AR TARGET SHEET

The following document was too large to scan as one unit, therefore, it has been broken down into sections.

EDMC#: 0070624
SECTION: 2 OF 2

DOCUMENT #: F2012

TITLE: Data Package

2-WC

GENERAL CHEMISTRY INITIAL CALIBRATION DATA

SDG No.: F2012

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: ASTM E777

Initial Calibration Date: 10/14/05 11:48

Instrument Name: TOC Skalar

Concentration Units: mg/Kg

Initial Calibration ID: 101405S1

Analyte	Curve Type	r	Q
Total Organic Carbon	LNR	0.9997	

Comments:

2B-WC

GENERAL CHEMISTRY SECOND SOURCE CALIBRATION VERIFICATION DATA

SDG No.: P2012

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: ASTM E777

Second Source ID: ICV-1014

Instrument Name: TOC Skalar

Concentration Units: mg/kg

Initial Calibration ID: 101405S1

Analyte	Expected	Found	%D	Q
Total Organic Carbon	6430	6680	3.9	

Comments:

2A-WC

GENERAL CHEMISTRY CALIBRATION VERIFICATION DATA

SDG No.: F2012

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: ASTM E777

Analytical Lot ID: 062806TOCS

Instrument Name: TOC Skalar

Concentration Units: mg/kg

Initial Calibration ID: 101405S1

CCV #1 ID: CV1-0628 CCV #2 ID: CV2-0628 CCV #3 ID: CV3-0628

Analyte	Expected	Found	%D	Q	Expected	Found	%D	Q	Expected	Found	%D	Q
Total Organic Carbon	4000	3910	-2.3		4000	4220	5.4		4000	4660	16.4	

Comments:

2A-WC

GENERAL CHEMISTRY CALIBRATION VERIFICATION DATA

SDG No.: F2012

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: ASTM E777

Analytical Lot ID: 062806TOCS

Instrument Name: TOC Skalar

Concentration Units: mg/kg

Initial Calibration ID: 101405S1

CCV #4 ID: CV4-0628 CCV #5 ID: CCV #6 ID:

Analyte	Expected	Found	%D	Q	Expected	Found	%D	Q	Expected	Found	%D	Q
Total Organic Carbon	4000	4180	4.5									

Comments:

2A-WC

GENERAL CHEMISTRY CALIBRATION VERIFICATION DATA

SDG No.: F2012

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: ASTM E777

Analytical Lot ID: 062906TOCS

Instrument Name: TOC Skalar

Concentration Units: mg/kg

Initial Calibration ID: 101405S1

CCV #1 ID: CV1-0629 CCV #2 ID: CV2-0629 CCV #3 ID:

Analyte	Expected	Found	%D	Q	Expected	Found	%D	Q	Expected	Found	%D	Q
Total Organic Carbon	4000	4140	3.5		4000	4390	9.7					

Comments:

3-WC

SOIL GENERAL CHEMISTRY METHOD BLANK SUMMARY

Field Sample ID:

SB1-0628

SDG No.: F2012

Analysis Method: ASTM E777

Initial Cal ID: 101405S1

Matrix: (Soil/Water) SOIL

Instrument: TOC Skalar

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: SB1-0628

Date Analyzed: 06/28/06

Time Analyzed: 0930

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
02	BS1S0628	BS1S0628	06/28/06	0919
10	J12N97	F201201	06/28/06	1135
11	J12N98	F201202	06/28/06	1144
12	J12NB8	F201203	06/28/06	1259
14	J12NC0	F201205	06/28/06	1533
15	J12NB9	F201204	06/28/06	1615
16	J12NB4	F201206	06/28/06	1628
17	J12NB5	F201207	06/28/06	1638
18	J12NB6	F201208	06/28/06	1647
20	J12NB1	F201209	06/28/06	1708

COMMENTS: _____

SOIL GENERAL CHEMISTRY METHOD BLANK SUMMARY

Field Sample ID:

SB1-0629

SDG No.: F2012

Analysis Method: ASTM E777

Initial Cal ID: 101405S1

Matrix: (Soil/Water) SOIL

Instrument: TOC Skalar

Lab Name: CH2M HILL/LAB/CVO

Lab Sample ID: SB1-0629

Date Analyzed: 06/29/06

Time Analyzed: 1000

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
02	BS1S0629	BS1S0629	06/29/06	0943
04	J12NB2	F201210	06/29/06	1018
05	J12NB3	F201211	06/29/06	1033
10	J12NB0	F201212	06/29/06	1534
11	J12N99	F201213	06/29/06	1549

COMMENTS:

GENERAL CHEMISTRY LABORATORY CONTROL SAMPLE

SDG No.: F2012

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: ASTM E777

LCS ID: BS1S0628

Initial Cal ID: 101405S1

Date Analyzed: 06/28/06

Matrix: (Soil/Water) SOIL

Time Analyzed: 0919

Instrument: TOC Skalar

Concentration Units: mg/kg

Analyte	Expected	Found	%R	QC Limits %R	Q
Total Organic Carbon	8840	9620	109	75-125	

* Values outside of QC limits

Comments:

7-WC

GENERAL CHEMISTRY LABORATORY CONTROL SAMPLE

SDG No.: F2012

Analysis Method: ASTM E777

Initial Cal ID: 101405S1

Matrix: (Soil/Water) SOIL

Instrument: TOC Skalar

Lab Name: CH2M HILL/LAB/CVO

LCS ID: BS1S0629

Date Analyzed: 06/29/06

Time Analyzed: 0943

Concentration Units: mg/kg

Analyte	Expected	Found	%R	QC Limits %R	Q
Total Organic Carbon	8840	10100	115	75-125	

* Values outside of QC limits

Comments:

14-WC

GENERAL CHEMISTRY ANALYTICAL SEQUENCE

SDG No.: F2012

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: ASTM E777

Lab Code: CVO

Instrument: TOC SKALAR

Analytical Lot ID: 101405TOCS

	CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
02	LEVEL1	LEVEL1	10/14/05	1148
03	LEVEL2	LEVEL2	10/14/05	1158
04	LEVEL3	LEVEL3	10/14/05	1208
05	LEVEL4	LEVEL4	10/14/05	1218
06	LEVEL5	LEVEL5	10/14/05	1228
07	ICV-1014	ICV-1014	10/14/05	1252

COMMENTS: _____

14-WC

GENERAL CHEMISTRY ANALYTICAL SEQUENCE

SDG No.: F2012

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: ASTM E777

Lab Code: CVO

Instrument: TOC Skalar

Analytical Lot ID: 062806TOCS

	CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
01	CV1-0628	CV1-0628	06/28/06	0858
02	BS1S0628	BS1S0628	06/28/06	0919
03	SB1-0628	SB1-0628	06/28/06	0930
09	CV2-0628	CV2-0628	06/28/06	1043
10	J12N97	F201201	06/28/06	1135
11	J12N98	F201202	06/28/06	1144
12	J12NB8	F201203	06/28/06	1259
13	CV3-0628	CV3-0628	06/28/06	1510
14	J12NC0	F201205	06/28/06	1533
15	J12NB9	F201204	06/28/06	1615
16	J12NB4	F201206	06/28/06	1628
17	J12NB5	F201207	06/28/06	1638
18	J12NB6	F201208	06/28/06	1647
20	J12NB1	F201209	06/28/06	1708
21	CV4-0628	CV4-0628	06/28/06	1720

COMMENTS: _____

14-WC

GENERAL CHEMISTRY ANALYTICAL SEQUENCE

SDG No.: F2012

Lab Name: CH2M HILL/LAB/CVO

Analysis Method: ASTM E777

Lab Code: CVO

Instrument: TOC Skalar

Analytical Lot ID: 062906TOCS

	CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
01	CV1-0629	CV1-0629	06/29/06	0927
02	BS1S0629	BS1S0629	06/29/06	0943
03	SB1-0629	SB1-0629	06/29/06	1000
04	J12NB2	F201210	06/29/06	1018
05	J12NB3	F201211	06/29/06	1033
10	J12NB0	F201212	06/29/06	1534
11	J12N99	F201213	06/29/06	1549
12	CV2-0629	CV2-0629	06/29/06	1718

COMMENTS: _____

CH2MHILL
Applied Sciences Laboratory

CH2M HILL
Applied Sciences Labortory (ASL)
2300 NW Walnut Blvd.
P.O. Box 428
Corvallis, OR 97330-0428
Telephone: 541-752-4271
Fax: 541-752-0276

06/30/06

MDL Study Report

Analytical Method: ASTM E777
Matrix: Soil

Instrument ID: TOC Skalar
Concentration Units: mg/kg

Analyte	Analysis Date	Amt. Spiked	Replicates 1	2	3	4	5	6	7	8	Std. Dev.	MDL
Total Organic Carbon	08/17/05	140	31.0	14.4	8.89	29.4	32.4	27.1	6.37		11.1	35.0

CHAIN OF CUSTODY/SHIPPING DOCUMENTS

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-9	Page 1 of 1

Collector Tiller, B.	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Project Designation 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location 1607-D2:1		SAF No. RC-072
Ice Chest No. ERC-96-012	Field Logbook No. EL-1597-Y2 AT 06-19-06	COA BESRAS6520	Method of Shipment GROUND TRANSPORT Fed EX 6/21/06
Shipped To CH2MHill - Corvallis	Offsite Property No. A060451		Bill of Lading/Air Bill No. SEE OSPC

Price Code 8N

Air Quality ☐

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

COOL 4 C

Preservation	COOL 4 C →	~~None~~	~~None~~ 6/14/06								
Type of Container		P	P/G								
No. of Container(s)		1	2 6/14/06								
Volume		1000g	1000g								
SAMPLE ANALYSIS		See item (1) in Special Instructions.	Sod Plant Toxicity ASTM E1963								

Sample No.	Matrix *	Sample Date	Sample Time										
J12N97	SOIL	06-19-06	1210	X	X		B1619-	01					—1
J12N98	SOIL	6-19-06	1240	X	X		B1619	02					—2

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From BRETT TILLER	Date/Time 1700 6-19-06	Received By/Stored In EAS LOCKED STORAGE	Date/Time 1700 6-19-06
Relinquished By/Removed From EAS LOCKED STORAGE	Date/Time 0900 6-21-06	Received By/Stored In LR Flanders	Date/Time 6-21-06 0900
Relinquished By/Removed From LR Flanders	Date/Time 6/21/06 1500	Received By/Stored In Fed EX	Date/Time
Relinquished By/Removed From Fed EX	Date/Time 6/22/06	Received By/Stored In Darin Hallard CH2M HILL	Date/Time 6-22-06 14:00
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) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

B

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
Li=Liquid
Ve=Vegetation
X=Other

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

BHI-EE-011 (08/29/2005)

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-14	Page 1 of 1

Collector: Tiller, B.	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location: 618-4	SAF No.: RC-072	
Ice Chest No.: ERC-96-012	Field Logbook No.: EL-1597-1	COA: BESRAS6520	Method of Shipment: ~~GROUND TRANSPORT~~ Fed Ex no 6/21/06
Shipped To: CH2MHill - Corvallis	Offsite Property No.: A060451		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

COOL 4 C

Preservation	COOL 4C →	~~None~~	~~None~~ 6/21/06								
Type of Container	P	P/G									
No. of Container(s)	1	2									
Volume	1000g	1,2000g	Fed 6-21-06								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Soil Plant Toxicity ASTM E1963									

Sample No.	Matrix *	Sample Date	Sample Time											
J12NB8	SOIL	06-19-06	1500	X	X		B1619-	03						-3
J12NB9	SOIL	06-19-06	1530	X	X		B1619-	04						-4
J12NC0	SOIL	06-19-06	1600	X	X		B1619-	05						-5

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: BRETT TILLER	Date/Time: 1700 6-19-06	Received By/Stored In: EAS LOCKED STORAGE	Date/Time: 1700 6-19-06
Relinquished By/Removed From: EAS LOCKED STORAGE	Date/Time: 0900 6-21-06	Received By/Stored In: JR Elmendorf 6-21-06	Date/Time: 0900
Relinquished By/Removed From: JR Elmendorf 6-21-06	Date/Time: 1500	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 6/22/06	Received By/Stored In: Daisy Hubbard CH2M HILL	Date/Time: 6-22-06 14:00
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) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

Matrix *

SoSoil
SESediment
SOaSolid
SlaSludge
WaWater
OaOil
AaAir
DSaDrum Solids
DLaDrum Liquids
TaTissue
WIaWipe
LaLiquid
VaVegetation
XaOther

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

BH-EE-011 (08/29/2005)

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-13	Page 1 of 1
Collector: Tiller, B.	Company Contact: JOAN KESSNER; Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 8N; Data Turnaround: 45 Days
Project Designation: 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location: 600-181	SAF No.: RC-072	Air Quality ☐
Ice Chest No.: ERC-96-012	Field Logbook No.: EL-1597-X2 BTOU-20-06; COA: BESRAS6520	Method of Shipment: ~~GROUND TRANSPORT~~ Fed Ex	6/21/06
Shipped To: CH2MHill - Corvallis	Offsite Property No.: A060451	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
NONE

Special Handling and/or Storage
COOL 4 C

Preservation	COOL 4C →	~~None~~	~~None~~ AB 61406								
Type of Container		P	P/G								
No. of Container(s)		1	2 X AB 61406								
Volume		1000g	1 2000g								
SAMPLE ANALYSIS		See item (1) in Special Instructions.	Soil Plant Toxicity ASTM E1963								

Sample No.	Matrix *	Sample Date	Sample Time										
J12NB4	SOIL	06-20-06	1045	X	X		B1619-	06					-6
J12NB5	SOIL	06-20-06	1130	X	X		B1619-	07					-7
J12NB6	SOIL	06-20-06	1200	X	X		B1619	08					-8
~~J12NB7~~	~~SOIL~~	AB 61306											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: BRETT TILLER	Date/Time: 1330 6-20-06	Received By/Stored In: EAS LOCKED STORAGE	Date/Time: 1330 6-20-06
Relinquished By/Removed From: EAS LOCKED STORAGE	Date/Time: 0900 6-21-06	Received By/Stored In: [illegible]	Date/Time: 6-21-06 0900
Relinquished By/Removed From: [illegible]	Date/Time: 6-21-06 1500	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 6-22-06	Received By/Stored In: Shirley Hubbard CH2M HILL	Date/Time: 6-22-06 14:00
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) Particle Size (Dry Sieve) - D422; Moisture Content - D2216. TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

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 (08/29/2005)

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-12	Page 1 of 1

Collector Tiller, B.	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Price Code	Data Turnaround 45 Days	Air Quality ☐	
Project Designation 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location 600-171		SAF No. RC-072
Ice Chest No. ERC-96-012	Field Logbook No. EL-1597-Y2 BTOU-20-06	COA BESRAS6520	Method of Shipment ~~GROUND TRANSPORT~~ Fed EX MA 6/21/06
Shipped To CH2MHill - Corvallis	Offsite Property No. A060451		Bill of Lading/Air Bill No. SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

COOL 4C

COOL 4C → Preservation			4 61406								
Type of Container		P	P/G								
No. of Container(s)		1	2								
Volume		1000g	~~2000g~~ 1000g JRE 6-21-06								
SAMPLE ANALYSIS		See item (1) in Special Instructions	Soil Plant Toxicity ASTM E1963								
Sample No.	Matrix *	Sample Date	Sample Time								
J12NB1	SOIL	06-20-06	0910	X	X		B1619-09				-9
J12NB2	SOIL	06-20-06	0930	X	X		B1619-10				-10
J12NB3	SOIL	06-20-06	1000	X	X		B1619-11				-11

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From BRETT TILLER	Date/Time 1330 6-20-06	Received By/Stored In EAS LOCKED STORAGE	Date/Time 1330 6-20-06
Relinquished By/Removed From EAS LOCKED STORAGE	Date/Time 0900 6-21-06	Received By/Stored In JR Elandon	Date/Time 6-21-06 0900
Relinquished By/Removed From JR Elandon 6/21/06	Date/Time 1500	Received By/Stored In Fed EX	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 6/22/06	Received By/Stored In Darien Hubbard CH2M HILL	Date/Time 6-22-06 14:20
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) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

Matrix *
SoSoil
SdSediment
SOnSolid
SlnSludge
WaWater
OnOil
AnAir
DSnDrum Solids
DLnDrum Liquids
TnTissue
WnWipe
LnLiquid
VnVegetation
XnOther

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

BHI-EE-011 (08/29/2005)

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-11	Page 1 of 1

Collector Tiller, B.	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Project Designation 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location 600-139		SAF No. RC-072
Ice Chest No. ERC-96-012	Field Logbook No. EL-1597-1	COA BESRAS6520	Method of Shipment ~~GROUND TRANSPORT~~ Fed Ex 6/20/06
Shipped To CH2MHill - Corvallis	Offsite Property No. A060451		Bill of Lading/Air Bill No. SEE OSPC

Price Code 8N

Air Quality ☐

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

COOL 4C

Preservation	COOL 4C →	~~None~~	~~None~~ 6/20/06								
Type of Container		P	P/G								
No. of Container(s)		1	2								
Volume		1000g	1 2000g								
SAMPLE ANALYSIS		See item (1) in Special Instructions.	Soil Plant Toxicity ASTM E1963								
Sample No.	Matrix *	Sample Date	Sample Time								
J12NB0	SOIL	06-19-06	1350	X	X			B1619-12			

12

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By/Removed From: BRETT TILLER, Date/Time 6-19-06 1700	Received By/Stored In: EAS LOCKED STORAGE, Date/Time 6-19-06 1700	(1) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0
Relinquished By/Removed From: EAS LOCKED STORAGE, Date/Time 6-21-06 0900	Received By/Stored In: [illegible] 6-21-06 0900	
Relinquished By/Removed From: [illegible] 6/21/06 1620	Received By/Stored In: Fed Ex, Date/Time	
Relinquished By/Removed From: Fed Ex, Date/Time 6/22/06	Received By/Stored In: Doug Hubbard CH2M HILL, Date/Time 6-22-06 14:20	
Relinquished By/Removed From, Date/Time	Received By/Stored In, Date/Time	
Relinquished By/Removed From, Date/Time	Received By/Stored In, Date/Time	

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

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

BHI-EE-011 (08/29/2005)

F2012 6/6

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-10	Page 1 of 1

Collector: Tiller, B.	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location: 116-DR-1&2	SAF No.: RC-072	
Ice Chest No.: ERC-96-012	Field Logbook No.: EL-1597 X2 AT 06-19-06	COA: BESRAS6520	Method of Shipment: ~~GROUND TRANSPORT~~ Fed Ex MO 6/21/06
Shipped To: CH2MHill - Corvallis	Offsite Property No.: A060451		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

COOL 4 C

Preservation	COOL 4C	~~None~~	~~None~~ 4/C 6/16/06								
Type of Container	P	P/G									
No. of Container(s)	1	2 x 6/16/06									
Volume	1000g	1 2000g									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Soil Plant Toxicity ASTM E1963									
Sample No. / Matrix * / Sample Date / Sample Time											
J12N99 / SOIL / 06-19-06 / 1310	X	X1			6/6/19-	13					13

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: BRETT TILLER	Date/Time: 6-19-06 1700	Received By/Stored In: EAS LOCKED STORAGE	Date/Time: 6-19-06 1700
Relinquished By/Removed From: EAS LOCKED STORAGE	Date/Time: 6-21-06 0900	Received By/Stored In: [signature]	Date/Time: 6-21-06 0900
Relinquished By/Removed From: [signature]	Date/Time: 6/21/06 1500	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 6/22/06	Received By/Stored In: Nancy Hilliard CH2M HILL	Date/Time: 6-22-06 14:28
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) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

Matrix *

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

BHI-EE-011 (08/29/2005)

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: F2012 Date received: 6-22-06

Client/Project Washington Closure Hanford

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE		✓
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ✓ Lt Side ___ Rt Side ___		
Type of packing material: (Ice) Blue Ice Bubble wrap		
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM		✓
Was there ice in the cooler? Enter temp. 0.1, 0.1 C	✓	
All VOCs free of air bubbles ?		NA

VERIFICATION OF SAMPLE PRESERVATION

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (solids/dnpres)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

Daisy Hubbard 6-22-06 14:30
Date/Time

Date/Time

G:\CSERVICE\ADMIN\FORMS\Sample Receiving\RECPTRCD.XLS

VersionCo	LabName	SDG	FieldID	NativeID	QAQCTypi	LRType	Matrix	LabSampl	AnalysisM	ExtractionI	SampleDa	SampleTin	ReceiveDa	ExtractDat	ExtractTim	AnalysisDa	AnalysisTi	PercentSo	LabLotCtl	CAS	ParamID	Analyte	Result	ExpectedV
4.00EPAC	CHMC	F2012	J12N97	J12N97	N		SOIL	F201201	ASTM D22	NONE	6/19/2006	12:10	6/22/2006			6/26/2006	16:01	97.26		MOISTURI	MOIST	Moisture	2.74	
4.00EPAC	CHMC	F2012	J12N98	J12N98	N		SOIL	F201202	ASTM D22	NONE	6/19/2006	12:40	6/22/2006			6/26/2006	16:01	98.14		MOISTURI	MOIST	Moisture	1.86	
4.00EPAC	CHMC	F2012	J12NB8	J12NB8	N		SOIL	F201203	ASTM D22	NONE	6/19/2006	15:00	6/22/2006			6/26/2006	16:01	99.52		MOISTURI	MOIST	Moisture	0.485	
4.00EPAC	CHMC	F2012	J12NB9	J12NB9	N		SOIL	F201204	ASTM D22	NONE	6/19/2006	15:30	6/22/2006			6/26/2006	16:01	99.24		MOISTURI	MOIST	Moisture	0.759	
4.00EPAC	CHMC	F2012	J12NC0	J12NC0	N		SOIL	F201205	ASTM D22	NONE	6/19/2006	16:00	6/22/2006			6/26/2006	16:01	98.82		MOISTURI	MOIST	Moisture	1.18	
4.00EPAC	CHMC	F2012	J12NB4	J12NB4	N		SOIL	F201206	ASTM D22	NONE	6/20/2006	10:45	6/22/2006			6/26/2006	16:01	97.14		MOISTURI	MOIST	Moisture	2.86	
4.00EPAC	CHMC	F2012	J12NB5	J12NB5	N		SOIL	F201207	ASTM D22	NONE	6/20/2006	11:30	6/22/2006			6/26/2006	16:01	99.23		MOISTURI	MOIST	Moisture	0.766	
4.00EPAC	CHMC	F2012	J12NB6	J12NB6	N		SOIL	F201208	ASTM D22	NONE	6/20/2006	12:00	6/22/2006			6/26/2006	16:01	99.36		MOISTURI	MOIST	Moisture	0.64	
4.00EPAC	CHMC	F2012	J12NB1	J12NB1	N		SOIL	F201209	ASTM D22	NONE	6/20/2006	9:10	6/22/2006			6/26/2006	16:01	98.8		MOISTURI	MOIST	Moisture	1.2	
4.00EPAC	CHMC	F2012	J12NB2	J12NB2	N		SOIL	F201210	ASTM D22	NONE	6/20/2006	9:30	6/22/2006			6/26/2006	16:01	98.79		MOISTURI	MOIST	Moisture	1.21	
4.00EPAC	CHMC	F2012	J12NB3	J12NB3	N		SOIL	F201211	ASTM D22	NONE	6/20/2006	10.00	6/22/2006			6/26/2006	16:01	99.51		MOISTURI	MOIST	Moisture	0.488	
4.00EPAC	CHMC	F2012	J12NB0	J12NB0	N		SOIL	F201212	ASTM D22	NONE	6/19/2006	13.50	6/22/2006			6/26/2006	16:01	99		MOISTURI	MOIST	Moisture	1	
4.00EPAC	CHMC	F2012	J12N99	J12N99	N		SOIL	F201213	ASTM D22	NONE	6/19/2006	13:10	6/22/2006			6/26/2006	16:01	99.85		MOISTURI	MOIST	Moisture	0.155	
4.00EPAC	CHMC	F2012	BS1S0628	BS1S0628	BS		SOIL	BS1S0628	ASTM E77	NONE						6/28/2006	9:19	100		TOC	TOC	Total Orga	9620	8840
4.00EPAC	CHMC	F2012	BS1S0629	BS1S0629	BS		SOIL	BS1S0629	ASTM E77	NONE						6/29/2006	9:43	100		TOC	TOC	Total Orga	10100	8840
4.00EPAC	CHMC	F2012	J12N97	J12N97	N		SOIL	F201201	ASTM E77	NONE	6/19/2006	12:10	6/22/2006			6/28/2006	11:35	97.26		TOC	TOC	Total Orga	325	
4.00EPAC	CHMC	F2012	J12N98	J12N98	N		SOIL	F201202	ASTM E77	NONE	6/19/2006	12:40	6/22/2006			6/28/2006	11:44	98.14		TOC	TOC	Total Orga	243	
4.00EPAC	CHMC	F2012	J12NB8	J12NB8	N		SOIL	F201203	ASTM E77	NONE	6/19/2006	15.00	6/22/2006			6/28/2006	12:59	99.52		TOC	TOC	Total Orga	153	
4.00EPAC	CHMC	F2012	J12NB9	J12NB9	N		SOIL	F201204	ASTM E77	NONE	6/19/2006	15:30	6/22/2006			6/28/2006	16:15	99.24		TOC	TOC	Total Orga	212	
4.00EPAC	CHMC	F2012	J12NC0	J12NC0	N		SOIL	F201205	ASTM E77	NONE	6/19/2006	16.00	6/22/2006			6/28/2006	15:33	98.82		TOC	TOC	Total Orga	494	
4.00EPAC	CHMC	F2012	J12NB4	J12NB4	N		SOIL	F201206	ASTM E77	NONE	6/20/2006	10:45	6/22/2006			6/28/2006	16:28	97.14		TOC	TOC	Total Orga	452	
4.00EPAC	CHMC	F2012	J12NB5	J12NB5	N		SOIL	F201207	ASTM E77	NONE	6/20/2006	11:30	6/22/2006			6/28/2006	16:38	99.23		TOC	TOC	Total Orga	1550	
4.00EPAC	CHMC	F2012	J12NB6	J12NB6	N		SOIL	F201208	ASTM E77	NONE	6/20/2006	12.00	6/22/2006			6/28/2006	16:47	99.36		TOC	TOC	Total Orga	559	
4.00EPAC	CHMC	F2012	J12NB1	J12NB1	N		SOIL	F201209	ASTM E77	NONE	6/20/2006	9:10	6/22/2006			6/28/2006	17.08	98.8		TOC	TOC	Total Orga	11100	
4.00EPAC	CHMC	F2012	J12NB2	J12NB2	N		SOIL	F201210	ASTM E77	NONE	6/20/2006	9.30	6/22/2006			6/29/2006	10:18	98.79		TOC	TOC	Total Orga	8580	
4.00EPAC	CHMC	F2012	J12NB3	J12NB3	N		SOIL	F201211	ASTM E77	NONE	6/20/2006	10.00	6/22/2006			6/29/2006	10:33	99.51		TOC	TOC	Total Orga	1060	
4.00EPAC	CHMC	F2012	J12NB0	J12NB0	N		SOIL	F201212	ASTM E77	NONE	6/19/2006	13.50	6/22/2006			6/29/2006	15:34	99		TOC	TOC	Total Orga	428	
4.00EPAC	CHMC	F2012	J12N99	J12N99	N		SOIL	F201213	ASTM E77	NONE	6/19/2006	13:10	6/22/2006			6/29/2006	15:49	99.85		TOC	TOC	Total Orga	398	
4.00EPAC	CHMC	F2012	SB1-0628	SB1-0628	LB		SOIL	SB1-0628	ASTM E77	NONE						6/28/2006	9:30	100		TOC	TOC	Total Orga	100	0
4.00EPAC	CHMC	F2012	SB1-0629	SB1-0629	LB		SOIL	SB1-0629	ASTM E77	NONE						6/29/2006	10:00	100		TOC	TOC	Total Orga	100	0
4.00EPAC	CHMC	F2012	BS1S0628	BS1S0628	BS		SOIL	BS1S0628	E300.0A	METHOD				6/28/2006	11:12	6/28/2006	11:12	100	SB1-0628	16887-00-I	CL	Chloride	25.3	25
4.00EPAC	CHMC	F2012	BS1S0628	BS1S0628	BS		SOIL	BS1S0628	E300.0A	METHOD				6/28/2006	11:12	6/28/2006	11:12	100	SB1-0628	16984-48-I	F	Fluoride	26.3	25
4.00EPAC	CHMC	F2012	BS1S0628	BS1S0628	BS		SOIL	BS1S0628	E300.0A	METHOD				6/28/2006	11:12	6/28/2006	11:12	100	SB1-0628	14808-79-I	SO4	Sulfate	27	25
4.00EPAC	CHMC	F2012	BS2S0628	BS2S0628	BS		SOIL	BS2S0628	E300.0A	METHOD				6/28/2006	11.57	6/28/2006	11:57	100	SB1-0628	14797-65-I	NO2N	Nitrite-N	5.78	5.65
4.00EPAC	CHMC	F2012	BS3S0628	BS3S0628	BS		SOIL	BS3S0628	E300.0A	METHOD				6/28/2006	12:19	6/28/2006	12:19	100	SB1-0628	14797-55-I	NO3N	Nitrate-N	38	36
4.00EPAC	CHMC	F2012	J12N97	J12N97	N		SOIL	F201201	E300.0A	METHOD	6/19/2006	12:10	6/22/2006	6/28/2006	15:19	6/28/2006	15:19	97.26	SB1-0628	16887-00-I	CL	Chloride	0.653	
4.00EPAC	CHMC	F2012	J12N97	J12N97	N		SOIL	F201201	E300.0A	METHOD	6/19/2006	12:10	6/22/2006	6/28/2006	15:19	6/28/2006	15:19	97.26	SB1-0628	16984-48-I	F	Fluoride	0.743	
4.00EPAC	CHMC	F2012	J12N97	J12N97	N		SOIL	F201201	E300.0A	METHOD	6/19/2006	12:10	6/22/2006	6/28/2006	15:19	6/28/2006	15:19	97.26	SB1-0628	14797-55-I	NO3N	Nitrate-N	0.658	
4.00EPAC	CHMC	F2012	J12N97	J12N97	N		SOIL	F201201	E300.0A	METHOD	6/19/2006	12:10	6/22/2006	6/28/2006	15:19	6/28/2006	15:19	97.26	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.532	
4.00EPAC	CHMC	F2012	J12N97	J12N97	N		SOIL	F201201	E300.0A	METHOD	6/19/2006	12:10	6/22/2006	6/28/2006	15:19	6/28/2006	15:19	97.26	SB1-0628	14808-79-I	SO4	Sulfate	2.4	
4.00EPAC	CHMC	F2012	J12N98	J12N98	N		SOIL	F201202	E300.0A	METHOD	6/19/2006	12:40	6/22/2006	6/28/2006	16:26	6/28/2006	16:26	98.14	SB1-0628	16887-00-I	CL	Chloride	0.265	
4.00EPAC	CHMC	F2012	J12N98	J12N98	N		SOIL	F201202	E300.0A	METHOD	6/19/2006	12:40	6/22/2006	6/28/2006	16:26	6/28/2006	16:26	98.14	SB1-0628	16984-48-I	F	Fluoride	0.369	
4.00EPAC	CHMC	F2012	J12N98	J12N98	N		SOIL	F201202	E300.0A	METHOD	6/19/2006	12:40	6/22/2006	6/28/2006	16:26	6/28/2006	16:26	98.14	SB1-0628	14797-55-I	NO3N	Nitrate-N	0.873	
4.00EPAC	CHMC	F2012	J12N98	J12N98	N		SOIL	F201202	E300.0A	METHOD	6/19/2006	12:40	6/22/2006	6/28/2006	16:26	6/28/2006	16:26	98.14	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.435	
4.00EPAC	CHMC	F2012	J12N98	J12N98	N		SOIL	F201202	E300.0A	METHOD	6/19/2006	12:40	6/22/2006	6/28/2006	16:26	6/28/2006	16:26	98.14	SB1-0628	14808-79-I	SO4	Sulfate	1.52	
4.00EPAC	CHMC	F2012	J12NB8	J12NB8	N		SOIL	F201203	E300.0A	METHOD	6/19/2006	15.00	6/22/2006	6/28/2006	16:49	6/28/2006	16:49	99.52	SB1-0628	16887-00-I	CL	Chloride	0.116	
4.00EPAC	CHMC	F2012	J12NB8	J12NB8	N		SOIL	F201203	E300.0A	METHOD	6/19/2006	15.00	6/22/2006	6/28/2006	16:49	6/28/2006	16:49	99.52	SB1-0628	16984-48-I	F	Fluoride	0.487	
4.00EPAC	CHMC	F2012	J12NB8	J12NB8	N		SOIL	F201203	E300.0A	METHOD	6/19/2006	15:00	6/22/2006	6/28/2006	16:49	6/28/2006	16:49	99.52	SB1-0628	14797-55-I	NO3N	Nitrate-N	0.218	
4.00EPAC	CHMC	F2012	J12NB8	J12NB8	N		SOIL	F201203	E300.0A	METHOD	6/19/2006	15.00	6/22/2006	6/28/2006	16:49	6/28/2006	16:49	99.52	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.467	
4.00EPAC	CHMC	F2012	J12NB8	J12NB8	N		SOIL	F201203	E300.0A	METHOD	6/19/2006	15.00	6/22/2006	6/28/2006	16:49	6/28/2006	16:49	99.52	SB1-0628	14808-79-I	SO4	Sulfate	1.21	
4.00EPAC	CHMC	F2012	J12NB9	J12NB9	N		SOIL	F201204	E300.0A	METHOD	6/19/2006	15:30	6/22/2006	6/28/2006	17:11	6/28/2006	17:11	99.24	SB1-0628	16887-00-I	CL	Chloride	0.0806	
4.00EPAC	CHMC	F2012	J12NB9	J12NB9	N		SOIL	F201204	E300.0A	METHOD	6/19/2006	15:30	6/22/2006	6/28/2006	17:11	6/28/2006	17:11	99.24	SB1-0628	16984-48-I	F	Fluoride	0.37	
4.00EPAC	CHMC	F2012	J12NB9	J12NB9	N		SOIL	F201204	E300.0A	METHOD	6/19/2006	15:30	6/22/2006	6/28/2006	17:11	6/28/2006	17:11	99.24	SB1-0628	14797-55-I	NO3N	Nitrate-N	0.142	
4.00EPAC	CHMC	F2012	J12NB9	J12NB9	N		SOIL	F201204	E300.0A	METHOD	6/19/2006	15:30	6/22/2006	6/28/2006	17:11	6/28/2006	17:11	99.24	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.475	
4.00EPAC	CHMC	F2012	J12NB9	J12NB9	N		SOIL	F201204	E300.0A	METHOD	6/19/2006	15:30	6/22/2006	6/28/2006	17:11	6/28/2006	17:11	99.24	SB1-0628	14808-79-I	SO4	Sulfate	1.13	
4.00EPAC	CHMC	F2012	J12NC0	J12NC0	N		SOIL	F201205	E300.0A	METHOD	6/19/2006	16:00	6/22/2006	6/28/2006	17:34	6/28/2006	17:34	98.82	SB1-0628	16887-00-I	CL	Chloride	0.13	
4.00EPAC	CHMC	F2012	J12NC0	J12NC0	N		SOIL	F201205	E300.0A	METHOD	6/19/2006	16:00	6/22/2006	6/28/2006	17:34	6/28/2006	17:34	98.82	SB1-0628	16984-48-I	F	Fluoride	0.483	

4.00EPAC CHMC	F2012	J12NC0	J12NC0	N	SOIL	F201205	E300.0A	METHOD	6/19/2006	16.00	6/22/2006	6/28/2006	17:34	6/28/2006	17:34	98.82	SB1-0628	14797-55-I	NO3N	Nitrate-N	0.468	
4.00EPAC CHMC	F2012	J12NC0	J12NC0	N	SOIL	F201205	E300.0A	METHOD	6/19/2006	16.00	6/22/2006	6/28/2006	17:34	6/28/2006	17:34	98.82	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.0448	
4.00EPAC CHMC	F2012	J12NC0	J12NC0	N	SOIL	F201205	E300.0A	METHOD	6/19/2006	16.00	6/22/2006	6/28/2006	17:34	6/28/2006	17:34	98.82	SB1-0628	14808-79-I	SO4	Sulfate	1.72	
4.00EPAC CHMC	F2012	J12NB4	J12NB4	N	SOIL	F201206	E300.0A	METHOD	6/20/2006	10:45	6/22/2006	6/28/2006	17:56	6/28/2006	17:56	97.14	SB1-0628	16887-00-I	CL	Chloride	0.297	
4.00EPAC CHMC	F2012	J12NB4	J12NB4	N	SOIL	F201206	E300.0A	METHOD	6/20/2006	10:45	6/22/2006	6/28/2006	17:56	6/28/2006	17:56	97.14	SB1-0628	16984-48-I	F	Fluoride	0.426	
4.00EPAC CHMC	F2012	J12NB4	J12NB4	N	SOIL	F201206	E300.0A	METHOD	6/20/2006	10:45	6/22/2006	6/28/2006	17:56	6/28/2006	17:56	97.14	SB1-0628	14797-55-I	NO3N	Nitrate-N	0.879	
4.00EPAC CHMC	F2012	J12NB4	J12NB4	N	SOIL	F201206	E300.0A	METHOD	6/20/2006	10:45	6/22/2006	6/28/2006	17:56	6/28/2006	17:56	97.14	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.196	
4.00EPAC CHMC	F2012	J12NB4	J12NB4	N	SOIL	F201206	E300.0A	METHOD	6/20/2006	10:45	6/22/2006	6/28/2006	17:56	6/28/2006	17:56	97.14	SB1-0628	14808-79-I	SO4	Sulfate	0.683	
4.00EPAC CHMC	F2012	J12NB5	J12NB5	N	SOIL	F201207	E300.0A	METHOD	6/20/2006	11:30	6/22/2006	6/28/2006	18:19	6/28/2006	18:19	99.23	SB1-0628	16887-00-I	CL	Chloride	0.472	
4.00EPAC CHMC	F2012	J12NB5	J12NB5	N	SOIL	F201207	E300.0A	METHOD	6/20/2006	11:30	6/22/2006	6/28/2006	18:19	6/28/2006	18:19	99.23	SB1-0628	16984-48-I	F	Fluoride	0.224	
4.00EPAC CHMC	F2012	J12NB5	J12NB5	N	SOIL	F201207	E300.0A	METHOD	6/20/2006	11:30	6/22/2006	6/28/2006	18:19	6/28/2006	18:19	99.23	SB1-0628	14797-55-I	NO3N	Nitrate-N	2.83	
4.00EPAC CHMC	F2012	J12NB5	J12NB5	N	SOIL	F201207	E300.0A	METHOD	6/20/2006	11:30	6/22/2006	6/28/2006	18:19	6/28/2006	18:19	99.23	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.444	
4.00EPAC CHMC	F2012	J12NB5	J12NB5	N	SOIL	F201207	E300.0A	METHOD	6/20/2006	11:30	6/22/2006	6/28/2006	18:19	6/28/2006	18:19	99.23	SB1-0628	14808-79-I	SO4	Sulfate	1.4	
4.00EPAC CHMC	F2012	J12NB6	J12NB6	N	SOIL	F201208	E300.0A	METHOD	6/20/2006	12:00	6/22/2006	6/28/2006	18:41	6/28/2006	18:41	99.36	SB1-0628	16887-00-I	CL	Chloride	0.167	
4.00EPAC CHMC	F2012	J12NB6	J12NB6	N	SOIL	F201208	E300.0A	METHOD	6/20/2006	12:00	6/22/2006	6/28/2006	18:41	6/28/2006	18:41	99.36	SB1-0628	16984-48-I	F	Fluoride	0.292	
4.00EPAC CHMC	F2012	J12NB6	J12NB6	N	SOIL	F201208	E300.0A	METHOD	6/20/2006	12:00	6/22/2006	6/28/2006	18:41	6/28/2006	18:41	99.36	SB1-0628	14797-55-I	NO3N	Nitrate-N	1.3	
4.00EPAC CHMC	F2012	J12NB6	J12NB6	N	SOIL	F201208	E300.0A	METHOD	6/20/2006	12:00	6/22/2006	6/28/2006	18:41	6/28/2006	18:41	99.36	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.172	
4.00EPAC CHMC	F2012	J12NB6	J12NB6	N	SOIL	F201208	E300.0A	METHOD	6/20/2006	12:00	6/22/2006	6/28/2006	18:41	6/28/2006	18:41	99.36	SB1-0628	14808-79-I	SO4	Sulfate	0.83	
4.00EPAC CHMC	F2012	J12NB1	J12NB1	N	SOIL	F201209	E300.0A	METHOD	6/20/2006	9:10	6/22/2006	6/28/2006	19:26	6/28/2006	19:26	98.8	SB1-0628	16887-00-I	CL	Chloride	0.319	
4.00EPAC CHMC	F2012	J12NB1	J12NB1	N	SOIL	F201209	E300.0A	METHOD	6/20/2006	9:10	6/22/2006	6/28/2006	19:26	6/28/2006	19:26	98.8	SB1-0628	16984-48-I	F	Fluoride	0.332	
4.00EPAC CHMC	F2012	J12NB1	J12NB1	N	SOIL	F201209	E300.0A	METHOD	6/20/2006	9:10	6/22/2006	6/28/2006	19:26	6/28/2006	19:26	98.8	SB1-0628	14797-55-I	NO3N	Nitrate-N	6.59	
4.00EPAC CHMC	F2012	J12NB1	J12NB1	N	SOIL	F201209	E300.0A	METHOD	6/20/2006	9:10	6/22/2006	6/28/2006	19:26	6/28/2006	19:26	98.8	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.51	
4.00EPAC CHMC	F2012	J12NB1	J12NB1	N	SOIL	F201209	E300.0A	METHOD	6/20/2006	9:10	6/22/2006	6/28/2006	19:26	6/28/2006	19:26	98.8	SB1-0628	14808-79-I	SO4	Sulfate	4.1	
4.00EPAC CHMC	F2012	J12NB2	J12NB2	N	SOIL	F201210	E300.0A	METHOD	6/20/2006	9:30	6/22/2006	6/28/2006	19:49	6/28/2006	19:49	98.79	SB1-0628	16887-00-I	CL	Chloride	0.241	
4.00EPAC CHMC	F2012	J12NB2	J12NB2	N	SOIL	F201210	E300.0A	METHOD	6/20/2006	9:30	6/22/2006	6/28/2006	19:49	6/28/2006	19:49	98.79	SB1-0628	16984-48-I	F	Fluoride	0.25	
4.00EPAC CHMC	F2012	J12NB2	J12NB2	N	SOIL	F201210	E300.0A	METHOD	6/20/2006	9:30	6/22/2006	6/28/2006	19:49	6/28/2006	19:49	98.79	SB1-0628	14797-55-I	NO3N	Nitrate-N	2.93	
4.00EPAC CHMC	F2012	J12NB2	J12NB2	N	SOIL	F201210	E300.0A	METHOD	6/20/2006	9:30	6/22/2006	6/28/2006	19:49	6/28/2006	19:49	98.79	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.373	
4.00EPAC CHMC	F2012	J12NB2	J12NB2	N	SOIL	F201210	E300.0A	METHOD	6/20/2006	9:30	6/22/2006	6/28/2006	19:49	6/28/2006	19:49	98.79	SB1-0628	14808-79-I	SO4	Sulfate	2.47	
4.00EPAC CHMC	F2012	J12NB3	J12NB3	N	SOIL	F201211	E300.0A	METHOD	6/20/2006	10:00	6/22/2006	6/28/2006	20:11	6/28/2006	20:11	99.51	SB1-0628	16887-00-I	CL	Chloride	0.173	
4.00EPAC CHMC	F2012	J12NB3	J12NB3	N	SOIL	F201211	E300.0A	METHOD	6/20/2006	10:00	6/22/2006	6/28/2006	20:11	6/28/2006	20:11	99.51	SB1-0628	16984-48-I	F	Fluoride	0.306	
4.00EPAC CHMC	F2012	J12NB3	J12NB3	N	SOIL	F201211	E300.0A	METHOD	6/20/2006	10:00	6/22/2006	6/28/2006	20:11	6/28/2006	20:11	99.51	SB1-0628	14797-55-I	NO3N	Nitrate-N	1.36	
4.00EPAC CHMC	F2012	J12NB3	J12NB3	N	SOIL	F201211	E300.0A	METHOD	6/20/2006	10:00	6/22/2006	6/28/2006	20:11	6/28/2006	20:11	99.51	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.337	
4.00EPAC CHMC	F2012	J12NB3	J12NB3	N	SOIL	F201211	E300.0A	METHOD	6/20/2006	10:00	6/22/2006	6/28/2006	20:11	6/28/2006	20:11	99.51	SB1-0628	14808-79-I	SO4	Sulfate	1.34	
4.00EPAC CHMC	F2012	J12NB0	J12NB0	N	SOIL	F201212	E300.0A	METHOD	6/19/2006	13:50	6/22/2006	6/28/2006	20:34	6/28/2006	20:34	99	SB1-0628	16887-00-I	CL	Chloride	0.13	
4.00EPAC CHMC	F2012	J12NB0	J12NB0	N	SOIL	F201212	E300.0A	METHOD	6/19/2006	13:50	6/22/2006	6/28/2006	20:34	6/28/2006	20:34	99	SB1-0628	16984-48-I	F	Fluoride	0.434	
4.00EPAC CHMC	F2012	J12NB0	J12NB0	N	SOIL	F201212	E300.0A	METHOD	6/19/2006	13:50	6/22/2006	6/28/2006	20:34	6/28/2006	20:34	99	SB1-0628	14797-55-I	NO3N	Nitrate-N	1.41	
4.00EPAC CHMC	F2012	J12NB0	J12NB0	N	SOIL	F201212	E300.0A	METHOD	6/19/2006	13:50	6/22/2006	6/28/2006	20:34	6/28/2006	20:34	99	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.499	
4.00EPAC CHMC	F2012	J12NB0	J12NB0	N	SOIL	F201212	E300.0A	METHOD	6/19/2006	13:50	6/22/2006	6/28/2006	20:34	6/28/2006	20:34	99	SB1-0628	14808-79-I	SO4	Sulfate	1.37	
4.00EPAC CHMC	F2012	J12N99	J12N99	N	SOIL	F201213	E300.0A	METHOD	6/19/2006	13:10	6/22/2006	6/28/2006	20:56	6/28/2006	20:56	99.85	SB1-0628	16887-00-I	CL	Chloride	0.166	
4.00EPAC CHMC	F2012	J12N99	J12N99	N	SOIL	F201213	E300.0A	METHOD	6/19/2006	13:10	6/22/2006	6/28/2006	20:56	6/28/2006	20:56	99.85	SB1-0628	16984-48-I	F	Fluoride	0.262	
4.00EPAC CHMC	F2012	J12N99	J12N99	N	SOIL	F201213	E300.0A	METHOD	6/19/2006	13:10	6/22/2006	6/28/2006	20:56	6/28/2006	20:56	99.85	SB1-0628	14797-55-I	NO3N	Nitrate-N	1.86	
4.00EPAC CHMC	F2012	J12N99	J12N99	N	SOIL	F201213	E300.0A	METHOD	6/19/2006	13:10	6/22/2006	6/28/2006	20:56	6/28/2006	20:56	99.85	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.131	
4.00EPAC CHMC	F2012	J12N99	J12N99	N	SOIL	F201213	E300.0A	METHOD	6/19/2006	13:10	6/22/2006	6/28/2006	20:56	6/28/2006	20:56	99.85	SB1-0628	14808-79-I	SO4	Sulfate	1.43	
4.00EPAC CHMC	F2012	SB1-0628	SB1-0628	LB	SOIL	SB1-0628	E300.0A	METHOD				6/28/2006	12:42	6/28/2006	12:42	100	SB1-0628	16887-00-I	CL	Chloride	0.255	0
4.00EPAC CHMC	F2012	SB1-0628	SB1-0628	LB	SOIL	SB1-0628	E300.0A	METHOD				6/28/2006	12:42	6/28/2006	12:42	100	SB1-0628	16984-48-I	F	Fluoride	0.5	0
4.00EPAC CHMC	F2012	SB1-0628	SB1-0628	LB	SOIL	SB1-0628	E300.0A	METHOD				6/28/2006	12:42	6/28/2006	12:42	100	SB1-0628	14797-55-I	NO3N	Nitrate-N	0.5	0
4.00EPAC CHMC	F2012	SB1-0628	SB1-0628	LB	SOIL	SB1-0628	E300.0A	METHOD				6/28/2006	12:42	6/28/2006	12:42	100	SB1-0628	14797-65-I	NO2N	Nitrite-N	0.5	0
4.00EPAC CHMC	F2012	SB1-0628	SB1-0628	LB	SOIL	SB1-0628	E300.0A	METHOD				6/28/2006	12:42	6/28/2006	12:42	100	SB1-0628	14808-79-I	SO4	Sulfate	0.5	0
4.00EPAC CHMC	F2012	BS1S0630	BS1S0630	BS	SOIL	BS1S0630	E350.3	METHOD				6/30/2006	14:32	6/30/2006	14:32	100	SB1-0630	7664-41-7	NH3N	Ammonia-I	193	200
4.00EPAC CHMC	F2012	J12N97	J12N97	N	SOIL	F201201	E350.3	METHOD	6/19/2006	12:10	6/22/2006	6/30/2006	14:50	6/30/2006	14:50	97.26	SB1-0630	7664-41-7	NH3N	Ammonia-I	15	
4.00EPAC CHMC	F2012	J12N98	J12N98	N	SOIL	F201202	E350.3	METHOD	6/19/2006	12:40	6/22/2006	6/30/2006	14:52	6/30/2006	14:52	98.14	SB1-0630	7664-41-7	NH3N	Ammonia-I	7.67	
4.00EPAC CHMC	F2012	J12NB8	J12NB8	N	SOIL	F201203	E350.3	METHOD	6/19/2006	15.00	6/22/2006	6/30/2006	14:57	6/30/2006	14:57	99.52	SB1-0630	7664-41-7	NH3N	Ammonia-I	3.8	
4.00EPAC CHMC	F2012	J12NB9	J12NB9	N	SOIL	F201204	E350.3	METHOD	6/19/2006	15:30	6/22/2006	6/30/2006	15:01	6/30/2006	15:01	99.24	SB1-0630	7664-41-7	NH3N	Ammonia-I	7.44	
4.00EPAC CHMC	F2012	J12NC0	J12NC0	N	SOIL	F201205	E350.3	METHOD	6/19/2006	16:00	6/22/2006	6/30/2006	15:03	6/30/2006	15.03	98.82	SB1-0630	7664-41-7	NH3N	Ammonia-I	8.41	
4.00EPAC CHMC	F2012	J12NB4	J12NB4	N	SOIL	F201206	E350.3	METHOD	6/20/2006	10:45	6/22/2006	6/30/2006	15:08	6/30/2006	15:08	97.14	SB1-0630	7664-41-7	NH3N	Ammonia-I	6.81	
4.00EPAC CHMC	F2012	J12NB5	J12NB5	N	SOIL	F201207	E350.3	METHOD	6/20/2006	11:30	6/22/2006	6/30/2006	15:12	6/30/2006	15:12	99.23	SB1-0630	7664-41-7	NH3N	Ammonia-I	12.8	
4.00EPAC CHMC	F2012	J12NB6	J12NB6	N	SOIL	F201208	E350.3	METHOD	6/20/2006	12:00	6/22/2006	6/30/2006	15:15	6/30/2006	15:15	99.36	SB1-0630	7664-41-7	NH3N	Ammonia-I	3.87	
4.00EPAC CHMC	F2012	J12NB1	J12NB1	N	SOIL	F201209	E350.3	METHOD	6/20/2006	9:10	6/22/2006	6/30/2006	15:21	6/30/2006	15:21	98.8	SB1-0630	7664-41-7	NH3N	Ammonia-I	5.93	

4.00EPAC CHMC	F2012	J12NB2	J12NB2	N	SOIL	F201210	E350.3	METHOD	6/20/2006	9:30	6/22/2006	6/30/2006	15.27	6/30/2006	15:27	98.79	SB1-0630	7664-41-7	NH3N	Ammonia-I	3.22	
4.00EPAC CHMC	F2012	J12NB3	J12NB3	N	SOIL	F201211	E350.3	METHOD	6/20/2006	10.00	6/22/2006	6/30/2006	15.32	6/30/2006	15:32	99.51	SB1-0630	7664-41-7	NH3N	Ammonia-I	6.66	
4.00EPAC CHMC	F2012	J12NB0	J12NB0	N	SOIL	F201212	E350.3	METHOD	6/19/2006	13:50	6/22/2006	6/30/2006	15:37	6/30/2006	15:37	99	SB1-0630	7664-41-7	NH3N	Ammonia-I	4.09	
4.00EPAC CHMC	F2012	J12N99	J12N99	N	SOIL	F201213	E350.3	METHOD	6/19/2006	13:10	6/22/2006	6/30/2006	15.38	6/30/2006	15:38	99.85	SB1-0630	7664-41-7	NH3N	Ammonia-I	4.22	
4.00EPAC CHMC	F2012	SB1-0630	SB1-0630	LB	SOIL	SB1-0630	E350.3	METHOD				6/30/2006	14:40	6/30/2006	14:40	100	SB1-0630	7664-41-7	NH3N	Ammonia-I	2	0
4.00EPAC CHMC	F2012	BS1S0703	BS1S0703	BS	SOIL	BS1S0703	E351.4	METHOD				7/3/2006	15:15	7/3/2006	15:15	100	SB1-0703	7727-37-9	KN	Total Kjeld	1590	1420
4.00EPAC CHMC	F2012	J12N97	J12N97	N	SOIL	F201201	E351.4	METHOD	6/19/2006	12:10	6/22/2006	7/3/2006	15:21	7/3/2006	15:21	97.26	SB1-0703	7727-37-9	KN	Total Kjeld	139	
4.00EPAC CHMC	F2012	J12N98	J12N98	N	SOIL	F201202	E351.4	METHOD	6/19/2006	12:40	6/22/2006	7/3/2006	15.24	7/3/2006	15:24	98.14	SB1-0703	7727-37-9	KN	Total Kjeld	181	
4.00EPAC CHMC	F2012	J12NB8	J12NB8	N	SOIL	F201203	E351.4	METHOD	6/19/2006	15.00	6/22/2006	7/3/2006	15.25	7/3/2006	15:25	99.52	SB1-0703	7727-37-9	KN	Total Kjeld	287	
4.00EPAC CHMC	F2012	J12NB9	J12NB9	N	SOIL	F201204	E351.4	METHOD	6/19/2006	15:30	6/22/2006	7/3/2006	15.28	7/3/2006	15:28	99.24	SB1-0703	7727-37-9	KN	Total Kjeld	237	
4.00EPAC CHMC	F2012	J12NC0	J12NC0	N	SOIL	F201205	E351.4	METHOD	6/19/2006	16.00	6/22/2006	7/3/2006	15.30	7/3/2006	15:30	98.82	SB1-0703	7727-37-9	KN	Total Kjeld	274	
4.00EPAC CHMC	F2012	J12NB4	J12NB4	N	SOIL	F201206	E351.4	METHOD	6/20/2006	10:45	6/22/2006	7/3/2006	15:32	7/3/2006	15:32	97.14	SB1-0703	7727-37-9	KN	Total Kjeld	265	
4.00EPAC CHMC	F2012	J12NB5	J12NB5	N	SOIL	F201207	E351.4	METHOD	6/20/2006	11:30	6/22/2006	7/3/2006	15:33	7/3/2006	15:33	99.23	SB1-0703	7727-37-9	KN	Total Kjeld	211	
4.00EPAC CHMC	F2012	J12NB6	J12NB6	N	SOIL	F201208	E351.4	METHOD	6/20/2006	12.00	6/22/2006	7/3/2006	15.35	7/3/2006	15:35	99.36	SB1-0703	7727-37-9	KN	Total Kjeld	249	
4.00EPAC CHMC	F2012	J12NB1	J12NB1	N	SOIL	F201209	E351.4	METHOD	6/20/2006	9:10	6/22/2006	7/3/2006	15:37	7/3/2006	15:37	98.8	SB1-0703	7727-37-9	KN	Total Kjeld	296	
4.00EPAC CHMC	F2012	J12NB2	J12NB2	N	SOIL	F201210	E351.4	METHOD	6/20/2006	9:30	6/22/2006	7/3/2006	15:39	7/3/2006	15:39	98.79	SB1-0703	7727-37-9	KN	Total Kjeld	280	
4.00EPAC CHMC	F2012	J12NB3	J12NB3	N	SOIL	F201211	E351.4	METHOD	6/20/2006	10:00	6/22/2006	7/3/2006	15:45	7/3/2006	15:45	99.51	SB1-0703	7727-37-9	KN	Total Kjeld	311	
4.00EPAC CHMC	F2012	J12NB0	J12NB0	N	SOIL	F201212	E351.4	METHOD	6/19/2006	13.50	6/22/2006	7/3/2006	15:47	7/3/2006	15:47	99	SB1-0703	7727-37-9	KN	Total Kjeld	257	
4.00EPAC CHMC	F2012	J12N99	J12N99	N	SOIL	F201213	E351.4	METHOD	6/19/2006	13:10	6/22/2006	7/3/2006	15.49	7/3/2006	15:49	99.85	SB1-0703	7727-37-9	KN	Total Kjeld	215	
4.00EPAC CHMC	F2012	SB1-0703	SB1-0703	LB	SOIL	SB1-0703	E351.4	METHOD				7/3/2006	15:18	7/3/2006	15:18	100	SB1-0703	7727-37-9	KN	Total Kjeld	68.8	0
4.00EPAC CHMC	F2012	J12N97	J12N97	N	SOIL	F201201	SW9045C	METHOD	6/19/2006	12:10	6/22/2006	6/28/2006	9:58	6/28/2006	9:58	97.26	SB1-0628	pH	PH	pH	8.37	
4.00EPAC CHMC	F2012	J12N98	J12N98	N	SOIL	F201202	SW9045C	METHOD	6/19/2006	12:40	6/22/2006	6/28/2006	10:00	6/28/2006	10:00	98.14	SB1-0628	pH	PH	pH	8.55	
4.00EPAC CHMC	F2012	J12NB8	J12NB8	N	SOIL	F201203	SW9045C	METHOD	6/19/2006	15.00	6/22/2006	6/28/2006	10:02	6/28/2006	10:02	99.52	SB1-0628	pH	PH	pH	8.54	
4.00EPAC CHMC	F2012	J12NB9	J12NB9	N	SOIL	F201204	SW9045C	METHOD	6/19/2006	15:30	6/22/2006	6/28/2006	10:04	6/28/2006	10:04	99.24	SB1-0628	pH	PH	pH	8.45	
4.00EPAC CHMC	F2012	J12NC0	J12NC0	N	SOIL	F201205	SW9045C	METHOD	6/19/2006	16.00	6/22/2006	6/28/2006	10.06	6/28/2006	10:06	98.82	SB1-0628	pH	PH	pH	8.47	
4.00EPAC CHMC	F2012	J12NB4	J12NB4	N	SOIL	F201206	SW9045C	METHOD	6/20/2006	10:45	6/22/2006	6/28/2006	10:08	6/28/2006	10:08	97.14	SB1-0628	pH	PH	pH	7.21	
4.00EPAC CHMC	F2012	J12NB5	J12NB5	N	SOIL	F201207	SW9045C	METHOD	6/20/2006	11.30	6/22/2006	6/28/2006	10:10	6/28/2006	10:10	99.23	SB1-0628	pH	PH	pH	7.22	
4.00EPAC CHMC	F2012	J12NB6	J12NB6	N	SOIL	F201208	SW9045C	METHOD	6/20/2006	12.00	6/22/2006	6/28/2006	10:13	6/28/2006	10:13	99.36	SB1-0628	pH	PH	pH	7.18	
4.00EPAC CHMC	F2012	J12NB1	J12NB1	N	SOIL	F201209	SW9045C	METHOD	6/20/2006	9:10	6/22/2006	6/28/2006	10:15	6/28/2006	10:15	98.8	SB1-0628	pH	PH	pH	7.58	
4.00EPAC CHMC	F2012	J12NB2	J12NB2	N	SOIL	F201210	SW9045C	METHOD	6/20/2006	9.30	6/22/2006	6/28/2006	10:18	6/28/2006	10:18	98.79	SB1-0628	pH	PH	pH	7.05	
4.00EPAC CHMC	F2012	J12NB3	J12NB3	N	SOIL	F201211	SW9045C	METHOD	6/20/2006	10:00	6/22/2006	6/28/2006	10:20	6/28/2006	10.20	99.51	SB1-0628	pH	PH	pH	7.05	
4.00EPAC CHMC	F2012	J12NB0	J12NB0	N	SOIL	F201212	SW9045C	METHOD	6/19/2006	13.50	6/22/2006	6/28/2006	10:23	6/28/2006	10:23	99	SB1-0628	pH	PH	pH	8.61	
4.00EPAC CHMC	F2012	J12N99	J12N99	N	SOIL	F201213	SW9045C	METHOD	6/19/2006	13:10	6/22/2006	6/28/2006	10.26	6/28/2006	10:26	99.85	SB1-0628	pH	PH	pH	8.41	

Units	Dilution	MDL	RL	LabQualifi	Surrogate	Comments	ParValUnc	Recovery	LowerCont	UpperCont	Basis	ConcQual	MDLAdjus	RLAdjuste	SampleDe	LeachMeth	LeachDate	LeachTime	LeachLot	AnalysisLo	CalRefID
PERCENT	1	0	0	N							D	=	0	0	J12N97	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12N98	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NB8	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NB9	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NC0	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NB4	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NB5	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NB6	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NB1	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NB2	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NB3	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12NB0	NONE				062606MC	NONE
PERCENT	1	0	0	N							D	=	0	0	J12N99	NONE				062606MC	NONE
MG/KG	1	54.3	155	N				109	75	125	D	=	54.3	155		NONE				SB1-0628	101405S1
MG/KG	1	46.2	132	N				115	75	125	D	=	46.2	132		NONE				SB1-0629	101405S1
MG/KG	1	62.6	179	N							D	=	62.6	179	J12N97	NONE				SB1-0628	101405S1
MG/KG	1	85	243 U	N							D	U	85	243	J12N98	NONE				SB1-0628	101405S1
MG/KG	1	53.4	153 U	N							D	U	53.4	153	J12NB8	NONE				SB1-0628	101405S1
MG/KG	1	30.4	87	N							D	=	30.4	87	J12NB9	NONE				SB1-0628	101405S1
MG/KG	1	27.5	78.8	N							D	=	27.5	78.8	J12NC0	NONE				SB1-0628	101405S1
MG/KG	1	34.4	98.4	N							D	=	34.4	98.4	J12NB4	NONE				SB1-0628	101405S1
MG/KG	1	29.3	83.8	N							D	=	29.3	83.8	J12NB5	NONE				SB1-0628	101405S1
MG/KG	1	25.6	73.4	N							D	=	25.6	73.4	J12NB6	NONE				SB1-0628	101405S1
MG/KG	1	98.1	281	N							D	=	98.1	281	J12NB1	NONE				SB1-0628	101405S1
MG/KG	1	94.8	271	N							D	=	94.8	271	J12NB2	NONE				SB1-0629	101405S1
MG/KG	1	77.9	223	N							D	=	77.9	223	J12NB3	NONE				SB1-0629	101405S1
MG/KG	1	27.8	79.6	N							D	=	27.8	79.6	J12NB0	NONE				SB1-0629	101405S1
MG/KG	1	33.9	97	N							D	=	33.9	97	J12N99	NONE				SB1-0629	101405S1
MG/KG	1	35	100 U	N							D	U	35	100		NONE				SB1-0628	101405S1
MG/KG	1	35	100 U	N							D	U	35	100		NONE				SB1-0629	101405S1
MG/KG	1	0.0607	0.5	N				101	90	110	D	=	0.0607	0.5		NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0543	0.5	N				105	90	110	D	=	0.0543	0.5		NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0806	0.5	N				108	90	110	D	=	0.0806	0.5		NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0449	0.5	N				102	90	110	D	=	0.0449	0.5		NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0469	0.5	N				106	90	110	D	=	0.0469	0.5		NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0627	0.516	N							D	=	0.0646	0.532	J12N97	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.056	0.516	N							D	=	0.0578	0.532	J12N97	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0485	0.516	N							D	=	0.05	0.532	J12N97	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0463	0.516 U	N							D	U	0.0478	0.532	J12N97	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0832	0.516	N							D	=	0.0858	0.532	J12N97	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0518	0.426 B	N							D	J	0.0528	0.435	J12N98	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0463	0.426 B	N							D	J	0.0472	0.435	J12N98	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.04	0.426	N							D	=	0.0408	0.435	J12N98	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0383	0.426 U	N							D	U	0.039	0.435	J12N98	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0687	0.426	N							D	=	0.0701	0.435	J12N98	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0561	0.462 B	N							D	J	0.0567	0.467	J12NB8	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0501	0.462	N							D	=	0.0506	0.467	J12NB8	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0434	0.462 B	N							D	J	0.0438	0.467	J12NB8	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0415	0.462 U	N							D	U	0.0419	0.467	J12NB8	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0745	0.462	N							D	=	0.0752	0.467	J12NB8	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0571	0.47 B	N							D	J	0.0577	0.475	J12NB9	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0511	0.47 B	N							D	J	0.0516	0.475	J12NB9	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0442	0.47 B	N							D	J	0.0446	0.475	J12NB9	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0422	0.47 U	N							D	U	0.0427	0.475	J12NB9	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0759	0.47	N							D	=	0.0766	0.475	J12NB9	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0598	0.492 B	N							D	J	0.0604	0.497	J12NC0	NONE				062806Q1	EPA300A-0614
MG/KG	1	0.0534	0.492 B	N							D	J	0.054	0.497	J12NC0	NONE				062806Q1	EPA300A-0614

MG/KG	1	0.0462	0.492 B	N				D	J	0.0467	0.497	J12NC0	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0442	0.492 B	N				D	J	0.0446	0.497	J12NC0	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0794	0.492	N				D	=	0.0802	0.497	J12NC0	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.066	0.544 B	N				D	J	0.0681	0.561	J12NB4	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.059	0.544 B	N				D	J	0.0609	0.561	J12NB4	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0511	0.544	N				D	=	0.0526	0.561	J12NB4	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0488	0.544 B	N				D	J	0.0503	0.561	J12NB4	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0877	0.544	N				D	=	0.0904	0.561	J12NB4	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.049	0.404	N				D	=	0.0495	0.408	J12NB5	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0438	0.404 B	N				D	J	0.0443	0.408	J12NB5	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0379	0.404	N				D	=	0.0383	0.408	J12NB5	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0362	0.404	N				D	=	0.0366	0.408	J12NB5	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0651	0.404	N				D	=	0.0658	0.408	J12NB5	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.063	0.519 B	N				D	J	0.0637	0.524	J12NB6	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0563	0.519 B	N				D	J	0.0569	0.524	J12NB6	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0487	0.519	N				D	=	0.0492	0.524	J12NB6	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0466	0.519 B	N				D	J	0.0471	0.524	J12NB6	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0837	0.519	N				D	=	0.0846	0.524	J12NB6	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0546	0.45 B	N				D	J	0.0552	0.454	J12NB1	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0488	0.45 B	N				D	J	0.0493	0.454	J12NB1	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0422	0.45	N				D	=	0.0427	0.454	J12NB1	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0404	0.45	N				D	=	0.0408	0.454	J12NB1	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0725	0.45	N				D	=	0.0733	0.454	J12NB1	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0527	0.434 B	N				D	J	0.0532	0.438	J12NB2	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0471	0.434 B	N				D	J	0.0475	0.438	J12NB2	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0407	0.434	N				D	=	0.0411	0.438	J12NB2	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0389	0.434 B	N				D	J	0.0393	0.438	J12NB2	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0699	0.434	N				D	=	0.0706	0.438	J12NB2	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0536	0.442 B	N				D	J	0.0542	0.446	J12NB3	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0479	0.442 B	N				D	J	0.0484	0.446	J12NB3	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0415	0.442	N				D	=	0.0419	0.446	J12NB3	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0396	0.442 B	N				D	J	0.04	0.446	J12NB3	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0712	0.442	N				D	=	0.0719	0.446	J12NB3	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.06	0.494 B	N				D	J	0.0606	0.499	J12NB0	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0536	0.494 B	N				D	J	0.0541	0.499	J12NB0	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0463	0.494	N				D	=	0.0468	0.499	J12NB0	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0443	0.494 U	N				D	U	0.0448	0.499	J12NB0	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0796	0.494	N				D	=	0.0804	0.499	J12NB0	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.053	0.436 B	N				D	J	0.053	0.436	J12N99	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0474	0.436 B	N				D	J	0.0474	0.436	J12N99	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.041	0.436	N				D	=	0.041	0.436	J12N99	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0392	0.436 B	N				D	J	0.0392	0.436	J12N99	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0704	0.436	N				D	=	0.0704	0.436	J12N99	NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0607	0.5 B	N				D	J	0.0607	0.5		NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0543	0.5 U	N				D	U	0.0543	0.5		NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0469	0.5 U	N				D	U	0.0469	0.5		NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0449	0.5 U	N				D	U	0.0449	0.5		NONE	062806Q1	EPA300A-0614
MG/KG	1	0.0806	0.5 U	N				D	U	0.0806	0.5		NONE	062806Q1	EPA300A-0614
MG/KG	1	0.534	2	N	96.6	75	125	D	=	0.534	2		NONE	063006NH	063006NH3
MG/KG	1	0.954	3.58	N				D	=	0.984	3.69	J12N97	NONE	063006NH	063006NH3
MG/KG	1	0.827	3.1	N				D	=	0.844	3.16	J12N98	NONE	063006NH	063006NH3
MG/KG	1	0.763	2.86	N				D	=	0.771	2.89	J12NB8	NONE	063006NH	063006NH3
MG/KG	1	0.855	3.2	N				D	=	0.864	3.24	J12NB9	NONE	063006NH	063006NH3
MG/KG	1	1.03	3.87	N				D	=	1.04	3.91	J12NC0	NONE	063006NH	063006NH3
MG/KG	1	0.836	3.13	N				D	=	0.862	3.23	J12NB4	NONE	063006NH	063006NH3
MG/KG	1	1.02	3.81	N				D	=	1.03	3.85	J12NB5	NONE	063006NH	063006NH3
MG/KG	1	0.84	3.15	N				D	=	0.849	3.18	J12NB6	NONE	063006NH	063006NH3
MG/KG	1	0.821	3.07	N				D	=	0.829	3.11	J12NB1	NONE	063006NH	063006NH3

MG/KG	1	0.77	2.88	N				D	=	0.778	2.91	J12NB2	NONE		063006NH 063006NH3
MG/KG	1	0.74	2.77	N				D	=	0.748	2.8	J12NB3	NONE		063006NH 063006NH3
MG/KG	1	0.708	2.65	N				D	=	0.715	2.68	J12NB0	NONE		063006NH 063006NH3
MG/KG	1	0.754	2.83	N				D	=	0.754	2.83	J12N99	NONE		063006NH 063006NH3
MG/KG	1	0.534	2 U	N				D	U	0.534	2		NONE		063006NH 063006NH3
MG/KG	1	27.3	100	N	112	75	125	D	=	27.3	100		NONE		070306KN 070306TKN
MG/KG	1	47.4	174 B	N				D	J	48.9	179	J12N97	NONE		070306KN 070306TKN
MG/KG	1	53.7	197 B	N				D	J	54.8	201	J12N98	NONE		070306KN 070306TKN
MG/KG	1	40.5	148	N				D	=	40.9	150	J12NB8	NONE		070306KN 070306TKN
MG/KG	1	38.5	141	N				D	=	38.9	143	J12NB9	NONE		070306KN 070306TKN
MG/KG	1	50.4	185	N				D	=	50.9	187	J12NC0	NONE		070306KN 070306TKN
MG/KG	1	53	194	N				D	=	54.6	200	J12NB4	NONE		070306KN 070306TKN
MG/KG	1	42.5	156	N				D	=	42.9	157	J12NB5	NONE		070306KN 070306TKN
MG/KG	1	35.4	130	N				D	=	35.7	131	J12NB6	NONE		070306KN 070306TKN
MG/KG	1	41.9	154	N				D	=	42.4	155	J12NB1	NONE		070306KN 070306TKN
MG/KG	1	37	136	N				D	=	37.4	137	J12NB2	NONE		070306KN 070306TKN
MG/KG	1	37.7	138	N				D	=	38	139	J12NB3	NONE		070306KN 070306TKN
MG/KG	1	39.3	144	N				D	=	39.7	146	J12NB0	NONE		070306KN 070306TKN
MG/KG	1	37.6	138	N				D	=	37.6	138	J12N99	NONE		070306KN 070306TKN
MG/KG	1	27.3	100 B	N				D	J	27.3	100		NONE		070306KN 070306TKN
PH UNITS	1	0	0	N				D	=	0	0	J12N97	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12N98	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NB8	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NB9	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NC0	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NB4	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NB5	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NB6	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NB1	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NB2	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NB3	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12NB0	NONE		062806PH NONE
PH UNITS	1	0	0	N				D	=	0	0	J12N99	NONE		062806PH NONE

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BIOASSAY REPORT
CHRONIC SCREENING BIOASSAYS
Conducted June 28 through July 26, 2006

Prepared for

ELR CONSULTING, INC.
WASHINGTON CLOSURE HANFORD

Prepared by

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August 7, 2006
Lab I.D. Nos. BG1619-01 thru 13
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APPENDIX A. RAW DATA SHEETS
APPENDIX B. CHAIN OF CUSTODY

INTRODUCTION

CH2M HILL conducted chronic screening bioassay tests using the Sandberg bluegrass (*Poa sandbergii*) on soil samples provided by the ELR Consulting for Washington Closure Hanford, Richland, Washington. The tests were conducted from June 28 through July 26, 2006.

METHODS AND MATERIALS

TEST METHODS

The chronic test methods were performed according to: *Standard Guide for Conducting Terrestrial Plant Toxicity Tests*, ASTM E 1963-02 (2002).

TEST ORGANISMS

The seeds used were obtained from Native Grass Seeds, Cornville, Arizona. All test conditions were maintained during planting, germination, and growth phases of the test as prescribed by the ASTM protocol.

CONTROL SOIL

The control soil used in the tests was artificial soil comprised of 70 grade silica sand (70 percent by weight), kaolin clay (20 percent), and peat moss (10 percent). Calcium carbonate (0.4 percent of total weight) was added to adjust soil pH to 7.0 ± 0.5.

HYDRATION WATER

The water used to initially hydrate the control and test soils was Milli-Q equivalent de-ionized water. After initial hydration, all test chambers were watered with half strength Hoagland's solution on an every other day basis. All hydration was accomplished via subirrigation.

TEST CONCENTRATIONS

The concentration tested in the bluegrass tests was 100 percent test sample with control soil alone for the control. For the bluegrass tests, 50 seeds per concentration were used with five replicate test chambers per concentration and 10 seeds planted per chamber. Following germination, test chambers were thinned as needed to a maximum five seedlings per replicate.

SAMPLE COLLECTION

The soil samples were collected from June 19 to 20, 2006. The samples were stored in the dark at 4°C until test solutions were prepared and tested. Chain of Custody for sample collection is provided in Appendix C.

SAMPLE CROSS-REFERENCE TABLE

Table 1 provides a cross-reference of the Client ID numbers, sampling dates, sampling locations, Bluegrass test sample identification (SDG) numbers, and Analytical Lab SDG numbers.

Table 1
Sample Cross-Reference

Client ID	Sample Date	Sample Location	Bluegrass test SDG	Analytical Lab SDG
J12N97	06/19/2006	1607-D2:1	BG1619-01	F2012-01
J12N98	06/19/2006	1607-D2:1	BG1619-02	F2012-02
J12NB8	06/19/2006	618-4	BG1619-03	F2012-03
J12NB9	06/19/2006	618-4	BG1619-04	F2012-04
J12NC0	06/19/2006	618-4	BG1619-05	F2012-05
J12NB4	06/20/2006	600-181	BG1619-06	F2012-06
J12NB5	06/20/2006	600-181	BG1619-07	F2012-07
J12NB6	06/20/2006	600-181	BG1619-08	F2012-08
J12NB1	06/20/2006	600-171	BG1619-09	F2012-09
J12NB2	06/20/2006	600-171	BG1619-10	F2012-10
J12NB3	06/20/2006	600-171	BG1619-11	F2012-11
J12NB0	06/19/2006	600-139	BG1619-12	F2012-12
J12N99	06/19/2006	116-DR-1&2	BG1619-13	F2012-13

SAMPLE PREPARATION

Test soils and control soil were dried and homogenized prior to use. For each replicate, 90 g dry weight of soil was added to each test chamber. The soils were initially hydrated with Milli-Q equivalent de-ionized water via subirrigation. In addition, a sub sample of the soil was added to a surrogate chamber and hydrated for pH measurements.

TEST INITIATION

Tests were initiated by the planting of 10 seeds in each test chamber. Seeds were planted 1 ½ times the seeds diameter (approx. 2 mm) and covered gently with soil. A small amount of hydration water (10 ml) was sprayed onto the soil surface to ensure seeds received moisture.

TEST MONITORING

According to information provided by the seed supplier, germination should take place between 14 and 28 days. The number of seeds in each test chamber that germinated was recorded on days 12, 14, 16, and 19. Germination was determined to have occurred on day 14.

Observations of the shoot appearance were recorded 7 days after post germination (day 21 after planting). The number of germinated seeds in each test chamber was also recorded. Chambers that had more than five germinated seeds had the smallest seedlings removed until the number of seedlings was reduced to five.

Soil pH was taken at initiation and termination by placing approximately 30 g of soil into a specimen cup, adding 100 ml of hydration water, and mixing.

TEST TERMINATION

Tests were terminated 14 days post germination (day 28 after planting). The number of seedlings, shoot appearance and height (tallest shoot of each plant), and root appearance and length (longest recovered root of each plant) was recorded.

For each test chamber, all of the above ground biomass (i.e. "shoots") from all germinated plants were combined and placed into tared aluminum tins. The shoots were weighed to determine the wet weight immediately following removal from the test chamber. The shoots were then dried in an oven at 60 °C for a minimum of 24 hours. The shoots were then placed into a dessicator for a minimum of 2 hours and weighed to determine dry weight.

The wet and dry weight for the roots were also obtained as described above.

DATA ANALYSIS

For each test chamber, the following endpoints were calculated:

- 14 Day Post-Germination Survival (%)
  (Calculated as the number of seedlings alive at 14 day post germination divided by 5)
- Average Above Ground Shoot Mass (Wet)
  (Calculated as the total wet weight of the shoots divided by the number of seedlings germinated)
- Average Above Ground Shoot Mass (Dry)
  (Calculated as the total dry weight of the shoots divided by the number of seedlings germinated)
- Average Root Mass (Wet)
  (Calculated as the total wet weight of the roots divided by the number of seedlings germinated)
- Average Root Mass (Dry)
  (Calculated as the total dry weight of the roots divided by the number of seedlings germinated)
- Average Total Mass (Wet)
  (Calculated as the total combined wet weights of the shoots and roots divided by the number of seedlings germinated)
- Average Total Mass (Dry)
  (Calculated as the total combined dry weights of the shoots and roots divided by the number of seedlings germinated)
- Average Shoot Height
  (Calculated as the total combined height of the tallest shoot of each seedling divided by the number of seedlings germinated)
- Average Root Length
  (Calculated as the total combined length of the longest root of each seedling divided by the number of seedlings germinated)

Statistical analysis for each endpoint listed comprised of entering the data obtained from each replicate chamber of a test soil and comparing the result to the data from the replicate chambers of the laboratory control. Comparisons were made as a single tailed t-test, evaluating for statistically significant reductions from the control value, using CETIS version 1.1.2. The Equal Variance t Two-Sample test was used. When the assumptions of equality of variance or normality necessary for Equal Variance t Two-Sample test was not met, the Unequal Variance t Two-Sample test or Wilcoxon Rank Sum Two Sample test was used.

RESULTS AND DISCUSSION

The endpoint data and the results statistical analysis are summarized in Table 2. The data represents the average value of the replicate chambers used in each test concentration.

The results for sample J12N97 indicated a statistically significant reduction in average root length, average above ground shoot mass (wet), average above ground shoot mass (dry), average root mass (wet), and average total mass (shoots + roots, wet) when compared to the laboratory control.

The results for sample J12N98 indicated a statistically significant reduction in average stem height, average root length, average above ground shoot mass (wet), average above ground shoot mass (dry), average root mass (wet), average root mass (dry), average total mass (shoots + roots, wet), and average total mass (shoots + roots, dry) when compared to the laboratory control.

The results for sample J12NB8 indicated a statistically significant reduction in average above ground shoot mass (wet) when compared to the laboratory control.

The results for sample J12NB9 indicated a statistically significant reduction in average root length, average above ground shoot mass (wet), and average total mass (shoots + roots, wet) when compared to the laboratory control.

The results for sample J12NC0 indicated a statistically significant reduction in average root length, average above ground shoot mass (wet), average root mass (wet), and average total mass (shoots + roots, wet) when compared to the laboratory control.

The results for sample J12NB4 indicated a statistically significant reduction in average above ground shoot mass (wet), average root mass (wet), and average total mass (shoots + roots, wet) when compared to the laboratory control.

The results for sample J12NB5 indicated a statistically significant reduction in average root length and average root mass (wet) when compared to the laboratory control.

The results for sample J12NB6 indicated a statistically significant reduction in average root length, average above ground shoot mass (wet), average root mass (wet), and average total mass (shoots + roots, wet) when compared to the laboratory control.

The results for sample J12NB1 indicated a statistically significant reduction in average root length when compared to the laboratory control.

The results for sample J12NB2 indicated a statistically significant reduction in average root length when compared to the laboratory control.

Table 2: Bluegrass Chronic Test Results for Washington Closure Hanford

E, statistically significant difference from lab control by use of Equal Variance t Two-Sample Test

ns indicates a non statistically significant result, ^{S}, indicates statistically significant at alpha (p) = 0.05, --, indicates no statistical test performed.

Lab ID:	Sample Number:	Bluegrass 14 day Germination Endpoint (%)	Significantly different compared to Lab Control?	Bluegrass Average Stem Height (mm)	Significantly different compared to Lab Control?	Bluegrass Average Root Length (mm)	Significantly different compared to Lab Control?	Average Above Ground Shoot Mass (Wet) (mg)	Significantly different compared to Lab Control?	Average Above Ground Shoot Mass (Dry) (mg)	Significantly different compared to Lab Control?	Average Root Mass (Wet) (mg)	Significantly different compared to Lab Control?	Average Root Mass (Dry) (mg)	Significantly different compared to Lab Control?	Average Total Mass (Shoots + Roots) (Wet) (mg)	Significantly different compared to Lab Control?	Average Total Mass (Shoots + Roots) (Dry) (mg)	Significantly different compared to Lab Control?
Tests started on May 11, 2009																			
Laboratory Control		100	--	86.2	--	107.7	--	31.5	--	4.43	--	32.3	--	1.29	--	63.9	--	5.72	--
BG1619-01	J12N97	100	ns	79.9	ns	77.0	E^{S}	21.9	E^{S}	3.28	E^{S}	22.3	E^{S}	1.46	ns	44.2	E^{S}	4.74	ns
BG1619-02	J12N98	92	ns	72.3	E^{S}	64.7	E^{S}	16.3	E^{S}	2.84	E^{S}	19.6	E^{S}	0.96	E^{S}	35.9	E^{S}	3.80	E^{S}
BG1619-03	J12NB8	100	ns	82.8	ns	100.8	ns	25.9	E^{S}	4.24	ns	34.3	ns	1.77	ns	60.1	ns	6.02	ns
BG1619-04	J12NB9	100	ns	77.8	ns	82.4	E^{S}	22.2	E^{S}	3.78	ns	26.7	ns	1.42	ns	48.9	E^{S}	5.20	ns
BG1619-05	J12NC0	100	ns	81.6	ns	82.4	E^{S}	21.2	E^{S}	3.51	ns	23.0	E^{S}	1.56	ns	44.3	E^{S}	5.07	ns
BG1619-06	J12NB4	100	ns	88.6	ns	97.9	ns	25.3	E^{S}	4.21	ns	25.3	E^{S}	1.65	ns	50.6	E^{S}	5.86	ns
BG1619-07	J12NB5	100	ns	82.3	ns	85.2	E^{S}	29.7	ns	4.54	ns	23.7	E^{S}	1.20	ns	53.4	ns	5.74	ns
BG1619-08	J12NB6	96	ns	79.4	ns	86.8	E^{S}	21.6	E^{S}	3.53	ns	21.9	E^{S}	1.55	ns	43.4	E^{S}	5.08	ns
BG1619-09	J12NB1	100	ns	87.4	ns	81.3	E^{S}	26.9	ns	4.67	ns	30.3	ns	1.88	ns	57.1	ns	6.55	ns
BG1619-10	J12NB2	100	ns	81.0	ns	78.4	E^{S}	29.4	ns	4.60	ns	24.5	ns	1.36	ns	53.9	ns	5.96	ns
BG1619-11	J12NB3	100	ns	89.9	ns	88.0	E^{S}	34.1	ns	5.12	ns	30.9	ns	1.51	ns	65.0	ns	6.64	ns
BG1619-12	J12NB0	96	ns	78.4	ns	82.0	E^{S}	21.6	E^{S}	3.71	ns	26.3	ns	1.08	ns	47.9	E^{S}	4.79	ns
BG1619-13	J12N99	100	ns	76.7	ns	78.8	E^{S}	24.4	E^{S}	3.91	ns	24.7	ns	1.54	ns	49.1	E^{S}	5.46	ns

The results for sample J12NB3 indicated a statistically significant reduction in average root length when compared to the laboratory control.

The results for sample J12NB0 indicated a statistically significant reduction in average root length, average above ground shoot mass (wet), and average total mass (shoots + roots, wet) when compared to the laboratory control.

The results for sample J12N99 indicated a statistically significant reduction in average root length, average above ground shoot mass (wet), and average total mass (shoots + roots, wet) when compared to the laboratory control.

CERTIFICATION STATEMENT

I certify that this data package is in compliance with the Statement of Work, both technically and for completeness, for 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:

APPENDIX A
RAW DATA SHEETS

BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2006

Day 0 (Initial) 8 Day 12 NJ Day 14 NJ Day 18 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Sample ID: Lab Control (70% 70 grade silica sand, 20% clay, 10% peat).

CONC.	REPLICATE	# seeds germinated: Emergence 7-10 (12 days after planting)	14 days after planting	18 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (29 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	7	7 ~~6~~	7	7			7→5	5	6.2	7.4
	B	8	8	8	8			8→5	5		
	C	9	9	9	9			9→5	5		
	D	8	8	8	8			8→5	5		
	E	6	6	6	6			6→5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A: 1lg G, 2med G, 2sm G Remove - 2SM G

Replicate B: 3lg G, 2med G Remove - 1med G 2sm G

Replicate C: 3lg G, 2med G Remove - 2 med G, 1sm G, 1sm B

Replicate D: 3lg G, 2med G Remove - 2med G, 1sm G

Replicate E: 2lg G, 3med G Remove - 1sm G

Appearance Code: Good (G) = deep green color with no brown; Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A: 3lg G, 1med G, 1sm G

Replicate B: ~~3lg~~ 4lg G, 1med G

Replicate C: 5lg G

Replicate D: 4lg G, 1med G

Replicate E: 4lg G, 1med G

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	100 mm	76 mm	37 mm	41 mm	95 mm
Replicate B	80 mm	103 mm	67 mm	85 mm	87 mm
Replicate C	87 mm	94 mm	90 mm	80 mm	95 mm
Replicate D	118 mm	86 mm	129 mm	75 mm	91 mm
Replicate E	102 mm	89 mm	95 mm	92 mm	72 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1248.66	1359.2	1263.62
Replicate B	1257.01	1417.4	1279.24
Replicate C	1257.92	~~1371~~ 1435.2	1282.76
Replicate D	1235.04	1401.3	1260.45
Replicate E	1257.04	1430.4	1280.34

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	124 mm	95 mm	44 mm	55 mm	140 mm
Replicate B	135 mm	94 mm	140 mm	125 mm	65 mm
Replicate C	100 mm	70 mm	130 mm	109 mm	126 mm
Replicate D	112 mm	107 mm	130 mm	99 mm	118 mm
Replicate E	128 mm	100 mm	120 mm	140 mm	85 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1247.04	1358.1	1251.45
Replicate B	1234.88	1383.4	1241.04
Replicate C	1286.21	1469.4	1293.03
Replicate D	1282.51	1479.0	1290.75
Replicate E	1288.18	1457.6	1294.73

Comments:

BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 26, 2006

Initials: Day 0 (TT) Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Bioassay Lab ID: BG 1619-01 Sample No: J12N97

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	8	8	8	8			8→5	5	8.6	8.4
	B	8	8	8	8			8→5	5		
	C	7	7	7	7			7→5	5		
	D	6	6	6	6			6→5	5		
	E	9	9	9	9			9→5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A 3lg G, 2med G Remove - 2med G, 1sm G

Replicate B 4lg G, 1med G Remove - 3med G

Replicate C 1lg G, 4med G Remove - 2med G

Replicate D 2lg G, 3med G Remove - 1sm G

Replicate E 3lg G, 2med G Remove - 3med G, 1sm G

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A 5lg G

Replicate B 5lg G

Replicate C 3lg G, 2med G

Replicate D 2lg G, 3med G

Replicate E 3lg G, 2med G

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	95 mm	73 mm	83 mm	76 mm	86 mm
Replicate B	80 mm	84 mm	91 mm	83 mm	84 mm
Replicate C	86 mm	77 mm	86 mm	68 mm	74 mm
Replicate D	88 mm	62 mm	71 mm	78 mm	73 mm
Replicate E	82 mm	84 mm	79 mm	89 mm	65 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)	Tin Tare Wt. (mg)
Replicate A	NJ 1277.66 ~~1277.32~~	1416.7	1319.76	1303.71
Replicate B	NJ 1287.70 ~~1287.18~~	1429.8	1324.73	1307.33
Replicate C	NJ 1290.47 ~~1290.16~~	1388.7	1311.91	1297.83
Replicate D	NJ 1284.49 ~~1284.22~~	1403.2	1311.36	1294.74
Replicate E	NJ 1296.24 ~~1295.95~~	1411.6	~~1311.36~~ NJ 135 1315.68	1297.94

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	111 mm	74 mm	94 mm	80 mm	73 mm
Replicate B	80 mm	85 mm	67 mm	70 mm	92 mm
Replicate C	138 mm	51 mm	70 mm	72 mm	55 mm
Replicate D	66 mm	43 mm	67 mm	81 mm	61 mm
Replicate E	75 mm	73 mm	82 mm	103 mm	71 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)	Tin Tare Wt.
Replicate A	NJ 1297.13 ~~1291.87~~	1484.2	1300.47	1293.84
Replicate B	NJ 1290.90 ~~1290.88~~	1475.6	1301.09	1294.69
Replicate C	NJ 1288.25 ~~1288.19~~	1389.1	1306.24	1299.39
Replicate D	NJ 1286.28 ~~1286.22~~	1380.8	1301.47	1290.96
Replicate E	NJ ~~1290.95~~	1390.5	1316.47	1304.28

Comments:

CETIS Test Summary

Report Date: 01 Aug-06 8:41 AM
Test Link: 09-8273-4015/B161901psc

Plant Bioassay - Chronic — CH2M Hill

Test No:	10-2842-7698	Test Type:	Plant Chronic	Duration:	28d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	12-1244-8913	Code:	B1619-01	Client:	
Sample Date:	19 Jun-06 12:01 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	8d 23h	Station:			

Comments: J12N97

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
04-2427-5360	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
14-9288-2675	Average Height (mm)	100	> 100	N/A	10.68%	Equal Variance t Two-Sample
12-0106-2979	Average Length (mm)	< 100	100	N/A	9.52%	Equal Variance t Two-Sample
14-1522-0830	Average AG Wt (Wet, mg)	< 100	100	N/A	15.56%	Equal Variance t Two-Sample
06-9497-4258	Average AG Wt (Dry, mg)	< 100	100	N/A	16.71%	Equal Variance t Two-Sample
13-3704-3710	Average Root Wt. (Wet, mg	< 100	100	N/A	26.84%	Equal Variance t Two-Sample
02-9982-2745	Average Root Wt. (Dry, mg)	100	> 100	N/A	29.32%	Equal Variance t Two-Sample
16-9537-6576	Average Total Wt (Wet, mg	< 100	100	N/A	19.84%	Equal Variance t Two-Sample
16-1044-7923	Average Total Wt (Dry, mg)	100	> 100	N/A	17.35%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 01 Aug-08 8:41 AM
Test Link: 09-8273-4015/B161901psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	79.880	74.400	84.400	1.742	3.8951	4.88%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	76.960	63.6	84.400	3.5499	7.9378	10.31%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	21.938	18.174	24.494	1.0447	2.336	10.65%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	3.27561	2.81602	3.54802	0.12920	0.28890	8.82%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	22.29	17.244	36.222	3.5861	8.0187	35.97%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.46320	1.23799	2.10200	0.16122	0.36051	24.64%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	44.228	36.116	60.716	4.3405	9.7057	21.94%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	4.73881	4.18601	5.42600	0.20268	0.45322	9.56%

CETIS Test Summary

Report Date: 01 Aug-06 8:41 AM
Test Link: 09-8273-4015/B161901psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		82.6	84.4000	78.2	74.4000	79.8000

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		84.4000	78.8000	77.2	63.6	80.8000

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		22.598	24.4940	18.174	21.692	22.7320

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		3.21001	3.48000	2.81602	3.32400	3.54802

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		22.072	36.2220	17.942	17.9680	17.244

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.32600	1.28000	1.37000	2.10200	1.23799

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		44.67	60.7160	36.116	39.6600	39.9760

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		4.53601	4.76001	4.18601	5.42600	4.78601

CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
% Germination	Comparison	09-8273-4015	09-8273-4015	01 Aug-06 8:40 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

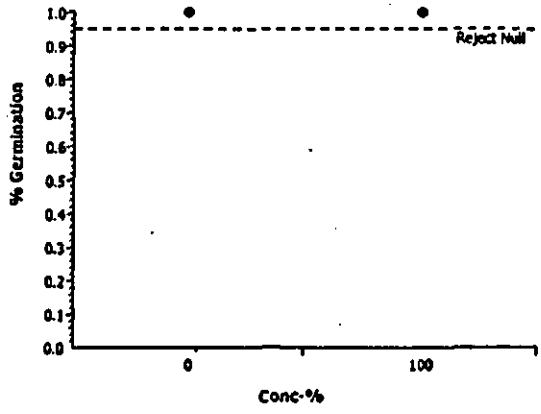
ANOVA Assumptions

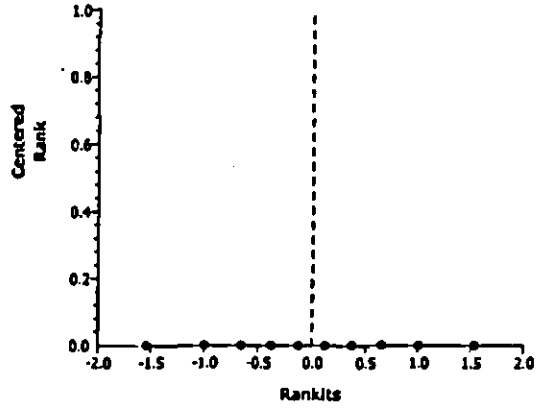
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Height (mm)	Comparison	09-8273-4015	09-8273-4015	01 Aug-06 8:40 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	10.68%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.28376	1.85955	0.1176	9.21255	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	101.124	101.124	1	1.65	0.23516	Non-Significant Effect
Error	490.8799	61.35999	8			
Total	592.00396	162.48401	9			

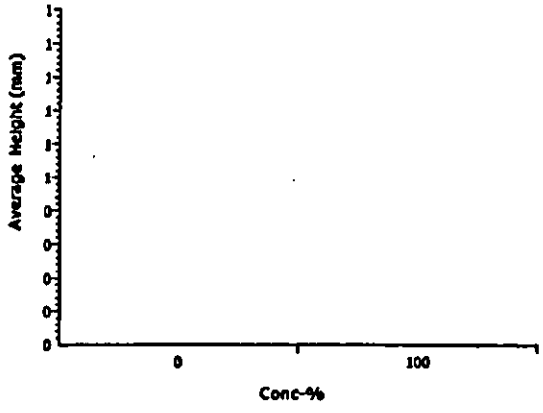
ANOVA Assumptions

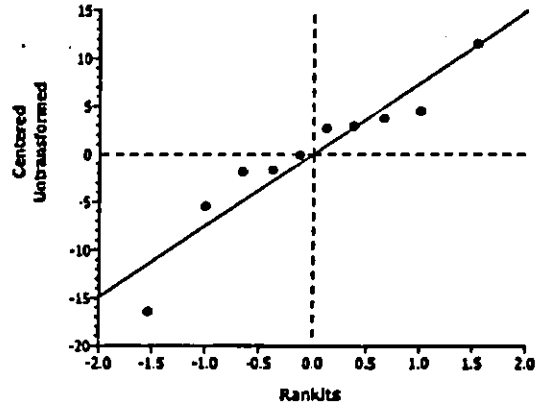
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	7.08858	23.15450	0.08415	Equal Variances
Distribution	Shapiro-Wilk W	0.91870		0.34622	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	79.880	74.4	84.4	3.8951				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	09-8273-4015	09-8273-4015	01 Aug-06 8:40 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	9.52%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	5.57129	1.85955	0.0003	10.2535	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	2359.296	2359.296	1	31.04	0.00053	Significant Effect
Error	608.0801	76.01001	8			
Total	2967.37573	2435.3057	9			

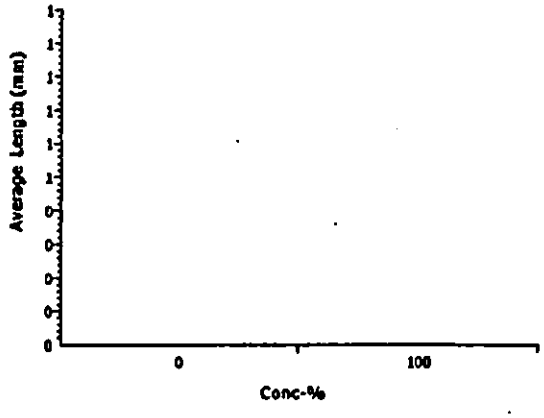
ANOVA Assumptions

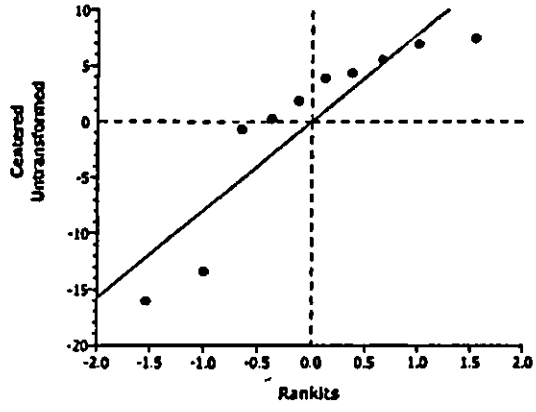
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.41271	23.15450	0.74592	Equal Variances
Distribution	Shapiro-Wilk W	0.80141		0.01508	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	76.960	63.6	84.4	7.9378				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Wet, mg)	Comparison	09-8273-4015	09-8273-4015	01 Aug-06 8:41 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	15.56%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	3.6301	1.85955	0.0033	4.90497	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	229.2107	229.2107	1	13.18	0.00668	Significant Effect
Error	139.1516	17.39395	8			
Total	368.362259	246.60464	9			

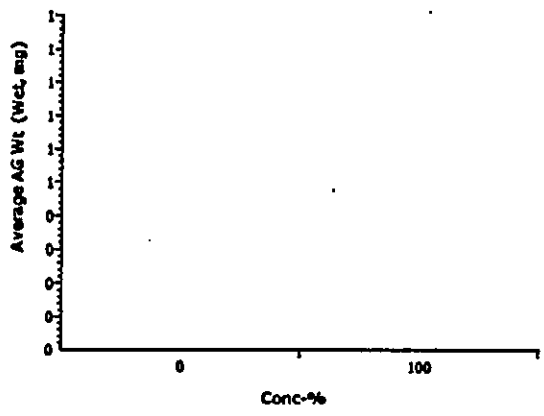
ANOVA Assumptions

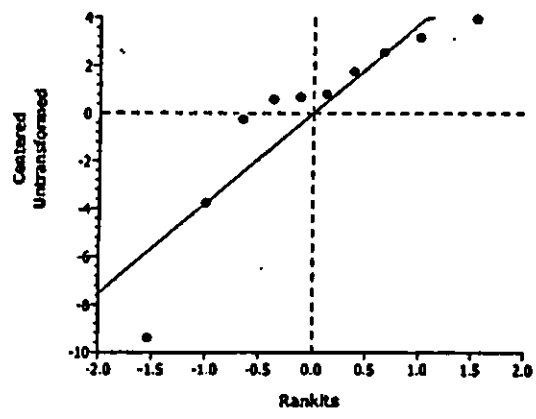
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	5.37506	23.15450	0.13219	Equal Variances
Distribution	Shapiro-Wilk W	0.82054		0.02573	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	21.938	18.174	24.494	2.336				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Dry, mg)	Comparison	09-8273-4015	09-8273-4015	01 Aug-06 8:41 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	16.71%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.89885	1.85955	0.0100	0.74025	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	3.329173	3.329173	1	8.40	0.01993	Significant Effect
Error	3.16939	0.396174	8			
Total	6.49856305	3.7253464	9			

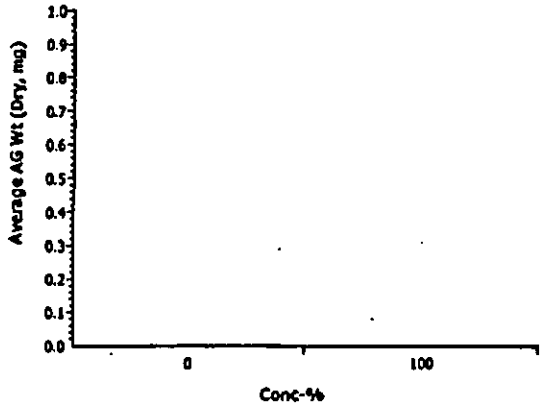
ANOVA Assumptions

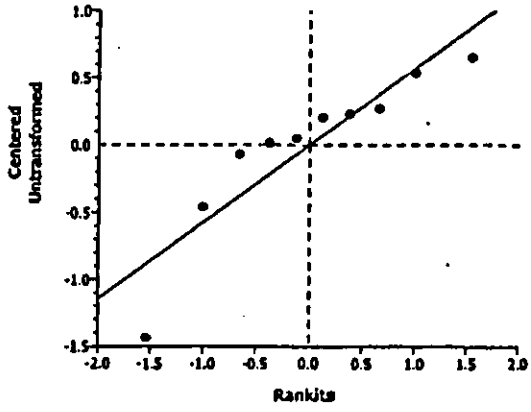
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	8.49324	23.15450	0.06190	Equal Variances
Distribution	Shapiro-Wilk W	0.84072		0.04501	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	3.27561	2.81602	3.54802	0.28890				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Root Wt. (Wet, mg)	Comparison	09-8273-4015	09-8273-4015	01 Aug-06 8:41 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	26.84%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.15412	1.85955	0.0317	8.68223	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	252.8879	252.8879	1	4.64	0.06337	Non-Significant Effect
Error	435.9911	54.49888	8			
Total	688.878952	307.38678	9			

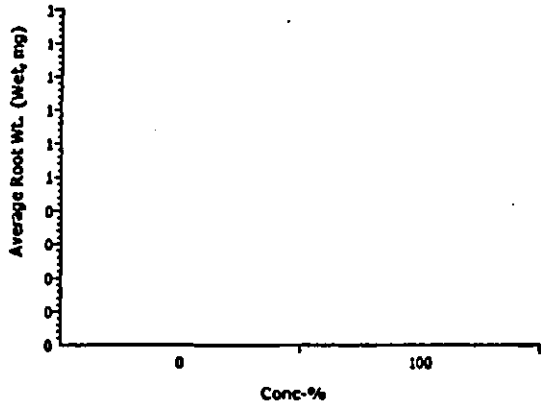
ANOVA Assumptions

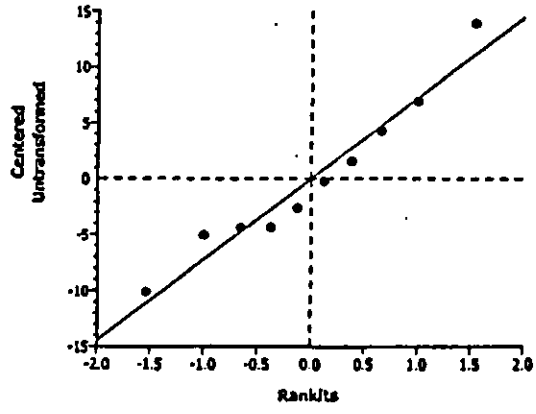
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.43849	23.15450	0.73318	Equal Variances
Distribution	Shapiro-Wilk W	0.95664		0.74693	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	22.29	17.244	36.222	8.0187				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Dry, mg)	Comparison	09-8273-4015	09-8273-4015	01 Aug-06 8:41 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	29.32%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.8673	1.85955	0.7945	0.37738	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0774408	0.077441	1	0.75	0.41106	Non-Significant Effect
Error	0.8237017	0.102963	8			
Total	0.90114256	0.1804035	9			

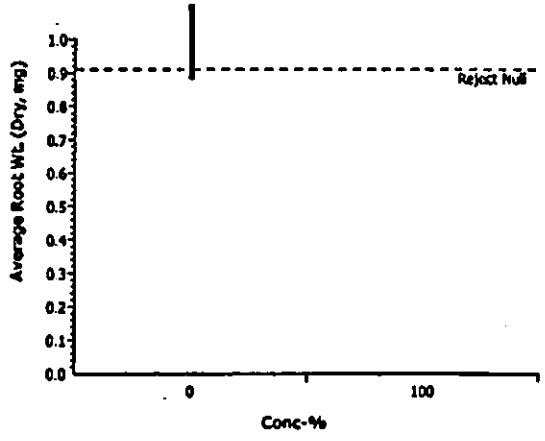
ANOVA Assumptions

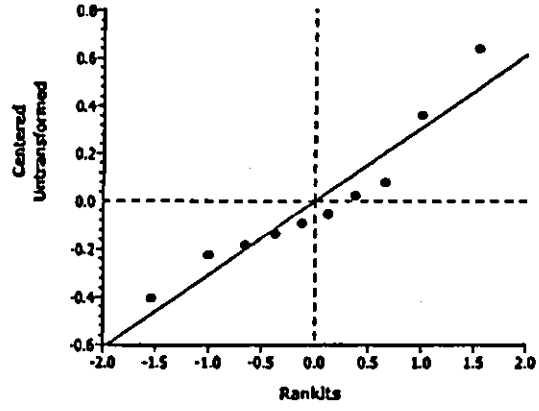
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.71095	23.15450	0.61564	Equal Variances
Distribution	Shapiro-Wilk W	0.91605		0.32520	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.46320	1.23799	2.10200	0.36051				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Total Wt (Wet, mg)	Comparison	09-8273-4015	09-8273-4015	01 Aug-06 8:41 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	19.84%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.88173	1.85955	0.0102	12.6688	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	963.6155	963.6155	1	8.30	0.02046	Significant Effect
Error	928.2998	116.0374	8			
Total	1891.91504	1079.6529	9			

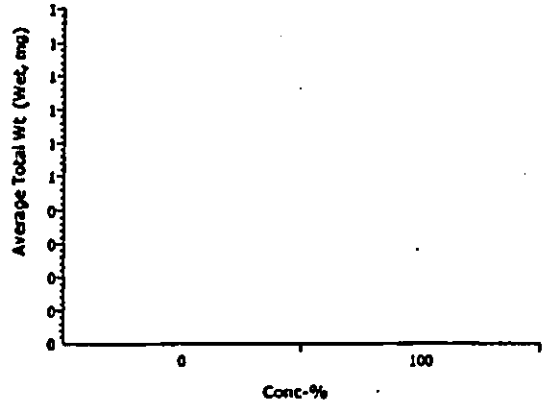
ANOVA Assumptions

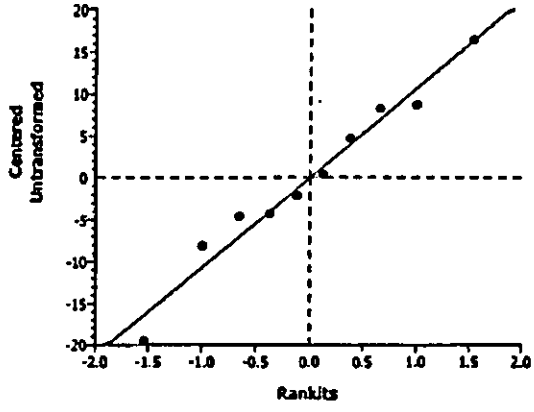
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.46363	23.15450	0.72105	Equal Variances
Distribution	Shapiro-Wilk W	0.97865		0.95753	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	44.228	36.116	60.716	9.7057				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Total Wt (Dry, mg)	Comparison	09-8273-4015	09-8273-4015	01 Aug-06 8:41 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	17.35%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.83381	1.85955	0.0520	0.99170	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	2.391105	2.391105	1	3.38	0.10403	Non-Significant Effect
Error	5.688244	0.711031	8			
Total	8.07934856	3.1021352	9			

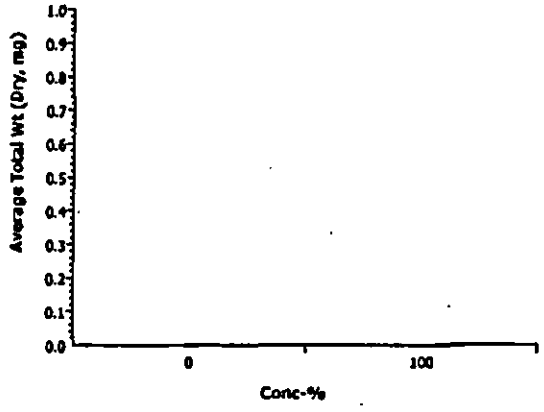
ANOVA Assumptions

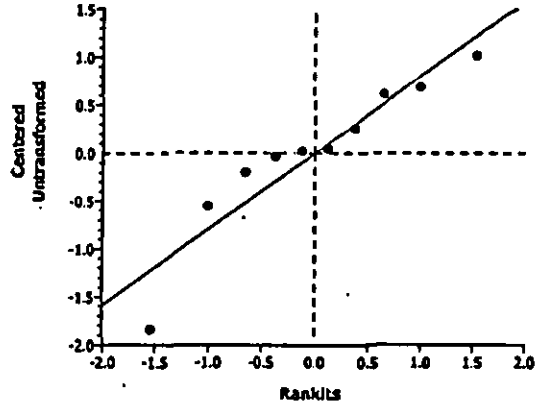
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	5.92318	23.15450	0.11313	Equal Variances
Distribution	Shapiro-Wilk W	0.89688		0.20240	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	4.73881	4.18601	5.42600	0.45322				

Graphics





Client: Washington Closure Hanford Project

Test Start Date: June 28, 2006

Initials: Day 0 HB Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Bioassay Lab ID: BG 1619-02 Sample No: J12N98

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	9	9	8	8			8 → 5	5	8.9	8.5
	B	5	5	5	5			5	5		
	C	3	3	3	3			3	3		
	D	8	8	8	8			8 → 5	5		
	E	4	5	6	6			6 → 5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A: 2lg G 3med G Remove-3med G

Replicate B: 1lg G 3med G NT 1sm G

Replicate C: 1lg G, 2med G

Replicate D: 3lg G, 2med G Remove- 1med G, 2sm G

Replicate E: 2lg G, 1med G, 2sm G Remove-1sm G

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A: 1lg G, 4med G

Replicate B: 1lg G, 3med G, 1sm G

Replicate C: 1lg G, 2med G

Replicate D: 3lg G, 2med G

Replicate E: 2lg G, 1med G, 2sm G

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	64 mm	82 mm	60 mm	70 mm	71 mm
Replicate B	71 mm	61 mm	50 mm	76 mm	77 mm
Replicate C	61 mm	68 mm	91 mm	mm	mm
Replicate D	76 mm	71 mm	91 mm	94 mm	83 mm
Replicate E	36 mm	77 mm	100 mm	51 mm	80 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1252.48	1328.9	1265.97
Replicate B	1277.47	1357.2	1291.41
Replicate C	1292.77	1340.5	1300.88
Replicate D	1283.72	1374.2	1300.30
Replicate E	1292.71	1374.5	1306.17

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	58 mm	94 mm	30 mm	44 mm	37 mm
Replicate B	61 mm	82 mm	51 mm	77 mm	71 mm
Replicate C	39 mm	100 mm	50 mm	mm	mm
Replicate D	120 mm	106 mm	51 mm	80 mm	52 mm
Replicate E	106 mm	19 mm	94 mm	23 mm	67 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1280.35	1366.7	1284.60
Replicate B	1284.83	1392.0	1289.76
Replicate C	1287.10	1329.7	1289.91
Replicate D	1281.60	1404.8	~~1300.30~~ 1286.74
Replicate E	1280.16	1383.0	~~1306.17~~ 1285.21

Comments:

CETIS Test Summary

Report Date: 01 Aug-06 8:58 AM
Test Link: 05-3709-9557/B161902psc

Plant Bioassay - Chronic — **CH2M Hill**

Test No:	14-5172-7565	Test Type:	Plant Chronic	Duration:	28d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	11-1778-2963	Code:	B1619-02	Client:	
Sample Date:	19 Jun-06 12:02 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	8d 23h	Station:			

Comments: J12N98

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
11-3303-4431	% Germination	100	> 100	N/A	14.90%	Wilcoxon Rank Sum Two-Sample
07-6191-2127	Average Height (mm)	< 100	100	N/A	11.76%	Equal Variance t Two-Sample
13-5238-5386	Average Length (mm)	< 100	100	N/A	11.25%	Equal Variance t Two-Sample
15-2621-4509	Average AG Wt (Wet, mg)	< 100	100	N/A	14.57%	Wilcoxon Rank Sum Two-Sample
15-1629-2610	Average AG Wt (Dry, mg)	< 100	100	N/A	16.60%	Equal Variance t Two-Sample
18-9105-9839	Average Root Wt. (Wet, mg	< 100	100	N/A	20.04%	Equal Variance t Two-Sample
10-9330-7357	Average Root Wt. (Dry, mg)	< 100	100	N/A	18.39%	Equal Variance t Two-Sample
03-3348-5989	Average Total Wt (Wet, mg	< 100	100	N/A	16.55%	Equal Variance t Two-Sample
17-7337-7058	Average Total Wt (Dry, mg)	< 100	100	N/A	16.68%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 01 Aug-06 8:58 AM
Test Link: 05-3709-9557/B161902psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	0.92000	0.60000	1.00000	0.08000	0.17889	19.44%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	72.300	67	83	2.8657	6.4078	8.86%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	64.720	53.8	81.800	4.9669	11.106	17.16%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	16.319	15.284	18.098	0.4763	1.065	6.53%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	2.83947	2.69202	3.31602	0.12042	0.26927	9.48%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	19.622	14.2	24.640	1.7929	4.0090	20.43%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	0.96214	0.85000	1.02800	0.03195	0.07145	7.43%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	35.941	30.11	42.736	2.1758	4.8653	13.54%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	3.80181	3.54800	4.34402	0.14059	0.31437	8.27%

CETIS Test Summary

Report Date: 01 Aug-06 8:58 AM
Test Link: 05-3709-9557/B161902psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	0.60000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		69.4000	67	73.3000	83	68.8000

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		56.6	68.4000	63	81.8000	53.8

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		15.2840	15.946	15.91	18.096	16.3580

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		2.69800	2.78801	2.70333	3.31602	2.69202

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		17.27	21.4340	14.2	24.6400	20.568

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		0.85000	0.98601	0.93669	1.02800	1.00999

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		32.5540	37.3800	30.11	42.7360	36.9260

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		3.54800	3.77402	3.64001	4.34402	3.70200

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
% Germination	Comparison	05-3709-9557	05-3709-9557	01 Aug-06 8:57 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	14.90%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	25		0.3452	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.021087	0.021087	1	1.00	0.34659	Non-Significant Effect
Error	0.168696	0.021087	8			
Total	0.18978297	0.042174	9			

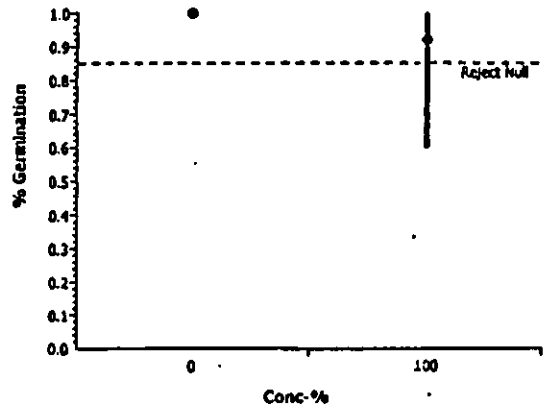
ANOVA Assumptions

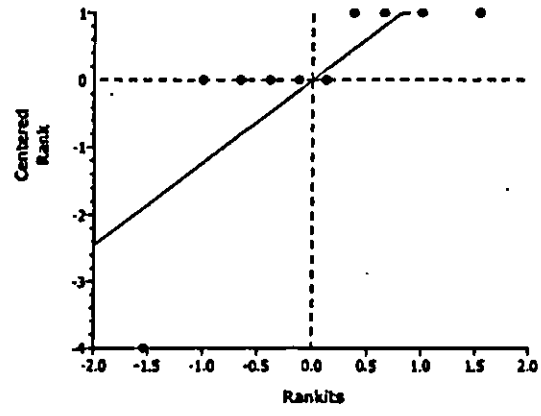
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	1.60000	11.25862	0.24150	Equal Variances
Distribution	Shapiro-Wilk W	0.62470		0.00011	Non-normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	6.00000	6.00000	6.00000	0.00000
100		5	0.92000	0.60000	1.00000	0.17889	5.00000	1.00000	6.00000	2.23607

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Height (mm)	Comparison	05-3709-9557	05-3709-9557	01 Aug-06 8:57 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	11.76%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.55698	1.85955	0.0169	10.1378	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	485.809	485.809	1	6.54	0.03381	Significant Effect
Error	594.4319	74.30399	8			
Total	1080.24091	560.11295	9			

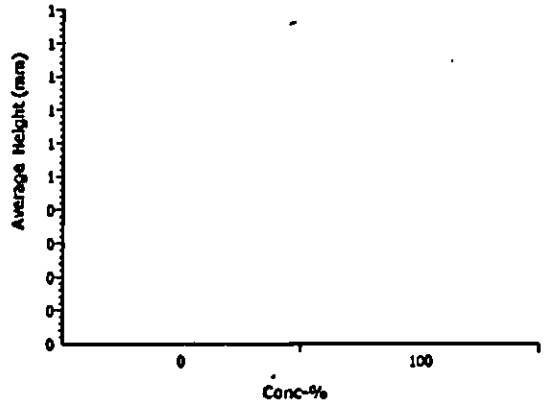
ANOVA Assumptions

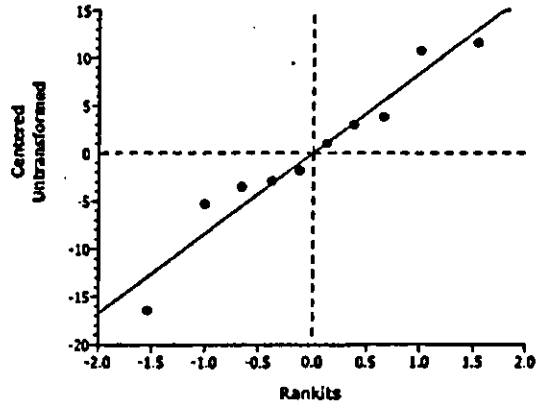
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.61929	23.15450	0.37367	Equal Variances
Distribution	Shapiro-Wilk W	0.94628		0.62479	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	72.300	67	83	6.4078				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	05-3709-9557	05-3709-9557	01 Aug-06 8:57 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	11.25%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	6.59187	1.85955	0.0001	12.1189	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	4613.904	4613.904	1	43.45	0.00017	Significant Effect
Error	849.4562	106.182	8			
Total	5463.35999	4720.0858	9			

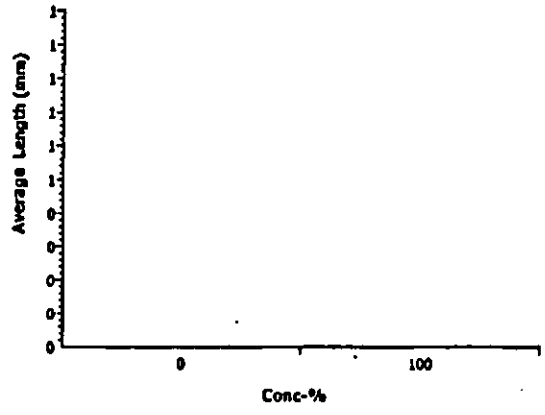
ANOVA Assumptions

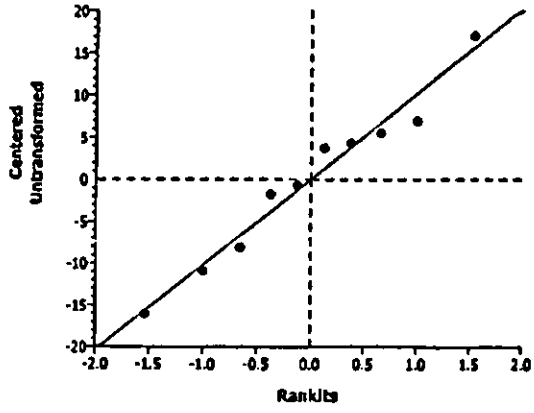
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.38579	23.15450	0.75956	Equal Variances
Distribution	Shapiro-Wilk W	0.97192		0.90809	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	64.720	53.8	81.8	11.106				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Wet, mg)	Comparison	05-3709-9557	05-3709-9557	01 Aug-06 8:57 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		<100	100		N/A	14.57%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	15		0.0040	0	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	577.174	577.174	1	37.89	0.00027	Significant Effect
Error	121.8609	15.23262	8			
Total	699.034897	592.40657	9			

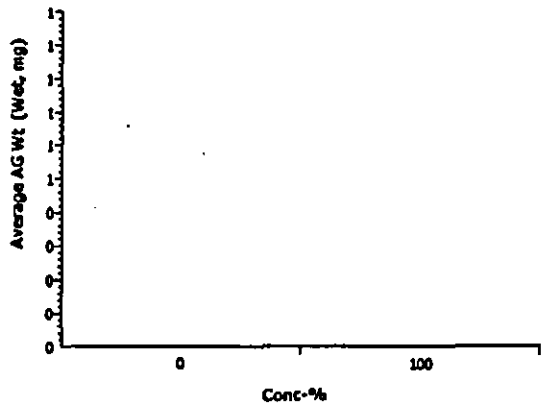
ANOVA Assumptions

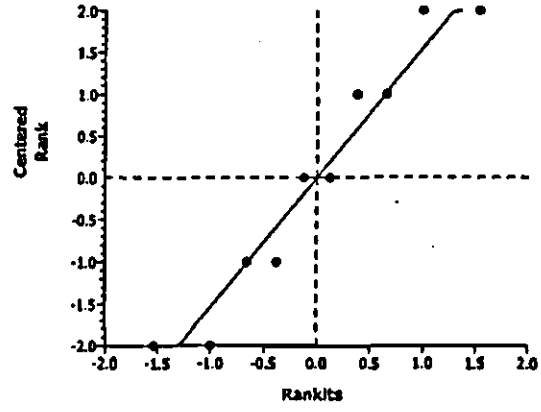
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	25.86017	23.15450	0.00811	Unequal Variances
Distribution	Shapiro-Wilk W	0.78593		0.00978	Non-normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158	8.00000	6.00000	10.0000	1.58114
100		5	16.319	15.284	18.096	1.065	3.00000	1.00000	5.00000	1.58114

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average AG Wt (Dry, mg)	Comparison	05-3709-9557	05-3709-9557	01 Aug-06 8:57 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	16.60%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	4.02235	1.85955	0.0019	0.73512	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	6.32117	6.32117	1	16.18	0.00383	Significant Effect
Error	3.125568	0.390696	8			
Total	9.44673777	6.7118658	9			

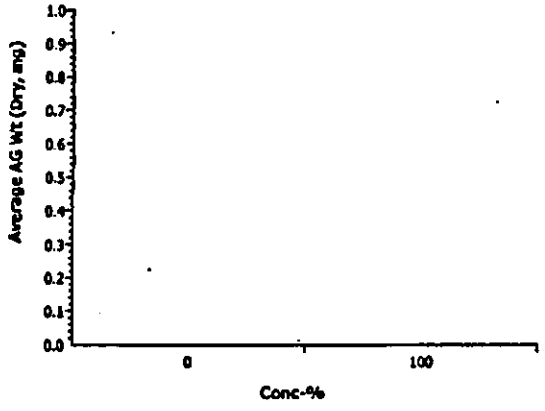
ANOVA Assumptions

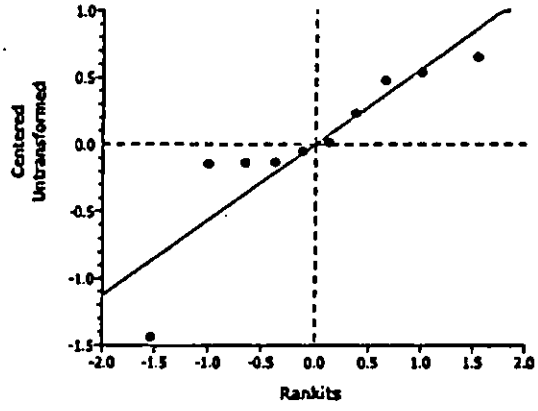
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	9.77652	23.15450	0.04847	Equal Variances
Distribution	Shapiro-Wilk W	0.82406		0.02837	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	2.83947	2.69202	3.31602	0.26927				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Root Wt. (Wet, mg)	Comparison	05-3709-9557	05-3709-9557	01 Aug-06 8:57 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	20.04%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	3.64995	1.85955	0.0032	6.48292	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	404.8011	404.8011	1	13.32	0.00649	Significant Effect
Error	243.0842	30.38553	8			
Total	647.885284	435.18658	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.78113	23.15450	0.34568	Equal Variances
Distribution	Shapiro-Wilk W	0.95775		0.75996	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	19.622	14.2	24.640	4.0090				

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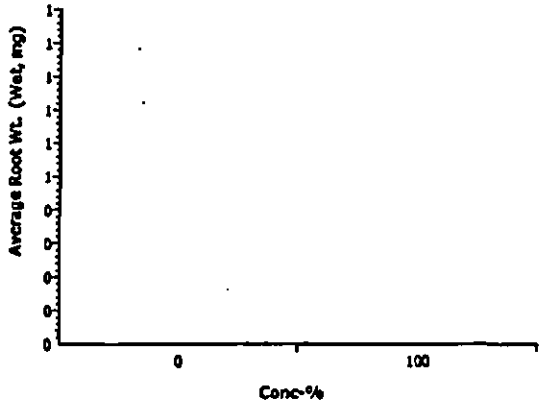

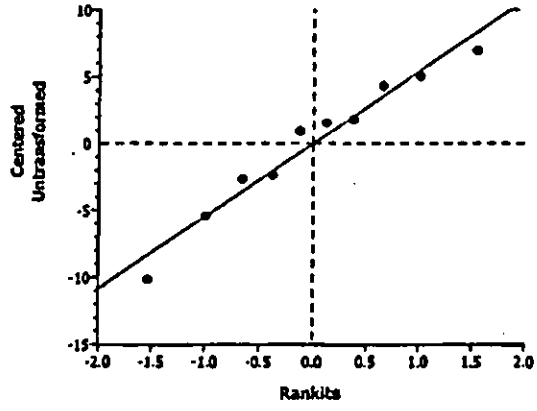

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Dry, mg)	Comparison	05-3709-9557	05-3709-9557	01 Aug-06 8:57 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	18.39%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.55288	1.85955	0.0170	0.23678	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.2641604	0.264160	1	6.52	0.03402	Significant Effect
Error	0.3242625	0.040533	8			
Total	0.58842289	0.3046932	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	14.87951	23.15450	0.02280	Equal Variances
Distribution	Shapiro-Wilk W	0.88807		0.16129	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	0.96214	0.85000	1.02800	0.07145				

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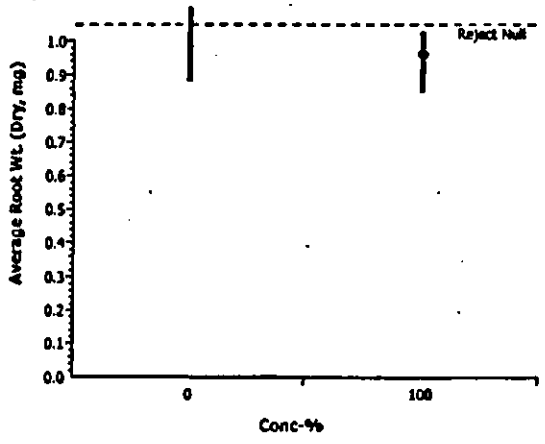
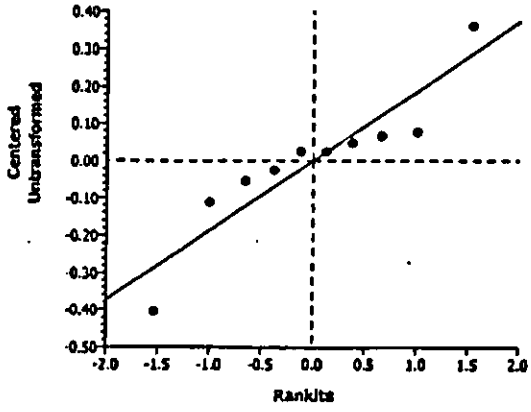




CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Wet, mg)	Comparison	05-3709-9557	05-3709-9557	01 Aug-06 8:57 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	16.55%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	4.91179	1.85955	0.0006	10.5699	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1948.703	1948.703	1	24.13	0.00118	Significant Effect
Error	646.1836	80.77295	8			
Total	2594.88647	2029.4758	9			

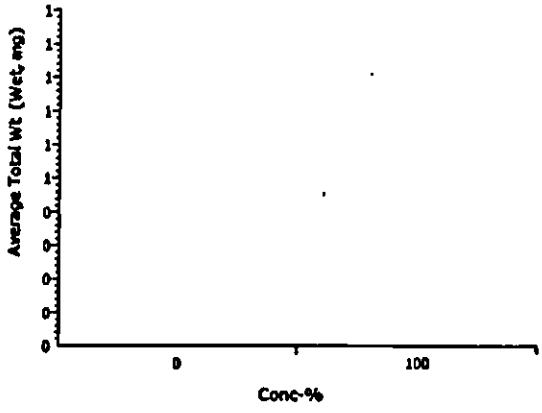
ANOVA Assumptions

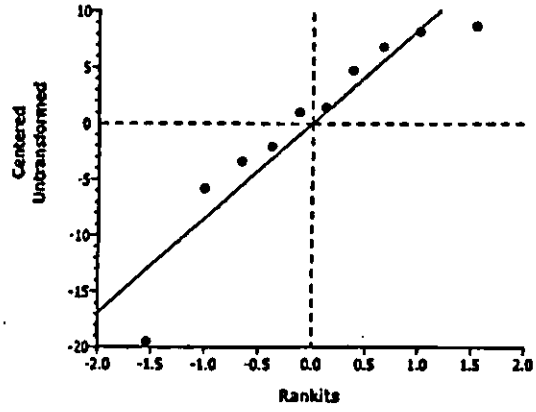
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	5.82452	23.15450	0.11624	Equal Variances
Distribution	Shapiro-Wilk W	0.88068		0.13285	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	35.941	30.11	42.736	4.8653				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**		**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Total Wt (Dry, mg)	Comparison		05-3709-9557	05-3709-9557	01 Aug-06 8:58 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	16.68%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	3.7338	1.85955	0.0029	0.95382	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	9.169745	9.169745	1	13.94	0.00576	Significant Effect
Error	5.261942	0.657743	8			
Total	14.4316878	9.8274882	9			

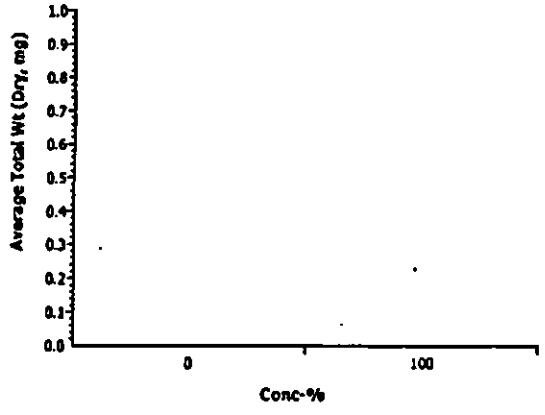
ANOVA Assumptions

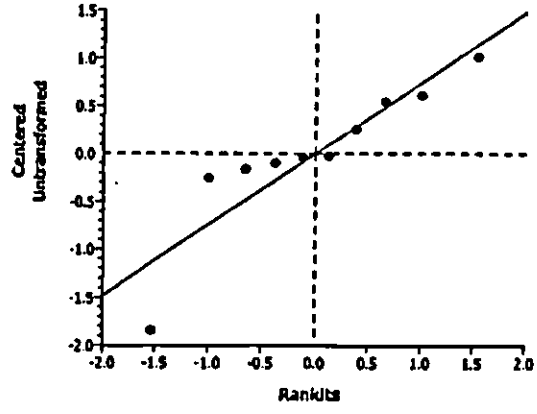
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	12.31053	23.15450	0.03217	Equal Variances
Distribution	Shapiro-Wilk W	0.85335		0.06366	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	3.80161	3.54800	4.34402	0.31437				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2006

Day 0 (TI) Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Bioassay Lab ID: BG 1619-03 Sample No: J12NB8

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	8	8	8	8			8→5	5	8.8	9.3
	B	6	6	6	6			6→5	5		
	C	6	6	6	6			6→5	5		
	D	10	10	10	10			10→5	~~8~~ 5		
	E	8	8	8	8			8→5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A 2lgG, 3medG Remove - 1medG, 2smG

Replicate B 2lgG, 2medG, 1smG Remove - 1smG

Replicate C 2lgG, 2medG, 1smG Remove - 1smG

Replicate D 3lgG, 3medG Remove - 4medG, 1smG

Replicate E 2lgG 3medG Remove - 2medG, 1smG

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A 4lgG, 1medG

Replicate B 4lgG, 1medG

Replicate C 3lgG, 1medG, ~~1~~ 1smG

Replicate D 3lgG, 2medG

Replicate E

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	85 mm	85 mm	87 mm	77 mm	95 mm
Replicate B	101 mm	64 mm	86 mm	81 mm	90 mm
Replicate C	88 mm	87 mm	79 mm	47 mm	104 mm
Replicate D	75 mm	82 mm	75 mm	113 mm	89 mm
Replicate E	73 mm	73 mm	71 mm	92 mm	69 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1281.94	1446.4	1302.21
Replicate B	1245.31	1381.6	1266.23
Replicate C	1257.90	1378.4	1278.66
Replicate D	1244.66	1383.4	1267.46
Replicate E	1255.30	1374.8	1274.66

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	106 mm	118 mm	90 mm	85 mm	112 mm
Replicate B	98 mm	143 mm	120 mm	69 mm	82 mm
Replicate C	75 mm	103 mm	101 mm	129 mm	90 mm
Replicate D	116 mm	114 mm	70 mm	114 mm	113 mm
Replicate E	112 mm	77 mm	98 mm	92 mm	53 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1250.32	1389.8	1258.03
Replicate B	1267.26	1477.4	1277.22
Replicate C	1251.40	1392.2	1260.05
Replicate D	1236.91	1441.6	1247.05
Replicate E	1248.77	1410.7	1256.63

Comments:

CETIS Test Summary

Report Date: 01 Aug-06 9:01 AM
Test Link: 00-9656-8390/B161903psc

Plant Bioassay - Chronic — **CH2M Hill**

Test No:	08-2031-9782	Test Type:	Plant Chronic	Duration:	28d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	12-8605-9318	Code:	B1619-03	Client:	
Sample Date:	19 Jun-06 12:03 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	8d 23h	Station:			

Comments: J12N88

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
06-7864-8411	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
08-6198-7823	Average Height (mm)	100	> 100	N/A	10.53%	Equal Variance t Two-Sample
04-0009-0694	Average Length (mm)	100	> 100	N/A	8.17%	Equal Variance t Two-Sample
11-6712-9576	Average AG Wt (Wet, mg)	< 100	100	N/A	15.11%	Equal Variance t Two-Sample
06-3298-8476	Average AG Wt (Dry, mg)	100	> 100	N/A	16.88%	Equal Variance t Two-Sample
18-9617-4916	Average Root Wt. (Wet, mg	100	> 100	N/A	24.56%	Equal Variance t Two-Sample
12-2130-7352	Average Root Wt. (Dry, mg)	100	> 100	N/A	23.12%	Equal Variance t Two-Sample
06-8770-3761	Average Total Wt (Wet, mg	100	> 100	N/A	18.79%	Equal Variance t Two-Sample
09-9108-1709	Average Total Wt (Dry, mg)	100	> 100	N/A	17.86%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 01 Aug-06 9:01 AM
Test Link: 00-9656-8390/B161903psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	82.800	79.400	86.800	1.5323	3.4264	4.14%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	100.8	93.400	106.40	2.1457	4.7979	4.76%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	25.86	23.9	27.748	0.8288	1.8532	7.17%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	4.24439	3.87200	4.58398	0.14114	0.31559	7.44%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	34.282	27.896	42.028	3.0509	6.822	19.90%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12328	0.27561	21.41%
100		5	1.77280	1.54202	2.02800	0.10212	0.22836	12.88%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	60.141	52.26	69.686	3.7514	8.3883	13.95%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	6.01720	5.44399	6.58799	0.24107	0.53904	8.96%

CETIS Test Summary

Report Date: 01 Aug-06 9:01 AM
Test Link: 00-9656-8390/B161903psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		85.8000	82.4000	79.4000	86.8000	79.6

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		102.2	102.400	99.6	106.400	93.4000

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		25.8920	27.658	24.1000	27.748	23.9

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		4.05400	4.58398	4.15200	4.55999	3.87200

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		27.8960	42.0280	28.16	40.938	32.386

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.54202	1.99199	1.73000	2.02800	1.57200

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		53.7880	69.686	52.26	68.686	56.286

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		5.59602	6.57598	5.88201	6.58799	5.44399

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
% Germination	Comparison	00-9656-8390	00-9656-8390	01 Aug-06 9:00 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

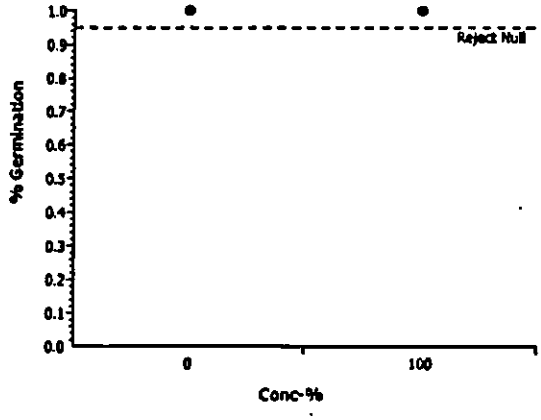
ANOVA Assumptions

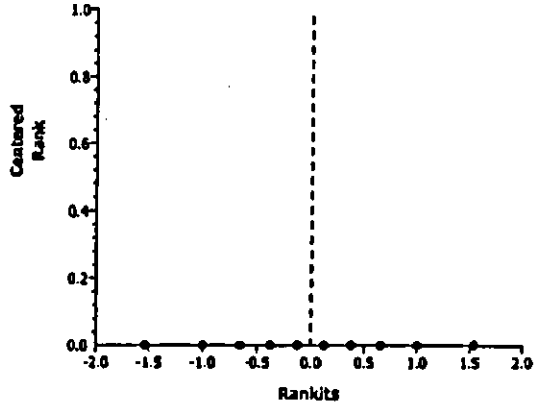
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Height (mm)	Comparison	00-9656-8390	00-9656-8390	01 Aug-06 9:00 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	10.53%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.70428	1.85955	0.2506	9.08282	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	29.58399	29.58399	1	0.50	0.50124	Non-Significant Effect
Error	477.152	59.644	8			
Total	506.735968	89.227987	9			

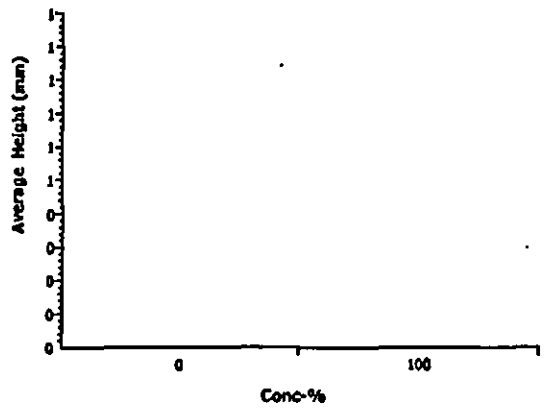
ANOVA Assumptions

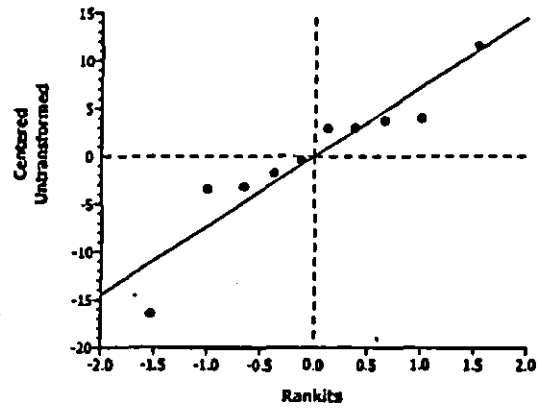
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	9.16081	23.15450	0.05430	Equal Variances
Distribution	Shapiro-Wilk W	0.89969		0.21737	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	82.800	79.4	86.8	3.4264				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	00-9656-8390	00-9656-8390	01 Aug-06 9:00 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	8.17%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.45348	1.85955	0.0921	8.80224	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	118.336	118.336	1	2.11	0.18417	Non-Significant Effect
Error	448.128	56.016	8			
Total	566.463951	174.35196	9			

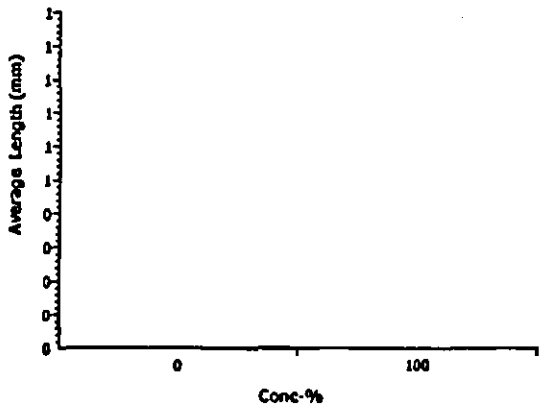
ANOVA Assumptions

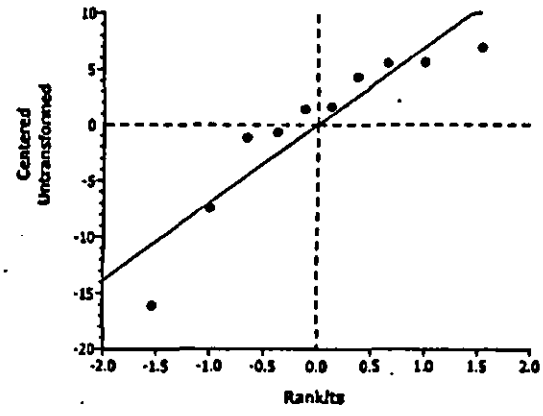
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	3.86672	23.15450	0.21862	Equal Variances
Distribution	Shapiro-Wilk W	0.85153		0.06057	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	100.8	93.4	106.4	4.7979				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic	CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Wet, mg)	Comparison	00-9656-8390	00-9656-8390	01 Aug-06 9:00 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	15.11%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.20852	1.85955	0.0291	4.76025	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	79.90781	79.90781	1	4.88	0.05821	Non-Significant Effect
Error	131.0616	16.3827	8			
Total	210.969391	96.290504	9			

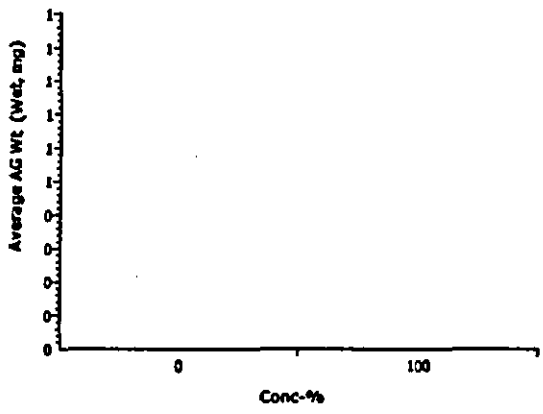
ANOVA Assumptions

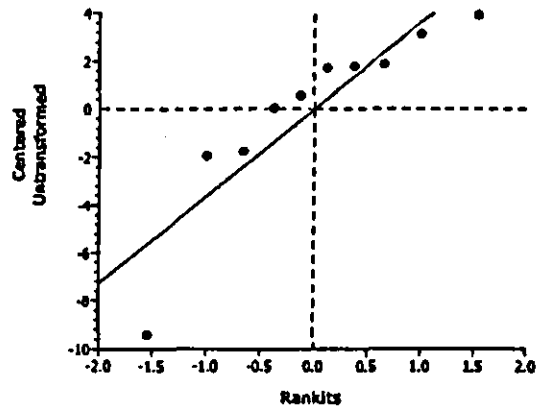
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	8.54042	23.15450	0.06131	Equal Variances
Distribution	Shapiro-Wilk W	0.82329		0.02777	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	25.86	23.9	27.748	1.8532				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Dry, mg)	Comparison	00-9656-8390	00-9656-8390	01 Aug-06 9:00 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	16.88%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.46055	1.85955	0.3287	0.74775	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0857435	0.085743	1	0.21	0.65738	Non-Significant Effect
Error	3.233917	0.40424	8			
Total	3.31965999	0.4899830	9			

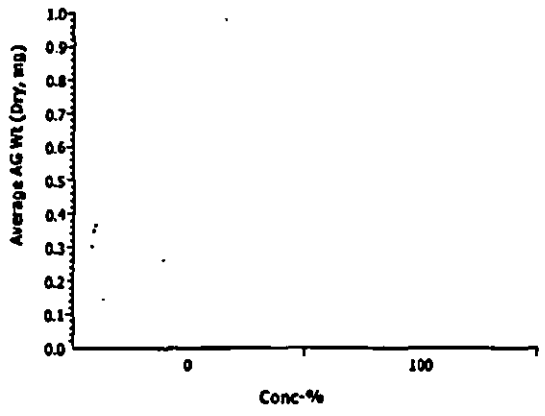
ANOVA Assumptions

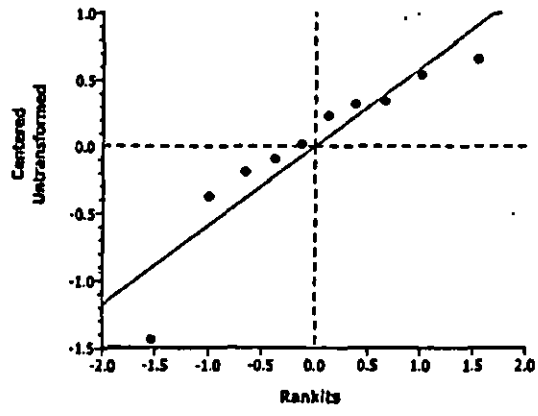
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	7.11759	23.15450	0.08358	Equal Variances
Distribution	Shapiro-Wilk W	0.86338		0.08364	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	4.24439	3.87200	4.58398	0.31559				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Wet, mg)	Comparison	00-9656-8390	00-9656-8390	01 Aug-06 9:00 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	24.56%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.4528	1.85955	0.6687	7.94348	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	9.35476	9.35476	1	0.21	0.66269	Non-Significant Effect
Error	364.9528	45.6191	8			
Total	374.307549	54.973859	9			

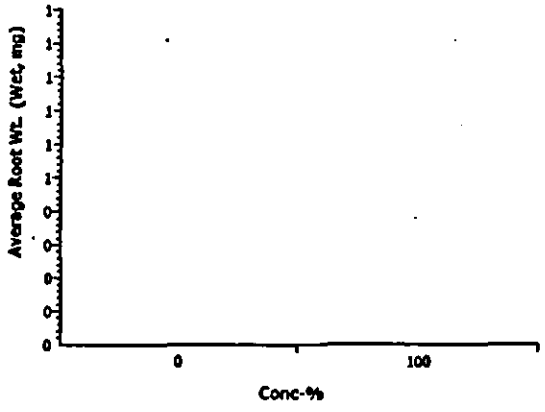
ANOVA Assumptions

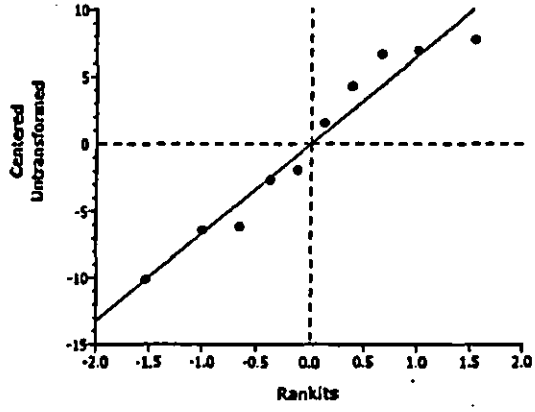
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.04118	23.15450	0.96975	Equal Variances
Distribution	Shapiro-Wilk W	0.92508		0.40129	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	34.282	27.896	42.028	6.822				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Dry, mg)	Comparison	00-9656-8390	00-9656-8390	01 Aug-06 9:00 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	23.12%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-3.0338	1.85955	0.9919	0.29765	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.5895317	0.589532	1	9.20	0.01622	Significant Effect
Error	0.5124304	0.064054	8			
Total	1.10196209	0.6535855	9			

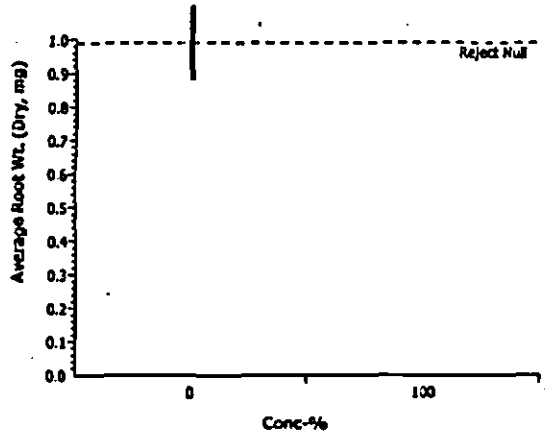
ANOVA Assumptions

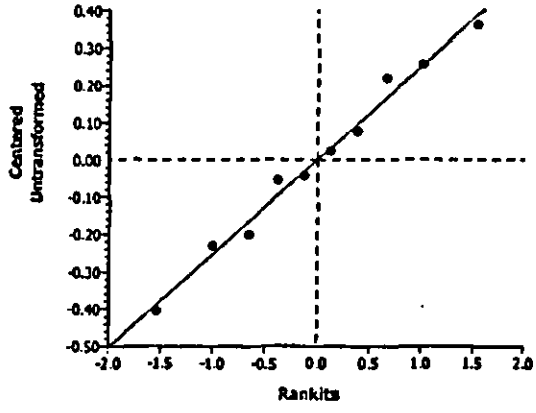
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.45666	23.15450	0.72438	Equal Variances
Distribution	Shapiro-Wilk W	0.97880		0.95842	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.77280	1.54202	2.02800	0.22838				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Wet, mg)	Comparison	00-9656-8390	00-9656-8390	01 Aug-06 9:01 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	18.79%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.57631	1.85955	0.2901	12.0006	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	34.581	34.581	1	0.33	0.58026	Non-Significant Effect
Error	832.9532	104.1192	8			
Total	867.534245	138.70015	9			

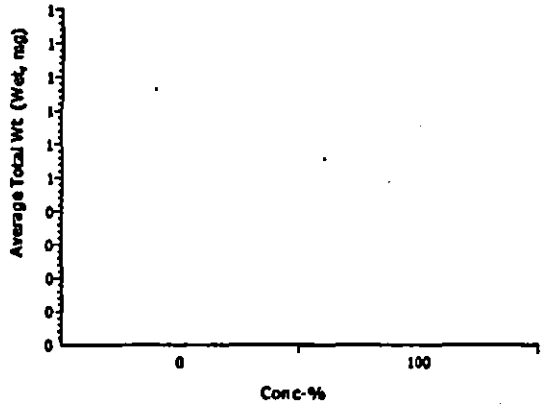
ANOVA Assumptions

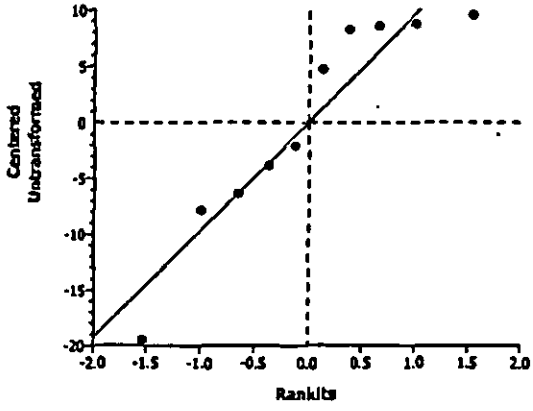
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.95945	23.15450	0.53074	Equal Variances
Distribution	Shapiro-Wilk W	0.88086		0.13351	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	60.141	52.26	69.686	8.3883				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Total Wt (Dry, mg)	Comparison	00-9656-8390	00-9656-8390	01 Aug-06 9:01 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	17.86%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.5472	1.85955	0.7004	1.02097	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.2256158	0.225616	1	0.30	0.59920	Non-Significant Effect
Error	6.028885	0.753611	8			
Total	6.25450097	0.9792263	9			

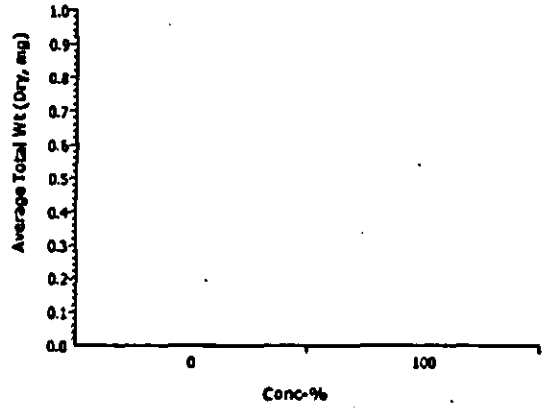
ANOVA Assumptions

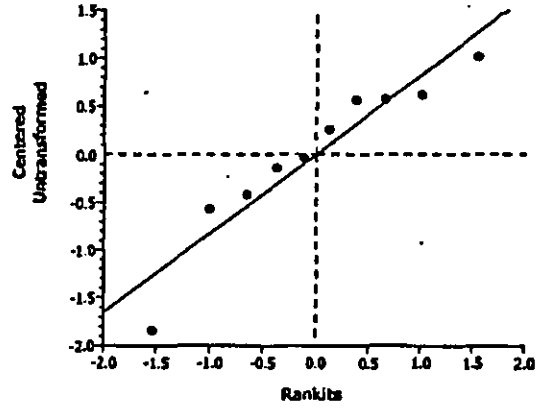
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	4.18719	23.15450	0.19433	Equal Variances
Distribution	Shapiro-Wilk W	0.90748		0.26411	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	6.01720	5.44399	6.58799	0.53904				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 26, 2006

Day 0 (Initials) Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ/BW Day ____

Bioassay Lab ID: BG 1619-04 Sample No: J12NB9

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	7	7	7	7			7→5	5	8.8	8.8
	B	7	7	7	7			7→5	5		
	C	6	6	6	6			6→5	5		
	D	4	4	4	4			NJ 4→5	5		
	E	8	8	8	8			8→5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A 2lg G, 1 3med G Remove - 2sm G

Replicate B 2lg G, 3med G Remove 1med G, 1sm G

Replicate C 1lg G, 4med G Remove - 1 med G

Replicate D 2lg G, 2med G 1sm G

Replicate E 1lg G, 3med G, 1sm G Remove - 3 sm G

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A 1lg G, 4med G

Replicate B 2lg G, 3med G

Replicate C 3lg G, 2med G

Replicate D 2lg G, 1lg G w/1 B shoot, 1 med G, 1sm G

Replicate E ~~3lg G, 3med G~~ 2lg G, 3med G

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	78 mm	77 mm	70 mm	91 mm	69 mm
Replicate B	61 mm	116 mm	61 mm	83 mm	75 mm
Replicate C	70 mm	82 mm	86 mm	73 mm	85 mm
Replicate D	80 mm	86 mm	70 mm	111 mm	34 mm
Replicate E	85 mm	81 mm	79 mm	77 mm	71 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1254.43	1375.6	1274.21
Replicate B	1254.10	1365.5	1272.84
Replicate C	1252.92	1360.6	1270.79
Replicate D	1249.39	1347.9	1267.79
Replicate E	~~1252.53~~ 1254.30	1370.4	1274.02

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	94 mm	64 mm	63 mm	66 mm	118 mm
Replicate B	70 mm	71 mm	69 mm	111 mm	135 mm
Replicate C	75 mm	68 mm	77 mm	69 mm	68 mm
Replicate D	151 mm	83 mm	95 mm	73 mm	34 mm
Replicate E	91 mm	92 mm	76 mm	80 mm	72 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1252.56	1394.5	1259.29
Replicate B	1260.43	1397.1	1267.81
Replicate C	1255.06	1378.3	1260.71
Replicate D	1242.60	1373.7	1251.52
Replicate E	~~1244.21~~ 1244.20	1379.5	1250.91

Comments:

CETIS Test Summary

Report Date: 01 Aug-06 9:10 AM
Test Link: 04-2846-9555/B161904psc

Plant Bioassay - Chronic — CH2M Hill

Test No:	09-4205-0480	Test Type:	Plant Chronic	Duration:	28d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	02-7544-8921	Code:	B1619-04	Client:	
Sample Date:	19 Jun-06 12:04 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	8d 23h	Station:			

Comments: J12NB9

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
14-1618-7582	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
05-5695-2130	Average Height (mm)	100	> 100	N/A	10.07%	Equal Variance t Two-Sample
09-4660-4160	Average Length (mm)	< 100	100	N/A	9.16%	Equal Variance t Two-Sample
06-2586-4502	Average AG Wt (Wet, mg)	< 100	100	N/A	15.00%	Equal Variance t Two-Sample
03-5869-9037	Average AG Wt (Dry, mg)	100	> 100	N/A	16.11%	Equal Variance t Two-Sample
04-6673-1324	Average Root Wt. (Wet, mg	100	> 100	N/A	17.56%	Equal Variance t Two-Sample
05-8954-8651	Average Root Wt. (Dry, mg)	100	> 100	N/A	23.63%	Equal Variance t Two-Sample
10-6046-2990	Average Total Wt (Wet, mg	< 100	100	N/A	15.74%	Equal Variance t Two-Sample
09-7239-2857	Average Total Wt (Dry, mg)	100	> 100	N/A	16.59%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 01 Aug-06 9:10 AM
Test Link: 04-2846-9555/B161904psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	77.8	76.2	79.2	0.5404	1.2083	1.55%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	82.4	71.400	90.2	3.2162	7.1917	8.73%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	22.194	19.702	24.234	0.7702	1.7223	7.76%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	3.78040	3.57400	3.95598	0.07461	0.16683	4.41%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	26.73	24.648	28.388	0.6252	1.398	5.23%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.41560	1.12998	1.78401	0.10752	0.24042	16.98%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	48.924	45.922	52.622	1.2749	2.8509	5.83%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	5.19600	4.70398	5.46401	0.12923	0.28898	5.56%

CETIS Test Summary

Report Date: 01 Aug-06 9:10 AM
Test Link: 04-2846-9555/B161904psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		77	78	79.2	76.2	78.6

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		81	90.2	71.4000	87.2	82.2

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		24.234	22.2800	21.536	19.7020	23.22

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		3.95598	3.74800	3.57400	3.68000	3.94399

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		28.388	27.334	24.648	26.22	27.0600

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.34600	1.47600	1.12998	1.78401	1.34202

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		52.622	49.614	46.184	45.922	50.2800

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		5.30198	5.22400	4.70398	5.46401	5.28601

CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
% Germination	Comparison	04-2846-9555	04-2846-9555	01 Aug-06 9:05 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

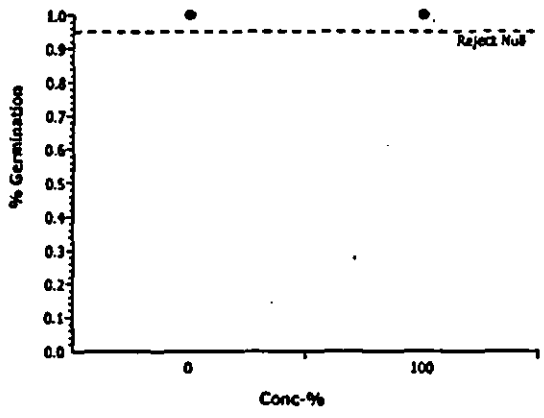
ANOVA Assumptions

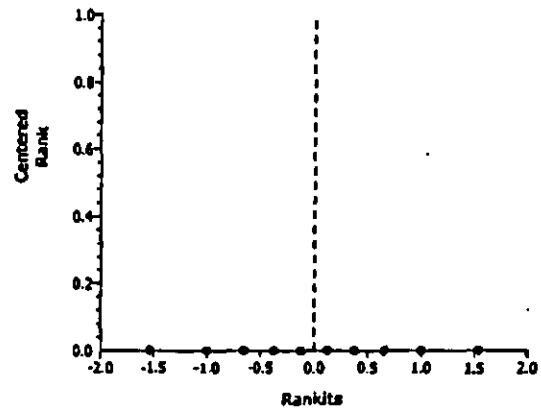
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Height (mm)	Comparison	04-2846-9555	04-2846-9555	01 Aug-06 9:05 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	10.07%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.80758	1.85955	0.0541	8.68264	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	178.0841	178.0841	1	3.27	0.10829	Non-Significant Effect
Error	436.032	54.50399	8			
Total	614.116058	232.58810	9			

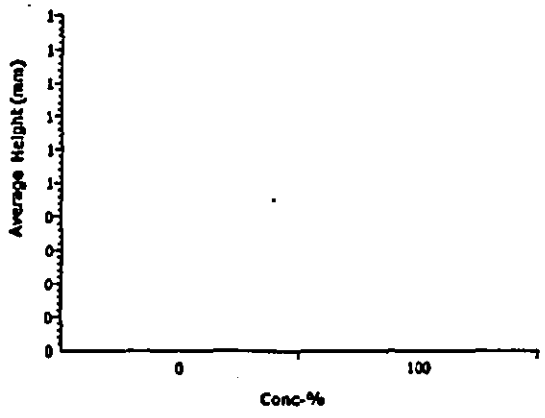
ANOVA Assumptions

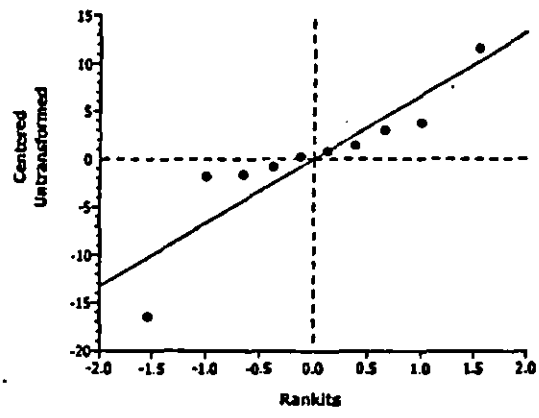
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	73.66302	23.15450	0.00107	Unequal Variances
Distribution	Shapiro-Wilk W	0.84349		0.04858	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	77.8	76.2	79.2	1.2083				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	04-2846-9555	04-2846-9555	01 Aug-06 9:05 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	9.16%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	4.76503	1.85955	0.0007	9.86549	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1597.696	1597.696	1	22.71	0.00142	Significant Effect
Error	562.9279	70.36598	8			
Total	2160.62390	1668.0620	9			

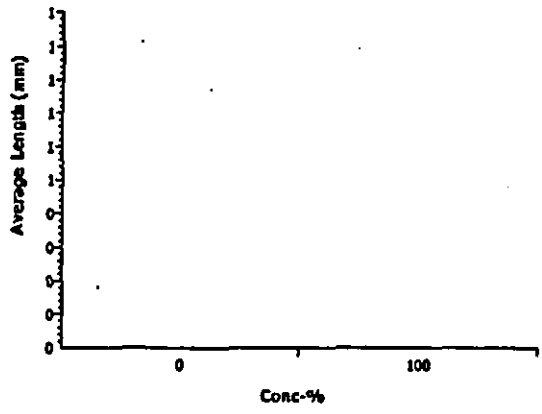
ANOVA Assumptions

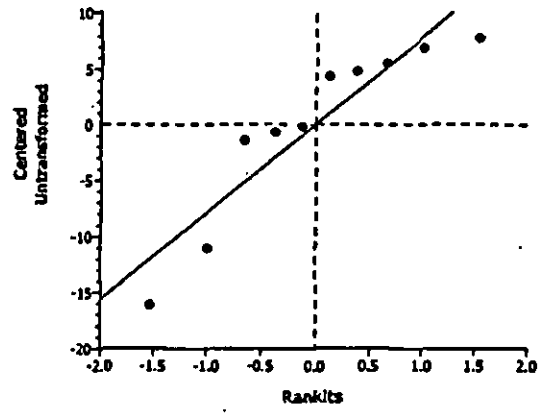
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.72104	23.15450	0.61182	Equal Variances
Distribution	Shapiro-Wilk W	0.85455		0.06578	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	82.4	71.4	90.2	7.1917				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average AG Wt (Wet, mg)	Comparison	04-2846-9555	04-2846-9555	01 Aug-06 9:08 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	15.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	3.66659	1.85955	0.0032	4.72612	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	217.1001	217.1001	1	13.44	0.00634	Significant Effect
Error	129.1887	16.14859	8			
Total	346.288773	233.24864	9			

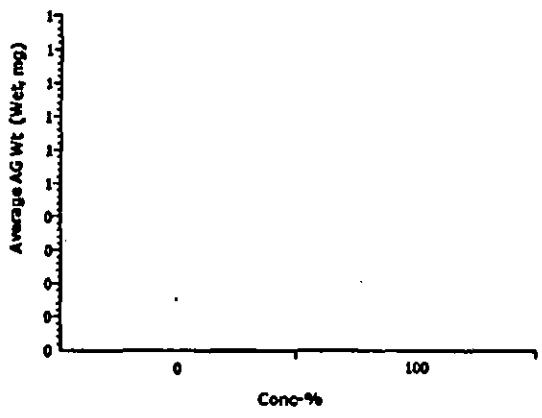
ANOVA Assumptions

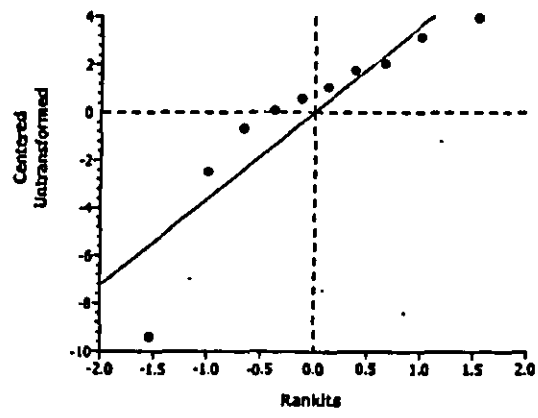
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	9.88855	23.15450	0.04751	Equal Variances
Distribution	Shapiro-Wilk W	0.82388		0.02823	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	22.194	19.702	24.234	1.7223				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Dry, mg)	Comparison	04-2846-9555	04-2846-9555	01 Aug-06 9:10 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	16.11%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.69126	1.85955	0.0646	0.71379	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1.053634	1.053634	1	2.86	0.12925	Non-Significant Effect
Error	2.946855	0.368357	8			
Total	4.00048888	1.4219907	9			

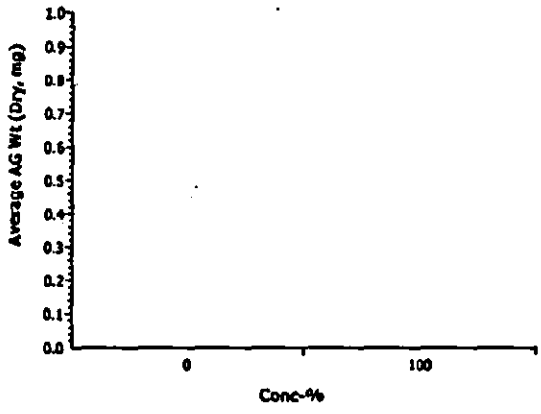
ANOVA Assumptions

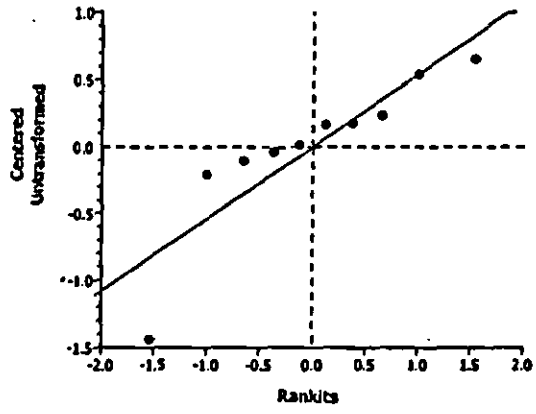
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	25.47137	23.15450	0.00835	Unequal Variances
Distribution	Shapiro-Wilk W	0.81151		0.02000	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	3.78040	3.57400	3.95598	0.16683				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Wet, mg)	Comparison	04-2846-9555	04-2846-9555	01 Aug-06 9:10 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	17.56%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.83893	1.85955	0.0516	5.68019	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	78.88238	78.88238	1	3.38	0.10322	Non-Significant Effect
Error	186.6128	23.3266	8			
Total	265.495216	102.20898	9			

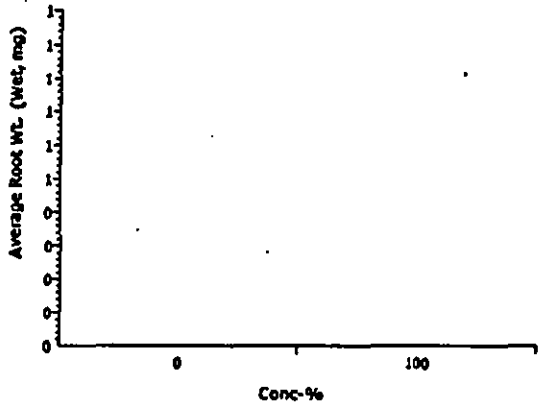
ANOVA Assumptions

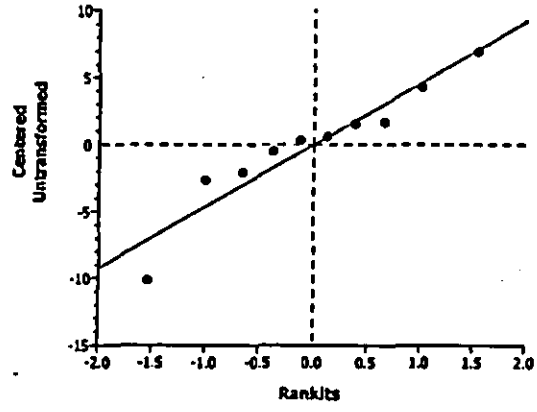
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	22.87127	23.15450	0.01024	Equal Variances
Distribution	Shapiro-Wilk W	0.92629		0.41243	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	26.73	24.648	28.388	1.398				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Root Wt. (Dry, mg)	Comparison	04-2846-9555	04-2846-9555	01 Aug-06 9:10 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	23.63%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.7850	1.85955	0.7725	0.30415	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0412185	0.041219	1	0.62	0.45505	Non-Significant Effect
Error	0.5350534	0.066882	8			
Total	0.5762719	0.1081002	9			

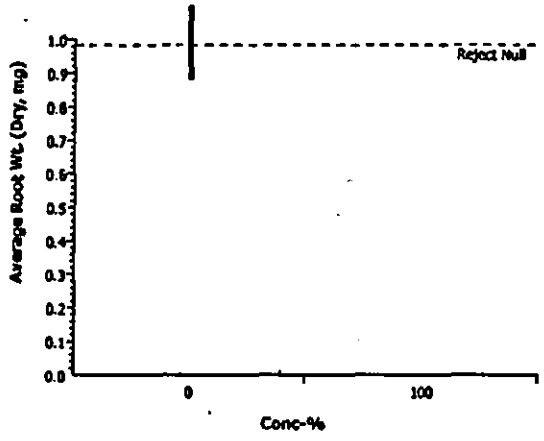
ANOVA Assumptions

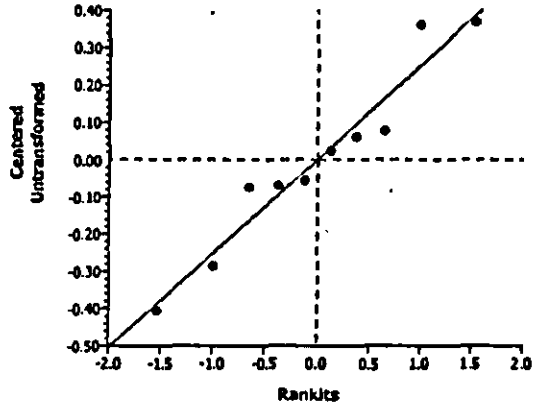
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.31413	23.15450	0.79763	Equal Variances
Distribution	Shapiro-Wilk W	0.93637		0.51339	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.41560	1.12998	1.78401	0.24042				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Total Wt (Wet, mg)	Comparison	04-2846-9555	04-2846-9555	01 Aug-06 9:10 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	15.74%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	2.76401	1.85955	0.0123	10.0485	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	557.7104	557.7104	1	7.64	0.02452	Significant Effect
Error	584.0075	73.00094	8			
Total	1141.7179	630.71133	9			

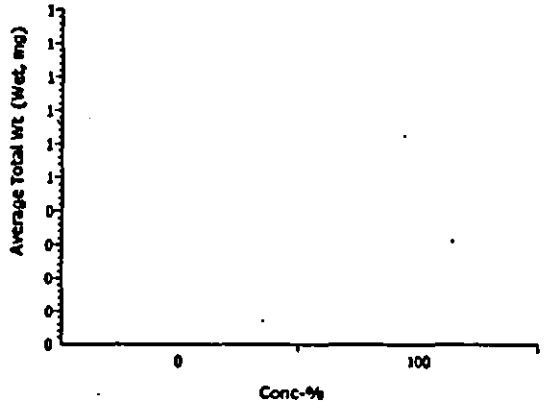
ANOVA Assumptions

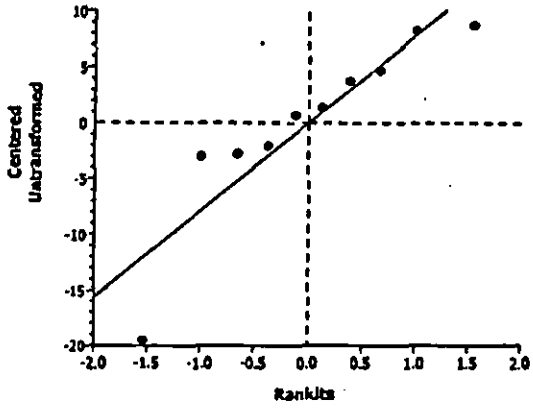
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	16.96419	23.15450	0.01790	Equal Variances
Distribution	Shapiro-Wilk W	0.84558		0.05145	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	48.924	45.922	52.622	2.8509				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**		**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Total Wt (Dry, mg)	Comparison		04-2846-9555	04-2846-9555	01 Aug-06 9:10 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	16.59%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.02129	1.85955	0.1685	0.94825	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.6780582	0.678058	1	1.04	0.33700	Non-Significant Effect
Error	5.200653	0.650082	8			
Total	5.87871128	1.3281398	9			

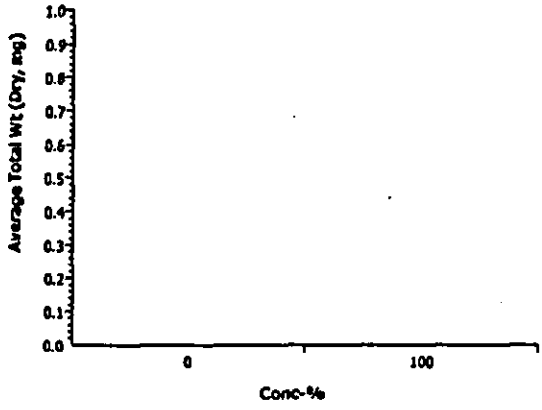
ANOVA Assumptions

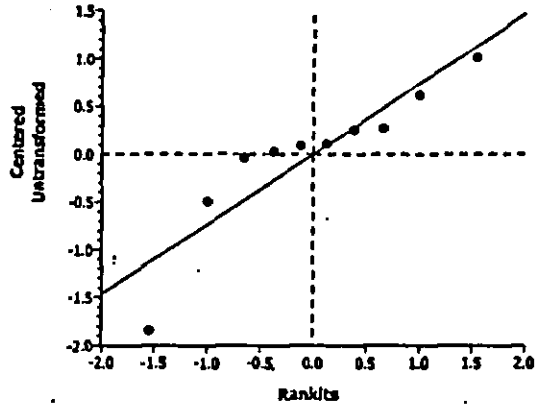
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	14.56930	23.15450	0.02369	Equal Variances
Distribution	Shapiro-Wilk W	0.84541		0.05122	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	5.19600	4.70398	5.46401	0.28898				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2006

Day 0 GD (initial) Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Bioassay Lab ID: BG 1619-05 Sample No: J12NC0

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (24 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	6	6	6	7			7→5	5	8.7	7.6
	B	5	5	5	5			5	5		
	C	6	6	6	6			6→5	5		
	D	7	7	7	8			8→5	5		~~8.8~~
	E	7	7	8	8			8→5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A: 2lgG, 3medG Remove - 2smG

Replicate B: 2lgG, 2medG, 1smG

Replicate C: 2lgG, 3medG Remove - 1smG

Replicate D: 1lgG, 4medG Remove - 1medG, 2smG

Replicate E: 5lgG Remove - 3medG

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A: 3lgG, 2medG

Replicate B: 1lgG, 3medG, 1smG

Replicate C: 2lgG, 3medG

Replicate D: 4lgG, 1medG

Replicate E: 5lgG

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	73 mm	93 mm	81 mm	78 mm	94 mm
Replicate B	79 mm	71 mm	89 mm	50 mm	71 mm
Replicate C	69 mm	71 mm	85 mm	66 mm	91 mm
Replicate D	81 mm	83 mm	82 mm	80 mm	93 mm
Replicate E	93 mm	90 mm	91 mm	91 mm	95 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1250.81	1354.9	1267.94
Replicate B	1250.23	1331.2	~~1261.18~~ 1262.62
Replicate C	1249.12	1355.2	1266.29
Replicate D	1249.37	1360.9	1266.85
Replicate E	1256.19	1384.6	1279.80

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	75 mm	117 mm	70 mm	83 mm	69 mm
Replicate B	74 mm	36 mm	60 mm	79 mm	63 mm
Replicate C	85 mm	80 mm	76 mm	85 mm	130 mm
Replicate D	90 mm	100 mm	68 mm	95 mm	77 mm
Replicate E	95 mm	91 mm	97 mm	90 mm	75 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1259.72	1346.0	1260.79
Replicate B	1256.91	1354.5	1261.78
Replicate C	1246.39	1353.5	1253.81
Replicate D	1243.29	1373.1	1253.86
Replicate E	1253.39	1463.6	1263.48

Comments:

CETIS Test Summary

Report Date: 01 Aug-06 9:13 AM
Test Link: 04-6914-5453/B161905psc

Plant Bioassay - Chronic — CH2M Hill

Test No:	07-3983-1029	Test Type:	Plant Chronic	Duration:	30d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	28 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	16-8637-2561	Code:	B1619-05	Client:	
Sample Date:	19 Jun-06 12:05 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	8d 23h	Station:			

Comments: J12NC0

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
15-9108-9948	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
06-6580-1072	Average Height (mm)	100	> 100	N/A	12.45%	Equal Variance t Two-Sample
15-6227-6826	Average Length (mm)	< 100	100	N/A	11.57%	Wilcoxon Rank Sum Two-Sample
03-4736-6585	Average AG Wt (Wet, mg)	< 100	100	N/A	16.89%	Equal Variance t Two-Sample
02-0622-9259	Average AG Wt (Dry, mg)	100	> 100	N/A	21.78%	Equal Variance t Two-Sample
18-1433-9929	Average Root Wt. (Wet, mg	< 100	100	N/A	21.29%	Equal Variance t Two-Sample
03-6697-3548	Average Root Wt. (Dry, mg)	100	> 100	N/A	36.68%	Equal Variance t Two-Sample
07-5574-1536	Average Total Wt (Wet, mg	< 100	100	N/A	18.44%	Equal Variance t Two-Sample
07-1626-2187	Average Total Wt (Dry, mg)	100	> 100	N/A	23.87%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 01 Aug-06 9:13 AM
Test Link: 04-6914-5453/B161905psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	81.600	72	92	3.4427	7.6981	9.43%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	82.4	62.400	91.2	5.2077	11.645	14.13%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	21.243	16.194	25.682	1.5249	3.4099	16.05%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	3.51120	2.47800	4.72202	0.35686	0.79797	22.73%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	23.032	18.256	30.042	2.1864	4.8889	21.23%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.56080	0.97400	2.11399	0.22198	0.49637	31.80%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	44.275	35.712	55.724	3.5370	7.9090	17.86%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	5.07200	3.45200	6.74001	0.54344	1.21516	23.96%

CETIS Test Summary

Report Date: 01 Aug-06 9:13 AM
Test Link: 04-6914-5453/B161905psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		83.8000	72	76.4000	83.8000	92

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		82.8000	62.4000	91.2	86	89.6

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		20.818	16.194	21.216	22.3060	25.6820

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		3.42598	2.47800	3.43401	3.49600	4.72202

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		18.2560	19.518	21.3820	25.962	30.042

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.21401	0.97400	1.48401	2.11399	2.01799

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		39.074	35.712	42.598	48.268	55.724

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		4.63999	3.45200	4.91802	5.60999	6.74001

CETIS Analysis Detail

Plant Bioassay - Chronic	CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
% Germination	Comparison	04-6914-5453	04-6914-5453	01 Aug-06 9:13 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

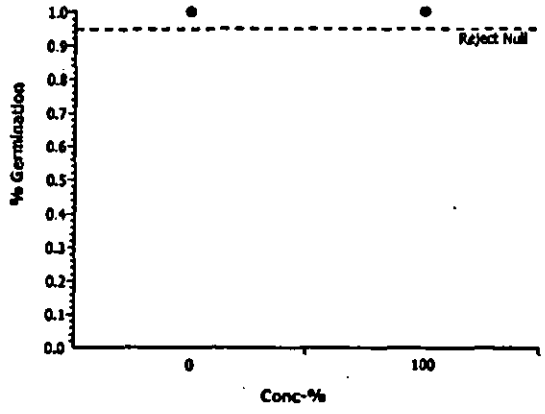
ANOVA Assumptions

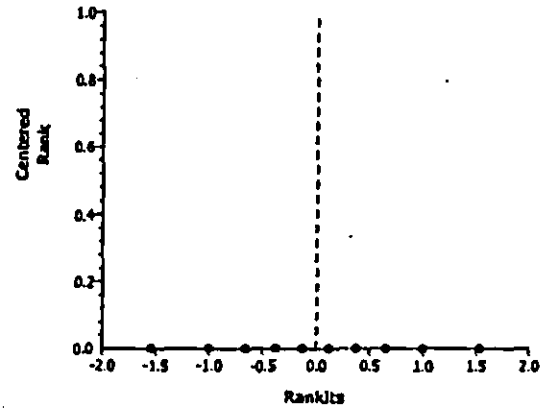
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Height (mm)	Comparison	04-6914-5453	04-6914-5453	01 Aug-06 9:13 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	12.45%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.80333	1.85955	0.2225	10.7407	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	53.82399	53.82399	1	0.65	0.44499	Non-Significant Effect
Error	667.2319	83.40399	8			
Total	721.05592	137.22798	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.81485	23.15450	0.57791	Equal Variances
Distribution	Shapiro-Wilk W	0.94823		0.64766	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	88.240	69.8	97.8	10.371				
100		5	81.600	72	92	7.6981				

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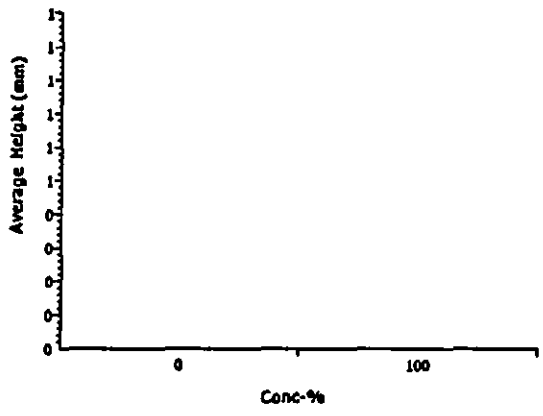
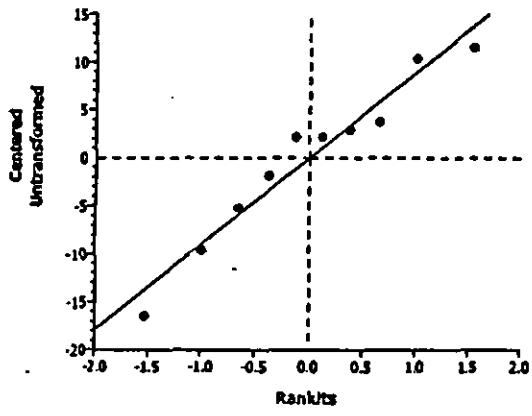




CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Length (mm)	Comparison	04-6914-5453	04-6914-5453	01 Aug-06 9:13 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		<100	100		N/A	11.57%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	15		0.0040	0	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1597.696	1597.696	1	14.23	0.00545	Significant Effect
Error	898.4479	112.306	8			
Total	2496.14368	1710.0018	9			

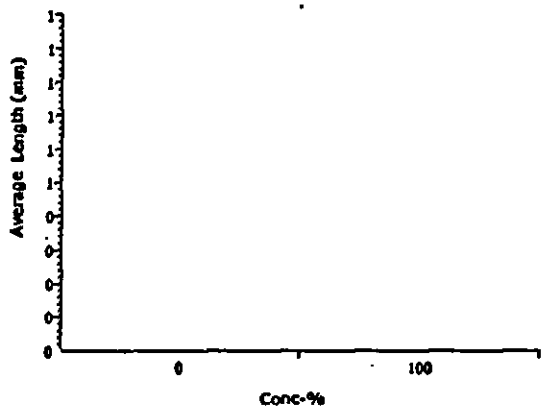
ANOVA Assumptions

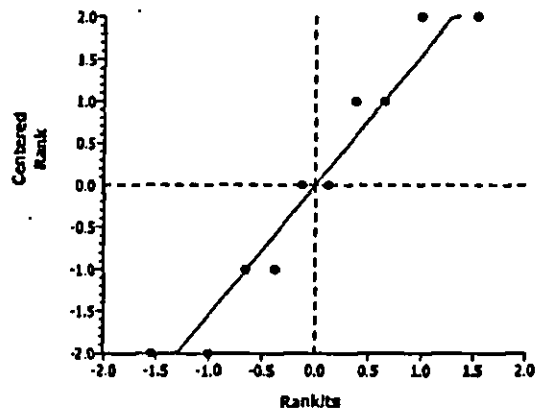
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.52339	23.15450	0.69334	Equal Variances
Distribution	Shapiro-Wilk W	0.77974		0.00822	Non-normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346	8.00000	6.00000	10.0000	1.58114
100		5	82.4	62.4	91.2	11.645	3.00000	1.00000	5.00000	1.58114

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average AG Wt (Wet, mg)	Comparison	04-6914-5453	04-6914-5453	01 Aug-06 9:13 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	16.89%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	3.58827	1.85955	0.0036	5.32222	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	263.682	263.682	1	12.88	0.00710	Significant Effect
Error	163.8327	20.47908	8			
Total	427.514664	284.16109	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.52263	23.15450	0.39201	Equal Variances
Distribution	Shapiro-Wilk W	0.86518		0.08780	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.458	5.4158				
100		5	21.243	16.194	25.682	3.4099				

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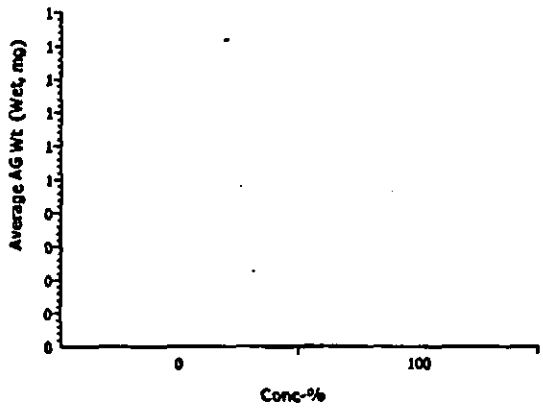

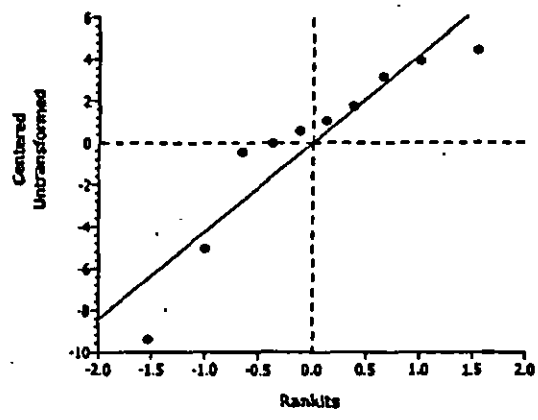

CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average AG Wt (Dry, mg)	Comparison	04-6914-5453	04-6914-5453	01 Aug-06 9:13 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	21.78%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.7703	1.85955	0.0573	0.96469	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	2.108595	2.108595	1	3.13	0.11463	Non-Significant Effect
Error	5.38257	0.672821	8			
Total	7.49116516	2.7814162	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.11327	23.15450	0.91968	Equal Variances
Distribution	Shapiro-Wilk W	0.93774		0.52817	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	3.51120	2.47800	4.72202	0.79797				

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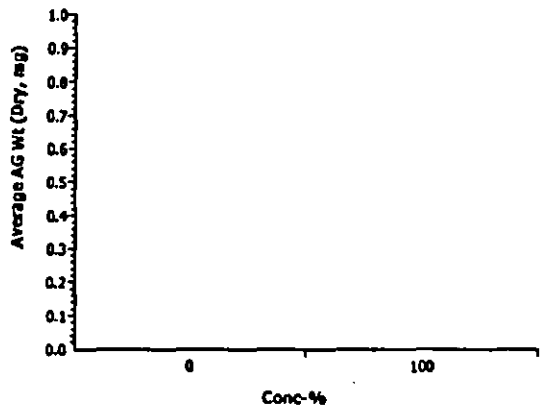

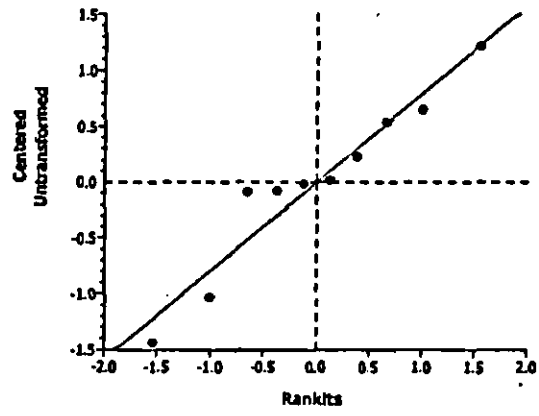

CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Root Wt. (Wet, mg)	Comparison	04-6914-5453	04-6914-5453	01 Aug-06 9:13 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	21.29%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.51486	1.85955	0.0180	6.88788	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	216.9323	216.9323	1	6.32	0.03610	Significant Effect
Error	274.401	34.30013	8			
Total	491.333374	251.23247	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.87013	23.15450	0.55918	Equal Variances
Distribution	Shapiro-Wilk W	0.95396		0.71546	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	23.032	18.256	30.042	4.8889				

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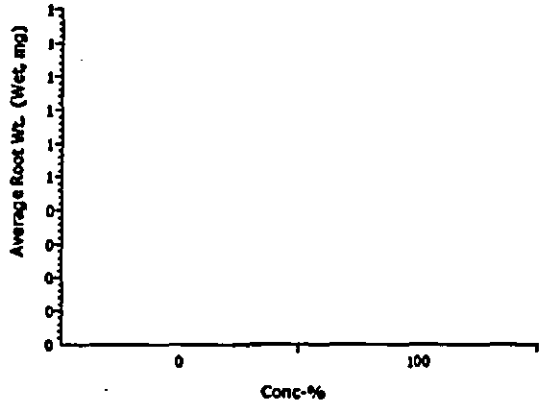
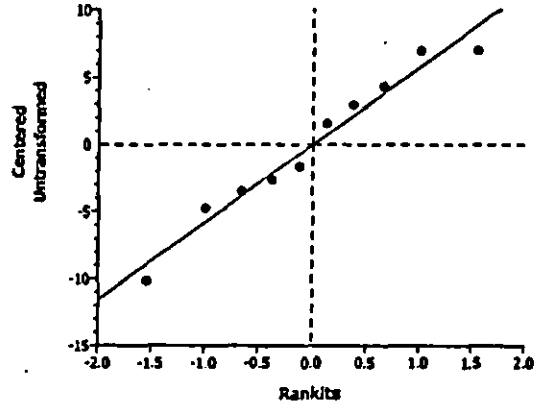




CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Root Wt. (Dry, mg)	Comparison	04-6914-5453	04-6914-5453	01 Aug-06 9:13 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	36.68%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-1.0776	1.85955	0.8437	0.47215	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.1871472	0.187147	1	1.16	0.31264	Non-Significant Effect
Error	1.289379	0.161172	8			
Total	1.47652671	0.3483197	9			

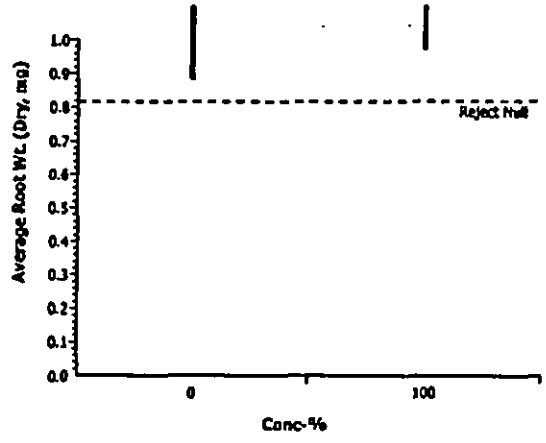
ANOVA Assumptions

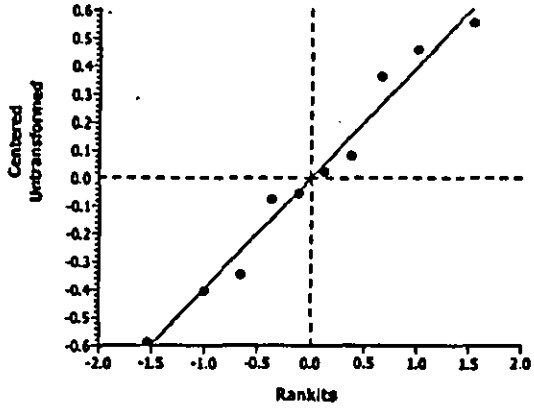
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	3.24358	23.15450	0.28084	Equal Variances
Distribution	Shapiro-Wilk W	0.95798		0.76259	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.56080	0.97400	2.11399	0.49637				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Wet, mg)	Comparison	04-6914-5453	04-6914-5453	01 Aug-06 9:13 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	18.44%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	3.09339	1.85955	0.0074	11.7734	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	958.9498	958.9498	1	9.57	0.01481	Significant Effect
Error	801.7095	100.2137	8			
Total	1760.65924	1059.1635	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.20413	23.15450	0.46283	Equal Variances
Distribution	Shapiro-Wilk W	0.93600		0.50944	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	44.275	35.712	55.724	7.9090				

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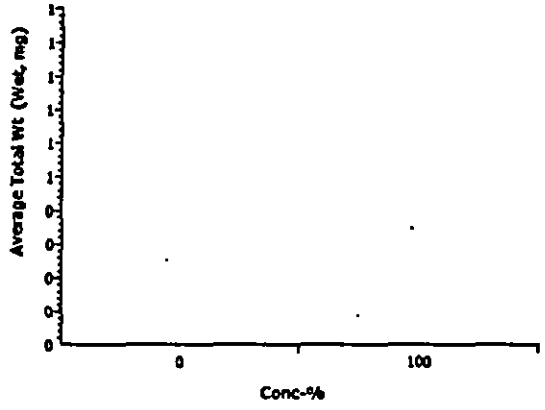
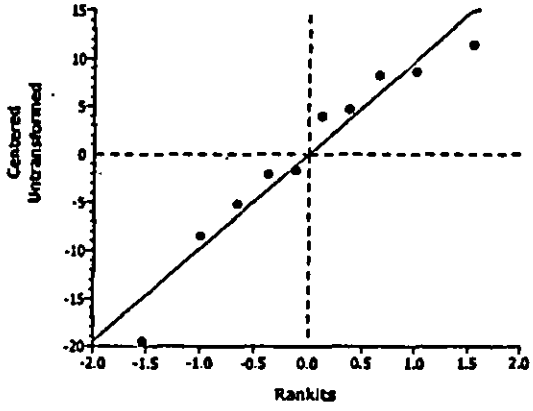




CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Dry, mg)	Comparison	04-6914-5453	04-6914-5453	01 Aug-06 9:13 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	23.87%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.87854	1.85955	0.2026	1.36478	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1.03937	1.03937	1	0.77	0.40526	Non-Significant Effect
Error	10.77306	1.346632	8			
Total	11.8124278	2.3860021	9			

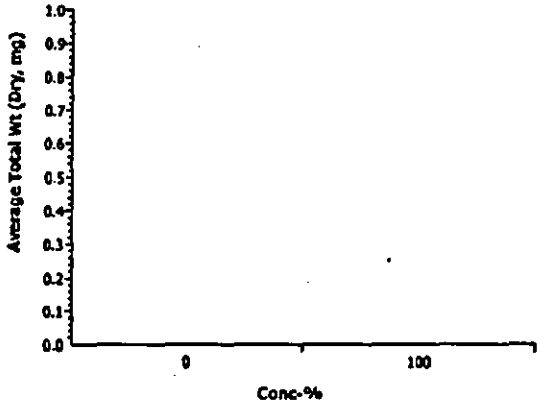
ANOVA Assumptions

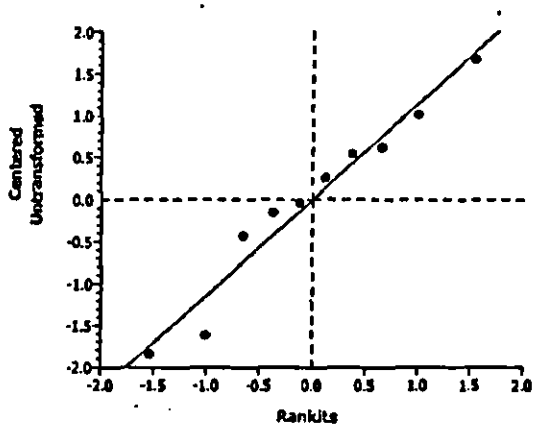
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.21366	23.15450	0.85567	Equal Variances
Distribution	Shapiro-Wilk W	0.95147		0.68590	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	5.07200	3.45200	6.74001	1.21516				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2008

Day 0 Initial (TP) Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ/BM Day ____

Bioassay Lab ID: BG 1619-06 Sample No: J12NB4

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	8	8	9	9			9→5	5	7.1	6.7
	B	7	7	7	7			7→5	5		
	C	9	9	9	9			9→5	5		
	D	8	8	8	8			8→5	5		
	E	6	6	6	6			6→5	5		

7-Days Post-Emergence: Selectively thin down to 5 seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A 2lgG, 3medG Remove - 1medG, 3smG

Replicate B 4lgG 1medG Remove - 1medG, 1smG

Replicate C 5lgG Remove - 3med 1smB

Replicate D 2lgG, 3medG Remove - 3medG

Replicate E 1lgG, 3medG, 1smG Remove - 1smG

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A 3lgG, 2medG

Replicate B 4lgG, 1medG

Replicate C 5lgG

Replicate D 4lgG, 1medG

Replicate E 3lgG, 2medG

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	90 mm	86 mm	74 mm	62 mm	92 mm
Replicate B	110 mm	78 mm	80 mm	93 mm	83 mm
Replicate C	109 mm	98 mm	114 mm	104 mm	102 mm
Replicate D	95 mm	74 mm	82 mm	104 mm	94 mm
Replicate E	85 mm	90 mm	90 mm	65 mm	61 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1234.50	1759.5	1255.26
Replicate B	1260.03	1396.7	1282.55
Replicate C	1241.13	1386.6	1265.31
Replicate D	1243.42	1358.1	1262.48
Replicate E	1245.03	1354.9	~~1265.91~~ NJ 1263.67

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the largest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	87 mm	100 mm	68 mm	115 mm	110 mm
Replicate B	82 mm	100 mm	98 mm	84 mm	95 mm
Replicate C	116 mm	104 mm	114 mm	64 mm	152 mm
Replicate D	62 mm	67 mm	82 mm	139 mm	133 mm
Replicate E	93 mm	110 mm	105 mm	60 mm	110 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1243.38	1379.7	1252.10
Replicate B	1239.86	1341.8	1246.61
Replicate C	1237.68	1378.2	1246.86
Replicate D	1259.79	1388.7	1268.26
Replicate E	1238.51	1363.3	1246.73

Comments:

CETIS Test Summary

Report Date: 01 Aug-06 9:16 AM
Test Link: 05-0232-4386/B161906psc

Plant Bioassay - Chronic — **CH2M Hill**

Test No:	01-5752-4192	Test Type:	Plant Chronic	Duration:	28d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	03-9907-6795	Code:	B1619-06	Client:	
Sample Date:	20 Jun-06 12:06 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	7d 23h	Station:			

Comments: J12NB4

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
08-5264-8428	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
11-1647-5546	Average Height (mm)	100	> 100	N/A	14.33%	Equal Variance t Two-Sample
09-3057-7041	Average Length (mm)	100	> 100	N/A	9.07%	Equal Variance t Two-Sample
09-1380-7129	Average AG Wt (Wet, mg)	< 100	100	N/A	16.30%	Equal Variance t Two-Sample
09-5789-4194	Average AG Wt (Dry, mg)	100	> 100	N/A	18.08%	Equal Variance t Two-Sample
02-6540-7459	Average Root Wt. (Wet, mg	< 100	100	N/A	18.85%	Equal Variance t Two-Sample
03-8330-9295	Average Root Wt. (Dry, mg)	100	> 100	N/A	21.41%	Equal Variance t Two-Sample
12-2083-7105	Average Total Wt (Wet, mg	< 100	100	N/A	16.25%	Equal Variance t Two-Sample
14-0917-3837	Average Total Wt (Dry, mg)	100	> 100	N/A	17.65%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 01 Aug-06 9:16 AM
Test Link: 05-0232-4386/B161906psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	88.600	78.2	105.40	4.7577	10.639	12.01%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	97.92	91.800	110	3.1322	7.0037	7.15%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	25.268	21.974	29.094	1.3279	2.9693	11.75%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	4.20640	3.72800	4.83601	0.20885	0.46700	11.10%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	25.299	20.388	28.104	1.3453	3.0082	11.89%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.65359	1.35000	1.83599	0.08226	0.18394	11.12%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	50.567	46.932	57.198	1.8918	4.2301	8.37%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	5.86000	5.37200	6.67200	0.22629	0.50600	8.63%

CETIS Test Summary

Report Date: 01 Aug-06 9:16 AM
Test Link: 05-0232-4386/B161906psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		80.8000	88.8000	105.400	89.8000	78.2

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		96	91.8000	110	96.6	95.2

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		25	27.334	29.094	22.936	21.974

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		4.15200	4.50400	4.83601	3.81199	3.72800

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		27.264	20.3880	28.104	25.782	24.9580

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.74399	1.35000	1.83599	1.69399	1.64399

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		52.264	47.722	57.198	48.718	46.9320

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		5.89600	5.85400	6.67200	5.50598	5.37200

CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
% Germination	Comparison	05-0232-4386	05-0232-4386	01 Aug-06 9:16 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

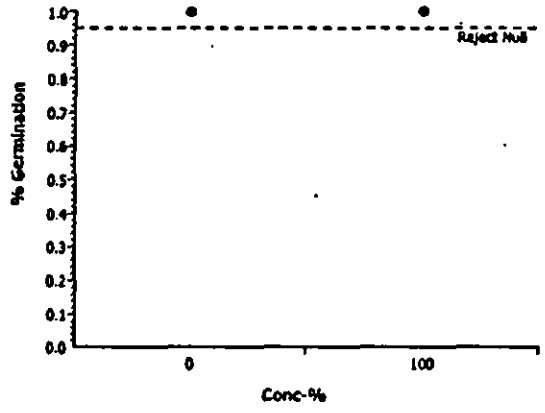
ANOVA Assumptions

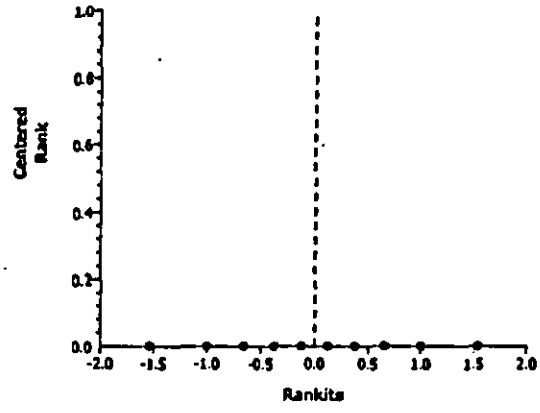
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Height (mm)	Comparison	05-0232-4386	05-0232-4386	01 Aug-06 9:16 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	14.33%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.3552	1.85955	0.6342	12.3552	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	13.92401	13.92401	1	0.13	0.73163	Non-Significant Effect
Error	882.912	110.364	8			
Total	896.836056	124.28801	9			

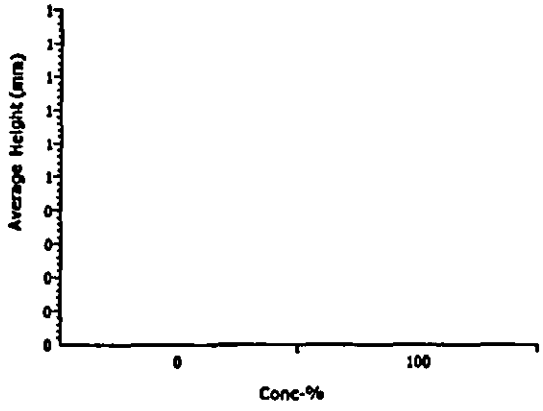
ANOVA Assumptions

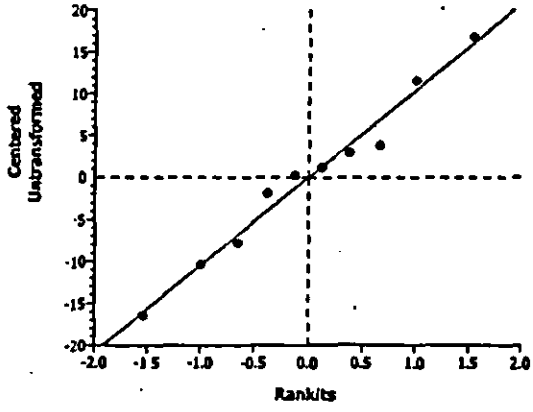
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.05237	23.15450	0.96173	Equal Variances
Distribution	Shapiro-Wilk W	0.97911		0.96022	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	88.600	78.2	105.4	10.639				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	05-0232-4386	05-0232-4386	01 Aug-06 9:16 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	9.07%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.85735	1.85955	0.0502	9.77153	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	238.144	238.144	1	3.45	0.10034	Non-Significant Effect
Error	552.256	69.032	8			
Total	790.399933	307.17595	9			

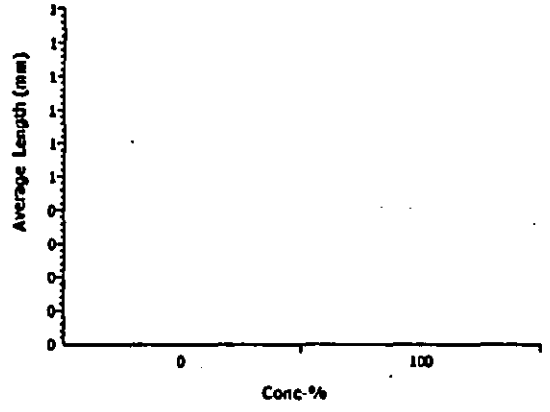
ANOVA Assumptions

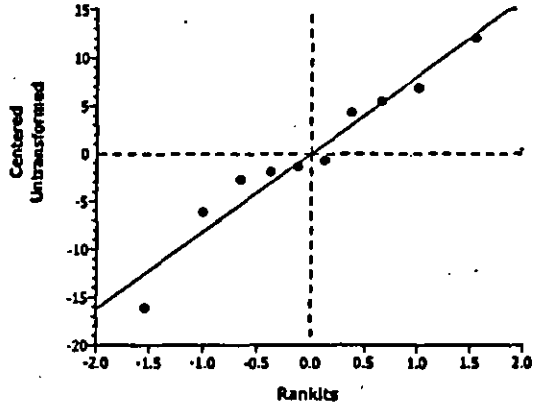
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.81465	23.15450	0.57798	Equal Variances
Distribution	Shapiro-Wilk W	0.95820		0.76512	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	97.92	91.8	110	7.0037				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Wet, mg)	Comparison	05-0232-4386	05-0232-4386	01 Aug-06 9:16 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	16.30%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.26113	1.85955	0.0268	5.13638	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	97.51883	97.51883	1	5.11	0.05363	Non-Significant Effect
Error	152.5912	19.07389	8			
Total	250.109985	116.59272	9			

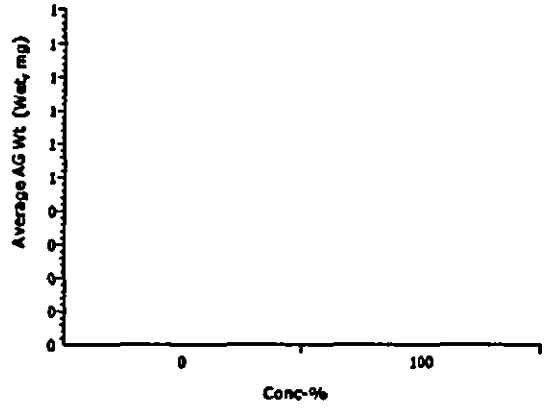
ANOVA Assumptions

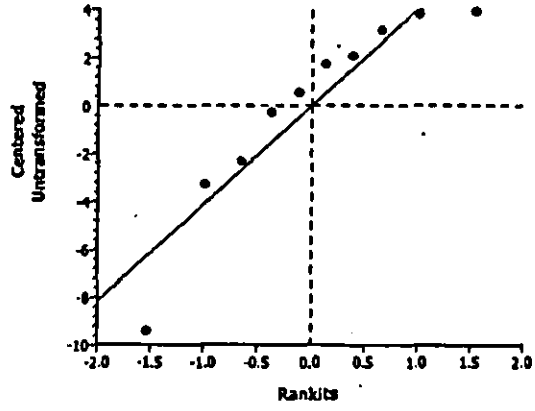
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	3.32673	23.15450	0.27112	Equal Variances
Distribution	Shapiro-Wilk W	0.86831		0.09553	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	25.268	21.974	29.094	2.9693				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**		**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average AG Wt (Dry, mg)	Comparison		05-0232-4386	05-0232-4386	01 Aug-06 9:16 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	18.08%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.51835	1.85955	0.3091	0.80067	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.1245328	0.124533	1	0.27	0.61824	Non-Significant Effect
Error	3.707895	0.463487	8			
Total	3.83242785	0.5880197	9			

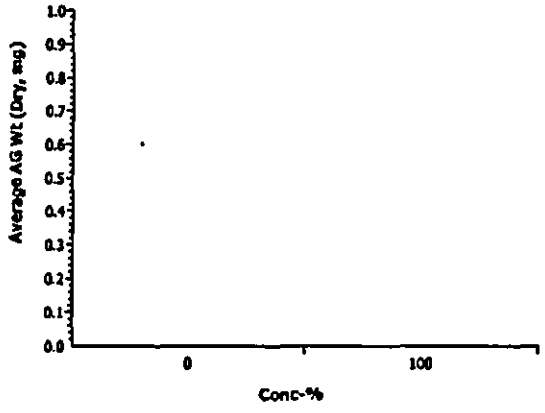
ANOVA Assumptions

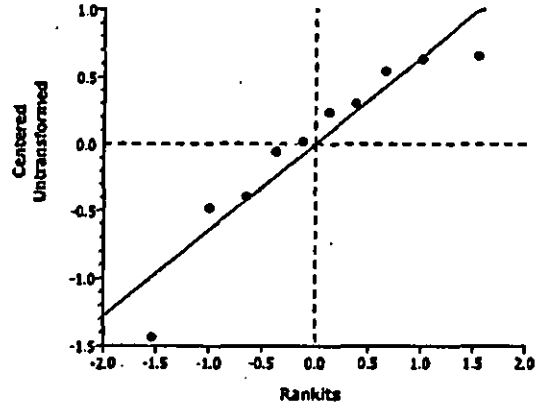
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	3.25041	23.15450	0.28002	Equal Variances
Distribution	Shapiro-Wilk W	0.88874		0.16411	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	4.20640	3.72800	4.83601	0.46700				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Wet, mg)	Comparison	05-0232-4386	05-0232-4386	01 Aug-06 9:16 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	18.85%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.14966	1.85955	0.0319	6.09682	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	124.1859	124.1859	1	4.62	0.06381	Non-Significant Effect
Error	214.9918	26.87398	8			
Total	339.177673	151.05983	9			

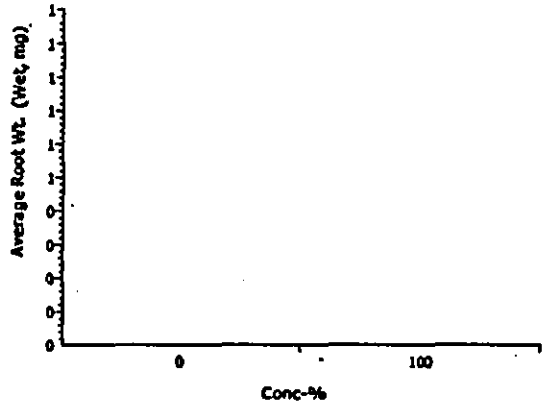
ANOVA Assumptions

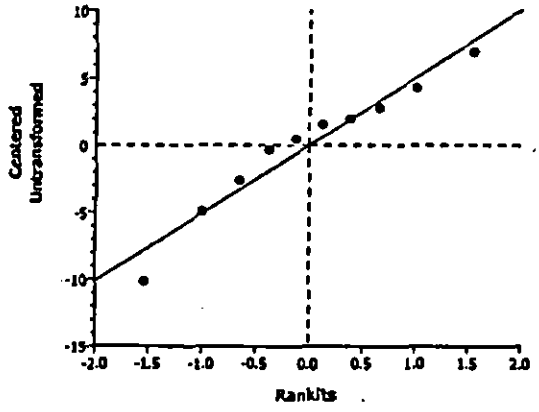
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	4.93958	23.15450	0.15099	Equal Variances
Distribution	Shapiro-Wilk W	0.95419		0.71819	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	25.299	20.388	28.104	3.0082				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Root Wt. (Dry, mg)	Comparison	05-0232-4386	05-0232-4386	01 Aug-06 9:16 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	21.41%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-2.4726	1.85955	0.9807	0.27556	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.3356159	0.335616	1	6.11	0.03856	Significant Effect
Error	0.4391751	0.054897	8			
Total	0.77479106	0.3905128	9			

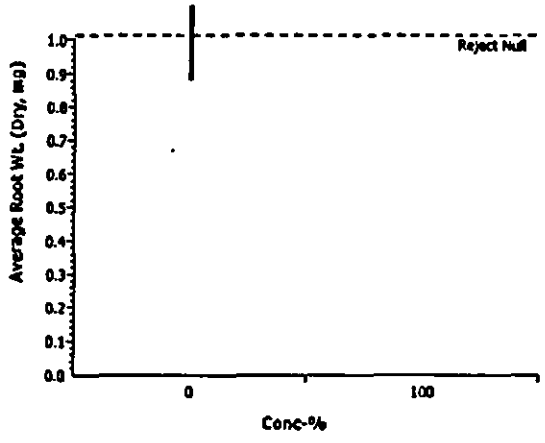
ANOVA Assumptions

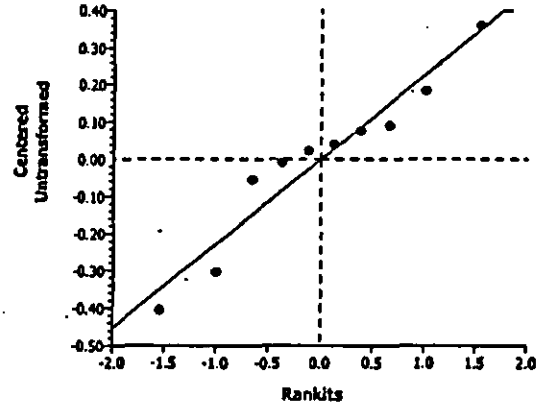
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.24515	23.15450	0.45270	Equal Variances
Distribution	Shapiro-Wilk W	0.93813		0.53236	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.65359	1.35000	1.83599	0.18394				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**		**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Total Wt (Wet, mg)	Comparison		05-0232-4386	05-0232-4386	01 Aug-06 9:16 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	16.25%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.38171	1.85955	0.0222	10.3792	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	441.7998	441.7998	1	5.67	0.04443	Significant Effect
Error	623.0737	77.88421	8			
Total	1064.87344	519.68398	9			

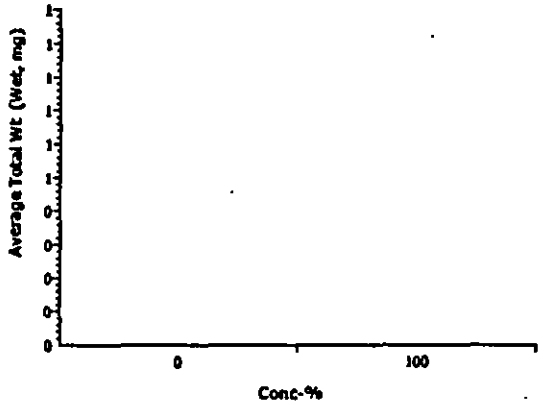
ANOVA Assumptions

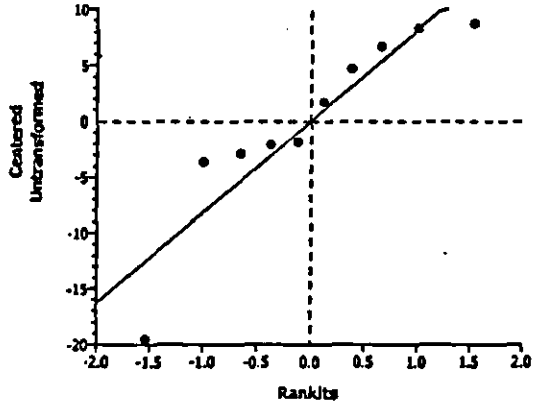
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	7.70510	23.15450	0.07311	Equal Variances
Distribution	Shapiro-Wilk W	0.85682		0.06998	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	50.567	46.932	57.198	4.2301				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Total Wt (Dry, mg)	Comparison	05-0232-4386	05-0232-4386	01 Aug-06 9:16 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	17.65%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.2639	1.85955	0.6007	1.00920	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0512713	0.051271	1	0.07	0.79855	Non-Significant Effect
Error	5.890768	0.736346	8			
Total	5.94203889	0.7876173	9			

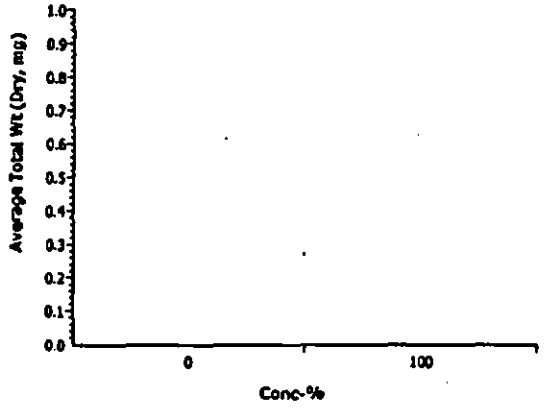
ANOVA Assumptions

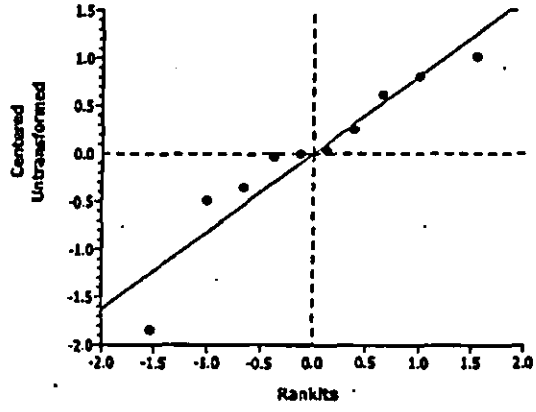
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	4.75188	23.15450	0.16034	Equal Variances
Distribution	Shapiro-Wilk W	0.90700		0.26104	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	5.86000	5.37200	6.67200	0.50600				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2008

Day 0 (initial) Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Bioassay Lab ID: BG 1619-07 Sample No: J12NB5

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (61 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH INITIAL (@ planting)	pH FINAL (@ 14 days Post-Emergence)
Control	A	5	5	5	5			5	5	7.0	7.4
	B	5	5	5	6			7→5	5		
	C	5	5	5	5			5	5		
	D	10	10	10	10			10→5	5		
	E	6	6	6	6			6→5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A 2lg G, 3med G

Replicate B 1lg G, 1med G 3smG Remove 2 smG

Replicate C 2lg G, 3med G

Replicate D 5lg G Remove - 2lg G, 1med G, 2smG

Replicate E 1lg G, 3 med G, 1smG Remove - 1smG

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A 4lg G, 1smG

Replicate B 1lg G, 2med G, 2smG

Replicate C 5lg G

Replicate D 3lg G, 1med G, 1smG

Replicate E

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	87 mm	79 mm	93 mm	90 mm	59 mm
Replicate B	94 mm	50 mm	65 mm	73 mm	51 mm
Replicate C	78 mm	80 mm	81 mm	101 mm	92 mm
Replicate D	107 mm	88 mm	115 mm	99 mm	88 mm
Replicate E	95 mm	71 mm	88 mm	98 mm	36 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1254.03	1390.1	1275.03
Replicate B	1257.77	1339.1	1269.94
Replicate C	1246.18	1426.5	1273.22
Replicate D	1251.34	1465.2	1285.47
Replicate E	1255.38	1385.9	1274.41

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	131 mm	105 mm	49 mm	77 mm	82 mm
Replicate B	57 mm	128 mm	37 mm	83 mm	45 mm
Replicate C	70 mm	80 mm	99 mm	129 mm	104 mm
Replicate D	124 mm	57 mm	83 mm	130 mm	79 mm
Replicate E	46 mm	130 mm	80 mm	109 mm	17 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1259.04	1376.3	1265.35
Replicate B	1255.36	1322.9	1259.12
Replicate C	1244.12	1386.9	1250.52
1241.69 → Replicate D	~~1251.54~~	1397.3	1249.33
Replicate E	1246.99	1357.2	1252.95

Comments:

CETIS Test Summary

Report Date: 03 Aug-06 4:29 PM
Test Link: 03-5247-0898/B161907psc

Plant Bioassay - Chronic — CH2M Hill

Test No:	05-1188-4249	Test Type:	Plant Chronic	Duration:	28d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	11-9262-0213	Code:	B1619-07	Client:	
Sample Date:	20 Jun-06 12:07 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	7d 23h	Station:			

Comments: J12NB5

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
02-3401-4452	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
18-2462-1847	Average Height (mm)	100	> 100	N/A	15.31%	Equal Variance t Two-Sample
13-3720-9644	Average Length (mm)	< 100	100	N/A	11.53%	Equal Variance t Two-Sample
06-3097-3102	Average AG Wt (Wet, mg)	100	> 100	N/A	30.33%	Equal Variance t Two-Sample
10-1873-2344	Average AG Wt (Dry, mg)	100	> 100	N/A	35.00%	Equal Variance t Two-Sample
05-4751-0103	Average Root Wt. (Wet, mg	< 100	100	N/A	24.53%	Equal Variance t Two-Sample
13-7977-8854	Average Root Wt. (Dry, mg)	100	> 100	N/A	25.48%	Equal Variance t Two-Sample
03-4558-0204	Average Total Wt (Wet, mg	100	> 100	N/A	26.77%	Equal Variance t Two-Sample
06-2110-5977	Average Total Wt (Dry, mg)	100	> 100	N/A	32.32%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 03 Aug-08 4:29 PM
Test Link: 03-5247-0898/B161907psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	82.32	66.6	99.400	5.3772	12.024	14.61%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4348	8.76%
100		5	85.240	70	96.400	5.1732	11.568	13.57%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	29.684	16.266	42.772	4.533	10.136	34.15%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	4.53560	2.43398	6.82600	0.74384	1.66328	36.67%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	23.736	13.508	31.122	3.0442	6.8071	28.68%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.20280	0.75200	1.52800	0.12621	0.28220	23.46%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	53.420	29.774	73.894	7.5470	16.876	31.59%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	5.73839	3.18599	8.35400	0.86256	1.92875	33.61%

CETIS Test Summary

Report Date: 03 Aug-06 4:29 PM
Test Link: 03-5247-0898/B161907psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		81.6	66.6	86.4000	99.4000	77.6

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		88.8000	70	96.4000	94.6	76.4000

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		27.214	16.266	36.064	42.772	26.1040

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		4.20400	2.43398	5.40798	6.82600	3.80601

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		23.4520	13.5080	28.5560	31.1220	22.042

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.26199	0.75200	1.28000	1.52800	1.19199

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		50.666	29.774	64.62	73.8940	48.146

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		5.46599	3.18599	6.68799	8.35400	4.99800

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
% Germination	Comparison	03-5247-0898	03-5247-0898	01 Aug-06 9:25 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

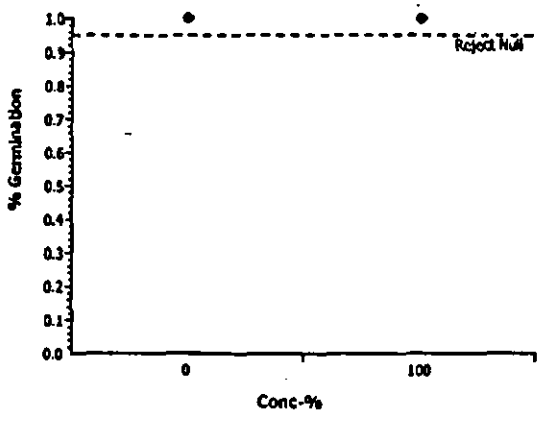
ANOVA Assumptions

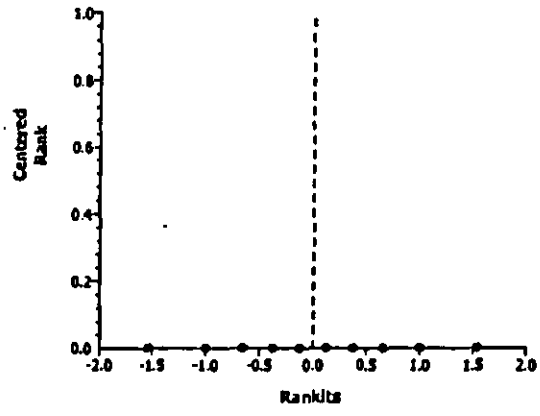
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Height (mm)	Comparison	03-5247-0898	03-5247-0898	01 Aug-06 9:25 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	15.31%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.55204	1.85955	0.2980	13.2046	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	38.41602	38.41602	1	0.30	0.59600	Non-Significant Effect
Error	1008.48	126.06	8			
Total	1046.89613	164.47604	9			

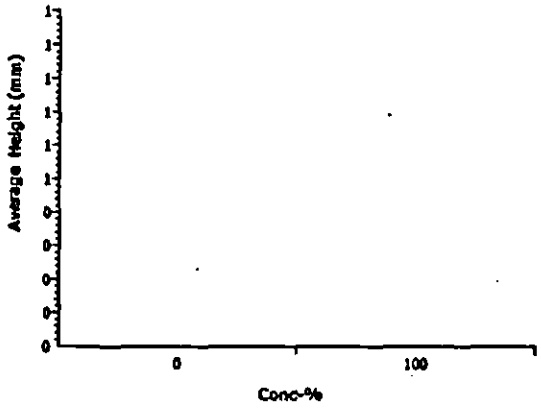
ANOVA Assumptions

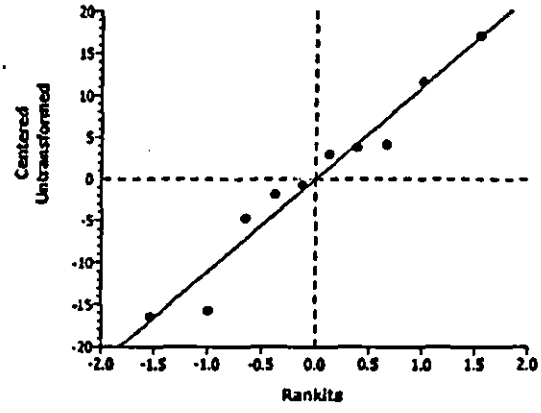
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.34426	23.15450	0.78131	Equal Variances
Distribution	Shapiro-Wilk W	0.94841		0.64978	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	82.32	66.6	99.4	12.024				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average AG Wt (Wet, mg)	Comparison	03-5247-0898	03-5247-0898	01 Aug-06 9:35 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	30.33%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.35591	1.85955	0.3656	9.55710	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	8.364931	8.364931	1	0.13	0.73111	Non-Significant Effect
Error	528.2842	66.03553	8			
Total	536.649172	74.400461	9			

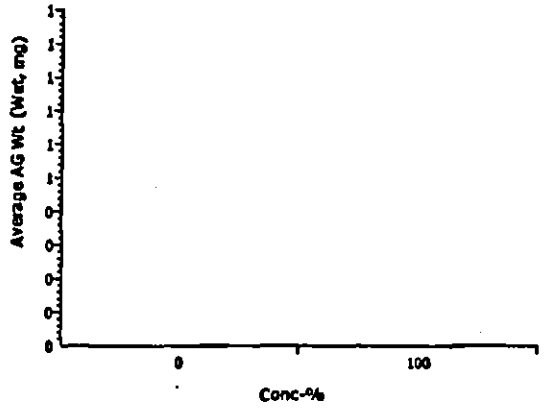
ANOVA Assumptions

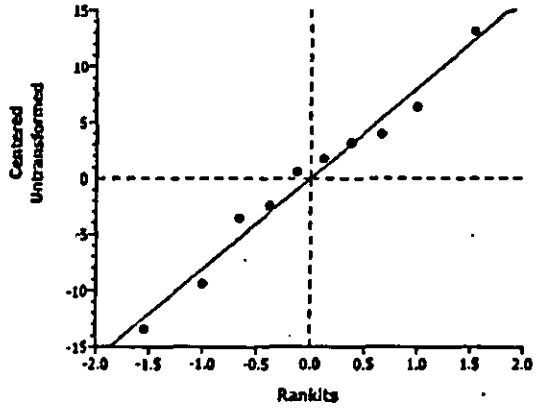
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	3.50278	23.15450	0.25212	Equal Variances
Distribution	Shapiro-Wilk W	0.97975		0.96379	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	29.684	16.266	42.772	10.136				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Dry, mg)	Comparison	03-5247-0898	03-5247-0898	01 Aug-06 9:35 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	35.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.1271	1.85955	0.5490	1.55033	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0280930	0.028093	1	0.02	0.90196	Non-Significant Effect
Error	13.90158	1.737697	8			
Total	13.9296681	1.7657899	9			

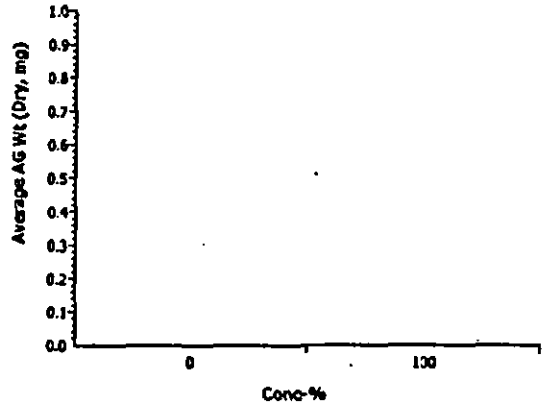
ANOVA Assumptions

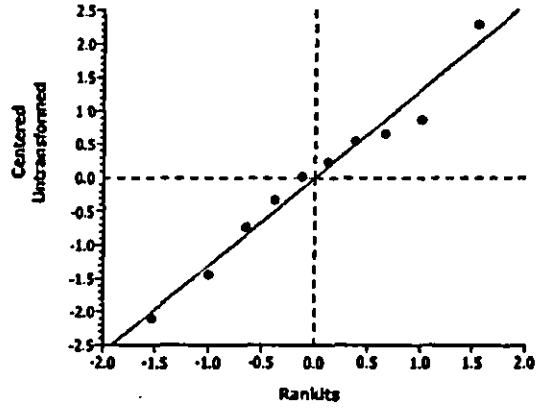
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	3.90263	23.15450	0.21568	Equal Variances
Distribution	Shapiro-Wilk W	0.98016		0.96603	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	4.53560	2.43398	6.82600	1.66328				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Wet, mg)	Comparison	03-5247-0898	03-5247-0898	01 Aug-06 9:35 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	24.53%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	2.0181	1.85955	0.0391	7.93466	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	185.3815	185.3815	1	4.07	0.07829	Non-Significant Effect
Error	364.1433	45.51791	8			
Total	549.524811	230.89944	9			

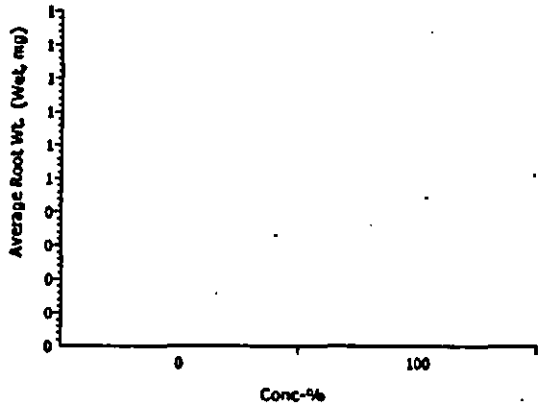
ANOVA Assumptions

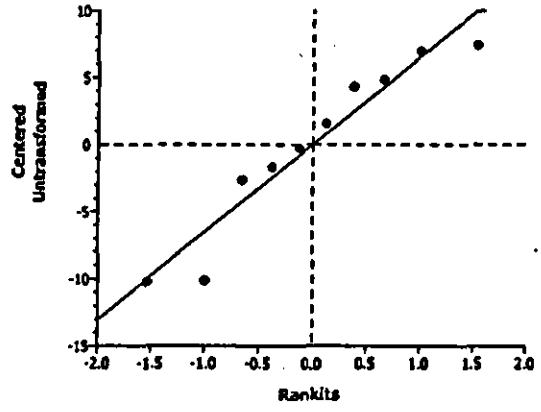
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.03665	23.15450	0.97301	Equal Variances
Distribution	Shapiro-Wilk W	0.90304		0.23650	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	23.736	13.508	31.122	6.8071				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Dry, mg)	Comparison	03-5247-0898	03-5247-0898	01 Aug-06 9:36 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	25.48%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.47843	1.85955	0.3226	0.32804	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0178082	0.017808	1	0.23	0.64514	Non-Significant Effect
Error	0.6223987	0.0778	8			
Total	0.64020689	0.095608	9			

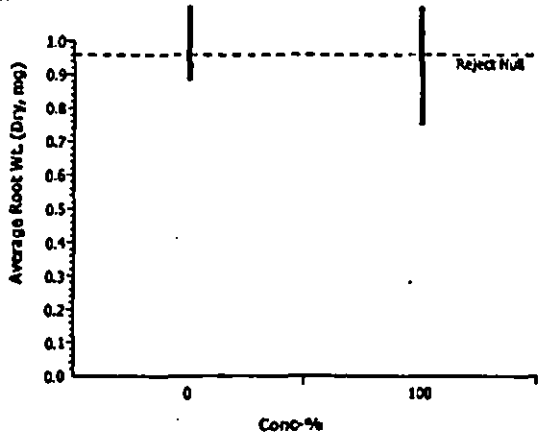
ANOVA Assumptions

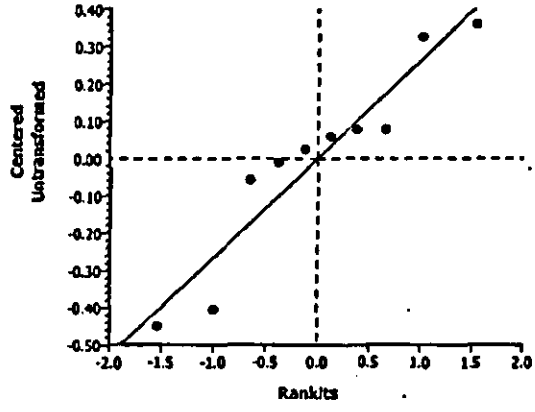
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.04843	23.15450	0.96455	Equal Variances
Distribution	Shapiro-Wilk W	0.89537		0.19473	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.20280	0.75200	1.52800	0.28220				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Total Wt (Wet, mg)	Comparison	03-5247-0898	03-5247-0898	01 Aug-06 9:36 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	26.77%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.13554	1.85955	0.1445	17.0970	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	272.5044	272.5044	1	1.29	0.28902	Non-Significant Effect
Error	1690.656	211.332	8			
Total	1963.16077	483.83644	9			

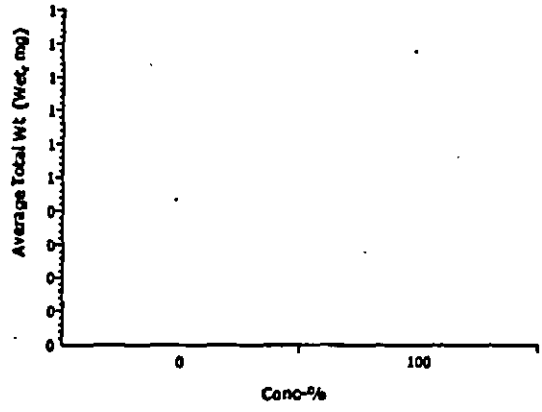
ANOVA Assumptions

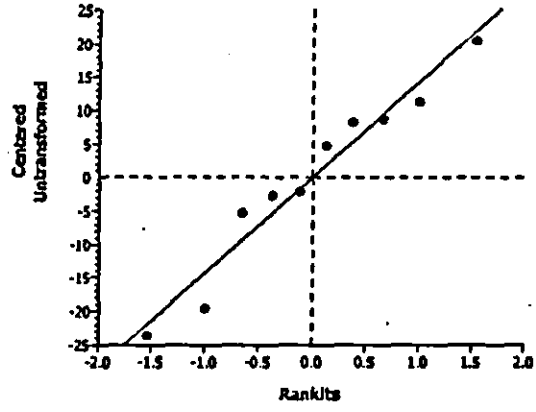
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.06557	23.15450	0.49961	Equal Variances
Distribution	Shapiro-Wilk W	0.94822		0.64743	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	53.420	29.774	73.894	16.878				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Total Wt (Dry, mg)	Comparison	03-5247-0898	03-5247-0898	01 Aug-06 9:36 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	32.32%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.0217	1.85955	0.5084	1.84775	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0011671	0.001167	1	0.00	0.98318	Non-Significant Effect
Error	19.74694	2.468367	8			
Total	19.7481058	2.4695344	9			

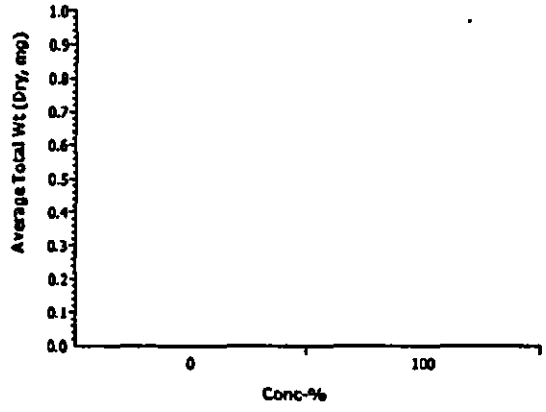
ANOVA Assumptions

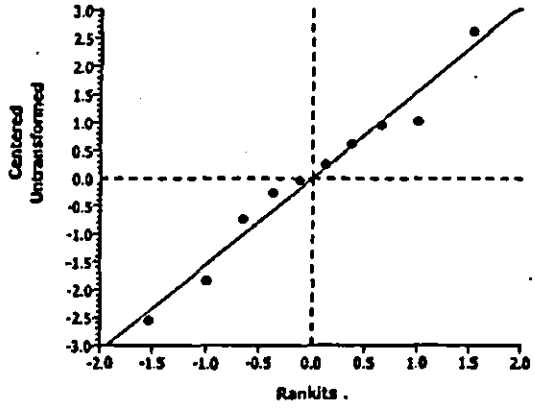
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	3.05763	23.15450	0.30455	Equal Variances
Distribution	Shapiro-Wilk W	0.97482		0.93160	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	5.73839	3.18599	8.35400	1.92875				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	03-5247-0898	03-5247-0898	03 Aug-06 4:29 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	11.53%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	3.36148	1.85955	0.0050	12.4137	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1258.884	1258.884	1	11.30	0.00991	Significant Effect
Error	891.28	111.41	8			
Total	2150.16376	1370.2938	9			

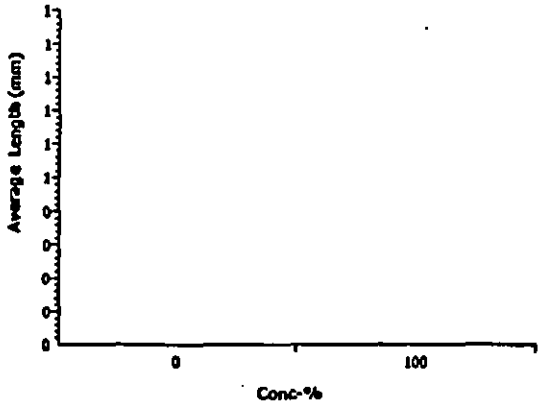
ANOVA Assumptions

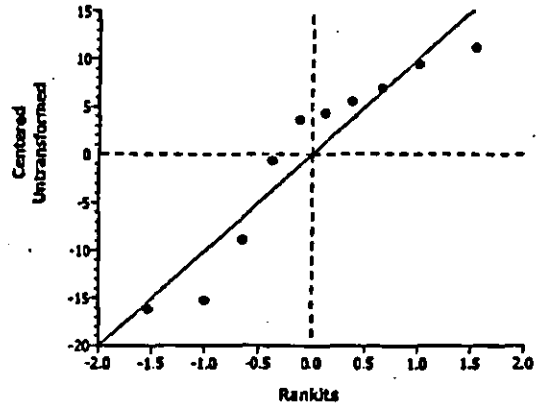
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.50326	23.15450	0.70250	Equal Variances
Distribution	Shapiro-Wilk W	0.87277		0.10767	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	85.240	70	96.4	11.568				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2006

Day 0 (Initial) TP Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Bioassay Lab ID: BG 1619-08 Sample No: J12NB6

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	7	7	7	7			7→5	5	6.9	6.7
	B	9	9	9	9			9→5	5		
	C	5	5	5	5			5	5		
	D	7	7	7	8			8→5	5		
	E	3	4	4	4			4	NJ ~~5~~ 4		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A 5 med G Remove - 1 med G, 1 sm Z

Replicate B 2 lg G 3 med G Remove - 4 med G

Replicate C 2 lg G, 2 med G, 1 sm G

Replicate D 3 lg G, 2 med G Remove - 1 med G, 2 sm G

Replicate E 4 med G

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance: NJ

Replicate A ~~3 lg G, 2 med G~~ 11 lg G, 4 med G

Replicate B NJ ~~4 lg G, 3 med G~~ 2 lg G, 3 med G

Replicate C NJ ~~3 lg G~~, 2 med G

Replicate D ~~3 med G, 2 sm G~~ NJ ~~4 lg G, 1 sm G~~ NJ 5 lg G

Replicate E ~~3 med G, 2 sm G~~ NJ 11 lg G, 3 med G

Measure Shoot Height

Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	NJ ~~87~~ 80 mm	NJ ~~95~~ 72 mm	NJ ~~75~~ 70 mm	NJ ~~68~~ 63 mm	NJ ~~77~~ 73 mm
Replicate B	NJ ~~104~~ 84 mm	NJ ~~86~~ 106 mm	74 mm	NJ ~~88~~ 67 mm	NJ ~~75~~ 71 mm
Replicate C	NJ ~~91~~ 93 mm	NJ ~~84~~ 114 mm	NJ ~~80~~ 82 mm	NJ ~~97~~ 77 mm	NJ ~~91~~ 60 mm
Replicate D	NJ ~~69~~ 84 mm	NJ ~~95~~ 80 mm	89 mm	90 ~~100~~ NJ mm	NJ ~~86~~ 83 mm
Replicate E	NJ ~~58~~ 69 mm	NJ ~~62~~ 91 mm	NJ ~~77~~ 68 mm	71 ~~85~~ NJ mm	~~69~~ NJ mm

Measure Shoot Weight

Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1248.57	1331.0	1261.69
Replicate B	1256.83	1363.1	1274.35
Replicate C	1251.35	1380.8	1272.44
Replicate D	1241.34	1378.3	1264.65
Replicate E	1249.70	1317.2	1260.26

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length:

Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	71 mm	99 mm	87 mm	48 mm	73 mm
Replicate B	149 mm	38 mm	114 mm	63 mm	37 mm
Replicate C	68 mm	112 mm	129 mm	110 mm	79 mm
Replicate D	99 mm	86 mm	99 mm	115 mm	80 mm
Replicate E	102 mm	92 mm	92 mm	41 mm	mm

Measure Root Weight:

Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1245.48	1305.9	1250.44
Replicate B	1259.23	1361.3	1266.37
Replicate C	1260.51	1434.9	1270.85
Replicate D	1244.79	1384.2	1255.62
Replicate E	1253.73	1309.8	1258.20

Comments:

CETIS Test Summary

Report Date: 03 Aug-06 4:32 PM
Test Link: 08-6650-1045/B161908psc

Plant Bioassay - Chronic | CH2M Hill

Test No:	14-0254-9346	Test Type:	Plant Chronic	Duration:	28d Ch
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	06-1662-0511	Code:	B1619-06	Client:	
Sample Date:	20 Jun-06 12:08 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	7d 23h	Station:			

Comments: J12NB6

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
11-2092-7112	% Germination	100	> 100	N/A	9.54%	Wilcoxon Rank Sum Two-Sample
12-6522-6408	Average Height (mm)	100	> 100	N/A	11.62%	Equal Variance t Two-Sample
12-9347-2314	Average Length (mm)	< 100	100	N/A	10.74%	Equal Variance t Two-Sample
11-4039-2449	Average AG Wt (Wet, mg)	< 100	100	N/A	19.48%	Equal Variance t Two-Sample
14-9411-0674	Average AG Wt (Dry, mg)	100	> 100	N/A	23.45%	Equal Variance t Two-Sample
06-8432-7053	Average Root Wt. (Wet, mg	< 100	100	N/A	29.97%	Equal Variance t Two-Sample
09-1838-2421	Average Root Wt. (Dry, mg)	100	> 100	N/A	39.10%	Equal Variance t Two-Sample
07-1795-3035	Average Total Wt (Wet, mg	< 100	100	N/A	24.14%	Equal Variance t Two-Sample
02-0861-5202	Average Total Wt (Dry, mg)	100	> 100	N/A	26.57%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 03 Aug-06 4:32 PM
Test Link: 08-6650-1045/B161908psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	0.96000	0.80000	1.00000	0.04000	0.08944	9.32%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	79.44	71.6	85.2	2.7411	6.1293	7.72%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	86.8	76.6	99.6	4.5686	10.216	11.77%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	21.575	16.486	27.392	2.2443	5.0184	23.26%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	3.52560	2.62000	4.66201	0.41257	0.92254	26.17%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	21.855	12.084	34.878	4.2714	9.5512	43.70%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.55429	0.99199	2.16599	0.24093	0.53875	34.66%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	43.431	28.570	60.768	6.4129	14.34	33.02%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	5.07990	3.61599	6.82800	0.65106	1.45581	28.66%

CETIS Test Summary

Report Date: 03 Aug-06 4:32 PM
Test Link: 08-6650-1045/B161908psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	0.80000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		71.6	80.4000	85.2	85.2	74.8000

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		76.6	80.2	99.6	95.8000	81.8000

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		16.4860	21.2540	25.8900	27.3920	16.855

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		2.62400	3.50400	4.21799	4.66201	2.62000

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.864
100		12.0840	20.4140	34.8780	27.882	14.0175

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		0.99199	1.42800	2.06799	2.16599	1.11749

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		28.5700	41.6680	60.7680	55.274	30.8725

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		3.61599	4.93201	6.28599	6.82800	3.73749

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
% Germination	Comparison	08-6650-1045	08-6650-1045	01 Aug-06 9:41 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	9.54%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	25		0.3452	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0056708	0.005671	1	1.00	0.34659	Non-Significant Effect
Error	0.0453663	0.005671	8			
Total	0.05103711	0.0113416	9			

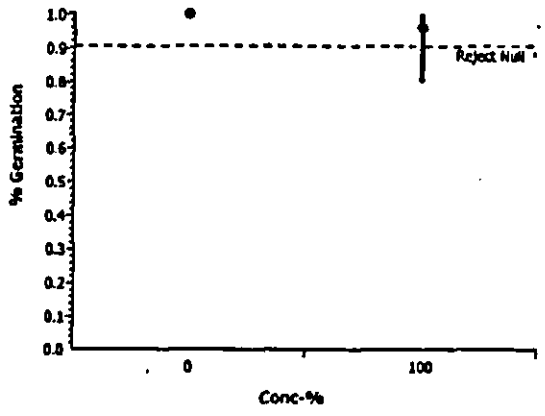
ANOVA Assumptions

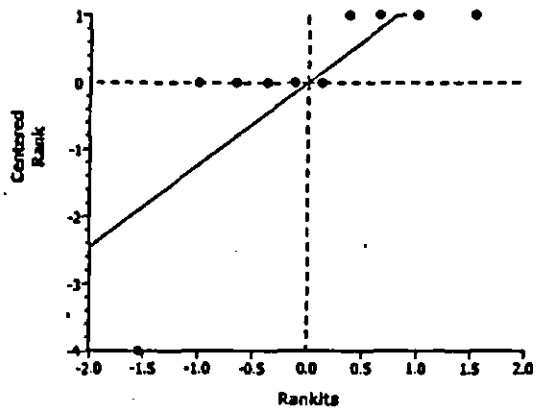
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	1.60000	11.25862	0.24150	Equal Variances
Distribution	Shapiro-Wilk W	0.62470		0.00011	Non-normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	6.00000	6.00000	6.00000	0.00000
100		5	0.96000	0.80000	1.00000	0.08944	5.00000	1.00000	6.00000	2.23607

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Length (mm)	Comparison	08-6650-1045	08-6650-1045	01 Aug-08 9:41 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	10.74%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	3.35752	1.85955	0.0050	11.5643	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1089.936	1089.936	1	11.27	0.00997	Significant Effect
Error	773.488	96.686	8			
Total	1863.42395	1186.6219	9			

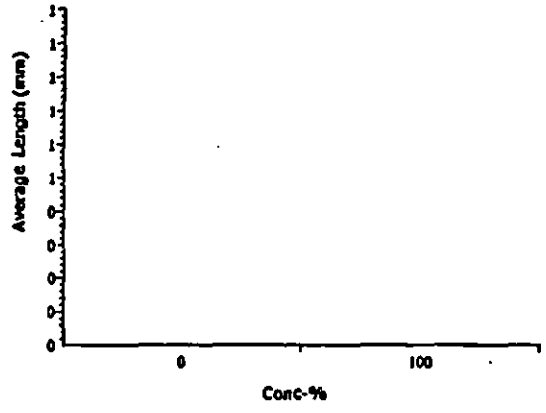
ANOVA Assumptions

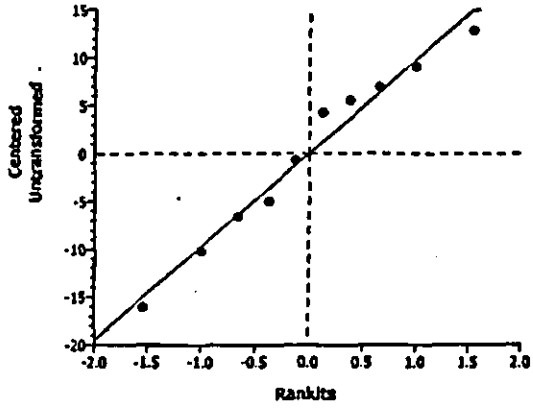
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.17243	23.15450	0.88119	Equal Variances
Distribution	Shapiro-Wilk W	0.96180		0.80621	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	86.8	76.6	99.6	10.216				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Wet, mg)	Comparison	08-6650-1045	08-6650-1045	01 Aug-06 9:41 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	19.48%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	3.00965	1.85955	0.0084	6.14018	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	246.8991	246.8991	1	9.06	0.01682	Significant Effect
Error	218.0605	27.25757	8			
Total	464.959625	274.15665	9			

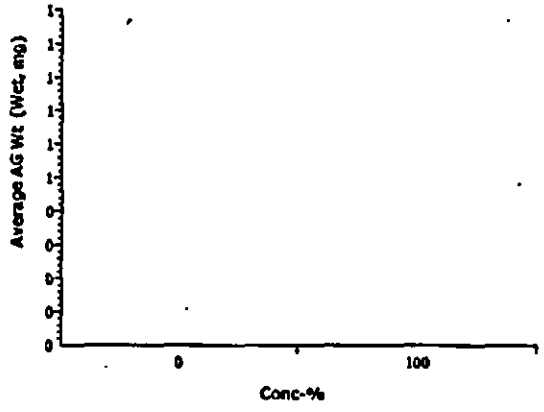
ANOVA Assumptions

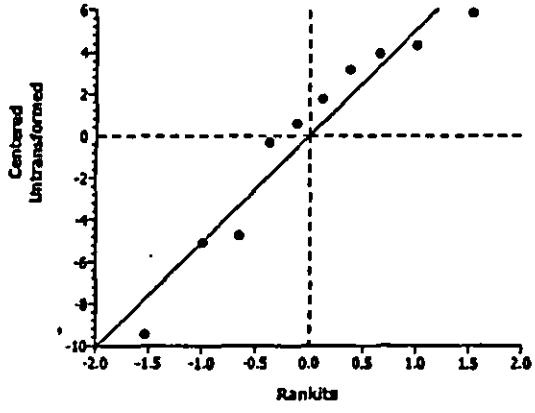
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.16466	23.15450	0.88612	Equal Variances
Distribution	Shapiro-Wilk W	0.91923		0.35059	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	21.575	16.486	27.392	5.0184				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average AG Wt (Dry, mg)	Comparison	08-6650-1045	08-6650-1045	01 Aug-08 9:41 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	23.45%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.61842	1.85955	0.0721	1.03867	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	2.042992	2.042992	1	2.62	0.14423	Non-Significant Effect
Error	6.239843	0.779980	8			
Total	8.28283525	2.8229723	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.20059	23.15450	0.86365	Equal Variances
Distribution	Shapiro-Wilk W	0.93303		0.47838	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	3.52560	2.62000	4.66201	0.92254				

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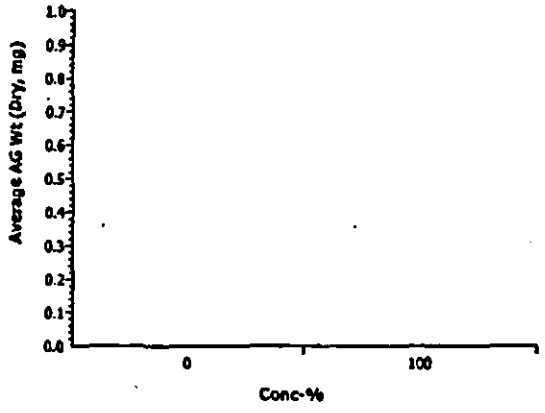

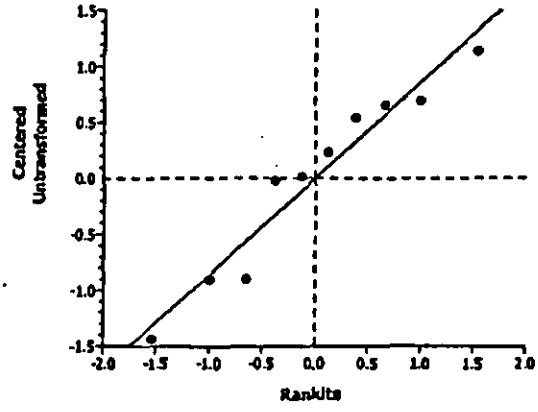

CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Root Wt. (Wet, mg)	Comparison	08-6650-1045	08-6650-1045	01 Aug-06 9:41 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	29.97%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.01233	1.85955	0.0395	9.69548	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	275.21	275.21	1	4.05	0.07899	Non-Significant Effect
Error	543.6934	67.96167	8			
Total	818.903320	343.17163	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.04087	23.15450	0.50661	Equal Variances
Distribution	Shapiro-Wilk W	0.95025		0.67144	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	21.855	12.084	34.878	9.5512				

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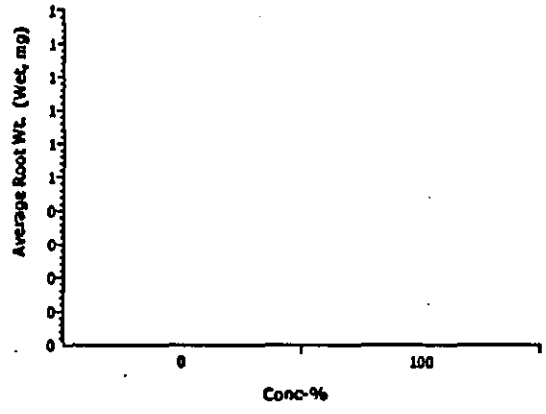

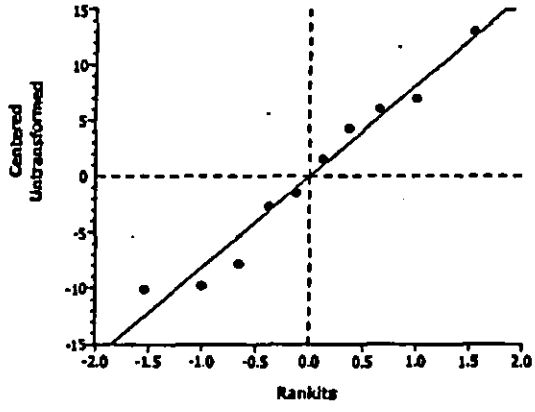

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Dry, mg)	Comparison	08-6650-1045	08-6650-1045	01 Aug-06 9:41 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	39.10%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.9869	1.85955	0.8237	0.50325	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.1783523	0.178352	1	0.97	0.35258	Non-Significant Effect
Error	1.464831	0.183104	8			
Total	1.64318313	0.3614561	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	3.82102	23.15450	0.22245	Equal Variances
Distribution	Shapiro-Wilk W	0.94812		0.64629	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.55429	0.99199	2.16599	0.53875				

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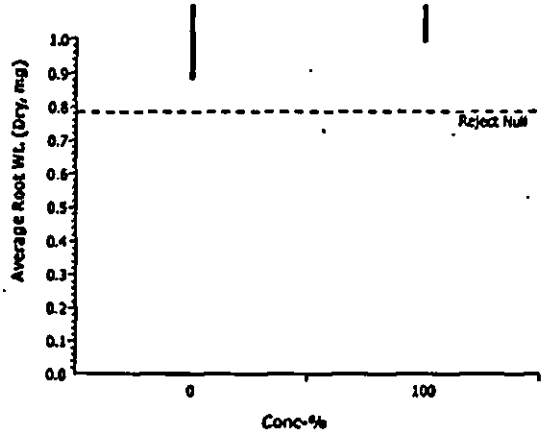

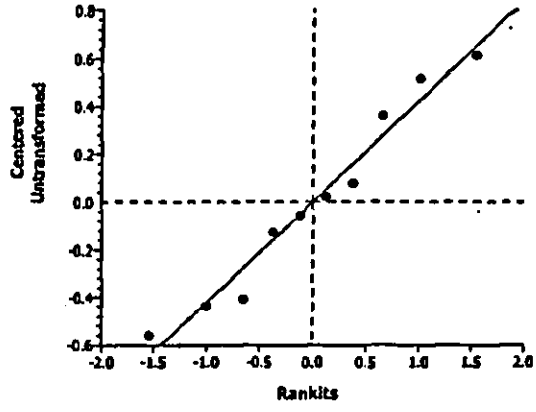

CETIS Analysis Detail

Plant Bioassay - Chronic	CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Wet, mg)	Comparison	08-6650-1045	08-6650-1045	01 Aug-06 9:42 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	24.14%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	2.46483	1.85955	0.0195	15.413	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1043.45	1043.45	1	6.08	0.03902	Significant Effect
Error	1374	171.7499	8			
Total	2417.44958	1215.2000	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.49140	23.15450	0.70798	Equal Variances
Distribution	Shapiro-Wilk W	0.94437		0.60259	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	43.431	28.570	60.768	14.34				

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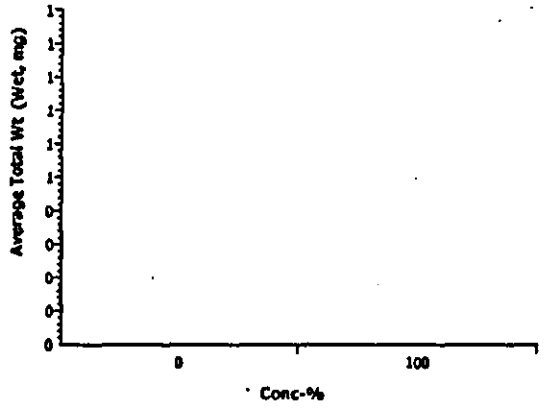

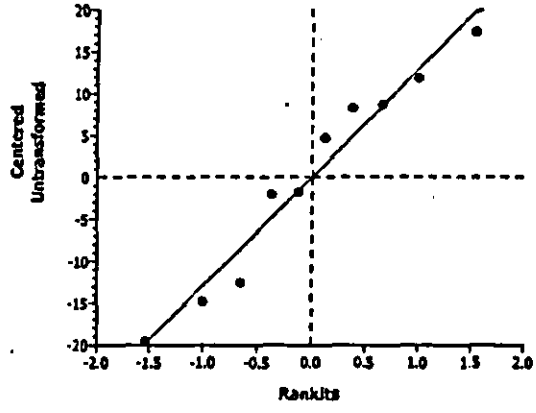

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Dry, mg)	Comparison	08-6650-1045	08-6650-1045	01 Aug-06 9:42 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	26.57%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.77972	1.85955	0.2290	1.51893	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1.014079	1.014079	1	0.61	0.45800	Non-Significant Effect
Error	13.3441	1.668013	8			
Total	14.3581798	2.6820915	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.74196	23.15450	0.60401	Equal Variances
Distribution	Shapiro-Wilk W	0.94381		0.59611	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	5.07990	3.61599	6.82800	1.45581				

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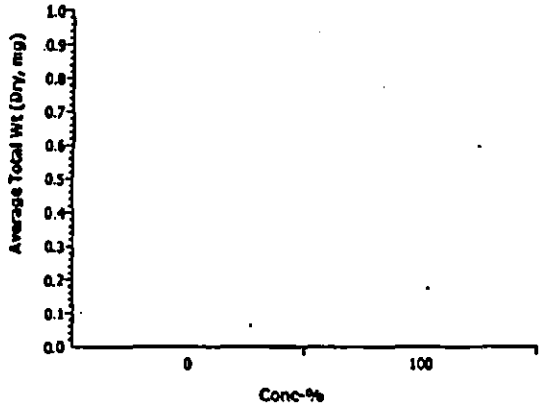
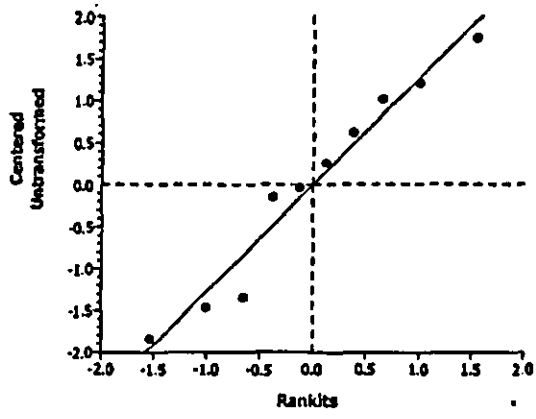




CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Height (mm)	Comparison	08-6650-1045	08-6650-1045	03 Aug-06 4:32 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	11.62%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.26222	1.85955	0.1212	10.018	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	115.6001	115.6001	1	1.59	0.24242	Non-Significant Effect
Error	580.4639	72.55798	8			
Total	696.063919	188.15804	9			

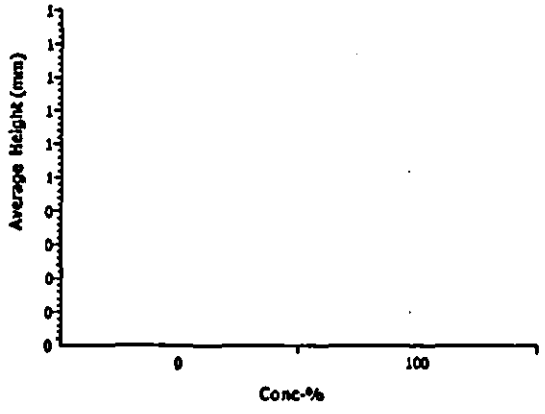
ANOVA Assumptions

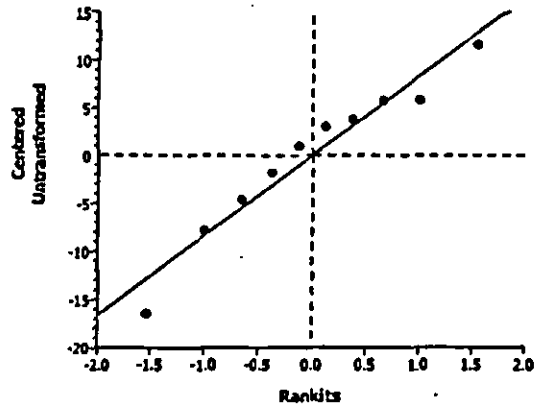
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.86276	23.15450	0.33272	Equal Variances
Distribution	Shapiro-Wilk W	0.95423		0.71865	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	79.44	71.6	85.2	6.1293				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2006

Initial Day 0 (AP) Day 12 NJ Day 14 NJ Day 18 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Bioassay Lab ID: BG 1619-09 Sample No: J12NB1

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	18 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH INITIAL (@ planting)	pH FINAL (@ 14 days Post-Emergence)
Control	A	7	7	7	7			7→5	5	7.4	7.0
	B	5	5	5	5			5	5		
	C	7	7	7	7			7→5	5		
	D	7	7	7	7			7→5	5		
	E	6	6	6	6			6→5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A: 3lg G, 2med G Remove - 2med G

Replicate B: 1lg G, 3med G, 1sm G

Replicate C: 3lg G, 2med G Remove 1med G, 1sm G

Replicate D: 2lg G, 3med G Remove - 2med G

Replicate E: 3lg G, 2med G Remove - 1med G

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A: 4lg G, 1med G

Replicate B: 1lg G, 3med G, 1sm G

Replicate C: 5lg G

Replicate D: 4lg G, 1med G

Replicate E: 3lg G, 1lg G w/1 B tipped shoot, 1med G

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	92 mm	105 mm	100 mm	74 mm	88 mm
Replicate B	59 mm	65 mm	67 mm	101 mm	74 mm
Replicate C	84 mm	82 mm	95 mm	90 mm	99 mm
Replicate D	100 mm	113 mm	82 mm	78 mm	94 mm
Replicate E	70 mm	83 mm	102 mm	~~97~~ NJ mm 99	89 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1247.83	1392.2	1273.29
Replicate B	1242.87	1348.0	1262.33
Replicate C	1253.92	1401.1	1279.07
Replicate D	1247.22	1393.8	1271.92
Replicate E	1244.56	1372.7	266.54

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	91 mm	81 mm	61 mm	88 mm	58 mm
Replicate B	47 mm	43 mm	92 mm	74 mm	68 mm
Replicate C	143 mm	81 mm	71 mm	100 mm	96 mm
Replicate D	120 mm	128 mm	107 mm	82 mm	91 mm
Replicate E	70 mm	70 mm	70 mm	100 mm	99 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1249.83	1435.4	1255.68
Replicate B	1249.90	1398.0	1255.01
Replicate C	1247.01	1449.4	1257.80
Replicate D	1260.44	1403.4	1279.35
Replicate E	1252.92	1380.7	1259.38

Comments:

CETIS Test Summary

Report Date: 03 Aug-06 4:35 PM
Test Link: 00-8379-6948/B161909psc

Plant Bioassay - Chronic — **CH2M Hill**

Test No:	15-3585-3182	**Test Type:**	Plant Chronic	**Duration:**	28d 0h
Start Date:	28 Jun-06	**Protocol:**	ASTM E1963-02 (2002)	**Species:**	Poa sandbergii
Ending Date:	26 Jul-06	**Dil Water:**		**Source:**	
Setup Date:	28 Jun-06 12:00 AM	**Brine:**			

Sample No:	16-8787-1472	**Code:**	B1619-09	**Client:**	
Sample Date:	20 Jun-06 12:09 AM	**Material:**	Soil	**Project:**	
Receive Date:		**Source:**	Hanford		
Sample Age:	7d 23h	**Station:**			

Comments: J12NB1

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
10-8305-4456	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
06-5995-0796	Average Height (mm)	100	> 100	N/A	12.71%	Equal Variance t Two-Sample
05-5013-7072	Average Length (mm)	< 100	100	N/A	15.73%	Equal Variance t Two-Sample
06-4996-2169	Average AG Wt (Wet, mg)	100	> 100	N/A	17.18%	Equal Variance t Two-Sample
06-6522-2887	Average AG Wt (Dry, mg)	100	> 100	N/A	18.53%	Equal Variance t Two-Sample
15-1704-6257	Average Root Wt. (Wet, mg	100	> 100	N/A	27.82%	Equal Variance t Two-Sample
05-5424-9007	Average Root Wt. (Dry, mg)	100	> 100	N/A	76.34%	Equal Variance t Two-Sample
12-7627-5506	Average Total Wt (Wet, mg	100	> 100	N/A	21.61%	Equal Variance t Two-Sample
17-0779-4988	Average Total Wt (Dry, mg)	100	> 100	N/A	26.72%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 03 Aug-06 4:35 PM
Test Link: 00-8379-6948/B161909psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	87.4	73.2	93.400	3.6414	8.1425	9.32%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	81.32	54.8	98.2	8.0753	18.057	22.20%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	26.856	21.026	29.436	1.6167	3.6152	13.46%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	4.67000	3.89199	5.09202	0.23032	0.51502	11.03%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	30.272	19.62	40.478	3.8046	8.5074	28.10%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.88480	1.02200	3.78201	0.51385	1.14900	60.98%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	57.128	40.646	69.914	5.2420	11.722	20.52%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	6.55480	4.91399	8.72202	0.65678	1.46860	22.40%

CETIS Test Summary

Report Date: 03 Aug-06 4:35 PM
Test Link: 00-8379-6948/B161909psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		91.8000	73.2	90	93.4000	88.6

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		74.2	54.8	98.2	97.6	81.8000

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		28.874	21.0260	29.436	29.3160	25.628

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		5.09202	3.89199	5.02998	4.94001	4.39600

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		37.1140	19.62	40.4780	28.5920	25.556

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.17002	1.02200	2.15801	3.78201	1.29199

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		65.9880	40.646	69.914	57.9080	51.184

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		6.26204	4.91399	7.18799	8.72202	5.68799

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
% Germination	Comparison	00-8379-6948	00-8379-6948	01 Aug-06 9:46 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

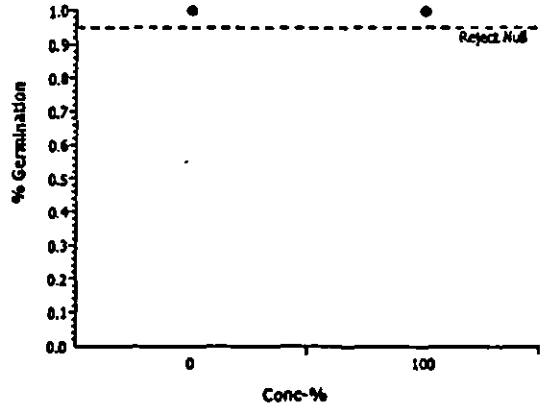
ANOVA Assumptions

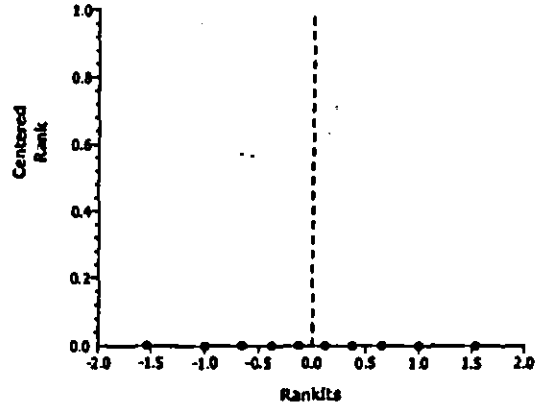
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Wet, mg)	Comparison	00-8379-6948	00-8379-6948	01 Aug-06 9:46 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	17.18%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.59928	1.85955	0.0742	5.41511	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	54.22372	54.22372	1	2.56	0.14843	Non-Significant Effect
Error	169.6013	21.20016	8			
Total	223.825043	75.423889	9			

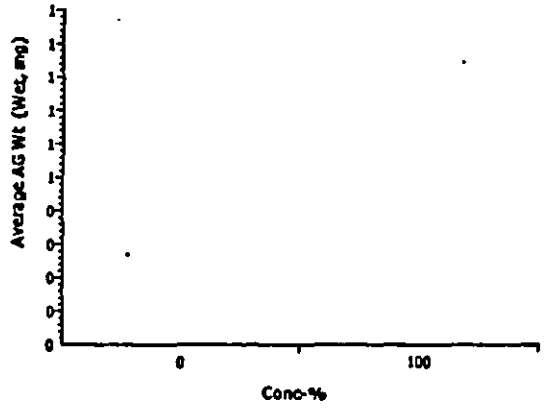
ANOVA Assumptions

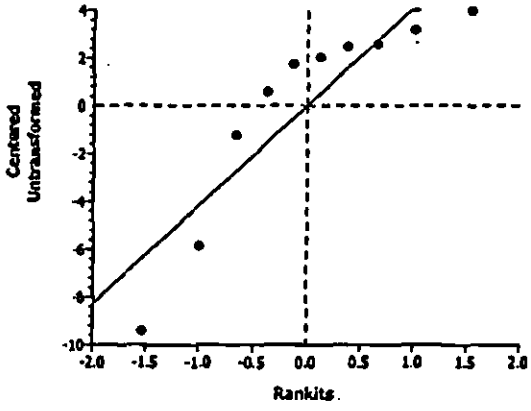
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.24427	23.15450	0.45292	Equal Variances
Distribution	Shapiro-Wilk W	0.80370		0.01608	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	26.856	21.026	29.436	3.6152				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average AG Wt (Dry, mg)	Comparison	00-8379-6948	00-8379-6948	01 Aug-06 9:46 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	18.53%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	-0.5447	1.85955	0.6996	0.82079	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.1444925	0.144493	1	0.30	0.60083	Non-Significant Effect
Error	3.896499	0.487062	8			
Total	4.04099192	0.6315549	9			

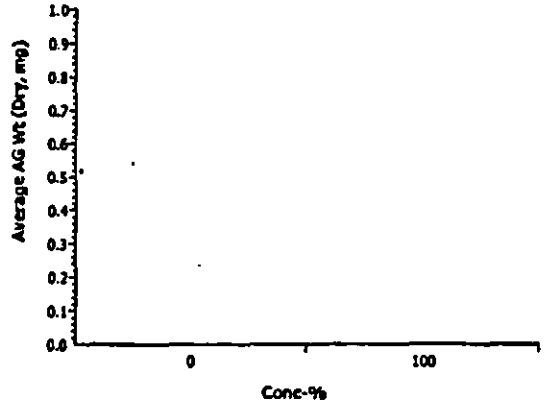
ANOVA Assumptions

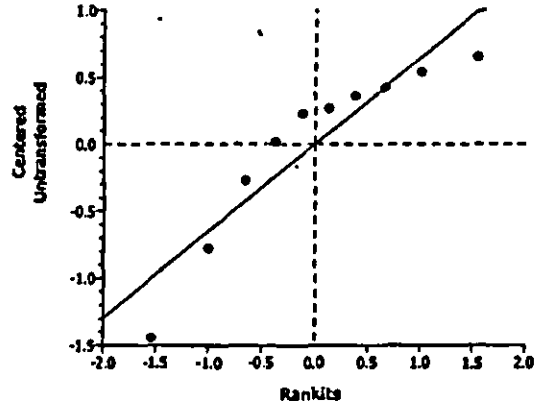
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.67259	23.15450	0.36409	Equal Variances
Distribution	Shapiro-Wilk W	0.85485		0.06633	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	4.67000	3.89199	5.09202	0.51502				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Root Wt. (Wet, mg)	Comparison	00-8379-6948	00-8379-6948	01 Aug-06 9:46 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	27.82%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.42886	1.85955	0.3397	8.99817	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	10.76608	10.76608	1	0.18	0.67934	Non-Significant Effect
Error	468.2994	58.53743	8			
Total	479.065519	69.303511	9			

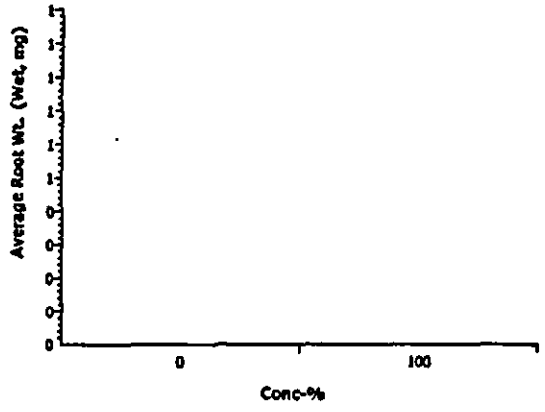
ANOVA Assumptions

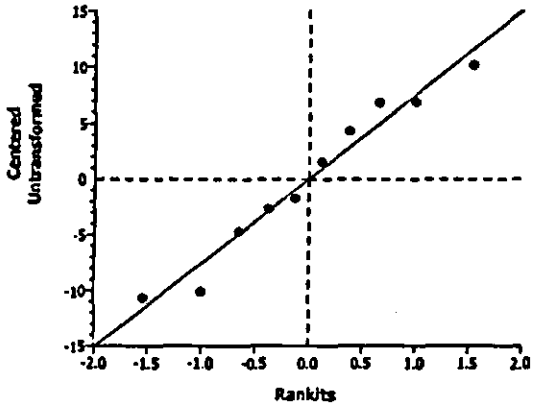
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.61919	23.15450	0.65200	Equal Variances
Distribution	Shapiro-Wilk W	0.94576		0.61870	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	30.272	19.62	40.478	8.5074				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Dry, mg)	Comparison	00-8379-6948	00-8379-6948	01 Aug-06 9:46 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	76.34%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-1.1309	1.85955	0.8546	0.98263	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.8928365	0.892837	1	1.28	0.29085	Non-Significant Effect
Error	5.58464	0.69808	8			
Total	6.47747606	1.5909165	9			

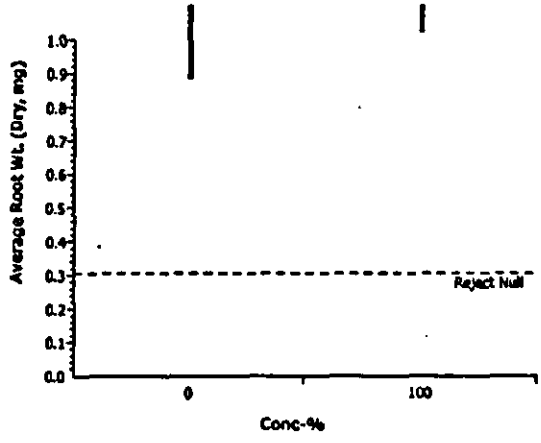
ANOVA Assumptions

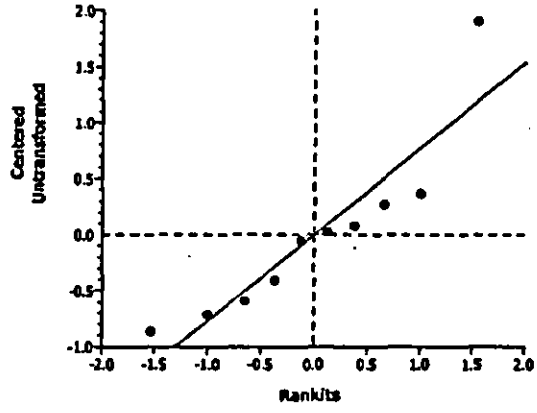
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	17.38006	23.15450	0.01712	Equal Variances
Distribution	Shapiro-Wilk W	0.85507		0.06673	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.88480	1.02200	3.78201	1.14900				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic | CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Wet, mg)	Comparison	00-8379-6948	00-8379-6948	01 Aug-06 9:46 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	21.61%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.90735	1.85955	0.1954	13.7975	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	113.3128	113.3128	1	0.82	0.39073	Non-Significant Effect
Error	1101.076	137.6345	8			
Total	1214.38862	250.94729	9			

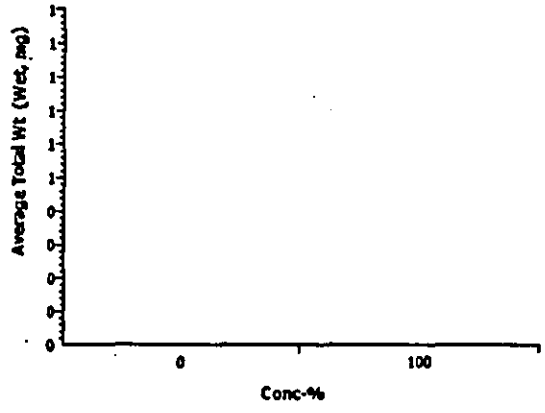
ANOVA Assumptions

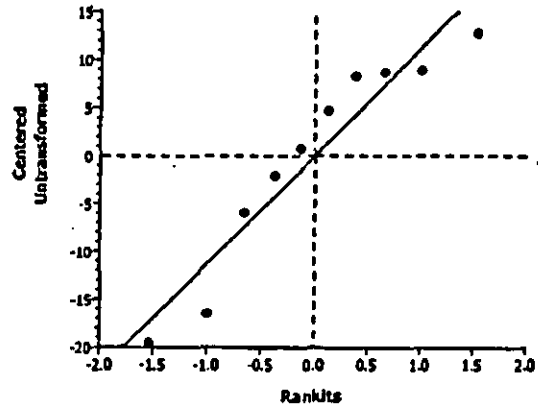
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.00349	23.15450	0.99738	Equal Variances
Distribution	Shapiro-Wilk W	0.89789		0.20770	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	57.128	40.646	69.914	11.722				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Dry, mg)	Comparison	00-8379-6948	00-8379-6948	01 Aug-06 9:46 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	26.72%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-1.0202	1.85955	0.8313	1.52742	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1.755683	1.755683	1	1.04	0.33747	Non-Significant Effect
Error	13.49373	1.686716	8			
Total	15.2494121	3.4423995	9			

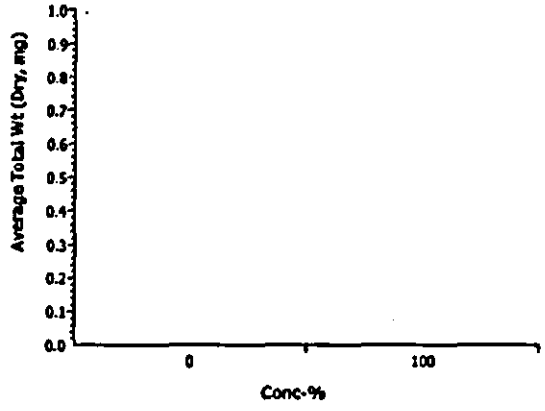
ANOVA Assumptions

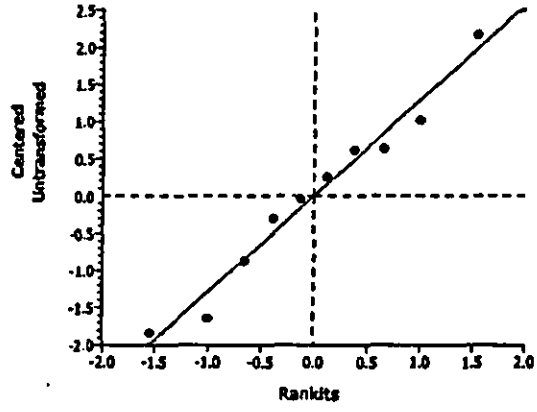
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.77271	23.15450	0.59280	Equal Variances
Distribution	Shapiro-Wilk W	0.97030		0.89362	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	6.55480	4.91399	8.72202	1.46860				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Height (mm)	Comparison	00-8379-6948	00-8379-6948	03 Aug-06 4:35 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	12.71%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.1967	1.85955	0.5755	10.965	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	3.363995	3.363995	1	0.04	0.84895	Non-Significant Effect
Error	695.3921	86.92401	8			
Total	698.756084	90.288006	9			

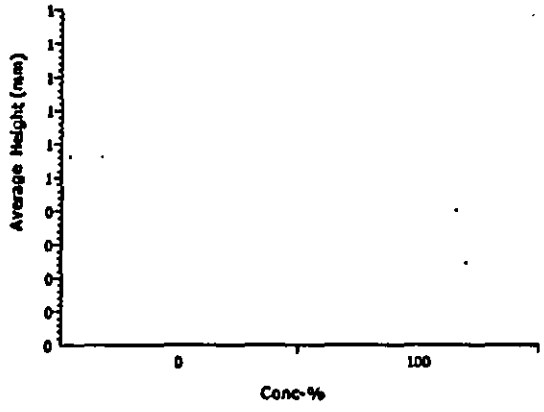
ANOVA Assumptions

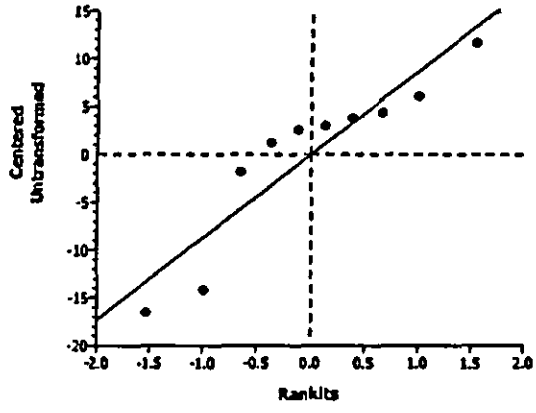
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.62214	23.15450	0.65078	Equal Variances
Distribution	Shapiro-Wilk W	0.85443		0.06558	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	88.240	69.8	97.8	10.371				
100		5	87.4	73.2	93.4	8.1425				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	00-8379-6948	00-8379-6948	03 Aug-06 4:35 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	15.73%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.89316	1.85955	0.0101	16.9426	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1737.124	1737.124	1	8.37	0.02010	Significant Effect
Error	1660.256	207.532	8			
Total	3397.38000	1944.6560	9			

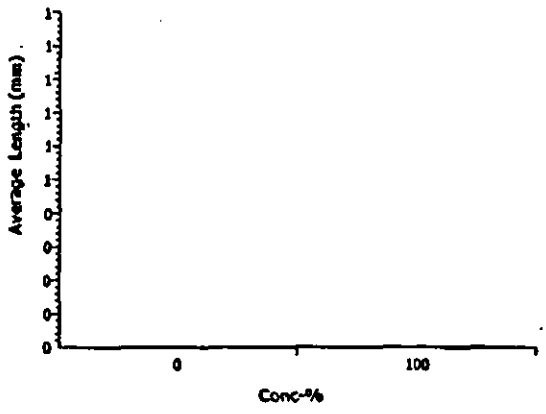
ANOVA Assumptions

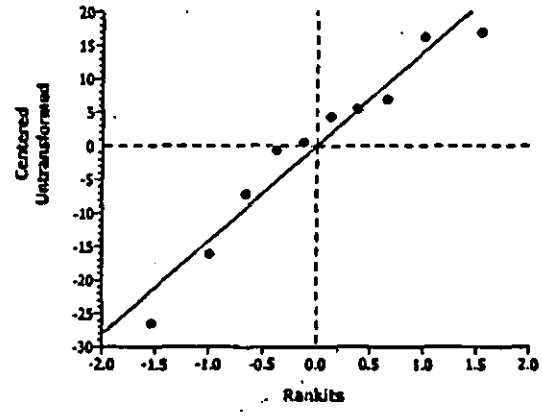
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	3.66301	23.15450	0.23649	Equal Variances
Distribution	Shapiro-Wilk W	0.93831		0.53435	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	81.32	54.8	98.2	18.057				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2008

Initials: Day 0 [illegible] Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Bioassay Lab ID: BG 1619-10 Sample No: J12NB2

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	6	7	7	7			7->5	5	7.8	6.9
	B	6	6	6	6			6->5	5		
	C	8	8	8	8			8->5	5		
	D	9	9	10	10			10->5	5		
	E	4	5	5	6			6->5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A: 3lg G 2med G Remove - 1Med G, 1sm G

Replicate B: 1lg G 4med G Remove - 1sm B

Replicate C: 2lg G 3med G Remove - 3sm G

Replicate D: 3lg G, 2med G Remove - 2med G, 3sm G

Replicate E: 3med G, 2sm G

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A: 3lg G, 2med G

Replicate B: 4lg G, 1med G

Replicate C: 5lg G

Replicate D: 4lg G, 1sm G

Replicate E: 3med G, 2sm G

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	87 mm	95 mm	73 mm	68 mm	97 mm
Replicate B	104 mm	80 mm	74 mm	88 mm	79 mm
Replicate C	91 mm	84 mm	80 mm	99 mm	91 mm
Replicate D	64 mm	96 mm	89 mm	100 mm	86 mm
Replicate E	58 mm	62 mm	77 mm	35 mm	69 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

		Tin Tare Wt (mg)	Wet Wt (mg)	Dry Wt (mg)
1277.66	Replicate A	~~1303.77~~ NT	1378.1	1301.87
1287.870	Replicate B	~~1307.33~~	1489.5	1310.45
1290.47	Replicate C	~~1297.83~~	1449.5	1315.23
1284.49	Replicate D	~~1294.14~~	1427.2	1315.54
1296.24	Replicate E	~~1297.94~~	1426.2	1308.41

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	37 mm	45 mm	25 mm	66 mm	94 mm
Replicate B	45 mm	96 mm	73 mm	85 mm	76 mm
Replicate C	101 mm	73 mm	106 mm	99 mm	65 mm
Replicate D	75 mm	66 mm	100 mm	117 mm	72 mm
Replicate E	103 mm	56 mm	65 mm	61 mm	110 mm

Measure Root Weight: Total mass of all roots from all seedlings

		Tin Tare Wt (mg)	Wet Wt (mg)	Dry Wt (mg)
1292.13	Replicate A	~~1293.84~~	1349.9	1288.23
1298.90	Replicate B	~~1294.69~~	1448.4	1297.26
1288.25	Replicate C	~~1299.39~~	1440.8	1296.98
1296.28	Replicate D	~~1290.91~~	1401.1	1294.85
1280.93	Replicate E	~~1304.28~~	1401.0	1285.23

Comments:

CETIS Test Summary

Report Date: 01 Aug-06 11:02 AM
Test Link: 08-1456-0408/B161910psc

Plant Bioassay - Chronic — CH2M Hill

Test No:	06-2178-9436	Test Type:	Plant Chronic	Duration:	28d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	14-0777-2359	Code:	B1619-10	Client:	
Sample Date:	20 Jun-06 12:10 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	7d 23h	Station:			

Comments: J12NB2

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
07-5806-0438	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
12-8667-4728	Average Height (mm)	100	> 100	N/A	15.15%	Equal Variance t Two-Sample
14-3231-7768	Average Length (mm)	< 100	100	N/A	13.33%	Wilcoxon Rank Sum Two-Sample
13-8183-5346	Average AG Wt (Wet, mg)	100	> 100	N/A	24.41%	Equal Variance t Two-Sample
09-7664-5916	Average AG Wt (Dry, mg)	100	> 100	N/A	30.13%	Equal Variance t Two-Sample
14-8427-4397	Average Root Wt. (Wet, mg	100	> 100	N/A	25.27%	Equal Variance t Two-Sample
15-4560-3437	Average Root Wt. (Dry, mg)	100	> 100	N/A	29.88%	Equal Variance t Two-Sample
09-3013-9189	Average Total Wt (Wet, mg	100	> 100	N/A	24.15%	Equal Variance t Two-Sample
06-3285-7543	Average Total Wt (Dry, mg)	100	> 100	N/A	29.46%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 01 Aug-06 11:02 AM
Test Link: 08-1456-0408/B161910psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	81.040	60.200	89	5.2803	11.807	14.57%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	78.440	53.400	88.800	6.4608	14.447	18.42%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	29.358	20.088	40.360	3.3538	7.4994	25.55%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	4.59760	2.43401	6.21001	0.61109	1.36644	29.72%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	24.508	13.554	31.5	3.2213	7.203	29.39%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.36239	0.85999	1.74600	0.16608	0.37136	27.26%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	53.866	33.642	71.860	6.4213	14.359	26.66%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	5.96000	3.29399	7.92400	0.75957	1.69845	28.50%

CETIS Test Summary

Report Date: 01 Aug-08 11:02 AM
Test Link: 08-1456-0408/B161910psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		84	85	89	87	60.2000

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		53.4000	85	88.8000	86	79

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		20.088	40.3600	31.8060	28.542	25.992

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		4.84199	4.55000	4.95200	6.21001	2.43401

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		13.5540	31.5	30.5100	22.964	24.014

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.22000	1.27200	1.74600	1.71399	0.85999

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		33.642	71.8600	62.3160	51.506	50.006

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		6.06199	5.82200	6.69800	7.92400	3.29399

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
% Germination	Comparison	08-1456-0408	08-1456-0408	01 Aug-06 11:01 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

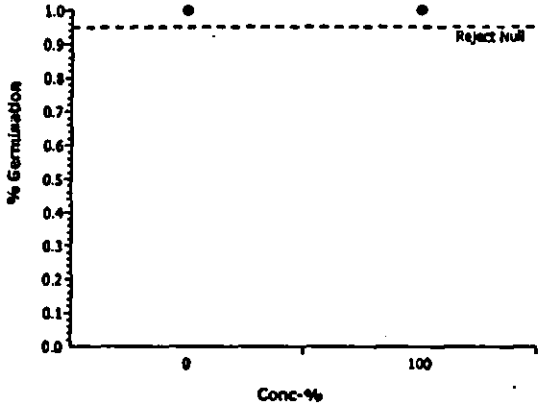
ANOVA Assumptions

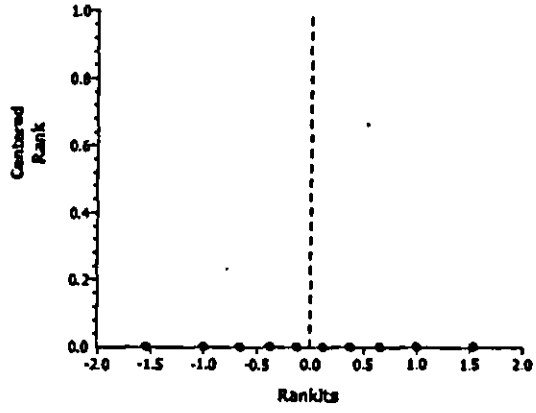
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Height (mm)	Comparison	08-1456-0408	08-1456-0408	01 Aug-06 11:01 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	15.15%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.73991	1.85955	0.2403	13.0687	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	67.60002	67.60002	1	0.55	0.48050	Non-Significant Effect
Error	987.8239	123.478	8			
Total	1055.42393	191.07801	9			

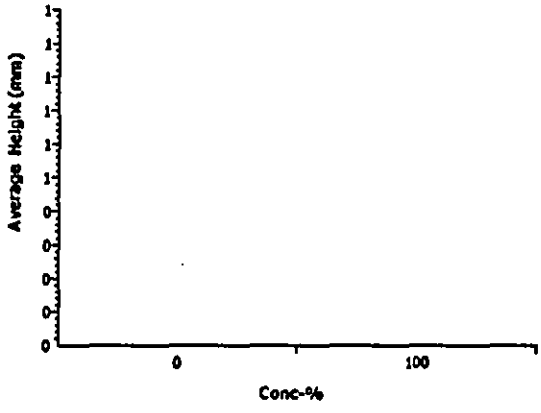
ANOVA Assumptions

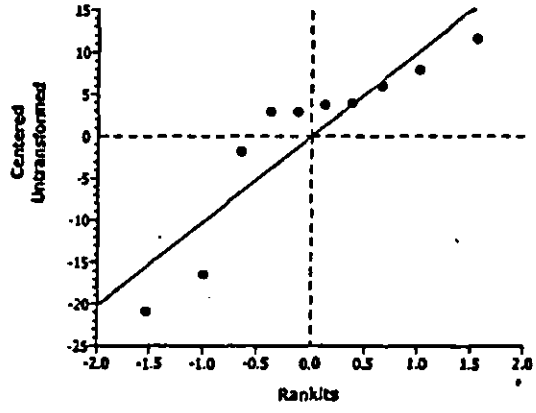
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.29624	23.15450	0.80756	Equal Variances
Distribution	Shapiro-Wilk W	0.81892		0.02459	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	81.040	60.2	89	11.807				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic . CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	08-1456-0408	08-1456-0408	01 Aug-06 11:01 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		<100	100		N/A	13.33%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	15		0.0040	0	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	2137.444	2137.444	1	14.36	0.00532	Significant Effect
Error	1190.88	148.86	8			
Total	3328.32361	2286.3036	9			

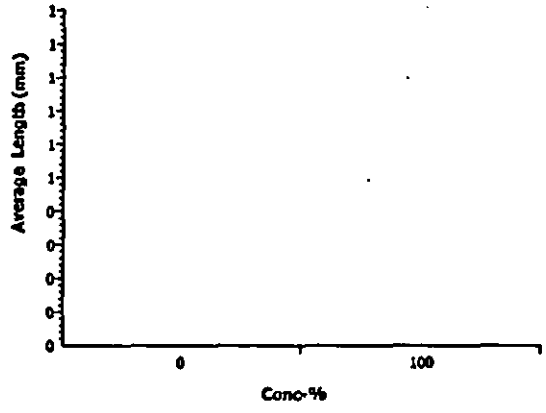
ANOVA Assumptions

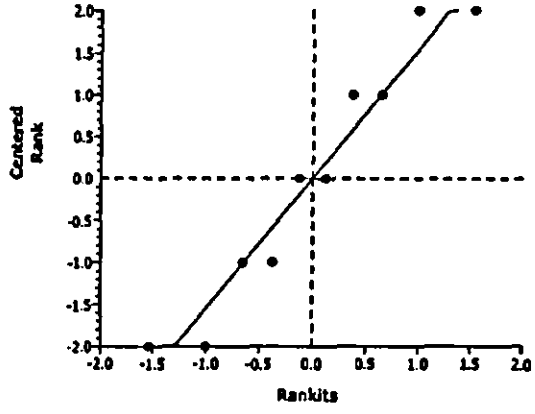
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.34472	23.15450	0.42943	Equal Variances
Distribution	Shapiro-Wilk W	0.78116		0.00855	Non-normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346	8.00000	6.00000	10.0000	1.58114
100		5	78.440	53.4	88.8	14.447	3.00000	1.00000	5.00000	1.58114

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Wet, mg)	Comparison	08-1456-0408	08-1456-0408	01 Aug-06 11:01 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	24.41%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.52106	1.85955	0.3082	7.69289	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	11.61649	11.61649	1	0.27	0.61644	Non-Significant Effect
Error	342.29	42.78625	8			
Total	353.906465	54.402734	9			

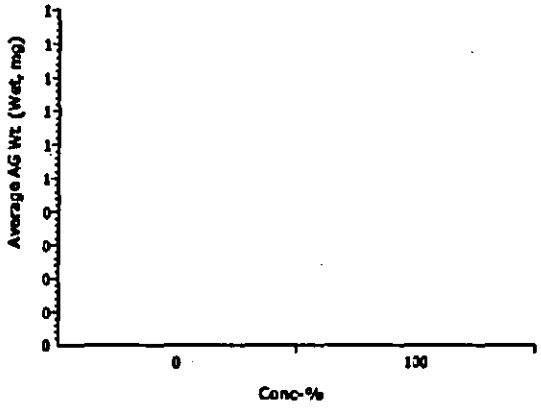
ANOVA Assumptions

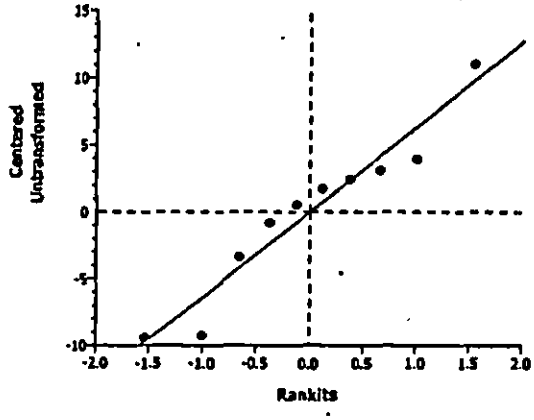
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.91747	23.15450	0.54384	Equal Variances
Distribution	Shapiro-Wilk W	0.93618		0.51135	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	29.358	20.088	40.360	7.4994				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average AG Wt (Dry, mg)	Comparison	08-1456-0408	08-1456-0408	01 Aug-06 11:01 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	30.13%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.2341	1.85955	0.5896	1.33474	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0705706	0.070571	1	0.05	0.82081	Non-Significant Effect
Error	10.30412	1.288015	8			
Total	10.3746888	1.3585854	9			

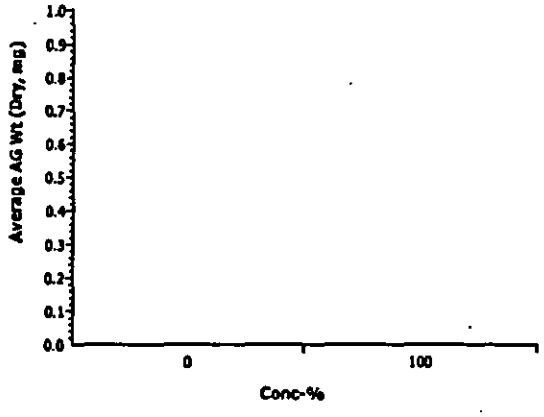
ANOVA Assumptions

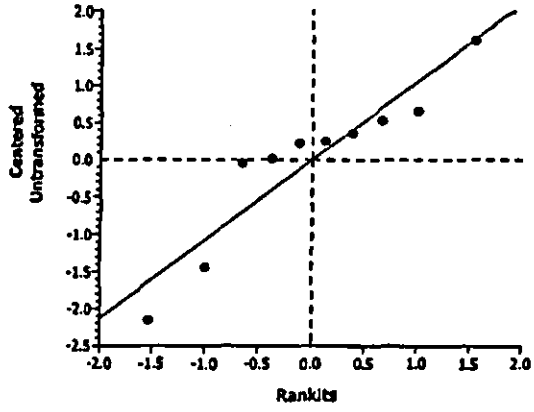
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.63393	23.15450	0.37100	Equal Variances
Distribution	Shapiro-Wilk W	0.88604		0.15296	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	4.59760	2.43401	6.21001	1.36644				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic	CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Wet, mg)	Comparison	08-1456-0408	08-1456-0408	01 Aug-06 11:01 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	25.27%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.78356	1.85955	0.0562	8.17277	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	153.6169	153.6169	1	3.18	0.11234	Non-Significant Effect
Error	386.3256	48.2907	8			
Total	539.942520	201.90760	9			

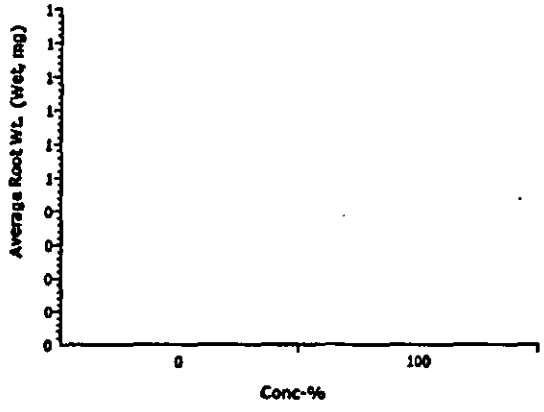
ANOVA Assumptions

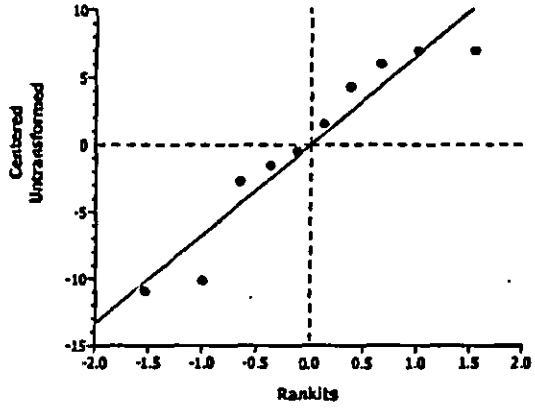
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.16071	23.15450	0.88864	Equal Variances
Distribution	Shapiro-Wilk W	0.89240		0.18043	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	24.508	13.554	31.5	7.203				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Root Wt. (Dry, mg)	Comparison	08-1456-0408	08-1456-0408	01 Aug-06 11:01 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	29.88%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.3636	1.85955	0.6372	0.38459	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0141358	0.014136	1	0.13	0.72559	Non-Significant Effect
Error	0.8554756	0.106935	8			
Total	0.86961144	0.1210703	9			

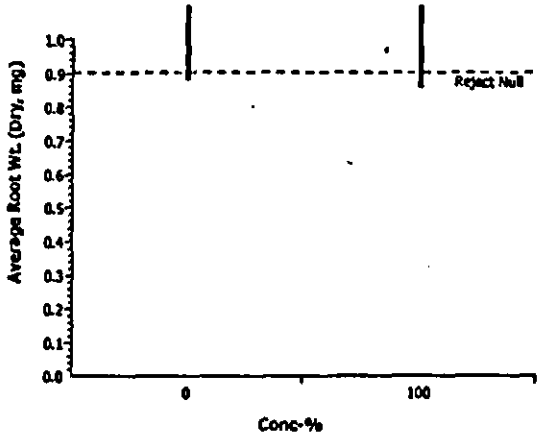
ANOVA Assumptions

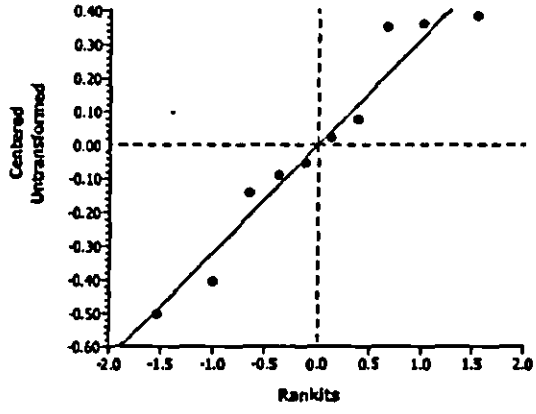
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.81552	23.15450	0.57767	Equal Variances
Distribution	Shapiro-Wilk W	0.92562		0.40625	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.36239	0.85999	1.74600	0.37136				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Wet, mg)	Comparison	08-1456-0408	08-1456-0408	01 Aug-06 11:01 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	24.15%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.20486	1.85955	0.1313	15.4251	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	249.7198	249.7198	1	1.45	0.26269	Non-Significant Effect
Error	1376.165	172.0206	8			
Total	1625.88489	421.74048	9			

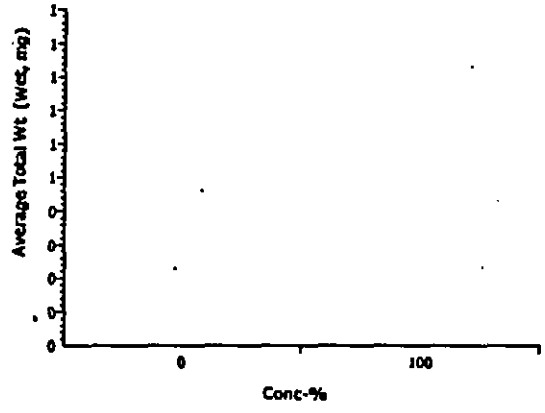
ANOVA Assumptions

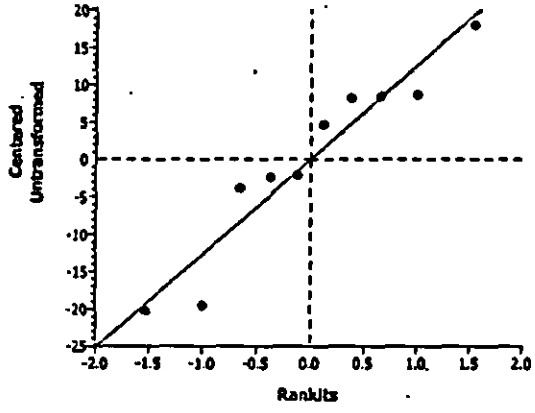
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.49532	23.15450	0.70616	Equal Variances
Distribution	Shapiro-Wilk W	0.91186		0.29399	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	53.866	33.642	71.860	14.359				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
Average Total Wt (Dry, mg)	Comparison	08-1456-0408	08-1456-0408	01 Aug-06 11:01 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	29.46%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.2685	1.85955	0.6025	1.68418	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.1478754	0.147875	1	0.07	0.79508	Non-Significant Effect
Error	16.40559	2.050698	8			
Total	16.5534816	2.1985736	9			

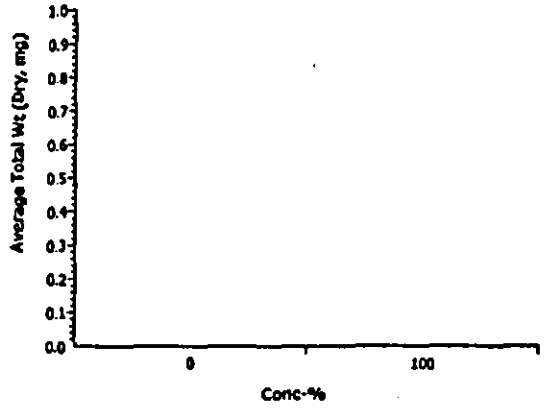
ANOVA Assumptions

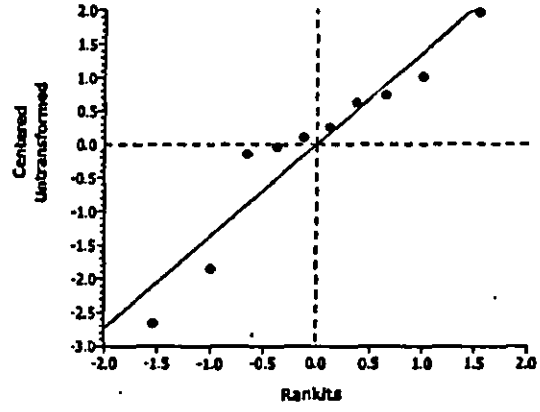
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.37104	23.15450	0.42357	Equal Variances
Distribution	Shapiro-Wilk W	0.91290		0.30154	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	5.96000	3.29399	7.92400	1.69845				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2006

Initial Day 0 RP Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ Day ____

Bioassay Lab ID: BG 1619-11 Sample No: J12NB3

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	7	7	7	7			7->5	5	6.9	6.6
	B	9	9	9	9			9->5	5		
	C	8	8	8	8			8->5	5		
	D	6	6	6	6			6->5	5		
	E	9	9	9	9			9->5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A 3lg G Remove - 1med G, 1sm G
Replicate B 3lg G 2med G Remove - 4med G
Replicate C 4lg G, 1med G Remove - 1 med G, 2sm G
Replicate D 2lg G, 3med G Remove - 1 med G
Replicate E 2lg G, 3med G Remove - 2med G, 2sm G

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A 5lg G
Replicate B 4lg G, 1med G
Replicate C 4lg G, 1 med G
Replicate D 4lg G, 1 med G
Replicate E 3lg G, 2med G

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	94 mm	87 mm	87 mm	94 mm	100 mm
Replicate B	84 mm	74 mm	91 mm	86 mm	86 mm
Replicate C	63 mm	95 mm	92 mm	91 mm	93 mm
Replicate D	109 mm	84 mm	83 mm	76 mm	161 mm
Replicate E	90 mm	75 mm	91 mm	89 mm	72 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1303.35	1508.8	1334.58
Replicate B	1301.75	1447.3	1324.24
Replicate C	1301.78	~~*1438.8~~	1328.60
Replicate D	1288.17	1465.0	1312.72
Replicate E	1286.95	1439.4	~~1312.72~~ ~~*1310~~ 1309.93

1475.2 * DW wet wt.

Describe root appearance:

Replicate A
Replicate B
Replicate C
Replicate D
Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	58 mm	105 mm	82 mm	112 mm	77 mm
Replicate B	86 mm	110 mm	83 mm	87 mm	93 mm
Replicate C	90 mm	67 mm	88 mm	49 mm	83 mm
Replicate D	59 mm	92 mm	126 mm	105 mm	78 mm
Replicate E	123 mm	88 mm	93 mm	86 mm	81 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1290.65	1418.4	1300.93
Replicate B	1301.57	1459.6	1307.09
Replicate C	1294.24	1438.8	1303.32
Replicate D	1294.45	1482.4	1300.93
Replicate E	1298.31	1452.4	1305.12

Comments: Ended 7-26-06 D.W.

CETIS Test Summary

Report Date: 03 Aug-06 4:38 PM
Test Link: 04-7916-2585/B161911psc

Plant Bioassay - Chronic — CH2M Hill

Test No:	02-9207-5826	Test Type:	Plant Chronic	Duration:	28d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	15-5696-5216	Code:	B1619-11	Client:	
Sample Date:	20 Jun-06 12:11 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	7d 23h	Station:			

Comments: J12NB3

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
08-9361-5691	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
16-1596-3272	Average Height (mm)	100	> 100	N/A	12.59%	Equal Variance t Two-Sample
06-2630-0537	Average Length (mm)	< 100	100	N/A	9.34%	Wilcoxon Rank Sum Two-Sample
19-2265-8586	Average AG Wt (Wet, mg)	100	> 100	N/A	18.94%	Equal Variance t Two-Sample
00-4334-0895	Average AG Wt (Dry, mg)	100	> 100	N/A	20.71%	Equal Variance t Two-Sample
07-0162-9079	Average Root Wt. (Wet, mg	100	> 100	N/A	20.59%	Equal Variance t Two-Sample
10-8142-0184	Average Root Wt. (Dry, mg)	100	> 100	N/A	31.64%	Equal Variance t Two-Sample
06-1175-9477	Average Total Wt (Wet, mg	100	> 100	N/A	16.62%	Equal Variance t Two-Sample
12-5322-2826	Average Total Wt (Dry, mg)	100	> 100	N/A	22.66%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 03 Aug-06 4:38 PM
Test Link: 04-7916-2585/B161911psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	89.880	83.400	102.6	3.5489	7.9355	8.83%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	88.040	75.400	94.2	3.3843	7.5676	8.60%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	34.148	29.110	41.090	2.1062	4.7097	13.79%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	5.12280	4.49800	6.24600	0.31882	0.71290	13.92%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	30.898	25.55	37.590	1.973	4.4117	14.28%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.51320	1.11599	2.05601	0.18101	0.40475	26.75%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	65.046	60.728	72.956	2.2342	4.9957	7.68%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	6.63600	5.61399	8.30200	0.49172	1.09952	16.57%

CETIS Test Summary

Report Date: 03 Aug-06 4:38 PM
Test Link: 04-7916-2585/B161911psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		92.4000	84.2	86.8000	102.6	83.4000

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		86.8000	91.8000	75.4000	92	94.2

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		41.0900	29.1100	34.684	35.366	30.4900

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		6.24600	4.49800	5.36399	4.90999	4.59602

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		25.55	31.618	28.9120	37.5900	30.818

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		2.05601	1.11599	1.81599	1.21602	1.36199

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		66.6400	60.7280	63.596	72.9560	61.3080

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		8.30200	5.61399	7.17998	6.12600	5.95801

CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
% Germination	Comparison	04-7916-2585	04-7916-2585	01 Aug-06 11:05 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

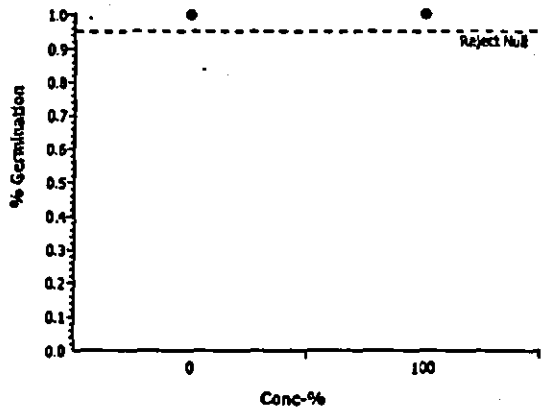
ANOVA Assumptions

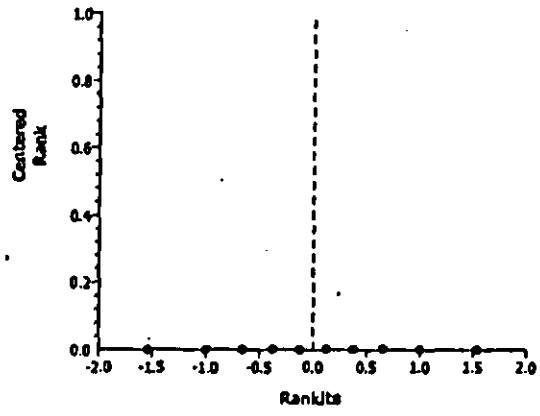
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Height (mm)	Comparison	04-7916-2585	04-7916-2585	01 Aug-06 11:05 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	12.59%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.6233	1.85955	0.7248	10.8595	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	33.12399	33.12399	1	0.39	0.55044	Non-Significant Effect
Error	682.0799	85.25999	8			
Total	715.203884	118.38398	9			

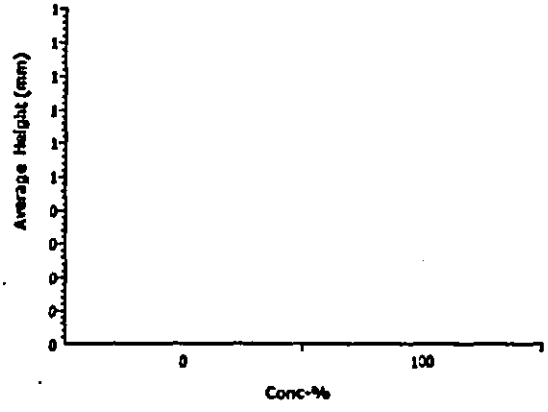
ANOVA Assumptions

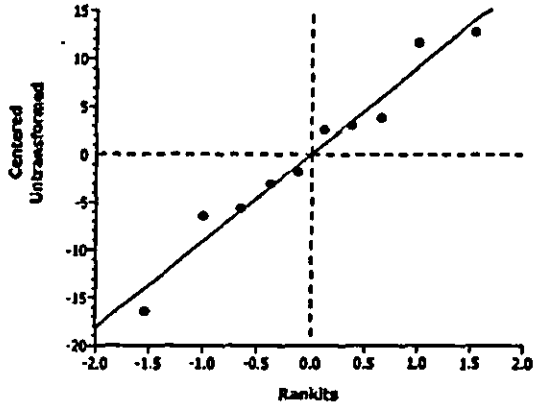
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.70787	23.15450	0.61681	Equal Variances
Distribution	Shapiro-Wilk W	0.96113		0.79866	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	89.880	83.4	102.6	7.9355				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	04-7916-2585	04-7916-2585	01 Aug-06 11:05 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		<100	100		N/A	9.34%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	18		0.0278	0	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	964.3238	964.3238	1	13.18	0.00667	Significant Effect
Error	585.1199	73.13999	8			
Total	1549.44373	1037.4638	9			

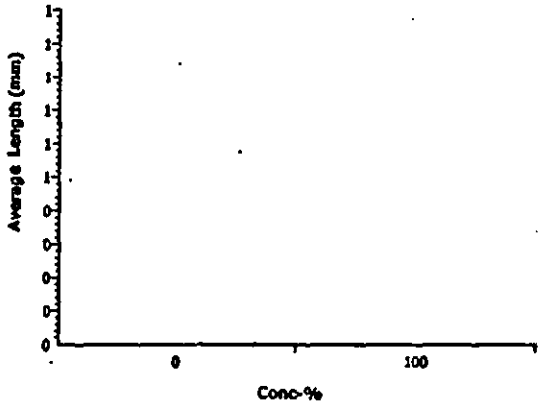
ANOVA Assumptions

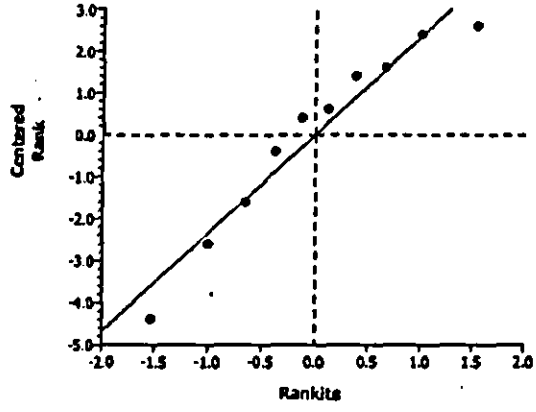
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.55431	23.15450	0.67960	Equal Variances
Distribution	Shapiro-Wilk W	0.78642		0.00991	Non-normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346	7.40000	3.00000	10.0000	2.70185
100		5	88.040	75.4	94.2	7.5676	3.60000	1.00000	6.00000	2.07364

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Wet, mg)	Comparison	04-7916-2585	04-7916-2585	03 Aug-08 4:38 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	18.94%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.8209	1.85955	0.7823	5.96867	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	17.35555	17.35555	1	0.67	0.43549	Non-Significant Effect
Error	206.0486	25.75608	8			
Total	223.404177	43.111628	9			

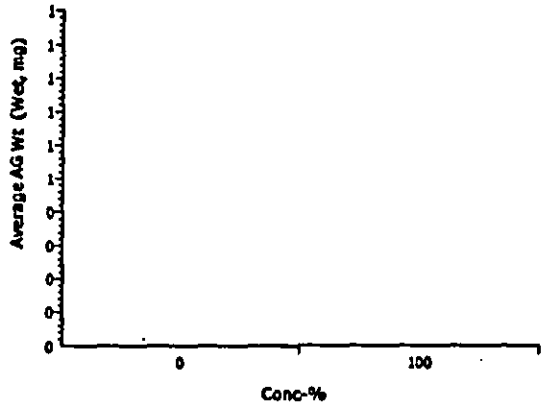
ANOVA Assumptions

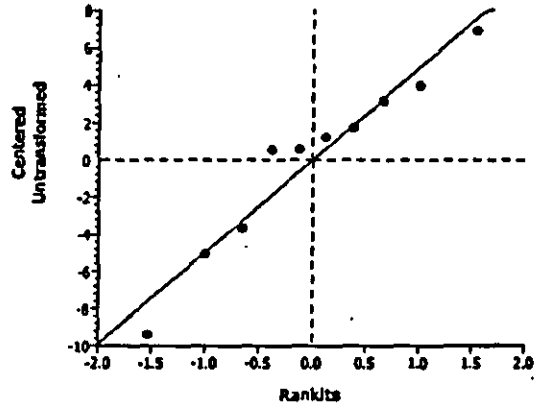
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.32234	23.15450	0.79314	Equal Variances
Distribution	Shapiro-Wilk W	0.94690		0.63202	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	34.148	29.110	41.090	4.7097				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average AG Wt (Dry, mg)	Comparison	04-7916-2585	04-7916-2585	03 Aug-06 4:38 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	20.71%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	-1.4050	1.85955	0.9012	0.91746	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1.201343	1.201343	1	1.97	0.19763	Non-Significant Effect
Error	4.868438	0.608555	8			
Total	6.06978154	1.8098981	9			

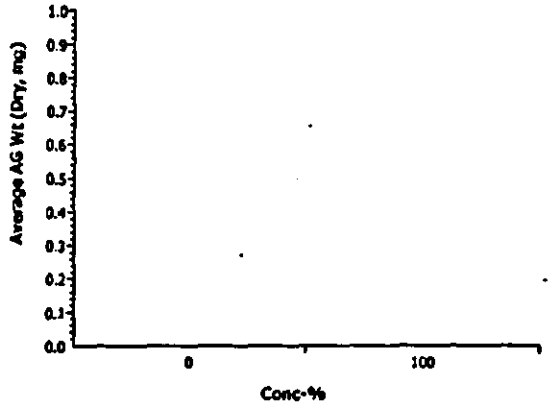
ANOVA Assumptions

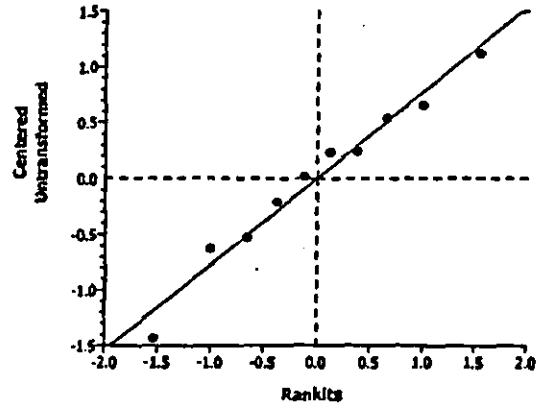
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.39482	23.15450	0.75495	Equal Variances
Distribution	Shapiro-Wilk W	0.97793		0.95314	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	5.12280	4.49800	6.24600	0.71290				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Wet, mg)	Comparison	04-7916-2585	04-7916-2585	03 Aug-06 4:38 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	20.59%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.40466	1.85955	0.3482	6.66134	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	5.253308	5.253308	1	0.16	0.69633	Non-Significant Effect
Error	256.6485	32.08106	8			
Total	261.901806	37.334370	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.29657	23.15450	0.44046	Equal Variances
Distribution	Shapiro-Wilk W	0.96215		0.81014	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	30.898	25.55	37.590	4.4117				

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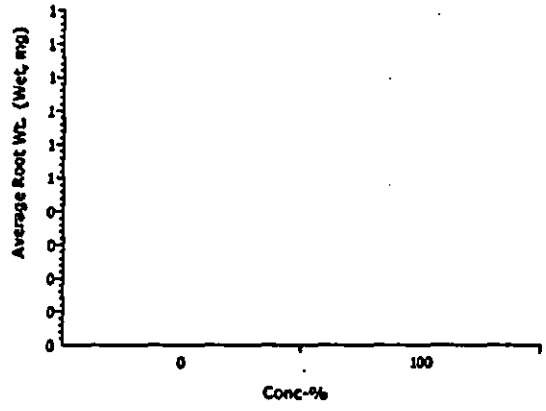

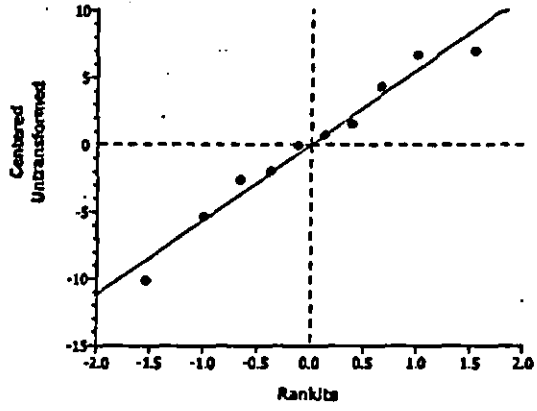

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Dry, mg)	Comparison	04-7916-2585	04-7916-2585	03 Aug-06 4:38 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	31.64%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-1.0320	1.85955	0.8339	0.40722	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.1276911	0.127691	1	1.07	0.33225	Non-Significant Effect
Error	0.9591218	0.119890	8			
Total	1.08681287	0.2475813	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.15664	23.15450	0.47497	Equal Variances
Distribution	Shapiro-Wilk W	0.94689		0.63187	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.51320	1.11599	2.05601	0.40475				

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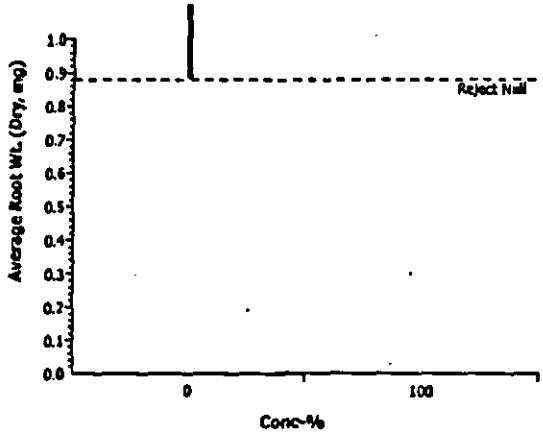

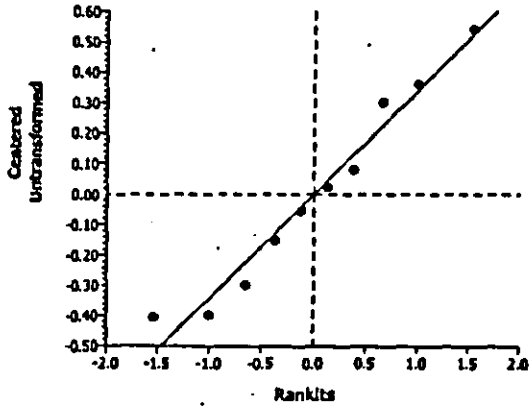

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Wet, mg)	Comparison	04-7916-2585	04-7916-2585	03 Aug-06 4:38 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	16.62%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-0.2077	1.85955	0.5797	10.6119	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	3.511837	3.511837	1	0.04	0.84068	Non-Significant Effect
Error	651.3273	81.41591	8			
Total	654.839107	84.927745	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	5.52441	23.15450	0.12655	Equal Variances
Distribution	Shapiro-Wilk W	0.86788		0.09443	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	65.046	60.728	72.956	4.9957				

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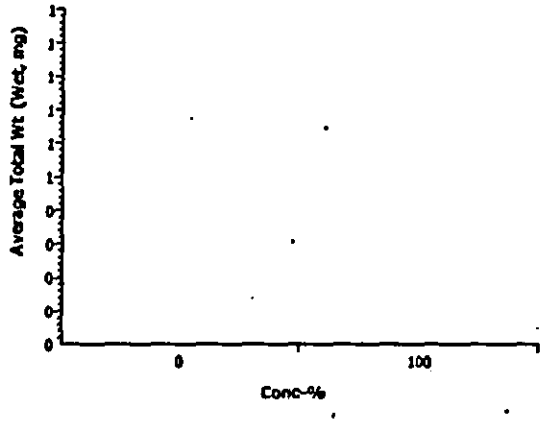

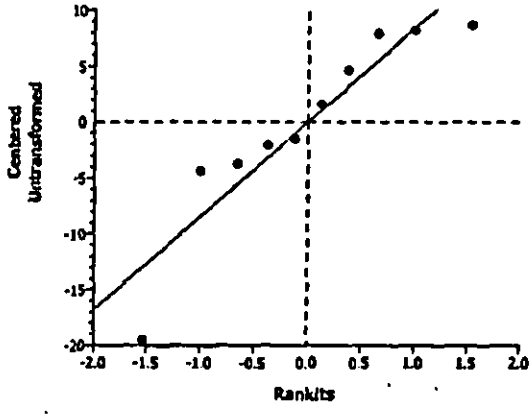

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Dry, mg)	Comparison	04-7916-2585	04-7916-2585	03 Aug-06 4:38 PM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	22.66%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	-1.3197	1.85955	0.8883	1.29518	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	2.112363	2.112363	1	1.74	0.22343	Non-Significant Effect
Error	9.702375	1.212797	8			
Total	11.8147383	3.3251598	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.00638	23.15450	0.99523	Equal Variances
Distribution	Shapiro-Wilk W	0.99106		0.99793	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	6.63600	5.61399	8.30200	1.09952				

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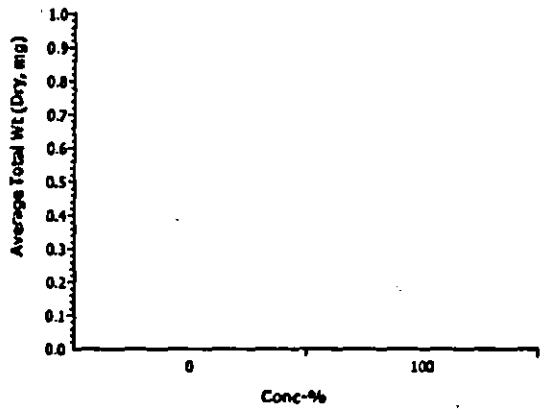
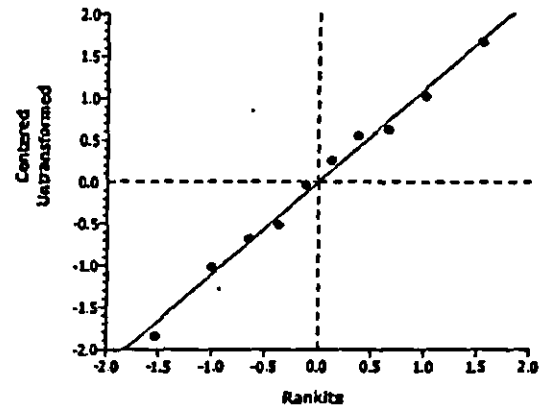




BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2006

Day 0 (initial) [illegible] Day 12 NJ Day 14 NJ Day 18 NJ Day 19 NJ Day 21 NJ Day 23 _____ Day 28 NJ Day _____

Bioassay Lab ID: BG 1619-12 Sample No: J12NB0

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	18 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	7	8	8	8			8→5	5	8.6	7.7
	B	5	5	5	4			4	4		
	C	6	7	7	7			7→5	5		
	D	5	5	5	5			5	5		
	E	7	10	10	10			10→5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A 2lg G, 3med G Remove - 2medG, 1smG

Replicate B 2lg G, 2med G

Replicate C 2lg G, 3medG Remove - 1medG, 1smG

Replicate D 2lg G, 3medG

Replicate E 3lg G 2medG Remove - 4medG, 1smG

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A 4lg G, 1medG, one lg has 1B shoot

Replicate B 2lg G, 1medG, 1smG

Replicate C 2lg G with 1B tip on each 3medG

Replicate D 2lg G, 2medG, 1smG

Replicate E 3lg G, 2medG

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	90 mm	79 mm	92 mm	77 mm	NO ~~293~~ mm
Replicate B	91 mm	82 mm	58 mm	70 mm	mm
Replicate C	65 mm	71 mm	82 mm	68 mm	91 mm
Replicate D	90 mm	70 mm	73 mm	82 mm	57 mm
Replicate E	83 mm	78 mm	83 mm	76 mm	90 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1293.69	1454.31	1317.99
Replicate B	1292.75	1359.3	1303.36
Replicate C	1299.78	1406.3	1319.56
Replicate D	1295.47	1391.0	1313.25
Replicate E	1286.45	1387.0	1304.04

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	112 mm	98 mm	112 mm	90 mm	121 mm
Replicate B	47 mm	86 mm	47 mm	96 mm	mm
Replicate C	88 mm	61 mm	72 mm	69 mm	86 mm
Replicate D	56 mm	63 mm	97 mm	102 mm	100 mm
Replicate E	67 mm	73 mm	78 mm	96 mm	71 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1297.95	1469.0	1305.38
Replicate B	1306.08	1402.8	1308.96
Replicate C	1283.76	1424.9	1289.47
Replicate D	1295.36	1408.5	1300.10
Replicate E	1288.39	1399.1	1293.87

Comments: Ended 7-26-06 DW

CETIS Test Summary

Report Date: 01 Aug-06 11:10 AM
Test Link: 07-0250-5695/B161912psc

Plant Bioassay - Chronic — **CH2M Hill**

Test No:	06-7992-3248	**Test Type:**	Plant Chronic	**Duration:**	28d 0h
Start Date:	28 Jun-06	**Protocol:**	ASTM E1963-02 (2002)	**Species:**	Poa sandbergii
Ending Date:	26 Jul-06	**Dil Water:**		**Source:**	
Setup Date:	28 Jun-06 12:00 AM	**Brine:**			

Sample No:	11-7753-5399	**Code:**	B1619-12	**Client:**	
Sample Date:	19 Jun-06 12:12 AM	**Material:**	Soil	**Project:**	
Receive Date:		**Source:**	Hanford		
Sample Age:	8d 23h	**Station:**			

Comments: J12NB0

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
11-3256-1266	% Germination	100	> 100	N/A	9.54%	Wilcoxon Rank Sum Two-Sample
13-7685-7077	Average Height (mm)	100	> 100	N/A	11.11%	Equal Variance t Two-Sample
08-0907-4639	Average Length (mm)	< 100	100	N/A	13.63%	Equal Variance t Two-Sample
06-9710-3132	Average AG Wt (Wet, mg)	< 100	100	N/A	21.89%	Equal Variance t Two-Sample
09-8457-8729	Average AG Wt (Dry, mg)	100	> 100	N/A	21.81%	Equal Variance t Two-Sample
12-1607-1535	Average Root Wt. (Wet, mg	100	> 100	N/A	21.52%	Equal Variance t Two-Sample
08-2869-7147	Average Root Wt. (Dry, mg)	100	> 100	N/A	25.43%	Equal Variance t Two-Sample
11-5047-5136	Average Total Wt (Wet, mg	< 100	100	N/A	20.93%	Equal Variance t Two-Sample
09-5669-2046	Average Total Wt (Dry, mg)	100	> 100	N/A	22.42%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 01 Aug-06 11:10 AM
Test Link: 07-0250-5695/B161912psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	0.96000	0.80000	1.00000	0.04000	0.08944	9.32%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	78.420	74.400	86.2	2.2495	5.0301	6.41%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	81.98	67.5	106.6	6.6679	14.91	18.19%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	21.606	15.388	32.122	2.8092	6.2816	29.07%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	3.70851	2.65250	4.86001	0.35790	0.80030	21.58%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	26.278	22.142	34.210	2.2533	5.0386	19.17%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.07840	0.72000	1.48601	0.12569	0.28105	26.06%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	47.884	39.568	66.332	4.9079	10.974	22.92%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	4.78691	3.37250	6.34602	0.48156	1.07681	22.49%

CETIS Test Summary

Report Date: 01 Aug-06 11:10 AM
Test Link: 07-0250-5695/B161912psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	0.80000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		86.2	75.3000	75.4000	74.4000	80.8000

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		106.6	67.5	75.2	83.6	77

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.456	33.2520	34.672
100		32.1220	15.3875	21.3040	19.1060	20.1100

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		4.86001	2.65250	3.95601	3.55601	3.51802

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		34.2100	24.1800	28.2280	22.6280	22.142

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.48601	0.72000	1.14199	0.94800	1.09600

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		66.3320	39.5675	49.5320	41.7340	42.2520

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		6.34602	3.37250	5.09800	4.50400	4.61401

CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
% Germination	Comparison	07-0250-5695	07-0250-5695	01 Aug-06 11:09 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	9.54%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	25		0.3452	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.0056708	0.005671	1	1.00	0.34659	Non-Significant Effect
Error	0.0453663	0.005671	8			
Total	0.05103711	0.0113416	9			

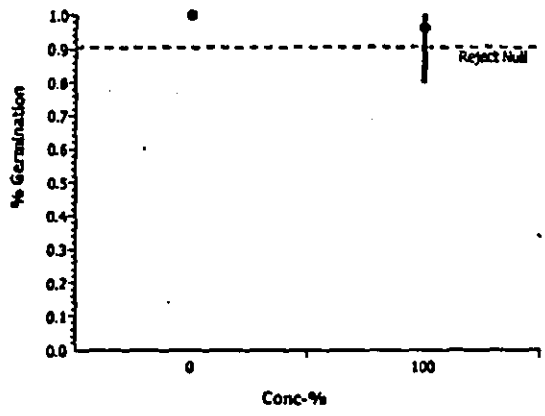
ANOVA Assumptions

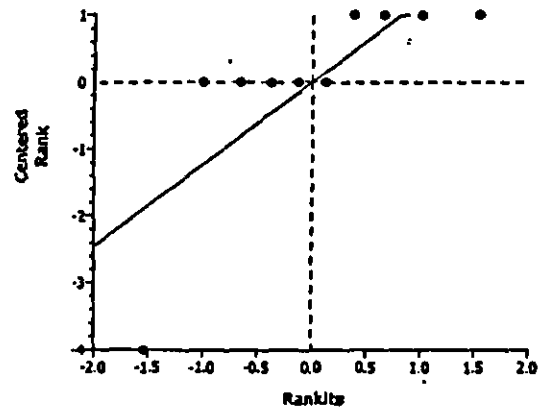
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	1.60000	11.25862	0.24150	Equal Variances
Distribution	Shapiro-Wilk W	0.62470		0.00011	Non-normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	6.00000	6.00000	6.00000	0.00000
100		5	0.96000	0.80000	1.00000	0.08944	5.00000	1.00000	6.00000	2.23607

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Height (mm)	Comparison	07-0250-5695	07-0250-5695	01 Aug-06 11:09 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	11.11%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.51709	1.85955	0.0839	9.58524	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	152.881	152.881	1	2.30	0.16772	Non-Significant Effect
Error	531.3999	66.42499	8			
Total	684.280884	219.30597	9			

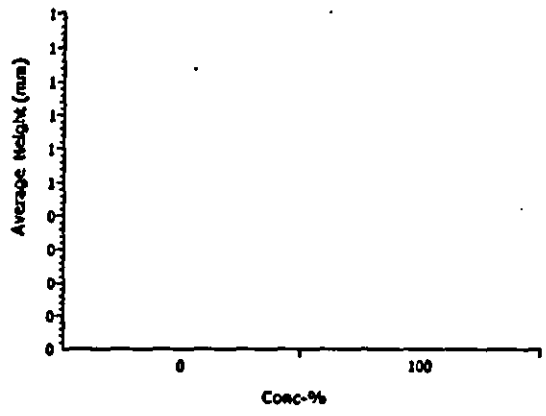
ANOVA Assumptions

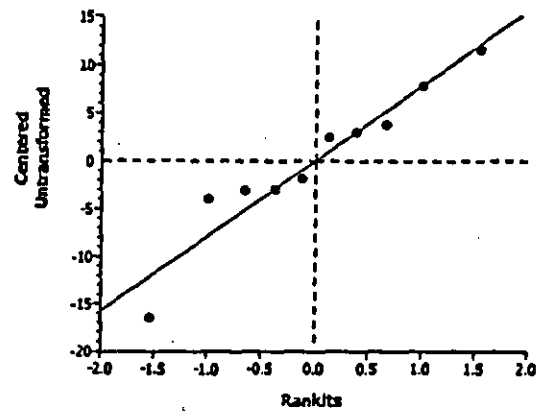
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	4.25058	23.15450	0.19001	Equal Variances
Distribution	Shapiro-Wilk W	0.93783		0.52913	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	78.420	74.4	86.2	5.0301				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	07-0250-5695	07-0250-5695	01 Aug-06 11:09 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	13.63%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	3.25701	1.85955	0.0058	14.6731	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1651.225	1651.225	1	10.61	0.01158	Significant Effect
Error	1245.256	155.657	8			
Total	2896.48096	1806.882	9			

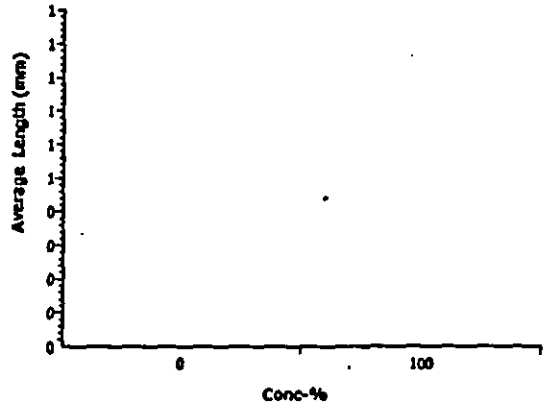
ANOVA Assumptions

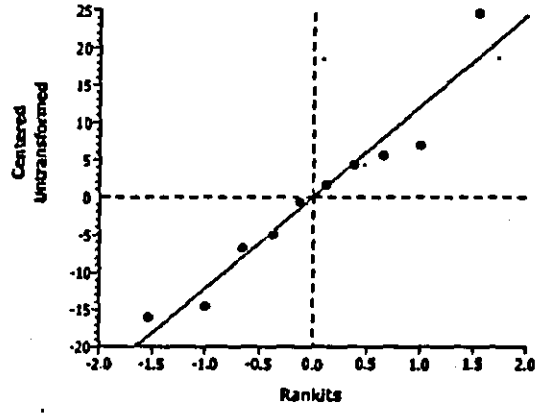
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.49744	23.15450	0.39701	Equal Variances
Distribution	Shapiro-Wilk W	0.94262		0.58251	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	81.98	67.5	106.6	14.91				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average AG Wt (Wet, mg)	Comparison	07-0250-5695	07-0250-5695	01 Aug-06 11:09 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	21.89%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	2.67102	1.85955	0.0142	6.89739	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	245.3858	245.3858	1	7.13	0.02832	Significant Effect
Error	275.1595	34.39494	8			
Total	520.545135	279.78056	9			

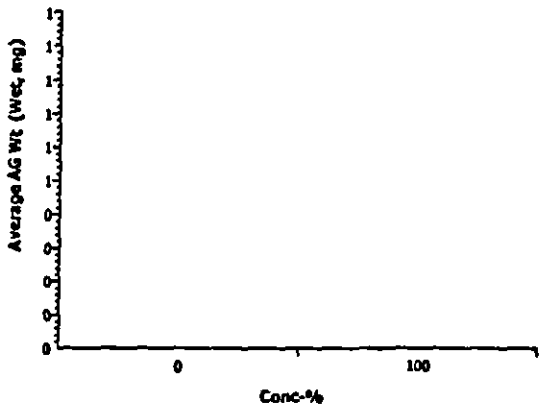
ANOVA Assumptions

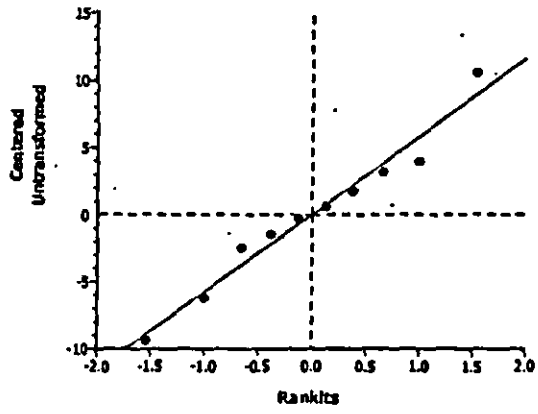
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.34529	23.15450	0.78075	Equal Variances
Distribution	Shapiro-Wilk W	0.97947		0.96226	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	21.606	15.388	32.122	6.2816				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average AG Wt (Dry, mg)	Comparison	07-0250-5695	07-0250-5695	01 Aug-06 11:09 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	21.81%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.38805	1.85955	0.1013	0.96802	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	1.299901	1.299901	1	1.93	0.20255	Non-Significant Effect
Error	5.397448	0.674681	8			
Total	6.69734955	1.9745825	9			

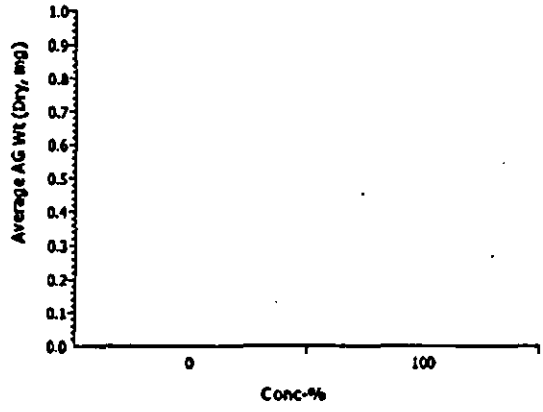
ANOVA Assumptions

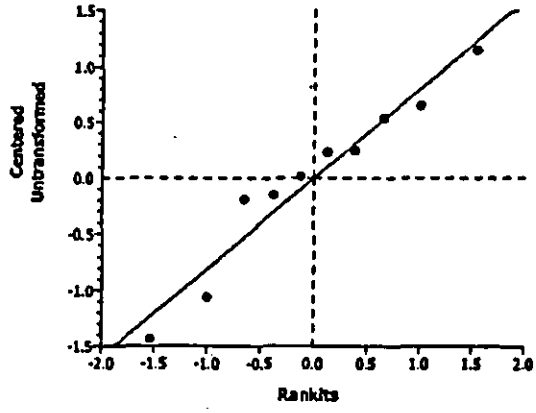
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.10680	23.15450	0.92402	Equal Variances
Distribution	Shapiro-Wilk W	0.94743		0.63821	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	3.70851	2.65250	4.86001	0.80030				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic	CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Wet, mg)	Comparison	07-0250-5695	07-0250-5695	01 Aug-06 11:09 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	21.52%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.62117	1.85955	0.0718	6.96208	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	92.09982	92.09982	1	2.63	0.14364	Non-Significant Effect
Error	280.3452	35.04315	8			
Total	372.445030	127.14297	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.76067	23.15450	0.59715	Equal Variances
Distribution	Shapiro-Wilk W	0.96226		0.81130	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	26.278	22.142	34.210	5.0386				

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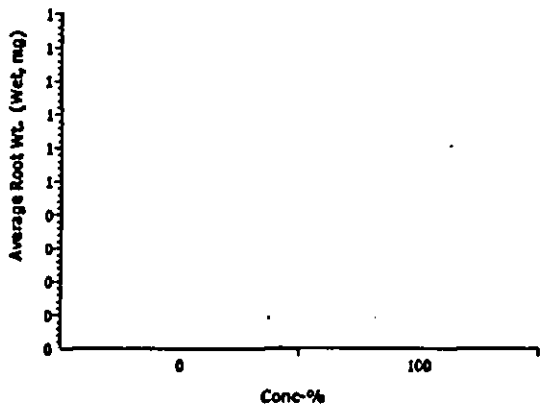

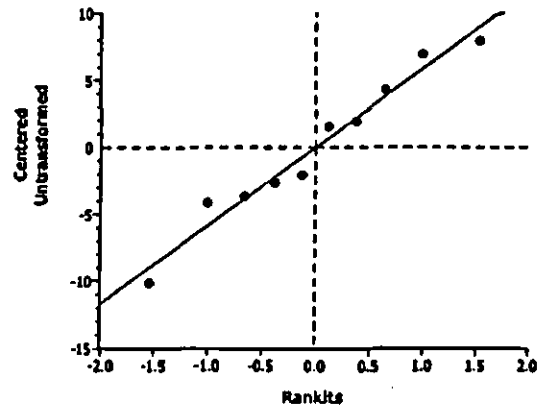

CETIS Analysis Detail

Plant Bioassay - Chronic	CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Dry, mg)	Comparison	07-0250-5695	07-0250-5695	01 Aug-06 11:09 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	25.43%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.18609	1.85955	0.1348	0.32735	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.1089911	0.108991	1	1.41	0.26962	Non-Significant Effect
Error	0.6197968	0.077475	8			
Total	0.72878791	0.1864657	9			

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.03986	23.15450	0.97069	Equal Variances
Distribution	Shapiro-Wilk W	0.93716		0.52190	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.07840	0.72000	1.48601	0.28105				

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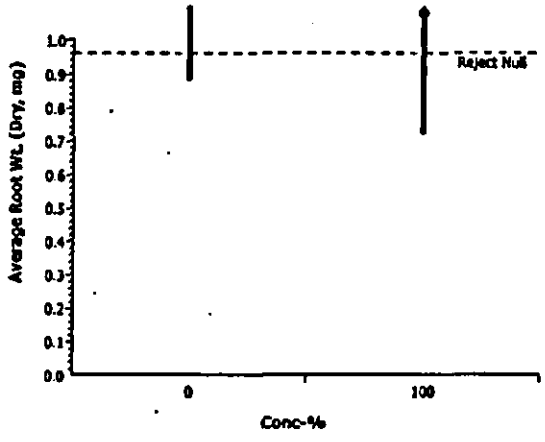
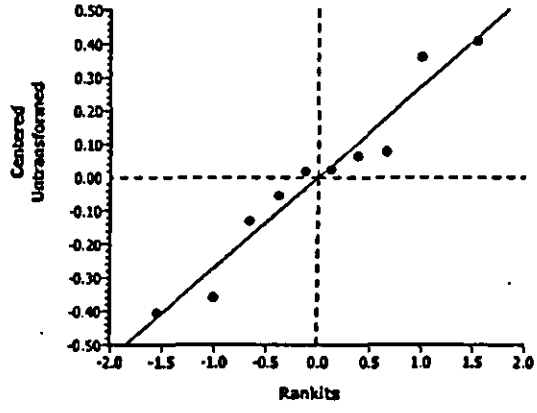




CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Wet, mg)	Comparison	07-0250-5695	07-0250-5695	01 Aug-06 11:10 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	20.93%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.22282	1.85955	0.0285	13.3658	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	638.1513	638.1513	1	4.94	0.05693	Non-Significant Effect
Error	1033.249	129.1561	8			
Total	1671.40045	767.30745	9			

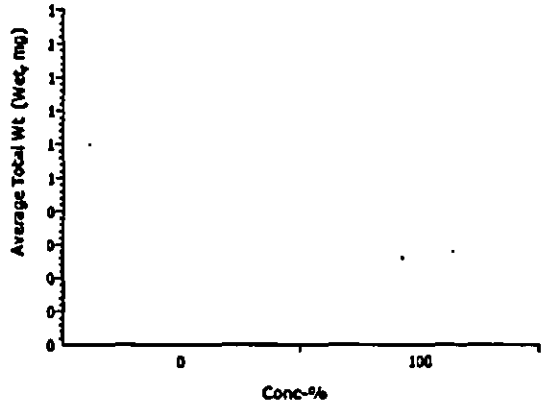
ANOVA Assumptions

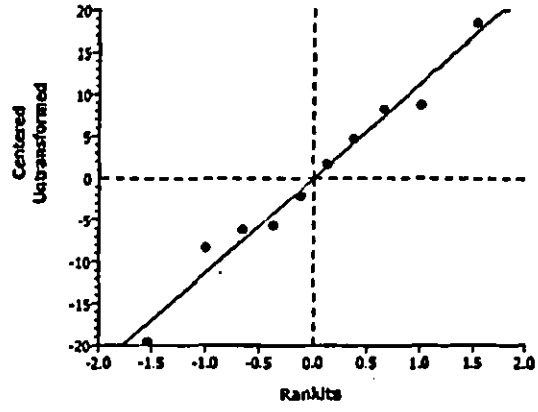
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.14478	23.15450	0.89890	Equal Variances
Distribution	Shapiro-Wilk W	0.98422		0.98374	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	47.884	39.568	66.332	10.974				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Total Wt (Dry, mg)	Comparison	07-0250-5695	07-0250-5695	01 Aug-08 11:10 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	22.42%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.34888	1.85955	0.1072	1.28192	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	2.161693	2.161693	1	1.82	0.21431	Non-Significant Effect
Error	9.504714	1.188089	8			
Total	11.6664073	3.3497826	9			

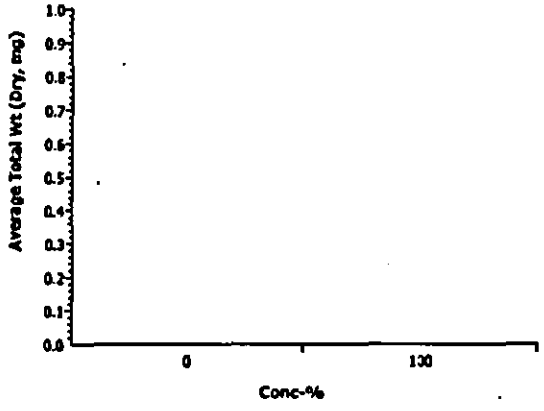
ANOVA Assumptions

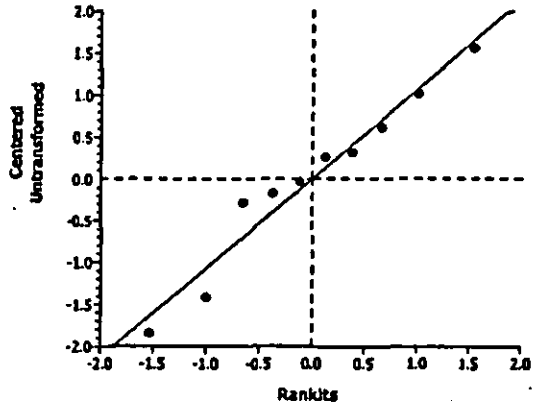
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.04927	23.15450	0.96394	Equal Variances
Distribution	Shapiro-Wilk W	0.95575		0.73654	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	4.78691	3.37250	6.34602	1.07681				

Graphics





BLUEGRASS GROWTH TEST

Client: Washington Closure Hanford Project

Test Start Date: June 28, 2006

Day 0 (TP) Day 12 NJ Day 14 NJ Day 16 NJ Day 19 NJ Day 21 NJ Day 23 ____ Day 28 NJ/BM Day ____

Bioassay Lab ID: BG 1619-13 Sample No: J12N99

CONC.	REPLICATE	# seeds germinated: Emergence 12 days after planting	14 days after planting	16 days after planting	19 days after planting	21 days after planting	23 days after planting	7-DAYS POST-EMERGENCE (21 days after planting)	14-DAYS POST-EMERGENCE (28 days after planting)	pH: INITIAL (@ planting)	FINAL (@ 14 days Post-Emergence)
Control	A	6	7	7	7			7->5	5	8.2	8.3
	B	5	5	5	5			5	5		
	C	9	9	9	9			9->5	5		
	D	6	6	6	6			6->5	5		
	E	4	6	6	6			6->5	5		

7-Days Post-Emergence: Selectively thin down to 5 Seedlings (leave the 5 tallest seedlings). Describe shoot appearance:

Replicate A 1lg G 3medG 1smG Remove-2smG

Replicate B 2lgG 3medG

Replicate C 4lgG, 1medG Remove-4medG

Replicate D 2lgG, 3medG Remove-1smG

Replicate E 1lgG, 1medG, 3smG

Appearance Code: Good (G) = deep green color with no brown, Brown (B) = brown color noted, # Lg = # of large plants (tallest, 6+ shoots), # Med = # of plants (smaller than large, fewer shoots), # Sm = # small plants (1-3 shoots)

14-Days Post-Emergence: Describe shoot appearance:

Replicate A 2lgG, 2medG, 1smG

Replicate B 1lgG, 4medG

Replicate C 4lgG, 1medG

Replicate D 3lgG, 1medG, 1smG

Replicate E 2lgG, 2medG, 1smG

Measure Shoot Height: Individual height of each seedling (above ground)

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	80 mm	74 mm	64 mm	95 mm	54 mm
Replicate B	65 mm	101 mm	75 mm	66 mm	64 mm
Replicate C	90 mm	84 mm	86 mm	93 mm	75 mm
Replicate D	86 mm	58 mm	78 mm	104 mm	84 mm
Replicate E	100 mm	50 mm	81 mm	59 mm	61 mm

Measure Shoot Weight: Total mass of all seedlings (above ground)

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1302.08	1406.0	1318.19
Replicate B	1299.10	1413.1	1316.62
Replicate C	1287.63	1442.8	1315.10
Replicate D	1273.26	1419.0	1296.32
Replicate E	1287.82	1378.2	1301.50

Describe root appearance:

Replicate A

Replicate B

Replicate C

Replicate D

Replicate E

Measure Root Length: Individual length of the longest root from each seedling

	1st Seedling	2nd Seedling	3rd Seedling	4th Seedling	5th Seedling
Replicate A	30 mm	98 mm	73 mm	57 mm	125 mm
Replicate B	112 mm	60 mm	58 mm	53 mm	68 mm
Replicate C	131 mm	101 mm	90 mm	65 mm	70 mm
Replicate D	69 mm	96 mm	124 mm	110 mm	57 mm
Replicate E	56 mm	47 mm	87 mm	40 mm	86 mm

Measure Root Weight: Total mass of all roots from all seedlings

	Tin Tare Wt. (mg)	Wet Wt (mg)	Dry Wt. (mg)
Replicate A	1294.92	1412.7	1301.17
Replicate B	1289.06	1377.9	1294.33
Replicate C	1298.14	1467.7	1312.05
Replicate D	1288.68	1442.7	1296.87
Replicate E	1290.80	1378.6	1295.74

Comments:

CETIS Test Summary

Report Date: 01 Aug-06 11:12 AM
Test Link: 12-8868-1295/B161913psc

Plant Bioassay - Chronic — CH2M Hill

Test No:	15-3870-7861	Test Type:	Plant Chronic	Duration:	28d 0h
Start Date:	28 Jun-06	Protocol:	ASTM E1963-02 (2002)	Species:	Poa sandbergii
Ending Date:	26 Jul-06	Dil Water:		Source:	
Setup Date:	28 Jun-06 12:00 AM	Brine:			

Sample No:	04-4520-6321	Code:	B1619-13	Client:	
Sample Date:	19 Jun-06 12:13 AM	Material:	Soil	Project:	
Receive Date:		Source:	Hanford		
Sample Age:	8d 23h	Station:			

Comments: J12N99

Comparison Summary

Analysis	Endpoint	NOEL	LOEL	ChV	PMSD	Method
16-8047-8044	% Germination	100	> 100	N/A	5.00%	Wilcoxon Rank Sum Two-Sample
05-6460-3204	Average Height (mm)	100	> 100	N/A	11.95%	Equal Variance t Two-Sample
02-3590-2581	Average Length (mm)	< 100	100	N/A	12.29%	Equal Variance t Two-Sample
08-2429-4116	Average AG Wt (Wet, mg)	< 100	100	N/A	20.42%	Equal Variance t Two-Sample
11-0904-1165	Average AG Wt (Dry, mg)	100	> 100	N/A	26.31%	Equal Variance t Two-Sample
03-5221-1405	Average Root Wt. (Wet, mg	100	> 100	N/A	25.75%	Equal Variance t Two-Sample
09-0737-9630	Average Root Wt. (Dry, mg)	100	> 100	N/A	50.88%	Equal Variance t Two-Sample
06-1758-0933	Average Total Wt (Wet, mg	< 100	100	N/A	22.53%	Equal Variance t Two-Sample
07-1341-0245	Average Total Wt (Dry, mg)	100	> 100	N/A	31.05%	Equal Variance t Two-Sample

CETIS Test Summary

Report Date: 01 Aug-06 11:12 AM
Test Link: 12-8868-1295/B161913psc

% Germination Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%
100		5	1.00000	1.00000	1.00000	0.00000	0.00000	0.00%

Average Height (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	86.240	69.800	97.800	4.6378	10.371	12.03%
100		5	76.68	70.2	85.6	3.0322	6.7803	8.84%

Average Length (mm) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	107.68	91.6	114.6	4.2193	9.4346	8.76%
100		5	78.76	63.200	92.2	5.7318	12.817	16.27%

Average AG Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	31.513	22.108	35.456	2.4220	5.4158	17.19%
100		5	24.368	18.076	31.034	2.4716	5.5267	22.68%

Average AG Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.37653	0.84195	19.01%
100		5	3.91360	2.73601	5.49399	0.50091	1.12007	28.62%

Average Root Wt. (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	32.347	22.212	39.298	2.9899	6.6857	20.67%
100		5	24.72	17.56	33.912	3.3351	7.4575	30.17%

Average Root Wt. (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.12326	0.27561	21.41%
100		5	1.54239	0.98799	2.78201	0.32994	0.73776	47.83%

Average Total Wt (Wet, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	63.860	44.32	72.550	5.2512	11.742	18.39%
100		5	49.088	35.636	64.946	5.6815	12.704	25.88%

Average Total Wt (Dry, mg) Summary

Conc-%	Control Type	Reps	Mean	Minimum	Maximum	SE	SD	CV
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	0.49329	1.10302	19.29%
100		5	5.45599	3.72400	8.27600	0.81723	1.82738	33.49%

CETIS Test Summary

Report Date: 01 Aug-06 11:12 AM
Test Link: 12-8868-1295/B161913psc

% Germination Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	1.00000	1.00000	1.00000	1.00000	1.00000
100		1.00000	1.00000	1.00000	1.00000	1.00000

Average Height (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	69.8000	84.4000	89.2	97.8000	90
100		71.4000	74.2	85.6	82	70.2

Average Length (mm) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	91.6	112	107	113.2	114.6
100		76.6	70.4000	91.4000	92.2	63.2000

Average AG Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.108	32.0780	35.458	33.2520	34.672
100		20.7840	22.8	31.0340	29.148	18.0760

Average AG Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	2.99199	4.44600	4.96799	5.08198	4.65999
100		3.22200	3.50400	5.49399	4.61199	2.73601

Average Root Wt. (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	22.212	29.7040	36.6380	39.298	33.884
100		23.556	17.768	33.912	30.804	17.56

Average Root Wt. (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	0.88198	1.23201	1.36401	1.64800	1.30999
100		1.25000	1.05398	2.78201	1.63799	0.98799

Average Total Wt (Wet, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	44.32	61.7820	72.094	72.5500	68.556
100		44.34	40.568	64.946	59.952	35.636

Average Total Wt (Dry, mg) Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Artificial Soil/S	3.87397	5.67800	6.33201	6.72998	5.96997
100		4.47200	4.55798	8.27600	6.24998	3.72400

CETIS Analysis Detail

Plant Bioassay - Chronic					CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**
% Germination	Comparison	12-8868-1295	12-8868-1295	01 Aug-06 11:12 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Wilcoxon Rank Sum Two-Sample	C > T	Rank		100	>100	1	N/A	5.00%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	Ties	Decision(0.05)
Artificial Soil/Sedi		100	27.5		0.5000	5	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0	0	1	65535.0	0.00000	Significant Effect
Error	0	0	8			
Total	0	0	9			

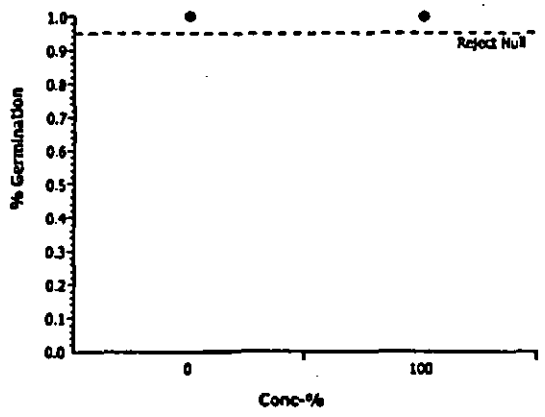
ANOVA Assumptions

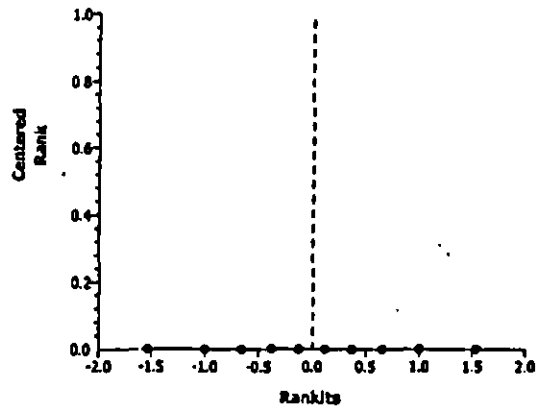
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Modified Levene	65535.00000	11.25862	0.00000	Unequal Variances

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000
100		5	1.00000	1.00000	1.00000	0.00000	5.50000	5.50000	5.50000	0.00000

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Height (mm)	Comparison	12-8868-1295	12-8868-1295	01 Aug-06 11:12 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	11.95%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.72528	1.85955	0.0614	10.304	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	228.4841	228.4841	1	2.98	0.12276	Non-Significant Effect
Error	614.08	76.75999	8			
Total	842.564056	305.24409	9			

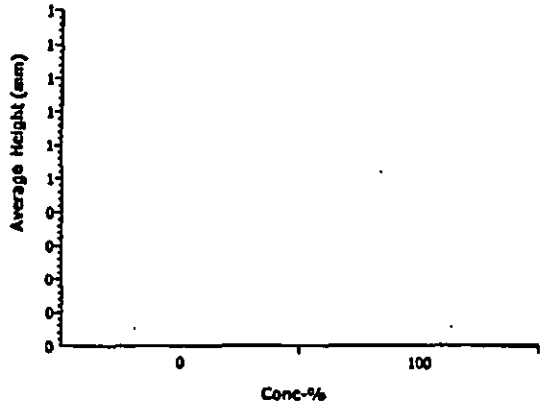
ANOVA Assumptions

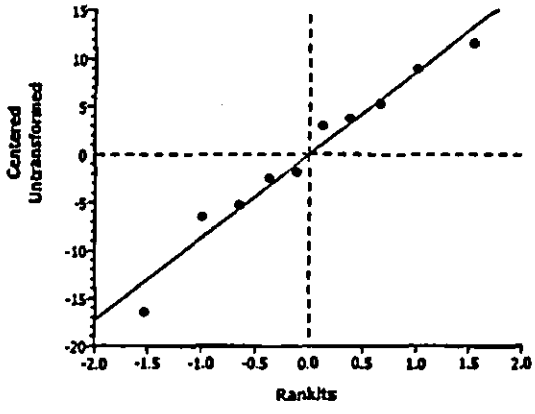
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.33942	23.15450	0.43062	Equal Variances
Distribution	Shapiro-Wilk W	0.96641		0.85571	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	86.240	69.8	97.8	10.371				
100		5	76.68	70.2	85.6	6.7803				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Length (mm)	Comparison	12-8868-1295	12-8868-1295	01 Aug-06 11:12 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	12.29%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	4.06334	1.85955	0.0018	13.235	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	2090.916	2090.916	1	16.51	0.00362	Significant Effect
Error	1013.12	126.64	8			
Total	3104.03571	2217.5558	9			

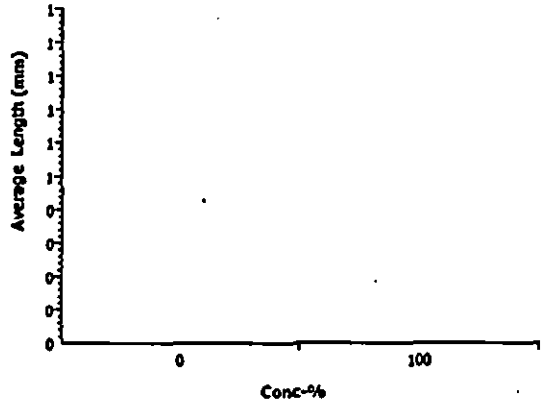
ANOVA Assumptions

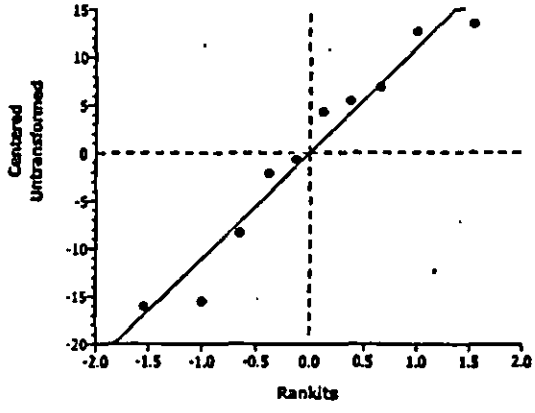
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.84546	23.15450	0.56743	Equal Variances
Distribution	Shapiro-Wilk W	0.92615		0.41113	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	107.68	91.6	114.6	9.4346				
100		5	78.76	63.2	92.2	12.817				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average AG Wt (Wet, mg)	Comparison	12-8868-1295	12-8868-1295	01 Aug-06 11:12 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	20.42%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	2.06467	1.85955	0.0364	6.43496	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	127.6201	127.6201	1	4.26	0.07283	Non-Significant Effect
Error	239.501	29.93763	8			
Total	367.121109	157.55771	9			

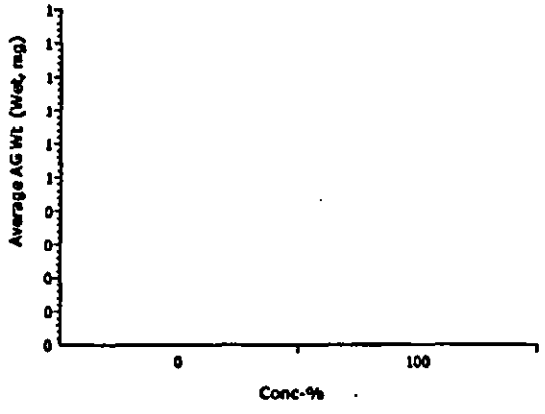
ANOVA Assumptions

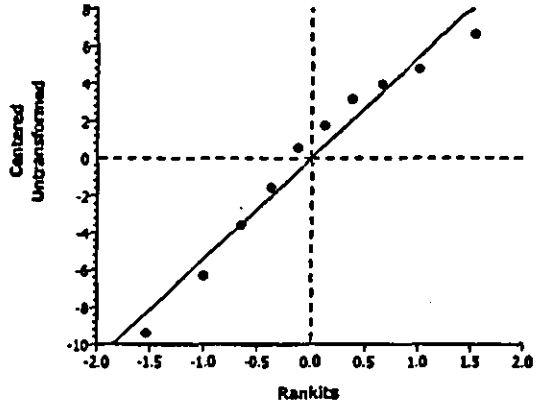
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.04136	23.15450	0.96961	Equal Variances
Distribution	Shapiro-Wilk W	0.95245		0.69750	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	31.513	22.108	35.456	5.4158				
100		5	24.368	18.076	31.034	5.5267				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average AG Wt (Dry, mg)	Comparison	12-8868-1295	12-8868-1295	01 Aug-06 11:12 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	26.31%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.82342	1.85955	0.2171	1.16528	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.6656177	0.665618	1	0.68	0.43413	Non-Significant Effect
Error	7.853723	0.981715	8			
Total	8.51934075	1.6473331	9			

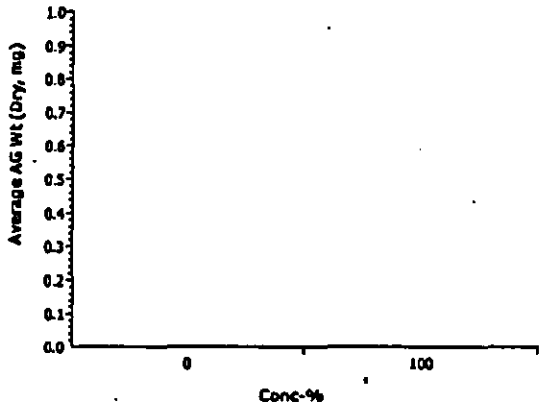
ANOVA Assumptions

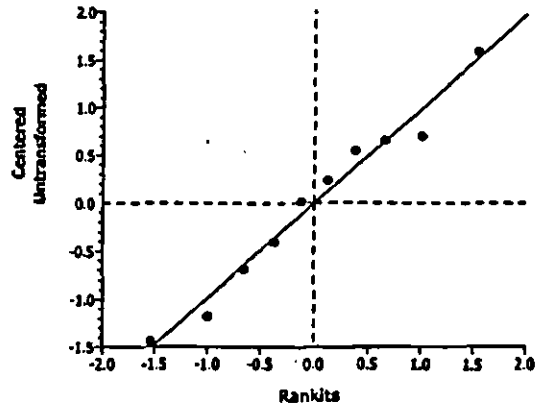
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.76975	23.15450	0.59388	Equal Variances
Distribution	Shapiro-Wilk W	0.97111		0.90096	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	4.42959	2.99199	5.08198	0.84195				
100		5	3.91360	2.73601	5.49399	1.12007				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Root Wt. (Wet, mg)	Comparison	12-8868-1295	12-8868-1295	01 Aug-06 11:12 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	25.75%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	1.70283	1.85955	0.0635	8.32918	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	145.4359	145.4359	1	2.90	0.12701	Non-Significant Effect
Error	401.2539	50.15674	8			
Total	546.689804	195.59261	9			

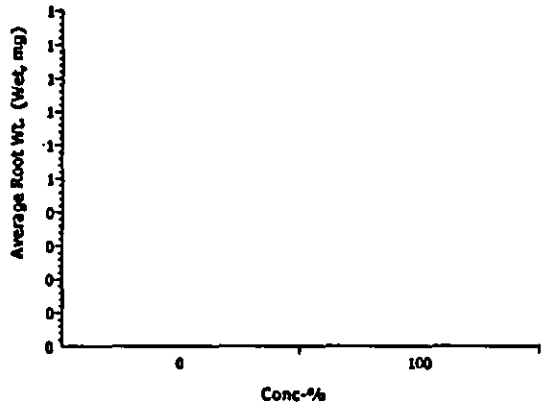
ANOVA Assumptions

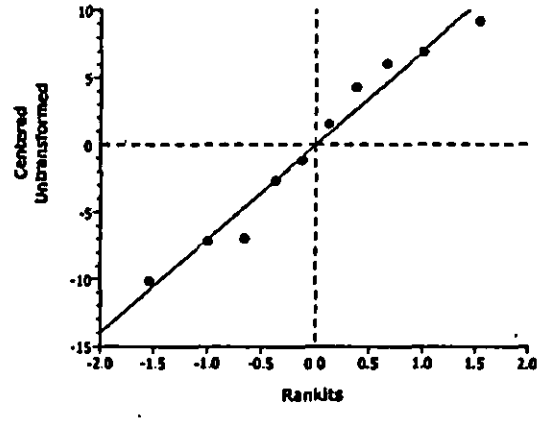
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.24421	23.15450	0.83742	Equal Variances
Distribution	Shapiro-Wilk W	0.94613		0.62297	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	32.347	22.212	39.298	6.6857				
100		5	24.72	17.56	33.912	7.4575				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Root Wt. (Dry, mg)	Comparison	12-8868-1295	12-8868-1295	01 Aug-06 11:12 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	50.88%

Group Comparisons

Control vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi	100	-0.7246	1.85955	0.7553	0.65495	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.1628116	0.162812	1	0.52	0.48937	Non-Significant Effect
Error	2.481029	0.310129	8			
Total	2.64384063	0.4729402	9			

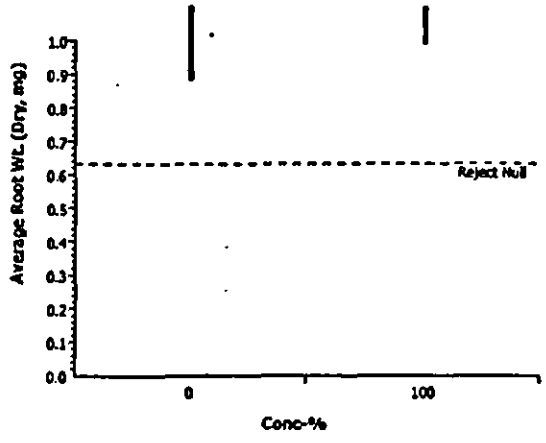
ANOVA Assumptions

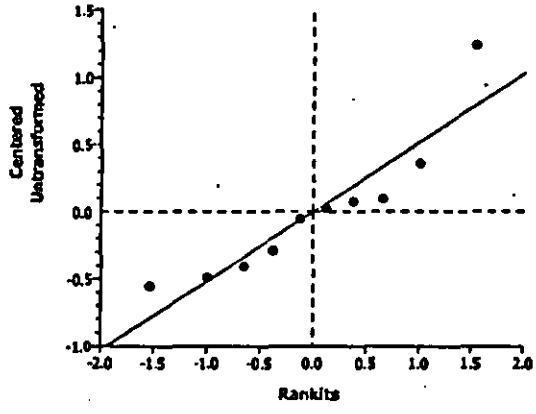
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	7.16551	23.15450	0.08264	Equal Variances
Distribution	Shapiro-Wilk W	0.86438		0.08593	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	1.28720	0.88198	1.64800	0.27561				
100		5	1.54239	0.98799	2.78201	0.73776				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic — CH2M Hill

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Average Total Wt (Wet, mg)	Comparison	12-8868-1295	12-8868-1295	01 Aug-06 11:12 AM	CETISv1.1.2

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		<100	100		N/A	22.53%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	1.90937	1.85955	0.0463	14.3865	Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	545.5302	545.5302	1	3.65	0.09262	Non-Significant Effect
Error	1197.091	149.6364	8			
Total	1742.62097	695.16650	9			

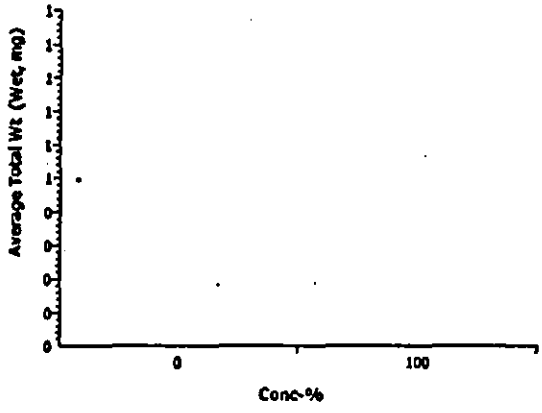
ANOVA Assumptions

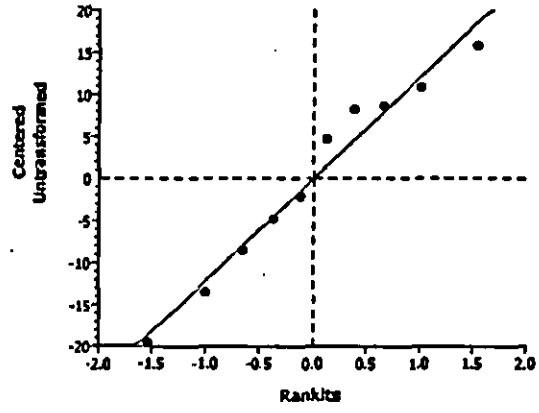
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	1.17062	23.15450	0.88234	Equal Variances
Distribution	Shapiro-Wilk W	0.95786		0.76124	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	63.860	44.32	72.55	11.742				
100		5	49.088	35.636	64.946	12.704				

Graphics





CETIS Analysis Detail

Plant Bioassay - Chronic						CH2M Hill
Endpoint	**Analysis Type**	**Sample Link**	**Control Link**	**Date Analyzed**	**Version**	
Average Total Wt (Dry, mg)	Comparison	12-8868-1295	12-8868-1295	01 Aug-06 11:12 AM	CETISv1.1.2	

Method	Alt H	Data Transform	Zeta	NOEL	LOEL	Toxic Units	ChV	PMSD
Equal Variance t Two-Sample	C > T	Untransformed		100	>100	1	N/A	31.05%

Group Comparisons

Control	vs	Conc-%	Statistic	Critical	P-Value	MSD	Decision(0.05)
Artificial Soil/Sedi		100	0.27321	1.85955	0.3958	1.77506	Non-Significant Effect

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P-Value	Decision(0.05)
Between	0.1700362	0.170036	1	0.07	0.79161	Non-Significant Effect
Error	18.22395	2.277993	8			
Total	18.3939818	2.4480294	9			

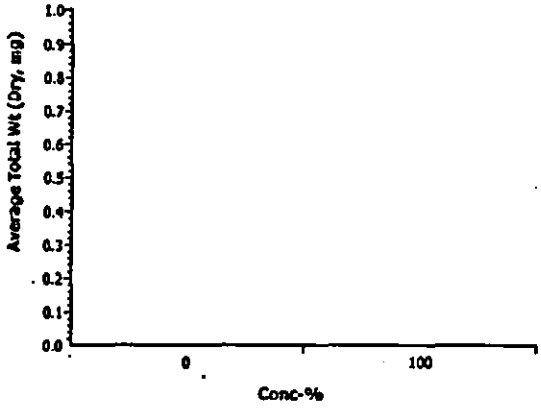
ANOVA Assumptions

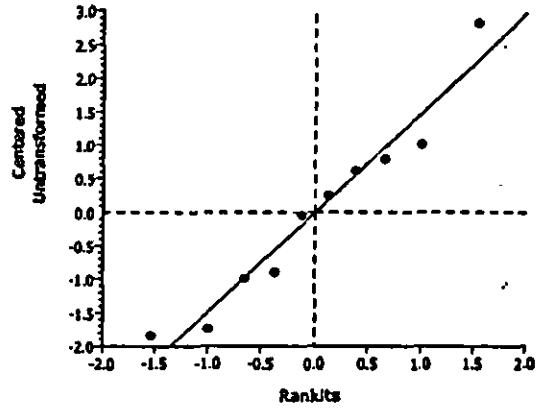
Attribute	Test	Statistic	Critical	P-Value	Decision(0.01)
Variances	Variance Ratio F	2.74468	23.15450	0.35170	Equal Variances
Distribution	Shapiro-Wilk W	0.94816		0.64683	Normal Distribution

Data Summary

			Original Data				Transformed Data			
Conc-%	Control Type	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
0	Artificial Soil/S	5	5.71679	3.87397	6.72998	1.10302				
100		5	5.45599	3.72400	8.27600	1.82738				

Graphics





APPENDIX B
CHAIN OF CUSTODY

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-9	Page 1 of 1

Collector: Tiller, B.	Company Contact: JOAN KESSNER — Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location: 1607-D2:1	SAF No.: RC-072	Air Quality ☐
Ice Chest No.: FRC-96-012	Field Logbook No.: EL-1597-82 BT 06-19-06 — COA: BESRAS6520	Method of Shipment: GROUND TRANSPORT Fed EX 6/21/06	
Shipped To: CH2MHill - Corvallis	Offsite Property No.: A060451	Bill of Ladine/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
NONE

Special Handling and/or Storage
COOL 4 C

Preservation	COOL 4 C → ~~None~~	~~None~~ 4 6/19/06									
Type of Container	P	P/G									
No. of Container(s)	1	2 4 6/19/06									
Volume	1000g	1000g									

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions	Soil Plant Toxicity ASTM E1963									
J12N97	SOIL	06-19-06	1210	X	X		B1619-	01						-1
J12N98	SOIL	6-19-06	1240	X	X		B1619	02						-2

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
BRETT TILLER	6-19-06 1700	EAS LOCKED STORAGE	6-19-06 1700
EAS LOCKED STORAGE	6-21-06 0900	LR Elmslie	6-21-06 0900
LR Elmslie	6/21/06 1500	Fed EX	
Fed Ex	6/22/06	Doug Howard CH2M HILL	6-22-06 14:00

SPECIAL INSTRUCTIONS
(1) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

B

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
Ve=Vegetation
X=Other

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

BHI-EE-011 (08/29/2005)

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-14	Page 1 of 1

Collector: Tiller, B.	Company Contact: JOAN KESSNER	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Price Code: 8N	Data Turnaround: 45 Days	Air Quality ☐	
Project Designation: 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location: 618-4	SAF No.: RC-072	
Ice Chest No.: ERC-96-012	Field Logbook No.: EL-1597-1	COA: BESRAS6520	Method of Shipment: GROUND TRANSPORT Fed Ex no 6/21/06
Shipped To: CH2MHill - Corvallis	Offsite Property No.: A060451		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS
NONE

Special Handling and/or Storage
COOL 4 C

Preservation	COOL 4C →	~~None~~	~~None~~ 6/16/06							
Type of Container	P	P/G								
No. of Container(s)	1	2								
Volume	1000g	1,2000g } Tare 6-21-06								
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Soil Plant Toxicity ASTM E1963								

Sample No.	Matrix *	Sample Date	Sample Time										
J12NB8	SOIL	06-19-06	1500	X	X		B1619-03						-3
J12NB9	SOIL	06-19-06	1530	X	X		B1619-04						-4
J12NC0	SOIL	06-19-06	1600	X	X		B1619-05						-5

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: BRETT TILLER	Date/Time: 6-19-06 1700	Received By/Stored In: EAS LOCKED STORAGE	Date/Time: 6-19-06 1700
Relinquished By/Removed From: EAS LOCKED STORAGE	Date/Time: 6-21-06 0900	Received By/Stored In: JR Blackburn 6-21-06	Date/Time: 0900
Relinquished By/Removed From: JR Blackburn 6-21-06	Date/Time: 1500	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: FedEx	Date/Time: 6/22/06	Received By/Stored In: Daisy Hubbard CH2M HILL	Date/Time: 6-22-06 14:00
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) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045. Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

Matrix *
S=Soil
SlS=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 (08/29/2005)

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-13	Page 1 of 1

Collector: Tiller, B.	Company Contact: JOAN KESSNER — Telephone No.: 375-4688	Project Coordinator: KESSNER, JH	Price Code: 8N — Data Turnaround: 45 Days
Project Designation: 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location: 600-181	SAF No.: RC-072	Air Quality ☐
Ice Chest No.: ERC-96-012	Field Logbook No.: EL-1597-X2 BT 6-20-06 — COA: BESRAS6520	Method of Shipment: ~~GROUND TRANSPORT~~ Fed Ex 6/21/06	
Shipped To: CH2MHill - Corvallis	Offsite Property No.: A060451	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
NONE

Special Handling and/or Storage
COOL 4C

Preservation	COOL 4C → ~~None~~ ~~None~~ AM 61406										
Type of Container	P	P/G									
No. of Container(s)	1	2									
Volume	1000g	2000g									
SAMPLE ANALYSIS	See item (1) in Special Instructions	Soil Plant Toxicity ASTM E1963									

Sample No.	Matrix *	Sample Date	Sample Time										
J12NB4	SOIL	06-20-06	1045	X	X		B1619-	06					-6
J12NB5	SOIL	06-20-06	1130	X	X		B1619-	07					-7
J12NB6	SOIL	06-20-06	1200	X	X		B1619	08					-8
~~J12NB7~~	~~SOIL~~	AM 61306											

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: BRETT TILLER	Date/Time: 1320 6-20-06	Received By/Stored In: EAS LOCKED STORAGE	Date/Time: 1320 6-20-06
Relinquished By/Removed From: EAS LOCKED STORAGE	Date/Time: 0900 6-21-06	Received By/Stored In: JR Edmondson	Date/Time:
Relinquished By/Removed From: JR Edmondson	Date/Time: 6-21-06 1500	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 6-22-06	Received By/Stored In: Nancy Hubbard CH2M HILL	Date/Time: 6-22-06 14:00
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) Particle Size (Dry Sieve) - D422, Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

Matrix *
SoSoil
SdSediment
SOuSolid
SlSludge
WaWater
OnOil
AnAir
DSoDrum Solids
DLoDrum Liquids
TsTissue
WiWipe
LeLeipoid
VeVegetation
OtOther

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

BHI-EE-011 (08/29/2005)

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-12	Page 1 of 1

Collector Tiller, B.	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Project Designation 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location 600-171		SAF No. RC-072
Ice Chest No. ERC-96-012	Field Logbook No. EL-1597-Y2	COA BESRAS6520	Method of Shipment ~~GROUND TRANSPORT~~ Fed Ex
Shipped To CH2MHill - Corvallis	Offsite Property No. A060451		Bill of Lading/Air Bill No. SEE OSPC

Price Code: Air Quality ☐

Data Turnaround: 45 Days

MS 6/21/06

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

COOL 4C

COOL 4C → Preservation	~~None~~	~~None~~ 4 6/4/06									
Type of Container	P	P/G									
No. of Container(s)	1	2									
Volume	1000g	~~2000g~~ 1000g SIRE 6-21-06									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Soil Plant Toxicity ASTM E1963									
Sample No. / Matrix * / Sample Date / Sample Time											
J12NB1 / SOIL / 06-20-06 / 0910	X •	X :		B1619-	09						-9
J12NB2 / SOIL / 06-20-06 / 0930	X •	X :		B1619-	10						-10
J12NB3 / SOIL / 06-20-06 / 1000	X •	X •		B1619-	11						-11

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From BRETT TILLER	Date/Time 1320 6-20-06	Received By/Stored In EAS LOCKED STORAGE	Date/Time 1320 6-20-06
Relinquished By/Removed From EAS LOCKED STORAGE	Date/Time 0900 6-21-06	Received By/Stored In JR Ellenbecker	Date/Time 6-21-06 0900
Relinquished By/Removed From JR Ellenbecker WCH	Date/Time 6/21/06 1500	Received By/Stored In Fed EX	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 6/22/06	Received By/Stored In Nancy Hubbard CH2M HILL	Date/Time 6-22-06 14:20
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) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

Matrix *

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

BHI-EE-011 (08/29/2005)

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-11	Page 1 of 1

Collector Tiller, B.	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Project Designation 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location 600-139		SAF No. RC-072
Ice Chest No. E RC-96-012	Field Logbook No. EL-1597-1	COA BESRAS6520	Method of Shipment ~~GROUND TRANSPORT~~ Fed Ex 6/20/06
Shipped To CH2MHill - Corvallis	Offsite Property No. A060451		Bill of Lading/Air Bill No. SEE OSPC

Price Code 8N

Air Quality ☐

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

COOL 4C

Preservation	COOL 4C →	~~None~~	~~None~~ N/A 6/19/06								
Type of Container	P	P/G									
No. of Container(s)	1	2									
Volume	1000g	1 2000g									

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Soil Plant Toxicity - ASTM E1963								
J12NB0	SOIL	06-19-06	1350	X.	X:			B1619-12					

CHAIN OF POSSESSION	Date/Time	Sign/Print Names: Received By/Stored In	Date/Time
Relinquished By/Removed From: BRETT TILLER	6-19-06 1700	EAS LOCKED STORAGE	6-19-06 1700
Relinquished By/Removed From: EAS LOCKED STORAGE	6-21-06 0900	[illegible]	6-21-06 0900
[illegible]	6/21/06 1000	Fed EX	
Relinquished By/Removed From: Fed Ex	6/22/06	Doug Hilliard CH2M HILL	6-22-06 14:30
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

Matrix *

SeSoil
SEnSediment
SOnSolid
SlnSludge
WnWater
OnOil
AnAir
DSnDrum Solids
DLnDrum Liquids
TnTissue
WnWipe
LnLiquid
VnVegetation
XnOther

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

BHI-EE-011 (08/29/2005)

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Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-072-10	Page 1 of 1

Collector Tiller, B.	Company Contact JOAN KESSNER	Telephone No. 375-4688	Project Coordinator KESSNER, JH
Project Designation 100 & 300 Area Component of the RCBRA - Discrete Soil S	Sampling Location 116-DR-1&2		SAF No. RC-072
Ice Chest No. ERC-96-012	Field Logbook No. EL-1597 X2 6-19-06	COA BESRAS6520	Method of Shipment ~~GROUND TRANSPORT~~ Fed Ex ms 6/21/06
Shipped To CH2MHill - Corvallis	Offsite Property No. A060451		Bill of Lading/Air Bill No. SEE OSPC

Price Code 8N

Air Quality ☐

Data Turnaround 45 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

COOL 4 C

Preservation	~~None~~	~~None~~ 4°C 6/19/06									
Type of Container	P	P/G									
No. of Container(s)	1	2 x 6/19/06									
Volume	1000g	2000g									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Soil Plant Toxicity ASTM E1963									

Sample No.	Matrix *	Sample Date	Sample Time										
J12N99	SOIL	06-19-06	1310	X	X1			6/6/9-	13				12

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From BRETT TILLER	Date/Time 1700 6-19-06	Received By/Stored In EAS LOCKED STORAGE	Date/Time 1700 6-19-06
Relinquished By/Removed From EAS LOCKED STORAGE	Date/Time 0900 6-21-06	Received By/Stored In [illegible]	Date/Time 6-21-06 0900
Relinquished By/Removed From [illegible]	Date/Time 6/21/06 1500	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	Date/Time 6/22/06	Received By/Stored In Nancy Hilliard CH2M HILL	Date/Time 6-22-06 14:20
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) Particle Size (Dry Sieve) - D422; Moisture Content - D2216; TOC - 9060; pH (Soil) - 9045; Nitrogen by Kjeldahl - 351.2; Ammonia - 350.3; IC Anions - 300.0

Matrix *

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

BHI-EE-011 (08/29/2005)

CH2MHILL
Analytical Services

Sample Receipt Record

Batch Number: F2012 Date received: 6-22-06

Client/Project Washington Closure Hanford

VERIFICATION OF SAMPLE CONDITIONS (verify all items) * HD = Client Hand delivered Samples

Observation	YES	NO
Radiological Screening for AFCEE		✓
Were custody seals intact and on the outside of the cooler?	✓	
If yes, Where? Front ✓ Rear ✓ Lt Side ___ Rt Side ___		
Type of packing material: (Ice) Blue Ice Bubble wrap		
Was the Chain of Custody inside the cooler?	✓	
Was the Chain of Custody properly filled out?	✓	
Were the sample containers in good condition?	✓	
Containers supplied by ASL?		✓
Any sample with < 1/2 holding time remaining? If so contact LPM		✓
Was there ice in the cooler? Enter temp. 0.1, 0.1 C	✓	
All VOCs free of air bubbles ?		NA

VERIFICATION OF SAMPLE PRESERVATION

Sample No	Nutrients pH <2	Metals pH <2	Volatiles pH <2	Cyanides pH >12	TOC pH <2	TOX pH <2	Other (specify)	N/A (soils/dnpres)
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								

LOGIN AND pH VERIFICATIONS PERFORMED BY

Daisy Hubbard 6-22-06 14:30
Date/Time

Date/Time

From: Origin ID: (509)376-7768
SHIPPING DEPT
FLUOR HANFORD
for the U.S. Dept. of Energy
2355 STEVENS DR BLDG 1162
RICHLAND, WA 99352

FedEx Express

Ship Date: 21JUN06
ActWgt: 83 LB
System#: 5851986/INET2500
Account#: S *********

REF: AC60451/ BESRAS6520

Delivery Address Bar Code

SHIP TO: (541)768-3127 BILL THIRD PARTY

LIZ TEPPER
CH2M HILL
APPLIED SCIENCE LABORATORY
2300 NW WALNUT BLVD.
CORVALLIS, OR 97339

PRIORITY OVERNIGHT

THU
Deliver By:
22JUN06

TRK# 7927 7573 2366 FORM 0201

PDX AA

97339 -OR-US

86 CVOA

Shipping Label

View all labels

Place label in shipping label pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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From: Origin ID: (509)376-7768
SHIPPING DEPT
FLUOR HANFORD
for the U.S. Dept. of Energy
2355 STEVENS DR BLDG 1162
RICHLAND, WA 99352

FedEx Express

Ship Date: 21JUN06
ActWgt: 94 LB
System#: 5851986/INET2500
Account#: S *********

REF: A060451/ BESRAS6520

[redacted]

Delivery Address Bar Code

SHIP TO: (541)768-3127 BILL THIRD PARTY

LIZ TEPPER
CH2M HILL
APPLIED SCIENCE LABORATORY
2300 NW WALNUT BLVD.
CORVALLIS, OR 97339

PRIORITY OVERNIGHT **THU**

Deliver By: 22JUN06

TRK# 7927 7573 2377 FORM 0201

PDX AA

97339 -OR-US

86 CVOA

[redacted]

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