

R. Schmitt

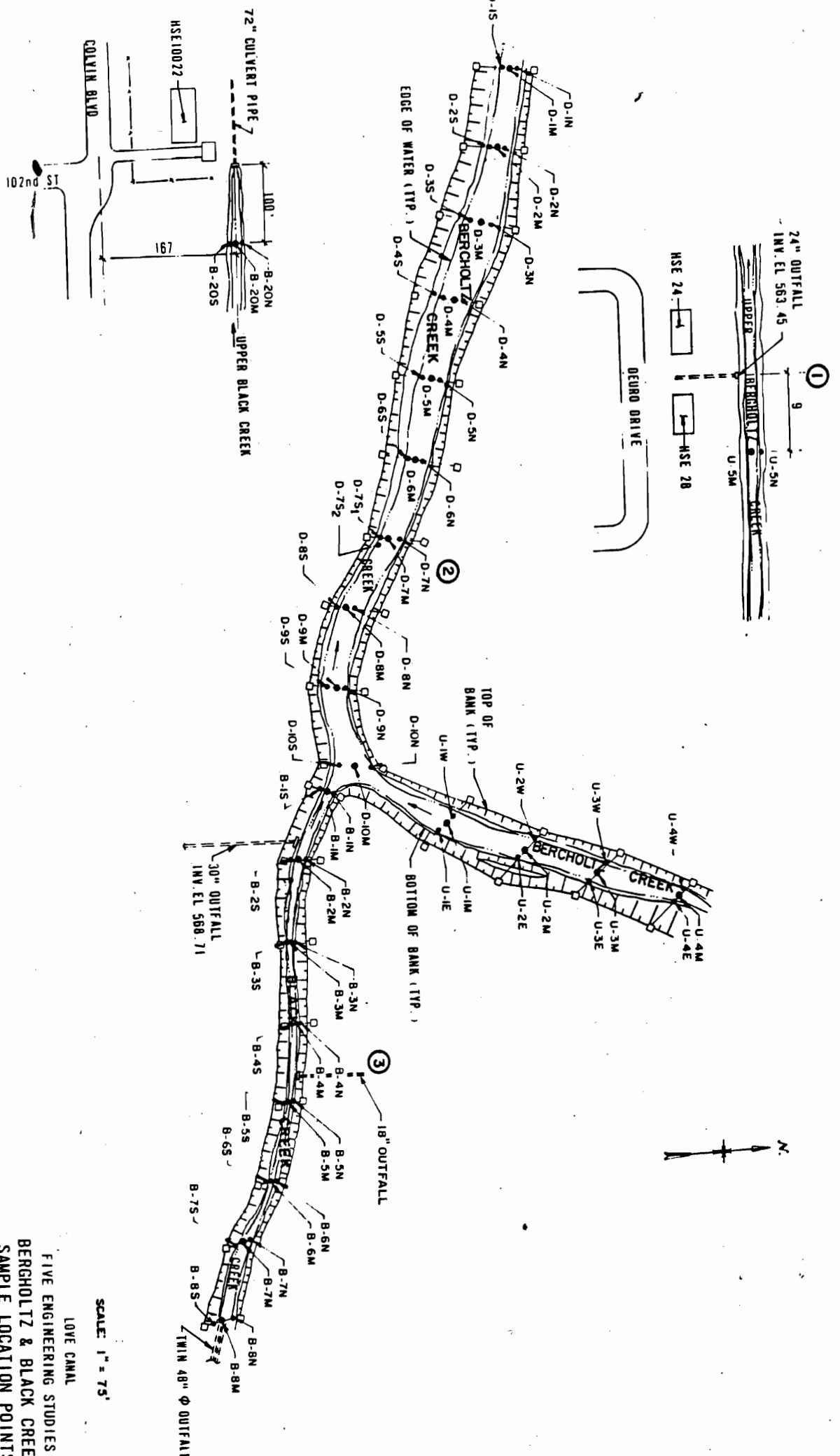
Environmental Information Document

**SITE INVESTIGATIONS
AND
REMEDIAL ACTION ALTERNATIVES
LOVE CANAL**

**For
Division of Solid and Hazardous Waste
New York State Department
of Environmental Conservation
Albany, New York**

October 1983

**By
Malcolm Pirnie, Inc.
Environmental Engineers, Scientists & Planners**



FIVE ENGINEERING STUDIES
 LOVE CANAL
 BERCHOLTZ & BLACK CREEK
 SAMPLE LOCATION POINTS
 TASK III

SCALE: 1" = 75'

TABLE 3-4

Summary of Inorganic Constituent Concentrations in Soil
 Samples from Around the State of New York. Ranges and Means
 Include 5 to 25 Samples (from Boerngen and Shacklette, 1981).

<u>Constituent</u>	<u>Range</u> ⁽¹⁾	<u>Mean</u>	<u>95.5% Confidence Limits</u> ⁽⁴⁾
Aluminum	15,000 to 100,000	48,000	0 to 100,000
Antimony	< 1 to 1	0.75 ⁽²⁾	0.21 to 1.29
Arsenic	1.5 to 16	7.0	0 to 15.6
Barium	200 to 500	300	0 to 500
Beryllium	ND to 2.0	0.6 ⁽³⁾	0 to 2.6
Cadmium	--	--	--
Calcium	800 to 28,000	5,200	0 to 17,200
Chromium	7 to 100	34	0 to 75
Cobalt	3 to 15	8	0 to 16
Copper	7 to 70	22	0 to 57
Iron	10,000 to 70,000	28,000	0 to 56,000
Lead	ND to 50	21	0 to 45
Magnesium	1,500 to 15,000	5,000	0 to 12,000
Manganese	70 to 2,000	1,100	0 to 6,900
Mercury	0.05 to 0.60	0.15	0 to 0.47
Nickel	ND to 30	14	0 to 29
Potassium	7,100 to 37,000	15,500	2,200 to 28,300
Selenium	< 0.1 to 0.6	0.3	0 to 0.7
Silver	--	--	--
Sodium	3,000 to 15,000	8,000	2,000 to 14,000
Thallium	6.05 to 12.37	9.08	4.30 to 13.86
Tin	1.19 to 2.16	1.93	0.93 to 2.93
Vanadium	20 to 150	60	0 to 130
Zinc	39 to 120	64	8 to 110
Cyanide	--	--	--

(1) All concentrations in ppm

(2) Concentrations below MDL were included in statistics at 0.5 MDL

(3) Not detected assumed to equal 0.0 in statistical calculations

(4) 95.5% confidence limit defined as mean \pm 2 standard deviations

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-014S-A
 Location ID: B-1-N
 CompuChem #: 2713

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile	222	Methylene Chloride	2,300	2,000	170
Acid	LS	Heneicosane	500	EC	1564
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	440	200	1488
	429	Di-N-Octyl Phthalate	420	200	1647
	LS	Pentacosane	8,000	EC	1387
	LS	Pentacosane	8,600	EC	1446
	LS	Tricosane	8,400	EC	1514
	LS	Pentacosane	8,000	EC	1597
	LS	Tricosane	7,600	EC	1694

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	17	1.0
105	Chromium, Total	6.8	1.0
106	Copper, Total	13	1.0
107	Lead, Total	15	1.0
109	Nickel, Total	7.1	1.0
112	Thallium, Total	8.6	1.0
113	Zinc, Total	39	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-018S-A
Location ID: B-2-S
CompuChem #: 2701

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	1,300	EC	1256
	LS	Eicosane	3,200	EC	1464
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	5,200	EC	1551
	LS	Pentacosane	37,000	EC	1325
	LS	Tricosane	38,000	EC	1375
	LS	Pentacosane	37,000	EC	1430
	LS	Pentacosane	36,000	EC	1495
	LS	Pentacosane	35,000	EC	1572

INORGANICS

INSUFFICIENT SAMPLE MATERIAL AVAILABLE TO PERFORM INORGANICS ANALYSIS.

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-021S-A
 Location ID: B-3-S
 CompuChem #: 2710

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid		None Detected			
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	4,500	2,000 ¹	1524
	LS	Tricosane	110,000	EC	1356
	LS	Pentacosane	150,000	EC	1409
	LS	Pentacosane	190,000	EC	1471
	LS	Pentacosane	110,000	EC	1543
	LS	Pentacosane	180,000	EC	1628

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	28	1.0
104	Cadmium, Total	1.7	1.0
105	Chromium, Total	13	1.0
106	Copper, Total	16	1.0
107	Lead, Total	62	1.0
109	Nickel, Total	13	1.0
112	Thallium, Total	12	1.0
113	Zinc, Total	44	1.0

¹ Sample extract could not be concentrated to 0.5 ml, thus the detection limits are higher than normal.

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-024S-B
 Location ID: B-4-N
 CompuChem #: 2640

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Cyclotrisiloxane, Hexamethyl-	390	EC	525
	LS	Cyclotetrasiloxane, Octamethyl-	320	EC	719
	LS	Unknown	660	EC	1257*
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	1,700	200	1523
	LS	Unknown	620	EC	1037

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	35	1.0
104	Cadmium, Total	1.6	1.0
105	Chromium, Total	10	1.0
106	Copper, Total	18	1.0
107	Lead, Total	20	1.0
109	Nickel, Total	13	1.0
112	Thallium, Total	14	1.0
113	Zinc, Total	38	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-027S-A
 Location ID: B-5-N
 CompuChem #: 2648

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	52,000	EC	1020
	LS	Unknown	130,000	EC	1461
	LS	Heneicosane	120,000	EC	1540
	LS	Unknown	25,000	EC	1575
	LS	Pentacosane	310,000	EC	1594
Base/Neutral/ Pesticide		None Detected			

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	27	1.0
105	Chromium, Total	18	1.0
106	Copper, Total	16	1.0
107	Lead, Total	48	1.0
109	Nickel, Total	11	1.0
112	Thallium, Total	2.5	1.0
113	Zinc, Total	91	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-027S-C
 Location ID: B-5-N
 CompuChem #: 2650

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	4,400	EC	1110
	LS	Unknown	12,000	EC	1292
	LS	Pentacosane	56,000	EC	1442
	LS	Unknown	19,000	EC	1457
	LS	Unknown	44,000	EC	1592
Base/Neutral/ Pesticide	429	Di-N-Octyl Phthalate	220	200	1736

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	17	1.0
104	Cadmium, Total	1.0	1.0
105	Chromium, Total	10	1.0
106	Copper, Total	15	1.0
107	Lead, Total	21	1.0
109	Nickel, Total	13	1.0
112	Thallium, Total	7.4	1.0
113	Zinc, Total	42	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-016L
Location ID: B-6
CompuChem #: 2004

Page 1

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/l)</u>	<u>Detection Limit (ug/l)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	10	EC	666
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	220	10	1529

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (mg/l)</u>	<u>Detection Limit (mg/l)</u>
	None Detected		

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-O-028S-A
 Location ID: B-6-M
 CompuChem #: 2651

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Eicosane	4,800	EC	1424
	LS	Eicosane	80,000	EC	1484
	LS	Heneicosane	270,000	EC	1541
	LS	Pentacosane	12,000	EC	1578
	LS	Pentacosane	38,000	EC	1595
Base/Neutral/ Pesticide	LS	Tricosane	58,000	EC	1374
	LS	Eicosane	72,000	EC	1430
	LS	Pentacosane	84,000	EC	1496
	LS	Pentacosane	96,000	EC	1574
	LS	Tricosane	96,000	EC	1674

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	32	1.0
105	Chromium, Total	13	1.0
106	Copper, Total	17	1.0
107	Lead, Total	25	1.0
109	Nickel, Total	11	1.0
112	Thallium, Total	8.8	1.0
113	Zinc, Total	49	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-033S-A
 Location ID: B-7-S
 CompuChem #: 2686

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Eicosane	1,600	EC	1512
	LS	Heneicosane	7,400	EC	1569
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	4,800	2,000 ¹	1552
	LS	Heneicosane	83,000	EC	1279
	LS	Eicosane	39,000	EC	1237
	LS	Pentacosane	98,000	EC	1323
	LS	Heneicosane	110,000	EC	1372
	LS	Pentacosane	110,000	EC	1427

INORGANICS

INSUFFICIENT SAMPLE MATERIAL AVAILABLE TO PERFORM INORGANICS ANALYSIS.

¹ Sample extract could not be concentrated to 0.5 ml, thus the detection limits are higher than normal.

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-034S-B
 Location ID: B-8-M
 CompuChem #: 2690

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	12,000	EC	1242
Base/Neutral/ Pesticide		None Detected			

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	24	1.0
104	Cadmium, Total	1.0	1.0
105	Chromium, Total	8.7	1.0
106	Copper, Total	11	1.0
107	Lead, Total	15	1.0
109	Nickel, Total	9.0	1.0
112	Thallium, Total	9.2	1.0
113	Zinc, Total	28	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-035S-B
 Location ID: B-8-S
 CompuChem #: 2693

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	1,600	EC	1580
Base/Neutral/ Pesticide	429	Di-N-Octyl Phthalate	260	200	1646

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	27	1.0
104	Cadmium, Total	1.0	1.0
105	Chromium, Total	13	1.0
106	Copper, Total	15	1.0
107	Lead, Total	25	1.0
109	Nickel, Total	12	1.0
112	Thallium, Total	6.6	1.0
113	Zinc, Total	52	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-109S-A
 Location ID: B-20-M
 CompuChem #: 2820

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Tricosane	8,000	EC	1405
	LS	Cyclohexane,Eicosyl-	210	EC	1443
	LS	Eicosane	330	EC	1504
	LS	Heneicosane	2,000	EC	1568
	LS	Unknown	613	EC	1595
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	1,400	400 ¹	1550
	LS	Pentacosane	7,600	EC	1323
	LS	Pentacosane	7,200	EC	1371
	LS	Pentacosane	7,200	EC	1427
	LS	Pentacosane	7,200	EC	1491
	LS	Pentacosane	6,800	EC	1568

INORGANICS

INSUFFICIENT SAMPLE MATERIAL AVAILABLE TO PERFORM INORGANICS ANALYSIS.

¹ Sample extract could not be concentrated to 0.5 ml, thus the detection limits are higher than normal.

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-109S-B
 Location ID: B-20-M
 CompuChem #: 2821

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	6,500	EC	863
	LS	Unknown	1,400	EC	1024
	LS	Unknown	5,400	EC	1380
	LS	Unknown	2,200	EC	1442
	LS	Unknown	720	EC	1562
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	680	200	1549
	LS	Pentacosane	11,000	EC	1372
	LS	Pentacosane	13,000	EC	1427
	LS	Unknown	15,000	EC	1570
	LS	Pentacosane	15,000	EC	1662
	LS	Pentacosane	14,000	EC	1772

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-109S-B
Location ID: B-20-M
CompuChem #: 2821

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	35	1.0
104	Cadmium, Total	1.3	1.0
105	Chromium, Total	9.9	1.0
106	Copper, Total	12	1.0
107	Lead, Total	18	1.0
109	Nickel, Total	14	1.0
112	Thallium, Total	13	1.0
113	Zinc, Total	31	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-109S-C
 Location ID: B-20-M
 CompuChem #: 2822

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Eicosane	1,400	EC	1506
	LS	Heneicosane	6,700	EC	1564
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	8,000	2,000 ¹	1528
	LS	Unknown	780,000	EC	1416
	LS	Unknown	900,000	EC	1478
	LS	Pentatriacontane	940,000	EC	1551
	LS	Pentatriacontane	1,800,000	EC	1638
	LS	Pentatriacontane	740,000	EC	1868

¹ Sample extract could not be concentrated to 0.5 ml, thus the detection limits are higher than normal.

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-109S-C
Location ID: B-20-M
CompuChem #: 2822

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	32	1.0
104	Cadmium, Total	1.8	1.0
105	Chromium, Total	12	1.0
106	Copper, Total	15	1.0
107	Lead, Total	21	1.0
109	Nickel, Total	15	1.0
112	Thallium, Total	17	1.0
113	Zinc, Total	38	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-107S-B
 Location ID: B-20-N
 CompuChem #: 2818

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	180	EC	641
	LS	Unknown	160	EC	1377
	LS	Eicosane	300	EC	1501
	LS	heneicosane	1,260	EC	1559
	LS	Pentatriacontane	560	EC	1596
Base/Neutral/ Pesticide	LS	Pentacosane	20,000	EC	1567
	LS	Unknown	120	EC	1677
	LS	Unknown	21,000	EC	1770
	LS	Pentane,2,2,3,3-Tetramethyl-	21,000	EC	1908
	LS	Pentacosane	19,000	EC	2072

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	43	1.0
104	Cadmium, Total	2.2	1.0
105	Chromium, Total	16	1.0
106	Copper, Total	22	1.0
107	Lead, Total	21	1.0
109	Nickel, Total	16	1.0
112	Thallium, Total	13	1.0
113	Zinc, Total	42	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-108S-A
 Location ID: B-20-S
 CompuChem #: 2819

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile	LS	2-Propanone	6,500	EC	149
	LS	Unknown	5,600	EC	388
Acid	LS	Unknown	960	EC	1256
	LS	Unknown	530	EC	1380
	LS	Pentacosane	1,300	EC	1445
	LS	Eicosane	6,300	EC	1505
	LS	Heneicosane	16,000	EC	1565
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	1,100	4,000 ¹	1493
	LS	Heneicosane	36,000	EC	1249
	LS	Pentacosane	32,000	EC	1290
	LS	Pentacosane	57,000	EC	1511
	LS	Pentacosane	68,000	EC	1593
	LS	Pentacosane	67,000	EC	1694

¹ Sample extract could not be concentrated to 0.5 ml, thus the detection limits are higher than normal.

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-108S-A
Location ID: B-20-S
CompuChem #: 2819

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	22	1.0
104	Cadmium, Total	1.3	1.0
105	Chromium, Total	9.5	1.0
106	Copper, Total	9.9	1.0
107	Lead, Total	15	1.0
109	Nickel, Total	10	1.0
112	Thallium, Total	14	1.0
113	Zinc, Total	28	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-002S-C
 Location ID: D-1-M
 CompuChem #: 2547

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid		None Detected			
Base/Neutral/ Pesticide	LS	Pentacosane	8,400	EC	1567
	LS	Pentacosane	9,600	EC	1659
	LS	Pentacosane	10,000	EC	1770
	LS	Pentacosane	9,800	EC	1905
	LS	Pentacosane	7,400	EC	2069

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	40	1.0
104	Cadmium, Total	1.2	1.0
105	Chromium, Total	13	1.0
106	Copper, Total	18	1.0
107	Lead, Total	18	1.0
109	Nickel, Total	15	1.0
112	Thallium, Total	6.9	1.0
113	Zinc, Total	42	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

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Malcolm-Pirnie ID#: III-0-003S-B
 Location ID: D-1-N
 CompuChem #: 2549

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Pentacosane	580	EC	1329
	LS	Tricosane	2,000	EC	1513
Base/Neutral/ Pesticide	LS	Unknown	380	EC	1291
	LS	Pentacosane	260	EC	1489
	LS	Unknown	260	EC	1655
	LS	Pentacosane	400	EC	1765
	LS	Eicosane	240	EC	1900

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	37	1.0
104	Cadmium, Total	2.2	1.0
105	Chromium, Total	13	1.0
106	Copper, Total	14	1.0
107	Lead, Total	20	1.0
109	Nickel, Total	14	1.0
112	Thallium, Total	15	1.0
113	Zinc, Total	69	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-010S-C
 Location ID: D-4-S
 CompuChem #: 2481

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	180	EC	1261
	LS	Unknown	100	EC	1273
	LS	Pentacosane	680	EC	1303
	LS	Unknown	200	EC	1378
	LS	Unknown	200	EC	1549
Base/Neutral/ Pesticide		None Detected			

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	7.2	1.0
105	Chromium, Total	8.5	1.0
106	Copper, Total	11	1.0
107	Lead, Total	9.4	1.0
109	Nickel, Total	8.1	1.0
112	Thallium, Total	8.5	1.0
113	Zinc, Total	38	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-041S-A
 Location ID: D-6-M
 CompuChem #: 2672

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	2,200	EC	1271
	LS	Pentacosane	420	EC	1435
	LS	Pentacosane	9,200	EC	1572
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	1,700	200	1490

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	14	1.0
105	Chromium, Total	6.0	1.0
106	Copper, Total	9.9	1.0
107	Lead, Total	13	1.0
109	Nickel, Total	6.8	1.0
112	Thallium, Total	11	1.0
113	Zinc, Total	23	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-041S-C
 Location ID: D-6-M
 CompuChem #: 2674

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Pentacosane	4,300	EC	1119
	LS	Pentacosane	4,600	EC	1444
	LS	Pentacosane	18,000	EC	1470
	LS	Pentacosane	14,000	EC	1482
Base/Neutral/ Pesticide	LS	Pentacosane	2,400	EC	1493
	LS	Pentacosane	2,800	EC	1569
	LS	Eicosane	2,600	EC	1660
	LS	Eicosane	2,400	EC	1770
	LS	Pentacosane	2,000	EC	1905

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	29	1.0
105	Chromium, Total	13	1.0
106	Copper, Total	17	1.0
107	Lead, Total	17	1.0
109	Nickel, Total	11	1.0
112	Thallium, Total	9.1	1.0
113	Zinc, Total	42	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-042S-A
 Location ID: D-6-N
 CompuChem #: 2675

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile	LS	1,4-Dioxane	20,000	EC	384
Acid	LS	Pentacosane	72,000	EC	1254
	LS	Pentacosane	40,000	EC	1332
	LS	Heneicosane,1-Cyclopentyl-	15,000	EC	1383
	LS	Pentacosane	20,000	EC	1444
	LS	Cyclohexane,Eicosyl-	56,000	EC	1508
Base/Neutral/ Pesticide	413	BIS (2-Ethylhexyl) Phthalate	220	200	1491
	LS	Unknown	220	EC	1688

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	20	1.0
104	Cadmium, Total	1.0	1.0
105	Chromium, Total	11	1.0
106	Copper, Total	17	1.0
107	Lead, Total	13	1.0
109	Nickel, Total	10	1.0
112	Thallium, Total	6.3	1.0
113	Zinc, Total	35	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-042S-C
 Location ID: D-6-N
 CompuChem #: 2677

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	1,300	EC	1583
Base/Neutral/ Pesticide	429	Di-N-Octyl Phthalate	520	200	1722
	LS	Unknown	540	EC	1537
	LS	Unknown	320	EC	1640
	LS	Unknown	2,800	EC	1772
	LS	Unknown	340	EC	1868
	LS	Unknown	780	EC	1995

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	33	1.0
104	Cadmium, Total	1.0	1.0
105	Chromium, Total	8.9	1.0
106	Copper, Total	16	1.0
107	Lead, Total	15	1.0
109	Nickel, Total	12	1.0
112	Thallium, Total	13	1.0
113	Zinc, Total	73	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

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Malcolm-Pirnie ID#: III-0-044S-A
 Location ID: D-7-M
 CompuChem #: 2630

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile	LS	1,4-Dioxane	5,100	EC	388
Acid	LS	Unknown	1,100	EC	1379
Base/Neutral/ Pesticide	LS	Unknown	3,600	EC	1364
	LS	Unknown	2,800	EC	1399
	LS	Unknown	4,400	EC	1410
	LS	Unknown	2,700	EC	1444

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	13	1.0
104	Cadmium, Total	1.0	1.0
105	Chromium, Total	36	1.0
106	Copper, Total	20	1.0
107	Lead, Total	49	1.0
109	Nickel, Total	5.3	1.0
112	Thallium, Total	4.3	1.0
113	Zinc, Total	110	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-043S-B
 Location ID: D-7-N
 CompuChem #: 2628

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Pentacosane	520	EC	1470
Base/Neutral/ Pesticide	429	Di-N-Octyl Phthalate	320	200	1646

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	31	1.0
104	Cadmium, Total	1.2	1.0
105	Chromium, Total	8.8	1.0
106	Copper, Total	18	1.0
107	Lead, Total	20	1.0
109	Nickel, Total	9.5	1.0
112	Thallium, Total	12	1.0
113	Zinc, Total	32	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-046S-A
Location ID: D-7-S₂
CompuChem #: 2800

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	1,800	EC	1562
Base/Neutral/ Pesticide	LS	Pentacosane	260,000	EC	1372
	LS	Pentacosane	300,000	EC	1427
	LS	Pentacosane	370,000	EC	1568
	LS	Unknown	370,000	EC	1662
	LS	Pentacosane	330,000	EC	1774

INORGANICS

INSUFFICIENT SAMPLE MATERIAL AVAILABLE TO PERFORM INORGANICS ANALYSIS.

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-051S-A
 Location ID: D-9-N
 CompuChem #: 2782

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Benzene,1-Chloro-2-Methyl-	250	EC	675
	LS	Naphthalene,1-Chloro-	320	EC	1096
	LS	Unknown	260	EC	1239
	LS	Unknown	160	EC	1350
	LS	Unknown	340	EC	1358
Base/Neutral/ Pesticide	416	2-Chloronaphthalene	340	200	916
	429	Di-N-Octyl Phthalate	360	200	1646
	LS	Unknown	220	EC	1587
	LS	Pentacosane	250	EC	1683
	LS	Pentacosane	350	EC	1799
	LS	Pentacosane	340	EC	1940
	LS	Pentacosane	350	EC	2114

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-051S-A
Location ID: D-9-N
CompuChem #: 2782

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	32	1.0
104	Cadmium, Total	1.0	1.0
105	Chromium, Total	13	1.0
106	Copper, Total	18	1.0
107	Lead, Total	17	1.0
109	Nickel, Total	12	1.0
112	Thallium, Total	22	1.0
113	Zinc, Total	42	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-052S-C
 Location ID: D-9-S
 CompuChem #: 2787

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile	222	Methylene Chloride	5,900	2,000	151
Acid		None Detected			
Base/Neutral/ Pesticide	429	Di-N-Octyl Phthalate	260	200	1648
	LS	Unknown	1,200	EC	848
	LS	Unknown	1,100	EC	952
	LS	Unknown	900	EC	1116
	LS	Unknown	620	EC	1162
	LS	Unknown	1,400	EC	1292

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	13	1.0
105	Chromium, Total	3.5	1.0
106	Copper, Total	8.4	1.0
107	Lead, Total	9.6	1.0
109	Nickel, Total	4.7	1.0
112	Thallium, Total	4.0	1.0
113	Zinc, Total	17	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Page 1

Malcolm-Pirnie ID#: III-0-053S-C
 Location ID: D-10-M
 CompuChem #: 2790

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid		None Detected			
Base/Neutral/ Pesticide	429	Di-N-Octyl Phthalate	500	200	1649
	LS	Unknown	480	EC	1489
	LS	Unknown	280	EC	1579
	LS	Unknown	260	EC	1774
	LS	Unknown	640	EC	1884
	LS	Unknown	300	EC	2216

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	17	1.0
105	Chromium, Total	4.8	1.0
106	Copper, Total	13	1.0
107	Lead, Total	12	1.0
109	Nickel, Total	6.8	1.0
112	Thallium, Total	6.2	1.0
113	Zinc, Total	26	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-066S-A
 Location ID: U-4-M
 CompuChem #: 2951

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid	LS	Unknown	400	EC	512
	LS	Cyclotrisiloxane, Hexamethyl-	420	EC	523
	LS	Unknown	280	EC	533
	LS	Cyclotetrasiloxane, Octamethyl-	460	EC	719
	LS	Unknown	110	EC	873
Base/Neutral/ Pesticide	429	Di-N-Octyl Phthalate	600	200	1731
	LS	Unknown	600	EC	1546
	LS	Unknown	360	EC	1650
	LS	Unknown	400	EC	1877
	LS	Unknown	920	EC	2005
	LS	Unknown	400	EC	2399

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-066S-A
Location ID: U-4-M
CompuChem #: 2951

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	35	1.0
105	Chromium, Total	8.6	1.0
106	Copper, Total	14	1.0
107	Lead, Total	20	1.0
109	Nickel, Total	9.8	1.0
112	Thallium, Total	5.8	1.0
113	Zinc, Total	34	1.0

MALCOLM-PIRNIE
SUMMARY OF ANALYSIS

Malcolm-Pirnie ID#: III-0-066S-B
 Location ID: U-4-M
 CompuChem #: 2952

ORGANICS

<u>Fraction</u>	<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>	<u>Scan Number</u>
Volatile		None Detected			
Acid		None Detected			
Base/Neutral/ Pesticide	429	Di-N-Octyl Phthalate	240	200	1731
	LS	Unknown	200	EC	1534
	LS	Unknown	200	EC	1546

INORGANICS

<u>Compound Number</u>	<u>Compound</u>	<u>Conc. (ug/g)</u>	<u>Detection Limit (ug/g)</u>
102	Arsenic, Total	34	1.0
104	Cadmium, Total	1.0	1.0
105	Chromium, Total	7.6	1.0
106	Copper, Total	15	1.0
107	Lead, Total	17	1.0
109	Nickel, Total	10	1.0
112	Thallium, Total	9.7	1.0
113	Zinc, Total	32	1.0