File / M/035/002

Kennecott Utah Copper Corporation
8315 West 3595 South
P.O. Box 6001
Magna, Utah 84044-6001
(801) 252-3179
(801) 252-3125 (FAX)

Elaine J. Dorward-King, Ph.D.
Director, Environmental Affairs

RECEIVED
JUN 07 1996
DIV. OF OIL, GAS & MINING

Kennecott

June 5, 1996

Mr. Robert B. Brobst, P.E.
Biosolids Program Manager
United States Environmental Protection Agency
Region VIII
999 18th Street - Suite 500
Denver, CO 80202-2466

Subject: 1996 Geochemical Sampling Results for the Bingham Canyon Mine Biosolids Test Plots

Dear Mr. Brobst:

Attached is a copy of the 1996 geochemical sampling results for the Bluewater 1 Biosolids Test Plots at the Bingham Canyon Mine. This report partially fulfills the approval letter requirements to report annual sampling results during the biosolids application project.

Also attached are tables comparing the baseline analytical data from the report submitted on January 31, 1995 to the new data set. Geochemical trends can not be confidently identified because of the high natural chemical and physical variability of the soil, and because of the limited data presently available.

Lisa Rogers from the State of Utah Division of Water Quality and D. Wayne Hedberg from the State Division of Oil, Gas and Mining are also being sent copies of this report. If you have any questions regarding the attached report or the project, please call Rich Borden of my staff at 801-569-6208.

Sincerely,

Elaine J. Dorward-King

Elaine J. Dorward-King, Ph.D.

EJDK\RKB:bt

Enclosure

cc: Lisa Rogers, DWQ
D. Wayne Hedberg, DOGM

Attachment 1 - Bingham Canyon Mine Bluewater 1 Biosolids Test Plots Baseline Data - Round 2

BINGHAM CANYON MINE
BLUEWATER I BIOSOLIDS TEST PLOTS
BASELINE DATA - ROUND 2

INTRODUCTION

The Bingham Canyon Mine, Bluwater I, Biosolids Test Plots are located immediately northwest of Kennecott Utah Copper's (KUC) Bluewater I Cutoff Wall and Repository in the NE/SW Section 18, Township 3 South, Range 2 West, Salt Lake Base Meridian. The general scope of the project is to apply biosolids (municipal sewage sludge) from the Central Valley Water Reclamation Facility (CVWRF) to a series of waste rock test plots as a soil amendment. The purpose of this report is to provide baseline data for a second round of sampling collected from the test plots area.

TEST PLOTS

Fifteen test plots were surveyed and constructed on the northeast end of the 5816 level near the toe of the mine waste rock dumps during the fall of 1994. Each plot measures 16 feet wide by 50 feet long with the long axis running east-west. The individual plots are separated by approximately 5 feet (see attachment A). The project area was graded to an even slope dipping approximately 20 degrees to the east. The surface lithology consists of yellow brown sandy, silty, clayey quartzitic mine waste rock. Dark brown volcanic derived silty clay underlies the waste rock.

BASELINE DATA - ROUND 2 SAMPLING

Previous sampling was conducted prior to biosolids application. A total of 13 soil samples and 1 water sample were collected from the test plots on November 14 and November 22, 1994. These samples were collected to develop baseline data that will be used later to help determine the effectiveness of the various treatments planned for each plot. The samples were submitted for analyses to Ford Analytical Laboratories on November 18 and November 22, 1994 respectively.

On March 27, 1996, a total of twelve soil samples were collected along with one water sample. The twelve soil samples were collected from three trenches with each trench approximately 3-4' east of the previous trenches sampled respectively. The water sample for this round was collected from the same location as the previous sample and it was labeled LEAWA-81A. The soil and water will be sent to Chemtech (Ford).

SOIL SAMPLE SITES

Twelve soil samples were collected from three trenches. Each trench was excavated to a depth of 4 feet approximately 6' east of test plots #4, #8, and #12 respectively. From each trench, four grab samples were collected at the following depths: 0'-1', 1'-2', 2'-3', and 0'-2'. The following table presents the sample ID's, depths, and soil type for each sample:

BLUEWATER I BIOSOLIDS TEST PLOTS SOIL SAMPLES

TRENCH	SAMPLE ID	DEPTH	SOIL TYPE
1	MSBWT1A	0'-1'	Mine Waste Rock
1	MSBWT1A	1'-2'	Mine Waste Rock
1	MSBWT1A	2'-3'	Mine Waste Rock
1	MSBWT1A	0'-2'	Mine Waste Rock
2	MSBWT2A	0'-1'	Mine Waste Rock
2	MSBWT2A	1'-2'	Mine Waste Rock
2	MSBWT2A	2'-3'	Mine Waste Rock
2	MSBWT2A	0'-2'	Mine Waste Rock
3	MSBWT3A	0'-1'	Mine Waste Rock
3	MSBWT3A	1'-2'	Mine Waste Rock
3	MSBWT3A	2'-3'	Dark Brown Silty Clay, minor volcanic clasts
3	MSBWT3A	0'-2'	Mine Waste Rock

ANALYTICAL TESTING

All trench samples from the 0'-1', 1'-2', and 2'-3' intervals are to be analyzed per 1A below. The three trench samples from the 0'-2' interval are to be analyzed per 1B below. The water sample will be analyzed for: Dissolved Metals (Fe, Zn, Cu, Mn, Cd, Pb, Ni, Cr, Al, As, Hg, Mo and Se and Totals (Ca, Mg, Na, K, Cl, SO_4, conductivity, pH, acidity, and TDS).

1A Agricultural - pH, SAR, EC, nitrogen as nitrate and nitrite, water holding capacity, CEC, acid-base potential, total organic matter content, soil texture, phosphorus, and carbon to nitrogen ration (C:N).

1B Metals - DTPA extractable metals (Fe, Zn, Cu, Mn, Cd, Pb, Ni, Cr, saturation extractable metals (Ca, Na, Mg) and total metals for As, Hg, Mo, and Se.

3/27/96 Kennecott Plant Projects (12)
B. Vinton

Mycorrhizae/Sewage Project
Blue Water I Round 2

As a continuation of baseline data for the Mycorrhizae/Sewage Project a round of data (2nd sampling event) is to be conducted immediately down gradient from the Blue Water I test plot area in the NE/4 section 18, T3S, R2W, SLBM.

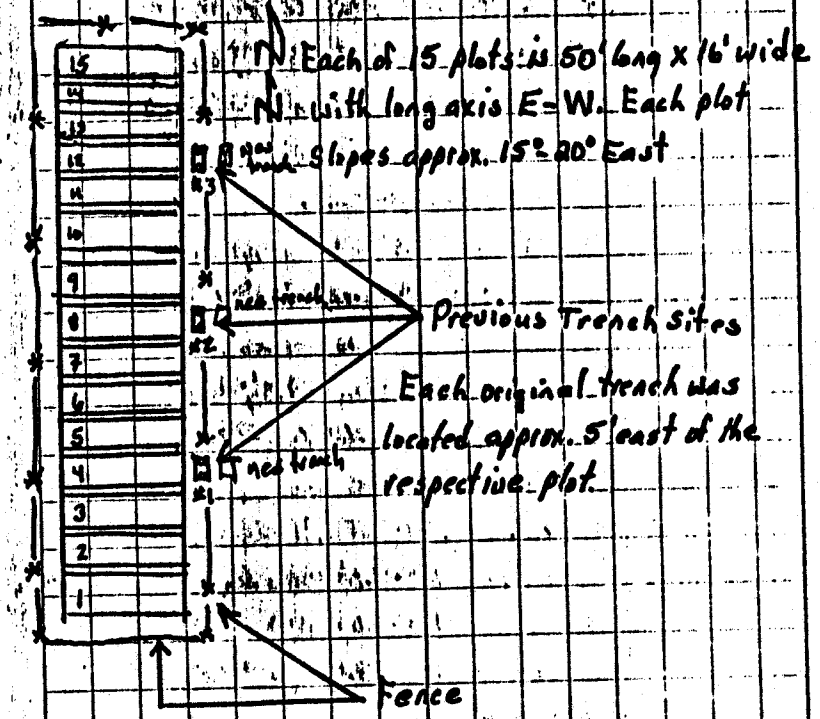
Data collection was requested by Lea Marks of Kennecott Plant Projects group. The first round of samples was collected on 11/14/94 by Brian Vinton of North American Exploration for Kennecott PP6. Coordination of project is under Lea Marks (Kue/PP6).

The objective of this event is measure any changes in soil chemistry that may have occurred at the control trenches. The previous trench locations were surveyed. This sampling event will have several slight modifications. Since the last sampling event a wire mesh fence was constructed surrounding the 15 test plots. Our original trench locations were located where the fence is located so we

3/27/96 (13)
B. Vinton

Mycorrhizae/sewage Project

Will move each new trench site east of the previous trench site i.e.



The three new trench sites are each approx. 3' east of the existing trench.

3/27/96
B. Vinton

(14)

Mayo/Sludge

Sampling

Decontaminate all stainless steel
trowels & spoons: Tap water wash, Alconox
wash, triple deionized rinse on each S.S. trowel & spoon

Trench 1, Trench 2, Trench 3 will all
be sampled using ~~sampl~~ same protocol
Use backhoe to dig 3½-4' deep trench
at lath. Laths were surveyed and located
~3' east of previous trench. Each trench
sampled as follows: 0.0-1.0'; 1.0'-2.0'
and 2.0'-3.0' plus sample 0.0-2.0. Each
sample weights 5-7 lbs. Push sampling Scraper/scrap trench side

NOTE: Trench 1 has 6" of fill over waste Rx

Trench 1 MSBWT1A 0.0-1.0' Yellow brn waste rx. Clay matrix
MSBWT1A 1.0-2.0 " " " "
MSBWT1A 2.0-3.0 " " " "
MSBWT1A 0.0-2.0 " " " "

Trench 2 (NOTE: Ground surface has 12" of fill
over waste rock. So begin sampling
at base of fill

3/27/96
B. Vinton

(15)

Mayo/Sludge

Trench 2 continued
MSBWT2A 0.0-1.0 Yellow brn waste rx w/ clay matrix
MSBWT2A 1.0-2.0 " " " " "
MSBWT2A 2.0-3.0 " " " " "
MSBWT2A 0.0-2.0 " " " " "

Trench 3
Note. Top surface has 16" of dk brn
fill. Begin sampling at base of top fill
MSBWT3A 0.0-1.0 Yell brn waste rx w/ clay matrix
MSBWT3A 1.0-2.0 " " " " "
MSBWT3A 2.0'-3.0 Dk brn silty clay
MSBWT3A 0.0-2.0 Yell brn waste rx w/ clay matrix

Note: Since trench 3 moved to east from
original site, the geology changes. The
waste rx was only 20" thick. So
the 0.0-1.0' interval is actually 0.0-10".
and the 1.0'-2.0' is actually 10"-20".

3/27/96
B. Vinton

(16)

Myrco / Slude continued.

Along w/ the trench samples the same location sampled for water on 11/14/94 was again sampled. The water sample is

LEAWA BIA collected from the Blue Water I Hour Glass

pH of 2.80

Cond of 34000 umho/cm

Rinsed each bottle 3 times w/ deionized water and 3 times with sample water. Pre-calib pH @ 4.47 & cond @ 20000 umho/cm

Collected ½ gallon jug & 2 pint bottles. Filter 1 pint thru new Mod Flow FILTER and add 26 drops of Nitric acid to filtered sample.

(17)

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003744
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT1A
0.0'-1.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	5,540	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.17	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	6	1.6	4/11/96 11:52	EPA 353.1M	TH
pH, units	3.00	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.04	0.05	4/22/96 18:05	ASA#2 10-3	RR
Sieve, % Rock, %	44.3	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	30.0	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	25.7	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	0.716	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	45	6	4/ 8/96 21:06	SW-846 6010	MA
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	4,470	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	458	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	291	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	506	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	6,860	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	2,080	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	39	1	4/16/96 10:15	SW-846 6010	LH

Approved By: R Tue

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003744
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT1A
0.0'-1.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	32	2	4/ 8/96 21:06	SW-846 6010	MA
Nickel (DTPA), as Ni, mg/Kg	6	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	985	8	4/ 8/96 21:06	SW-846 6010	MA
Selenium (T), as Se, mg/Kg	< 8	8	4/ 8/96 21:06	SW-846 6010	MA
Sodium (T), as Na, mg/Kg	592	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	9.7	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	19	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	4.74	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	22.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	397	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	375	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	69.9	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.4	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	17.6	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Western Analysis.

Approved By: R. Zum

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801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003745
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT1A
1.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	7,820	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.16	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	3	1.6	4/11/96 11:52	EPA 353.1M	TH
pH, units	2.80	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.03	0.05	4/22/96 18:05	ASA#2 10-3	RR
Sieve, % Rock, %	43.3	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	25.2	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	31.5	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	0.990	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	37	6	4/ 8/96 21:06	SW-846 6010	MA
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	3,870	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	472	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	376	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	405	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	6,740	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	2,370	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	46	1	4/16/96 10:15	SW-846 6010	LH

Approved By: R. Dun

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6005

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003745
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT1A
1.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	55	2	4/ 8/96 21:06	SW-846 6010	MA
Nickel (DTPA), as Ni, mg/Kg	7	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	872	8	4/ 8/96 21:06	SW-846 6010	MA
Selenium (T), as Se, mg/Kg	< 8	8	4/ 8/96 21:06	SW-846 6010	MA
Sodium (T), as Na, mg/Kg	589	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	8.0	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	23	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	4.85	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	31.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	392	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	361	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	68.0	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.4	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	17.2	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Western Analysis.

Approved By: R Rm

(generic.rpt)

801 262 7299 PHONE
801 262 7373 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003746
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT1A
2.0'-3.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	9,060	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.09	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	3	1.6	4/11/96 11:52	EPA 353.1M	TH
pH, units	2.72	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.02	0.05	4/22/96 18:25	ASA#2 10-3	RR
Sieve, % Rock, %	38.8	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	36.4	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	24.8	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	1.39	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	38	6	4/ 8/96 21:06	SW-846 6010	MA
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	4,390	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	482	0.1	4/22/96 18:51	ASA#2 10-3	MA
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	313	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	427	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	5,560	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	2,260	0.1	4/22/96 18:51	ASA#2 10-3	MA
Manganese (DTPA), as Mn, mg/Kg	38	1	4/16/96 10:15	SW-846 6010	LH

Approved By: R Dum

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003746
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT1A
2.0'-3.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	42	2	4/ 8/96 21:06	SW-846 6010	MA
Nickel (DTPA), as Ni, mg/Kg	6	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	871	8	4/ 8/96 21:06	SW-846 6010	MA
Selenium (T), as Se, mg/Kg	< 8	8	4/ 8/96 21:06	SW-846 6010	MA
Sodium (T), as Na, mg/Kg	595	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	4.1	0.1	4/22/96 18:51	ASA#2 10-3	MA
Zinc (DTPA), as Zn, mg/Kg	18	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	8.79	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	43.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	403	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	360	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	69.3	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.3	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	18.0	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Western Analysis.

Approved By: R Dm

(generic.rpt)

801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003747
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT1A
0.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	6,290	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.10	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	4	1.6	4/11/96 11:52	EPA 353.1M	TH
pH, units	3.05	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.02	0.05	4/22/96 18:25	ASA#2 10-3	RR
Sieve, % Rock, %	54.5	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	22.7	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	22.8	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	1.14	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	39	6	4/ 8/96 21:06	SW-846 6010	MA
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	4,490	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	481	0.1	4/22/96 18:51	ASA#2 10-3	MA
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	298	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	395	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	6,440	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	2,270	0.1	4/22/96 18:51	ASA#2 10-3	MA
Manganese (DTPA), as Mn, mg/Kg	38	1	4/16/96 10:15	SW-846 6010	LH

Approved By: R Dm

{generic.rpt}

801 262 7299 PHONE
801 262 7376 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003747
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT1A
0.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	24	2	4/ 8/96 21:06	SW-846 6010	MA
Nickel (DTPA), as Ni, mg/Kg	6	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	942	8	4/ 8/96 21:06	SW-846 6010	MA
Selenium (T), as Se, mg/Kg	< 8	8	4/ 8/96 21:06	SW-846 6010	MA
Sodium (T), as Na, mg/Kg	568	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	5.5	0.1	4/22/96 18:51	ASA#2 10-3	MA
Zinc (DTPA), as Zn, mg/Kg	20	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	5.40	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	36.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	404	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	368	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	69.3	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.3	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	15.8	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Wester Analysis.

Approved By: R Pm

(generic.rpt)

801 262 7299 PHONE
801 262 7375 FAX

6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003748
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT2A
0.0'-1.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	5,120	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.07	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	3	1.6	4/11/96 11:52	EPA 353.1M	TH
pH, units	3.20	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.02	0.05	4/22/96 18:05	ASA#2 10-3	RR
Sieve, % Rock, %	67.6	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	16.9	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	15.5	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	1.40	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	43	6	4/ 8/96 21:06	SW-846 6010	MA
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	4,160	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	445	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	299	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	469	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	6,440	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	2,000	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	43	1	4/16/96 10:15	SW-846 6010	LH

Approved By: R Dune

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801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6805

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003748
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT2A
0.0'-1.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	198	2	4/ 8/96 21:06	SW-846 6010	MA
Nickel (DTPA), as Ni, mg/Kg	10	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	1,000	8	4/ 8/96 21:06	SW-846 6010	MA
Selenium (T), as Se, mg/Kg	< 8	8	4/ 8/96 21:06	SW-846 6010	MA
Sodium (T), as Na, mg/Kg	662	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	4.4	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	19	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	5.49	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	44.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	404	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	360	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	72.0	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.3	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	19.3	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

Approved By: R Jones

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801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003748
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT2A
0.0'-1.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					

NOTE: C/N ratio analyzed by Western Analysis.

Two integrations performed by ICP on Molybdenum as it seem high compared to others in group. Both integrations agreed.

Approved By: _____

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801 262 7299 PHONE
801 262 7378 FAX

6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003749
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT2A
1.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	6,290	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.10	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	4	1.6	4/11/96 11:52	EPA 353.1M	TH
pH, units	3.15	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.02	0.05	4/22/96 18:05	ASA#2 10-3	RR
Sieve, % Rock, %	52.0	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	24.4	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	23.6	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	0.565	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	47	6	4/ 8/96 21:06	SW-846 6010	MA
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	4,150	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	463	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	312	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	436	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	6,770	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	2,250	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	42	1	4/16/96 10:15	SW-846 6010	LH

Approved By: _____

{generic.rpt}

801 262 7299 PHONE
801 262 7379 FAX

6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003749
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT2A
1.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	37	2	4/ 8/96 21:06	SW-846 6010	MA
Nickel (DTPA), as Ni, mg/Kg	7	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	1,000	8	4/ 8/96 21:06	SW-846 6010	MA
Selenium (T), as Se, mg/Kg	< 8	8	4/ 8/96 21:06	SW-846 6010	MA
Sodium (T), as Na, mg/Kg	607	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	3.9	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	20	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	4.82	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	18.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	405	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	387	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	65.6	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.3	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	17.5	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Western Analysis.

Approved By: R Jones

(generic.rpt)

801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003750
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT2A
2.0'-3.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	8,200	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.09	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	4	1.6	4/11/96 11:52	EPA 353.1M	TH
pH, units	3.10	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.02	0.05	4/22/96 18:05	ASA#2 10-3	RR
Sieve, % Rock, %	47.5	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	27.5	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	25.0	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	1.37	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	34	6	4/ 8/96 21:06	SW-846 6010	MA
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	3,460	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	451	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	348	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	370	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	5,690	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	2,050	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	44	1	4/16/96 10:15	SW-846 6010	LH

Approved By: R Dr

(generic.rpt)

801 262 7299 PHONE
801 262 7978 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003750
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT2A
2.0'-3.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	25	2	4/ 8/96 21:06	SW-846 6010	MA
Nickel (DTPA), as Ni, mg/Kg	8	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	785	8	4/ 8/96 21:06	SW-846 6010	MA
Selenium (T), as Se, mg/Kg	< 8	8	4/ 8/96 21:06	SW-846 6010	MA
Sodium (T), as Na, mg/Kg	559	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	4.2	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	25	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	6.55	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	43.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	404	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	361	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	71.4	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.3	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	20.0	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Western Analysis.

Approved By: _____

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX

6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003751
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT2A
0.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	5,950	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.08	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	3	2	4/11/96 11:52	EPA 353.1M	TH
pH, units	3.18	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.04	0.05	4/22/96 18:05	ASA#2 10-3	RR
Sieve, % Rock, %	51.1	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	25.6	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	23.3	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	0.482	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	40	6	4/ 9/96 14:11	SW-846 6010	LH
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	3,650	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	449	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	291	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	440	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	6,510	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	1,930	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	41	1	4/16/96 10:15	SW-846 6010	LH

Approved By: R. Dunn

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003751
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT2A
0.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	30	2	4/ 9/96 14:11	SW-846 6010	LH
Nickel (DTPA), as Ni, mg/Kg	7	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	975	8	4/ 9/96 14:11	SW-846 6010	LH
Selenium (T), as Se, mg/Kg	10	8	4/ 9/96 14:11	SW-846 6010	LH
Sodium (T), as Na, mg/Kg	541	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	9.8	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	18	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	5.82	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	15.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	404	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	389	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap.. ~~mg/Kg~~ %	73.7	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.3	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	23.9	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Western Analysis.

Approved By: _____

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003752
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT3A
0.0'-1.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	3,740	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.25	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	5	1.6	4/11/96 1:46	EPA 353.1M	TH
pH, units	4.92	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.10	0.05	4/22/96 18:05	ASA#2 10-3	RR
Sieve, % Rock, %	42.3	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	29.0	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	28.7	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	2.09	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	80	6	4/ 9/96 14:11	SW-846 6010	LH
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	10,500	20	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	449	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	358	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	340	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	6,900	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	1,120	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	84	1	4/16/96 10:15	SW-846 6010	LH

Approved By: R Dunn

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801 262 7299 PHONE
801 262 7378 FAX
8100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003752
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT3A
0.0'-1.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	32	2	4/ 9/96 14:11	SW-846 6010	LH
Nickel (DTPA), as Ni, mg/Kg	8	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	1,190	8	4/ 9/96 14:11	SW-846 6010	LH
Selenium (T), as Se, mg/Kg	< 8	8	4/ 9/96 14:11	SW-846 6010	LH
Sodium (T), as Na, mg/Kg	853	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	16.9	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	42	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	14.2	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	65.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	404	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	339	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	89.6	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.6	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	15.9	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Western Analysis.

Approved By: _____

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX

6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003753
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT3A
1.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	4,210	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.07	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	5	1.6	4/11/96 1:46	EPA 353.1M	TH
pH, units	3.77	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.03	0.05	4/22/96 18:05	ASA#2 10-3	RR
Sieve, % Rock, %	38.4	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	26.7	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	34.9	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	0.993	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	44	6	4/ 9/96 14:11	SW-846 6010	LH
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	5,060	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	438	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	148	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	458	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	6,360	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	1,260	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	63	1	4/16/96 10:15	SW-846 6010	LH

Approved By: _____

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801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003753
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT3A
1.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	56	2	4/ 9/96 14:11	SW-846 6010	LH
Nickel (DTPA), as Ni, mg/Kg	4	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	1,010	8	4/ 9/96 14:11	SW-846 6010	LH
Selenium (T), as Se, mg/Kg	< 8	8	4/ 9/96 14:11	SW-846 6010	LH
Sodium (T), as Na, mg/Kg	680	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	5.2	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	19	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	9.68	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	31.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	405	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	374	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	75.0	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.5	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	26.4	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Western Analysis.

Approved By: _____

(generic.rpt)

801 262 7299 PHONE
801 262 7378 FAX

6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003754
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT3A
2.0'-3.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	1,410	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.06	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	5	1.6	4/11/96 1:46	EPA 353.1M	TH
pH, units	5.98	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.15	0.05	4/22/96 18:05	ASA#2 10-3	PR
Sieve, % Rock, %	5.50	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	30.2	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	64.3	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	0.031	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	13	6	4/ 9/96 14:11	SW-846 6010	LH
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	4,140	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	532	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	13	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	32	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	6	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	6,020	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	276	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	137	1	4/16/96 10:15	SW-846 6010	LH

Approved By: _____

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 5905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003754
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT3A
2.0'-3.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	< 2	2	4/ 9/96 14:11	SW-846 6010	LH
Nickel (DTPA), as Ni, mg/Kg	6	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	371	8	4/ 9/96 14:11	SW-846 6010	LH
Selenium (T), as Se, mg/Kg	< 8	8	4/ 9/96 14:11	SW-846 6010	LH
Sodium (T), as Na, mg/Kg	516	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	17.1	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	6	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	9.20	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	1.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	405	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	404	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/kg~~ %	90.2	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	1.2	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	34.4	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio anlayzed by Western Analysis.

Approved By: R Dm

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX
6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 5/ 1/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7496
Lab #: 96-U003755
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT3A
0.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Conductance, Specific, umhos/cm	4,540	0.1	4/11/96 11:15	EPA 120.1M	DI
Mercury (T), as Hg, mg/Kg	0.12	0.04	4/ 2/96 14:46	SW 846 7471	KA
Nitrate/Nitrite-Nitrogen, mg/Kg	4	1.6	4/11/96 1:46	EPA 353.1M	TH
pH, units	3.93	0.05	4/ 9/96 16:00	SW 846 9045	TM
Sodium Absorption Ratio, Sat.	0.07	0.05	4/22/96 18:05	ASA#2 10-3	RR
Sieve, % Rock, %	47.7	0.01	4/11/96 9:30	CAL	TH
Sieve, % Sand, %	26.3	0.01	4/11/96 9:30	CAL	TH
Sieve, % Silt & Clay, %	26.0	0.01	4/11/96 9:30	CAL	TH
Sulfur as S, %	0.926	0.005	4/22/96 15:00	ASA#2 28-1	MA
Arsenic (T), as As, mg/Kg	30	6	4/ 9/96 14:11	SW-846 6010	LH
Cadmium (DTPA), as Cd, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Calcium (T), as Ca, mg/Kg	7,910	10	4/ 8/96 17:00	SW-846 6010	MA
Calcium (Sat), as Ca, mg/L	435	0.1	4/22/96 10:48	ASA#2 10-3	LH
Chromium (DTPA), as Cr, mg/Kg	< 0.5	0.5	4/16/96 10:15	SW-846 6010	LH
Copper (DTPA), as Cu, mg/Kg	216	1	4/16/96 10:15	SW-846 6010	LH
Iron (DTPA), as Fe, mg/Kg	518	1	4/16/96 10:15	SW-846 6010	LH
Lead (DTPA), as Pb, mg/Kg	< 4	4	4/16/96 10:15	SW-846 6010	LH
Magnesium (T), as Mg, mg/Kg	7,650	10	4/ 8/96 17:00	SW-846 6010	MA
Magnesium (Sat), as Mg, mg/L	1,630	0.1	4/22/96 10:48	ASA#2 10-3	LH
Manganese (DTPA), as Mn, mg/Kg	52	1	4/16/96 10:15	SW-846 6010	LH

Approved By: _____

{generic.rpt}

801 262 7299 PHONE
801 262 7378 FAX

6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Date: 5/ 1/96

Group #: 7496
Lab #: 96-U003755
Project: BIOSOLIDS TEST PLOTS (LEN M)
Sample Desc: MSBWT3A
0.0'-2.0'

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled:
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Molybdenum (T), as Mo, mg/Kg	42	2	4/ 9/96 14:11	SW-846 6010	LH
Nickel (DTPA), as Ni, mg/Kg	6	1	4/16/96 10:15	SW-846 6010	LH
Phosphorus (T), as P, mg/Kg	1,140	8	4/ 9/96 14:11	SW-846 6010	LH
Selenium (T), as Se, mg/Kg	< 8	8	4/ 9/96 14:11	SW-846 6010	LH
Sodium (T), as Na, mg/Kg	757	10	4/ 8/96 17:00	SW-846 6010	MA
Sodium (Sat), as Na, mg/L	13.4	0.1	4/22/96 10:48	ASA#2 10-3	LH
Zinc (DTPA), as Zn, mg/Kg	23	1	4/16/96 10:15	SW-846 6010	LH
Carbon/Nitrogen Ratio,	13.3	0.01	4/11/96	CAL	Subcon.
Acid Pot., ton CaCO3/1000 ton	29.0	0.1	4/22/96 15:00	UT Div OGM	MA
Neut. Pot., ton CaCO3/1000 ton	405	0.1	4/21/96 15:30	UT Div OGM	RCG
Acid Base Pot., ton CaCO3/1000 ton	376	0.1	4/23/96 7:21	UT Div OGM	RR
Saturation cap., ~~mg/Kg~~ %	72.8	0.01	4/19/96 15:00	UT Div OGM	LH
% Organic Matter, %	0.4	0.1	4/10/96 17:00	ASTM D-2974	MA
Cation Exchange Capacity, meq/100g	25.4	0.01	4/19/96	ASA#2 8-3	LH
Receiving Temperature, C	17	0	3/29/96 13:00		RCG

NOTE: C/N ratio analyzed by Western Analysis.

Approved By: R Dun

(generic.rpt)

801 262 7299 PHONE
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6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

KENNECOTT UTAH COPPER CORPORATION **CHAIN OF CUSTODY** **ENGINEERING SERVICES/PLANT PROJECTS GROUP**

PROJECT CODE/NAME: BIOSOLIDS TEST PLOTS (LIN M) | PO # | PPG 1036

LAB ID (lab use only)	SAMPLE ID	CONTROL #	DATE COLLECTED	TIME	SAMPLE TYPE / # OF CONTAINERS: Soil	Water	Other	FIELD PARAMETERS: pH	Cond	Temp	Eh		ANALYSIS REQUESTED
	MSBWT1A 0.0'-1.0'		3/27/96		✓		EC = cond water sol						Needed analysis:
	MSBWT1A 1.0'-2.0'		3/27/96		✓		Spire						① pH, SAR, EC, N as (NO_2 +
	MSBWT1A 2.0'-3.0'		3/27/96		✓		% Org matter						NO_3), water holding cap., CEC,
	MSBWT1A 0.0'-2.0'		3/27/96		✓		SAR - sat ext metals						ABP, & total organics,
	MSBWT2A 0.0'-1.0'		3/27/96		✓		Acid Pot = Sulfur						Texture, P, C/N ratio,
	MSBWT2A 1.0-2.0'		3/27/96		✓		NPH + Pot						② DTPA metals: Fe, Zn, Cu,
	MSBWT2A 2.0'-3.0'		3/27/96		✓		~~[illegible]~~						Mn, Cd, Pb, Ni, Cr.
	MSBWT2A 0.0-2.0'		3/27/96		✓								
	MSBWT3A 0.0'-1.0		3/27/96		✓								③ Sat. Ext. metals: Ca, Na, Mg
	MSBWT3A 1.0'-2.0'		3/27/96		✓								
	MSBWT3A 2.0-3.0'		3/27/96		✓								④ Total metals: As, Hg, Mo,
	MSBWT3A 0.0-2.0'		3/27/96		✓								and Se.
													(AIR DRY SAMPLES FIRST)

SAMPLER'S SIGNATURE: Brian Vetter LAB SUBMITTED TO: CHEMTECH/FORD

REPORT RESULTS TO: Asim Mukherjee PHONE #: FAX #:

SURRENDERED BY: Brian Vetter RECEIVED BY: Jeffy A. Huberly DATE/TIME: 3-29-96 12:35

SURRENDERED BY: Jeffy A. Huberly RECEIVED BY: Becky Christensen DATE/TIME: 3-29-96 13:00

SURRENDERED BY: RECEIVED BY: DATE/TIME:

COMMENTS:

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 4/25/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7488
Lab #: 96-U003725
Project: 96-0151
Sample Desc: LEAWA-81A
Biosolids Test Plots

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled: 14:05
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Acidity, mg/L	33,300	250	3/31/96 13:00	EPA 305.1	TM
Chloride, mg/L	287	10	3/30/96	EPA 325.3	TM
Conductance, Specific, umhos/cm	38,500	0.1	4/ 9/96 9:35	EPA 120.1	DI
Mercury, as Hg (D), mg/L	0.0006	0.0002	4/ 1/96 14:14	EPA 245.1	KA
Nitrate, Nitrogen, mg/L	3	1	4/18/96 12:14	EPA 353.1	TH
Nitrite, Nitrogen, mg/L	0.10	0.012	3/29/96 17:45	EPA 354.1	KA
pH, units	2.90	0.05	3/29/96 15:30	EPA 150.1	LS
Sulfate, mg/L	68,900	16700	4/ 4/96 15:00	EPA 375.4	TM
Total Dissolved Solids, mg/L	97,400	250	4/ 2/96 10:30	EPA 160.1	MO
Aluminum (D), as Al, mg/L	2,450	0.15	4/ 8/96 16:59	EPA 200.7	MA
Arsenic (D), as As, mg/L	< 0.3	0.3	4/ 8/96 16:59	EPA 200.7	MA
Cadmium (D), as Cd, mg/L	0.98	0.025	4/ 8/96 16:59	EPA 200.7	MA
Calcium (T), as Ca, mg/L	193	0.2	4/25/96 9:10	EPA 200.7	LH
Chromium (D), as Cr, mg/L	0.42	0.025	4/ 8/96 16:59	EPA 200.7	MA
Copper (D), as Cu, mg/L	229	0.05	4/ 8/96 16:59	EPA 200.7	MA
Iron (D), as Fe, mg/L	126	0.05	4/ 8/96 16:59	EPA 200.7	MA
Lead (D), as Pb, mg/L	< 0.2	0.2	4/ 8/96 16:59	EPA 200.7	MA
Magnesium (T), as Mg, mg/L	8,830	0.2	4/25/96 9:10	EPA 200.7	LH
Manganese (D), as Mn, mg/L	177	0.05	4/ 8/96 16:59	EPA 200.7	MA
Molybdenum (D), as Mo, mg/L	< 0.1	0.1	4/ 8/96 16:59	EPA 200.7	MA

Approved By: R Zu

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SALT LAKE CITY UTAH 84107 6905

CHEMTECH-FORD ANALYTICAL LABORATORIES

Date: 4/25/96

To: KENNECOTT UTAH COPPER CORP.
%ASIM MUKERJEE
P.O. Box 112
Bingham Canyon, UT 84006

Group #: 7488
Lab #: 96-U003725
Project: 96-0151
Sample Desc: LEAWA-81A
Biosolids Test Plots

Date Sampled: 3/27/96
Date Submitted: 3/29/96

Time Sampled: 14:05
Time Received: 13:00

CERTIFICATE OF ANALYSIS

PARAMETER	RESULT	MDL	DATE ANALYZED	METHOD	ANALYST
INORGANIC PARAMETERS					
Nickel (D), as Ni, mg/L	18.4	0.05	4/ 8/96 16:59	EPA 200.7	MA
Potassium (T), as K, mg/L	< 1	1	4/25/96 9:10	EPA 200.7	LH
Selenium (D), as Se, mg/L	< 0.4	0.4	4/ 8/96 16:59	EPA 200.7	MA
Sodium (T), as Na, mg/L	7	1.0	4/25/96 9:10	EPA 200.7	LH
Zinc (D), as Zn, mg/L	97.3	0.05	4/ 8/96 16:59	EPA 200.7	MA
Receiving Temperature, C	1	0	3/29/96 13:00		KEF

NOTE: Sample submitted on ice.

Approved By: R Dun

{generic.rpt}

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6100 SOUTH STRATLER
SALT LAKE CITY UTAH 84107 6905

KENNECOTT UTAH COPPER CORPORATION **CHAIN OF CUSTODY** **ENGINEERING SERVICES/PLANT PROJECTS GROUP**

PROJECT CODE/NAME: BIOSOLIDS TEST PLOTS | PO #: | PPG 1035

LAB ID (lab use only)	SAMPLE ID	CONTROL #	DATE COLLECTED	TIME	SAMPLE TYPE / # OF CONTAINERS: Soil	Water	Other	FIELD PARAMETERS: pH	Cond	Temp	Eh		ANALYSIS REQUESTED
3725	LEAWA-BIA	96-0151	3/27/96	14:05		✓		2.80	34,000				Dissolved: (1 pt plastic bottle) Filtered & pH<2 Fe, Zn, Cu, Mn, Cd, Pb, Al, Ni, Cr, As, Hg, Mo, Se Totals: Ca, Na, K, Mg, Cl, SO4, Nitrate, Nitrite, pH, Cond, Acidity, TDS

SAMPLER'S SIGNATURE: Brian Vta LAB SUBMITTED TO: CHEMTECH/FORD

REPORT RESULTS TO: Asin Mukherjee PHONE #: FAX #:

SURRENDERED BY: Brian Vta RECEIVED BY: Jeffrey S. Huebig DATE/TIME: 3-29-96 12:35

SURRENDERED BY: Jeffrey S. Huebig RECEIVED BY: Becky Christensen DATE/TIME: 3-29-96 13:00

SURRENDERED BY: RECEIVED BY: DATE/TIME:

COMMENTS:

WHITE COPY, LAB/SAMPLES YELLOW COPY: PPG PINK COPY, SAMPLER

Attachment 2 - Comparison of Baseline and First Annual Data

TABLE 2.0
COMPARISON OF ANNUAL BASELINE DATA
BLUEWATER 1 BIOSOLIDS TEST PLOTS
SOIL SAMPLES
MUNICIPAL SLUDGE BLUEWATER TRENCH 1 (MSBWT1)

PARAMETER	0'–1'		1'–2'		2'–3'		0'–2'	
	1994	1996	1994	1996	1994	1996	1994	1996
Acid Base Potential, Tons CaCO3/1000 Tons Soil *	31.2	375	31.2	361	93.8	360	84.4	368
CEC, meq/100 gm	12.3	17.6	11.7	17.2	12.3	18	12.6	15.8
Conductivity, umhos/cm	7030	5540	7330	7820	7500	9060	8010	6290
Organic Matter, %	0.33	0.4	0.24	0.4	0.41	0.3	0.3	0.3
pH Units	2.73	3	2.7	2.8	2.76	2.72	2.72	3.05
Sodium Absorption Ratio	<0.01	0.04	<0.01	0.03	<0.01	0.02	<0.01	0.02
Sieve, % Rock	37.3	44.3	45.9	43.3	49.7	38.8	32.8	54.5
Sieve, % Sand	30.4	30	27.7	25.2	25.4	36.4	31.8	22.7
Sieve, % Silt	32.3	25.7	26.4	31.5	24.9	24.8	35.4	22.8
Water Holding Capacity, %	32.3	69.9	32.2	68	31	69.3	30.4	69.3
Nitrate/Nitrite–N, mg/Kg	4.76	6	3.45	3	2.33	3	2.16	4
Carbon Nitrogen Ratio	6.67	4.74	5.49	4.85	11.03	8.79	6.3	5.4
WATER SOLUBLE								
Calcium, as Ca, mg/l **	3304	458	3321	472	2822	482	2760	481
Magnesium, as Mg, mg/l	2405	2080	2478	2370	2555	2260	2120	2270
Sodium, as Na, mg/l	1.1	9.7	<1.0	8	<1.0	4.1	<1.0	5.5
DPTA								
Cadmium, as Cd, mg/Kg	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50
Chromium, as Cr, mg/Kg	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50
Copper, as Cu, mg/Kg	304	291	334	376	364	313	305	298
Iron, as Fe, mg/Kg	55.7	506	29.7	405	17.8	427	38.4	395
Lead, as Pb, mg/Kg	5.48	<4	4.23	<4	3.57	<4	4.55	<4
Manganese, as Mn, mg/Kg	38.5	39	39.3	46	30.9	38	37.1	38
Nickel, as Ni, mg/Kg	7.14	6	6.97	7	6.89	6	6.96	6
Zinc, as Zn, mg/Kg	30.8	19	27.7	23	24.8	18	31.7	20
TOTAL								
Arsenic, as As, mg/Kg	47.7	45	50.4	37	55.4	38	48.2	39
Calcium, as Ca, mg/Kg	NA	4470	NA	3870	NA	4390	NA	4490
Magnesium, as Mg, mg/Kg	NA	6860	NA	6740	NA	5560	NA	6440
Mercury, as Hg, mg/Kg	<0.20	0.17	<0.20	0.16	<0.20	0.09	<0.20	<0.10
Molybdenum, as Mo, mg/Kg	30.6	32	35	55	40.8	42	32.6	24
Phosphorus, as P, mg/Kg	1234	985	1274	872	1300	871	1252	942
Selenium, as Se, mg/Kg	<1.0	<8.0	<1.0	<8.0	<1.0	<8.0	<1.0	<8.0
Sodium, as Na, mg/Kg	NA	592	NA	589	NA	595	NA	568

* 1994 assay results for acid base potential are probably for acid potential.
** 1994 assay results for water soluble Ca are probably for total Ca.

TABLE 2.1
COMPARISON OF ANNUAL BASELINE DATA
BLUEWATER 1 BIOSOLIDS TEST PLOTS
SOIL SAMPLES
MUNICIPAL SLUDGE BLUEWATER TRENCH 2 (MSBWT2)

PARAMETER	0'–1'		1'–2'		2'–3'		0'–2'	
	1994	1996	1994	1996	1994	1996	1994	1996
Acid Base Potential, Tons CaCO3/1000 Tons Soil *	40.6	360	59.4	387	96.9	361	43.8	389
CEC, meq/100 gm	15.3	19.3	12.1	17.5	11.4	20	13.9	23.9
Conductivity, umhos/cm	7540	5120	6530	6290	8220	8200	6490	5950
Organic Matter, %	0.51	0.3	0.49	0.3	0.46	0.3	0.65	0.3
pH Units	3.32	3.2	3.15	3.15	3.15	3.1	3.21	3.18
Sodium Absorption Ratio	0.11	0.02	<0.01	0.02	<0.01	0.02	0.08	0.04
Sieve, % Rock	35.5	67.6	34.5	52	68.6	47.5	36.4	51.1
Sieve, % Sand	33.1	16.9	30.2	24.4	16.8	27.5	29.9	25.6
Sieve, % Silt	31.4	15.5	35.3	23.6	14.6	25	33.7	23.3
Water Holding Capacity, %	37.5	72	31.4	65.6	34.9	71.4	38.8	73.7
Nitrate/Nitrite–N, mg/Kg	2.42	3	2.69	4	2.21	4	5.89	3
Carbon Nitrogen Ratio	15.92	5.49	7.89	4.82	7.27	6.55	8.88	5.82
WATER SOLUBLE								
Calcium, as Ca, mg/l **	5714	445	2756	463	4161	451	5044	449
Magnesium, as Mg, mg/l	2573	2000	2992	2250	3248	2050	2375	1930
Sodium, as Na, mg/l	38.3	4.4	1.5	3.9	1.7	4.2	27.2	9.8
DPTA								
Cadmium, as Cd, mg/Kg	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50
Chromium, as Cr, mg/Kg	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50
Copper, as Cu, mg/Kg	430	299	431	312	467	348	433	291
Iron, as Fe, mg/Kg	8.96	469	12.4	436	11.4	370	9.99	440
Lead, as Pb, mg/Kg	2.85	<4	1.7	<4	2.1	<4	4.3	<4
Manganese, as Mn, mg/Kg	18.7	43	24.8	42	22.4	44	31.3	41
Nickel, as Ni, mg/Kg	8.11	10	8.55	7	9.25	8	6.55	7
Zinc, as Zn, mg/Kg	31.8	19	23.3	20	28.9	25	27.1	18
TOTAL								
Arsenic, as As, mg/Kg	50.9	43	56.6	47	55.2	34	46.6	40
Calcium, as Ca, mg/Kg	NA	4160	NA	4150	NA	3460	NA	3650
Magnesium, as Mg, mg/Kg	NA	6440	NA	6770	NA	5690	NA	6510
Mercury, as Hg, mg/Kg	<0.20	0.07	<0.20	0.1	<0.20	0.09	<0.20	0.08
Molybdenum, as Mo, mg/Kg	36.3	198	35.8	37	58.8	25	26.6	30
Phosphorus, as P, mg/Kg	1284	1000	1299	1000	1371	785	1142	975
Selenium, as Se, mg/Kg	<1	<8	<1	<8	<1	<8	<1	10
Sodium, as Na, mg/Kg	NA	662	NA	607	NA	559	NA	541

* 1994 assay results for acid base potential are probably for acid potential.
** 1994 assay results for water soluble Ca are probably for total Ca.

TABLE 2.2
COMPARISON OF ANNUAL BASELINE DATA
BLUEWATER 1 BIOSOLIDS TEST PLOTS
SOIL SAMPLES
MUNICIPAL SLUDGE BLUEWATER TRENCH 3 (MSBWT3)

PARAMETER	0'–1'		1'–2'		2'–3'		0'–2'	
	1994	1996	1994	1996	1994	1996	1994	1996
Acid Base Potential, Tons CaCO3/1000 Tons Soil *	56.2	339	62.5	374	11.6	404	34.4	376
CEC, meq/100 gm	15.6	15.9	13.2	26.4	18.4	34.4	12.8	25.4
Conductivity, umhos/cm	7180	3740	5270	4210	2180	1410	5150	4540
Organic Matter, %	0.89	0.6	0.39	0.5	2	1.2	0.32	0.4
pH Units	3.46	4.92	2.77	3.77	6.38	5.98	2.96	3.93
Sodium Absorption Ratio	0.03	0.1	<0.01	0.03	0.04	0.15	<0.01	0.07
Sieve, % Rock	39.7	42.3	35.6	38.4	15.2	5.5	47	47.7
Sieve, % Sand	28.5	29	30	26.7	25.4	30.2	28.2	26.3
Sieve, % Silt	31.8	28.7	34.4	34.9	59.4	64.3	24.8	26
Water Holding Capacity, %	36.9	89.6	34.2	75	32	90.2	33	72.8
Nitrate/Nitrite–N, mg/Kg	4.18	5	5.15	5	6.26	5	3.22	4
Carbon Nitrogen Ratio	10	14.2	5.69	9.68	14.05	9.2	8.03	13.3
WATER SOLUBLE								
Calcium, as Ca, mg/l **	4389	449	3275	438	1896	532	2879	435
Magnesium, as Mg, mg/l	1777	1120	1593	1260	1162	276	2006	1630
Sodium, as Na, mg/l	8.8	16.9	<1	5.2	9.1	17.1	<1	13.4
DPTA								
Cadmium, as Cd, mg/Kg	0.3	<0.50	<0.10	<0.50	1.69	<0.50	<0.10	<0.50
Chromium, as Cr, mg/Kg	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50	<0.10	<0.50
Copper, as Cu, mg/Kg	402	358	220	148	177	13	379	216
Iron, as Fe, mg/Kg	6.46	340	153	458	8.54	32	41.4	518
Lead, as Pb, mg/Kg	1.91	<4	8.21	<4	375	6	10.8	<4
Manganese, as Mn, mg/Kg	21.6	84	46.5	63	126	137	39.7	52
Nickel, as Ni, mg/Kg	8.21	8	5.78	4	4.16	6	7.42	6
Zinc, as Zn, mg/Kg	37.3	42	32.6	19	102	6	38.2	23
TOTAL								
Arsenic, as As, mg/Kg	66.5	80	55.1	44	67	13	53.7	50
Calcium, as Ca, mg/Kg	NA	10500	NA	5060	NA	4140	NA	7910
Magnesium, as Mg, mg/Kg	NA	6900	NA	6360	NA	6020	NA	7650
Mercury, as Hg, mg/Kg	<0.20	0.25	<0.20	0.07	<0.20	0.06	<0.20	0.12
Molybdenum, as Mo, mg/Kg	36.5	32	50.3	56	8.4	<2	44.9	42
Phosphorus, as P, mg/Kg	1334	1190	1421	1010	827	371	1275	1140
Selenium, as Se, mg/Kg	<1	<8	<1	<8	<1	<8	<1	<8
Sodium, as Na, mg/Kg	NA	853	NA	680	NA	516	NA	757

* 1994 assay results for acid base potential are probably for acid potential.
** 1994 assay results for water soluble Ca are probably for total Ca.