H1407

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Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L228

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B125Y4 | | | | | | |
| SILVER, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| SILVER, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| SILVER, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ALUMINUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ALUMINUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ALUMINUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| BISMUTH, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| BISMUTH, TOTAL REP | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| BISMUTH, TOTAL SPIKE | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| CALCIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CALCIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CALCIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CADMIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CADMIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CADMIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CHROMIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CHROMIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CHROMIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| COPPER, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| COPPER, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| COPPER, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| IRON, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| IRON, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| IRON, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MERCURY, TOTAL | 001 | S | 01C0228 | 06/27/01 | 07/23/01 | 07/23/01 |
| MERCURY, TOTAL | 001 REP | S | 01C0228 | 06/27/01 | 07/23/01 | 07/23/01 |
| MERCURY, TOTAL | 001 MS | S | 01C0228 | 06/27/01 | 07/23/01 | 07/23/01 |
| POTASSIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| POTASSIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| POTASSIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MAGNESIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MAGNESIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MAGNESIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MANGANESE, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MANGANESE, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L228

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| MANGANESE, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MOLYBDENUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| MOLYBDENUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| MOLYBDENUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| SODIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| SODIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| SODIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| NICKEL, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| NICKEL, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| NICKEL, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| LEAD, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| LEAD, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| LEAD, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| VANADIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| VANADIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| VANADIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ZINC, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ZINC, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ZINC, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| SILVER LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| SILVER, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| ALUMINUM LABORTORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| ALUMINUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| BISMUTH, LCS | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/25/01 |
| BISMUTH, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/25/01 |
| CALCIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CALCIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CADMIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CADMIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CHROMIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CHROMIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| COPPER LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| COPPER, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| IRON LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| IRON, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L228

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| MERCURY LABORATORY | LC1 BS | S | 01C0228 | N/A | 07/23/01 | 07/23/01 |
| MERCURY, TOTAL | MB1 | S | 01C0228 | N/A | 07/23/01 | 07/23/01 |
| POTASSIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| POTASSIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MAGNESIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MAGNESIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MANGANESE LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MANGANESE, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MOLYBDENUM LABORATOR | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/25/01 |
| MOLYBDENUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/25/01 |
| SODIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| SODIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| NICKEL LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| NICKEL, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| LEAD LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| LEAD, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| VANADIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| VANADIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| ZINC LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| ZINC, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L231

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B125X2 | | | | | | |
| SILVER, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| SILVER, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| SILVER, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ALUMINUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ALUMINUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ALUMINUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| BISMUTH, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| BISMUTH, TOTAL REP | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| BISMUTH, TOTAL SPIKE | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| CALCIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CALCIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CALCIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CADMIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CADMIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CADMIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CHROMIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CHROMIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| CHROMIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| COPPER, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| COPPER, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| COPPER, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| IRON, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| IRON, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| IRON, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MERCURY, TOTAL | 001 | S | 01C0228 | 06/27/01 | 07/23/01 | 07/23/01 |
| MERCURY, TOTAL | 001 REP | S | 01C0228 | 06/27/01 | 07/23/01 | 07/23/01 |
| MERCURY, TOTAL | 001 MS | S | 01C0228 | 06/27/01 | 07/23/01 | 07/23/01 |
| POTASSIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| POTASSIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| POTASSIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MAGNESIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MAGNESIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MAGNESIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MANGANESE, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MANGANESE, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L231

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| MANGANESE, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| MOLYBDENUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| MOLYBDENUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| MOLYBDENUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/25/01 |
| SODIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| SODIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| SODIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| NICKEL, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| NICKEL, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| NICKEL, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| LEAD, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| LEAD, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| LEAD, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| VANADIUM, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| VANADIUM, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| VANADIUM, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ZINC, TOTAL | 001 | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ZINC, TOTAL | 001 REP | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |
| ZINC, TOTAL | 001 MS | S | 01L0426 | 06/27/01 | 07/14/01 | 07/23/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| SILVER LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| SILVER, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| ALUMINUM LABORTORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| ALUMINUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| BISMUTH, LCS | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/25/01 |
| BISMUTH, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/25/01 |
| CALCIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CALCIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CADMIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CADMIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CHROMIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| CHROMIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| COPPER LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| COPPER, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| IRON LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| IRON, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L231

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| MERCURY LABORATORY | LC1 BS | S | 01C0228 | N/A | 07/23/01 | 07/23/01 |
| MERCURY, TOTAL | MB1 | S | 01C0228 | N/A | 07/23/01 | 07/23/01 |
| POTASSIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| POTASSIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MAGNESIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MAGNESIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MANGANESE LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MANGANESE, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| MOLYBDENUM LABORATOR | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/25/01 |
| MOLYBDENUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/25/01 |
| SODIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| SODIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| NICKEL LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| NICKEL, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| LEAD LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| LEAD, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| VANADIUM LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| VANADIUM, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| ZINC LABORATORY | LC1 BS | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |
| ZINC, TOTAL | MB1 | S | 01L0426 | N/A | 07/14/01 | 07/23/01 |

LIONVILLE LABORATORY INC.

**Analytical Report**

**Client:** TNU-HANFORD B01-058
**LVL#:** 0107L228, 231
**SDG/SAF#:** H1409/B01-058

**W.O.#:** 11343-606-001-9999-00
**Date Received:** 07-05-01

## METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperatures have been recorded on the Chain of Custodies.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for 7 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration levels for the following analytes:

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 24 pages.

| Sample ID | Element | PDS Concentration (ppb) | PDS % Recovery |
|---|---|---|---|
| B125Y4 | Aluminum | 20,000 | 106.1 |
| | Iron | 20,000 | 89.0 |
| B125X2 | Aluminum | 20,000 | 91.5 |
| | Bismuth | 5,000 | 87.1 |
| | Calcium | 20,000 | 93.7 |
| | Iron | 20,000 | 61.0 |

12. The duplicate analyses for 10 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

07-31-01
Date

gmb/m07-228, 231

# METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Recra Lot#: 0107L228, 231

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

## Metals Analysis Methods

| | SW846 | | EPA | | STD MTD | EPA OSWR | USATHAMA |
|---|---|---|---|---|---|---|---|
| Aluminum | ✓6010B | | 200.7 | | | | 99 |
| Antimony | 6010B | 7041 [5] | 200.7 | 204.2 | | | 99 |
| Arsenic | 6010B | 7060A [5] | 200.7 | 206.2 | 3113B | | 99 |
| Barium | 6010B | | 200.7 | | | | 99 |
| Beryllium | 6010B | | 200.7 | | | | 99 |
| Bismuth | ✓6010B [1] | | 200.7 [1] | | | 1620 | 99 |
| Boron | 6010B | | 200.7 | | | | 99 |
| Cadmium | ✓6010B | 7131A [5] | 200.7 | 213.2 | | | 99 |
| Calcium | ✓6010B | | 200.7 | | | | 99 |
| Chromium | ✓6010B | 7191 [5] | 200.7 | 218.2 | | | SS17 |
| Cobalt | 6010B | | 200.7 | | | | 99 |
| Copper | ✓6010B | 7211 [5] | 200.7 | 220.2 | | | 99 |
| Iron | ✓6010B | | 200.7 | | | | 99 |
| Lead | ✓6010B | 7421 [5] | 200.7 | 239.2 | 3113B | | 99 |
| Lithium | 6010B | 7430 [4] | 200.7 | | | 1620 | 99 |
| Magnesium | ✓6010B | | 200.7 | | | | 99 |
| Manganese | ✓6010B | | 200.7 | | | | 99 |
| Mercury | ✓7470A [3] | 7471A [3] | 245.1 [2] | 245.5 [2] | | | 99 |
| Molybdenum | ✓6010B | | 200.7 | | | | 99 |
| Nickel | ✓6010B | | 200.7 | | | | 99 |
| Potassium | ✓6010B | 7610 [4] | 200.7 | 258.1 [4] | | | 99 |
| Rare Earths | 6010B [1] | | 200.7 [1] | | | 1620 | 99 |
| Selenium | 6010B | 7740 [5] | 200.7 | 270.2 | 3113B | | 99 |
| Silicon | 6010B [1] | | 200.7 | | | 1620 | 99 |
| Silica | 6010B | | 200.7 | | | 1620 | 99 |
| Silver | ✓6010B | 7761 [5] | 200.7 | 272.2 | | | 99 |
| Sodium | ✓6010B | 7770 [4] | 200.7 | 273.1 [4] | | | 99 |
| Strontium | 6010B | | 200.7 | | | | 99 |
| Thallium | 6010B | 7841 [5] | 200.7 | 279.2 | 200.9 | | 99 |
| Tin | 6010B | | 200.7 | | | | 99 |
| Titanium | 6010B | | 200.7 | | | | 99 |
| Uranium | 6010B [1] | | 200.7 [1] | | | 1620 | 99 |
| Vanadium | ✓6010B | | 200.7 | | | | 99 |
| Zinc | ✓6010B | | 200.7 | | | | 99 |
| Zirconium | 6010B [1] | | 200.7 [1] | | | 1620 | 99 |

Other:_____ Method:_____

L-WI-033/M-11/99

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

## ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/26/01

*CLIENT: TNUHANFORD B01-058 H1409* *LVL LOT #: 0107L228*

*WORK ORDER: 11343-606-001-9999-00*

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | B12SY4 | Silver, Total | 0.29 u | MG/KG | 0.29 | 1.0 |
| | | Aluminum, Total | 5900 | MG/KG | 1.7 | 1.0 |
| | | Bismuth, Total | 8.2 | MG/KG | 5.7 | 1.0 |
| | | Calcium, Total | 7980 | MG/KG | 2.7 | 1.0 |
| | | Cadmium, Total | 0.44 u | MG/KG | 0.44 | 1.0 |
| | | Chromium, Total | 8.9 | MG/KG | 0.40 | 1.0 |
| | | Copper, Total | 12.9 | MG/KG | 0.25 | 1.0 |
| | | Iron, Total | 20200 | MG/KG | 1.1 | 1.0 |
| | | Mercury, Total | 0.02 u | MG/KG | 0.02 | 1.0 |
| | | Potassium, Total | 771 | MG/KG | 44.6 | 1.0 |
| | | Magnesium, Total | 4080 | MG/KG | 2.7 | 1.0 |
| | | Manganese, Total | 272 | MG/KG | 0.19 | 1.0 |
| | | Molybdenum, Total | 10.3 u | MG/KG | 10.3 | 1.0 |
| | | Sodium, Total | 832 | MG/KG | 2.0 | 1.0 |
| | | Nickel, Total | 8.7 | MG/KG | 1.2 | 1.0 |
| | | Lead, Total | 5.0 | MG/KG | 3.2 | 1.0 |
| | | Vanadium, Total | 52.3 | MG/KG | 0.44 | 1.0 |
| | | Zinc, Total | 38.4 | MG/KG | 0.30 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/26/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| BLANK1 | 01L0426-MB1 | Silver, Total | 0.28 | u | MG/KG | 0.28 | 1.0 |
| | | Aluminum, Total | 1.7 | u | MG/KG | 1.7 | 1.0 |
| | | Bismuth, Total | 5.6 | u | MG/KG | 5.6 | 1.0 |
| | | Calcium, Total | 2.6 | u | MG/KG | 2.6 | 1.0 |
| | | Cadmium, Total | 0.43 | u | MG/KG | 0.43 | 1.0 |
| | | Chromium, Total | 0.39 | u | MG/KG | 0.39 | 1.0 |
| | | Copper, Total | 0.24 | u | MG/KG | 0.24 | 1.0 |
| | | Iron, Total | 1.1 | u | MG/KG | 1.1 | 1.0 |
| | | Potassium, Total | 43.4 | u | MG/KG | 43.4 | 1.0 |
| | | Magnesium, Total | 2.6 | u | MG/KG | 2.6 | 1.0 |
| | | Manganese, Total | 0.18 | u | MG/KG | 0.18 | 1.0 |
| | | Molybdenum, Total | 10.0 | u | MG/KG | 10.0 | 1.0 |
| | | Sodium, Total | 3.3 | | MG/KG | 1.9 | 1.0 |
| | | Nickel, Total | 1.1 | u | MG/KG | 1.1 | 1.0 |
| | | Lead, Total | 3.1 | u | MG/KG | 3.1 | 1.0 |
| | | Vanadium, Total | 0.43 | u | MG/KG | 0.43 | 1.0 |
| | | Zinc, Total | 0.89 | | MG/KG | 0.29 | 1.0 |
| BLANK1 | 01C0228-MB1 | Mercury, Total | 0.02 | u | MG/KG | 0.02 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 07/26/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | B125Y4 | Silver, Total | 4.9 | 0.29u | 5.1 | 96.1 | 1.0 |
| | | Aluminum, Total | 6750 | 5900 | 206 | 411.5* | 1.0 |
| | | Bismuth, Total | 489 | 8.2 | 514 | 93.6 | 1.0 |
| | | Calcium, Total | 10100 | 7980 | 2570 | 82.3 | 1.0 |
| | | Cadmium, Total | 4.9 | 0.44u | 5.1 | 96.1 | 1.0 |
| | | Chromium, Total | 30.2 | 8.9 | 20.6 | 103.4 | 1.0 |
| | | Copper, Total | 36.7 | 12.9 | 25.7 | 92.6 | 1.0 |
| | | Iron, Total | 22200 | 20200 | 103 | 1956 * | 1.0 |
| | | Mercury, Total | 0.16 | 0.02u | 0.16 | 100 | 1.0 |
| | | Potassium, Total | 3150 | 771 | 2570 | 92.6 | 1.0 |
| | | Magnesium, Total | 6660 | 4080 | 2570 | 100.6 | 1.0 |
| | | Manganese, Total | 325 | 272 | 51.4 | 102.7* | 1.0 |
| | | Molybdenum, Total | 95.7 | 10.3 u | 103 | 93.1 | 1.0 |
| | | Sodium, Total | 3290 | 832 | 2570 | 95.8 | 1.0 |
| | | Nickel, Total | 62.1 | 8.7 | 51.4 | 103.9 | 1.0 |
| | | Lead, Total | 52.9 | 5.0 | 51.4 | 93.2 | 1.0 |
| | | Vanadium, Total | 105 | 52.3 | 51.4 | 102.3 | 1.0 |
| | | Zinc, Total | 89.2 | 38.4 | 51.4 | 98.8 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 07/26/01

CLIENT: TNUHANFORD B01-058 H1409

LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|---|
| -001REP | B125Y4 | Silver, Total | 0.29u | 0.45 | NC | Z O O | 1.0 |
| | | Aluminum, Total | 5900 | 6750 | 13.4 | | 1.0 |
| | | Bismuth, Total | 8.2 | 5.7 u | NC | Z O * | 1.0 |
| | | Calcium, Total | 7980 | 8380 | 4.9 | | 1.0 |
| | | Cadmium, Total | 0.44u | 0.44u | NC | | 1.0 |
| | | Chromium, Total | 8.9 | 11.9 | 28.8 | | 1.0 |
| | | Copper, Total | 12.9 | 15.2 | 16.4 | | 1.0 |
| | | Iron, Total | 20200 | 26300 | 26.4 | | 1.0 |
| | | Mercury, Total | 0.02u | 0.02u | NC | | 1.0 |
| | | Potassium, Total | 771 | 860 | 10.9 | | 1.0 |
| | | Magnesium, Total | 4080 | 4910 | 18.6 | | 1.0 |
| | | Manganese, Total | 272 | 368 | 30.1 | | 1.0 |
| | | Molybdenum, Total | 10.3 u | 10.3 u | NC | | 1.0 |
| | | Sodium, Total | 832 | 960 | 14.3 | | 1.0 |
| | | Nickel, Total | 8.7 | 17.0 | 64.6 | | 1.0 |
| | | Lead, Total | 5.0 | 7.9 | 45.0 | | 1.0 |
| | | Vanadium, Total | 52.3 | 68.7 | 27.1 | | 1.0 |
| | | Zinc, Total | 38.4 | 47.8 | 21.8 | | 1.0 |

MJB 7/30/01

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/26/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCS1 | 01L0426-LC1 | Silver, LCS | 47.0 | 50.0 | MG/KG | 94.0 |
| | | Aluminum, LCS | 481 | 500 | MG/KG | 96.1 |
| | | Bismuth, LCS | 478 | 500 | MG/KG | 95.7 |
| | | Calcium, LCS | 2440 | 2500 | MG/KG | 97.5 |
| | | Cadmium, LCS | 23.8 | 25.0 | MG/KG | 95.2 |
| | | Chromium, LCS | 49.4 | 50.0 | MG/KG | 98.8 |
| | | Copper, LCS | 117 | 125 | MG/KG | 93.8 |
| | | Iron, LCS | 487 | 500 | MG/KG | 97.4 |
| | | Potassium, LCS | 2350 | 2500 | MG/KG | 94.0 |
| | | Magnesium, LCS | 2370 | 2500 | MG/KG | 94.9 |
| | | Manganese, LCS | 73.2 | 75.0 | MG/KG | 97.6 |
| | | Molybdenum, LCS | 484 | 500 | MG/KG | 96.8 |
| | | Sodium, LCS | 2330 | 2500 | MG/KG | 93.0 |
| | | Nickel, LCS | 196 | 200 | MG/KG | 98.2 |
| | | Lead, LCS | 241 | 250 | MG/KG | 96.4 |
| | | Vanadium, LCS | 241 | 250 | MG/KG | 96.4 |
| | | Zinc, LCS | 95.4 | 100 | MG/KG | 95.4 |
| LCS1 | 01C0228-LC1 | Mercury, LCS | 2.7 | 2.5 | MG/KG | 108.2 |

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/26/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | B125X2 | Silver, Total | 0.30 u | MG/KG | 0.30 | 1.0 |
| | | Aluminum, Total | 9540 | MG/KG | 1.8 | 1.0 |
| | | Bismuth, Total | 198 | MG/KG | 5.9 | 1.0 |
| | | Calcium, Total | 8130 | MG/KG | 2.8 | 1.0 |
| | | Cadmium, Total | 0.46 u | MG/KG | 0.46 | 1.0 |
| | | Chromium, Total | 27.3 | MG/KG | 0.41 | 1.0 |
| | | Copper, Total | 11.9 | MG/KG | 0.25 | 1.0 |
| | | Iron, Total | 19200 | MG/KG | 1.1 | 1.0 |
| | | Mercury, Total | 0.18 | MG/KG | 0.02 | 1.0 |
| | | Potassium, Total | 1720 | MG/KG | 46.0 | 1.0 |
| | | Magnesium, Total | 5460 | MG/KG | 2.7 | 1.0 |
| | | Manganese, Total | 318 | MG/KG | 0.19 | 1.0 |
| | | Molybdenum, Total | 10.6 u | MG/KG | 10.6 | 1.0 |
| | | Sodium, Total | 1510 | MG/KG | 2.1 | 1.0 |
| | | Nickel, Total | 38.0 | MG/KG | 1.2 | 1.0 |
| | | Lead, Total | 11.6 | MG/KG | 3.3 | 1.0 |
| | | Vanadium, Total | 39.8 | MG/KG | 0.46 | 1.0 |
| | | Zinc, Total | 39.9 | MG/KG | 0.31 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/26/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| BLANK1 | 01L0426-MB1 | Silver, Total | 0.28 | u | MG/KG | 0.28 | 1.0 |
| | | Aluminum, Total | 1.7 | u | MG/KG | 1.7 | 1.0 |
| | | Bismuth, Total | 5.6 | u | MG/KG | 5.6 | 1.0 |
| | | Calcium, Total | 2.6 | u | MG/KG | 2.6 | 1.0 |
| | | Cadmium, Total | 0.43 | u | MG/KG | 0.43 | 1.0 |
| | | Chromium, Total | 0.39 | u | MG/KG | 0.39 | 1.0 |
| | | Copper, Total | 0.24 | u | MG/KG | 0.24 | 1.0 |
| | | Iron, Total | 1.1 | u | MG/KG | 1.1 | 1.0 |
| | | Potassium, Total | 43.4 | u | MG/KG | 43.4 | 1.0 |
| | | Magnesium, Total | 2.6 | u | MG/KG | 2.6 | 1.0 |
| | | Manganese, Total | 0.18 | u | MG/KG | 0.18 | 1.0 |
| | | Molybdenum, Total | 10.0 | u | MG/KG | 10.0 | 1.0 |
| | | Sodium, Total | 3.3 | | MG/KG | 1.9 | 1.0 |
| | | Nickel, Total | 1.1 | u | MG/KG | 1.1 | 1.0 |
| | | Lead, Total | 3.1 | u | MG/KG | 3.1 | 1.0 |
| | | Vanadium, Total | 0.43 | u | MG/KG | 0.43 | 1.0 |
| | | Zinc, Total | 0.89 | | MG/KG | 0.29 | 1.0 |
| BLANK1 | 01C0228-MB1 | Mercury, Total | 0.02 | u | MG/KG | 0.02 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 07/26/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | B125X2 | Silver, Total | 4.9 | 0.30u | 5.3 | 92.5 | 1.0 |
| | | Aluminum, Total | 10700 | 9540 | 212 | 536.7* | 1.0 |
| | | Bismuth, Total | 882 | 198 | 530 | 129.1 | 1.0 |
| | | Calcium, Total | 17500 | 8130 | 2650 | 353.9 | 1.0 |
| | | Cadmium, Total | 4.7 | 0.46u | 5.3 | 88.7 | 1.0 |
| | | Chromium, Total | 48.3 | 27.3 | 21.2 | 99.1 | 1.0 |
| | | Copper, Total | 36.5 | 11.9 | 26.5 | 92.8 | 1.0 |
| | | Iron, Total | 21300 | 19200 | 106 | 2045 * | 1.0 |
| | | Mercury, Total | 0.31 | 0.18 | 0.17 | 74.3 | 1.0 |
| | | Potassium, Total | 4460 | 1720 | 2650 | 103.3 | 1.0 |
| | | Magnesium, Total | 8360 | 5460 | 2650 | 109.2 | 1.0 |
| | | Manganese, Total | 384 | 318 | 53.0 | 124.7* | 1.0 |
| | | Molybdenum, Total | 97.5 | 10.6 u | 106 | 92.0 | 1.0 |
| | | Sodium, Total | 4320 | 1510 | 2650 | 106.1 | 1.0 |
| | | Nickel, Total | 98.7 | 38.0 | 53.0 | 114.5 | 1.0 |
| | | Lead, Total | 55.6 | 11.6 | 53.0 | 83.0 | 1.0 |
| | | Vanadium, Total | 98.6 | 39.8 | 53.0 | 110.9 | 1.0 |
| | | Zinc, Total | 93.8 | 39.9 | 53.0 | 101.7 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 07/26/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | B125X2 | Silver, Total | 0.30u | 0.30u | NC | 1.0 |
| | | Aluminum, Total | 9540 | 9860 | 3.3 | 1.0 |
| | | Bismuth, Total | 198 | 260 | 27.1 | 1.0 |
| | | Calcium, Total | 8130 | 9530 | 15.8 | 1.0 |
| | | Cadmium, Total | 0.46u | 0.46u | NC | 1.0 |
| | | Chromium, Total | 27.3 | 26.9 | 1.5 | 1.0 |
| | | Copper, Total | 11.9 | 11.6 | 2.6 | 1.0 |
| | | Iron, Total | 19200 | 21200 | 10.2 | 1.0 |
| | | Mercury, Total | 0.18 | 0.18 | 0.54 | 1.0 |
| | | Potassium, Total | 1720 | 1660 | 3.7 | 1.0 |
| | | Magnesium, Total | 5460 | 5540 | 1.3 | 1.0 |
| | | Manganese, Total | 318 | 358 | 11.8 | 1.0 |
| | | Molybdenum, Total | 10.6 u | 10.6 u | NC | 1.0 |
| | | Sodium, Total | 1510 | 1590 | 5.7 | 1.0 |
| | | Nickel, Total | 38.0 | 38.9 | 2.3 | 1.0 |
| | | Lead, Total | 11.6 | 10.6 | 9.0 | 1.0 |
| | | Vanadium, Total | 39.8 | 46.9 | 16.4 | 1.0 |
| | | Zinc, Total | 39.9 | 42.6 | 6.5 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/26/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCS1 | 01L0426-LC1 | Silver, LCS | 47.0 | 50.0 | MG/KG | 94.0 |
| | | Aluminum, LCS | 481 | 500 | MG/KG | 96.1 |
| | | Bismuth, LCS | 478 | 500 | MG/KG | 95.7 |
| | | Calcium, LCS | 2440 | 2500 | MG/KG | 97.5 |
| | | Cadmium, LCS | 23.8 | 25.0 | MG/KG | 95.2 |
| | | Chromium, LCS | 49.4 | 50.0 | MG/KG | 98.8 |
| | | Copper, LCS | 117 | 125 | MG/KG | 93.8 |
| | | Iron, LCS | 487 | 500 | MG/KG | 97.4 |
| | | Potassium, LCS | 2350 | 2500 | MG/KG | 94.0 |
| | | Magnesium, LCS | 2370 | 2500 | MG/KG | 94.9 |
| | | Manganese, LCS | 73.2 | 75.0 | MG/KG | 97.6 |
| | | Molybdenum, LCS | 484 | 500 | MG/KG | 96.8 |
| | | Sodium, LCS | 2330 | 2500 | MG/KG | 93.0 |
| | | Nickel, LCS | 196 | 200 | MG/KG | 98.2 |
| | | Lead, LCS | 241 | 250 | MG/KG | 96.4 |
| | | Vanadium, LCS | 241 | 250 | MG/KG | 96.4 |
| | | Zinc, LCS | 95.4 | 100 | MG/KG | 95.4 |
| LCS1 | 01C0228-LC1 | Mercury, LCS | 2.7 | 2.5 | MG/KG | 108.2 |

Lionville Laboratory Use Only

01071228

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

LVLI Lionville Laboratory Inc

Client: TRU- Hanford B01-058

Est. Final Proj. Sampling Date:

Project #: 11343-6006-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: DJ

QC: Sprc Del: Std TAT: 30 day

Date Rec'd: 7-5-01 Date Due: 8-4-01

| | | A | | | | B | | C | D |
|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 4 | | | | 4 | | 4 | 4 |
| #/Type Container | Liquid | 1Pr | | | | 1Pr | | | |
| | Solid | ↓ | | | | ↓ | | 1PG | 1PG |
| Volume | Liquid | | | | | | | | |
| | Solid | 500 | | | | 500 | | 1L | 500 |
| Preservatives | | - | | | | - | | - | - |
| ANALYSES REQUESTED → | | ORGANIC: VOA | BNA | Pest/PCB | Herb | INORG: Metal | Gen | | |

| MATRIX CODES: | |
|---|---|
| S - | Soil |
| SE - | Sediment |
| SO - | Solid |
| SL - | Sludge |
| W - | Water |
| O - | Oil |
| A - | Air |
| DS - | Drum Solids |
| DL - | Drum Liquids |
| L - | EP/TCLP Leachate |
| WI - | Wipe |
| X - | Other |
| F - | Fish |

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | BNA | Pest/PCB | Herb | VOA | Metal | Gen | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lionville Laboratory Use Only | | | | | | | |
| 001 | B12544 | ✓ | ✓ | S | 6/27/01 | 0430 | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ |

Special Instructions: SAF B01-058

Met① = Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg,

Inorg① = ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4, INH3N, IN3N2, ICNTO, IOCT, IPH

Met② = Al, Bi, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Ag, Na, V, Zn

DATE/REVISIONS:

→ 1. Ice melted when to Tech

2.

3.

4.

5.

6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # See Attached

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N; 2) Unbroken on Outer Package (Y) or N; 3) Present on Sample (Y) or N; 4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 17° °C

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 423579545524

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Ed Eo | [illegible] | 7/5/01 | 1015 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | ORIGINAL REWRITTEN | | |

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| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-058-14 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Thomas G./Watson D. | Company Contact: Todd, M.E. | Telephone No.: (509) 372-9631 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | Air Quality ☐ | |
| Project Designation: 200-TW-1 & 2 - Soil Sampling | Sampling Location: T-26/200 W | SAF No.: B01-058 | |
| Ice Chest No.: ERC99-065 / SML442 | Field Logbook No.: EL-1518 | COA: B20TW1A44C | Method of Shipment: Fed EX |
| Shipped To: ~~TMA~~/RECRA | Offsite Property No.: A010428 | Bill of Lading/Air Bill No.: 4235 7954.5524/5535 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Radioactive* COUNTS: BACKGROUND ON SPLIT SPOON < 0.5 mrem DOSE

Special Handling and/or Storage

| | | | | | | |
|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None |
| Type of Container | aG | aG | aG | aG | aG | aG |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 |
| Volume | 500mL | 1000mL | 1000mL | 500mL | 500mL | 1000mL |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | See item (2) in Special Instructions. | VOA - 8260A (TCL) DELETE DAW 6-27-01 | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. DAW 6-27-01 |

Samples stored in Ref.# 1B at the Shipping Facility on 6/27/01. Collector not available to relenquis samples on 7/2/01 for shipme

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B125Y4 | SOIL | 06-27-01 | 0430 | X | X | | X | X | | | TIETO | B125Y5 |
| | | | | | | | | | | | | B126J1 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: DWatson/RSWAC | 06-27-01 0820 | REF 1B 3728 | 06-27-01 0820 |
| Relinquished By/Removed From: Ref 1B 3728 | 7-2-01 0800 | R L Thorey | 7-2-01 0800 |
| Relinquished By/Removed From: R L Thorey | 7-2-01 0800 | FEDEX | |
| Relinquished By/Removed From: FEDEX | 7/5/01 10:15 | [illegible] | 7/5/01 1015 |
| Relinquished By/Removed From | | Received By/Stored In | |
| Relinquished By/Removed From | | Received By/Stored In | |

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV); Chromium Hex - 7196
(2) IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}
~~(5) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium -- H3; Isotopic Uranium.~~

RT 6-23-01

Matrix *: S=Soil; SE=Sediment; SO=Solid; Sl=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; Wi=Wipe; L=Liquid; V=Vegetation; X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

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Lionville Laboratory Use Only

0107L231

# Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI Lionville Laboratory Inc.

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: TWU-HANFORD SAF# B01-058

Est. Final Proj. Sampling Date:

Project #: 11343-6060-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OS

GC: Spec Del: Sts TAT: 30 day

Date Rec'd: 7-5-01 Date Due: 8-4-01

| | | A | | | | | | B | | C | D | | E | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | S | | | | | | S | | S | S | | S | | |
| #/Type Container | Liquid | | | | | | | | | | | | | | |
| | Solid | 1AG | | | | | | 1AG | | 1AG | 1AG | | 1AG | | |
| Volume | Liquid | | | | | | | | | | | | | | |
| | Solid | 250 | | | | | | 120 | | 60 | 250 | | 120 | | |
| Preservatives | | — | | | | | | — | | — | — | | — | | |
| ANALYSES REQUESTED | ORGANIC: VOA | BNA | Pest/PCB | Herb | | | | INORG: TAL Metal | CN | Chloride | Fluoride | | Sulfate | | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | VOA | BNA (625SX) | Pest/PCB | Herb | CN | TAL Metal (Met 1) | Chloride (ICRL) | Fluoride (Inorg 1) | Sulfate | Sulfate (Met 2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | B125X2 | ✓ | ✓ | S | 6-27-01 | 1115 | | 1 | | | ✓ | 1 | 1 | 1 | | 1 |

Special Instructions: SAF B01-058

Met 1 = Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg

Inorg 1 = ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4, INH3N, IN3N2, ICNTU, IOCT, IPH

Met 2 = Al, Bi, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Ag, Na, V, Zn

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # Sue Bulat
2) Ambient or Chilled
3) Received In Good Condition Y or N
4) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N

Tamper Resistant Seal w
1) Present on Outer Package Y or N
2) Unbroken on Out Package Y or N
3) Present on Sampl Y or N
4) Unbroken on Sample Y or N

COC Record Preser Upon Sample Rec't Y or N

Cooler Temp. 4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [signature] | [signature] | 7/5/01 | 10:15 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | ORIGINAL REWRITTEN | | |

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 4235795455524

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| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | B01-058-2 | Page 1 of 1 |
|---|---|---|---|---|
| Collector: Thomas G./Watson D./Fahlberg, R. | Company Contact: Todd, M.E. | Telephone No.: (509) 372-9631 | Project Coordinator: TRENT, SJ | Price Code: 8N; Data Turnaround: 45 Days |
| Project Designation: 200-TW-1 & 2 - Soil Sampling | Sampling Location: T-26/200 W | | SAF No.: B01-058 | Air Quality ☐ |
| Ice Chest No. SM1 153 RT 6-30-01 268 | Field Logbook No.: EL-1518 | COA: B20TW1A44C | Method of Shipment: Government Vehichle/Fed EX | |
| Shipped To: RT 6-28-01 RCRA ~~Severn Trent Incorporated~~ | Offsite Property No.: RSR 104130 | | Bill of Lading/Air Bill No.: N/A | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Radioactive* 55K dpm ACTIVITY ON BOTTLES <0.5 mrem/hr

**Special Handling and/or Storage**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 120mL | 60mL | 250mL | 60mL | 250mL | 120mL | 250mL | 250mL | | |
| **SAMPLE ANALYSIS** | See item (1) in Special Instructions. | Chromium Hex - 7196 | See item (2) in Special Instructions. | VOA - 8260A (TCL) | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. | Activity Scan | | |

DELETE EL 7/18/01

RT 6-28-01

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B125X2 | SOIL | 06-27-01 | 1115 | X | X | X | | X | X | | | TIETO | B12628 |

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 6/28/01. Collector not available to relinquish samples on 7/2/01 for shipment. RT 7-2-01

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| R. Fahlberg / R. Fahlberg | 0800 6-28-01 | Ref 1-C | 0800 6-28-01 |
| R. Fahlberg / 1C 3728 | 0800 7/2/01 | R. Thorem / R. Thorem | 0800 7-2-01 |
| R. Thorem | 0800 7-2-01 | FEDEX | |
| FedEx | 7/5/01 1015 | G. Sherman | 7/5/01 1015 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybderum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}
(5) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec. Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - HD; Isotopic Uranium~~

RT 6-28-01

Matrix *: S=Soil; SD=Sediment; SO=Solid; SL=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

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BHI-EE-011 (10/99)

AUG 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L231

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B125X2 | | | | | | |
| % SOLIDS | 001 | S | 01L%S083 | 06/27/01 | 07/06/01 | 07/07/01 |
| % SOLIDS | 001 REP | S | 01L%S083 | 06/27/01 | 07/06/01 | 07/07/01 |
| CHLORIDE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| CHLORIDE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| CHLORIDE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRITE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRITE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRITE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRATE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRATE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRATE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| TOTAL CYANIDE | 001 | S | 01LCA67 | 06/27/01 | 07/09/01 | 07/09/01 |
| TOTAL CYANIDE | 001 REP | S | 01LCA67 | 06/27/01 | 07/09/01 | 07/09/01 |
| TOTAL CYANIDE | 001 MS | S | 01LCA67 | 06/27/01 | 07/09/01 | 07/09/01 |
| PHOSPHATE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| PHOSPHATE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| PHOSPHATE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| CHROMIUM VI | 001 | S | 01LVIA61 | 06/27/01 | 07/20/01 | 07/20/01 |
| CHROMIUM VI | 001 REP | S | 01LVIA61 | 06/27/01 | 07/20/01 | 07/20/01 |
| CHROMIUM VI | 001 MS | S | 01LVIA61 | 06/27/01 | 07/20/01 | 07/20/01 |
| CHROMIUM VI | 001 MSD | S | 01LVIA61 | 06/27/01 | 07/20/01 | 07/20/01 |
| SULFATE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| SULFATE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| SULFATE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRATE NITRITE | 001 | S | 01LN3F39 | 06/27/01 | 07/18/01 | 07/18/01 |
| NITRATE NITRITE | 001 REP | S | 01LN3F39 | 06/27/01 | 07/18/01 | 07/18/01 |
| NITRATE NITRITE | 001 MS | S | 01LN3F39 | 06/27/01 | 07/18/01 | 07/18/01 |
| AMMONIA | 001 | S | 01LAM035 | 06/27/01 | 07/10/01 | 07/11/01 |
| AMMONIA | 001 REP | S | 01LAM035 | 06/27/01 | 07/10/01 | 07/11/01 |
| AMMONIA | 001 MS | S | 01LAM035 | 06/27/01 | 07/10/01 | 07/11/01 |
| TOTAL ORGANIC CARBON | 001 | S | 01LTZ019 | 06/27/01 | 07/18/01 | 07/20/01 |
| TOTAL ORGANIC CARBON | 001 REP | S | 01LTZ019 | 06/27/01 | 07/18/01 | 07/20/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L231

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| TOTAL ORGANIC CARBON | 001 MS | S | 01LTZ019 | 06/27/01 | 07/18/01 | 07/20/01 |
| PH | 001 | S | 01LPH050 | 06/27/01 | 07/19/01 | 07/19/01 |
| PH | 001 REP | S | 01LPH050 | 06/27/01 | 07/19/01 | 07/19/01 |

B QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| CHLORIDE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| CHLORIDE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRITE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRITE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRATE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRATE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| TOTAL CYANIDE | LCS L | S | 01LCA67 | N/A | 07/09/01 | 07/09/01 |
| TOTAL CYANIDE | LCS L | S | 01LCA67 | N/A | 07/09/01 | 07/09/01 |
| TOTAL CYANIDE | MB1 | S | 01LCA67 | N/A | 07/09/01 | 07/09/01 |
| PHOSPHATE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| PHOSPHATE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| CHROMIUM VI | MB1 | S | 01LVIA61 | N/A | 07/20/01 | 07/20/01 |
| CHROMIUM VI | MB1 BS | S | 01LVIA61 | N/A | 07/20/01 | 07/20/01 |
| CHROMIUM VI | MB1 BSD | S | 01LVIA61 | N/A | 07/20/01 | 07/20/01 |
| SULFATE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| SULFATE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRATE NITRITE | MB1 | S | 01LN3F39 | N/A | 07/18/01 | 07/18/01 |
| NITRATE NITRITE | MB1 BS | S | 01LN3F39 | N/A | 07/18/01 | 07/18/01 |
| AMMONIA | MB1 | S | 01LAM035 | N/A | 07/10/01 | 07/11/01 |
| AMMONIA | MB1 BS | S | 01LAM035 | N/A | 07/10/01 | 07/11/01 |
| AMMONIA | MB1 BSD | S | 01LAM035 | N/A | 07/10/01 | 07/11/01 |
| TOTAL ORGANIC CARBON | MB1 | S | 01LTZ019 | N/A | 07/18/01 | 07/20/01 |
| TOTAL ORGANIC CARBON | MB1 BS | S | 01LTZ019 | N/A | 07/18/01 | 07/20/01 |

LIONVILLE LABORATORY INC.

## Analytical Report

**Client:** TNU-HANFORD B01-058 H1409
**LVL#:** 0107L231

**W.O.#:** 11343-606-001-9999-00
**Date Received:** 07-05-01

### INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain of custody.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike (MS) recoveries were within the 75-125% control limits with the exception of Nitrate Nitrite that was below the control limits that may be attributed to sample inhomogeneity and Soluble Chromium VI MS recovery that was below the control limits that may be attributed to matrix interference to the potassium dichromate spiking solution.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit with the exception Nitrate, Sulfate and Total Organic Carbon (TOC) that may be attributed to sample inhomogeneity.

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 15 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

9. Results for solid samples are reported on a dry weight basis and TOC samples are dried prior to analysis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

07-30-01
Date

njp\i07-228

LVLI
LIONVILLE LABORATORY INC.

Lionville Laboratory Incorporated

## WET CHEMISTRY

## METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

| | ASTM | SW846 | OTHER |
|---|---|---|---|
| % Ash | __ D2216-80 | | |
| % Moisture | __ D2216-80 | | __ ILMO4.0 (e) |
| % Solids | ✓ D2216-80 | | __ ILMO4.0 (e) |
| % Volatile Solids | __ D2216-80 | | |
| ASTM Extraction in Water | __ D3987-81/85 | | |
| BTU | __ D240-87 | | |
| CEC | | __ 9081 | __ c |
| Chromium VI | | ✓ 3060A/7196A | |
| Corrosivity __ by coupon __ by pH | | __ 1110(mod) __ 9045C | |
| Cyanide, Total | | ✓ 9010B/9014 | __ ILMO4.0 (e) |
| Cyanide, Reactive | | __ Section 7.3/9014 | |
| Halides, Extractable Organic | | __ 9020B | __ EPA 600/4/84-008 |
| Halides, Total | | __ 9020B | __ EPA 600/4/84-008 |
| EP Toxicity | | __ 1310A | |
| Flash Point | | __ 1010 | |
| Ignitability | | __ 1010 | |
| Oil & Grease | | __ 9071A | |
| Carbon, Total Organic | | ✓ 9060 | ✓ Lloyd Kahn (mod) |
| Oxygen Bomb Prep for Anions | __ D240-87(mod) | __ 5050 | |
| Petroleum Hydrocarbons, Total Recoverable | | __ 9071 | __ EPA 418.1 |
| pH, Soil | | ✓ 9045C | |
| Sulfide, Reactive | | __ Section 7.3/9030B | |
| Sulfide | | __ 9030B(mod) | |
| Specific Gravity | __ D1429-76C/ | __ D5057-90 | |
| Sulfur, Total | | __ 9056 | |
| Synthetic Preparation Leach | | __ 1312 | |
| Paint Filter | | __ 9095A | |

**Other:** Chloride, Fluoride, Nitrite, **Method:** EPA 300.0 (mod.)

**Other:** Nitrate, Phosphate, Sulfate **Method**

Nitrate Nitrite EPA 353.2 (mod.)

Ammonia EPA 350.3

L-WI-034/B-01/01

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

## ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | B125X2 | % Solids | 93.4 | % | 0.01 | 1.0 |
| | | Chloride by IC | 3.6 | MG/KG | 1.3 | 1.0 |
| | | Fluoride by IC | 168 | MG/KG | 26.8 | 10.0 |
| | | Nitrite by IC | 1.34 u | MG/KG | 1.34 | 1.0 |
| | | Nitrate by IC | 12.1 | MG/KG | 1.34 | 1.0 |
| | | Cyanide, Total | 0.43 u | MG/KG | 0.43 | 1.0 |
| | | Phosphate by IC | 13.1 | MG/KG | 1.3 | 1.0 |
| | | Chromium VI | 4.2 | MG/KG | 0.43 | 1.0 |
| | | Sulfate by IC | 11.2 | MG/KG | 1.3 | 1.0 |
| | | Nitrate Nitrite | 3.4 | MG/KG | 0.22 | 1.0 |
| | | Ammonia, as N | 5.3 u | MG/KG | 5.3 | 1.0 |
| | | Total Organic Carbon | 132 u | MG/KG | 132 | 1.0 |
| | | pH | 8.8 | SOIL PH | 0.01 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| BLANK10 | 01LICA45-MB1 | Chloride by IC | 1.2 u | MG/KG | 1.2 | 1.0 |
| | | Fluoride by IC | 2.5 u | MG/KG | 2.5 | 1.0 |
| | | Nitrite by IC | 1.25 u | MG/KG | 1.25 | 1.0 |
| | | Nitrate by IC | 1.25 u | MG/KG | 1.25 | 1.0 |
| | | Phosphate by IC | 1.2 u | MG/KG | 1.2 | 1.0 |
| | | Sulfate by IC | 1.2 u | MG/KG | 1.2 | 1.0 |
| BLANK1 | 01LCA67-MB1 | Cyanide, Total | 0.50 u | MG/KG | 0.50 | 1.0 |
| BLANK10 | 01LVIA61-MB1 | Chromium VI | 0.40 u | MG/KG | 0.40 | 1.0 |
| BLANK10 | 01LN3F39-MB1 | Nitrate Nitrite | 0.20 u | MG/KG | 0.20 | 1.0 |
| BLANK10 | 01LAM035-MB1 | Ammonia, as N | 5.0 u | MG/KG | 5.0 | 1.0 |
| BLANK10 | 01LTZ019-MB1 | Total Organic Carbon | 20.0 u | MG/KG | 20.0 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | B125X2 | Chloride by IC | 53.4 | 3.6 | 53.6 | 93.1 | 2.0 |
| | | Fluoride by IC | 731 | 168 | 536 | 105.2 | 10.0 |
| | | Nitrite by IC | 47.1 | 1.34u | 53.6 | 88.0 | 2.0 |
| | | Nitrate by IC | 66.1 | 12.1 | 53.6 | 100.9 | 2.0 |
| | | Cyanide, Total | 3.78 | 0.43u | 3.92 | 96.6 | 1.0 |
| | | Phosphate by IC | 61.1 | 13.1 | 53.6 | 89.6 | 2.0 |
| | | Soluble Chromium VI | 2.1 | 4.2 | 4.3 | 0.0 | 1.0 |
| | | Insoluble Chromium VI | 1610 | 4.2 | 1310 | 122.3 | 100 |
| | | Sulfate by IC | 63.1 | 11.2 | 53.6 | 96.8 | 2.0 |
| | | Nitrate Nitrite | 7.3 | 3.4 | 5.3 | 73.4 | 1.0 |
| | | Ammonia, as N | 210 | 5.3 u | 206 | 101.8 | 1.0 |
| | | Total Organic Carbon | 2570 | 117 | 2670 | 92.1 | 1.0 |
| BLANK10 | 01LICA45-MB1 | Chloride by IC | 23.5 | 1.2 u | 25.0 | 93.9 | 1.0 |
| | | Fluoride by IC | 54.6 | 2.5 u | 50.0 | 109.2 | 1.0 |
| | | Nitrite by IC | 23.6 | 1.25u | 25.0 | 94.4 | 1.0 |
| | | Nitrate by IC | 25.0 | 1.25u | 25.0 | 100.1 | 1.0 |
| | | Phosphate by IC | 25.4 | 1.2 u | 25.0 | 101.8 | 1.0 |
| | | Sulfate by IC | 23.1 | 1.2 u | 25.0 | 92.4 | 1.0 |
| BLANK10 | 01LVIA61-MB1 | Soluble Chromium VI | 3.6 | 0.40u | 4.0 | 90.7 | 1.0 |
| | | Insoluble Chromium VI | 1790 | 0.40u | 1740 | 103.1 | 100 |
| BLANK10 | 01LN3F39-MB1 | Nitrate Nitrite | 5.2 | 0.20u | 5.0 | 103.0 | 1.0 |
| BLANK10 | 01LAM035-MB1 | Ammonia, as N | 98.0 | 5.0 u | 100 | 98.0 | 1.0 |
| | | Ammonia, as N MSD | 99.5 | 5.0 u | 100 | 99.5 | 1.0 |
| BLANK10 | 01LTZ019-MB1 | Total Organic Carbon | 395 | 20.0 u | 400 | 98.8 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKE#1 %RECOV | SPIKE#2 %RECOV | %DIFF |
|---|---|---|---|---|---|
| BLANK10 | 01LAM035-MB1 | Ammonia, as N | 98.0 | 99.5 | 1.5 |

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | B125X2 | % Solids | 93.4 | 94.4 | 1.1 | 1.0 |
| | | Chloride by IC | 3.6 | 3.6 | 0.90 | 1.0 |
| | | Fluoride by IC | 168 | 196 | 15.6 | 10.0 |
| | | Nitrite by IC | 1.34u | 1.34u | NC | 1.0 |
| | | Nitrate by IC | 12.1 | 15.6 | 25.2 | 1.0 |
| | | Cyanide, Total | 0.43u | 0.44u | NC | 1.0 |
| | | Phosphate by IC | 13.1 | 12.6 | 3.4 | 1.0 |
| | | Chromium VI | 4.2 | 4.0 | 3.9 | 1.0 |
| | | Sulfate by IC | 11.2 | 14.0 | 22.1 | 1.0 |
| | | Nitrate Nitrite | 3.4 | 3.3 | 1.9 | 1.0 |
| | | Ammonia, as N | 5.3 u | 5.3 u | NC | 1.0 |
| | | Total Organic Carbon | 132 u | 163 | 32.5 | 1.0 |
| | | pH | 8.76 | 8.7 | 0.2 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L231

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCSS1 | 01LCA67-LCS1 | Cyanide, Total LCS | 1.80 | 2.0 | MG/KG | 90.0 |
| LCSS2 | 01LCA67-LCS2 | Cyanide, Total LCS | 9.92 | 10.0 | MG/KG | 99.2 |

Lionville Laboratory Use Only

0107L231

# Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI Lionville Laboratory Inc.

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: INU-HANFORD SAF# B01-058

Est. Final Proj. Sampling Date:

Project #: 11343-6000-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OS

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 7-5-01 Date Due: 8-4-01

| | | A | | | | B | | C | D | | E | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | S | | | | S | | S | S | | S | | |
| #/Type Container | Liquid | | | | | | | | | | | | |
| | Solid | 1AG | | | | 1AG | | 1AG | 1AG | | 1AG | | |
| Volume | Liquid | | | | | | | | | | | | |
| | Solid | 250 | | | | 120 | | 60 | 250 | | 120 | | |
| Preservatives | | — | | | | — | | — | — | | — | | |
| ANALYSES REQUESTED | | ORGANIC: VOA | BNA | Pest/PCB | Herb | INORG: TAL Metal | CN | TCLP Metals | Anions | | TPH 418.1 | | |
| Lionville Laboratory Use Only | | | 0625X | | | | | | | | | | |
| | | | | | 8270 | Met① | | ICAP | Inorg① | | Met② | | |

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S - Soil<br>SE - Sediment<br>SO - Solid<br>SL - Sludge<br>W - Water<br>O - Oil<br>A - Air<br>DS - Drum Solids<br>DL - Drum Liquids<br>L - EP/TCLP Leachate<br>WI - Wipe<br>X - Other<br>F - Fish | 001 | B125X2 | ✓ | ✓ | S | 6-27-01 | 1115 | | 1 | | | ✓ | | | 1 | | 1 | 1 | | 1 | |

Special Instructions: Saf B01-058

Met①=Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg

Inorg①=ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4, INH3N, IN3N2, ICNTU, IOCT, IPH

Met②=Al, Bi, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Ag, Na, V-, Zn

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

**Lionville Laboratory Use Only**

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # Ice Bchst

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Samples Properly Preserved Y or N

5) Received Within Holding Times Y or N

Tamper Resistant Seal was: 1) Present on Outer Package Y or N 2) Unbroken on Outer Package Y or N 3) Present on Sample Y or N 4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [signature] | [signature] | 7/5/01 | 10:15 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | ORIGINAL REWRITTEN | | |

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 4235795455524

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-058-2 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Collector** Thomas G./Watson D. / FAHLBERG, R. | **Company Contact** Todd, M.E. | **Telephone No.** (509) 372-9631 | **Project Coordinator** TRENT, SJ |
| **Price Code** 8N | **Data Turnaround** 45 Days | **Air Quality** ☐ | |
| **Project Designation** 200-TW-1 & 2 - Soil Sampling | **Sampling Location** T-26/200 W | | **SAF No.** B01-058 |
| **Ice Chest No.** SM1 ~~153~~ 268 RT 6-30-01 | **Field Logbook No.** EL-1518 | **COA** B20TW1A44C | **Method of Shipment** Government Vehichle/Fed EX |
| **Shipped To** ~~Severn Trent Incorporated~~ RT 6-28-01 RCRA | **Offsite Property No.** RSR 104130 | | **Bill of Lading/Air Bill No.** NA |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Radioactive* 55K dpm ACTIVITY ON BOTTLES <0.5 mREM DOSE

**Special Handling and/or Storage**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None | None | | |
| **Type of Container** | aG | aG | aG | aG | aG | aG | aG | aG | | |
| **No. of Container(s)** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| **Volume** | 120mL | 60mL | 250mL | 60mL | 250mL | 120mL | 250mL | 250mL | | |
| **SAMPLE ANALYSIS** | See item (1) in Special Instructions. | Chromium Hex - 7196 | See item (2) in Special Instructions. | VOA - 8260A (TCL) | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. | Activity Scan | | |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | |
| B125X2 / SOIL / 06-27-01 / 1115 | X | X | X | | X | X | | | TIETO | B12629 |

DELETE 6-28-01 RT

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 6/28/01. Collector not available to relinquish samples on 7/2/01 for shipment. RT 7-2-01

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: R. Fahlberg R. Fahlberg 6-28-01 | 0800 | Received By/Stored In: Ref 1-C 6-28-01 | 0800 |
| Relinquished By/Removed From: Ref 1C 3728 7/2/01 | 0800 | Received By/Stored In: R. Thoren R. Thoren 7-2-01 | 0800 |
| Relinquished By/Removed From: R. Thoren 7-2-01 | 0800 | Received By/Stored In: FEDEX | |
| Relinquished By/Removed From: FedEx 7/5/01 | 1015 | Received By/Stored In: V. Hernandez 7/5/01 | 1015 |
| Relinquished By/Removed From | | Received By/Stored In | |
| Relinquished By/Removed From | | Received By/Stored In | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}
(5) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

RT 6-28-01

**Matrix ***
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 7/5/01 10:15

SDG#: 01074231

Work Order Number: _____ SAF# B01-058

Shipping Container ID: _____ Chain of Custody # _____

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 4°
5. Vermiculite/packing materials is Wet [✓] Dry [ ]
6. Number of samples in shipping container: 5
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ____ tape
   - ____ hazard labels
   - ✓ custody seals
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [signature] Date: 7-5-01

Telephoned to: _____ On _____ By _____

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

AUG 2001
RECEIVED

RFW LOT # :01071[illegible]

| CLIENT ID | RFW # | MTX | PREP # | COLLECTN | DATE REC | EXT/PREP | ANALYSIS |
|---|---|---|---|---|---|---|---|
| B125X2 | 001 | S | 01LE0801 | 06/27/01 | 07/05/01 | 07/06/01 | 07/10/01 |
| B125X2 | 001 R1 | S | 01LE0871 | 06/27/01 | 07/05/01 | 07/20/01 | 07/26/01 |
| B125X2 | 001 MS | S | 01LE0801 | 06/27/01 | 07/05/01 | 07/06/01 | 07/10/01 |
| B125X2 | 001 MS R1 | S | 01LE0871 | 06/27/01 | 07/05/01 | 07/20/01 | 07/26/01 |
| B125X2 | 001 MSD | S | 01LE0801 | 06/27/01 | 07/05/01 | 07/06/01 | 07/10/01 |
| B125X2 | 001 MSD R1 | S | 01LE0871 | 06/27/01 | 07/05/01 | 07/20/01 | 07/26/01 |
| LAB QC: | | | | | | | |
| BLK | MB1 | S | 01LE0801 | N/A | N/A | 07/06/01 | 07/10/01 |
| BLK | MB1 BS | S | 01LE0801 | N/A | N/A | 07/06/01 | 07/10/01 |
| BLK | MB1 | S | 01LE0871 | N/A | N/A | 07/20/01 | 07/25/01 |
| BLK | MB1 BS | S | 01LE0871 | N/A | N/A | 07/20/01 | 07/25/01 |

LIONVILLE LABORATORY INC.

**Analytical Report**

**Client :** TNU HANFORD B01-058
**LVL# :** 0107L231
**SDG/SAF#:** H1405/B01-058

**W.O #:** 11343-606-001-9999-00
**Date Received:** 07-05-01

**DIESEL RANGE ORGANICS**

One (1) soil sample was collected on 06-27-01.

The sample and its associated QC samples were prepared on 07-06-01, re-extracted on 07-20-01, and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 07-10,25, 26-01. The analysis met the intent of method WTPH-D.

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for analysis were met. Due to low surrogate recoveries, the sample was re-extracted outside of hold time. Both the original and the re-extracted results have been reported. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
3. All initial calibrations associated with this data set were within acceptance criteria.
4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
5. Five (5) of ten (10) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. All blank spike recoveries were within acceptance criteria.
7. One (1) of four (4) matrix spike recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

7/31/01
Date

R:\share\dro\07-231.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

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7/31/01

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: _____

Initiator: L. Kauffman Batch: 01076228, 231 Parameter: ODRO
Date: 7-19-01 Samples: All Matrix: SOIL
Client: TNU Hanford Method: SW846/MCAWW/CLP/ Prep Batch: 01LE801

**1. Reason for SDR**

**a. COC Discrepancy** __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

**b. General Discrepancy**

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

**c. Problem** (Include all relevant specific results; attach data if necessary)

Very low recoveries for surrogates in all samples and QC (0-12%).

**2. Known or Probable Causes(s)**

**3. Discussion and Proposed Action** Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
✓ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

**4. Project Manager Instructions**...signature/date: [signature]

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

**5. Final Action**...signature/date: [signature] 7/26/01 Other Explanation:

✓ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

01LE0871
Samples extracted past holdtime LK 7/26/01

**When Final Action has been recorded, forward original to QA Specialist for distribution and filing.**

| Route | Distribution of Completed SDR | Route | Distribution of Completed SDR |
|---|---|---|---|
| __ | X Initiator | __ | __ Metals: Beegle |
| __ | X Lab General Manager: M. Taylor | __ | __ Inorganic: Perrone |
| 1 | X Project Mgr: Stone/Johnson/Haslett | 2 | X GC/LC: Kiger |
| __ | X Technical Mgr: Wesson/Daniels | __ | __ MS: Rychlak/Layman |
| __ | X QA (file): Alberts | __ | __ Log-in: Keppel |
| __ | __ Data Management: Feldman | __ | __ Admin: Soos |
| __ | __ Sample Prep: Beegle/Kiger | __ | __ Other: _____ |

L-WI-006/E-01/01

4

# GLOSSARY OF DIESEL RANGE ORGANICS DATA

## DATA QUALIFIERS

| | | |
|---|---|---|
| **U** | = | Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g. 10U ). |
| **J** | = | Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J. |
| **B** | = | This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. |
| **E** | = | Indicates a compound was detected beyond the calibration range and was subsequently analyzed at a dilution. |
| **I** | = | Interference. |

## ABBREVIATIONS

| | | |
|---|---|---|
| **BS** | = | Indicates blank spike reagent grade water spiked with the matrix spiking solution. Spike recoveries are reported. |
| **BSD** | = | Indicates a blank spike duplicate. |
| **MS** | = | Indicates a matrix spike. |
| **MSD** | = | Indicates a matrix spike duplicate. |
| **NA** | = | Not Applicable. |
| **NS** | = | Not spiked. |
| **DF** | = | Dilution factor. |
| **NR** | = | Not required. |
| **SP** | = | Indicates a spiked compound. |

**Lionville Laboratory, Inc.**

DIESEL RANGE ORGANICS BY GC

Report Date: 07/27/01 10:32

RFW Batch Number: **0107L231** Client: **TNUHANFORD B01-058 H1409** Work Order: 11343606001 Page: 1

| | Cust ID: | B125X2 | B125X2 | B125X2 | B125X2 | B125X2 | B125X2 |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 | 001 MS | 001 MS | 001 MSD | 001 MSD |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | | REPREP | | REPREP | | REPREP |
| | p-Terphenyl | 10 * % | 78 % | 0 * % | 86 % | 4 * % | 88 % |
| Diesel Range Organics | | 13 | 12.8 U | U * % | 72 % | 37 % | 69 % |

| | Cust ID: | BLK | BLK BS | BLK | BLK BS |
|---|---|---|---|---|---|
| Sample Information | RFW#: | 01LE0801-MB1 | 01LE0801-MB1 | 01LE0871-MB1 | 01LE0871-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | mg/kg | mg/kg | mg/kg | mg/kg |
| | p-Terphenyl | 12 * % | 0 * % | 89 % | 108 % |
| Diesel Range Organics | | 12.0 U | 59 % | 12.0 U | 87 % |

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

7/27/01

Lionville Laboratory Use Only

0107L231

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: TNU-HANFORD SAF# B01-058

Est. Final Proj. Sampling Date:

Project #: 11343-6060-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OS

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 7-5-01 Date Due: 8-4-01

| | | A | | | | | B | | C | D | | E | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | S | | | | | S | | S | S | | S | | |
| #/Type Container | Liquid | | | | | | | | | | | | | |
| | Solid | 1AG | | | | | 1AG | | 1AG | 1AG | | 1AG | | |
| Volume | Liquid | | | | | | | | | | | | | |
| | Solid | 250 | | | | | 120 | | 60 | 250 | | 120 | | |
| Preservatives | | — | | | | | — | | — | — | | — | | |
| ANALYSES REQUESTED | ORGANIC: VOA | BNA | Pest/PCB | Herb | | | INORG: TAL Metal | CN | Metals | Inorg | | Metals | | |

Lionville Laboratory Use Only

| MATRIX CODES | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | BNA | | | Pest/PCB | | | Metals (1) | | ICP/Inorg | Inorg (1) | | Metals (2) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 001 | B125X2 | ✓ | ✓ | S | 6-27-01 | 1115 | | 1 | | | ✓ | | | 1 | | 1 | 1 | | 1 | | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Special Instructions: SAF B01-058

Met(1) = Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg

Inorg(1) = ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4, INH3N, IN3N2, ICNTU, IOCT, IPH

Met(2) = Al, Bi, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Ag, Na, V, Zn

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ___ or Hand Delivered ___ Airbill # Our Bus

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Samples Properly Preserved Y or N

5) Received Within Holding Times Y or N

Tamper Resistant Seal was: 1) Present on Outer Package Y or N

2) Unbroken on Outer Package Y or N

3) Present on Sample Y or N

4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [signature] | [signature] | 7/5/01 | 10:15 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | ORIGINAL REWRITTEN | | |

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES: 4235795455 24

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | B01-058-2 | Page 1 of 1 |
|---|---|---|---|---|
| Collector: Thomas G./Watson D./FAHLBERG, R. | Company Contact: Todd, M.E. | Telephone No.: (509) 372-9631 | Project Coordinator: TRENT, SJ | Price Code: 8N |
| Project Designation: 200-TW-1 & 2 - Soil Sampling | Sampling Location: T-26/200 W | | SAF No.: B01-058 | Data Turnaround: 45 Days |
| Ice Chest No.: SM1 ~~153~~ 268 RT 6-30-01 | Field Logbook No.: EL-1518 | COA: B20TW1A44C | Method of Shipment: Government Vehichle/Fed EX | Air Quality ☐ |
| Shipped To: RT 6-28-01 ~~Severn Trent Incorporated~~ RCRA | Offsite Property No.: RSR 104130 | | Bill of Lading/Air Bill No.: NA | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Radioactive* 55K dpm ACTIVITY ON BOTTLES <0.5 mREM DOSE

**Special Handling and/or Storage**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 120mL | 60mL | 250mL | 60mL | 250mL | 120mL | 250mL | 250mL | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | Chromium Hex - 7196 | See item (2) in Special Instructions. | VOA - 8260A (TCL) | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. | Activity Scan | | |
| Sample No. / Matrix * / Sample Date / Sample Time | | | | | | | | | | |
| B125X2 / SOIL / 06-27-01 / 1115 | X | X | X | | X | X | | | TIE TO | B12608 |

DELETE 6/28/01 RT 6-28-01

Samples stored in Ref.# IC at the 3728 Shipping Facility on 6/28/01. Collector not available to relinquish samples on 7/2/01 for shipment. RT 7-2-01

**CHAIN OF POSSESSION** — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| R. Fahlberg RFahlberg | 0800 6-28-01 | RF I.C | 0800 6-28-01 |
| RW IC 3728 | 0800 7/2/01 | RThoren | 0800 7-2-01 |
| R. Thoren | 0800 7-2-01 | FEDEX | |
| FedEx | 7/5/01 1015 | V. Hernandez | 7/5/01 1015 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA – 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}
(5) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90; Total Sr; Technetium-99; Total Uranium; Tritium-H3; Isotopic Uranium~~

RT 6-28-01

Matrix *: S=Soil, SD=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 7/5/01 10:15

SDG#: 01074231

Work Order Number: _____ SAF# B01-058

Shipping Container ID: _____ Chain of Custody # _____

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 4°
5. Vermiculite/packing materials is Wet [✓] Dry [ ]
6. Number of samples in shipping container: 5
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ____ tape
   - ✓ custody seals
   - ____ hazard labels
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ broken
   - ____ leaking
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [signature] Date: 7-5-01

Telephoned to: _____ On _____ By _____



9

AUG 2001
RECEIVED

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L231

| CLIENT ID | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B125X2 | 001 | S | 01LE0800 | 06/27/01 | 07/06/01 | 07/16/01 |
| B125X2 | 001 MS | S | 01LE0800 | 06/27/01 | 07/06/01 | 07/16/01 |
| B125X2 | 001 MSD | S | 01LE0800 | 06/27/01 | 07/06/01 | 07/16/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| SBLKBP | MB1 | S | 01LE0800 | N/A | 07/06/01 | 07/16/01 |
| SBLKBP | MB1 BS | S | 01LE0800 | N/A | 07/06/01 | 07/16/01 |

LIONVILLE LABORATORY INC.

**Client:** TNU-HANFORD B01-058
**LVL #:** 0107L231
**SDG/SAF #:** H1409/B01-058

**W.O. #:** 11343-606-001-9999-00
**Date Received:** 07-05-2001

**SEMIVOLATILE**

One (1) soil sample was collected on 06-27-2001.

The sample and its associated QC samples were extracted on 07-06-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL and Tributylphosphate Semivolatile target compounds on 07-16-2001.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The sample was extracted and analyzed within required holding times.

3. A non-target compound was detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. One (1) of twenty-two (22) matrix spike recoveries was outside EPA QC limits. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

6. All blank spike recoveries were within EPA QC limits.

7. Internal standard area and retention time criteria were met.

8. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

By _____ 08-23-01
J. Michael Taylor — Date
President
Lionville Laboratory Incorporated

som\gorup\data\bna\tnu-hanford-0107-231.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 2 pages.



208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 01MS256

Initiator: John W. Smith Batch: 01072231 Parameter: 0625 X
Date: 7/17/01 Samples: 001 T Matrix: Soil
Client: TWO Hanford 801-058 H1409 Method: SW846/MCAWW/CLP/ Prep Batch: 01LE08C0

**1. Reason for SDR**

**a. COC Discrepancy** __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

**b. General Discrepancy**

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

**c. Problem** (Include all relevant specific results; attach data if necessary)

1,2,4-Trichlorobenzene fails low in -001 T. All other spikes and surrogates meet criteria.

**2. Known or Probable Causes(s)**

**3. Discussion and Proposed Action**

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Other Description: Report & Narrate

**4. Project Manager Instructions**...signature/date: [signature]

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

**5. Final Action**...signature/date: OT 8/2/01 Other Explanation:

X Verified re-[log][leach][extract][digest][analysis] (circle)
X Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

**When Final Action has been recorded, forward original to QA Specialist for distribution and filing.**

| Route | Distribution of Completed SDR | Route | Distribution of Completed SDR |
|---|---|---|---|
| __ | X Initiator | __ | __ Metals: Beegle |
| __ | X Lab General Manager: M. Taylor | __ | __ Inorganic: Perrone |
| 1 | X Project Mgr: Stone/Johnson/Haslett | __ | __ GC/LC: Kiger |
| __ | X Technical Mgr: Wesson/Daniels | 2 | __ MS: Rychlak/Layman |
| __ | X QA (file): Alberts | __ | __ Log-in: Keppel |
| __ | __ Data Management: Feldman | __ | __ Admin: Soos |
| __ | __ Sample Prep: Beegle/Kiger | __ | __ Other: _____ |

L-WI-006/E-01/01

# GLOSSARY OF BNA DATA

## DATA QUALIFIERS

| | | |
|---|---|---|
| U | = | Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture. |
| J | = | Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J. |
| B | = | This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound. |
| E | = | Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution. |
| D | = | Identifies all compounds identified in an analysis at a secondary dilution factor. |
| I | = | Interference. |
| NQ | = | Result qualitatively confirmed but not able to quantify. |
| A | = | Indicates that a TIC is a suspected aldol-condensation product. |
| N | = | Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used. |
| X | = | This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard). |
| Y | = | Additional qualifiers used as required are explained in the case narrative. |

VLI
LIONVILLE LABORATORY INC

# GLOSSARY OF BNA DATA

## ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| SP, Z | = | Indicates Spiked Compound. |

VLI
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## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

**MP** - Missed Peak: manually added peak not found by automatic quantitation program.

**PA** - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

**RI** - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

**SP** - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

**CB** - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

**PI** - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

**Lionville Laboratory, Inc.**

Semivolatiles by GC/MS, Special List

RFW Batch Number: 0107L231 Client: TNUHANFORD B01-058 H1409 Work Order: 11343606001 Report Date: 07/27/01 14:58 Page: 1a

| | Cust ID: | B125X2 | | B125X2 | | B125X2 | | SBLKBP | | SBLKBP BS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | | 001 MS | | 001 MSD | | 01LE0800-MB1 | | 01LE0800-MB1 | |
| | Matrix: | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | D.F.: | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| | Units: | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | |
| Surrogate Recovery | Nitrobenzene-d5 | 63 | % | 64 | % | 38 | % | 64 | % | 84 | % |
| | 2-Fluorobiphenyl | 69 | % | 66 | % | 39 | % | 69 | % | 86 | % |
| | p-Terphenyl-d14 | 93 | % | 87 | % | 54 | % | 93 | % | 113 | % |
| | Phenol-d5 | 77 | % | 72 | % | 43 | % | 78 | % | 93 | % |
| | 2-Fluorophenol | 69 | % | 65 | % | 38 | % | 70 | % | 85 | % |
| | 2,4,6-Tribromophenol | 88 | % | 74 | % | 44 | % | 81 | % | 105 | % |
| | | fl | | fl | | fl | | fl | | fl | |
| Phenol | | 340 | U | 71 | % | 41 | % | 330 | U | 87 | % |
| bis(2-Chloroethyl)ether | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2-Chlorophenol | | 340 | U | 66 | % | 38 | % | 330 | U | 83 | % |
| 1,3-Dichlorobenzene | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 1,4-Dichlorobenzene | | 340 | U | 58 | % | 32 | % | 330 | U | 72 | % |
| 1,2-Dichlorobenzene | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2-Methylphenol | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2,2'-oxybis(1-Chloropropane) | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 4-Methylphenol | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| N-Nitroso-Di-n-propylamine | | 340 | U | 86 | % | 49 | % | 330 | U | 109 | % |
| Hexachloroethane | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Nitrobenzene | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Isophorone | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2-Nitrophenol | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2,4-Dimethylphenol | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| bis(2-Chloroethoxy)methane | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2,4-Dichlorophenol | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 1,2,4-Trichlorobenzene | | 340 | U | 65 | % | 37 * | % | 330 | U | 80 | % |
| Naphthalene | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 4-Chloroaniline | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Hexachlorobutadiene | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 4-Chloro-3-methylphenol | | 340 | U | 73 | % | 43 | % | 330 | U | 96 | % |
| 2-Methylnaphthalene | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Hexachlorocyclopentadiene | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2,4,6-Trichlorophenol | | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2,4,5-Trichlorophenol | | 860 | U | 880 | U | 890 | U | 830 | U | 830 | U |

*= Outside of EPA CLP QC limits.

| Cust ID: | B125X2 | | B125X2 | | B125X2 | | SBLKBP | | SBLKBP BS | |
|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 001 | | 001 MS | | 001 MSD | | 01LE0800-MB1 | | 01LE0800-MB1 | |
| 2-Chloronaphthalene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2-Nitroaniline | 860 | U | 880 | U | 890 | U | 830 | U | 830 | U |
| Dimethylphthalate | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Acenaphthylene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2,6-Dinitrotoluene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 3-Nitroaniline | 860 | U | 880 | U | 890 | U | 830 | U | 830 | U |
| Acenaphthene | 340 | U | 63 | % | 39 | % | 330 | U | 86 | % |
| 2,4-Dinitrophenol | 860 | U | 880 | U | 890 | U | 830 | U | 830 | U |
| 4-Nitrophenol | 860 | U | 53 | % | 32 | % | 830 | U | 72 | % |
| Dibenzofuran | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 2,4-Dinitrotoluene | 340 | U | 62 | % | 35 | % | 330 | U | 89 | % |
| Diethylphthalate | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 4-Chlorophenyl-phenylether | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Fluorene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 4-Nitroaniline | 860 | U | 880 | U | 890 | U | 830 | U | 830 | U |
| 4,6-Dinitro-2-methylphenol | 860 | U | 880 | U | 890 | U | 830 | U | 830 | U |
| N-Nitrosodiphenylamine (1) | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 4-Bromophenyl-phenylether | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Hexachlorobenzene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Pentachlorophenol | 860 | U | 73 | % | 45 | % | 830 | U | 100 | % |
| Phenanthrene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Anthracene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Carbazole | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Di-n-Butylphthalate | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Fluoranthene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Pyrene | 340 | U | 80 | % | 48 | % | 330 | U | 105 | % |
| Butylbenzylphthalate | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| 3,3'-Dichlorobenzidine | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Benzo(a)anthracene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Chrysene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| bis(2-Ethylhexyl)phthalate | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Di-n-Octyl phthalate | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Benzo(b)fluoranthene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Benzo(k)fluoranthene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Benzo(a)pyrene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Indeno(1,2,3-cd)pyrene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Dibenzo(a,h)anthracene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Benzo(g,h,i)perylene | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |
| Tributylphosphate | 340 | U | 350 | U | 360 | U | 330 | U | 330 | U |

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B125X2

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-058 H1409

Matrix: (soil/water) SOIL

Lab Sample ID: 0107L231-001

Sample wt/vol: 31.3 (g/mL) G

Lab File ID: A071613

Level: (low/med) LOW

Date Received: 07/05/01

% Moisture: 7 decanted: (Y/N)__

Date Extracted: 07/06/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 07/16/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 7.685 | 200 | JB |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKBP

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-058 H1409

Matrix: (soil/water) SOIL

Lab Sample ID: 01LE0800-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: A071604

Level: (low/med) LOW

Date Received: 07/06/01

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 07/06/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 07/16/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 7.691 | 90 | J |

Lionville Laboratory Use Only

0107L231

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: INU-HANFORD SAF# B01-058

Est. Final Proj. Sampling Date:

Project #: 11343-6000-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OS

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 7-5-01 Date Due: 8-4-01

| | | A | | | | | B | | C | D | | E | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | S | | | | | S | | S | S | | S | | |
| #/Type Container | Liquid | | | | | | | | | | | | | |
| | Solid | 1AG | | | | | 1AG | | 1AG | 1AG | | 1AG | | |
| Volume | Liquid | | | | | | | | | | | | | |
| | Solid | 250 | | | | | 120 | | 60 | 250 | | 120 | | |
| Preservatives | | — | | | | | — | | — | — | | — | | |
| ANALYSES REQUESTED | ORGANIC: VOA | BNA | Pest/PCB | Herb | | | INORG: TAL Metal | CN | TPH | Inorg | | IPH | | |

Lionville Laboratory Use Only

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | VOA | BNA 8025X | Pest/PCB | Herb | 8080 | | | Met(1) | CN | ICRLD | Inorg(1) | | Met(2) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, Wi - Wipe, X - Other, F - Fish | 001 | B125X2 | ✓ | ✓ | S | 6-27-01 | 1115 | | 1 | | | ✓ | | | 1 | | 1 | 1 | | 1 | | |

Special Instructions: SAF B01-058

Met(1)-Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg

Inorg(1)-ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4, INH3N, IN3N2, ICNTU, IOCT, IPH

Met(2): Al, Bi, Cd, Ca, Cr, Cu, Fr, Pb, Mg, Mn, Mo, Ni, K, Ag, Na, V-, Zn

DATE/REVISIONS:

1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___

Airbill # Due Bulot

2) Ambient or Chilled

3) Received in Good Condition Y or N

4) Samples Properly Preserved Y or N

5) Received Within Holding Times Y or N

Tamper Resistant Seal was: 1) Present on Outer Package Y or N; 2) Unbroken on Outer Package Y or N; 3) Present on Sample Y or N; 4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. 4° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 7/5/01 | 10:15 |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | ORIGINAL REWRITTEN | | |

Discrepancies Between Samples Labels and COC Record? Y or N

NOTES:

4235795455 24

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-058-2 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Collector** Thomas G./Watson D./FAHLBERG, R. | **Company Contact** Todd, M.E. | **Telephone No.** (509) 372-9631 | **Project Coordinator** TRENT, SJ |
| **Price Code** 8N | **Data Turnaround** 45 Days | **Air Quality** ☐ | |
| **Project Designation** 200-TW-1 & 2 - Soil Sampling | **Sampling Location** T-26/200 W | | **SAF No.** B01-058 |
| **Ice Chest No.** SM1 ~~153~~ 268 RT 6-30-01 | **Field Logbook No.** EL-1518 | **COA** B20TW1A44C | **Method of Shipment** Government Vehichle/Fed EX |
| **Shipped To** ~~Severn Trent Incorporated~~ RT 6-28-01 RECRA | **Offsite Property No.** RSR 104130 | | **Bill of Lading/Air Bill No.** NA |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Radioactive* 55K dpm ACTIVITY ON BOTTLES <0.5 mREM DOSE

**Special Handling and/or Storage**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None | None | | |
| **Type of Container** | aG | aG | aG | aG | aG | aG | aG | aG | | |
| **No. of Container(s)** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| **Volume** | 120mL | 60mL | 250mL | 60mL | 250mL | 120mL | 250mL | 250mL | | |

DELETE RT 6-28-01

**SAMPLE ANALYSIS**

| Sample No. | Matrix * | Sample Date | Sample Time | See item (1) in Special Instructions. | Chromium Hex - 7196 | See item (2) in Special Instructions. | VOA 8260A (TCL) | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. | Activity Scan | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B125X2 | SOIL | 06-27-01 | 1115 | X | X | X | | X | X | | | TIETO | 612638 |

Samples stored in Ref.# 1C at the 3728 Shipping Facility on 6/28/01. Collector not available to relinquish samples on 7/2/01 for shipment. RT 7-2-01

**CHAIN OF POSSESSION** / **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| R. Fahlberg (R. Fahlberg) | 0800 6-28-01 | Ref 1-C | 0800 6-28-01 |
| Ref 1C 3728 | 0800 7/2/01 | RThoren | 0800 7-2-01 |
| RThoren | 0800 7-2-01 | FEDEX | |
| FedEx | 7/5/01 1015 | V. Skeman | 7/5/01 1015 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}
(5) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium.~~

RT 6-28-01

**Matrix ***
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

AUG 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L228

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B125Y4 | | | | | | |
| % SOLIDS | 001 | S | 01L%S083 | 06/27/01 | 07/06/01 | 07/07/01 |
| % SOLIDS | 001 REP | S | 01L%S083 | 06/27/01 | 07/06/01 | 07/07/01 |
| CHLORIDE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| CHLORIDE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| CHLORIDE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRITE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRITE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRITE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRATE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRATE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRATE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| TOTAL CYANIDE | 001 | S | 01LC068 | 06/27/01 | 07/11/01 | 07/11/01 |
| TOTAL CYANIDE | 001 REP | S | 01LC068 | 06/27/01 | 07/11/01 | 07/11/01 |
| TOTAL CYANIDE | 001 MS | S | 01LC068 | 06/27/01 | 07/11/01 | 07/11/01 |
| PHOSPHATE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| PHOSPHATE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| PHOSPHATE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| CHROMIUM VI | 001 | S | 01LVIA61 | 06/27/01 | 07/20/01 | 07/20/01 |
| CHROMIUM VI | 001 REP | S | 01LVIA61 | 06/27/01 | 07/20/01 | 07/20/01 |
| CHROMIUM VI | 001 MS | S | 01LVIA61 | 06/27/01 | 07/20/01 | 07/20/01 |
| CHROMIUM VI | 001 MSD | S | 01LVIA61 | 06/27/01 | 07/20/01 | 07/20/01 |
| SULFATE BY IC | 001 | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| SULFATE BY IC | 001 REP | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| SULFATE BY IC | 001 MS | S | 01LICA45 | 06/27/01 | 07/10/01 | 07/10/01 |
| NITRATE NITRITE | 001 | S | 01LN3F39 | 06/27/01 | 07/18/01 | 07/18/01 |
| NITRATE NITRITE | 001 REP | S | 01LN3F39 | 06/27/01 | 07/18/01 | 07/18/01 |
| NITRATE NITRITE | 001 MS | S | 01LN3F39 | 06/27/01 | 07/18/01 | 07/18/01 |
| AMMONIA | 001 | S | 01LAM036 | 06/27/01 | 07/18/01 | 07/19/01 |
| AMMONIA | 001 REP | S | 01LAM036 | 06/27/01 | 07/18/01 | 07/19/01 |
| AMMONIA | 001 MS | S | 01LAM036 | 06/27/01 | 07/18/01 | 07/19/01 |
| TOTAL ORGANIC CARBON | 001 | S | 01LTZ019 | 06/27/01 | 07/18/01 | 07/20/01 |
| TOTAL ORGANIC CARBON | 001 REP | S | 01LTZ019 | 06/27/01 | 07/18/01 | 07/20/01 |

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L228

| CLIENT ID /ANALYSIS | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| TOTAL ORGANIC CARBON | 001 MS | S | 01LTZ019 | 06/27/01 | 07/18/01 | 07/20/01 |
| PH | 001 | S | 01LPH050 | 06/27/01 | 07/19/01 | 07/19/01 |
| PH | 001 REP | S | 01LPH050 | 06/27/01 | 07/19/01 | 07/19/01 |

QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| CHLORIDE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| CHLORIDE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| FLUORIDE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRITE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRITE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRATE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRATE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| TOTAL CYANIDE | LCS L | S | 01LC068 | N/A | 07/11/01 | 07/11/01 |
| TOTAL CYANIDE | LCS L | S | 01LC068 | N/A | 07/11/01 | 07/11/01 |
| TOTAL CYANIDE | MB1 | S | 01LC068 | N/A | 07/11/01 | 07/11/01 |
| PHOSPHATE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| PHOSPHATE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| CHROMIUM VI | MB1 | S | 01LVIA61 | N/A | 07/20/01 | 07/20/01 |
| CHROMIUM VI | MB1 BS | S | 01LVIA61 | N/A | 07/20/01 | 07/20/01 |
| CHROMIUM VI | MB1 BSD | S | 01LVIA61 | N/A | 07/20/01 | 07/20/01 |
| SULFATE BY IC | MB1 | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| SULFATE BY IC | MB1 BS | S | 01LICA45 | N/A | 07/10/01 | 07/10/01 |
| NITRATE NITRITE | MB1 | S | 01LN3F39 | N/A | 07/18/01 | 07/18/01 |
| NITRATE NITRITE | MB1 BS | S | 01LN3F39 | N/A | 07/18/01 | 07/18/01 |
| AMMONIA | MB1 | S | 01LAM036 | N/A | 07/18/01 | 07/19/01 |
| AMMONIA | MB1 BS | S | 01LAM036 | N/A | 07/18/01 | 07/19/01 |
| AMMONIA | MB1 BSD | S | 01LAM036 | N/A | 07/18/01 | 07/19/01 |
| TOTAL ORGANIC CARBON | MB1 | S | 01LTZ019 | N/A | 07/18/01 | 07/20/01 |
| TOTAL ORGANIC CARBON | MB1 BS | S | 01LTZ019 | N/A | 07/18/01 | 07/20/01 |

LIONVILLE LABORATORY INC.

**Analytical Report**

**Client:** TNU-HANFORD B01-058 H1409
**LVL#:** 0107L228

**W.O.#:** 11343-606-001-9999-00
**Date Received:** 07-05-01

## INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain of custody.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries were within the 75-125% control limits with the exception of Insoluble Chromium VI that was above the control limits and Soluble Chromium VI and Phosphate that were below the control limits; poor matrix spike recoveries may be attributed to sample inhomogeneity.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit with the exception Total Organic Carbon (TOC) that may be attributed to sample inhomogeneity.

9. Results for solid samples are reported on a dry weight basis and TOC samples are dried prior to analysis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

07-30-01
Date

njp\i07-228

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.



208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

**Lionville Laboratory Incorporated**

**WET CHEMISTRY**

**METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS**

| | ASTM | SW846 | OTHER |
|---|---|---|---|
| % Ash | __ D2216-80 | | |
| % Moisture | __ D2216-80 | | __ ILMO4.0 (e) |
| % Solids | ✓ D2216-80 | | __ ILMO4.0 (e) |
| % Volatile Solids | __ D2216-80 | | |
| ASTM Extraction in Water | __ D3987-81/85 | | |
| BTU | __ D240-87 | | |
| CEC | | __ 9081 | __ c |
| Chromium VI | | ✓ 3060A/7196A | |
| Corrosivity ___ by coupon ___ by pH | | __ 1110(mod) __ 9045C | |
| Cyanide, Total | | ✓ 9010B/9014 | __ ILMO4.0 (e) |
| Cyanide, Reactive | | __ Section 7.3/9014 | |
| Halides, Extractable Organic | | __ 9020B | __ EPA 600/4/84-008 |
| Halides, Total | | __ 9020B | __ EPA 600/4/84-008 |
| EP Toxicity | | __ 1310A | |
| Flash Point | | __ 1010 | |
| Ignitability | | __ 1010 | |
| Oil & Grease | | __ 9071A | |
| Carbon, Total Organic | | ✓ 9060 | ✓ Lloyd Kahn (mod) |
| Oxygen Bomb Prep for Anions | __ D240-87(mod) | __ 5050 | |
| Petroleum Hydrocarbons, Total Recoverable | | __ 9071 | __ EPA 418.1 |
| pH, Soil | | ✓ 9045C | |
| Sulfide, Reactive | | __ Section 7.3/9030B | |
| Sulfide | | __ 9030B(mod) | |
| Specific Gravity | __ D1429-76C/ | __ D5057-90 | |
| Sulfur, Total | | __ 9056 | |
| Synthetic Preparation Leach | | __ 1312 | |
| Paint Filter | | __ 9095A | |

**Other:** Chloride, Fluoride, Nitrite, **Method:** EPA 300.0 (mod.)

**Other:** Nitrate, Phosphate, Sulfate **Method**

Nitrate Nitrite EPA 353.2 (mod)

Ammonia EPA 350.3

L-WI-034/B-01/01

Lionville Laboratory Incorporated

# METHOD REFERENCES AND DATA QUALIFIERS

## DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

## ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

## ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Lababoratory, Inc.

INORGANICS DATA SUMMARY REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | B125Y4 | % Solids | 94.4 | % | 0.01 | 1.0 |
| | | Chloride by IC | 2.6 | MG/KG | 1.3 | 1.0 |
| | | Fluoride by IC | 9.5 | MG/KG | 2.6 | 1.0 |
| | | Nitrite by IC | 1.32 u | MG/KG | 1.32 | 1.0 |
| | | Nitrate by IC | 33.4 | MG/KG | 1.32 | 1.0 |
| | | Cyanide, Total | 0.41 u | MG/KG | 0.41 | 1.0 |
| | | Phosphate by IC | 2.5 | MG/KG | 1.3 | 1.0 |
| | | Chromium VI | 0.87 | MG/KG | 0.42 | 1.0 |
| | | Sulfate by IC | 22.0 | MG/KG | 1.3 | 1.0 |
| | | Nitrate Nitrite | 6.7 | MG/KG | 0.21 | 1.0 |
| | | Ammonia, as N | 5.3 u | MG/KG | 5.3 | 1.0 |
| | | Total Organic Carbon | 188 | MG/KG | 129 | 1.0 |
| | | pH | 9.9 | SOIL PH | 0.01 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| BLANK10 | 01LICA45-MB1 | Chloride by IC | 1.2 u | MG/KG | 1.2 | 1.0 |
| | | Fluoride by IC | 2.5 u | MG/KG | 2.5 | 1.0 |
| | | Nitrite by IC | 1.25 u | MG/KG | 1.25 | 1.0 |
| | | Nitrate by IC | 1.25 u | MG/KG | 1.25 | 1.0 |
| | | Phosphate by IC | 1.2 u | MG/KG | 1.2 | 1.0 |
| | | Sulfate by IC | 1.2 u | MG/KG | 1.2 | 1.0 |
| BLANK1 | 01LC068-MB1 | Cyanide, Total | 0.50 u | MG/KG | 0.50 | 1.0 |
| BLANK10 | 01LVIA61-MB1 | Chromium VI | 0.40 u | MG/KG | 0.40 | 1.0 |
| BLANK10 | 01LN3F39-MB1 | Nitrate Nitrite | 0.20 u | MG/KG | 0.20 | 1.0 |
| NK10 | 01LAM036-MB1 | Ammonia, as N | 5.0 u | MG/KG | 5.0 | 1.0 |
| BLANK10 | 01LTZ019-MB1 | Total Organic Carbon | 20.0 u | MG/KG | 20.0 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS ACCURACY REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409

LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | INITIAL RESULT | SPIKED AMOUNT | %RECOV | DILUTION FACTOR(SPK) |
|---|---|---|---|---|---|---|---|
| -001 | B125Y4 | Chloride by IC | 50.3 | 2.6 | 53.0 | 90.1 | 2.0 |
| | | Fluoride by IC | 118 | 9.5 | 106 | 102.0 | 2.0 |
| | | Nitrite by IC | 49.3 | 1.32u | 53.0 | 93.0 | 2.0 |
| | | Nitrate by IC | 83.0 | 33.4 | 53.0 | 93.7 | 2.0 |
| | | Cyanide, Total | 4.55 | 0.41u | 4.99 | 91.2 | 1.0 |
| | | Phosphate by IC | 41.4 | 2.5 | 53.0 | 73.3 | 2.0 |
| | | Soluble Chromium VI | 4.0 | 0.87 | 4.2 | 74.8 | 1.0 |
| | | Insoluble Chromium VI | 1590 | 0.87 | 1230 | 129.0 | 100 |
| | | Sulfate by IC | 69.4 | 22.0 | 53.0 | 89.6 | 2.0 |
| | | Nitrate Nitrite | 11.3 | 6.7 | 5.3 | 87.8 | 2.0 |
| | | Ammonia, as N | 210 | 5.3 u | 210 | 100 | 1.0 |
| | | Total Organic Carbon | 2650 | 188 | 2650 | 93.1 | 1.0 |
| BLANK10 | 01LICA45-MB1 | Chloride by IC | 23.5 | 1.2 u | 25.0 | 93.9 | 1.0 |
| | | Fluoride by IC | 54.6 | 2.5 u | 50.0 | 109.2 | 1.0 |
| | | Nitrite by IC | 23.6 | 1.25u | 25.0 | 94.4 | 1.0 |
| | | Nitrate by IC | 25.0 | 1.25u | 25.0 | 100.1 | 1.0 |
| | | Phosphate by IC | 25.4 | 1.2 u | 25.0 | 101.8 | 1.0 |
| | | Sulfate by IC | 23.1 | 1.2 u | 25.0 | 92.4 | 1.0 |
| BLANK10 | 01LVIA61-MB1 | Soluble Chromium VI | 3.6 | 0.40u | 4.0 | 90.7 | 1.0 |
| | | Insoluble Chromium VI | 1790 | 0.40u | 1740 | 103.1 | 100 |
| BLANK10 | 01LN3F39-MB1 | Nitrate Nitrite | 5.2 | 0.20u | 5.0 | 103.0 | 1.0 |
| BLANK10 | 01LAM036-MB1 | Ammonia, as N | 96.0 | 5.0 u | 100 | 96.0 | 1.0 |
| | | Ammonia, as N MSD | 96.0 | 5.0 u | 100 | 96.0 | 1.0 |
| BLANK10 | 01LTZ019-MB1 | Total Organic Carbon | 395 | 20.0 u | 400 | 98.8 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKE#1 %RECOV | SPIKE#2 %RECOV | %DIFF |
|---|---|---|---|---|---|
| BLANK10 | 01LAM036-MB1 | Ammonia, as N | 96.0 | 96.0 | 0.00 |

Lionville Lababoratory, Inc.

INORGANICS PRECISION REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | INITIAL RESULT | REPLICATE | RPD | DILUTION FACTOR(REP) |
|---|---|---|---|---|---|---|
| -001REP | B125Y4 | % Solids | 94.4 | 95.6 | 1.3 | 1.0 |
| | | Chloride by IC | 2.6 | 2.5 | 4.2 | 1.0 |
| | | Fluoride by IC | 9.5 | 8.6 | 10.4 | 1.0 |
| | | Nitrite by IC | 1.32u | 1.32u | NC | 1.0 |
| | | Nitrate by IC | 33.4 | 31.6 | 5.6 | 1.0 |
| | | Cyanide, Total | 0.41u | 0.51u | NC | 1.0 |
| | | Phosphate by IC | 2.5 | 2.5 | 0.20 | 1.0 |
| | | Chromium VI | 0.87 | 0.85 | 2.8 | 1.0 |
| | | Sulfate by IC | 22.0 | 20.8 | 5.3 | 1.0 |
| | | Nitrate Nitrite | 6.7 | 5.7 | 15.9 | 1.0 |
| | | Ammonia, as N | 5.3 u | 5.2 u | NC | 1.0 |
| | | Total Organic Carbon | 188 | 137 | 31.5 | 1.0 |
| | | pH | 9.88 | 9.9 | 0.1 | 1.0 |

Lionville Lababoratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 07/27/01

CLIENT: TNUHANFORD B01-058 H1409 LVL LOT #: 0107L228

WORK ORDER: 11343-606-001-9999-00

| SAMPLE | SITE ID | ANALYTE | SPIKED SAMPLE | SPIKED AMOUNT | UNITS | %RECOV |
|---|---|---|---|---|---|---|
| LCSS1 | 01LC068-LCS1 | Cyanide, Total LCS | 1.97 | 2.0 | MG/KG | 98.6 |
| LCSS2 | 01LC068-LCS2 | Cyanide, Total LCS | 9.76 | 10.0 | MG/KG | 97.6 |

| Lionville Laboratory Use Only |
|---|
| 0107L228 |

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Client: TRU- Hanford B01-058
Est. Final Proj. Sampling Date:
Project #: 11343-(e0(e-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: OS
QC: Spec Del: Std TAT: 30 day

Date Rec'd: 7-5-01 Date Due: 8-4-01

| | | A | | | | | | B | | CD | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 4 | | | | | | 4 | | 4 | 4 | | | | |
| #/Type Container | Liquid | 1Ag | | | | | | 1Ag | | | | | | | |
| | Solid | ↓ | | | | | | ↓ | | 1Ag | 1Ag | | | | |
| Volume | Liquid | | | | | | | | | | | | | | |
| | Solid | 500 | | | | | | 500 | | 1L | 500 | | | | |
| Preservatives | | - | | | | | | - | | - | - | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | Metal | Gn | | | | | | |
| | | ↓ Lionville Laboratory Use Only ↓ | | | | | | | | | | | | | |
| | | | 8025X | | | 8DRO | | Met① | ICRL | Inorg① | Met② | | | | |

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S - Soil<br>SE - Sediment<br>SO - Solid<br>SL - Sludge<br>W - Water<br>O - Oil<br>A - Air<br>DS - Drum Solids<br>DL - Drum Liquids<br>L - EP/TCLP Leachate<br>Wi - Wipe<br>X - Other<br>F - Fish | 001 | B125Y4 | ✓ | ✓ | S | (e2701 | 0430 | | ✓ | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | | | |

Special Instructions: SaF B01-058

Met①: Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg,
Inorg①: ICCL, ICFL, Icno2, Icno3, ICPO4, ICSO4, InH3n, In3n2, IcnTO, IOCT, IPH
Met②: Al, Bi, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Ag, Na, V-, Zn

DATE/REVISIONS:
→ 1. Ice melted when to Tech
2.
3.
4.
5.
6.

**Lionville Laboratory Use Only**

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # See Fedex
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 17° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Fed Ex | [signature] | 7/5/01 | 1015 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | | | |

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES: 423579545524

ORIGINAL REWRITTEN

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-058-14 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Thomas G./Watson D. | Company Contact: Todd, M.E. | Telephone No.: (509) 372-9631 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | Air Quality ☐ | |
| Project Designation: 200-TW-1 & 2 - Soil Sampling | Sampling Location: T-26/200 W | SAF No.: B01-058 | |
| Ice Chest No.: ERC99-065 / SML442 | Field Logbook No.: EL-1518 | COA: B20TW1A44C | Method of Shipment: Fed EX |
| Shipped To: ~~TMA~~ RECRA | Offsite Property No.: A01 0428 | Bill of Lading/Air Bill No.: 42357954-5524/5535 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Radioactive* COUNTS: BACKGROUND ON SPLIT SPOON < 0.5mREM DOSE

Special Handling and/or Storage

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None | |
| Type of Container | aG | aG | aG | aG | aG | aG | |
| No. of Container(s) | 1 | 1 | | 1 | 1 | 1 | |
| Volume | 500mL | 1000mL | 1000mL | 500mL | 500mL | 1000mL | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | See item (2) in Special Instructions. | VOA 8260A (TCL) DELETE DSW 06-27-01 | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. DSW 6-27 | |

Samples stored in Ref.# 1B at the 3 Shipping Facility on 6/27/01. Collector not available to relenquist samples on 7/2/01 for shipmen

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B125Y4 | SOIL | 06-27-01 | 0430 | X | X | | X | X | | | | TIETO | ~~B125Y5~~ B126J1 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names: Received By/Stored In | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: DSWATSON/TRWAC | 06-27-01 0830 | Received By/Stored In: REF. 1B 3728 | 06-27-01 0830 |
| Relinquished By/Removed From: Ref 1B 3728 | 7.2.01 0800 | Received By/Stored In: R L Thorne | 7.2.01 0800 |
| Relinquished By/Removed From: R L Thorne | 7.2.01 0800 | Received By/Stored In: FEDEX | |
| Relinquished By/Removed From: FedEx | 7/5/01 10:15 | Received By/Stored In: [illegible] | 7/5/01 1015 |
| Relinquished By/Removed From | | Received By/Stored In | |
| Relinquished By/Removed From | | Received By/Stored In | |

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV); Chromium Hex - 7196
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}
~~(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

6-23-01

Matrix *: S=Soil, SD=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 7/5/01 10:15

SDG#: 0107 C228

Work Order Number: _____ SAF# B01-058

Shipping Container ID: _____ Chain of Custody # _____

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 17°
5. Vermiculite/packing materials is Wet [✓] Dry [ ]
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ____ tape
   - ____ hazard labels
   - ✓ custody seals
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [signature] Jennifer Tabor Davis Date: 7/5/01

Telephoned to: _____ On _____ By _____

Lionville Laboratory, Inc.
DRO ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

AUG 2001
RECEIVED

RFW LOT # :01074228

| CLIENT ID | RFW # | MTX | PREP # | COLLECTN | DATE REC | EXT/PREP | ANALYSIS |
|---|---|---|---|---|---|---|---|
| B125Y4 | 001 | S | 01LE0801 | 06/27/01 | 07/05/01 | 07/06/01 | 07/10/01 |
| B125Y4 | 001 R1 | S | 01LE0871 | 06/27/01 | 07/05/01 | 07/20/01 | 07/26/01 |
| B125Y4 | 001 MS | S | 01LE0801 | 06/27/01 | 07/05/01 | 07/06/01 | 07/10/01 |
| B125Y4 | 001 MS R1 | S | 01LE0871 | 06/27/01 | 07/05/01 | 07/20/01 | 07/26/01 |
| B125Y4 | 001 MSD | S | 01LE0801 | 06/27/01 | 07/05/01 | 07/06/01 | 07/10/01 |
| B125Y4 | 001 MSD R1 | S | 01LE0871 | 06/27/01 | 07/05/01 | 07/20/01 | 07/26/01 |

LAB QC:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| BLK | MB1 | S | 01LE0801 | N/A | N/A | 07/06/01 | 07/10/01 |
| BLK | MB1 BS | S | 01LE0801 | N/A | N/A | 07/06/01 | 07/10/01 |
| BLK | MB1 | S | 01LE0871 | N/A | N/A | 07/20/01 | 07/25/01 |
| BLK | MB1 BS | S | 01LE0871 | N/A | N/A | 07/20/01 | 07/25/01 |

7/30/01

LIONVILLE LABORATORY INC.

**Analytical Report**

**Client :** TNU HANFORD B01-058
**LVL# :** 0107L228
**SDG/SAF#:** H1409/B01-058

**W.O #:** 11343-606-001-9999-00
**Date Received:** 07-05-01

**DIESEL RANGE ORGANICS**

One (1) soil sample was collected on 06-27-01.

The sample and its associated QC samples were prepared on 07-06-01, re-extracted on 07-20-01, and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 07-10,25,26-01. The analysis met the intent of method WTPH-D.

1. The cooler temperature has been recorded on the chain-of-custody.
2. All required holding times for the analysis were met. Due to low surrogate recoveries, the sample was re-extracted outside of hold time. Both the original and the re-extracted results have been reported. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
3. All initial calibrations associated with this data set were within acceptance criteria.
4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
5. Five (5) of ten (10) surrogate recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
6. All blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

7/31/01
Date

R:\share\dro\07-228.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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d 2/31/01

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 01LC058

Initiator: L. Kauffman Batch: 01076228, 231 Parameter: ODRO
Date: 7-19-01 Samples: All Matrix: SOIL
Client: TWU Hanford Method: SW846/MCAWW/CLP/ Prep Batch: 01LE801

**1. Reason for SDR**

**a. COC Discrepancy** __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

**b. General Discrepancy**

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

**c. Problem** (Include all relevant specific results; attach data if necessary)

Very low recoveries for surrogates in all samples and QC (0-12%).

**2. Known or Probable Causes(s)**

**3. Discussion and Proposed Action** Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
✓ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

**4. Project Manager Instructions**...signature/date: [signature]

✓ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

**5. Final Action**...signature/date: [signature] 7/26/01 Other Explanation:

✓ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

01LE0871
Samples extracted past holdtime LK 7/26/01

**When Final Action has been recorded, forward original to QA Specialist for distribution and filing.**

| Route | Distribution of Completed SDR | Route | Distribution of Completed SDR |
|---|---|---|---|
| __ | X Initiator | __ | __ Metals: Beegle |
| __ | X Lab General Manager: M. Taylor | __ | __ Inorganic: Perrone |
| I | X Project Mgr: Stone/Johnson/Haslett | 2 | X GC/LC: Kiger |
| __ | X Technical Mgr: Wesson/Daniels | __ | __ MS: Rychlak/Layman |
| __ | X QA (file): Alberts | __ | __ Log-in: Keppel |
| __ | __ Data Management: Feldman | __ | __ Admin: Soos |
| __ | __ Sample Prep: Beegle/Kiger | __ | __ Other: _____ |

L-WI-006/E-01/01

4

# GLOSSARY OF DIESEL RANGE ORGANICS DATA

## DATA QUALIFIERS

**U** = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g. 10U ).

**J** = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

**B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.

**E** = Indicates a compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

**I** = Interference.

## ABBREVIATIONS

**BS** = Indicates blank spike reagent grade water spiked with the matrix spiking solution. Spike recoveries are reported.

**BSD** = Indicates a blank spike duplicate.

**MS** = Indicates a matrix spike.

**MSD** = Indicates a matrix spike duplicate.

**NA** = Not Applicable.

**NS** = Not spiked.

**DF** = Dilution factor.

**NR** = Not required.

**SP** = Indicates a spiked compound.

**Lionville Laboratory, Inc.**

DIESEL RANGE ORGANICS BY GC

Report Date: 07/27/01 10:42

RFW Batch Number: **0107L228** Client: **TNUHANFORD B01-058 H1409** Work Order: 11343606001 Page: 1

| | Cust ID: | B125Y4 | B125Y4 | B125Y4 | B125Y4 | B125Y4 | B125Y4 |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | 001 | 001 MS | 001 MS | 001 MSD | 001 MSD |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | | REPREP | | REPREP | | REPREP |
| | p-Terphenyl | 0 * % | 89 % | 1 * % | 87 % | 11 * % | 99 % |
| Diesel Range Organics | | 12.4 U | 12.7 U | 72 % | 66 % | 87 % | 76 % |

| | Cust ID: | BLK | BLK BS | BLK | BLK BS |
|---|---|---|---|---|---|
| Sample Information | RFW#: | 01LE0801-MB1 | 01LE0801-MB1 | 01LE0871-MB1 | 01LE0871-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | mg/kg | mg/kg | mg/kg | mg/kg |
| | p-Terphenyl | 12 * % | 0 * % | 89 % | 108 % |
| Diesel Range Organics | | 12.0 U | 59 % | 12.0 U | 87 % |

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

| Lionville Laboratory Use Only |
|---|
| 0107L228 |

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

LVLI Lionville Laboratory Inc.

Client: TRU-Hanford B01-058
Est. Final Proj. Sampling Date:
Project #: 11343-6006-001-9999-00
Project Contact/Phone #:
Lionville Laboratory Project Manager: DJ
QC: Spec Del: Std TAT: 30 day
Date Rec'd: 7-5-01 Date Due: 8-4-01

| | | A | | | | | | B | | CD | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 4 | | | | | | 4 | | 4 | 4 | | | | 4 |
| #/Type Container | Liquid | 1AG | | | | | | 1AG | | | | | | | |
| | Solid | ↓ | | | | | | ↓ | | 1AG | 1AG | | | | |
| Volume | Liquid | | | | | | | | | | | | | | |
| | Solid | 500 | | | | | | 500 | | 1L | 500 | | | | |
| Preservatives | | - | | | | | | - | | - | - | | | | |
| ANALYSES REQUESTED → | | ORGANIC | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | Metal | CN | | | | | | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | |
| | | | 0625X | | | ODRO | | Met① | ICRU | Inorg① | Met② | | | | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | 0625X | ODRO | Met① | ICRU | Inorg① | Met② |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | B12SY4 | ✓ | ✓ | S | 6/27/01 | 0430 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Special Instructions: SAF B01-058

Met①=Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg,
Inorg①=ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4, InNH3N, In3N2, ICNTO, IOCT, IPH
Met②=Al, Bi, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Ag, Na, V, Zn

DATE/REVISIONS:
→ 1. Ice melted when to Tech
2.
3.
4.
5.
6.

**Lionville Laboratory Use Only**

Samples were: 1) Shipped ___ or Hand Delivered ___
Airbill # See Attached
2) Ambient or Chilled
3) Received in Good Condition ✓ or N
4) Samples Properly Preserved ✓ or N
5) Received Within Holding Times ✓ or N

Tamper Resistant Seal was: 1) Present on Outer Package ✓ or N
2) Unbroken on Outer Package ✓ or N
3) Present on Sample ✓ or N
4) Unbroken on Sample ✓ or N
COC Record Present Upon Sample Rec't ✓ or N
Cooler Temp. 17° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Ed Eo | [signature] | 7/5/01 | 1015 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | | ORIGINAL REWRITTEN | |

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: 4235795455 24

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-058-14 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Thomas G./Watson D. | Company Contact: Todd, M.E. — Telephone No.: (509) 372-9631 | Project Coordinator: TRENT, SJ | Price Code: 8N — Data Turnaround: 45 Days (00) — Air Quality ☐ |
| Project Designation: 200-TW-1 & 2 - Soil Sampling | Sampling Location: T-26/200 W | SAF No.: B01-058 | |
| Ice Chest No.: ERC99-065 / SML442 | Field Logbook No.: EL-1518 — COA: B20TW1A44C | Method of Shipment: Fed EX | |
| Shipped To: ~~TMA~~/RECRA | Offsite Property No.: A010428 | Bill of Lading/Air Bill No.: 4235794-5524/5535 | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Radioactive* COUNTS: BACKGROUND ON SPLIT SPOON < 0.5 mrem DOSE

Special Handling and/or Storage

| | | | | | | |
|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None |
| Type of Container | aG | aG | aG | aG | aG | aG |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 |
| Volume | 500mL | 1000mL | 1000mL | 500mL | 500mL | 1000mL |

Samples stored in Ref.# 1B at the 3 Shipping Facility on 6/27/01. Collector not available to relenquisl samples on 7/2/01 for shipmer

SAMPLE ANALYSIS

| Sample No. | Matrix * | Sample Date | Sample Time | See item (1) in Special Instructions. | See item (2) in Special Instructions. | VOA 8260A (TCL) DAW 06-27-01 | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. DAW 6-27 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B125Y4 | SOIL | 06-27-01 | 0430 | X | X | | X | X | | | | TIETO | ~~B12675~~ B12631 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

DELETE

| CHAIN OF POSSESSION | | Sign/Print Names | |
|---|---|---|---|
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| DWatson/TRWR | 06-27-01 0820 | REF 1B 3728 | 06-27-01 0820 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Ref 1B 3728 | 7-2-01 0800 | R Thorey | 7-2-01 0800 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| R Thorey | 7-2-01 0800 | FEDEX | |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| FedEx | 7/5/01 10:15 | [illegible] | 7/5/01 1015 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| | | | |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| | | | |

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV); Chromium Hex - 7196
(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D
(4) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}
(5) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 - Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium~~

6-23-01

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

Figure 1. Sample Check-in List

Date/Time Received: 7/5/01 10:15

SDG#: 0107 L228

Work Order Number: _____ SAF# B01-058

Shipping Container ID: _____ Chain of Custody # _____

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 17°
5. Vermiculite/packing materials is Wet [✓] Dry [ ]
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ____ tape
   - ____ hazard labels
   - ✓ custody seals
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles

10. Were any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: [signature] Zenith Laboratories Date: 7/5/01

Telephoned to: _____ On _____ By _____



9

AUG 2001
RECEIVED

Lionville Laboratory, Inc.
BNA ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-058 H1409

DATE RECEIVED: 07/05/01 LVL LOT # :0107L228

| CLIENT ID | LVL # | MTX | PREP # | COLLECTION | EXTR/PREP | ANALYSIS |
|---|---|---|---|---|---|---|
| B125Y4 | 001 | S | 01LE0800 | 06/27/01 | 07/06/01 | 07/12/01 |
| B125Y4 | 001 MS | S | 01LE0800 | 06/27/01 | 07/06/01 | 07/12/01 |
| B125Y4 | 001 MSD | S | 01LE0800 | 06/27/01 | 07/06/01 | 07/12/01 |

LAB QC:

| | | | | | | |
|---|---|---|---|---|---|---|
| SBLKBP | MB1 | S | 01LE0800 | N/A | 07/06/01 | 07/16/01 |
| SBLKBP | MB1 BS | S | 01LE0800 | N/A | 07/06/01 | 07/16/01 |

LIONVILLE LABORATORY INC.

**Client:** TNU-HANFORD B01-058
**RFW #:** 0107L228
**SDG/SAF #:** H1409/B01-058

**W.O. #:** 11343-606-001-9999-00
**Date Received:** 07-05-2001

**SEMIVOLATILE**

One (1) soil sample was collected on 06-27-2001.

The sample and its associated QC samples were extracted on 07-06-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL and Tributylphosphate Semivolatile target compounds on 07-12,16-2001.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.

2. The sample was extracted and analyzed within required holding times.

3. A non-target compound was detected in the sample.

4. All surrogate recoveries were within EPA QC limits.

5. All matrix spike recoveries were within EPA QC limits.

6. All blank spike recoveries were within EPA QC limits.

7. Internal standard area and retention time criteria were met.

8. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

J. Michael Taylor
President
Lionville Laboratory Incorporated

8/6/01
Date

som\gorup\data\bna\tnu-hanford-0107-228.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 1 pages.



208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

## GLOSSARY OF BNA DATA

### DATA QUALIFIERS

U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.

J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.

E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.

D = Identifies all compounds identified in an analysis at a secondary dilution factor.

I = Interference.

NQ = Result qualitatively confirmed but not able to quantify.

A = Indicates that a TIC is a suspected aldol-condensation product.

N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).

Y = Additional qualifiers used as required are explained in the case narrative.

# GLOSSARY OF BNA DATA

## ABBREVIATIONS

| | | |
|---|---|---|
| **BS** | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| **BSD** | = | Indicates blank spike duplicate. |
| **MS** | = | Indicates matrix spike. |
| **MSD** | = | Indicates matrix spike duplicate. |
| **DL** | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| **NA** | = | Not Applicable. |
| **DF** | = | Dilution Factor. |
| **NR** | = | Not Required. |
| **SP, Z** | = | Indicates Spiked Compound. |

LIONVILLE LABORATORY INC

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

**MP** - Missed Peak: manually added peak not found by automatic quantitation program.

**PA** - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

**RI** - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.

**SP** - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

**CB** - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.

**PI** - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

**Lionville Laboratory, Inc.**

Semivolatiles by GC/MS, Special List

Report Date: 07/27/01 14:53

RFW Batch Number: **0107L228** Client: **TNUHANFORD B01-058 H1409** Work Order: 11343606001 Page: 1a

| | Cust ID: | B125Y4 | | B125Y4 | | B125Y4 | | SBLKBP | | SBLKBP BS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 001 | | 001 MS | | 001 MSD | | 01LE0800-MB1 | | 01LE0800-MB1 | |
| | Matrix: | SOIL | | SOIL | | SOIL | | SOIL | | SOIL | |
| | D.F.: | 1.00 | | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| | Units: | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | | ug/Kg | |
| Surrogate Recovery | Nitrobenzene-d5 | 67 | % | 65 | % | 60 | % | 64 | % | 84 | % |
| | 2-Fluorobiphenyl | 69 | % | 67 | % | 68 | % | 69 | % | 86 | % |
| | p-Terphenyl-d14 | 105 | % | 80 | % | 92 | % | 93 | % | 113 | % |
| | Phenol-d5 | 78 | % | 74 | % | 74 | % | 78 | % | 93 | % |
| | 2-Fluorophenol | 73 | % | 66 | % | 67 | % | 70 | % | 85 | % |
| | 2,4,6-Tribromophenol | 75 | % | 71 | % | 73 | % | 81 | % | 105 | % |
| Phenol | | 350 | U | 69 | % | 71 | % | 330 | U | 87 | % |
| bis(2-Chloroethyl)ether | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2-Chlorophenol | | 350 | U | 64 | % | 67 | % | 330 | U | 83 | % |
| 1,3-Dichlorobenzene | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 1,4-Dichlorobenzene | | 350 | U | 51 | % | 57 | % | 330 | U | 72 | % |
| 1,2-Dichlorobenzene | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2-Methylphenol | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,2'-oxybis(1-Chloropropane) | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Methylphenol | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| N-Nitroso-Di-n-propylamine | | 350 | U | 77 | % | 77 | % | 330 | U | 109 | % |
| Hexachloroethane | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Nitrobenzene | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Isophorone | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2-Nitrophenol | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4-Dimethylphenol | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| bis(2-Chloroethoxy)methane | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4-Dichlorophenol | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 1,2,4-Trichlorobenzene | | 350 | U | 58 | % | 62 | % | 330 | U | 80 | % |
| Naphthalene | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Chloroaniline | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Hexachlorobutadiene | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Chloro-3-methylphenol | | 350 | U | 70 | % | 71 | % | 330 | U | 96 | % |
| 2-Methylnaphthalene | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Hexachlorocyclopentadiene | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4,6-Trichlorophenol | | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4,5-Trichlorophenol | | 860 | U | 870 | U | 870 | U | 830 | U | 830 | U |

*= Outside of EPA CLP QC limits.

RFW Batch Number: 0107L228 Client: TNUHANFORD B01-058 H1409 Work Order: 11343606001 Page: 1b

| Cust ID: | B125Y4 | | B125Y4 | | B125Y4 | | SBLKBP | | SBLKBP BS | |
|---|---|---|---|---|---|---|---|---|---|---|
| RFW#: | 001 | | 001 MS | | 001 MSD | | 01LE0800-MB1 | | 01LE0800-MB1 | |
| 2-Chloronaphthalene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2-Nitroaniline | 860 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| Dimethylphthalate | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Acenaphthylene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,6-Dinitrotoluene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 3-Nitroaniline | 860 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| Acenaphthene | 350 | U | 66 | % | 69 | % | 330 | U | 86 | % |
| 2,4-Dinitrophenol | 860 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| 4-Nitrophenol | 860 | U | 52 | % | 53 | % | 830 | U | 72 | % |
| Dibenzofuran | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 2,4-Dinitrotoluene | 350 | U | 65 | % | 69 | % | 330 | U | 89 | % |
| Diethylphthalate | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Chlorophenyl-phenylether | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Fluorene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Nitroaniline | 860 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| 4,6-Dinitro-2-methylphenol | 860 | U | 870 | U | 870 | U | 830 | U | 830 | U |
| N-Nitrosodiphenylamine (1) | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 4-Bromophenyl-phenylether | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Hexachlorobenzene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Pentachlorophenol | 860 | U | 73 | % | 76 | % | 830 | U | 100 | % |
| Phenanthrene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Anthracene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Carbazole | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Di-n-Butylphthalate | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Fluoranthene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Pyrene | 350 | U | 76 | % | 86 | % | 330 | U | 105 | % |
| Butylbenzylphthalate | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| 3,3'-Dichlorobenzidine | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(a)anthracene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Chrysene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| bis(2-Ethylhexyl)phthalate | 350 | U | 350 | U | 93 | J | 330 | U | 330 | U |
| Di-n-Octyl phthalate | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(b)fluoranthene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(k)fluoranthene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(a)pyrene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Indeno(1,2,3-cd)pyrene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Dibenzo(a,h)anthracene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Benzo(g,h,i)perylene | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |
| Tributylphosphate | 350 | U | 350 | U | 350 | U | 330 | U | 330 | U |

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B125Y4

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-058 H1409

Matrix: (soil/water) SOIL

Lab Sample ID: 0107L228-001

Sample wt/vol: 30.7 (g/mL) G

Lab File ID: A071213

Level: (low/med) LOW

Date Received: 07/05/01

% Moisture: 6 decanted: (Y/N)__

Date Extracted: 07/06/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 07/12/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 7.917 | 100 | JB |

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLKBP

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B01-058 H1409

Matrix: (soil/water) SOIL

Lab Sample ID: 01LE0800-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: A071604

Level: (low/med) LOW

Date Received: 07/06/01

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 07/06/01

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 07/16/01

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | UNKNOWN | 7.691 | 90 | J |

Lionville Laboratory Use Only

01071228

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

VLI LIONVILLE LABORATORY INC

Client: TRU- Hanford B01-058

Est. Final Proj. Sampling Date:

Project #: 11343-COOL-001-9999-00

Project Contact/Phone #:

Lionville Laboratory Project Manager: OJ

QC: Spec Del: Std TAT: 30 day

Date Rec'd: 7-5-01 Date Due: 8-4-01

| | | A | | | | | | B | | CD | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | 4 | | | | | | 4 | | 4 | 4 | | | | |
| #/Type Container | Liquid | 1PG | | | | | | 1PG | | | | | | | |
| | Solid | ↓ | | | | | | ↓ | | 1PG | 1PG | | | | |
| Volume | Liquid | | | | | | | | | | | | | | |
| | Solid | 500 | | | | | | 500 | | 1L | 500 | | | | |
| Preservatives | | - | | | | | | - | | - | - | | | | |
| ANALYSES REQUESTED | | ORGANIC | | | | | | INORG | | | | | | | |
| | | VOA | BNA | Pest/PCB | Herb | | | Metal | Gen | | | | | | |
| | | Lionville Laboratory Use Only | | | | | | | | | | | | | |
| | | | 8025X | | | 8080 | | Met① | ICP | Inorg① | Met② | | | | |

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | B12SY4 | ✓ | ✓ | S | 6/27/01 | 0430 | | ✓ | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | | | |

Special Instructions: SAF B01-058

Met① = Cd, Cr, Cu, Ni, Ag, Bi, Pb, Hg,

Inorg① = ICCL, ICFL, ICNO2, ICNO3, ICPO4, ICSO4, INH3N, IN3N2, ICNTO, IOCT, IPH

Met② = Al, Bi, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Ag, Na, V-, Zn

DATE/REVISIONS:

→ 1. Ice melted warm to Touch

2.

3.

4.

5.

6.

**Lionville Laboratory Use Only**

Samples were: 1) Shipped ___ or Hand Delivered ___ Airbill # Sec Detail

2) Ambient or Chilled

3) Received in Good Condition (Y) or N

4) Samples Properly Preserved (Y) or N

5) Received Within Holding Times (Y) or N

Tamper Resistant Seal was: 1) Present on Outer Package (Y) or N

2) Unbroken on Outer Package (Y) or N

3) Present on Sample (Y) or N

4) Unbroken on Sample (Y) or N

COC Record Present Upon Sample Rec't (Y) or N

Cooler Temp. 17° °C

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| Ed Eo | [signature] | 7/5/01 | 1015 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| COMPOSITE WASTE | | | |

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 4235 7954 5524

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-058-14 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Thomas G./Watson D. | Company Contact: Todd, M.E. | Telephone No.: (509) 372-9631 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | Air Quality ☐ | |
| Project Designation: 200-TW-1 & 2 - Soil Sampling | Sampling Location: T-26/200 W | SAF No.: B01-058 | |
| Ice Chest No.: ERC99-065 / SML442 | Field Logbook No.: EL-1518 | COA: B20TW1A44C | Method of Shipment: Fed EX |
| Shipped To: ~~TMA~~ RECRA | Offsite Property No.: A010428 | Bill of Lading/Air Bill No.: 4235 7934-5524 / 5535 | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Radioactive* COUNTS: BACKGROUND ON SPLIT SPOON < 0.5 mREM DOSE

**Special Handling and/or Storage**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None | |
| Type of Container | aG | aG | aG | aG | aG | aG | |
| No. of Container(s) | 1 | 1 | | 1 | 1 | 1 | |
| Volume | 500mL | 1000mL | 1000mL | 500mL | 500mL | 1000mL | |

Samples stored in Ref.# 1B at the 37 Shipping Facility on 6/27/01. Collector not available to relenquish samples on 7/2/01 for shipment

**SAMPLE ANALYSIS**

| Sample No. | Matrix * | Sample Date | Sample Time | See item (1) in Special Instructions. | See item (2) in Special Instructions. | VOA - 8260A (TCL) DOW DELETE 06-27-01 | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. DOW 6-27 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B125Y4 | SOIL | 06-27-01 | 0430 | X | X | | X | X | | | | TKEO | 81275 B12631 |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| DS Watson / TG Watson | 06-27-01 0820 | REF. 1B 3728 | 06-27-01 0820 |
| Ref 1B 3728 | 7-2-01 0800 | R L Thorey | 7-2-01 0800 |
| R L Thorey | 7-2-01 0800 | FED EX | |
| FED EX | 7/5/01 10:15 | Thorey | 7/5/01 1015 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV); Chromium Hex - 7196

(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045

(3) Semi-VOA -- 8270A (Add-On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D

(4) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}

(5) ~~Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on (Radium-226, Radium-228); Isotopic Plutonium; Isotopic Thorium (Thorium-232); Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium -- H3; Isotopic Uranium~~

KT 6-23-01

*Matrix **

S=Soil, SB=Sediment, SO=Solid, Sl=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

| | | | |
|---|---|---|---|
| LABORATORY SECTION | Received By | Title | Date/Time |
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

ORIGINAL Original

SDR # B01-100
Revision #: 0
Date Initiated: 08/13/01

# SAMPLE DISPOSITION RECORD

SAF: B01-058
OU: 200-TW-1/2
Project ID: 200 TW 1&2
Task ID: 1
Sampling Event: 200-TW-1 & 2 - Soil

Laboratory: TMA/RECRA

Task Manager: M. E. Todd

Sampling Information:
Number of Samples: 2
ID Numbers: B125X2, B125X3
Matrix: SOIL
Collection Date: 06/26/01 – 06/27/01

Issue Background:

Class: ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

Type: Cancellation of Analyses

Description: Cancellation of 6010A (TAL) Analysis

Disposition:

Description: The chain of custody for the listed sample requested two metals analyses by method 6010A. The Groundwater/Vadose Zone project requested that the 6010A – TAL analysis be cancelled and that the lab continue with the 6010A – Client List analysis.

Justification: Metals data reported under the 6010A – TAL analysis are not needed for this sample.

Approval Signatures:

S. J. Trent — 10/1/01
Project Coordinator (Print/Sign Name) — Date

M. E. Todd — 10/3/01
Task Manager (Print/Sign Name) — Date

BHI-EE-109 (02/99)

ORIGINAL Dayes

SDR # B01-086
Revision #: 0
Date Initiated: 07/10/01

# SAMPLE DISPOSITION RECORD

**SAF: B01-058**
**OU: 200-TW-1/2**
**Project ID: 200 TW 1&2**
**Task ID: 1**
**Sampling Event: 200-TW-1 & 2 – Soil**

**Laboratory: TMA/RECRA**

**Task Manager: M. E. Todd**

**Sampling Information:**
**Number of Samples: 1**
**ID Numbers: B125Y4**
**Matrix: Soil**
**Collection Date: 06/27/01**

**Issue Background:**

**Class:** ☐ Project Data Use ☒ General Laboratory Direction ☐ Validation Direction ☐ Sample Management Direction

**Type: Cancellation of Analyses**

**Description: Cancellation of 6010A Metals TAL Analysis**

**Disposition:**

**Description: The request for analysis inadvertently identified both the 6010A Metals TAL and the 6010A Metals Client List. The correct analysis is the 6010A Metals Client List. The laboratory was instructed to analyze the sample using the 6010A Client List, and to cancel the 6010A Metals TAL analysis.**

**Justification: The 200 Area Source Characterization project requires data for the metals associated with the 6010A Metals Client List.**

**Approval Signatures:**

S. J. Trent — 7/16/01
Project Coordinator (Print/Sign Name) — Date

M. E. Todd — 7/26/01
Task Manager (Print/Sign Name) — Date

## 1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1409 was composed of three solid (soil) samples designated under SAF No. B01-058 with a Project Designation of: 200-TW-1 & 2 – Soil Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

## 2.0 ANALYSIS NOTES

### 2.1 Tritium Analyses

The matrix spike percent recovery (84%) was slightly below the 3σ limits (86 to 114%), but within the laboratory protocol limits (80 to120%). No other problems were encountered during the course of the analyses.

### 2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

### 2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

### 2.4 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

### 2.5 Total Strontium Analyses

No problems were encountered during the course of the analyses.

### 2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

### 2.7 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

### 2.8 Total Uranium Analyses

No problems were encountered during the course of the analyses.

### 2.9 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

### 2.10 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

### 2.11 Americium-241 Analyses

No problems were encountered during the course of the analyses.

## 2.12 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

**Case Narrative Certification Statement**

**"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."**

Melissa Mannion

**Melissa C. Mannion**
**Program Manager**

8/16/01

**Date**

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

SDG 7027
Contact Melissa C. Mannion

## SAMPLE SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1409

| CLIENT SAMPLE ID | LOCATION | MATRIX | LEVEL | LAB SAMPLE ID | SAF NO | CHAIN OF CUSTODY | COLLECTED |
|---|---|---|---|---|---|---|---|
| B125X2 | T-26/200 W | SOLID | | R107019-01 | B01-058 | B01-058-2 | 06/27/01 11:15 |
| B125Y4 | T-26/200 W | SOLID | | R107019-02 | B01-058 | B01-058-14 | 06/27/01 04:30 |
| Method Blank | | SOLID | | R107019-04 | B01-058 | | |
| Lab Control Sample | | SOLID | | R107019-03 | B01-058 | | |
| Duplicate (R107019-01) | T-26/200 W | SOLID | | R107019-05 | B01-058 | | 06/27/01 11:15 |
| Spike (R107019-01) | T-26/200 W | SOLID | | R107019-06 | B01-058 | | 06/27/01 11:15 |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

SDG 7027
Contact Melissa C. Mannion

## QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1409

| QC BATCH | CHAIN OF CUSTODY | CLIENT SAMPLE ID | MATRIX | % SOLIDS | SAMPLE AMOUNT | BASIS AMOUNT | DAYS SINCE RECEIVED | DAYS SINCE COLL | LAB SAMPLE ID | DEPARTMENT SAMPLE ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 7027 | B01-058-14 | B125Y4 | SOLID | 90.2 | 1890 g | | 07/03/01 | 6 | R107019-02 | 7027-002 |
| | B01-058-2 | B125X2 | SOLID | 92.9 | 401.4 g | | 07/03/01 | 6 | R107019-01 | 7027-001 |
| | | Method Blank | SOLID | | | | | | R107019-04 | 7027-004 |
| | | Lab Control Sample | SOLID | | | | | | R107019-03 | 7027-003 |
| | | Duplicate (R107019-01) | SOLID | 92.9 | 401.4 g | | 07/03/01 | 6 | R107019-05 | 7027-005 |
| | | Spike (R107019-01) | SOLID | 92.9 | 401.4 g | | 07/03/01 | 6 | R107019-06 | 7027-006 |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

SDG 7027
Contact Melissa C. Mannion

## PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1409

| TEST | MATRIX | METHOD | PREPARATION BATCH | ERROR 2σ % | PLANCHETS ANALYZED CLIENT | MORE | RE | BLANK | LCS | DUP/ORIG | MS/ORIG | QUALIFIERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alpha Spectroscopy** | | | | | | | | | | | | |
| AM | SOLID | Americium 241 in Soil | 6994-084 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| NP | SOLID | Neptunium in Soil | 6994-084 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| PU | SOLID | Plutonium, Isotopic in Solids | 6994-084 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| TH | SOLID | Thorium, Isotopic in Soil | 6994-084 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| U | SOLID | Uranium, Isotopic in Soil | 6994-084 | 5.0 | 2 | | | 1 | 1 | 1/1 | | |
| **Beta Counting** | | | | | | | | | | | | |
| SR | SOLID | Total Strontium in Soil | 6994-084 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |
| TC | SOLID | Technetium 99 in Soil | 6994-084 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |
| **Gamma Spectroscopy** | | | | | | | | | | | | |
| GAM | SOLID | Gamma Scan | 6994-084 | 15.0 | 2 | | | 1 | 1 | 1/1 | | |
| **Kinetic Phosphorimetry** | | | | | | | | | | | | |
| U_T | SOLID | Uranium, Total in Soil | 6994-084 | 9.0 | 2 | | | 1 | 1 | 1/1 | | |
| **Liquid Scintillation Counting** | | | | | | | | | | | | |
| C | SOLID | Carbon 14 in Soil | 6994-084 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |
| H | SOLID | Tritium in Soil | 6994-084 | 10.0 | 2 | | | 1 | 1 | 1/1 | 1/1 | X |
| NI_L | SOLID | Nickel 63 in Soil | 6994-084 | 10.0 | 2 | | | 1 | 1 | 1/1 | | |

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

SDG 7027
Contact Melissa C. Mannion

## WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H1409

| CLIENT SAMPLE ID / LOCATION / CUSTODY | SAF No | MATRIX | LAB SAMPLE ID / COLLECTED / RECEIVED | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| B125X2 | | | R107019-01 | 7027-001 | AM | | 07/20/01 | 08/15/01 | MCM | Americium 241 in Soil |
| T-26/200 W | | SOLID | 06/27/01 | 7027-001 | C | | 08/01/01 | 08/15/01 | MCM | Carbon 14 in Soil |
| B01-058-2 | B01-058 | | 07/03/01 | 7027-001 | GAM | | 07/18/01 | 08/15/01 | MCM | Gamma Scan |
| | | | | 7027-001 | H | | 07/30/01 | 08/15/01 | MCM | Tritium in Soil |
| | | | | 7027-001 | NI_L | | 07/17/01 | 08/15/01 | MCM | Nickel 63 in Soil |
| | | | | 7027-001 | NP | | 07/19/01 | 08/15/01 | MCM | Neptunium in Soil |
| | | | | 7027-001 | PU | | 07/18/01 | 08/15/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7027-001 | SR | | 07/13/01 | 08/15/01 | MCM | Total Strontium in Soil |
| | | | | 7027-001 | TC | | 07/30/01 | 08/15/01 | MCM | Technetium 99 in Soil |
| | | | | 7027-001 | TH | | 07/19/01 | 08/15/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7027-001 | U | | 07/17/01 | 08/15/01 | MCM | Uranium, Isotopic in Soil |
| | | | | 7027-001 | U_T | | 08/06/01 | 08/15/01 | MCM | Uranium, Total in Soil |
| B125Y4 | | | R107019-02 | 7027-002 | AM | | 07/20/01 | 08/15/01 | MCM | Americium 241 in Soil |
| T-26/200 W | | SOLID | 06/27/01 | 7027-002 | C | | 08/01/01 | 08/15/01 | MCM | Carbon 14 in Soil |
| B01-058-14 | B01-058 | | 07/03/01 | 7027-002 | GAM | | 07/18/01 | 08/15/01 | MCM | Gamma Scan |
| | | | | 7027-002 | H | | 07/30/01 | 08/15/01 | MCM | Tritium in Soil |
| | | | | 7027-002 | NI_L | | 07/18/01 | 08/15/01 | MCM | Nickel 63 in Soil |
| | | | | 7027-002 | NP | | 07/18/01 | 08/15/01 | MCM | Neptunium in Soil |
| | | | | 7027-002 | PU | | 07/18/01 | 08/15/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7027-002 | SR | | 07/13/01 | 08/15/01 | MCM | Total Strontium in Soil |
| | | | | 7027-002 | TC | | 07/30/01 | 08/15/01 | MCM | Technetium 99 in Soil |
| | | | | 7027-002 | TH | | 07/19/01 | 08/15/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7027-002 | U | | 07/17/01 | 08/15/01 | MCM | Uranium, Isotopic in Soil |
| | | | | 7027-002 | U_T | | 08/06/01 | 08/15/01 | MCM | Uranium, Total in Soil |
| Method Blank | | | R107019-04 | 7027-004 | AM | | 07/24/01 | 08/15/01 | MCM | Americium 241 in Soil |
| | | SOLID | | 7027-004 | C | | 08/01/01 | 08/15/01 | MCM | Carbon 14 in Soil |
| | B01-058 | | | 7027-004 | GAM | | 07/18/01 | 08/15/01 | MCM | Gamma Scan |
| | | | | 7027-004 | H | | 07/30/01 | 08/15/01 | MCM | Tritium in Soil |
| | | | | 7027-004 | NI_L | | 07/18/01 | 08/15/01 | MCM | Nickel 63 in Soil |
| | | | | 7027-004 | NP | | 07/19/01 | 08/15/01 | MCM | Neptunium in Soil |
| | | | | 7027-004 | PU | | 07/18/01 | 08/15/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7027-004 | SR | | 07/13/01 | 08/15/01 | MCM | Total Strontium in Soil |
| | | | | 7027-004 | TC | | 07/30/01 | 08/15/01 | MCM | Technetium 99 in Soil |
| | | | | 7027-004 | TH | | 07/16/01 | 08/15/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7027-004 | U | | 07/17/01 | 08/15/01 | MCM | Uranium, Isotopic in Soil |
| | | | | 7027-004 | U_T | | 08/06/01 | 08/15/01 | MCM | Uranium, Total in Soil |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

SDG 7027
Contact Melissa C. Mannion

## WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1409

| CLIENT SAMPLE ID / LOCATION / CUSTODY | SAF No | MATRIX | LAB SAMPLE ID / COLLECTED / RECEIVED | PLANCHET | TEST | SUF-FIX | ANALYZED | REVIEWED | BY | METHOD |
|---|---|---|---|---|---|---|---|---|---|---|
| Lab Control Sample | | | R107019-03 | 7027-003 | AM | | 07/20/01 | 08/15/01 | MCM | Americium 241 in Soil |
| | | SOLID | | 7027-003 | C | | 08/01/01 | 08/15/01 | MCM | Carbon 14 in Soil |
| | B01-058 | | | 7027-003 | GAM | | 07/18/01 | 08/15/01 | MCM | Gamma Scan |
| | | | | 7027-003 | H | | 07/30/01 | 08/15/01 | MCM | Tritium in Soil |
| | | | | 7027-003 | NI_L | | 07/18/01 | 08/15/01 | MCM | Nickel 63 in Soil |
| | | | | 7027-003 | NP | | 07/18/01 | 08/15/01 | MCM | Neptunium in Soil |
| | | | | 7027-003 | PU | | 07/18/01 | 08/15/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7027-003 | SR | | 07/13/01 | 08/15/01 | MCM | Total Strontium in Soil |
| | | | | 7027-003 | TC | | 07/30/01 | 08/15/01 | MCM | Technetium 99 in Soil |
| | | | | 7027-003 | TH | | 07/16/01 | 08/15/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7027-003 | U | | 07/17/01 | 08/15/01 | MCM | Uranium, Isotopic in Soil |
| | | | | 7027-003 | U_T | | 08/06/01 | 08/15/01 | MCM | Uranium, Total in Soil |
| Duplicate (R107019-01) | | | R107019-05 | 7027-005 | AM | | 07/20/01 | 08/15/01 | MCM | Americium 241 in Soil |
| T-26/200 W | | SOLID | 06/27/01 | 7027-005 | C | | 08/01/01 | 08/15/01 | MCM | Carbon 14 in Soil |
| | B01-058 | | 07/03/01 | 7027-005 | GAM | | 07/18/01 | 08/15/01 | MCM | Gamma Scan |
| | | | | 7027-005 | H | | 07/30/01 | 08/15/01 | MCM | Tritium in Soil |
| | | | | 7027-005 | NI_L | | 07/18/01 | 08/15/01 | MCM | Nickel 63 in Soil |
| | | | | 7027-005 | NP | | 07/19/01 | 08/15/01 | MCM | Neptunium in Soil |
| | | | | 7027-005 | PU | | 07/18/01 | 08/15/01 | MCM | Plutonium, Isotopic in Solids |
| | | | | 7027-005 | SR | | 07/13/01 | 08/15/01 | MCM | Total Strontium in Soil |
| | | | | 7027-005 | TC | | 08/01/01 | 08/15/01 | MCM | Technetium 99 in Soil |
| | | | | 7027-005 | TH | | 07/20/01 | 08/15/01 | MCM | Thorium, Isotopic in Soil |
| | | | | 7027-005 | U | | 07/17/01 | 08/15/01 | MCM | Uranium, Isotopic in Soil |
| | | | | 7027-005 | U_T | | 08/06/01 | 08/15/01 | MCM | Uranium, Total in Soil |
| Spike (R107019-01) | | | R107019-06 | 7027-006 | H | | 07/30/01 | 08/15/01 | MCM | Tritium in Soil |
| T-26/200 W | | SOLID | 06/27/01 | | | | | | | |
| | B01-058 | | 07/03/01 | | | | | | | |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

SDG 7027
Contact Melissa C. Mannion

## WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H1409

### COUNTS OF TESTS BY SAMPLE TYPE

| TEST | SAF No | METHOD | REFERENCE | CLIENT | MORE | RE | BLANK | LCS | DUP | SPIKE | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | B01-058 | Americium 241 in Soil | AMCMISO_IE_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| C | B01-058 | Carbon 14 in Soil | C14_COX_LSC | 2 | | | 1 | 1 | 1 | | 5 |
| GAM | B01-058 | Gamma Scan | GAMMA_GS | 2 | | | 1 | 1 | 1 | | 5 |
| H | B01-058 | Tritium in Soil | 906.0_H3_LSC | 2 | | | 1 | 1 | 1 | 1 | 6 |
| NI_L | B01-058 | Nickel 63 in Soil | NI63_LSC | 2 | | | 1 | 1 | 1 | | 5 |
| NP | B01-058 | Neptunium in Soil | NP237_LLE_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| PU | B01-058 | Plutonium, Isotopic in Solids | PUISO_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| SR | B01-058 | Total Strontium in Soil | SRTOT_SEP_PRECIP_GPC | 2 | | | 1 | 1 | 1 | | 5 |
| TC | B01-058 | Technetium 99 in Soil | TC99_TR_SEP_LSC | 2 | | | 1 | 1 | 1 | | 5 |
| TH | B01-058 | Thorium, Isotopic in Soil | THISO_IE_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| U | B01-058 | Uranium, Isotopic in Soil | UISO_PLATE_AEA | 2 | | | 1 | 1 | 1 | | 5 |
| U_T | B01-058 | Uranium, Total in Soil | UTOT_KPA | 2 | | | 1 | 1 | 1 | | 5 |
| TOTALS | | | | 24 | | | 12 | 12 | 12 | 1 | 61 |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 08/15/01

# E B E R L I N E  S E R V I C E S / R I C H M O N D

**SAMPLE DELIVERY GROUP H1409**

**R107019-04** **Method Blank**

## M E T H O D  B L A N K

| | | | |
|---|---|---|---|
| SDG | 7027 | Client/Case no | Hanford SDG H1409 |
| Contact | Melissa C. Mannion | Contract | No. 630 |
| Lab sample id | R107019-04 | Client sample id | Method Blank |
| Dept sample id | 7027-004 | Material/Matrix | SOLID |
| | | SAF No | B01-058 |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Tritium | 10028-17-8 | 1.50 | 3.3 | 5.5 | 400 | U | H |
| Carbon 14 | 14762-75-5 | -0.368 | 2.7 | 4.5 | 50 | U | C |
| Nickel 63 | 13981-37-8 | -0.882 | 30 | 51 | 30 | U | NI_L |
| Total Strontium | SR-RAD | 1.05 | 9.5 | 19 | 1.0 | U | SR |
| Americium 241 | 14596-10-2 | 1.42 | 2.8 | 5.4 | 1.0 | U | AM |
| Technetium 99 | 14133-76-7 | -0.556 | 1.0 | 3.6 | 15 | U | TC |
| Thorium 228 | 14274-82-9 | -0.790 | 1.1 | 2.2 | | U | TH |
| Thorium 230 | 14269-63-7 | -1.23 | 1.8 | 3.6 | 1.0 | U | TH |
| Thorium 232 | TH-232 | 0.175 | 0.53 | 0.67 | 1.0 | U | TH |
| Total Uranium (ug/g) | 7440-61-1 | 0 | 0.005 | 0.012 | 0.10 | U | U_T |
| Uranium 233 | U-233/234 | 1.07 | 2.1 | 4.1 | 1.0 | U | U |
| Uranium 235 | 15117-96-1 | 0 | 1.3 | 4.9 | 1.0 | U | U |
| Uranium 238 | U-238 | 0 | 1.1 | 4.1 | 1.0 | U | U |
| Neptunium 237 | 13994-20-2 | 1.03 | 2.1 | 2.8 | 1.0 | U | NP |
| Plutonium 238 | 13981-16-3 | -0.612 | 2.4 | 5.9 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 1.84 | 2.5 | 4.7 | 1.0 | U | PU |
| Potassium 40 | 13966-00-2 | U | | 3.6 | | U | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.31 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | U | | 0.32 | 0.10 | U | GAM |
| Radium 226 | 13982-63-3 | U | | 0.61 | 0.10 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 1.2 | 0.20 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 0.73 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.86 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.52 | 0.10 | U | GAM |
| Thorium 228 | 14274-82-9 | U | | 0.39 | | U | GAM |
| Thorium 232 | TH-232 | U | | 1.2 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.92 | | U | GAM |
| Uranium 238 | U-238 | U | | 37 | | U | GAM |
| Americium 241 | 14596-10-2 | U | | 0.64 | | U | GAM |

200-TW-1 & 2 - Soil Sampling

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/15/01 |

# B L A N K ,  c o n t .

| | | | | |
|---|---|---|---|---|
| SDG | 7027 | Client/Case no | Hanford | SDG H1409 |
| Contact | Melissa C. Mannion | Contract | No. 630 | |
| Lab sample id | R107019-04 | Client sample id | Method Blank | |
| Dept sample id | 7027-004 | Material/Matrix | | SOLID |
| | | SAF No | B01-058 | |

QC-BLANK 39162



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/15/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

R107019-03

Lab Control Sample

## LAB CONTROL SAMPLE

SDG 7027
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1409
Case no No. 630

Lab sample id R107019-03
Dept sample id 7027-003

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-058

| ANALYTE | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ADDED pCi/g | 2σ ERR pCi/g | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritium | 485 | 11 | 5.4 | 400 | | H | 479 | 19 | 101 | 83-117 | 80-120 |
| Carbon 14 | 10200 | 100 | 13 | 50 | | C | 11300 | 450 | 90 | 85-115 | 80-120 |
| Nickel 63 | 5920 | 130 | 62 | 30 | | NI_L | 5800 | 230 | 102 | 83-117 | 80-120 |
| Total Strontium | 1200 | 34 | 9.9 | 1.0 | | SR | 1100 | 44 | 109 | 82-118 | 80-120 |
| Americium 241 | 458 | 19 | 1.6 | 1.0 | | AM | 478 | 19 | 96 | 89-111 | 80-120 |
| Technetium 99 | 809 | 23 | 3.7 | 15 | | TC | 787 | 31 | 103 | 83-117 | 80-120 |
| Thorium 230 | 534 | 19 | 3.7 | 1.0 | | TH | 510 | 20 | 105 | 89-111 | 80-120 |
| Total Uranium (ug/g) | 71.5 | 8.3 | 0.12 | 0.10 | | U_T | 72.0 | 2.9 | 99 | 77-123 | 80-120 |
| Uranium 233 | 468 | 44 | 21 | 1.0 | | U | 464 | 19 | 101 | 83-117 | 80-120 |
| Uranium 235 | 374 | 39 | 4.7 | 1.0 | | U | 378 | 15 | 99 | 82-118 | 80-120 |
| Uranium 238 | 520 | 47 | 20 | 1.0 | | U | 505 | 20 | 103 | 83-117 | 80-120 |
| Neptunium 237 | 483 | 51 | 3.1 | 1.0 | | NP | 530 | 21 | 91 | 83-117 | 80-120 |
| Plutonium 238 | 632 | 62 | 5.1 | 1.0 | | PU | 620 | 25 | 102 | 82-118 | 80-120 |
| Plutonium 239/240 | 690 | 66 | 5.1 | 1.0 | | PU | 660 | 26 | 104 | 82-118 | 80-120 |
| Cobalt 60 | 19.9 | 1.3 | 0.65 | 0.050 | | GAM | 19.8 | 0.79 | 100 | 75-125 | 80-120 |
| Cesium 137 | 20.9 | 1.1 | 0.85 | 0.10 | | GAM | 20.5 | 0.82 | 102 | 75-125 | 80-120 |

200-TW-1 & 2 - Soil Sampling

QC-LCS 39161

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

R107019-05 B125X2

## DUPLICATE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7027 | | | Client/Case no | Hanford SDG H1409 |
| Contact | Melissa C. Mannion | | | Case no | No. 630 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | R107019-05 | Lab sample id | R107019-01 | Client sample id | B125X2 |
| Dept sample id | 7027-005 | Dept sample id | 7027-001 | Location/Matrix | T-26/200 W SOLID |
| | | Received | 07/03/01 | Collected/Weight | 06/27/01 11:15 401.4 g |
| % solids | 92.9 | % solids | 92.9 | Custody/SAF No | B01-058-2 B01-058 |

| ANALYTE | DUPLICATE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ORIGINAL pCi/g | 2σ ERR (COUNT) | MDA pCi/g | QUALI-FIERS | RPD % | 3σ TOT | PROT LIMIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritium | 0.250 | 0.93 | 1.6 | 400 | U | H | 0.466 | 0.94 | 1.6 | U | - | | |
| Carbon 14 | 0.257 | 2.6 | 4.3 | 50 | U | C | -0.955 | 2.7 | 4.6 | U | - | | |
| Nickel 63 | 0.885 | 30 | 51 | 30 | U | NI_L | -1.80 | 31 | 52 | U | - | | |
| Total Strontium | 51000 | 230 | 9.7 | 1.0 | | SR | 49100 | 230 | 11 | | 4 | 21 | |
| Americium 241 | 204 | 33 | 7.6 | 1.0 | | AM | 227 | 19 | 4.1 | | 11 | 29 | |
| Technetium 99 | 2.08 | 1.1 | 3.2 | 15 | U | TC | 0.909 | 1.3 | 3.8 | U | - | | |
| Thorium 228 | 0.749 | 0.95 | 1.6 | | U | TH | 4.09 | 4.7 | 6.5 | U | - | | |
| Thorium 230 | -2.25 | 1.6 | 3.7 | 1.0 | U | TH | 0.582 | 3.5 | 4.5 | U | - | | |
| Thorium 232 | 0.749 | 0.55 | 0.65 | 1.0 | J | TH | 1.74 | 2.3 | 4.5 | U | 80 | 285 | |
| Total Uranium (ug/g) | 61.5 | 7.1 | 0.12 | 0.10 | | U_T | 61.1 | 7.1 | 0.12 | | 1 | 31 | |
| Uranium 233 | 19.9 | 6.1 | 3.8 | 1.0 | | U | 18.1 | 6.1 | 3.8 | | 9 | 69 | |
| Uranium 235 | 1.80 | 2.4 | 4.6 | 1.0 | U | U | 1.22 | 1.2 | 4.7 | U | - | | |
| Uranium 238 | 24.4 | 7.1 | 3.8 | 1.0 | | U | 21.1 | 6.2 | 3.8 | | 15 | 63 | |
| Neptunium 237 | 1.88 | 1.9 | 2.8 | 1.0 | U | NP | 2.17 | 4.3 | 8.3 | U | - | | |
| Plutonium 238 | 22.3 | 13 | 19 | 1.0 | | PU | 35.2 | 15 | 18 | | 45 | 104 | |
| Plutonium 239/240 | 6380 | 680 | 20 | 1.0 | | PU | 6320 | 540 | 7.8 | | 1 | 23 | |
| Ruthenium 106 | U | | 43 | | U | GAM | U | | | | 0 | 214 | |
| Antimony 125 | U | | 25 | | U | GAM | U | | | | 0 | 214 | |
| Potassium 40 | 13.3 | 6.3 | 5.5 | | | GAM | 17.0 | 5.2 | 4.5 | | 24 | 87 | |
| Cobalt 60 | U | | 0.76 | 0.050 | U | GAM | U | | 0.85 | U | - | | |
| Barium 133 | U | | 8.2 | | U | GAM | U | | | | 0 | 215 | |
| Cesium 137 | 21100 | 20 | 6.8 | 0.10 | | GAM | 21200 | 20 | 6.9 | | 0 | 32 | |
| Radium 226 | U | | 8.9 | 0.10 | U | GAM | U | | 9.1 | U | - | | |
| Radium 228 | U | | 9.8 | 0.20 | U | GAM | U | | 11 | U | - | | |
| Europium 152 | U | | 20 | 0.10 | U | GAM | U | | 20 | U | - | | |
| Europium 154 | 57.3 | 4.6 | 3.7 | 0.10 | | GAM | 61.9 | 4.6 | 3.4 | | 8 | 36 | |
| Europium 155 | 81.8 | 7.8 | 11 | 0.10 | | GAM | 85.1 | 8.0 | 12 | | 4 | 38 | |
| Thorium 228 | U | | 8.1 | | U | GAM | U | | 8.2 | U | - | | |

200-TW-1 & 2 - Soil Sampling

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 08/15/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

R107019-05 B125X2

## DUPLICATE, cont.

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7027 | | | Client/Case no | Hanford SDG H1409 |
| Contact | Melissa C. Mannion | | | Case no | No. 630 |
| | DUPLICATE | | ORIGINAL | | |
| Lab sample id | R107019-05 | Lab sample id | R107019-01 | Client sample id | B125X2 |
| Dept sample id | 7027-005 | Dept sample id | 7027-001 | Location/Matrix | T-26/200 W SOLID |
| | | Received | 07/03/01 | Collected/Weight | 06/27/01 11:15 401.4 g |
| % solids | 92.9 | % solids | 92.9 | Custody/SAF No | B01-058-2 B01-058 |

| ANALYTE | DUPLICATE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ORIGINAL pCi/g | 2σ ERR (COUNT) | MDA pCi/g | QUALI-FIERS | RPD % | 3σ TOT | PROT LIMIT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thorium 232 | U | | 9.8 | | U | GAM | U | | 11 | U | - | | |
| Uranium 235 | U | | 18 | | U | GAM | U | | 19 | U | - | | |
| Uranium 238 | U | | 300 | | U | GAM | U | | 310 | U | - | | |
| Americium 241 | U | | 290 | | U | GAM | U | | 300 | U | - | | |

200-TW-1 & 2 - Soil Sampling

QC-DUP#1 39163

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DUP |
| Version | 3.06 |
| Report date | 08/15/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

R107019-06 B125X2

## MATRIX SPIKE

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7027 | | | Client/Case no | Hanford SDG H1409 |
| Contact | Melissa C. Mannion | | | Case no | No. 630 |
| | MATRIX SPIKE | | ORIGINAL | | |
| Lab sample id | R107019-06 | Lab sample id | R107019-01 | Client sample id | B125X2 |
| Dept sample id | 7027-006 | Dept sample id | 7027-001 | Location/Matrix | T-26/200 W SOLID |
| | | Received | 07/03/01 | Collected/Weight | 06/27/01 11:15 401.4 g |
| % solids | 92.9 | % solids | 92.9 | Custody/SAF No | B01-058-2 B01-058 |

| ANALYTE | SPIKE pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST | ADDED pCi/g | 2σ ERR pCi/g | ORIGINAL pCi/g | 2σ ERR (COUNT) | REC % | 3σ LMTS (TOTAL) | PROTOCOL LIMITS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tritium | 720 | 7.3 | 1.6 | 400 | X | H | 857 | 34 | 0.466 | 0.94 | 84 | 86-114 | 60-140 |

200-TW-1 & 2 - Soil Sampling

QC-MS#1 39164

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

**SAMPLE DELIVERY GROUP H1409**

**R107019-01** **B125X2**

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7027 | Client/Case no | Hanford | SDG_H1409 | |
| Contact | Melissa C. Mannion | Contract | No. 630 | | |
| Lab sample id | R107019-01 | Client sample id | B125X2 | | |
| Dept sample id | 7027-001 | Location/Matrix | T-26/200 W | SOLID | |
| Received | 07/03/01 | Collected/Weight | 06/27/01 11:15 | 401.4 g | |
| % solids | 92.9 | Custody/SAF No | B01-058-2 | B01-058 | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Tritium | 10028-17-8 | 0.466 | 0.94 | 1.6 | 400 | U | H |
| Carbon 14 | 14762-75-5 | -0.955 | 2.7 | 4.6 | 50 | U | C |
| Nickel 63 | 13981-37-8 | -1.80 | 31 | 52 | 30 | U | NI_L |
| Total Strontium | SR-RAD | 49100 | 230 | 11 | 1.0 | | SR |
| Americium 241 | 14596-10-2 | 227 | 19 | 4.1 | 1.0 | | AM |
| Technetium 99 | 14133-76-7 | 0.909 | 1.3 | 3.8 | 15 | U | TC |
| Thorium 228 | 14274-82-9 | 4.09 | 4.7 | 6.5 | | U | TH |
| Thorium 230 | 14269-63-7 | 0.582 | 3.5 | 4.5 | 1.0 | U | TH |
| Thorium 232 | TH-232 | 1.74 | 2.3 | 4.5 | 1.0 | U | TH |
| Total Uranium (ug/g) | 7440-61-1 | 61.1 | 7.1 | 0.12 | 0.10 | | U_T |
| Uranium 233 | U-233/234 | 18.1 | 6.1 | 3.8 | 1.0 | | U |
| Uranium 235 | 15117-96-1 | 1.22 | 1.2 | 4.7 | 1.0 | U | U |
| Uranium 238 | U-238 | 21.1 | 6.2 | 3.8 | 1.0 | | U |
| Neptunium 237 | 13994-20-2 | 2.17 | 4.3 | 8.3 | 1.0 | U | NP |
| Plutonium 238 | 13981-16-3 | 35.2 | 15 | 18 | 1.0 | | PU |
| Plutonium 239/240 | PU-239/240 | 6320 | 540 | 7.8 | 1.0 | | PU |
| Potassium 40 | 13966-00-2 | 17.0 | 5.2 | 4.5 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.85 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | 21200 | 20 | 6.9 | 0.10 | | GAM |
| Radium 226 | 13982-63-3 | U | | 9.1 | 0.10 | U | GAM |
| Radium 228 | 15262-20-1 | U | | 11 | 0.20 | U | GAM |
| Europium 152 | 14683-23-9 | U | | 20 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | 61.9 | 4.6 | 3.4 | 0.10 | | GAM |
| Europium 155 | 14391-16-3 | 85.1 | 8.0 | 12 | 0.10 | | GAM |
| Thorium 228 | 14274-82-9 | U | | 8.2 | | U | GAM |
| Thorium 232 | TH-232 | U | | 11 | | U | GAM |
| Uranium 235 | 15117-96-1 | U | | 19 | | U | GAM |
| Uranium 238 | U-238 | U | | 310 | | U | GAM |

200-TW-1 & 2 - Soil Sampling

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/15/01 |

# DATA SHEET, cont

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7027 | Client/Case no | Hanford | | SDG H1409 |
| Contact | Melissa C. Mannion | Contract | No. 630 | | |
| Lab sample id | R107019-01 | Client sample id | B125X2 | | |
| Dept sample id | 7027-001 | Location/Matrix | T-26/200 W | | SOLID |
| Received | 07/03/01 | Collected/Weight | 06/27/01 11:15 | 401.4 g | |
| % solids | 92.9 | Custody/SAF No | B01-058-2 | B01-058 | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Americium 241 | 14596-10-2 | U | | 300 | | U | GAM |

200-TW-1 & 2 - Soil Sampling



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/15/01 |

# EBERLINE SERVICES/RICHMOND

**SAMPLE DELIVERY GROUP H1409**

**R107019-02** **B125Y4**

## DATA SHEET

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7027 | Client/Case no | Hanford | SDG H1409 | |
| Contact | Melissa C. Mannion | Contract | No. 630 | | |
| Lab sample id | R107019-02 | Client sample id | B125Y4 | | |
| Dept sample id | 7027-002 | Location/Matrix | T-26/200 W | SOLID | |
| Received | 07/03/01 | Collected/Weight | 06/27/01 04:30 | 1890 g | |
| % solids | 90.2 | Custody/SAF No | B01-058-14 | B01-058 | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Tritium | 10028-17-8 | 0.028 | 0.055 | 0.092 | 400 | U | H |
| Carbon 14 | 14762-75-5 | 1.23 | 2.6 | 4.2 | 50 | U | C |
| Nickel 63 | 13981-37-8 | 0.487 | 1.4 | 2.3 | 30 | U | NI_L |
| Total Strontium | SR-RAD | 0.026 | 0.16 | 0.33 | 1.0 | U | SR |
| Americium 241 | 14596-10-2 | -0.005 | 0.050 | 0.092 | 1.0 | U | AM |
| Technetium 99 | 14133-76-7 | -0.007 | 0.17 | 0.58 | 15 | U | TC |
| Thorium 228 | 14274-82-9 | 0.447 | 0.33 | 0.50 | | U | TH |
| Thorium 230 | 14269-63-7 | 0.284 | 0.32 | 0.39 | 1.0 | U | TH |
| Thorium 232 | TH-232 | 0.365 | 0.24 | 0.31 | 1.0 | J | TH |
| Total Uranium (ug/g) | 7440-61-1 | 1.72 | 0.20 | 0.024 | 0.10 | | U_T |
| Uranium 233 | U-233/234 | 0.355 | 0.20 | 0.19 | 1.0 | J | U |
| Uranium 235 | 15117-96-1 | 0.061 | 0.062 | 0.23 | 1.0 | U | U |
| Uranium 238 | U-238 | 0.659 | 0.26 | 0.19 | 1.0 | J | U |
| Neptunium 237 | 13994-20-2 | 0.033 | 0.067 | 0.10 | 1.0 | U | NP |
| Plutonium 238 | 13981-16-3 | 0 | 0.057 | 0.22 | 1.0 | U | PU |
| Plutonium 239/240 | PU-239/240 | 0.086 | 0.11 | 0.22 | 1.0 | U | PU |
| Potassium 40 | 13966-00-2 | 4.98 | 2.6 | 0.43 | | | GAM |
| Cobalt 60 | 10198-40-0 | U | | 0.041 | 0.050 | U | GAM |
| Cesium 137 | 10045-97-3 | 0.540 | 0.049 | 0.046 | 0.10 | | GAM |
| Radium 226 | 13982-63-3 | 0.203 | 0.11 | 0.080 | 0.10 | | GAM |
| Radium 228 | 15262-20-1 | 0.246 | 0.19 | 0.17 | 0.20 | | GAM |
| Europium 152 | 14683-23-9 | U | | 0.097 | 0.10 | U | GAM |
| Europium 154 | 15585-10-1 | U | | 0.12 | 0.10 | U | GAM |
| Europium 155 | 14391-16-3 | U | | 0.075 | 0.10 | U | GAM |
| Thorium 228 | 14274-82-9 | 0.349 | 0.073 | 0.046 | | | GAM |
| Thorium 232 | TH-232 | 0.246 | 0.19 | 0.17 | | | GAM |
| Uranium 235 | 15117-96-1 | U | | 0.13 | | U | GAM |
| Uranium 238 | U-238 | U | | 4.7 | | U | GAM |

200-TW-1 & 2 - Soil Sampling

| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/15/01 |

# DATA SHEET, cont

| | | | | | |
|---|---|---|---|---|---|
| SDG | 7027 | Client/Case no | Hanford | | SDG H1409 |
| Contact | Melissa C. Mannion | Contract | No. 630 | | |
| Lab sample id | R107019-02 | Client sample id | B125Y4 | | |
| Dept sample id | 7027-002 | Location/Matrix | T-26/200 W | | SOLID |
| Received | 07/03/01 | Collected/Weight | 06/27/01 04:30 | 1890 g | |
| % solids | 90.2 | Custody/SAF No | B01-058-14 | B01-058 | |

| ANALYTE | CAS NO | RESULT pCi/g | 2σ ERR (COUNT) | MDA pCi/g | RDL pCi/g | QUALI-FIERS | TEST |
|---|---|---|---|---|---|---|---|
| Americium 241 | 14596-10-2 | U | | 0.038 | | U | GAM |

200-TW-1 & 2 - Soil Sampling



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-DS |
| Version | 3.06 |
| Report date | 08/15/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test AM Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

AMERICIUM 241 IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Americium 241 |
|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | 227 |
| B125Y4 | R107019-02 | | | 7027-002 | U |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | 1.42 U |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | ok |
| Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling | | | | RDLs (pCi/g) | 1.0 |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 5.0 % | | | | Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 4.1 | 0.0200 | | | 21 | | 998 | | | 23 | 07/20/01 | 07/20 | SS-028 |
| B125Y4 | R107019-02 | | | 0.092 | 0.500 | | | 49 | | 998 | | | 23 | 07/20/01 | 07/20 | SS-029 |
| BLK (QC ID=39162) | R107019-04 | | | 5.4 | 0.0200 | | | 50 | | 162 | | | | 07/20/01 | 07/24 | SS-043 |
| LCS (QC ID=39161) | R107019-03 | | | 1.6 | 0.0200 | | | 51 | | 998 | | | | 07/20/01 | 07/20 | SS-031 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 7.6 | 0.0200 | | | 77 | | 101 | | | 23 | 07/20/01 | 07/20 | SS-019 |
| Nominal values and limits from method | | | | 1.0 | 0.0200 | | | 20-105 | | 100 | 100 | | 180 | | | |

| PROCEDURES | REFERENCE | AMCMISO_IE_PLATE_AEA |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-070 | Soil Dissolution, < 1.0g Aliquot, rev 4 |
| | CP-940 | Plutonium Separation and Purification, rev 3 |
| | CP-960 | Americium-Curium Purification, Large Aliquot, rev 4 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| | MDA | 3.8 | ± | 6.0 |
| | YIELD | 50 | ± | 40 |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test NP Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Neptunium 237 | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | 2.17 | U |
| B125Y4 | R107019-02 | | | 7027-002 | U | |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | 1.03 | U |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok | |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | - | U |

Nominal values and limits from method RDLs (pCi/g) 1.0
200-TW-1 & 2 - Soil Sampling

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 5.0 % | | | | | | | Reference Lab Notebook 6994 pg. 084 | | | | | | | | |
| B125X2 | R107019-01 | | | 8.3 | 0.0200 | | | 50 | | ~~204~~ | 108 | | 22 | 07/17/01 | 07/19 | SS-028 |
| B125Y4 | R107019-02 | | | 0.10 | 0.500 | | | 66 | | ~~199~~ | 105 | | 21 | 07/17/01 | 07/18 | SS-043 |
| BLK (QC ID=39162) | R107019-04 | | | 2.8 | 0.0200 | | | 52 | | ~~200~~ | 109 | | | 07/17/01 | 07/19 | SS-042 |
| LCS (QC ID=39161) | R107019-03 | | | 3.1 | 0.0200 | | | 52 | | ~~199~~ | 104 | | | 07/17/01 | 07/18 | SS-044 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 2.8 | 0.0200 | | | 61 | | ~~204~~ | 108 | | 22 | 07/17/01 | 07/19 | SS-027 |
| Nominal values and limits from method | | | | 1.0 | 0.0200 | | | 20-105 | | 100 | | | 180 | | | |

mm 8/16/01

| PROCEDURES | REFERENCE | NP237_LLE_PLATE_AEA |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-070 | Soil Dissolution, < 1.0g Aliquot, rev 4 |
| | CP-934 | Neptunium from Solids and Water by Extraction Chromatography, rev 2 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| | MDA | 3.4 | ± | 6.0 |
| | YIELD | 56 | ± | 14 |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test PU Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Plutonium 238 | Plutonium 239/240 |
|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | 35.2 | 6320 |
| B125Y4 | R107019-02 | | | 7027-002 | U | U |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | U | 1.84 U |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok | ok |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | ok | ok |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 1.0 | 1.0 |
| 200-TW-1 & 2 - Soil Sampling | | | | | | |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 5.0 % | | | Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 18 | 0.0200 | | | 83 | | 108 | | | 21 | 07/18/01 | 07/18 | SS-029 |
| B125Y4 | R107019-02 | | | 0.22 | 0.500 | | | 72 | | 108 | | | 21 | 07/18/01 | 07/18 | SS-031 |
| BLK (QC ID=39162) | R107019-04 | | | 5.9 | 0.0200 | | | 85 | | 108 | | | | 07/18/01 | 07/18 | SS-033 |
| LCS (QC ID=39161) | R107019-03 | | | 5.1 | 0.0200 | | | 76 | | 108 | | | | 07/18/01 | 07/18 | SS-032 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 20 | 0.0200 | | | 44 | | 108 | | | 21 | 07/18/01 | 07/18 | SS-034 |
| Nominal values and limits from method | | | | 1.0 | 0.0200 | | | 20-105 | | 100 | 100 | | 180 | | | |

| PROCEDURES | REFERENCE | PUISO_PLATE_AEA |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-940 | Plutonium Separation and Purification, rev 3 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| | MDA | 9.8 | ± | 17 |
| | YIELD | 72 | ± | 33 |



Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test TH Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Thorium 228 | | Thorium 230 | | Thorium 232 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | U | | U | | 1.74 | U |
| B125Y4 | R107019-02 | | | 7027-002 | U | | U | | 0.365 | J |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | U | | U | | U | |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | | | ok | | | |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | - | U | - | U | ok | J |
| Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling | | | | RDLs (pCi/g) | | | 1.0 | | 1.0 | |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 5.0 % | | | Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 4.5 | 0.0200 | | | 89 | | 158 | | | 22 | 07/16/01 | 07/19 | SS-022 |
| B125Y4 | R107019-02 | | | 0.39 | 0.250 | | | 98 | | 158 | | | 22 | 07/16/01 | 07/19 | SS-024 |
| BLK (QC ID=39162) | R107019-04 | | | 3.6 | 0.0200 | | | 88 | | 1062 | | | | 07/16/01 | 07/16 | SS-022 |
| LCS (QC ID=39161) | R107019-03 | | | 3.7 | 0.0200 | | | 81 | | 1063 | | | | 07/16/01 | 07/16 | SS-021 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 3.7 | 0.0200 | | | 97 | | 158 | | | 23 | 07/16/01 | 07/20 | SS-022 |
| Nominal values and limits from method | | | | 1.0 | 0.0200 | | | 20-105 | | 150 | | | 180 | | | |

| PROCEDURES | REFERENCE | THISO_IE_PLATE_AEA |
|---|---|---|
| | CP-070 | Soil Dissolution, < 1.0g Aliquot, rev 4 |
| | CP-905 | Thorium in Water and Dissolved Solid Sample Using TRU and AG 1x8 Resin, rev 1 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| | MDA | 3.2 | ± | 3.2 |
| | YIELD | 91 | ± | 14 |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

| | |
|---|---|
| Test U | Matrix SOLID |
| SDG 7027 | |
| Contact Melissa C. Mannion | |

## METHOD SUMMARY

*URANIUM, ISOTOPIC IN SOIL*

ALPHA SPECTROSCOPY

| | |
|---|---|
| Client Hanford | |
| Contract No. 630 | |
| Contract SDG H1409 | |

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | 1: Uranium 233 | 2: Uranium 235 | 3: Uranium 238 | RESULT RATIOS (%) 1÷3 | 2σ | 2÷3 | 2σ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | 18.1 | 1.22 U | 21.1 | 86 | 38 | 6 | 6 |
| B125Y4 | R107019-02 | | | 7027-002 | 0.355 J | U | 0.659 J | 54 | 37 | 9 | 10 |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | 1.07 U | U | U | | | | |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok | ok | ok | | | | |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | ok | - U | ok | 82 | 34 | 7 | 10 |
| Nominal values and limits from method | | | | RDLs (pCi/g) | 1.0 | 1.0 | 1.0 | 100 | | 4 | |
| 200-TW-1 & 2 - Soil Sampling | | | | | | | Averages | 74 | | 7 | |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 5.0 % | | | | Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 4.7 | 0.0200 | | | 104 | | 118 | | | 20 | 07/13/01 | 07/17 | SS-027 |
| B125Y4 | R107019-02 | | | 0.23 | 0.500 | | | 78 | | 118 | | | 20 | 07/13/01 | 07/17 | SS-028 |
| BLK (QC ID=39162) | R107019-04 | | | 4.9 | 0.0200 | | | 90 | | 118 | | | | 07/13/01 | 07/17 | SS-031 |
| LCS (QC ID=39161) | R107019-03 | | | 21 | 0.0200 | | | 100 | | 118 | | | | 07/13/01 | 07/17 | SS-029 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 4.6 | 0.0200 | | | 94 | | 118 | | | 20 | 07/13/01 | 07/17 | SS-032 |
| Nominal values and limits from method | | | | 1.0 | 0.0200 | | | 20-105 | | 100 | 100 | | 180 | | | |

| | | |
|---|---|---|
| PROCEDURES | REFERENCE | UISO_PLATE_AEA |
| | CP-911 | Uranium in Water and Dissolved Sample by Extraction Chromatography, rev 3 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

| | | | |
|---|---|---|---|
| AVERAGES ± 2 SD | MDA | 7.1 | ± 16 |
| FOR 5 SAMPLES | YIELD | 93 | ± 20 |



| | |
|---|---|
| Lab id | TMANC |
| Protocol | Hanford |
| Version | Ver 1.0 |
| Form | DVD-CMS |
| Version | 3.06 |
| Report date | 08/15/01 |

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test SR Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Total Strontium |
|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | 49100 |
| B125Y4 | R107019-02 | | | 7027-002 | U |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | 1.05 U |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | ok |
| Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling | | | | RDLs (pCi/g) | 1.0 |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 11 | 0.0200 | | | 74 | | 150 | | | 16 | 07/13/01 | 07/13 | GRB-231 |
| B125Y4 | R107019-02 | | | 0.33 | 1.00 | | | 88 | | 100 | | | 16 | 07/13/01 | 07/13 | GRB-201 |
| BLK (QC ID=39162) | R107019-04 | | | 19 | 0.0200 | | | 75 | | 100 | | | | 07/13/01 | 07/13 | GRB-204 |
| LCS (QC ID=39161) | R107019-03 | | | 9.9 | 0.0200 | | | 72 | | 200 | | | | 07/13/01 | 07/13 | GRB-218 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 9.7 | 0.0200 | | | 77 | | 150 | | | 16 | 07/13/01 | 07/13 | GRB-230 |
| Nominal values and limits from method | | | | 1.0 | 0.0200 | | | 30-105 | | 100 | | | 180 | | | |

| | | |
|---|---|---|
| PROCEDURES | REFERENCE | SRTOT_SEP_PRECIP_GPC |
| | CP-502 | Strontium in Solids, rev 4 |
| | CP-519 | Strontium Planchet Demounting and Preparation for 90Y Decontamination, rev 3 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 10 ± 13
YIELD 77 ± 13

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test TC Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Technetium 99 | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | U | |
| B125Y4 | R107019-02 | | | 7027-002 | U | |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | U | |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok | |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | - | U |

Nominal values and limits from method RDLs (pCi/g) 15
200-TW-1 & 2 - Soil Sampling

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 3.8 | 0.150 | | | 94 | | 50 | | | 33 | 07/24/01 | 07/30 | GRB-221 |
| B125Y4 | R107019-02 | | | 0.58 | 1.00 | | | 86 | | 50 | | | 33 | 07/24/01 | 07/30 | GRB-222 |
| BLK (QC ID=39162) | R107019-04 | | | 3.6 | 0.150 | | | 95 | | 50 | | | | 07/24/01 | 07/30 | GRB-224 |
| LCS (QC ID=39161) | R107019-03 | | | 3.7 | 0.150 | | | 96 | | 50 | | | | 07/24/01 | 07/30 | GRB-223 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 3.2 | 0.160 | | | 88 | | 73 | | | 35 | 07/24/01 | 08/01 | GRB-232 |
| Nominal values and limits from method | | | | 15 | 0.150 | | | 20-105 | | 50 | | | 180 | | | |

| PROCEDURES | REFERENCE | TC99_TR_SEP_LSC |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-021 | Preparation of Tc-99m Tracer, rev 1 |
| | CP-002 | Q.C. Preparation, rev 3 |
| | CP-003 | Tracing, rev 3 |
| | CP-542 | Technetium-99 Purification (Soil) by Extraction Chromatography, rev 1 |
| | CP-008 | Heavy Element Electroplating, rev 6 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 3.0 ± 2.7
YIELD 92 ± 9

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test GAM Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Cobalt 60 | | Cesium 137 |
|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | U | | 21200 |
| B125Y4 | R107019-02 | | | 7027-002 | U | | 0.540 |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | U | | U |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok | | ok |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | - | U | ok |
| Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling | | | | RDLs (pCi/g) | 0.050 | | 0.10 |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MAX MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 2σ prep error 15.0 % Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 3.5 | 11.8 | | | | | 401 | | | 21 | 07/16/01 | 07/18 | SP,01,00 |
| B125Y4 | R107019-02 | | | 0.093 | 214 | | | | | 407 | | | 21 | 07/16/01 | 07/18 | JR,07,00 |
| BLK (QC ID=39162) | R107019-04 | | | 0.57 | 11.8 | | | | | 405 | | | | 07/16/01 | 07/18 | JR,04,00 |
| LCS (QC ID=39161) | R107019-03 | | | 0.65 | 11.8 | | | | | 414 | | | | 07/16/01 | 07/18 | JR,05,00 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 3.5 | 11.8 | | | | | 412 | | | 21 | 07/16/01 | 07/18 | SP,01,00 |
| Nominal values and limits from method | | | | 0.050 | 11.8 | | | | | 100 | | | 180 | | | |

| PROCEDURES | REFERENCE | GAMMA_GS |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-100 | Ge(Li) Preparation for Commercial Samples, rev 3 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| | MDA | 1.7 | ± | 3.4 |
| | YIELD | | ± | |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test U T Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

URANIUM, TOTAL IN SOIL
KINETIC PHOSPHORIMETRY

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Total Uranium (ug/g) |
|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | 61.1 |
| B125Y4 | R107019-02 | | | 7027-002 | 1.72 |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | U |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | ok |
| Nominal values and limits from method 200-TW-1 & 2 - Soil Sampling | | | | RDLs (ug/g) | 0.10 |

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA ug/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 2σ prep error 9.0 % Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 0.12 | 0.0200 | | | | | | | | 40 | 08/06/01 | 08/06 | KPA-001 |
| B125Y4 | R107019-02 | | | 0.024 | 0.100 | | | | | | | | 40 | 08/06/01 | 08/06 | KPA-001 |
| BLK (QC ID=39162) | R107019-04 | | | 0.012 | 0.0200 | | | | | | | | | 08/06/01 | 08/06 | KPA-001 |
| LCS (QC ID=39161) | R107019-03 | | | 0.12 | 0.0200 | | | | | | | | | 08/06/01 | 08/06 | KPA-001 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 0.12 | 0.0200 | | | | | | | | 40 | 08/06/01 | 08/06 | KPA-001 |
| Nominal values and limits from method | | | | 0.10 | 0.0200 | | | | | | | | 180 | | | |

| PROCEDURES | REFERENCE | UTOT_KPA |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-070 | Soil Dissolution, < 1.0g Aliquot, rev 4 |
| | CP-044 | Sample Preparation for Total Uranium by Kinetic Phosphorimetry, rev 3 |
| | CP-928 | Total Uranium by Kinetic Phosphorimetry, rev 3 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.079 ± 0.11
YIELD ____ ± ____

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test C Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

CARBON 14 IN SOIL

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Carbon 14 | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | U | |
| B125Y4 | R107019-02 | | | 7027-002 | U | |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | U | |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok | |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | - | U |

Nominal values and limits from method RDLs (pCi/g) 50
200-TW-1 & 2 - Soil Sampling

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 10.0 % | | | | Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 4.6 | 0.202 | | | 100 | | 100 | | | 35 | 07/31/01 | 08/01 | LSC-007 |
| B125Y4 | R107019-02 | | | 4.2 | 0.203 | | | 100 | | 100 | | | 35 | 07/31/01 | 08/01 | LSC-007 |
| BLK (QC ID=39162) | R107019-04 | | | 4.5 | 0.200 | | | 100 | | 100 | | | | 07/31/01 | 08/01 | LSC-007 |
| LCS (QC ID=39161) | R107019-03 | | | 13 | 0.200 | | | 100 | | 12 | | | | 07/31/01 | 08/01 | LSC-007 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 4.3 | 0.203 | | | 100 | | 100 | | | 35 | 07/31/01 | 08/01 | LSC-007 |
| Nominal values and limits from method | | | | 50 | 0.200 | | | | | 50 | | | 180 | | | |

| PROCEDURES | REFERENCE | C14_COX_LSC |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-251 | Tritium/Carbon-14 Oxidation, rev 3 |

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 6.1 ± 7.7
YIELD 100 ± 0

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test H Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Tritium | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | U | |
| B125Y4 | R107019-02 | | | 7027-002 | U | |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | U | |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok | |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | - | U |
| Spike (R107019-01) | R107019-06 | | | 7027-006 | LOW | X |

Nominal values and limits from method RDLs (pCi/g) 400
200-TW-1 & 2 - Soil Sampling

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 1.6 | 1.14 | | | 100 | | 120 | | | 33 | 07/30/01 | 07/30 | LSC-005 |
| B125Y4 | R107019-02 | | | 0.092 | 21.9 | | | 91 | | 120 | | | 33 | 07/30/01 | 07/30 | LSC-005 |
| BLK (QC ID=39162) | R107019-04 | | | 5.5 | 1.00 | | | 33 | | 120 | | | | 07/30/01 | 07/30 | LSC-005 |
| LCS (QC ID=39161) | R107019-03 | | | 5.4 | 1.00 | | | 33 | | 120 | | | | 07/30/01 | 07/30 | LSC-005 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 1.6 | 1.15 | | | 100 | | 120 | | | 33 | 07/30/01 | 07/30 | LSC-005 |
| Spike (R107019-01) (QC ID=39164) | R107019-06 | | | 1.6 | 1.18 | | | 100 | | 115 | | | 33 | 07/30/01 | 07/30 | LSC-005 |
| Nominal values and limits from method | | | | 400 | 1.00 | | | | | 25 | | | 180 | | | |

| PROCEDURES | REFERENCE | 906.0_H3_LSC |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | CP-216 | Tritium in Solid Samples by Azeotropic Distillation, rev 4 |

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 2.6 ± 4.5
YIELD 76 ± 67

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

# EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1409

Test NI_L Matrix SOLID
SDG 7027
Contact Melissa C. Mannion

## METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H1409

## RESULTS

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | PLANCHET | Nickel 63 | |
|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | | | | | | |
| B125X2 | R107019-01 | | | 7027-001 | U | |
| B125Y4 | R107019-02 | | | 7027-002 | U | |
| BLK (QC ID=39162) | R107019-04 | | | 7027-004 | U | |
| LCS (QC ID=39161) | R107019-03 | | | 7027-003 | ok | |
| Duplicate (R107019-01) | R107019-05 | | | 7027-005 | - | U |

Nominal values and limits from method RDLs (pCi/g) 30
200-TW-1 & 2 - Soil Sampling

## METHOD PERFORMANCE

| CLIENT SAMPLE ID | LAB SAMPLE ID | RAW TEST | SUF-FIX | MDA pCi/g | ALIQ g | PREP FAC | DILU-TION | YIELD % | EFF % | COUNT min | FWHM keV | DRIFT KeV | DAYS HELD | PREPARED | ANAL-YZED | DETECTOR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preparation batch 6994-084 | 2σ prep error 10.0 % Reference Lab Notebook 6994 pg. 084 | | | | | | | | | | | | | | | |
| B125X2 | R107019-01 | | | 52 | 0.0200 | | | 94 | | 100 | | | 20 | 07/14/01 | 07/17 | LSC-004 |
| B125Y4 | R107019-02 | | | 2.3 | 0.500 | | | 87 | | 100 | | | 21 | 07/14/01 | 07/18 | LSC-004 |
| BLK (QC ID=39162) | R107019-04 | | | 51 | 0.0200 | | | 95 | | 100 | | | | 07/14/01 | 07/18 | LSC-004 |
| LCS (QC ID=39161) | R107019-03 | | | 62 | 0.0200 | | | 96 | | 72 | | | | 07/14/01 | 07/18 | LSC-004 |
| Duplicate (R107019-01) (QC ID=39163) | R107019-05 | | | 51 | 0.0200 | | | 95 | | 100 | | | 21 | 07/14/01 | 07/18 | LSC-004 |
| Nominal values and limits from method | | | | 30 | 0.0200 | | | 30-105 | | 50 | | | 180 | | | |

| PROCEDURES | REFERENCE | NI63_LSC |
|---|---|---|
| | CP-060 | Soil Preparation, rev 3 |
| | RP-431 | Nickel-63 Purification, rev 0 |

| AVERAGES ± 2 SD FOR 5 SAMPLES | | | | |
|---|---|---|---|---|
| | MDA | 44 | ± | 47 |
| | YIELD | 93 | ± | 7 |

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 08/15/01

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | B01-058-2 | Page 1 of 1 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Collector: Thomas G./Watson D./FAHLBERG, R. | Company Contact: Todd, M.E. | Telephone No.: (509) 372-9631 | Project Coordinator: TRENT, SJ |
| Price Code: 8N | Data Turnaround: 45 Days | Air Quality ☐ | |
| Project Designation: 200-TW-1 & 2 - Soil Sampling | Sampling Location: T-26/200 W H1409 (7027) | SAF No.: B01-058 | |
| Ice Chest No.: SM1-4616 (1 of 1) | Field Logbook No.: EL-1518 | COA: B20TW1A44C | Method of Shipment: Government Vehicle/Fed EX |
| Shipped To: RT 6-28-01 ~~Severn Trent Incorporated~~ TMA (EBERLINE) | Offsite Property No.: RSR 106556 | | Bill of Lading/Air Bill No.: NA |

POSSIBLE SAMPLE HAZARDS/REMARKS

*Radioactive* 55K dpm ACTIVITY ON BOTTLES <0.5 mrem DOSE

**Special Handling and/or Storage**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None | None | | |
| Type of Container | aG | aG | aG | aG | aG | aG | aG | aG | | |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Volume | 120mL | 60mL | 250mL | 60mL | 250mL | 120mL | 250mL | 60mL | | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | Chromium Hex - 7196 | See item (2) in Special Instructions. | VOA - 8260A (TCL) | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. | Activity Scan | | |
| Sample No. / Matrix* / Sample Date / Sample Time | | | | | | | | | | |
| B125X2 / SOIL / 06-27-01 / 1115 | | | | | | | X | X | TIETO | B12629 |

DELETE 6-28-01 RT

RT 6-28-01

| CHAIN OF POSSESSION | Date/Time | Sign/Print Names | Date/Time |
|---|---|---|---|
| Relinquished By/Removed From: R. Fahlberg R. Fahlberg 6-28-01 | 0800 | Received By/Stored In: Ref 1-C | 0800 6-28-01 |
| Relinquished By/Removed From: Ref 1C 3728 | 0800 7-2-01 | Received By/Stored In: R. Thorey R. Thorey | 0800 7-2-01 |
| Relinquished By/Removed From: R. Thorey | 0800 7-2-01 | Received By/Stored In: FED EX | 7-2-01 |
| Relinquished By/Removed From: FED-EXP12458 | 10:00 7-3-01 | Received By/Stored In: SC-2 E. Regan ENSPECUS | 10:00 7-3-01 |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |

SPECIAL INSTRUCTIONS

RT 6-28-01

~~(1) ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV)~~
~~(2) IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}~~; Ammonia - 350.1; NO2/NO3 - 353.1; Total Cyanide - 9010; TOC - 9060; pH (Soil) - 9045
~~(3) Semi-VOA - 8270A (Add On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D~~
~~(4) ICP Metals - 6010TR (Client List) {Aluminum, Bismuth, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}~~
(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

**Samples stored in Ref.# 1C at the 3728 Shipping Facility on 6/28/01. Collector not available to relinquish samples on 7/2/01 for shipment.** RT 7-2-01

Matrix*: S=Soil; SB=Sediment; SO=Solid; SL=Sludge; W=Water; O=Oil; A=Air; DS=Drum Solids; DL=Drum Liquids; T=Tissue; WI=Wipe; L=Liquid; V=Vegetation; X=Other

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

| Bechtel Hanford Inc. | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | B01-058-14 | Page 1 of 1 |
|---|---|---|---|---|
| Collector: Thomas G./Watson D. | Company Contact: Todd, M.E. | Telephone No.: (509) 372-9631 | Project Coordinator: TRENT, SJ | Price Code: 8N; Data Turnaround: 45 Days |
| Project Designation: 200-TW-1 & 2 - Soil Sampling | Sampling Location: T-26/200 W H1409 (7027) | | SAF No.: B01-058 | Air Quality ☐ |
| Ice Chest No.: ERC00-005 / ERC99-023 | Field Logbook No.: EL-1518 | COA: B20TW1A44C | Method of Shipment: Fed EX | |
| Shipped To: ~~CMA/RECRA~~ | Offsite Property No.: A010241 | | Bill of Lading/Air Bill No.: 4235795455 02 / 5513 | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*Radioactive* COUNTS: BACKGROUND ON SPLIT SPOON < 0.5mrem DOSE

**Special Handling and/or Storage**

| Preservation | Cool 4C | Cool 4C | Cool 4C | Cool 4C | None | None |
|---|---|---|---|---|---|---|
| Type of Container | aG | aG | aG | aG | aG | aG |
| No. of Container(s) | 1 | 1 | 1 | 1 | 1 | 1 |
| Volume | 500mL | 1000mL | 120mL | 500mL | 500mL | 1000mL |
| **SAMPLE ANALYSIS** | See item (1) in Special Instructions. | See item (2) in Special Instructions. | VOA - 8260A (TCL) | See item (3) in Special Instructions. | See item (4) in Special Instructions. | See item (5) in Special Instructions. |

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 6/27/01. Collector not available to relenquish samples on 7/2/01 for shipment.

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B125Y4 | SOIL | 06-27-01 | 0430 | | | | | X | | | MFTO | B2675 |
| | | | | | | | | | | | | B2631 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| DJWatson/SCW | 6-27-01 0820 | REF1B | 6-27-01 0820 |
| RTRichard 3728 | 7-2-01 0800 | RTThorey | 7-2-01 0800 |
| RTThorey | 7-2-01 0800 | FED EX | 7-2-01 |
| FED EXPRESS | 7-3-01 2:PM | SCA-2 / E Jegus | 7-3-01 10AM |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) ~~ICP Metals - 6010A (TAL) {Cadmium, Chromium, Copper, Nickel, Silver}; ICP Metals - 6010A (Add-on) {Bismuth, Lead}; Mercury - 7470 - (CV), Chromium Hex - 7196~~
(2) ~~IC Anions - 300.0 {Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate}; Ammonia - 350.3; NO2/NO3 - 353.1; Total Cyanide - 9010, TOC - 9060, pH (Soil) - 9045~~
(3) ~~Semi-VOA - 8270A (Add On) {Tributyl phosphate}; TPH-Diesel Range - WTPH-D~~
(4) ~~ICP Metals - 6010TR (Client List) {Aluminum, Biomass, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Silver, Sodium, Vanadium, Zinc}~~
(5) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Radium-226, Radium-228}; Isotopic Plutonium; Isotopic Thorium {Thorium-232}; Americium-241; Carbon-14; Neptunium-237; Nickel-63; Strontium-89,90 -- Total Sr; Technetium-99; Total Uranium; Tritium - H3; Isotopic Uranium

RT 6/28/01

**Matrix ***
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

BHI-EE-011 (10/99)

## SAMPLE RECEIPT CHECKLIST

### SAMPLE RECEIPT

Client: Bechtel Hanford Inc. Date/Time received 7-03-01 2:00 PM

CoC No. B01-058-14

Container I.D. No. ERC 00-005/ ERC 99-023 Requested TAT (Days) 45 DAYS P.O. Received Yes [ ] No [✓]

### INSPECTION

1. Custody seals on shipping container intact? Yes [✓] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [✓] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [✓] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [✓] No [ ] N/A [ ]
5. Cooler Temperature: _____ Packing material is: Wet [ ] Dry [✓]
6. Number of samples in shipping container: 1 SAMPLE
7. Number of containers per sample: (1 EACH) (Or see CoC _____)
8. Paperwork agrees with samples? Yes [✓] No [ ]
9. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]
10. Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]
11. Describe any anomalies: _____

13. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
14. Received by Alvie D Maestas Date: 7/3/01 Time: 2:00 PM

| Customer Sample No. | cpm | mr/hr | Customer Sample No. | Cpm | mr/hr |
|---|---|---|---|---|---|
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Ion Chamber Ser. No. _____ Calibration date _____

Survey Meter Ser No. _____ Calibration date _____