linear trend versus Al and/or Fe in a given depositional

Table 1

Summary data for metals, total organic carbon (TOC) and granulometry in sediments from the coastal Beaufort Sea

| Samples | | Ag ($\mu g/g$) | Al (%) | As ($\mu g/g$) | Ba ($\mu g/g$) | Be ($\mu g/g$) | Cd ($\mu g/g$) | Co ($\mu g/g$) | Cr ($\mu g/g$) | Cu ($\mu g/g$) |
|--------------------------------|----------------------------------|------------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Surface sediment 1999 and 2000 | Mean \pm Std. Dev. ($n=88$) | 0.11 \pm 0.05 | 3.93 \pm 1.63 | 11.1 \pm 4.1 | 394 \pm 146 | 1.2 \pm 0.50 | 0.22 \pm 0.12 | 7.3 \pm 3.3 | 56.9 \pm 23.4 | 18.9 \pm 10.5 |
| Sediment cores 2001 | Mean \pm Std. Dev. ($n=104$) | 0.12 \pm 0.05 | 4.48 \pm 0.80 | 9.3 \pm 3.2 | 460 \pm 60 | 1.1 \pm 0.2 | 0.26 \pm 0.10 | 9.0 \pm 2.0 | 64.4 \pm 9.6 | 21.8 \pm 6.5 |
| All data | Range | 0.03–0.44 | 1.1–7.3 | 4.2–28.4 | 155–753 | 0.3–2.3 | 0.03–0.82 | 2.2–18.6 | 12.7–104 | 3.6–50.2 |

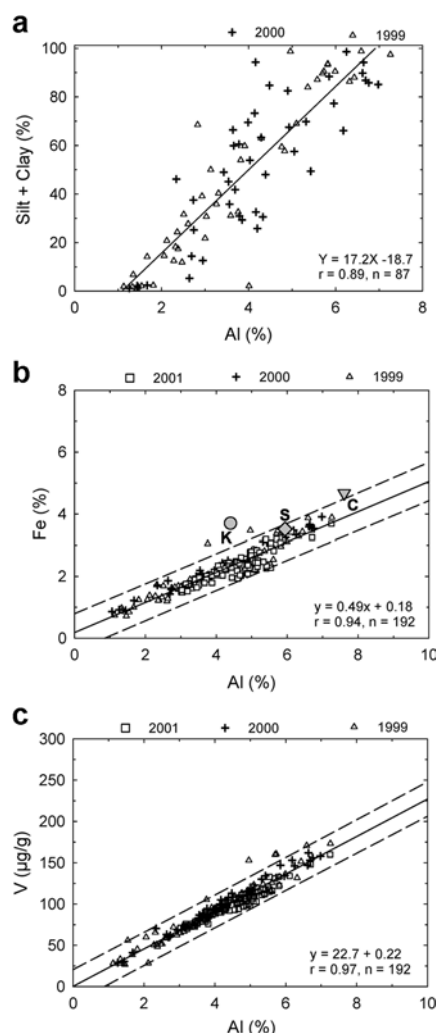


Fig. 2.

Concentrations in sediment for Al versus **a** silt+clay, **b** Fe, and **c** V. Equations are from linear regression calculations, r is the correlation coefficient and n is the number of data points. Dashed lines show 99% prediction interval. Points marked with large letters on the Fe graph are for suspended sediment from the Sagavanirktok (S), Kuparuk (K) and Colville (C) rivers

environment. For example, concentrations of V correlate well with Al ($r=0.97$, Fig. 2c) and Fe ($r=0.96$) in all surface and subsurface sediment samples collected. The broad range in V concentrations, yet good linear fit for Al (and Fe) versus V, is consistent with mixing of relatively uniform composition, metal-rich aluminosilicate phases with metal-poor quartz sand and carbonates. Vanadium levels in natural sediments from the Beaufort Sea are predicted

to follow the trend presented in Fig. 2c. Thus, the strong relationship for Al versus V in Fig. 2c also supports a lack of anthropogenic inputs of V and no impact on V levels due to sediment diagenesis. The three points that plot slightly above the upper prediction interval in Fig. 2c exceed that limit by <10% and are consistent with the statistical boundaries of a 99% prediction interval. Crecelius and others (1991) used V, in the absence of data for Al and Fe, to normalize concentrations of other trace metals in sediments from the coastal Beaufort Sea. Aluminum was chosen for normalization in the present study because it is least affected by chemical weathering and diagenesis.

Graphs for Al versus Pb, Cu, Cr and Ni (Fig. 3) also show strong ($r>0.87$) linear relationships with no points that plot at more than 10% above the upper prediction interval. Correlation coefficients for Al versus Co (0.85), Sb (0.84) and Tl (0.86) also are strong with no data points that plot at >10% above the upper prediction interval. Collectively, the results support the conclusion that no discernible anthropogenic inputs of these seven metals can be identified. Available metal data for suspended sediments from source rivers (Pb, Cu, Cr, Zn; Fig. 3) show that the metal/Al ratios for river particles fit within, or very close to, the prediction intervals found for bottom sediments in the coastal Beaufort Sea. These similarities in metal/Al ratios for river source material and bottom sediment, when linked to data for sediment cores discussed below, are used to evaluate whether diagenetic impacts distort the historical record for these metals in area sediments. Concentrations of metals in the river-suspended matter plotted at the higher end of the metal/Al continuum (Fig. 3) as previously described for Al and Fe.

In contrast with the metals discussed above, concentrations at one or more locations were >10% above the upper prediction interval on the metal versus Al plots for Zn, Hg and Ba (Fig. 3). An anomalous Zn value was observed for site 5H (near Endicott Island), and anomalous values for Hg and Ba were found for sediments collected near Northstar Island (Fig. 3). Considerable industrial activity is common to both areas; however, the degree of metal enrichment averaged <25% more than the value at the upper prediction limit for a given concentration of Al. In addition to the anomalies from the 1999 to 2001 data for Ba described above, concentrations of Ba in samples collected during 1989 (Boehm and others 1990) from sites 7A and 7G in western Harrison Bay also plot above the upper limit of the 99% prediction interval (Fig. 3). Elevated Ba levels at sites 7A and 7G in Harrison Bay during

| Fe (%) | Hg (µg/g) | Mn (µg/g) | Ni (µg/g) | Pb (µg/g) | Sb (µg/g) | Tl (µg/g) | V (µg/g) | Zn (µg/g) | TOC (%) | Silt+Clay (%) |
|-----------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------------|
| 2.21±0.87 | 0.041±0.029 | 317±144 | 24.3±10.5 | 9.7±4.9 | 0.50±0.21 | 0.40±0.18 | 92.6±40.1 | 70.1±31.7 | 0.86±0.70 | 46.9±30.4 |
| 2.30±0.44 | 0.054±0.011 | 294±117 | 31.9±6.3 | 10.3±2.5 | 0.62±0.12 | 0.47±0.07 | 99.7±17.4 | 91.5±22.6 | 1.13±0.54 | 72.8±18.8 |
| 0.7–3.9 | 0.003–0.20 | 62–898 | 6.0–48.4 | 3.2–22.3 | 0.15–1.14 | 0.12–0.92 | 26.9–173 | 14.8–157 | 0.01–4.41 | 1.0–98.8 |

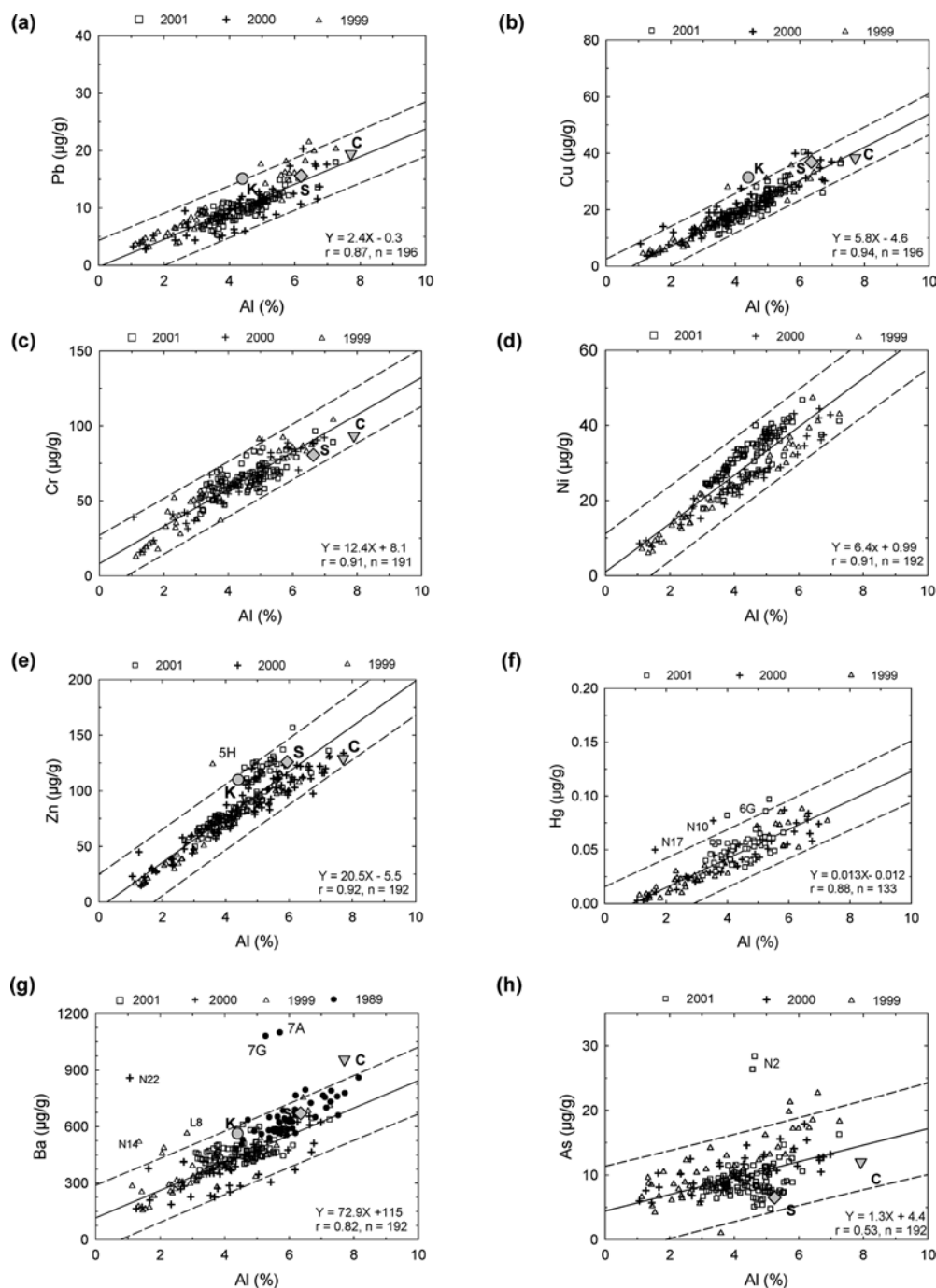


Fig. 3

Concentrations in sediment for Al versus Pb (a), Cu (b), Cr (c), Ni (d), Zn (e), Hg (f), Ba (g) and As (h). Equations are from linear regression calculations, r is the correlation coefficient and n is the total number of data points. Dashed lines above and below the regression line show the 99% prediction interval. Points marked with large letters on selected graphs are for suspended sediment from the Sagavanirktok (S), Kuparuk (K) and Colville (C) rivers. Data for sites identified on the graph were not included in the regression calculations

1989 are consistent with exploratory drilling and drilling residues in the area (Snyder-Conn and others 1990; Crecelius and others 1991). The sensitivity of normalizing to Al is demonstrated by calculating the excess Ba concentration as total Ba minus natural Ba, where the natural Ba level determined from Fig. 3g is the value for Ba at the upper prediction interval for a given Al concentration. The most anomalous sample point in Fig. 3g from station N22 has an excess Ba level of 509 $\mu\text{g/g}$ (859–350 $\mu\text{g/g}$) that can be explained by the presence of barite at only 0.09% of the total sediment mass, where pure barite contains Ba at 588,000 $\mu\text{g/g}$. Subtle enhancement of Ba concentrations at site L8 (1999) may be a remnant of exploratory drilling in

the area in 1982 and 1997 (URS 2001). Although these various anomalies are minor, they do support the sensitivity of Al versus metal graphs and can help focus future field investigations.

Concentrations of Ag and Be were low and somewhat more variable (Table 1); therefore the correlations versus Al were weaker (Ag, $r=0.57$; Be, $r=0.69$). Background levels of As in the study area were high relative to average marine sediment. This point was previously noted throughout the Beaufort Sea by Valette-Silver and others (1999). In the present study, the authors found As levels in suspended sediments from local rivers to average 15 ± 5 $\mu\text{g/g}$ ($n=17$). Data shown on Fig. 3h for As are more scattered with a

Table 2

Summary of results for metal/Al ratios and related coefficients of variation (CV) in sediment cores from the following locations: Prudhoe Bay ($n=29$), Endicott Island ($n=13$), Pole Island 3A ($n=10$), Colville Delta (6A, $n=23$; 6G, $n=14$), Northstar Island (N2, $n=15$)

| Metal | (Metal/Al) ($\times 10^{-4}$) All 104 samples | Range for CV (%) for (Metal/Al) for all six cores | Average CV (%) for (Metal/Al) from each of six cores |
|-------|--|---|--|
| Ni/Al | 7.1 \pm 0.9 | 2–6 | 3.5 |
| V/Al | 22.3 \pm 1.2 | 3–6 | 3.6 |
| Zn/Al | 20.3 \pm 2.6 | 2–6 | 4.4 |
| Fe/Al | 5100 \pm 200 | 2–10 | 4.6 |
| Cr/Al | 14.6 \pm 1.8 | 4–6 | 5.1 |
| Ba/Al | 105 \pm 16 | 5–8 | 5.8 |
| Co/Al | 2.0 \pm 0.4 | 3–10 | 6.1 |
| Tl/Al | 0.11 \pm 0.01 | 4–11 | 6.4 |
| Be/Al | 0.24 \pm 0.3 | 5–14 | 7.7 |
| Pb/Al | 2.3 \pm 0.4 | 4–16 | 8.7 |
| Sb/Al | 0.14 \pm 0.02 | 5–15 | 9.4 |
| Cu/Al | 4.8 \pm 1.0 | 7–14 | 10.2 |
| Cd/Al | 0.06 \pm 0.02 | 12–19 | 14.8 |
| As/Al | 2.1 \pm 0.7 | 11–22 | 15.1 |
| Mn/Al | 65 \pm 19 | 8–42 | 20.4 |
| Ag/Al | 0.03 \pm 0.01 | 16–39 | 26.5 |

lower r value of 0.53 and several points above the upper prediction interval, (Fig. 3h). These trends for As also were observed for Mn and Cd (Table 2) and are related to diagenetic impacts as discussed below.

Temporal distribution of sediment metal concentrations

The historical record of metal levels in sediments from the coastal Beaufort Sea is developed here from age-dated cores. Metal data from sediment cores, coupled with results for river-suspended particles, also are used to help identify possible diagenetic effects. Collecting sediment cores suitable for age-dating in the study area is complicated by bottom-fast ice, ice gouging, low net sediment accumulation rates, low activities of excess ^{210}Pb and ^{137}Cs , and storm-induced resuspension and transport of sediments offshore into deeper water. Even when coring sites were chosen based on bathymetry (i.e., semi-restricted basins) or surface sediment composition (i.e., >90% silt plus clay), only one in four cores was viable for establishing a geochronology over the past 50 to 100 years. In many instances, extremely low levels of excess ^{210}Pb (<0.2 dpm/g) or ^{137}Cs (<0.02 dpm/g) were found, even in the top 0.5 cm of sediment. Such observations are consistent with previous reports that characterize this coastal area as a net erosional environment (Reimnitz and Wolf 1998).

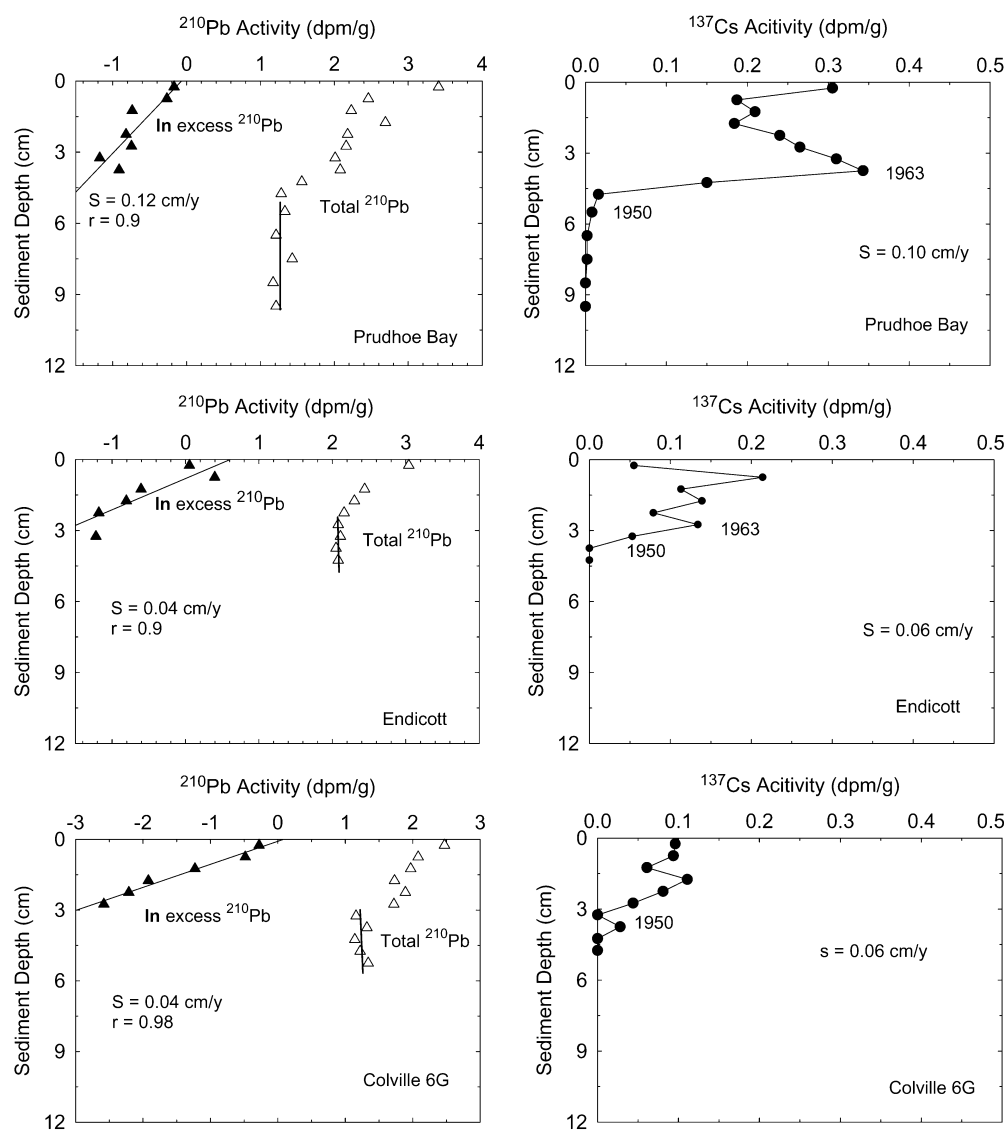
Past efforts to reconstruct recent geochronology for coastal sediments from this nearshore area of the Beaufort Sea (Weiss and Naidu 1986; Naidu and others 2001) have encountered many of the same difficulties reported here. Weiss and Naidu (1986) used vertical profiles for the activity of total ^{210}Pb to calculate sedimentation rates of 0.6 to 1 cm/year at sites in Simpson Lagoon, near stations 6A and 6G (Fig. 1); however, the activities for total ^{210}Pb

averaged <2 dpm/g with variable texture in each core. In recent work, Naidu and others (2001) reported no excess ^{210}Pb and no detectable ^{137}Cs in a core from Simpson Lagoon whereas they found levels of excess ^{210}Pb levels at 0.9 to 1.2 dpm/g and ^{137}Cs activities of 0.2 dpm/g at a site near our station 3B (Fig. 1). Based on inherent difficulties with area sediments, a primary goal of the geochronology effort for the present study was to collect some representative sediment that was deposited prior to the onset of development during the late 1960s and early 1970s and some sediments that was deposited post-development. Detailed results for geochronology were obtained for three sites: (1) station P1 in Prudhoe Bay, (2) station E1, just east of Endicott Island near the mouth of the Sagavanirktok River, and (3) station 6G in the eastern section of the Colville River delta (Fig. 1). At stations L2, 3A, N2 and 6A, either no detectable excess ^{210}Pb and ^{137}Cs were found or very low levels were found only in the top 0.5 cm. The locations of these sites with little or no detectable recent sediments extend across the study area and support the contention that deposition of present-day sediment is patchy and thin.

In Prudhoe Bay (station P1), the maximum activity of excess ^{210}Pb in the surface layer of sediment was 0.84 dpm/g with detectable decay to a depth of ~5 cm and a calculated sedimentation rate of 0.11 \pm 0.02 cm/year (Fig. 4a). The vertical profile for ^{137}Cs supports the results from excess ^{210}Pb with a sedimentation rate of 0.10 cm/year based on the 1950 appearance of ^{137}Cs at ~5 cm and the observed 1963 peak at ~3.75 cm (Fig. 4b). Samples from depths >4 cm were most likely deposited before development began during the 1960s in the area of Prudhoe Bay. Preservation of such detail in the geochronological record over such a short depth interval for this site is surprising; however, boat traffic in the inner portion of the Prudhoe Bay is rare and water depths in the deepest portion of the secluded bay (~3 m) are sufficient to minimize the effects of bottom-fast ice and ice gouging. Even if a combination of sediment deposition and winnowing at station P1 created an apparent sedimentation rate, it seems reasonable to suggest that the top 1 to 2 cm contain post-development sediments and that sediments found deeper than 4 to 5 cm were deposited prior to development.

At station E1, the activity of excess ^{210}Pb was 1.1 dpm/g at 0 to 0.5 cm and 1.5 dpm/g at 0.5 to 1.0 cm (Fig. 4c). The calculated sedimentation rate based on excess ^{210}Pb is about 0.04 \pm 0.02 cm/year. Activities of ^{137}Cs were detectable to a depth of 3.25 cm, yielding a sedimentation rate of ~0.06 cm/year (Fig. 4d), a value that is reasonably consistent with that obtained from the profile for excess ^{210}Pb considering the uncertainty in the data. These data for station E1 support the likelihood that sediments at depths >4 cm pre-date development.

Additional support for low sedimentation rates at stations P1 and E1 can be developed from data for river inputs of sediment. The Sagavanirktok River, the major river carrying sediments into this area, is estimated to have an annual sediment load of about 0.3×10^6 mt (Rember and Trefry 2003). The depositional area for these sediments in

**Fig. 4a-f**

Vertical profiles for activities of excess ^{210}Pb , total ^{210}Pb and ^{137}Cs for sediment cores from sites in Prudhoe Bay (P1), near the Endicott development (E1) and on the Colville River delta (6G)

the coastal Beaufort Sea is at least $1,000 \text{ km}^2$ to yield an estimated deposition rate of $\sim 0.02 \text{ cm/year}$ based on a sediment bulk density of 1.6 g/cm^3 $[(0.3 \times 10^{12} \text{ g dry sediment}/1,000 \times 10^{10} \text{ cm}^2) \times [(1.6 \text{ g wet sediment}/\text{cm}^3)/(2.6 \text{ g dry sediment}/\text{cm}^3)]]$. As previously noted, the study area may be net erosional at this time (Reimnitz and Wolf 1998).

In the Colville River delta at station 6G, the maximum activity of excess ^{210}Pb was 0.76 dpm/g and the calculated sedimentation rate was $0.04 \pm 0.02 \text{ cm/year}$ (Fig. 4e). The ^{137}Cs profile supports a sediment accumulation rate of $\sim 0.06 \text{ cm/year}$ (Fig. 4f). Once again, the record of sediment input since the 1950s is sequestered in the top 4 to 5 cm of sediment. At nearby station 6A, detectable levels of excess ^{210}Pb at 0.27 dpm/g were observed only in the top 0.5 cm of the sediment column. This latter result is consistent with that of Naidu and others (2001) for the same area.

Concentrations of trace metals were determined for 104 samples from six cores (P1, E1, 3A, 6A, 6G and N2). Some variability in concentrations of metals was observed in

each core (Table 1 and Figs. 5, 6), mainly due to variations in amounts of fine-grained sediment. However, the CV for metal/Al ratios averaged 10% in each of the six cores for Ni, V, Zn, Fe, Cr, Ba, Co, Tl, Be, Pb, Sb and Cu (Table 2). Such uniform metal/Al ratios support long-term deposition of sediments with uniform composition and no identifiable impact from diagenesis for these metals. These conclusions are further supported below through detailed evaluation of cores from stations P1 and 6G and from data for river-suspended sediments.

In Prudhoe Bay (station P1), concentrations of Al and Fe follow parallel trends down core (Fig. 5). Variations in concentrations of Al and Fe in the core result from shifts in the fraction of sand, silt and clay deposited during a given time period. Vertical distributions for Ba, Pb, Cr, V and Zn (Fig. 5), as well as Be, Cu, Ni, Sb and Tl, follow trends similar to those observed for Al and Fe with the CVs for the metal/Al ratios all $< 8\%$. These vertical profiles support long-term deposition of sediments with no discernible shifts in metal/Al ratios or anthropogenic inputs. Metal concentrations and the metal/Al ratios for

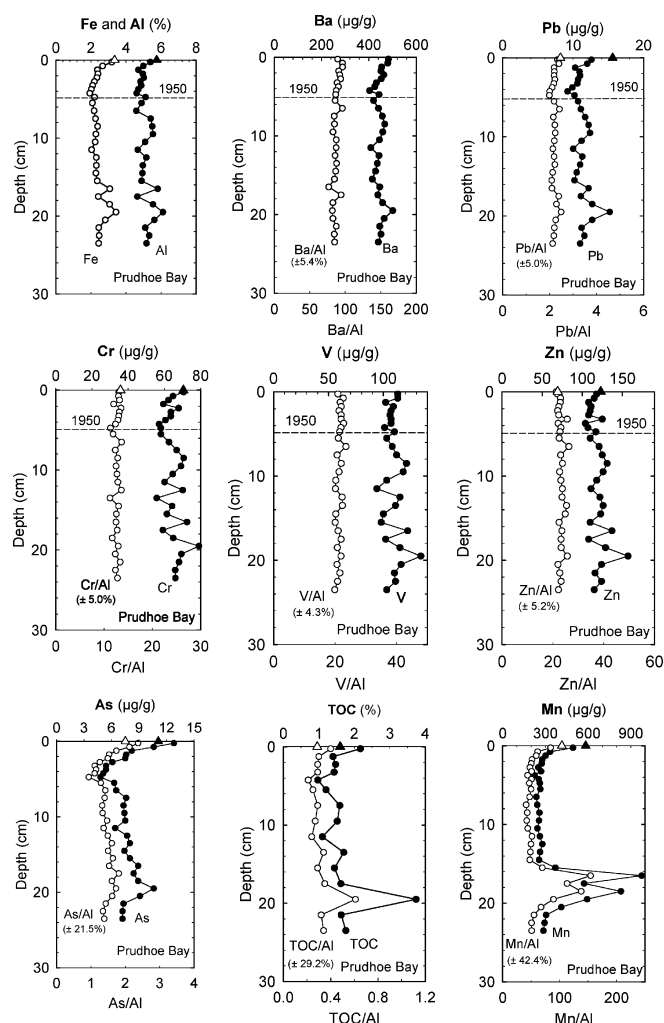


Fig. 5

Vertical profiles for concentrations and ratios to Al in sediment core from Prudhoe Bay (station P1) for Fe and Al, Ba, Pb, Cr, V, Zn, As, total organic carbon (TOC), and Mn. Triangles plotted at 0 cm show concentrations and metal/Al ratios for suspended sediment from the Sagavanirktok River. Numbers in parentheses show coefficient of variation for metal/Al ratio. Graphs with no line identifying a sediment age of 1950 (As, TOC and Mn) lack geochronological significance due to post-depositional diagenesis/diffusion

Fe, Al, Pb, Cr, Zn in suspended sediments from the Sagavanirktok River are plotted at the top of each vertical profile in Fig. 5 and are coincident with values found in the surficial layers of the core. This continuity, in conjunction with the vertical profiles, supports no discernible diagenetic impacts in the vertical distributions for Ag, Ba, Be, Co, Cr, Cu, Hg, Ni, Pb, Sb, Tl, V and Zn.

Concentrations of TOC (and the TOC/Al ratio) are elevated by about 30% in the top 0.5 cm and by a factor of ~2 at about 20 cm relative to other sections in the core (Fig. 5). Coincident with elevated levels of TOC in the surface layer of sediment are higher values of As/Al and slightly lower levels of Mn/Al (Fig. 5). Furthermore, the Mn/Al ratios are enriched in the layers at ~20 cm where concentrations of TOC are high. Diagenetic impacts on Mn in sediments are well studied and can lead to a variety of perturbations in concentrations of Mn (Trefry and Presley

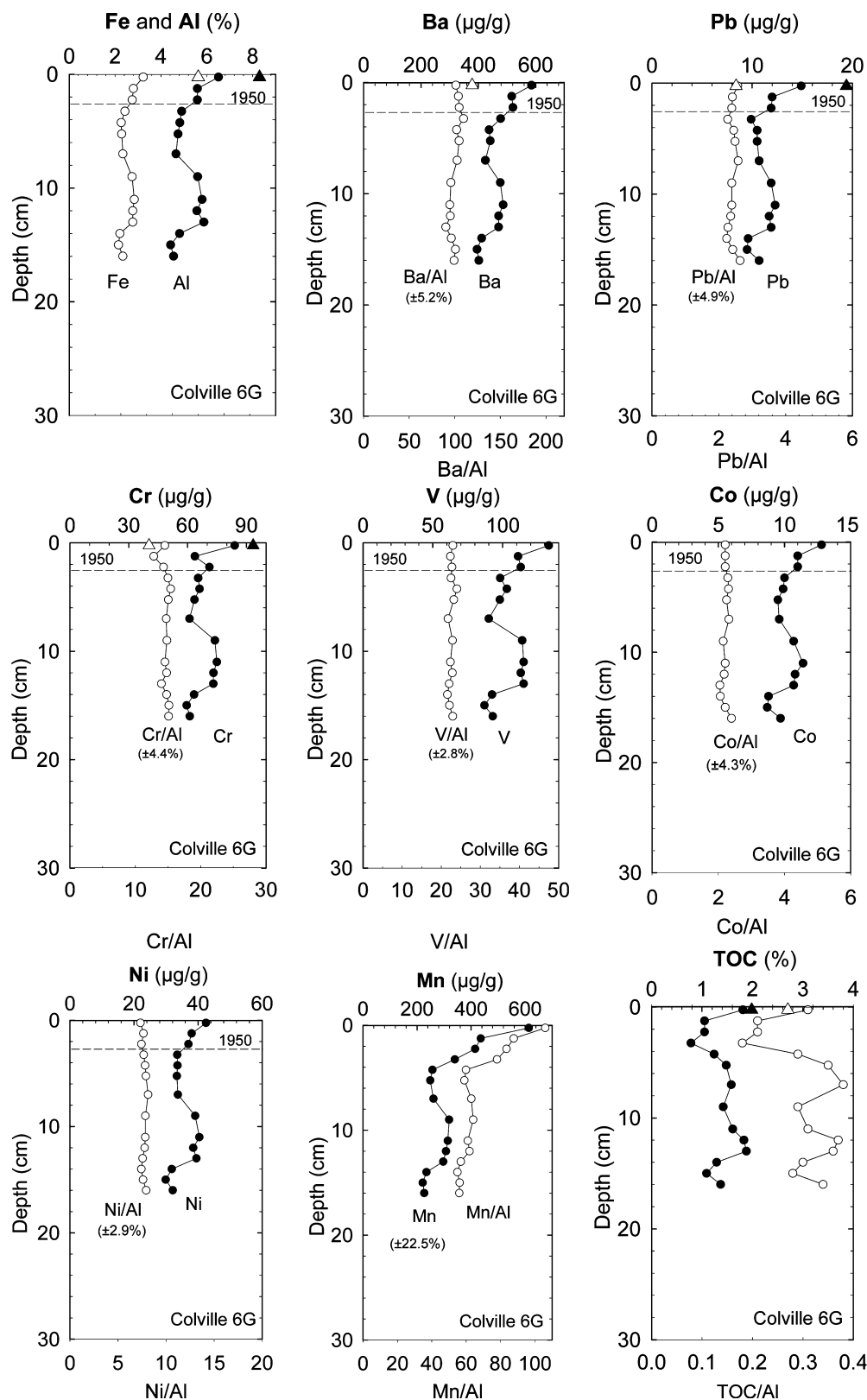
1982; Gobeil and others 1997). In the top 0.5 cm of the core from Prudhoe Bay, concentrations of Mn are about double levels found in subsequent layers to a depth of 15 cm, yet the Mn and Mn/Al levels in the top 0.5 cm of sediment are about 25% lower than in river-suspended sediment. One possible explanation for this observation is that particles deposited in the sediment lose Mn via reductive dissolution and diffusion of dissolved Mn^{2+} from the sediments to the overlying water column (e.g., Gobeil and others 1997). The onset of this process in Prudhoe Bay occurs in the top layer of sediment and reaches completion at depths >1 cm. Such behavior (reducing conditions in the top 1 cm) seems inconsistent with a sedimentation rate of 0.1 cm/year and may reflect processes that occur in a stagnant, thin (<1-m-thick) layer of water trapped under 2 m of ice during 8 months of the year. A similar impact on As levels is observed in this core. The loss of As from the sediments is related to release of As from sediments to the overlying water during diagenetic remobilization under reducing conditions (Farmer and Lovell 1986). Overall, diagenetic effects alter the vertical distributions of Mn, As and, to some lesser degree, Cd, but none of the other metals studied are impacted.

At station 6G, on the Colville River delta, post-development sediments appear to be restricted to the top 3 cm of the sediment column. No discernible differences in metal/Al ratios are observed for all metals except Mn (Fig. 6). Available data for suspended sediments from the Colville River show that concentrations of Fe, Al, Pb and Cr are higher than observed for sediments at station 6G; however, the metal/Al ratios are similar (Fig. 6). No indications of anthropogenic inputs of metals are found in the core from station 6G and only concentrations of Mn are impacted by diagenesis.

Metal data from other cores in the area of Pole Island (station 3A) to Northstar Island, including stations 3A, L2, E1 and N2, show similar trends with uniform metal/Al ratios throughout the cores (Table 2). In some cases, the surficial layer of sediment could be quite old as demonstrated by undetectable levels of ^{137}Cs and excess ^{210}Pb . Concentrations of Mn, As and Cd show varying amounts of distortion due to diagenetic effects. Overall, concentrations of Ag, Ba, Be, Co, Cr, Cu, Hg, Ni, Pb, Sb, Tl, V and Zn in cores from these five sites are unimpacted by anthropogenic inputs or diagenesis.

Conclusions

Region wide, nearly all sediments collected contained natural levels of Ag, Ba, Be, Co, Cr, Cu, Hg, Ni, Pb, Sb, Tl, V and Zn. About eight exceptions (or 0.7% of the 1,222 data points from 94 surface samples) were identified by clear, positive anomalies (>10% above upper prediction interval) on the metal/Al plots. These exceptions include the following: Ag (N14 in 1999), Ba (N14 in 1999; L08 in 1999 and N22 in 2000), Hg (N10 and N17 in 2000), Sb (5(10) in 1999) and Zn (5H in 1999). Most of these minor

**Fig. 6**

Vertical profiles for concentrations and ratios to Al in sediment core from Colville River delta (station 6G) for Fe and Al, Ba, Pb, Cr, V, Co, Ni, Mn and total organic carbon (TOC). Triangles plotted at 0 cm show concentrations and metal/Al ratios for suspended sediment from the Colville River. Numbers in parentheses show coefficient of variation for metal/Al ratio. Graphs with no line identifying a sediment age of 1950 (Mn and TOC) lack geochronological significance due to post-depositional diagenesis/diffusion

deviations were found in the most active areas between West Dock (near station 5D) and Northstar Island; however, the instances and magnitude of the deviations show that, with respect to trace metals, the sediments are essentially pristine. In a 1989 study that incorporated a

larger geographical area (Boehm and others 1990), concentrations of Ba and/or Cr were elevated at locations in Harrison Bay (7A, 7B and 7G) and near the mouth of the Canning River (2E). Thus, in addition to the patchy distribution of sediment types in the study area,

a few instances of minor contamination have been observed.

Early detection of potential environmental problems near industrial sites is the goal at many locations around the Earth, including the coastal waters of the western Beaufort Sea. Because many trace metals are a ubiquitous part of modern industry, metals in sediments can often help identify subtle increases in the accumulation of potential pollutants before they lead to an adverse environmental consequence. For example, in sediments from the coastal Beaufort Sea with an Al concentration of 6.0%, natural Pb levels are predicted to be $15 \pm 5 \mu\text{g/g}$ with 99% confidence (Fig. 3a). Data for two sediment samples represented on Fig. 3a with slightly $>6\%$ Al show that Pb levels of 20.3 and $21.5 \mu\text{g/g}$ plot slightly above the upper prediction limit. These samples are from stations N23 and 5(10), respectively. The slight degree of Pb enrichment and the locations of these two sites near Northstar Island help focus future efforts in this area.

Overall, the constancy of metal/Al ratios in (1) river-suspended sediment, (2) the surface layers of bottom sediments and (3) deeper, older layers in bottom sediments show that anthropogenic inputs of trace metals have not significantly elevated metals levels in sediments in areas of offshore oil exploration and production in the coastal Beaufort Sea. The results presented in this study provide a framework for continued efforts to assess any cumulative impacts of offshore development in the coastal Beaufort Sea. However, the sediments in this region are dynamic and care must be taken to assure that investigators know whether sediment samples that are collected are representative of the most recent inputs.

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