N61165.AR.003851
CNC CHARLESTON
5090.3a

ZONE A BACKGROUND CORRECTIVE MEASURES STUDY SCOPING RCRA FACILITY INVESTIGATION COMMENTS CNC CHARLESTON SC
12/1/1997
NAVFAC SOUTHERN

ZONE 1 BACKGROUND / CMS SCOPING
RFI COMMENTS

Memorandum

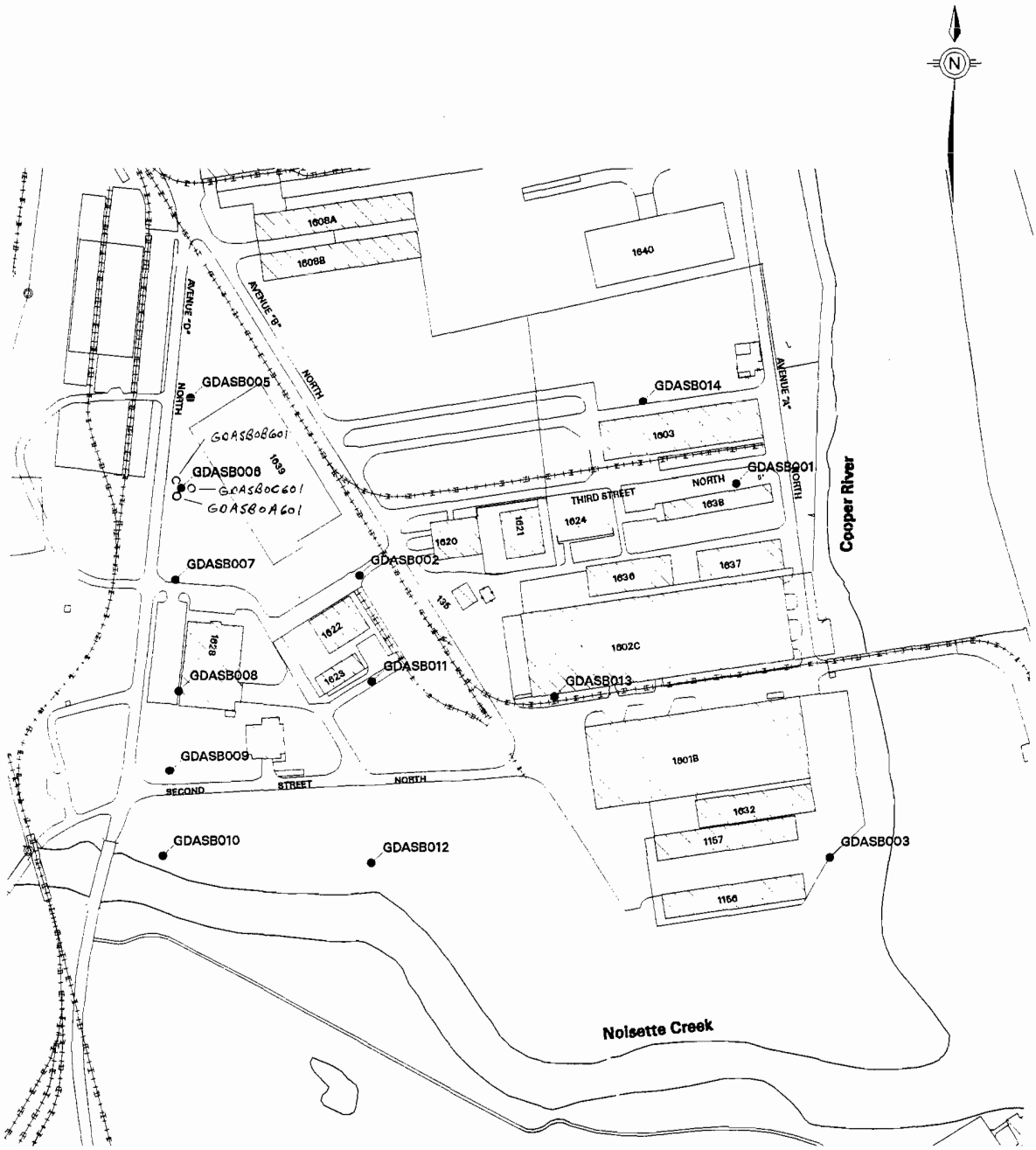
To: Naval Base Charleston Project Team

From: Todd Haverkost, P.G.
E/A&H

Date: June 2, 1997

Re: Zone A, Arsenic Results for Grid Location GDASB006

During the outlier evaluation performed as part of the Zone A background determination, the project team agreed by consensus that the surface soil arsenic concentration of 30.1 ppm at GDASB006 warranted further consideration. E\A&H was tasked by the Navy to collect additional samples around the grid 6 location to determine if the arsenic concentration was an isolated anomaly. Three surface soil samples were collected within a 10' radius of GDASB006 and sent to a laboratory for arsenic analysis. The results were 6.2, 7.2, and 15.3 ppm. Background for aresenic was calculated at 9.44 ppm. Attached are copies of the laboratory reports and a rough figure showing the approximate sample locations. Note that only the last six boring ID appear on the lab reports. E/A&H does not recommend any further action for this area other than to report the findings in the final version of the Zone A RFI report. Please be prepared to discuss this item at the June technical subcommittee meeting.



0 400 feet

LEGEND

- Soil Boring

Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.7.1 - Grid-Based Soil Sample Locations

CEIMIC NARRATIVE

Narrative Project: Zone A
Reference No.: 2901-08420
Client: Ensafe
SDG No.: 7624

METALS

Three soil samples were prepared according to ILM04.0 guidelines for soil digestion. These samples were digested and analyzed for one metal according to EPA CLP ILM04.0 methods. The table below shows list of metal, analytical instrument used, and date analyzed.

Metal	Instrument	Date Analyzed
Arsenic	ICAP-T	05/09/97

ICAP-T (Inductively Coupled Argon Plasma Trace)

QC Criteria	Status	Comments
Holding Time	Compliant	
Blanks	Compliant	
Initial Calibration	Compliant	
Continuing Calibration	Compliant	
LCS Recovery	Compliant	
Matrix Recovery	Compliant	
Post Digestion Matrix Recovery	Compliant	Not applicable
Duplicate Reproducibility	Non-Compliant.	The duplicate RPD results was not within control limits and flagged with an "*".
ICP Serial Dilution Recovery	Compliant	

There were no problems associated with these samples.

FLAGS FOR METALS

B - Concentration that is less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

E - Dilution analysis for the analyte is not at or within 10% of the sample, therefore chemical or physical interference effect must be suspected.

N - Spiked sample recovery not within control limits.

S - The reported value was determined by the Method of Standard Additions (MSA).

W - Post-digest spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

U - Analyte was analyzed but not detected.

*- Duplicate analysis not within control limits.

+- Correlation coefficient for the MSA is less than 0.995.

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: CEIMIC_CORPORATION_____ Contract: 32624-11__

Lab Code: CCSD__ Case No.: ZONE_A SAS No.: _____ SDG No.: 7624__

SOW No.: ILM04.0

EPA Sample No.	Lab Sample ID
BOA601	7624-01
BOB601	7624-02
BOB601D	7624-02D
BOB601L	7624-02L
BOB601S	7624-02S
BOC601	7624-03

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No YES

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: Julio Paredes

Date: 5/19/97 Title: Chemist

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOA601

Lab Name: CEIMIC_CORPORATION_____ Contract: 32624-11__

Lab Code: CCSD__ Case No.: ZONE_A SAS No.: _____ SDG No.: 7624__

Matrix (soil/water): SOIL_ Lab Sample ID: 7624-01

Level (low/med): LOW__ Date Received: 05/01/97

% Solids: _82.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	15.3		*	P_

Color Before: GRAY_____ Clarity Before: _____ Texture: FINE__

Color After: YELLOW___ Clarity After: _____ Artifacts: YES___

Comments:
BOA601 = NBCA\GDASBOA601
ARTIFACTS = PEBBLES/ROOTS

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOB601

Lab Name: CEIMIC_CORPORATION_____ Contract: 32624-11__

Lab Code: CCSD__ Case No.: ZONE_A SAS No.: _____ SDG No.: 7624__

Matrix (soil/water): SOIL_ Lab Sample ID: 7624-02

Level (low/med): LOW__ Date Received: 05/01/97

% Solids: _83.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	7.2		*	P_

Color Before: GRAY_____ Clarity Before: _____ Texture: FINE__

Color After: YELLOW___ Clarity After: _____ Artifacts: YES___

Comments:
___BOB601_=_NBCA\GDASBOB601
___ARTIFACTS_=_PEBBLES/ROOTS

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

BOC601

Lab Name: CEIMIC_CORPORATION_____ Contract: 32624-11__

Lab Code: CCSD__ Case No.: ZONE_A SAS No.: _____ SDG No.: 7624__

Matrix (soil/water): SOIL_ Lab Sample ID: 7624-03

Level (low/med): LOW__ Date Received: 05/01/97

% Solids: _82.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	6.4		*	P_

Color Before: GRAY_____ Clarity Before: _____ Texture: FINE__

Color After: YELLOW___ Clarity After: _____ Artifacts: YES___

Comments:
___BOC601_=_NBCA\GDASBOC601
___ARTIFACTS_=_PEBBLES/ROOTS

MEMO 4-22-97

FROM: EnSafe
TO: Project Team Subcommittee members

RE: Zone A background value -- Chromium in deep groundwater

The original **chromium** background reference value of 7.53 μg/L was twice the mean of one first-round detection (7.3 μg/L) and two estimated values for nondetects. Results for four sampling rounds include four detections:

GDAHW02D01 = 7.3 μg/L (GW02D01 = 4UJ μg/L)
GDAGW01D04 = 1.6 μg/L
GDAGW02D04 = 48.85 μg/L (mean of 55.4 and 42.3 μg/L)
GDAGW03D04 = 136 μg/L

Three of the four total detections came in the fourth round. The two highest detections came from samples that also reported the highest concentrations of aluminum of the 12 total samples, indicating that the chromium could possibly have been adsorbed onto clay particles suspended in the sample; however, field records (attached) show that turbidity levels during purging in both wells were recorded as zero NTUs. If the maximum value were used as the nonparametric UTL, the UTL would be 136 μg/L. The second highest detection was 48.85 μg/L. If both of these high values are removed from the dataset, the nonparametric UTL becomes 7.3 μg/L.

The MCL for chromium in groundwater is 100 μg/L (total chromium). The RBC for trivalent chromium is 3700 μg/L; for hexavalent chromium, it is 18 μg/L. The maximum concentration of chromium in any Zone A groundwater sample collected during 1995-1997 is 136 μg/L (see above), which is the only observed concentration greater than the MCL. The maximum hexachrome concentration is 32 μg/L in duplicate sample 039HW00301, which is the only observed hexachrome concentration greater than the RBC. Only four samples from two wells (out of 28 samples analyzed for hexachrome) reported hexachrome detections.

4th Qtr

FIGURE 6-1

Groundwater Sampling Form

Groundwater Sampling	Sample ID: NBCA\ GDAGW02D 04

PROJECT NAME: NAVAL BASE CHARLESTON (clean) JOB NO: _____ DATE: 10-17-96

WELL NO: NBCA\ GDA-02D LOCATION: ZONE A

WEATHER CONDITIONS: Sunny AMBIENT TEMP: 78°F

REVIEWED BY: [illegible] PERSONNEL: Bill Herrick M. Litchfield

PURGING DEVICE	SAMPLING DEVICE
Type device ? Peristaltic Pump	Type device? Peristalitic Pump
How was the device decontaminated? Per CSAP	How was the device decontaminated? Per CSAP
How was the line decontaminated? Per CSAP	How was the line decontaminated? Per CSAP
Which well was previously purged? NBCA\ GDA-002	Which well was previously sampled? NBCA\ GDA-002

INITIAL WELL VOLUME	PURGING
Well diameter (in.) 2	Time started 0825 Finished 1019
Stickup (ft.) 0	Volume purged 21.75 gal
Depth to bottom of well from TOC (ft.) 49.6	Comments on Well Recovery Excellent
Depth to water surface from TOC (ft.) 6.93	Depth to water (ft.) 7.08
Lenght of water (ft.) 42.67	Completion –
Volume of water (ft.) –	Additional Comments –
(gal.) 7.25	Sample Collected: Start 1024
Amount of sediment at bottom of well (ft.) None	Finish 1100
3 volumes of water (gal.) 21.76	

IN-SITU TESTING Time:	0845	0903	0922	0941	1000	1019	
	1	2	3	4	5	6	7
Well Volume Purged (gal.)	3.625	7.25	10.875	14.5	18.125	21.75	
Turbity	60	1	0	0	0	0	
Odor	Sulfur	Sulfur	Sulfur	Sulfur	Sulfur	Sulfur	
pH (units)	6.35	6.37	6.47	6.46	6.52	6.50	
Conductivity (µmho)	.532	19.1	20.4	20.5	20.6	20.5	
Water Temperature (deg. C)	23.6	23.1	22.8	22.7	22.7	22.8	
Depth to water (ft.)	7.24	7.31	7.26	7.2	7.13	7.28	

NOTES: 1 FT. LENGTH OF 4" equals 0.067 ft or 0.65 gal. 1 ft. length 2" equals 0.022ft or 0.16 gal.
Turbity choices: clear, turbid, opaque Revision Date: 8/5/92

4th Qtr

FIGURE 6-1

Groundwater Sampling Form

Groundwater Sampling	Sample ID: NBCA\ GDAGW03D04

PROJECT NAME: NAVAL BASE CHARLESTON (clean) JOB NO: _____ DATE: 10-16-96

WELL NO: NBCA\ GDA-03D LOCATION: ZONE A

WEATHER CONDITIONS: sunny AMBIENT TEMP: 70°F

REVIEWED BY: A Blumgold PERSONNEL: B. Herrick M. Fitzsimmons

PURGING DEVICE	SAMPLING DEVICE
Type device ? Peristaltic Pump	Type device? Peristalitic Pump
How was the device decontaminated? Per CSAP	How was the device decontaminated? Per CSAP
How was the line decontaminated? Per CSAP	How was the line decontaminated? Per CSAP
Which well was previously purged? NBCA\ GDA-003	Which well was previously sampled? NBCA\ GDA-003

INITIAL WELL VOLUME	PURGING
Well diameter (in.) 2	Time started 0931 Finished 1100
Stickup (ft.) 3'	Volume purged 15 gal
Depth to bottom of well from TOC (ft.) 36.92	Comments on Well Recovery Excellent
Depth to water surface from TOC (ft.) 7.37	Depth to water (ft.) 8.16'
Lenght of water (ft.) 29.55	Completion –
Volume of water (ft.) –	Additional Comments –
(gal.) 5	Sample Collected: Start 11:05
Amount of sediment at bottom of well (ft.) None	Finish 1200
3 volumes of water (gal.) 15	

IN-SITU TESTING Time:	0947	1002	1016	1030	1045	1100	
	1	2	3	4	5	6	7
Well Volume Purged (gal.)	2.5	5	7.5	10	12.5	15	
Turbity	0	0	0	0	0		
Odor	Sulfur	Sulfur	Sulfur	Sulfur	Sulfur	Sulfur	
pH (units)	6.49	6.48	6.49	6.51	6.50	6.51	
Conductivity (µmho)	56.8	60.0	60.9	61.6	61.5	61.4	
Water Temperature (deg. C)	23.2	22.8	22.9	22.9	23.0	23.0	
Depth to water (ft.)	8.11	8.16	8.16	8.16	8.16	8.16	

NOTES: 1 FT. LENGTH OF 4" equals 0.087 ft or 0.65 gal. 1 ft. length 2" equals 0.022ft or 0.16 gal.
Turbity choices: clear, turbid, opaque Revision Date: 8/5/92

TOTAL P.07

E N V I R O N M E N T A L S A F E T Y & D E S I G N S

2901-00001 - CHARLESTON ZONE A - SOIL & 1ST GW

Samples by Chemical Report

7440-47-3 - Chromium (Cr)

>= 0.0000 for UG/L - Hits Only

Sample ID	Ext. Orig. ID	Type	Date	Result	VQual	Units	SDG #	
038-G-W002-01	038GW00201	Water	12/07/95	4.2000	J	UG/L	L5997	VAL
042-G-W002-01	042GW00201	Water	12/05/95	4.9000	J	UG/L	L5970	VAL
GDA-G-W001-01	GDAGW00101	Water	12/07/95	5.0000	J	UG/L	L5997	VAL
038-G-W001-01	038GW00101	Water	12/07/95	5.6000	J	UG/L	L5997	VAL
039-G-W005-01	039GW00501	Water	12/06/95	5.8000	J	UG/L	L5991	VAL
GDA-G-W002-01	GDAGW00201	Water	12/08/95	6.1000	J	UG/L	L6008	VAL
GDA-H-W02D-01	GDAHW02D01	Water	12/08/95	7.3000	J	UG/L	L6007	VAL
039-G-W002-01	039GW00201	Water	12/05/95	8.3000	J	UG/L	L5970	VAL
506-G-W001-01	506GW00101	Water	12/07/95	9.7000	J	UG/L	L5997	VAL
S02-H-0005-01	S02W051D	Water	11/15/93	343.0000		ug/l	CNS23	VAL
S02-G-0005-01	S02W0501	Water	11/15/93	630.0000		ug/l	CNS25	VAL

*** End of Report ***

E N V I R O N M E N T A L S A F E T Y & D E S I G N S

2901-00002 - CHARLESTON ZONE A - QUARTERLY GW

Samples by Chemical Report Quarters 2,3,4

7440-47-3 - Chromium (Cr)

>= 0.0000 for All Concentration Units - Hits Only

Sample ID	Ext. Orig. ID	Type	Date	Result	VQual	Units	SDG #	
039-G-W15D-01	039GW15D01	Water	02/06/97	1.1000	J	UG/L	28417	VAL
039-G-W10D-A2	039GW10DA2	Water	03/11/97	1.2000	B	UG/L	28773	NV
043-G-W001-01	043GW00101	Water	02/07/97	1.2000	J	UG/L	28417	VAL
039-G-W10I-A2	039GW10IA2	Water	03/11/97	1.3000	B	UG/L	28773	NV
039-G-W13I-A2	039GW13IA2	Water	03/12/97	1.3000	B	UG/L	28773	NV
039-G-W09D-A2	039GW09DA2	Water	03/11/97	1.4000	B	UG/L	28773	NV
039-G-W12D-A2	039GW12DA2	Water	03/12/97	1.4000	B	UG/L	28773	NV
039-G-W13D-A2	039GW13DA2	Water	03/12/97	1.5000	B	UG/L	28773	NV
GDA-G-W01D-04	GDAGW01D04	Water	10/15/96	1.6000	J	UG/L	6434	VAL
039-G-W008-A2	039GW008A2	Water	03/10/97	1.7000	B	UG/L	28773	NV
039-G-W012-04	039GW01204	Water	10/16/96	1.8000	J	UG/L	6434	VAL
039-G-W08D-A2	039GW08DA2	Water	03/10/97	1.8000	B	UG/L	28773	NV
039-G-W008-04	039GW00804	Water	10/11/96	2.1000	J	UG/L	6434	VAL
039-G-W006-04	039GW00604	Water	10/10/96	2.2000	J	UG/L	6434	VAL
039-G-W013-A2	039GW013A2	Water	03/12/97	2.2000	B	UG/L	28773	NV
039-G-W12D-04	039GW12D04	Water	10/16/96	2.2000	J	UG/L	6434	VAL
039-H-W010-A2	039HW010A2	Water	03/11/97	2.3000	B	UG/L	28773	NV
039-G-W010-A2	039GW010A2	Water	03/11/97	2.4000	B	UG/L	28773	NV
039-G-W015-01	039GW01501	Water	02/06/97	2.4000	J	UG/L	28417	VAL
002-G-W002-04	002GW00204	Water	10/04/96	5.2000	J	UG/L	6382	VAL
039-G-W08D-04	039GW08D04	Water	10/15/96	5.4000	J	UG/L	6434	VAL
505-G-W001-02	505GW00102	Water	04/24/96	6.4000	J	UG/L	L6904W	VAL
039-H-W003-02	039HW00302	Water	04/24/96	6.9000	J	UG/L	L6904W	VAL
506-G-W001-02	506GW00102	Water	04/25/96	7.1000	J	UG/L	L6916W	VAL
GDA-G-W001-04	GDAGW00104	Water	10/15/96	7.4000	J	UG/L	6434	VAL
GDA-G-W002-04	GDAGW00204	Water	10/17/96	9.6000	J	UG/L	6414	VAL
042-G-W003-03	042GW00303	Water	06/21/96	9.7000	J	UG/L	L7294M	VAL
039-G-W013-01	039GW01301	Water	02/07/97	21.5000		UG/L	28417	VAL
GDA-H-W02D-04	GDAHW02D04	Water	10/17/96	42.3000	J	UG/L	6468	VAL
042-G-W003-02	042GW00302	Water	04/24/96	45.9000		UG/L	L6904W	VAL
GDA-G-W02D-04	GDAGW02D04	Water	10/17/96	55.4000	J	UG/L	6468	VAL
GDA-G-W03D-04	GDAGW03D04	Water	10/16/96	136.0000	J	UG/L	6434	VAL

*** End of Report ***

MCL = 100 µg/L

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E N V I R O N M E N T A L S A F E T Y & D E S I G N S

2901-00001 - CHARLESTON ZONE A - SOIL & 1ST GW

Samples by Chemical Report

18540-29-9 - Chromium (Hexavalent)

>= 0.0000 for MG/L

Sample ID	Ext. Orig. ID	Type	Date	Result	VQual	Units	SDG #	
039-H-W003-01	039HW00301	Water	12/06/95	0.0320		MG/L	L5992	VAL
GDA-H-W02D-01	GDAHW02D01	Water	12/08/95	0.0020	J	MG/L	L6007	VAL

*** End of Report ***

E N V I R O N M E N T A L S A F E T Y & D E S I G N S

2901-00002 - CHARLESTON ZONE A - QUARTERLY GW

Samples by Chemical Report Quarters 2,3,4

18540-29-9 - Chromium (Hexavalent)

>= 0.0000 for All Concentration Units

Sample ID	Ext. Orig. ID	Type	Date	Result	VQual	Units	SDG #
039-G-W001-02	039GW00102	Water	04/23/96	0.0030	U	MG/L	L6891I VAL
039-G-W001-03	039GW00103	Water	06/20/96	0.0030	U	MG/L	L7287I VAL
039-G-W002-02	039GW00202	Water	04/23/96	0.0030	U	MG/L	L6891I VAL
039-G-W002-03	039GW00203	Water	06/20/96	0.0030	U	MG/L	L7287I VAL
039-G-W003-02	039GW00302	Water	04/24/96	0.0080	J	MG/L	L6904I VAL
039-H-W003-02	039HW00302	Water	04/24/96	0.0120	J	MG/L	L6904I VAL
039-G-W003-03	039GW00303	Water	06/20/96	0.0030	U	MG/L	L7287I VAL
039-H-W003-03	039HW00303	Water	06/20/96	0.0030	U	MG/L	L7288I VAL
039-G-W004-02	039GW00402	Water	04/24/96	0.0030	U	MG/L	L6904I VAL
039-G-W004-03	039GW00403	Water	06/21/96	0.0030	U	MG/L	L7294I VAL
039-G-W005-02	039GW00502	Water	04/24/96	0.0030	U	MG/L	L6904I VAL
039-G-W005-03	039GW00503	Water	06/21/96	0.0030	U	MG/L	L7294I VAL
039-G-W04D-02	039GW04D02	Water	04/25/96	0.0030	U	MG/L	L6916I VAL
039-G-W04D-03	039GW04D03	Water	06/21/96	0.0030	U	MG/L	L7294I VAL
GDA-G-W001-03	GDAGW00103	Water	06/24/96	0.0030	U	MG/L	L7310I VAL
GDA-G-W001-04	GDAGW00104	Water	10/15/96	0.0200	U	MG/L	6434 VAL
GDA-G-W002-03	GDAGW00203	Water	06/24/96	0.0030	U	MG/L	L7310I VAL
GDA-G-W002-04	GDAGW00204	Water	10/17/96	0.0200	U	MG/L	6414 VAL
GDA-G-W003-03	GDAGW00303	Water	06/25/96	0.0030	U	MG/L	L7317I VAL
GDA-G-W003-04	GDAGW00304	Water	10/16/96	0.0200	U	MG/L	6434 VAL
GDA-G-W01D-03	GDAGW01D03	Water	06/24/96	0.0030	U	MG/L	L7310I VAL
GDA-G-W01D-04	GDAGW01D04	Water	10/15/96	0.0200	U	MG/L	6434 VAL
GDA-H-W02D-02	GDAHW02D02	Water	04/25/96	0.0040	J	MG/L	L6914I VAL
GDA-G-W02D-03	GDAGW02D03	Water	06/24/96	0.0030	U	MG/L	L7310I VAL
GDA-H-W02D-03	GDAHW02D03	Water	06/24/96	0.0030	U	MG/L	L7309I VAL
GDA-G-W02D-04	GDAGW02D04	Water	10/17/96	0.0200	U	MG/L	6468 VAL
GDA-H-W02D-04	GDAHW02D04	Water	10/17/96	0.0200	U	MG/L	6468 VAL
GDA-G-W03D-03	GDAGW03D03	Water	06/25/96	0.0030	U	MG/L	L7317I VAL
GDA-G-W03D-04	GDAGW03D04	Water	10/16/96	0.0200	U	MG/L	6434 VAL

*** End of Report ***

MEMO 4-4-97

TO: Project Team members
FROM: EnSafe

RE: Summary of dataset adjustments, data transformations, and calculations used to obtain background reference values for Zone A

Upper interval soil

Original data values (n = 13) provided the best distribution for **aluminum** (Figs. 1a, 1b), which was detected in all 13 samples. UTL = 7366 + (2.670)(2030) = **12,800 mg/kg**.

The highest data value for **arsenic** (30.1 mg/kg in GDASB00601) was identified as an outlier in both original (Figs. 1a, 1b) and LN-transformed (Figs. 2a, 2b) datasets. After removing this value (n = 12), the best data distribution was square-root transformed (Figs. 5a, 5b, vs. Figs. 3a, 3b and Figs. 4a, 4b). UTL = $[2.060 + (2.736)(0.370)]^2$ = **9.44 mg/kg**. All samples had detections. Elevated arsenic sample GDASB00601 is located in grass just east of Avenue D North. The corresponding lower interval soil sample reported 3.3 mg/kg arsenic (the mean for lower interval samples is 3.9 mg/kg). There is no obvious arsenic source. Possibly, arsenates were sprayed for weed control, or coal clinker runoff came from across Avenue D North. Adjoining samples GDASB00501 and -00701 reported the third highest and highest arsenic detections (5.6 mg/kg and 7.45 mg/kg, respectively) of the remaining samples.

Although the **chromium** distribution is skewed positively (Fig. 1a), there are no outliers (Fig. 2b). The LN-transformation (Figs. 2a, 2b) provides a more normal distribution than the square-root transformation (Figs. 3a, 3b). UTL = exp[2.655 + (2.670)(0.474)] = **50.4 mg/kg**. Chromium was detected in all 13 samples. Seven of the 17 Zone A soil samples analyzed for hexachrome reported detections, ranging from 0.024 mg/kg to 0.12 mg/kg (in sample 042SB00902).

Lower interval soil

All 12 subsurface soil grid samples reported **chromium** detections, with four of the 12 clustered around 13 mg/kg (Fig. 1b). The LN-transformation (Figs. 2a, 2b) provided the best measures of skewness, CV, etc., but did not produce a particularly close approximation of a normal distribution. The original parametric UTL of 175.7 was based on this transformation. Because of the nonnormal distribution, a nonparametric UTL based on the largest value is **63.4 mg/kg**. Two of the five lower interval Zone A soil samples analyzed for hexachrome reported detections (see above).

Because the original UTL for **nickel** (102 mg/kg) was not far below its generic SSL of 130 mg/kg (assuming DAF = 20), the UTL was also reviewed. The nickel dataset is strongly skewed to the right (Figs. 1a, 1b), even after being LN-transformed (Figs. 2a, 2b). The original UTL was based on this transformation. Because the transformed dataset does not approximate normality, a nonparametric UTL based on the largest value was used instead: **35.0 mg/kg**. Nickel was detected in eight samples.

Shallow groundwater

The original background reference value of 53.5 μg/L for **arsenic** was twice the mean of a large detection (68.3 μg/L in GDAGW00101) and two nondetects. Using four rounds of data, the value of 68.3 μg/L from the first round is seen to be an outlier (Figs. 1b, 2b). After removing the outlier, there are four detections in 11 samples, requiring the use of a nonparametric UTL: maximum *detected* value = **7.4 μg/L**. Note: Using the maximum value as the UTL when n = 11 gives only 76% coverage with 95% confidence, rather than the desired 95% coverage. For comparison purposes, a parametric UTL based on a LN-transformed dataset with n = 11 would be 22.1 μg/L. The nonparametric UTL of 7.4 μg/L is exceeded by 27 samples from shallow wells at five Zone A sites in the four sampling rounds. However, only sample concentrations from SWMU 39 exceed the higher figure of 22.1 μg/L. EnSafe recommends the nonparametric UTL with the recognition that arsenic levels in groundwater are relatively high near the coast, and attention should be focused on the one site with elevated levels: SWMU 39.

All 12 samples from four rounds reported **manganese** detections, which are numerically clustered in groups around the individual wells (Fig. 1b). The original background reference value (378.5 μg/L) was twice the mean of the first-round concentrations. The LN-transformation provides the best approximation of normality (Figs. 2a, 2b), although the distribution is not ideal. UTL = exp[5.156 + (2.736)(0.636)] = **988 μg/L**.

Deep groundwater

The original background reference value for **arsenic** (10.67 μg/L) was twice the mean of first-round results, which included one detection (4.0 μg/L from well GDA01D) and two estimated values for nondetects. After eliminating one sample result that was qualified "UR," the revised dataset consists of 11 samples with three detections. The nonparametric UTL is the highest detected value, which is **11.1 μg/L** in sample GDAGW01D04.

The original **barium** background value (187.7 μg/L) was reviewed because it was not far below the RBC of 260 μg/L. Results for four sampling rounds were nine detections in 12 samples. The distribution is clustered (Fig. 1b), with the three highest values from well GDA02D (the second-round sample from this well was reported as 167U μg/L). LN-transforming the values provides a much better box-and-whisker plot as well as better numbers for skewness, kurtosis, and CV, but not a very good approximation of a normal distribution (Fig. 2a). Therefore,

EnSafe recommends using a nonparametric UTL, which would be the maximum value: **179 μg/L** (mean of samples GDAGW02D03 and GDAHW02D03).

The original **chromium** background reference value of 7.53 μg/L was twice the mean of one first-round detection (7.3 μg/L) and two estimated values for nondetects. Results for four sampling rounds include four detections:

GDAHW02D01 = 7.3 μg/L (GW02D01 = 4UJ μg/L)
GDAGW01D04 = 1.6 μg/L
GDAGW02D04 = 48.85 μg/L (mean of 55.4 and 42.3 μg/L)
GDAGW03D04 = 136 μg/L

Three of the four total detections came in the fourth round. The two highest detections came from samples that also reported the highest concentrations of aluminum of the 12 total samples, indicating that the chromium could possibly have been adsorbed onto clay particles suspended in the sample. If the maximum value were used as the nonparametric UTL, the UTL would be 136 μg/L. If this value were removed as an outlier, the next highest value would produce a UTL of **48.9 μg/L**, which EnSafe recommends.

The original background reference value for **manganese** (2,786 μg/L) was twice the mean of three detections in the first round. All 12 samples from four rounds reported detections, clustered numerically by well (Figs. $1a_1$, 1b). Although values for skewness, kurtosis, and CV are acceptably low, the distribution is not approximately normal; if it were, the parametric UTL would be 3,990 μg/L based on original values. The recommended nonparametric UTL is the maximum value of **2,690 μg/L.** There is no apparent source for the relatively high manganese concentrations in well GDA02D; lower interval soil sample GDASB00202, from approximately the same location, reported manganese at 10.4 mg/kg.

Thallium's original background value was determined incorrectly by averaging one detection (163 μg/L from sample GDAGW03D01) with one estimated nondetect; samples GDAGW02D01 and GDAHW02D01 were both qualified "UR" and therefore were not included in the mean. The first-round detected value of 163 should have been removed as an outlier. Sample results from well GDA03D for the four rounds were reported as:

-01 = 163J μg/L
-02 = 23J μg/L
-03 = 17J μg/L
-04 = 156UR μg/L

If the first-round sample from well GDA03D is removed as an outlier, there remain two detections in nine samples from four rounds (two samples were removed because they were qualified "UR"). The nonparametric UTL would then be the highest remaining detection, or **23 μg/L**. The RBC for thallium is 0.29 μg/L; MCL = 2.0 μg/L.

Zone A soil

4-3-97

Alternative background reference values (mg/kg)

	Surface Soil					Subsurface Soil				
Chemical	RBC	2xMean	$UTL_{90,90}$	$UTL_{95,95}$	UTL_{orig}	SSL	2xMean	$UTL_{90,90}$	$UTL_{95,95}$	UTL_{orig}
Aluminum	7,800n	14,700	11,300	12,800	12,786	--	--	--	--	--
Arsenic	0.43c	8.74	7.77	9.44	9.439	--	--	--	--	--
Chromium	39*n	31.5	35.5	50.4	50.43	38*	50.4	55.4 (?)	63.4	175.7
Nickel	--	--	--	--	--	130	18.3	28.5 (?)	35.0	102

hexachrome

Zone A groundwater

Alternative background reference values (μg/L)

	Shallow Groundwater					Deep Groundwater			
Chemical	RBC/MCL	2xMean	$UTL_{90,90}$	$UTL_{95,95}$	UTL_{orig}	2xMean	$UTL_{90,90}$	$UTL_{95,95}$	UTL_{orig}
Arsenic	0.045c/50	7.87	4.9 (?)	7.4	53.5	12.2	8 (?)	11.1	10.67
Barium	260/2000	--	--	--	--	165	165 (?)	179	187.7
Chromium	Hex 18*/100 total	--	--	--	--	14.5	7.3 (?)	48.9	7.53
Manganese	84n/NA	423	606	988	378.5	2760	2455 (?)	2690	2786
Thallium	0.29/2.0	--	--	--	--	NA	20 (?)	23	165

Note:

* Chromium RBCs and SSL shown refer to hexachrome

Outliers removed from background datasets: Zone A 4-7-97

Upper interval soil

GDASB00601	30.1 mg/kg arsenic

Shallow groundwater

GDAGW00101	68.3 μg/L arsenic

Deep groundwater

GDAGW03D04	136 μg/L chromium
GDAGW03D01	163 μg/L thallium

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU's 1 and 2

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID S02SB007					
Inorganic Compounds (mg/kg)					
Cadmium and compounds	4.00	ND	3.90	NA	NA
Boring ID S02SB009					
Inorganic Compounds (mg/kg)					
Antimony and compounds	11.00	ND	3.10	NA	NA
Boring ID S02SB011					
Inorganic Compounds (mg/kg)					
Antimony and compounds	40.00	ND	3.10	NA	NA
Cadmium and compounds	7.80	ND	3.90	NA	NA
Mercury (inorganic)	15.00	0.07	2.30	NA	NA
Boring ID S02SB015					
Inorganic Compounds (mg/kg)					
Antimony and compounds	8.50	NS	3.10	NA	NA
Boring ID S02SB016					
Inorganic Compounds (mg/kg)					
Antimony and compounds	23.00	ND	3.10	NA	NA
Cadmium and compounds	3.40	6.30	3.90	NA	NA
Boring ID S02SB018					
Inorganic Compounds (mg/kg)					
Antimony and compounds	8.30	ND	3.10	NA	NA
Boring ID 038SB001					
Inorganic Compounds (mg/kg)					
Arsenic (as carcinogen)	19.80	11.90	0.43	9.43	9.86
Beryllium and compounds	ND	0.29	0.15	NA	NA
Chlorinated Pesticides (ug/kg)					
DDD	450,000.00	1,800.00	2,700.00	NA	NA
DDE	37,000.00	140.00	1,900.00	NA	NA
DDT	1,000,000.00	11,000.00	1,900.00	NA	NA
Boring ID 038SB003					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.50	NS	0.15	NA	NA
Chlorinated Pesticides (ug/kg)					
DDD	3,300.00	NS	2,700.00	NA	NA
DDT	7,800.00	NS	1,900.00	NA	NA

Notes:
ND: Not Detected
NS: No Sample Taken/Sample Not Analyzed
NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds deteeted in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID S01SB002					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	147.51	ND	88.00	NA	NA
Benzo[a]pyrene	110.00	ND	88.00	NA	NA
Inorganic Compounds (mg/kg)					
Antimony and compounds	17.50	ND	3.10	NA	NA
Mercury (inorganic)	14.80	0.24	2.30	NA	NA
Boring ID 002SB001					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.30	ND	0.15	NA	NA
Boring ID 002SB006					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.36	ND	0.15	NA	NA
Boring ID 002SB007					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	ND	0.29	0.15	NA	NA
Boring ID 002SB009					
Inorganic Compounds (mg/kg)					
Antimony and compounds	18.00	ND	3.10	NA	NA
Beryllium and compounds	0.45	ND	0.15	NA	NA
Boring ID 002SB012					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	ND	0.29	0.15	NA	NA
Boring ID 002SB013					
Inorganic Compounds (mg/kg)					
Antimony and compounds	ND	12.30	3.10	NA	NA
Beryllium and compounds	ND	0.30	0.15	NA	NA
Boring ID 002SB015					
Inorganic Compounds (mg/kg)					
Antimony and compounds	13.30	ND	3.10	NA	NA
Beryllium and compounds	0.62	ND	0.15	NA	NA
Boring ID 002SB016					
Inorganic Compounds (mg/kg)					
Thallium	2.15	0.66	0.63	NA	NA

Notes:
ND: Not Detected
NS: No Sample Taken/Sample Not Analyzed
NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU's 1 and 2

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID 002SB018					
Inorganic Compounds (mg/kg)					
Thallium	2.30	3.30	0.63	NA	NA
Boring ID 002SB020					
Inorganic Compounds (mg/kg)					
Antimony and compounds	54.40	ND	3.10	NA	NA
Beryllium and compounds	0.21	0.14	0.15	NA	NA
Boring ID 002SB021					
Inorganic Compounds (mg/kg)					
Antimony and compounds	6.10	1.50	3.10	NA	NA
Lead	591.50	179.00	400.00	140.00	22.00
Mercury (inorganic)	4.45	0.07	2.30	NA	NA
Thallium	0.69	0.61	0.63	NA	NA
Boring ID 002SB022					
Inorganic Compounds (mg/kg)					
Antimony and compounds	7.60	ND	3.10	NA	NA
Cadmium and compounds	4.60	ND	3.90	NA	NA
Boring ID 002SB023					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.33	ND	0.15	NA	NA
Boring ID 002SB028					
Inorganic Compounds (mg/kg)					
Cadmium and compounds	6.60	NS	3.90	NA	NA
Boring ID 002SB029					
Inorganic Compounds (mg/kg)					
Cadmium and compounds	4.90	NS	3.90	NA	NA
Boring ID 002SB031					
Inorganic Compounds (mg/kg)					
Thallium	1.10	1.80	0.63	NA	NA
Boring ID 002SB033					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.17	0.16	0.15	NA	NA
Thallium	0.49	0.75	0.63	NA	NA

Notes:
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NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU's 1 and 2

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID 002SB034					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.20	0.13	0.15	NA	NA
Thallium	ND	0.68	0.63	NA	NA
Boring ID 002SB035					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.23	NS	0.15	NA	NA
Boring ID 002SB036					
Inorganic Compounds (mg/kg)					
Antimony and compounds	470.00	13.00	3.10	NA	NA
Beryllium and compounds	0.37	0.47	0.15	NA	NA
Cadmium and compounds	5.10	0.67	3.90	NA	NA
Lead	89,000.00	1,120.00	400.00	140.00	22.00
Boring ID 002SB037					
Inorganic Compounds (mg/kg)					
Arsenic (as carcinogen)	21.50	26.50	0.43	9.43	9.86
Beryllium and compounds	0.39	0.34	0.15	NA	NA
Copper and compounds	475.00	49.40	310.00	165.34	33.70
Boring ID 002SB038					
Inorganic Compounds (mg/kg)					
Antimony and compounds	3.15	1.20	3.10	NA	NA
Beryllium and compounds	0.13	0.25	0.15	NA	NA
Boring ID 002SB039					
Inorganic Compounds (mg/kg)					
Antimony and compounds	3.40	0.70	3.10	NA	NA
Beryllium and compounds	0.27	0.20	0.15	NA	NA
Manganese in food (soil)	2,380.00	168.00	180.00	98.12	85.50
Thallium	1.50	0.43	0.63	NA	NA
Boring ID 002SB040					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.11	0.39	0.15	NA	NA
Boring ID 002SB041					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.18	0.55	0.15	NA	NA

Notes:
ND: Not Detected
NS: No Sample Taken/Sample Not Analyzed
NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU 38

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID 038SB004					
Inorganic Compounds (mg/kg)					
Antimony and compounds	ND	14.80	3.10	NA	NA
Boring ID 038SB005					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	ND	0.44	0.15	NA	NA
Boring ID 038SB006					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	500.00	ND	83.00	NA	NA
Dioxins (ng/kg)					
Dioxin (TCDD TEQ)	28.04	NS	4.10	NA	NA
Boring ID 038SB007					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	410.00	ND	83.00	NA	NA
Boring ID 038SB011					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	720.00	NS	83.00	NA	NA
Boring ID 038SB012					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	1,300.00	NS	83.00	NA	NA
Boring ID 039SB002					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	1,100.00	ND	83.00	NA	NA
Boring ID 039SB003					
Volatile Organic Compounds (ug/kg)					
2-Hexanone	1.80	ND	NA	NA	NA
Boring ID 039SB005					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	5,784.90	ND	88.00	NA	NA
Benz[a]anthracene	4,000.00	ND	880.00	NA	NA
Benzo[b]fluoranthene	6,200.00	ND	880.00	NA	NA
Dibenz[ah]anthracene	950.00	ND	88.00	NA	NA
Indeno[1,2,3-cd]pyrene	2,700.00	ND	880.00	NA	NA
Benzo[a]pyrene	3,500.00	ND	88.00	NA	NA

Notes:
ND: Not Detected
NS: No Sample Taken/Sample Not Analyzed
NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one deteet

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU 39

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Inorganic Compounds (mg/kg)					
Mercury (inorganic)	2.80	ND	2.30	NA	NA
Boring ID 039SB006					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.45	ND	0.15	NA	NA
Boring ID 039SB007					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	98.00	ND	83.00	NA	NA
Boring ID 039SB010					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.24	ND	0.15	NA	NA
Boring ID 039SB017					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	340.00	NS	83.00	NA	NA
Petroleum Hydrocarbons (mg/kg)					
Gasoline	11.30	25,500.00	NA	NA	NA
Boring ID 039SB019					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	ND	8.30	NA	NA	NA
Boring ID 039SB020					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	ND	46,800.00	NA	NA	NA
Boring ID 039SB021					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	261.00	2,110,000.00	NA	NA	NA
Boring ID 039SB022					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	38.00	ND	NA	NA	NA
Boring ID 039SB024					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	33.00	7.16	NA	NA	NA

Notes:
ND: Not Detected
NS: No Sample Taken/Sample Not Analyzed
NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU 39

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID 039SB025					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	1,640.00	52,100.00	NA	NA	NA
Boring ID 039SB026					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	39.20	ND	NA	NA	NA
Boring ID 039SB027					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	39,650.00	10.40	NA	NA	NA
Boring ID 039SB028					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	ND	47,700.00	NA	NA	NA
Boring ID 039SB029					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	ND	98,800.00	NA	NA	NA
Boring ID 039SB030					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	25,900.00	41.20	NA	NA	NA
Boring ID 039SB031					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	23,300.00	80,500.00	NA	NA	NA
Boring ID 039SB032					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	5.70	49.10	NA	NA	NA
Boring ID 039SB033					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	0.01	0.09	NA	NA	NA
Boring ID 039SB034					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	ND	86,100.00	NA	NA	NA

Notes:
ND: Not Detected
NS: No Sample Taken/Sample Not Analyzed
NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU 39

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID 039SB035					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	18.70	19,500.00	NA	NA	NA
Boring ID 039SB036					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	0.86	14.45	NA	NA	NA
Boring ID 039SB037					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	0.04	16.00	NA	NA	NA
Boring ID 039SB039					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	0.02	0.01	NA	NA	NA
Boring ID 039SB040					
Petroleum Hydrocarbons (mg/kg)					
Gasoline	0.02	ND	NA	NA	NA
Boring ID 042SB001					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	ND	0.29	0.15	NA	NA
Boring ID 042SB002					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.27	0.24	0.15	NA	NA
Boring ID 042SB003					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.37	ND	0.15	NA	NA
Boring ID 042SB007					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	753.51	ND	88.00	NA	NA
Benzo[a]pyrene	570.00	ND	88.00	NA	NA
Boring ID 042SB008					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	ND	0.25	0.15	NA	NA

Notes:
ND: Not Detected
NS: No Sample Taken/Sample Not Analyzed
NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU 42 and AOC 505

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID 042SB009					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	399.30	ND	88.00	NA	NA
Benzo[a]pyrene	290.00	ND	88.00	NA	NA
Boring ID 042SB010					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	1,887.40	NS	88.00	NA	NA
Benz[a]anthracene	1,100.00	NS	880.00	NA	NA
Benzo[b]fluoranthene	3,400.00	NS	880.00	NA	NA
Dibenz[ah]anthracene	350.00	NS	88.00	NA	NA
Benzo[a]pyrene	1,000.00	NS	88.00	NA	NA
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.38	NS	0.15	NA	NA
Chlorinated Pesticides (ug/kg)					
DDE	2,500.00	NS	1,900.00	NA	NA
DDT	2,300.00	NS	1,900.00	NA	NA
Boring ID 042SB011					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	537.20	ND	88.00	NA	NA
Benzo[a]pyrene	360.00	ND	88.00	NA	NA
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.19	0.17	0.15	NA	NA
Semi-volatile Organic Compounds (ug/kg)					
4-Chloro-3-methylphenol	78.00	ND	NA	NA	NA
Boring ID 042SB012					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.28	0.24	0.15	NA	NA
Boring ID 042SB013					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	626.81	472.12	88.00	NA	NA
Dibenz[ah]anthracene	130.00	100.00	88.00	NA	NA
Benzo[a]pyrene	380.00	280.00	88.00	NA	NA
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.19	0.14	0.15	NA	NA
Boring ID 042SB014					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	1,227.20	ND	88.00	NA	NA
Benzo[b]fluoranthene	1,200.00	ND	880.00	NA	NA

Notes:
ND: Not Detected
NS: No Sample Taken/Sample Not Analyzed
NA: Not Applieable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU 42 and AOC 505

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Dibenz[ah]anthracene	240.00	ND	88.00	NA	NA
Benzo[a]pyrene	730.00	ND	88.00	NA	NA
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.27	0.16	0.15	NA	NA
Semi-volatile Organic Compounds (ug/kg)					
4-Chloro-3-methylphenol	ND	86.00	NA	NA	NA
Boring ID 042SB015					
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.16	0.11	0.15	NA	NA
Boring ID 042SB016					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	1,067.08	ND	88.00	NA	NA
Dibenz[ah]anthracene	240.00	ND	88.00	NA	NA
Benzo[a]pyrene	640.00	ND	88.00	NA	NA
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.17	0.13	0.15	NA	NA
Boring ID 042SB017					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	1,882.95	2,296.70	88.00	NA	NA
Benz[a]anthracene	820.00	1,300.00	880.00	NA	NA
Benzo[b]fluoranthene	1,000.00	1,500.00	880.00	NA	NA
Dibenz[ah]anthracene	500.00	410.00	88.00	NA	NA
Indeno[1,2,3-cd]pyrene	900.00	890.00	880.00	NA	NA
Benzo[a]pyrene	1,100.00	1,500.00	88.00	NA	NA
Inorganic Compounds (mg/kg)					
Arsenic (as carcinogen)	38.60	21.40	0.43	9.43	9.86
Beryllium and compounds	0.23	0.34	0.15	NA	NA
Boring ID 042SB019					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	374.74	112.39	88.00	NA	NA
Benzo[a]pyrene	230.00	88.00	88.00	NA	NA
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.17	0.14	0.15	NA	NA
Boring ID 042SB020					
Inorganic Compounds (mg/kg)					
Arsenic (as carcinogen)	31.60	12.00	0.43	9.43	9.86

Notes:
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NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU 42 and AOC 505

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID 042SB021					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	124.05	ND	88.00	NA	NA
Benzo[a]pyrene	100.00	ND	88.00	NA	NA
Boring ID 042SB022					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	1,019.84	NS	88.00	NA	NA
Benzo[b]fluoranthene	1,400.00	NS	880.00	NA	NA
Benzo[a]pyrene	760.00	NS	88.00	NA	NA
Boring ID 042SB023					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	350.65	NS	88.00	NA	NA
Benzo[a]pyrene	280.00	NS	88.00	NA	NA
Boring ID 042SB024					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	7,389.10	NS	88.00	NA	NA
Benz[a]anthracene	5,000.00	NS	880.00	NA	NA
Benzo[b]fluoranthene	5,800.00	NS	880.00	NA	NA
Dibenz[ah]anthracene	560.00	NS	88.00	NA	NA
Indeno[1,2,3-cd]pyrene	1,900.00	NS	880.00	NA	NA
Benzo[a]pyrene	5,500.00	NS	88.00	NA	NA
Boring ID 505SB001					
Inorganic Compounds (mg/kg)					
Antimony and compounds	ND	13.60	3.10	NA	NA
Boring ID 505SB002					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	270.00	NS	83.00	NA	NA
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	698.42	NS	88.00	NA	NA
Dibenz[ah]anthracene	160.00	NS	88.00	NA	NA
Benzo[a]pyrene	420.00	NS	88.00	NA	NA
Boring ID 505SB004					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	995.87	730.68	88.00	NA	NA
Benzo[b]fluoranthene	960.00	390.00	880.00	NA	NA
Dibenz[ah]anthracene	170.00	190.00	88.00	NA	NA
Benzo[a]pyrene	620.00	430.00	88.00	NA	NA

Notes:
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NS: No Sample Taken/Sample Not Analyzed
NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU 42 and AOC 505

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Inorganic Compounds (mg/kg)					
Beryllium and compounds	ND	0.25	0.15	NA	NA
Boring ID 505SB005					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	483.62	0.16	88.00	NA	NA
Benzo[a]pyrene	350.00	ND	88.00	NA	NA
Volatile Organic Compounds (ug/kg)					
2-Hexanone	ND	1.20	NA	NA	NA
Boring ID 505SB006					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	210.00	NS	83.00	NA	NA
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	448.35	NS	88.00	NA	NA
Benzo[a]pyrene	310.00	NS	88.00	NA	NA
Boring ID 505SB007					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	780.00	ND	83.00	NA	NA
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	1,365.90	ND	88.00	NA	NA
Benzo[b]fluoranthene	1,500.00	ND	880.00	NA	NA
Dibenz[ah]anthracene	250.00	ND	88.00	NA	NA
Benzo[a]pyrene	810.00	ND	88.00	NA	NA
Boring ID 505SB008					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	1,800.00	59.00	83.00	NA	NA
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	2,348.80	ND	88.00	NA	NA
Benz[a]anthracene	1,000.00	ND	880.00	NA	NA
Benzo[b]fluoranthene	2,200.00	ND	880.00	NA	NA
Dibenz[ah]anthracene	500.00	ND	88.00	NA	NA
Indeno[1,2,3-cd]pyrene	1,100.00	ND	880.00	NA	NA
Benzo[a]pyrene	1,400.00	ND	88.00	NA	NA
Boring ID 505SB012					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	251.81	ND	88.00	NA	NA
Benzo[a]pyrene	160.00	ND	88.00	NA	NA

Notes:
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NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
SWMU 42 and AOC 505

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID 505SB014					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	267.97	NS	88.00	NA	NA
Benzo[a]pyrene	160.00	NS	88.00	NA	NA
Boring ID 505SB017					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	184.35	3,207.50	88.00	NA	NA
Benz[a]anthracene	150.00	1,350.00	880.00	NA	NA
Benzo[b]fluoranthene	150.00	1,750.00	880.00	NA	NA
Dibenz[ah]anthracene	ND	805.00	88.00	NA	NA
Indeno[1,2,3-cd]pyrene	130.00	1,750.00	880.00	NA	NA
Benzo[a]pyrene	140.00	1,900.00	88.00	NA	NA
Semi-volatile Organic Compounds (ug/kg)					
3-Methylphenol (m-Cresol)	NS	71.00	NA	NA	NA
Boring ID 043SB001					
Other Compounds					
pH	8.20	7.20	NA	NA	NA
Boring ID 043SB002					
Other Compounds					
pH	8.10	NS	NA	NA	NA
Boring ID 043SB003					
Other Compounds					
pH	8.21	NS	NA	NA	NA
Boring ID 043SB004					
Other Compounds					
pH	7.80	7.40	NA	NA	NA
Boring ID 043SB005					
Other Compounds					
pH	8.00	7.20	NA	NA	NA
Boring ID 043SB006					
Other Compounds					
pH	8.00	8.00	NA	NA	NA
Boring ID 506SB001					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	ND	8,376.50	88.00	NA	NA

Notes:
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Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
AOC 506

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Benz[a]anthracene	ND	5,700.00	880.00	NA	NA
Benzo[b]fluoranthene	ND	8,000.00	880.00	NA	NA
Dibenz[ah]anthracene	ND	1,300.00	88.00	NA	NA
Indeno[1,2,3-cd]pyrene	ND	3,000.00	880.00	NA	NA
Benzo[a]pyrene	ND	5,400.00	88.00	NA	NA
Boring ID 506SB002					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	ND	436.32	88.00	NA	NA
Benzo[a]pyrene	ND	340.00	88.00	NA	NA
Boring ID 506SB004					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	ND	210.25	88.00	NA	NA
Benzo[a]pyrene	ND	210.00	88.00	NA	NA
Boring ID GDASB003					
Polychlorinated Biphenyls (ug/kg)					
Aroclor-1260	86.00	ND	83.00	NA	NA
Boring ID GDASB006					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	1,384.98	ND	88.00	NA	NA
Benzo[b]fluoranthene	1,800.00	ND	880.00	NA	NA
Dibenz[ah]anthracene	230.00	ND	88.00	NA	NA
Benzo[a]pyrene	830.00	ND	88.00	NA	NA
Inorganic Compounds (mg/kg)					
Beryllium and compounds	0.32	ND	0.15	NA	NA
Boring ID GDASB007					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	434.01	ND	88.00	NA	NA
Benzo[a]pyrene	325.00	ND	88.00	NA	NA
Dioxins (ng/kg)					
Dioxin (TCDD TEQ)	7.09	NS	4.10	NA	NA
Boring ID GDASB009					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	429.17	ND	88.00	NA	NA
Benzo[a]pyrene	340.00	ND	88.00	NA	NA

Notes:
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NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, deteetions are avcraged and listed as one detect

Chemicals Detected In Zone A Soil Samples over RBC or UTL
Grid-Based Sampling

Name	Surface Conc.	Subsurface Conc.	RBC (THQ = 0.1)	Surface UTL	Subsurface UTL
Boring ID GDASB013					
Carcinogenic PAH Compounds (ug/kg)					
Benzo(a)pyrene Equivalents	567.03	ND	88.00	NA	NA
Benzo[a]pyrene	450.00	ND	88.00	NA	NA

Notes:
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NA: Not Applicable
Not all samples were analyzed for all compounds. Refer to the Methods Tables in Section 6 for methods run at each
For compounds detected in both the primary and duplicate sample,the concentrations for both the value of the detection was used
For compounds that were detected in only one of the primary or duplicate sample, detections are averaged and listed as one detect

Chemicals Detected In Zone A Monitoring Wells over RBC or MCL

Sampling Rounds 1, 2, 3 and 4

Name	Round 1	Round 2	Round 3	Round 4	RBC	UTL	MCL
Monitoring Well NBCH002001							
Inorganic Chemicals (mg/L)							
Iron (Fe)	NS	1,270.00	896.00	113.00	1,100.00	NA	NL
Manganese (Mn)	NS	496.00	1,990.00	219.00	84.00	577.00	NL
Monitoring Well NBCH002002							
Inorganic Chemicals (mg/L)							
Iron (Fe)	NS	2,220.00	2,520.00	3,900.00	1,100.00	NA	NL
Manganese (Mn)	NS	3,350.00	3,000.00	3,410.00	84.00	577.00	NL
Monitoring Well NBCH002003							
Inorganic Chemicals (mg/L)							
Arsenic (As)	NS	ND	ND	2.20	0.05	7.40	50.00
Iron (Fe)	NS	733.00	1,340.00	681.00	1,100.00	NA	NL
Manganese (Mn)	NS	291.00	307.00	294.00	84.00	577.00	NL
Monitoring Well NBCH002004							
Inorganic Chemicals (mg/L)							
Arsenic (As)	NS	ND	4.60	10.30	0.05	7.40	50.00
Iron (Fe)	NS	15,500.00	15,700.00	11,700.00	1,100.00	NA	NL
Manganese (Mn)	NS	119.00	168.00	241.00	84.00	577.00	NL
Silver (Ag)	NS	ND	ND	39.80	18.00	NA	NL
Monitoring Well NBCH002005							
Inorganic Chemicals (mg/L)							
Lead (Pb)	NS	18.90	ND	NS	15.00	NA	15.00
Monitoring Well NBCH002006							
Inorganic Chemicals (mg/L)							
Beryllium (Be)	NS	ND	ND	0.42	0.02	NA	4.00
Monitoring Well NBCH038001							
Inorganic Chemicals (mg/L)							
Arsenic (As)	6.00	ND	12.50	14.90	0.05	7.40	50.00
Iron (Fe)	16,100.00	16,200.00	14,100.00	13,600.00	1,100.00	NA	NL
Manganese (Mn)	168.00	146.00	141.00	157.00	84.00	577.00	NL
Pesticide/PCB Compounds (ug/L)							
4,4'-DDD	3.80	4.00	2.90	3.18	0.28	NA	NL
4,4'-DDT	1.50	2.60	0.23	ND	0.20	NA	NL

Notes:

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NS: Not Sampled
UTL numbers are preliminary and subject to change
Data as of May 7, 1997

Chemicals Detected In Zone A Monitoring Wells over RBC or MCL

Sampling Rounds 1, 2, 3 and 4

Name	Round 1	Round 2	Round 3	Round 4	RBC	UTL	MCL
Monitoring Well NBCH038002							
Inorganic Chemicals (mg/L)							
Arsenic (As)	ND	ND	3.10	ND	0.05	7.40	50.00
Iron (Fe)	1,840.00	5,990.00	4,210.00	645.00	1,100.00	NA	NL
Manganese (Mn)	172.00	187.00	152.00	78.70	84.00	577.00	NL
Thallium (Tl)	4.00	ND	ND	ND	0.29	NA	2.00
Monitoring Well NBCH03801D							
Inorganic Chemicals (mg/L)							
Iron (Fe)	2,710.00	3,550.00	3,770.00	3,660.00	1,100.00	NA	NL
Manganese (Mn)	666.00	694.00	633.00	714.00	84.00	2,690.00	NL
Monitoring Well NBCH039001							
Dioxins (pg/L)							
Dioxin Equiv.	NS	NS	NS	1.47	0.43	NA	NL
Inorganic Chemicals (mg/L)							
Arsenic (As)	43.80	34.60	39.10	36.70	0.05	7.40	50.00
Iron (Fe)	36,600.00	31,900.00	28,300.00	31,200.00	1,100.00	NA	NL
Manganese (Mn)	904.00	932.00	794.00	969.00	84.00	577.00	NL
Semi-volatile Organic Compounds (ug/L)							
bis(2-Ethylhexyl)phthalate (BEHP)	ND	ND	13.00	ND	4.80	NA	NL
Volatile Organic Compounds (ug/L)							
Benzene	25.00	47.00	35.00	110.00	0.36	NA	5.00
Monitoring Well NBCH039002							
Inorganic Chemicals (mg/L)							
Aluminum (Al)	2,490.00	1,280.00	6,610.00	462.00	3,700.00	3,200.00	NL
Arsenic (As)	33.10	40.70	48.10	43.60	0.05	7.40	50.00
Iron (Fe)	9,330.00	8,700.00	7,250.00	7,880.00	1,100.00	NA	NL
Manganese (Mn)	1,240.00	1,120.00	1,070.00	1,100.00	84.00	577.00	NL
Monitoring Well NBCH039003							
Inorganic Chemicals (mg/L)							
Arsenic (As)	ND	ND	3.25	ND	0.05	7.40	50.00
Iron (Fe)	1,388.50	3,400.00	656.00	108.00	1,100.00	NA	NL
Volatile Organic Compounds (ug/L)							
Dibromochloromethane	ND	5.50	ND	ND	0.13	NA	NL
1,2-Dibromo-3-Chloropropane	ND	NS	3.00	ND	0.05	NA	0.20
cis-1,2-Dichloroethene	4.80	2.95	6.50	3.00	6.10	NA	70.00
1,1-Dichloroethene	ND	ND	1.05	ND	0.04	NA	7.00
1,1,2,2-Tetrachloroethane	ND	ND	1.40	ND	0.05	NA	NL
Tetrachloroethene	15.50	9.15	11.50	7.50	1.10	NA	5.00

Notes:

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Data as of May 7, 1997

Chemicals Detected In Zone A Monitoring Wells over RBC or MCL

Sampling Rounds 1, 2, 3 and 4

Name	Round 1	Round 2	Round 3	Round 4	RBC	UTL	MCL
Trichloroethene	41.00	48.50	91.00	30.00	1.60	NA	5.00
Monitoring Well NBCH039004							
Dioxins (pg/L)							
Dioxin Equiv.	NS	NS	0.42	0.58	0.43	NA	NL
Inorganic Chemicals (mg/L)							
Arsenic (As)	42.60	51.40	46.30	48.40	0.05	7.40	50.00
Iron (Fe)	13,200.00	16,600.00	13,500.00	12,700.00	1,100.00	NA	NL
Manganese (Mn)	2,020.00	1,880.00	1,910.00	1,810.00	84.00	577.00	NL
Volatile Organic Compounds (ug/L)							
Tetrachloroethene	ND	3.80	1.70	ND	1.10	NA	5.00
Trichloroethene	ND	2.30	1.60	ND	1.60	NA	5.00
Monitoring Well NBCH039005							
Dioxins (pg/L)							
Dioxin Equiv.	NS	NS	0.50	0.21	0.43	NA	NL
Inorganic Chemicals (mg/L)							
Arsenic (As)	61.30	66.80	74.90	77.70	0.05	7.40	50.00
Iron (Fe)	54,400.00	57,200.00	50,500.00	47,100.00	1,100.00	NA	NL
Manganese (Mn)	2,050.00	2,040.00	1,890.00	1,840.00	84.00	577.00	NL
Semi-volatile Organic Compounds (ug/L)							
bis(2-Ethylhexyl)phthalate (BEHP)	ND	ND	5.10	ND	4.80	NA	NL
Volatile Organic Compounds (ug/L)							
Benzene	90.00	100.00	170.00	78.00	0.36	NA	5.00
Vinyl chloride	1.90	ND	5.80	ND	0.02	NA	2.00
Monitoring Well NBCH039006							
Inorganic Chemicals (mg/L)							
Iron (Fe)	NS	NS	NS	9,870.00	1,100.00	NA	NL
Monitoring Well NBCH039007							
Inorganic Chemicals (mg/L)							
Arsenic (As)	NS	NS	NS	3.30	0.05	7.40	50.00
Iron (Fe)	NS	NS	NS	5,090.00	1,100.00	NA	NL
Monitoring Well NBCH039008							
Inorganic Chemicals (mg/L)							
Arsenic (As)	NS	NS	NS	9.30	0.05	7.40	50.00
Iron (Fe)	NS	NS	NS	8,720.00	1,100.00	NA	NL
Manganese (Mn)	NS	NS	NS	257.00	84.00	577.00	NL

Notes:

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NS: Not Sampled
UTL numbers are preliminary and subject to change
Data as of May 7, 1997

Chemicals Detected In Zone A Monitoring Wells over RBC or MCL

Sampling Rounds 1, 2, 3 and 4

Name	Round 1	Round 2	Round 3	Round 4	RBC	UTL	MCL
Monitoring Well NBCH039009							
Inorganic Chemicals (mg/L)							
Arsenic (As)	NS	NS	NS	25.10	0.05	7.40	50.00
Iron (Fe)	NS	NS	NS	9,840.00	1,100.00	NA	NL
Manganese (Mn)	NS	NS	NS	981.00	84.00	577.00	NL
Volatile Organic Compounds (ug/L)							
cis-1,2-Dichloroethene	NS	NS	NS	38.00	6.10	NA	70.00
Trichloroethene	NS	NS	NS	2.00	1.60	NA	5.00
Vinyl chloride	NS	NS	NS	6.00	0.02	NA	2.00
Monitoring Well NBCH039010							
Inorganic Chemicals (mg/L)							
Iron (Fe)	NS	NS	NS	6,780.00	1,100.00	NA	NL
Monitoring Well NBCH039011							
Inorganic Chemicals (mg/L)							
Arsenic (As)	NS	NS	NS	2.50	0.05	7.40	50.00
Iron (Fe)	NS	NS	NS	28,400.00	1,100.00	NA	NL
Semi-volatile Organic Compounds (ug/L)							
Azobenzene	NS	NS	NS	6.00	0.61	NA	NL
bis(2-Ethylhexyl)phthalate (BEHP)	NS	NS	NS	8.00	4.80	NA	NL
2-Methylnaphthalene	NS	NS	NS	255.00	150.00	NA	NL
Naphthalene	NS	NS	NS	420.00	150.00	NA	NL
Volatile Organic Compounds (ug/L)							
Benzene	NS	NS	NS	190.00	0.36	NA	5.00
1,2-Dichloroethane	NS	NS	NS	4.00	0.12	NA	5.00
Ethylbenzene	NS	NS	NS	165.00	130.00	NA	700.00
Monitoring Well NBCH039012							
Inorganic Chemicals (mg/L)							
Arsenic (As)	NS	NS	NS	107.00	0.05	7.40	50.00
Iron (Fe)	NS	NS	NS	20,800.00	1,100.00	NA	NL
Manganese (Mn)	NS	NS	NS	2,230.00	84.00	577.00	NL
Volatile Organic Compounds (ug/L)							
cis-1,2-Dichloroethene	NS	NS	NS	130.00	6.10	NA	70.00
1,1-Dichloroethene	NS	NS	NS	3.00	0.04	NA	7.00
Trichloroethene	NS	NS	NS	92.00	1.60	NA	5.00
Vinyl chloride	NS	NS	NS	3.00	0.02	NA	2.00
Monitoring Well NBCH039013							
Inorganic Chemicals (mg/L)							
Aluminum (Al)	11,100.00	NS	NS	NS	3,700.00	3,200.00	NL
Arsenic (As)	14.40	NS	NS	NS	0.05	7.40	50.00

Notes:

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UTL numbers are preliminary and subject to change
Data as of May 7, 1997

Chemicals Detected In Zone A Monitoring Wells over RBC or MCL

Sampling Rounds 1, 2, 3 and 4

Name	Round 1	Round 2	Round 3	Round 4	RBC	UTL	MCL
Beryllium (Be)	1.20	NS	NS	NS	0.02	NA	4.00
Chromium (Cr)	21.50	NS	NS	NS	18.00	8.70	100.00
Iron (Fe)	18,300.00	NS	NS	NS	1,100.00	NA	NL
Lead (Pb)	16.50	NS	NS	NS	15.00	NA	15.00
Manganese (Mn)	135.00	NS	NS	NS	84.00	577.00	NL
Thallium (Tl)	4.60	NS	NS	NS	0.29	NA	2.00
Vanadium (V)	32.60	NS	NS	NS	26.00	5.40	NL
Semi-volatile Organic Compounds (ug/L)							
bis(2-Ethylhexyl)phthalate (BEHP)	20.00	NS	NS	NS	4.80	NA	NL
Volatile Organic Compounds (ug/L)							
1,2-Diehloroethene (total)	32.00	NS	NS	NS	5.50	NA	70.00
Tetrachloroethene	25.00	NS	NS	NS	1.10	NA	5.00
Trichloroethene	6.00	NS	NS	NS	1.60	NA	5.00
Monitoring Well NBCH039014							
Inorganic Chemicals (mg/L)							
Arsenic (As)	23.00	NS	NS	NS	0.05	7.40	50.00
Iron (Fe)	32,900.00	NS	NS	NS	1,100.00	NA	NL
Thallium (Tl)	7.40	NS	NS	NS	0.29	NA	2.00
Semi-volatile Organic Compounds (ug/L)							
bis(2-Ethylhexyl)phthalate (BEHP)	10.00	NS	NS	NS	4.80	NA	NL
Volatile Organic Compounds (ug/L)							
Benzene	8.00	NS	NS	NS	0.36	NA	5.00
Monitoring Well NBCH039015							
Inorganic Chemicals (mg/L)							
Arsenic (As)	5.10	NS	NS	NS	0.05	7.40	50.00
Barium (Ba)	731.00	NS	NS	NS	260.00	104.00	2,000.00
Beryllium (Be)	0.32	NS	NS	NS	0.02	NA	4.00
Iron (Fe)	8,930.00	NS	NS	NS	1,100.00	NA	NL
Manganese (Mn)	129.00	NS	NS	NS	84.00	577.00	NL
Thallium (Tl)	3.70	NS	NS	NS	0.29	NA	2.00
Monitoring Well NBCH03904D							
Inorganic Chemicals (mg/L)							
Manganese (Mn)	91.50	106.00	96.90	103.00	84.00	2,690.00	NL
Monitoring Well NBCH03908D							
Inorganic Chemicals (mg/L)							
Arsenic (As)	NS	NS	NS	14.30	0.05	11.10	50.00
Iron (Fe)	NS	NS	NS	18,600.00	1,100.00	NA	NL
Manganese (Mn)	NS	NS	NS	2,180.00	84.00	2,690.00	NL

Notes:

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Data as of May 7, 1997

Chemicals Detected In Zone A Monitoring Wells over RBC or MCL

Sampling Rounds 1, 2, 3 and 4

Name	Round 1	Round 2	Round 3	Round 4	RBC	UTL	MCL
Monitoring Well NBCH03910D							
Volatile Organic Compounds (ug/L)							
cis-1,2-Dichloroethene	7.00	NS	NS	NS	6.10	NA	70.00
Monitoring Well NBCH03910I							
Volatile Organic Compounds (ug/L)							
cis-1,2-Dichloroethene	48.00	NS	NS	NS	6.10	NA	70.00
Vinyl chloride	10.00	NS	NS	NS	0.02	NA	2.00
Monitoring Well NBCH03912I							
Inorganic Chemicals (mg/L)							
Arsenic (As)	NS	NS	NS	2.20	0.05	7.40	50.00
Manganese (Mn)	NS	NS	NS	460.00	84.00	577.00	NL
Volatile Organic Compounds (ug/L)							
cis-1,2-Dichloroethene	NS	NS	NS	240.00	6.10	NA	70.00
1,1-Dichloroethene	NS	NS	NS	5.00	0.04	NA	7.00
Trichloroethene	NS	NS	NS	120.00	1.60	NA	5.00
Monitoring Well NBCH03913D							
Volatile Organic Compounds (ug/L)							
Chloroform	7.00	NS	NS	NS	0.15	NA	100.00
cis-1,2-Dichloroethene	70.00	NS	NS	NS	6.10	NA	70.00
Tetrachloroethene	33.00	NS	NS	NS	1.10	NA	5.00
Trichloroethene	56.00	NS	NS	NS	1.60	NA	5.00
Monitoring Well NBCH03913I							
Volatile Organic Compounds (ug/L)							
cis-1,2-Dichloroethene	69.00	NS	NS	NS	6.10	NA	70.00
Tetrachloroethene	110.00	NS	NS	NS	1.10	NA	5.00
Trichloroethene	22.00	NS	NS	NS	1.60	NA	5.00
Vinyl chloride	9.00	NS	NS	NS	0.02	NA	2.00
Monitoring Well NBCH03915D							
Inorganic Chemicals (mg/L)							
Manganese (Mn)	145.00	NS	NS	NS	84.00	2,690.00	NL
Semi-volatile Organic Compounds (ug/L)							
bis(2-Ethylhexyl)phthalate (BEHP)	6.00	NS	NS	NS	4.80	NA	NL
Monitoring Well NBCH505001							
Inorganic Chemicals (mg/L)							
Arsenic (As)	ND	ND	9.00	6.40	0.05	7.40	50.00
Iron (Fe)	2,030.00	2,570.00	2,260.00	715.00	1,100.00	NA	NL

Notes:

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Data as of May 7, 1997

Chemicals Detected In Zone A Monitoring Wells over RBC or MCL

Sampling Rounds 1, 2, 3 and 4

Name	Round 1	Round 2	Round 3	Round 4	RBC	UTL	MCL
Iron (Fe)	25,800.00	31,200.00	32,100.00	28,000.00	1,100.00	NA	NL
Manganese (Mn)	353.00	306.00	313.00	218.00	84.00	577.00	NL
Manganese (Mn)	232.00	281.00	287.00	323.00	84.00	577.00	NL
Semi-volatile Organic Compounds (ug/L)							
1,4-Dichlorobenzene	2.00	ND	ND	NS	0.44	NA	75.00
Volatile Organic Compounds (ug/L)							
Chloromethane	7.80	ND	ND	ND	1.40	NA	NL
1,1-Dichloroethene	1.00	ND	ND	ND	0.04	NA	7.00
1,1,2,2-Tetrachloroethane	1.50	ND	ND	ND	0.05	NA	NL
Tetrachloroethene	5.90	1.50	1.40	ND	1.10	NA	5.00
Monitoring Well NBCH042002							
Inorganic Chemicals (mg/L)							
Arsenic (As)	ND	ND	ND	2.90	0.05	7.40	50.00
Iron (Fe)	11,100.00	8,500.00	9,070.00	3,620.00	1,100.00	NA	NL
Manganese (Mn)	827.00	690.00	656.00	533.00	84.00	577.00	NL
Monitoring Well NBCH042003							
Inorganic Chemicals (mg/L)							
Aluminum (Al)	229.00	27,200.00	6,760.00	ND	3,700.00	3,200.00	NL
Chromium (Cr)	ND	45.90	9.70	ND	18.00	8.70	100.00
Iron (Fe)	260.00	32,300.00	6,490.00	192.00	1,100.00	NA	NL
Manganese (Mn)	365.00	692.00	549.00	18.60	84.00	577.00	NL
Silver (Ag)	ND	ND	ND	111.00	18.00	NA	NL
Vanadium (V)	ND	61.00	9.00	ND	26.00	5.40	NL
Monitoring Well NBCH043001							
Inorganic Chemicals (mg/L)							
Arsenic (As)	18.30	NS	NS	NS	0.05	7.40	50.00
Iron (Fe)	21,600.00	NS	NS	NS	1,100.00	NA	NL
Thallium (Tl)	4.80	NS	NS	NS	0.29	NA	2.00
Semi-volatile Organic Compounds (ug/L)							
bis(2-Ethylhexyl)phthalate (BEHP)	140.00	NS	NS	NS	4.80	NA	NL
Monitoring Well NBCH506001							
Inorganic Chemicals (mg/L)							
Iron (Fe)	3,710.00	2,800.00	1,850.00	112.00	1,100.00	NA	NL
Manganese (Mn)	85.70	ND	36.20	16.60	84.00	577.00	NL

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Data as of May 7, 1997

Chemicals Detected In Zone A Monitoring Wells over RBC or MCL

Sampling Rounds 1, 2, 3 and 4

Name	Round 1	Round 2	Round 3	Round 4	RBC	UTL	MCL
Monitoring Well NBCHGDA001							
Inorganic Chemicals (mg/L)							
Arsenic (As)	68.30	ND	ND	2.60	0.05	7.40	50.00
Iron (Fe)	72,100.00	18,300.00	7,320.00	8,960.00	1,100.00	NA	NL
Manganese (Mn)	336.00	343.00	577.00	305.00	84.00	577.00	NL
Monitoring Well NBCHGDA002							
Inorganic Chemicals (mg/L)							
Aluminum (Al)	2,840.00	1,600.00	451.00	5,220.00	3,700.00	3,200.00	NL
Antimony (Sb)	ND	ND	ND	4.00	1.50	NA	6.00
Arsenic (As)	ND	ND	4.40	ND	0.05	7.40	50.00
Iron (Fe)	21,800.00	13,900.00	16,900.00	14,400.00	1,100.00	NA	NL
Manganese (Mn)	152.00	158.00	134.00	166.00	84.00	577.00	NL
Monitoring Well NBCHGDA003							
Inorganic Chemicals (mg/L)							
Arsenic (As)	ND	ND	7.40	4.90	0.05	7.40	50.00
Iron (Fe)	8,230.00	8,880.00	9,860.00	8,390.00	1,100.00	NA	NL
Manganese (Mn)	79.80	96.00	94.60	94.00	84.00	577.00	NL
Monitoring Well NBCHGDA01D							
Inorganic Chemicals (mg/L)							
Arsenic (As)	4.00	ND	8.00	11.10	0.05	11.10	50.00
Iron (Fe)	12,500.00	7,760.00	7,040.00	5,120.00	1,100.00	NA	NL
Manganese (Mn)	344.00	301.00	204.00	183.00	84.00	2,690.00	NL
Monitoring Well NBCHGDA02D							
Inorganic Chemicals (mg/L)							
Beryllium (Be)	ND	ND	ND	3.30	0.02	NA	4.00
Chromium (Cr)	7.30	ND	ND	48.85	18.00	7.53	100.00
Iron (Fe)	17,450.00	22,600.00	22,500.00	21,600.00	1,100.00	NA	NL
Manganese (Mn)	2,365.00	2,345.00	2,455.00	2,690.00	84.00	2,690.00	NL
Silver (Ag)	ND	ND	9.60	20.60	18.00	NA	NL
Volatile Organic Compounds (ug/L)							
Bromodichloromethane	3.40	NS	ND	ND	0.17	NA	100.00
Monitoring Well NBCHGDA03D							
Inorganic Chemicals (mg/L)							
Antimony (Sb)	ND	7.10	ND	ND	1.50	NA	6.00
Chromium (Cr)	ND	ND	ND	136.00	18.00	7.53	100.00
Copper (Cu)	ND	7.00	ND	445.00	150.00	5.80	1,300.00
Lead (Pb)	ND	ND	18.50	ND	15.00	NA	15.00
Manganese (Mn)	1,470.00	1,220.00	1,310.00	1,700.00	84.00	2,690.00	NL

Notes:

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Data as of May 7, 1997

Chemicals Detected In Zone A Monitoring Wells over RBC or MCL

Sampling Rounds 1, 2, 3 and 4

Name	Round 1	Round 2	Round 3	Round 4	RBC	UTL	MCL
Nickel (Ni)	ND	ND	ND	74.40	73.00	NA	100.00
Thallium (Tl)	163.00	23.00	17.00	ND	0.29	NA	2.00
Zinc (Zn)	6.90	ND	ND	1,440.00	1,100.00	66.20	NL

Notes:
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NA: Not Applicable
NL: Not Listed
NS: Not Sampled
UTL numbers are preliminary and subject to change
Data as of May 7, 1997

Charleston Naval Base

RCRA CAP
Zone A
CMS Site Selection Effort

5 June 1997

Background:

Zone A is one of twelve designated zones at Charleston Naval Base. This zone is located in the northern portion of base. It is bounded by a fuel farm operated by the Hess Oil Company to the north, the Cooper River to the east, Noisette Creek to the south and a vegetated area and a residential community to the west.

The draft RCRA RFI report cites findings for 6 SWMUs and 2 AOCs.

Primary Areas of Interest:

SWMU 39 and SWMU 42 (and AOC 505) represent areas of particular interest in regards to potential CMS activities. SWMU 39 is a site with known chlorinated solvent and TPH contamination in the groundwater. This SWMU is located adjacent to the Hess Oil Company fuel farm. SWMU 42 (and AOC 505) is the site of a former asphalt plant/boiler plant and creosote material storage area. SWMU 42 (and AOC 505) is known to contain soil and groundwater contamination (primarily inorganics and chlorinated SVOCs). The following summary further describes these sites.

Site by Site Briefing:

A site-specific briefing for Zone A follows. The briefing is presented from a CMS perspective and its objective is to render opinions of CMS applicability for each site. Note that opinions stated are based on data that is currently available. This zone is still undergoing a RCRA facility investigation and therefore additional information such as risk assessment analysis for several sites is forthcoming.

CHARLESTON NAVAL BASE
ZONE A
CMS RECOMMENDATION TABLE
(As of 5 June 1997)

Site	NFA	CMS
SWMUs 1 ~~and 2~~ SWMU 2	x (tentative approval)	Waiting BRA results (probable CMS candidate)
SWMU 38		X
SWMU 39		Waiting BRA results (probable CMS candidate)
SWMU 42/AOC 505		X
SWMU 43	X	
AOC 506	X	

SWMU 1 and SWMU 2

- SWMU 1 is the site of former DRMO storage and SWMU 2 is a nearby area that is contains elevated levels of Pb in soil.

- Ground cover material at the subject site consists of grassed areas, soil, asphalt and concrete. Please reference the attached figures for a general rendering of site surface conditions.

- Soil, sediment, and GW have been sampled extensively at this site. Sampling has continued into 1997 and thus the formal risk assessment has not yet been completed.

- The site has exhibited high concentrations of soil Pb in a pre-RFI sampling event (1986). Hurricane Hugo (1989) may have impacted any contaminant distribution. Attached figures show Pb contamination in site soils. Several of the earlier "hot" sample locations were duplicated in this assessment.

- Approximately 70% of the elevated Pb soil samples were procured from areas presently covered by asphalt. The remaining elevated sample points were located primarily in areas covered with various types of gravel material. Elevated concentrations primarily ranged from about 400 to 4000 ppm, yet one sample contained about 90,000 ppm Pb (its subsurface contained lead at approx. 1,100 ppm.

- Soil -- As at concentrations > RBC was also identified in surface soils. The concentrations > RBC ranged from approximately 10 to 30 ppm. Other inorganic compounds exceeding RBC consisted of: Hg, An, Be, Tl, Pb, Cd, and Cu. A majority of the accedences occurred in the surface soil as opposed to the subsurface soil.

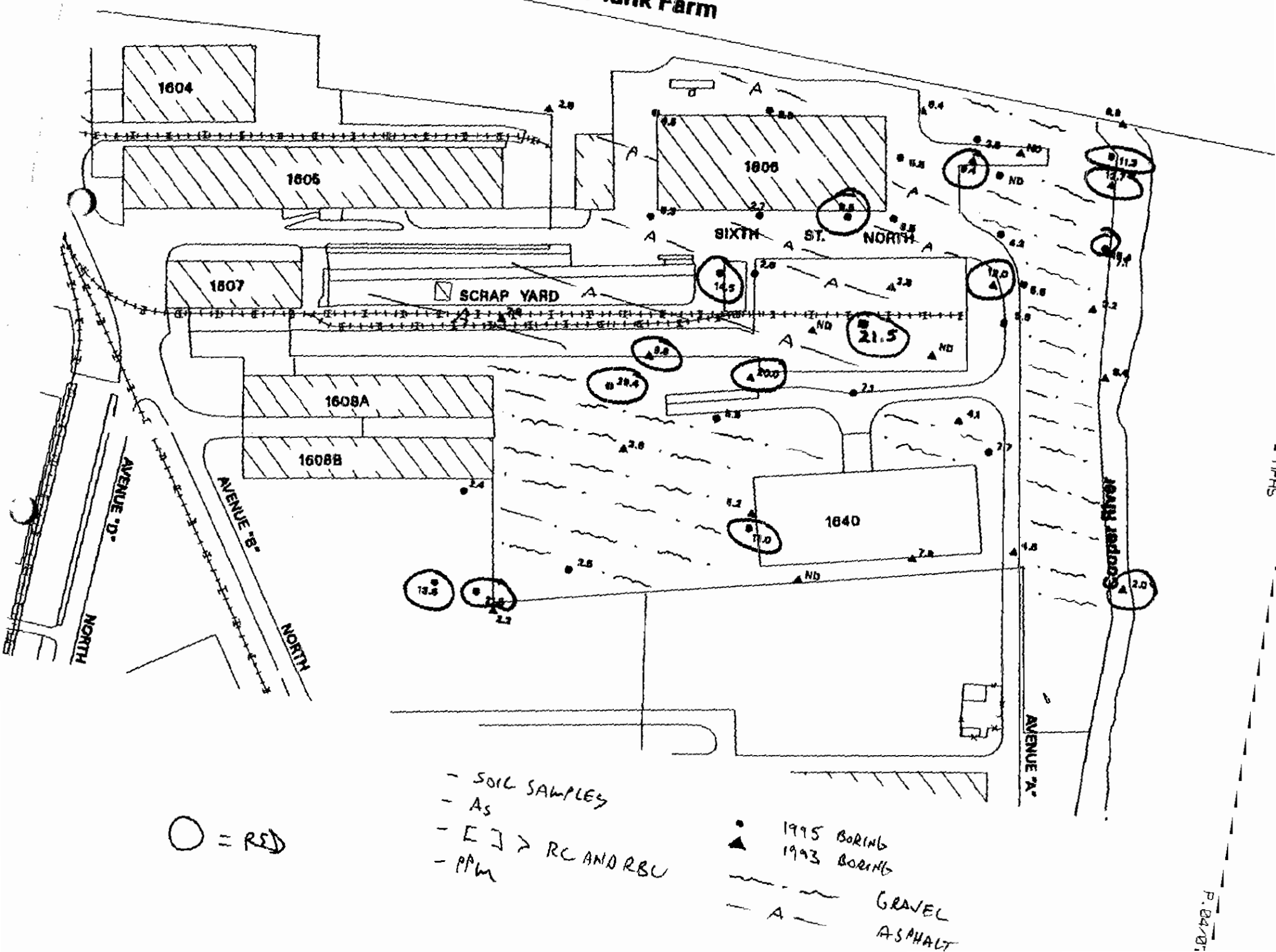
- GW -- As was detected in two wells exceeding an RBC of 0.05 ppm. However, note that the As UTL is 7.4 ppm and its MCL is 50 ppm. For well 003; As=not sampled/ND/ND/2.2 ppm. For well 004; As=not sampled/ND/4.6 ppm/10.3 ppm. Therefore, no well exceeded the MCL for As and well 004 only marginally exceeded the UTL for As. In addition, only one well (well 005) exhibited Pb concentrations (19 ppm) >MCL (15 ppm) for 2nd sampling event only. Pb was ND for the third event and the well was not sampled for the fourth event. This well was not screened in the same lithologic unit as the others (ie, is was screened in a clay-like material instead of sand and thus was hard to sample due to low recharge rate). The well has since been damaged beyond repair and thus abandoned in place.

- CMS:

  1) Comment - Risk assessment completion is required prior to the rendering of a CMS opinion. Results of final risk assessment must be considered in the CMS go/no go decision process. However, potential remedial alternatives could include hot spot removal and/or institutional controls. Long term GW monitoring may be prudent should it be determined that soil Pb to GW transport is possible.

  2) **Opinion - not stated until results of risk assessment made available, yet probable CMS site.**

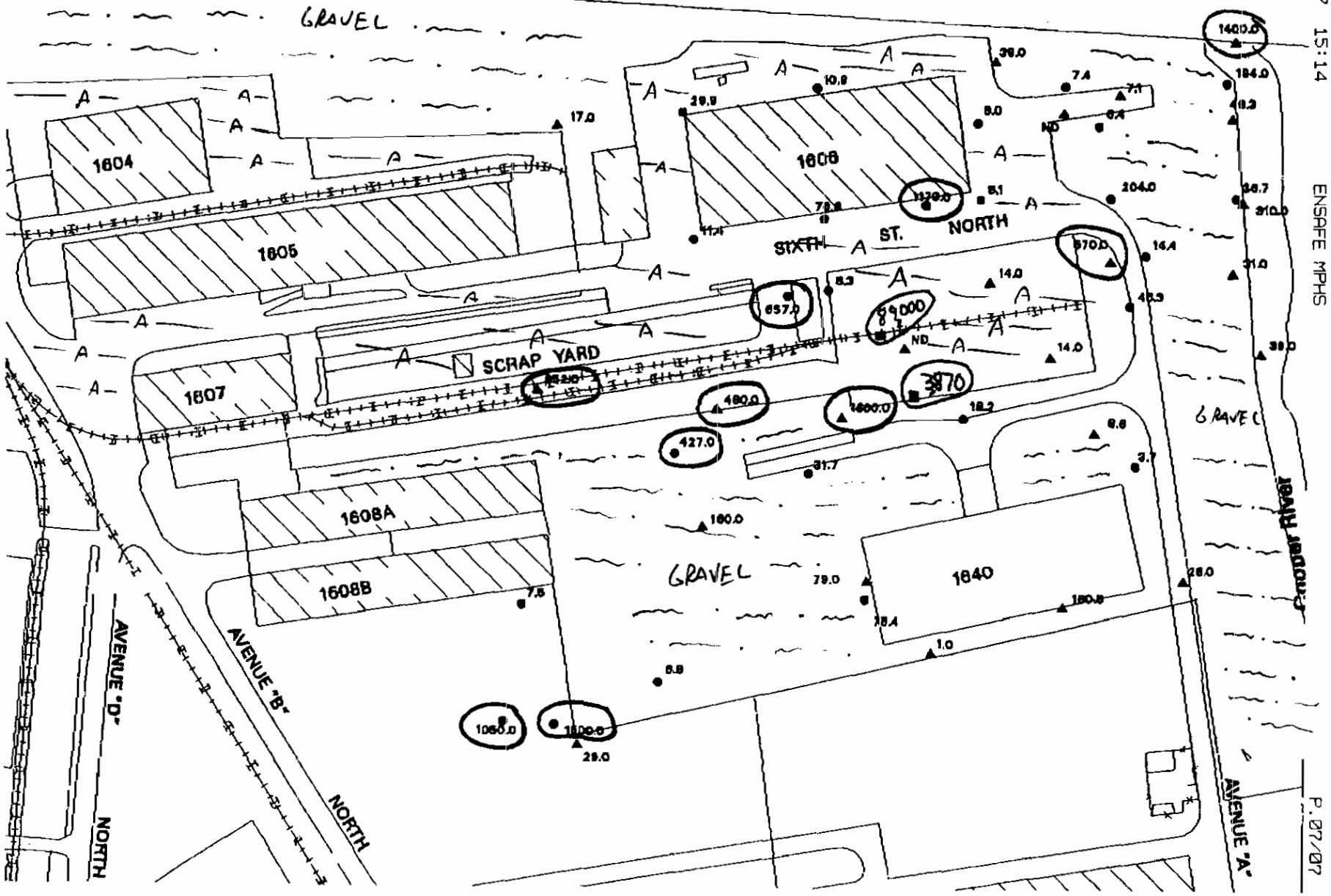
Hess Oil Tank Farm

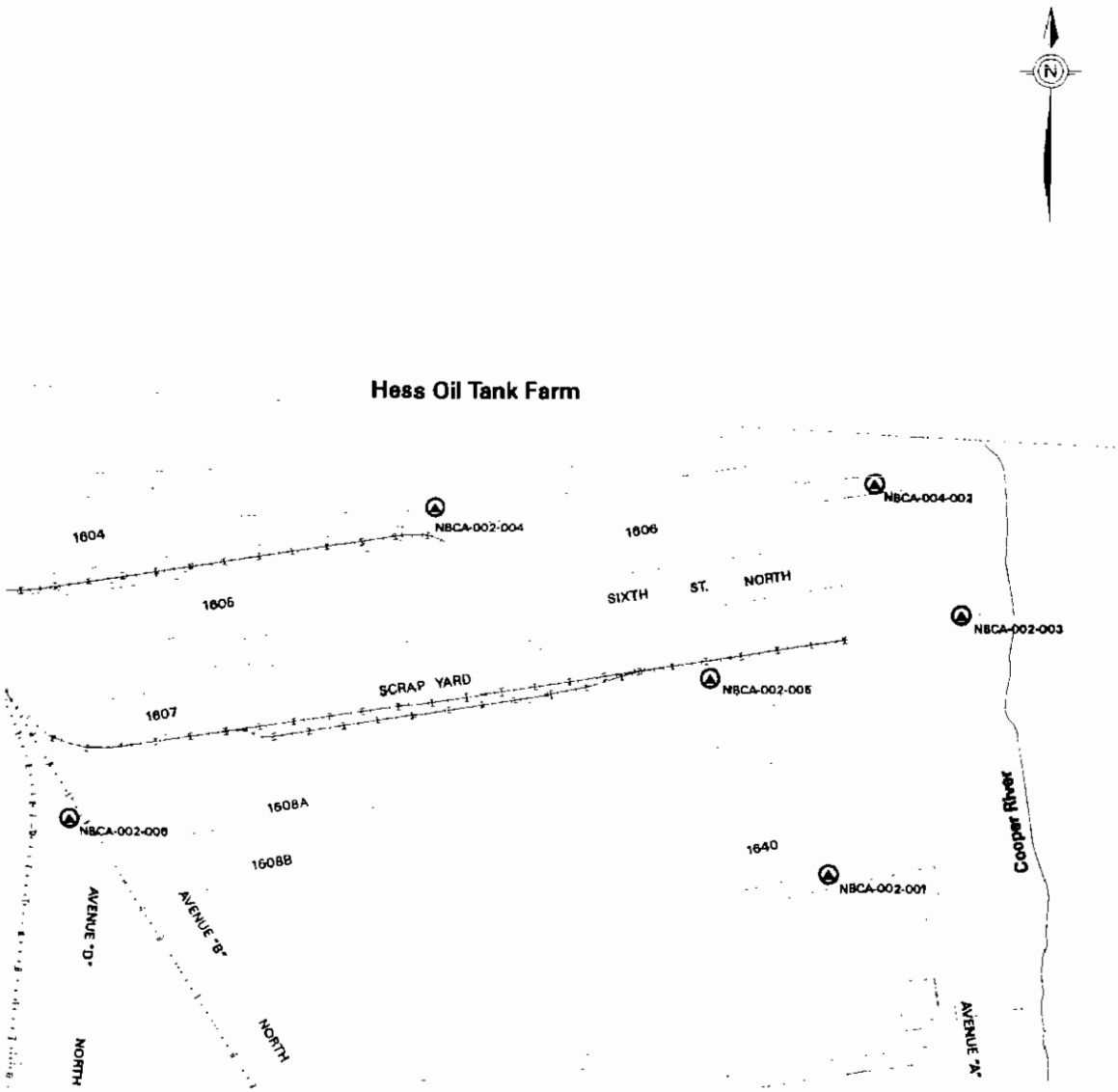


- SOIL SAMPLES
- LEAD
- [ ] > 400 PPM ARE CIRCLED USEPA RESIDENTIAL CLEANUP LEVELS
- PPM

GRAVEL
ASPHALT
● 1995 BORING
▲ 1993 BORING

Hess Oil Tank Farm





0 200 feet

LEGEND

Shallow Monitoring Well

Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.1.5 - SWMUs 1 and 2 Groundwater Sample Locations

SWMU 38

- The site is a gravel lot near the northern property line of the base and adjacent and east of SWMU 39. The investigation area was reduced to focus on the portion of the SWMU where HM was stored.

- Soil COCs = pesticides, PCBs (A-1260), As and Al. Shallow GW COCs = pesticides. Residential risk > 1E-4 for site soils and between 1E-6 and 1E-4 for site GW.

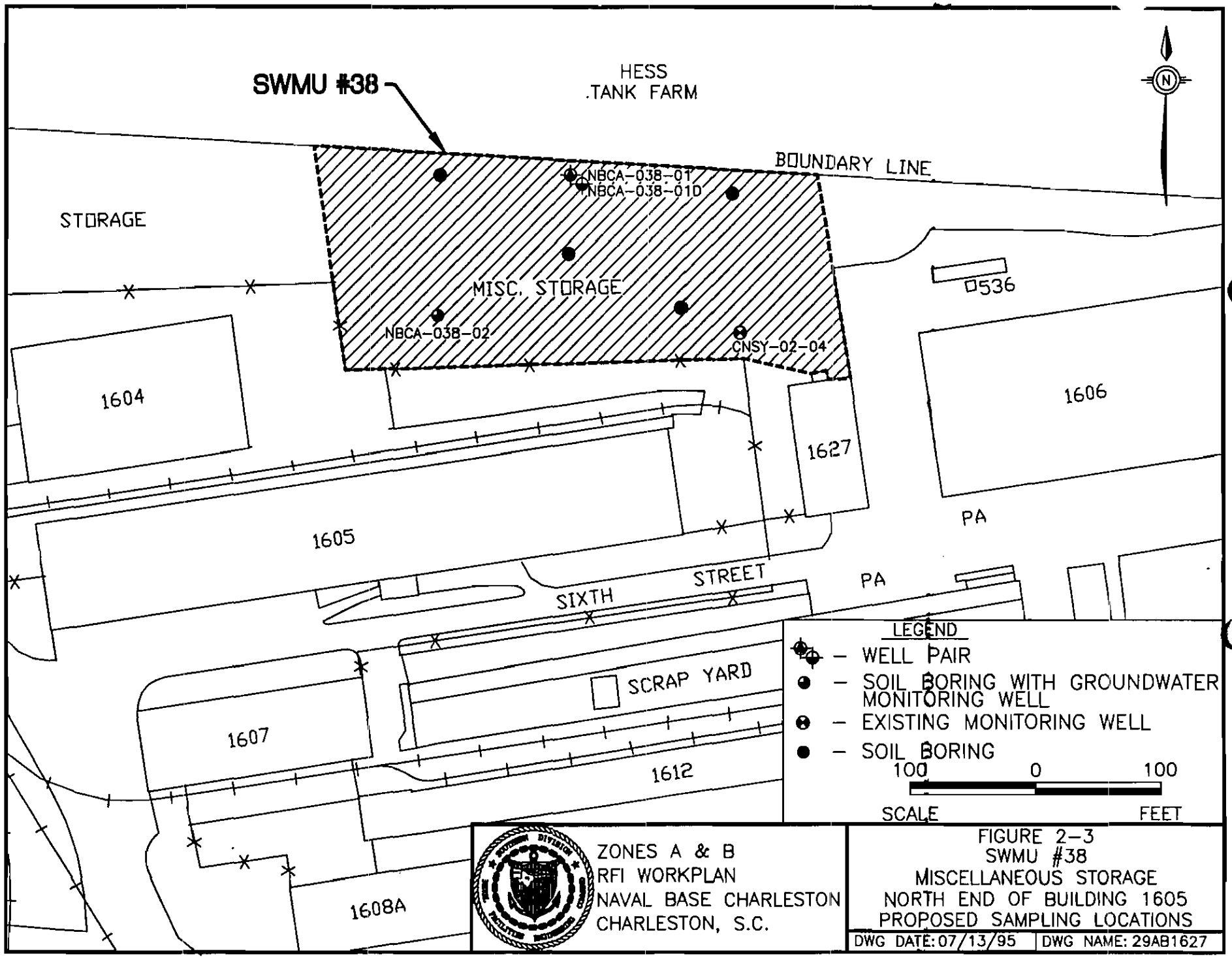
- PCBs > RBC in four upper-interval soil samples. Based on initial RFI results, additional sampling along the fence line separating the base from the Hess fuel farm might be warranted.

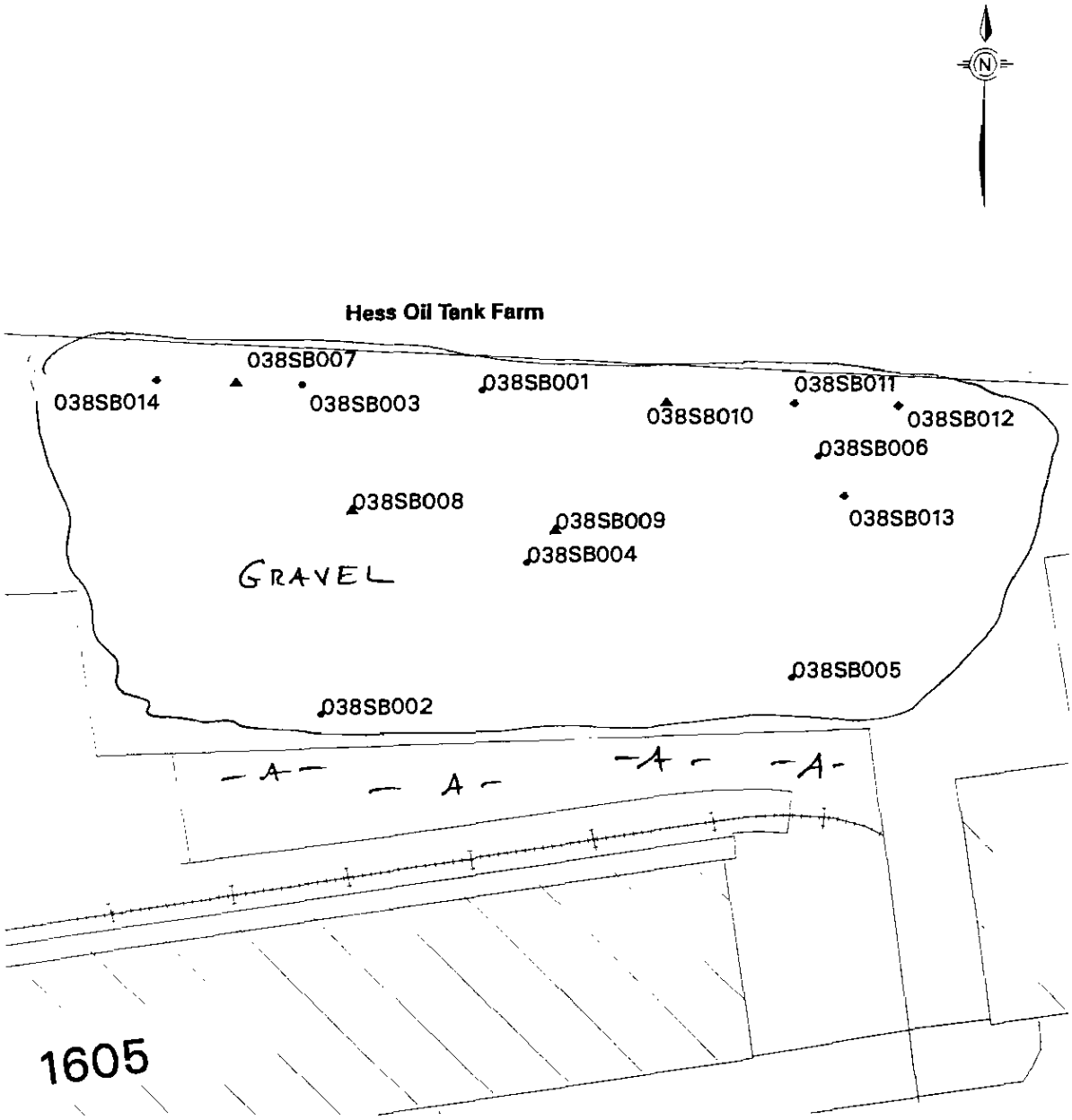
- TPH was detected in one soil sample (2400 ppm). Visual observations of impact (likely from Hess Oil) were not as widespread as seen at SWMU 39 (which is immediately west of SWMU 38).

- CMS:

  1) Comment - Additional soil sampling for PCBs possibly warranted along fence line (ie, near north property line). Potential treatment alternative consists of source removal (eg, surface soil excavation and monitoring of GW). Also, source of TPH contamination (ie, likely to be Hess Oil Company) needs to be addressed.

  2) **Opinion - CMS candidate based on results of risk assessment.**


SWMU #38
HESS
TANK FARM
BOUNDARY LINE
NBCA-038-01
NBCA-038-01D
STORAGE
MISC. STORAGE
NBCA-038-02
CNSY-02-04
D536
1604
1606
1627
1605
PA
SIXTH
STREET
PA
SCRAP YARD
1607
1612
1608A
LEGEND
– WELL PAIR
– SOIL BORING WITH GROUNDWATER MONITORING WELL
– EXISTING MONITORING WELL
– SOIL BORING
100
0
100
SCALE
FEET
ZONES A & B
RFI WORKPLAN
NAVAL BASE CHARLESTON
CHARLESTON, S.C.
FIGURE 2-3
SWMU #38
MISCELLANEOUS STORAGE
NORTH END OF BUILDING 1605
PROPOSED SAMPLING LOCATIONS
DWG DATE: 07/13/95
DWG NAME: 29AB1627



LEGEND

- 1st Round Soil Boring
- 2nd Round Soil Boring
- 3rd Round Soil Boring

Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.2.1 - SWMU 3B
Soil Sample Locations

SWMU 39

- The site is the former POL drum storage area north and adjacent to Building 1604. The actual SWMU is the paved area north of the building, however the investigation area includes a much larger area and is comprised of the gravel lot north of the building and directly south of the Hess fuel farm.

- Sampling activities have continued into 1997 and therefore no formal risk assessment has been completed as of this writing. Thus, no COCs for soil or GW are reported.

- Contaminants detected at the site include: a chlorinated solvent plume in the shallow and intermediate GW levels, and TPH components in the shallow GW level. It is suspected that Hess Oil Company is the source of the TPH components. DNAPL and LNAPL have each been observed in a GW monitoring well.

- BEQs > RBSL were identified in one soil sample. Subsequent sampling did not produce evidence that the BEQs were widespread.

- PCBs > RBC in three upper-interval samples. Additional sampling indicated that PCBs were limited to a small area located at the northern portion of the site. Note that PCBs were similarly found located along the northern fenceline at SWMU 38. This northern area includes a bermed area that separates the navy base from the Hess fuel farm.

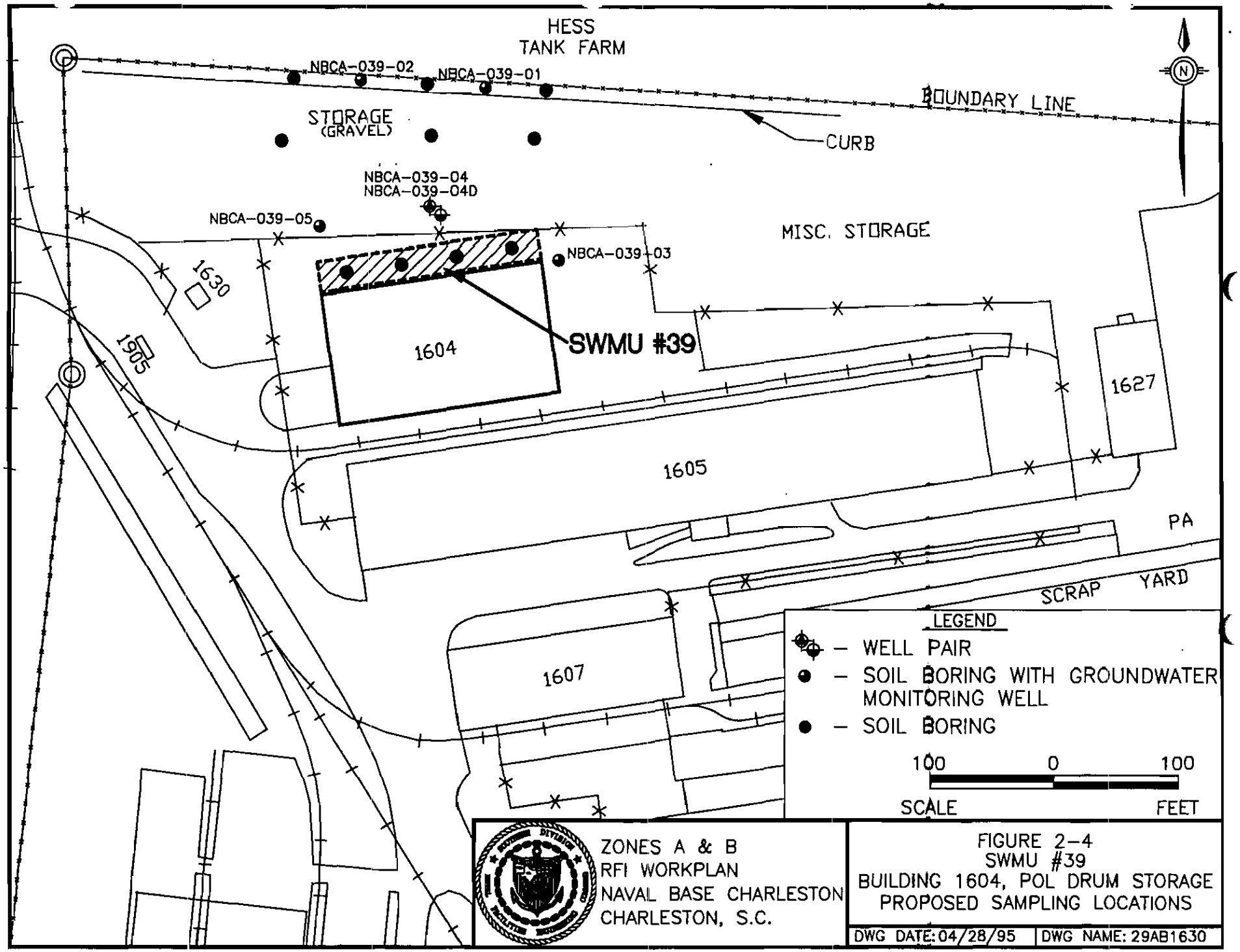
- TPH detections were widespread at the site.

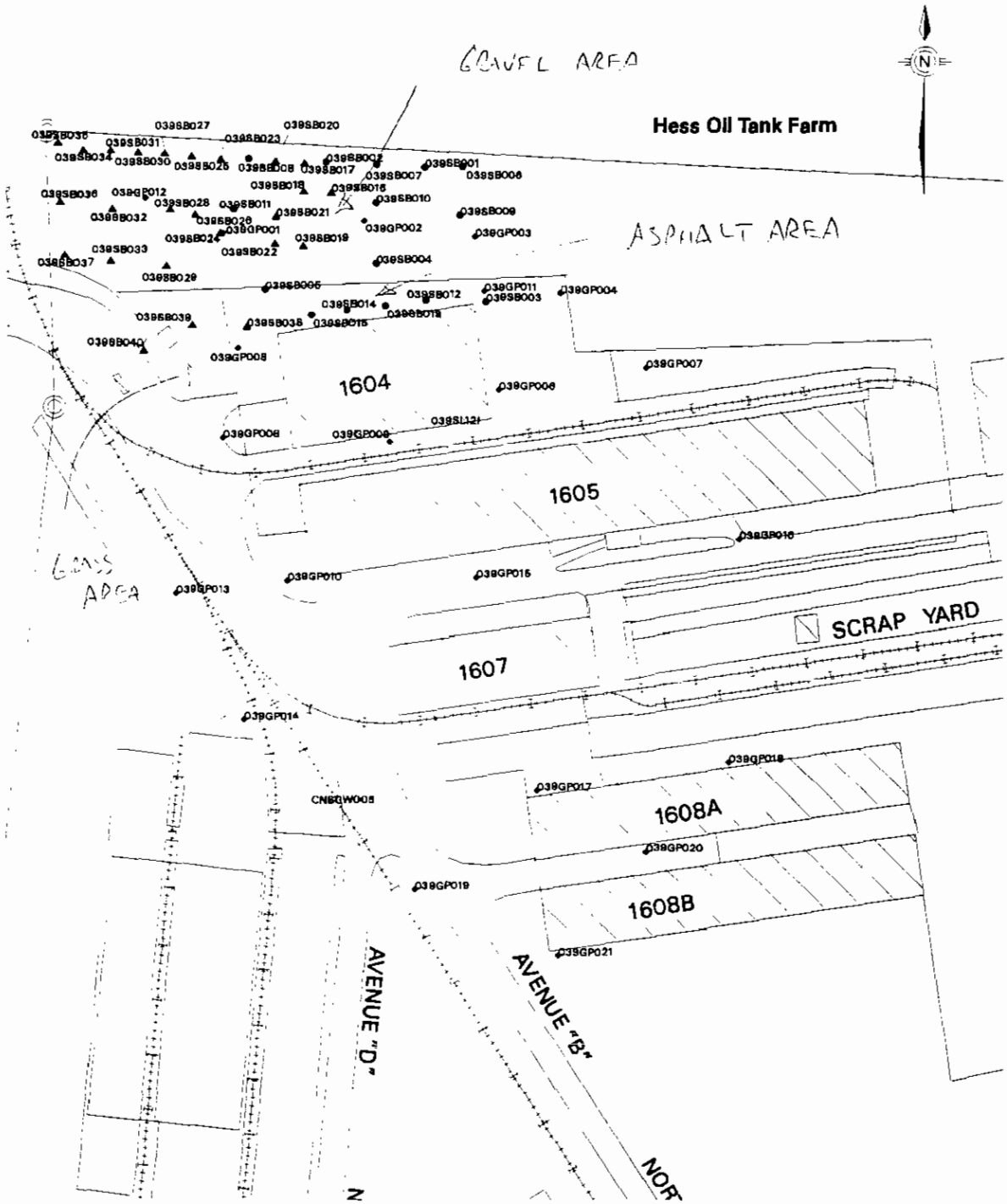
- CMS:

    1) Comment - Additional soil sampling for PCBs is possibly warranted along fence line (ie, near north property line). Also, source of TPH contamination needs to be addressed. This is the same comment as stated for SWMU 38. Treatment alternatives will likely consist of source removal/containment (via P&T and/or passive or active walls) and monitoring.

    2) Comment - Risk assessment completion is required prior to the rendering of a CMS opinion. Results of final risk assessment must be considered in the CMS go/no go decision process.

    3) Opinion - not stated until results of risk assessment made available but likely CMS candidate.


HESS
TANK FARM
NBCA-039-02
NBCA-039-01
BOUNDARY LINE
STORAGE
(GRAVEL)
CURB
NBCA-039-04
NBCA-039-04D
NBCA-039-05
NBCA-039-03
MISC. STORAGE
1630
1905
1604
SWMU #39
1627
1605
PA
SCRAP YARD
1607
LEGEND
– WELL PAIR
– SOIL BORING WITH GROUNDWATER MONITORING WELL
– SOIL BORING
100 0 100
SCALE FEET
ZONES A & B
RFI WORKPLAN
NAVAL BASE CHARLESTON
CHARLESTON, S.C.
FIGURE 2-4
SWMU #39
BUILDING 1604, POL DRUM STORAGE
PROPOSED SAMPLING LOCATIONS
DWG DATE: 04/28/95
DWG NAME: 29AB1630



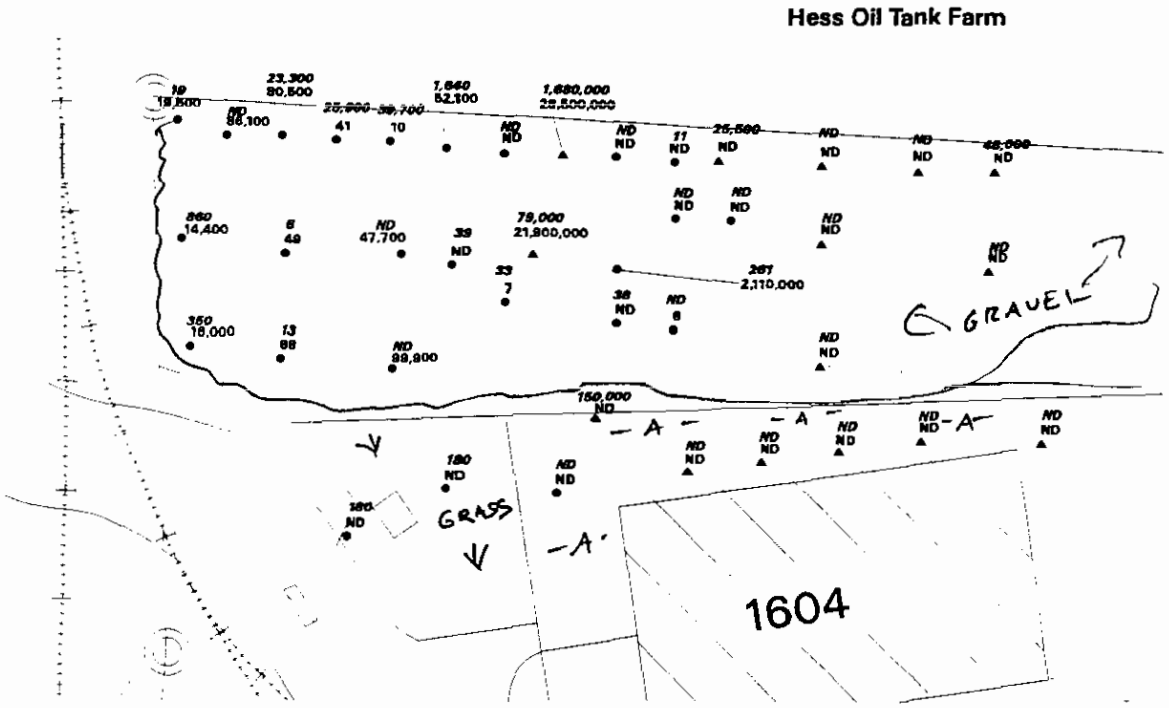
LEGEND

- 1st Round Soil Borings
- 2nd Round Soil Borings
- Geoprobe Borings

0 200 feet

Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.3.1 - SWMU 39
Soil Sample Locations



LEGEND

- ▲ 1st Round Soil Borings
- ● 2nd Round Soil Borings

● Surface
Subsurface - TPH data (ppb)

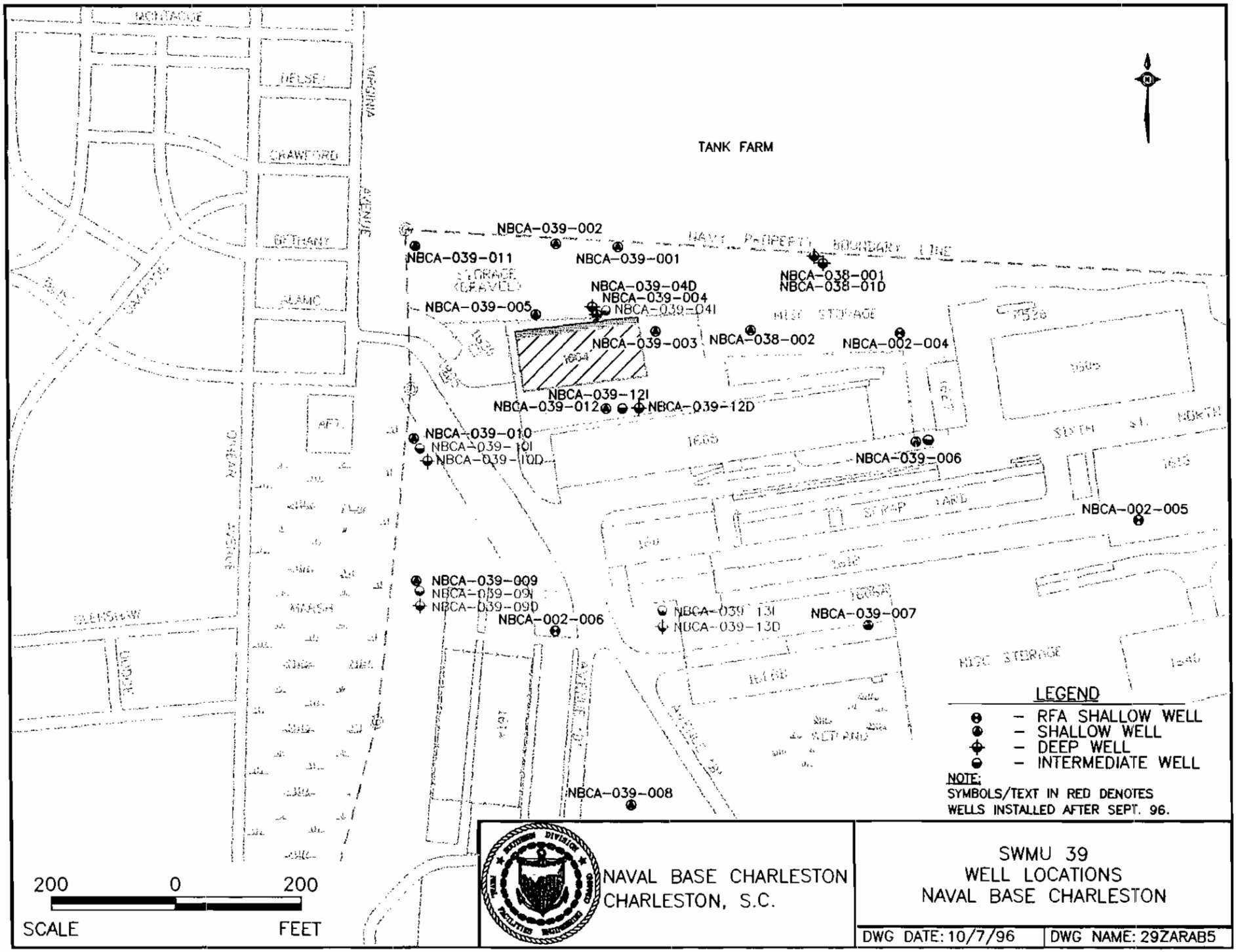
▲ ● TPH Concentration (Surface and/or Subsurface) Exceedes 100,000 ppb

Note: ND - Not Detected

0 100 feet

Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.3.2 - SWMU 39
TPH Detections in Soil


TANK FARM
NBCA-039-002
NBCA-039-011
NBCA-039-001
NBCA-038-001
NBCA-038-01D
NBCA-039-04D
NBCA-039-004
NBCA-039-041
NBCA-039-005
NBCA-039-003
NBCA-038-002
NBCA-002-004
NBCA-039-12I
NBCA-039-012
NBCA-039-12D
NBCA-039-010
NBCA-039-10I
NBCA-039-10D
NBCA-039-006
NBCA-002-005
NBCA-039-009
NBCA-039-09I
NBCA-039-09D
NBCA-002-006
NBCA-039-13I
NBCA-039-13D
NBCA-039-007
NBCA-039-008
LEGEND
– RFA SHALLOW WELL
– SHALLOW WELL
– DEEP WELL
– INTERMEDIATE WELL
NOTE:
SYMBOLS/TEXT IN RED DENOTES WELLS INSTALLED AFTER SEPT. 96.
200 0 200
SCALE FEET
NAVAL BASE CHARLESTON
CHARLESTON, S.C.
SWMU 39
WELL LOCATIONS
NAVAL BASE CHARLESTON
DWG DATE: 10/7/96
DWG NAME: 29ZARAB5

SWMU 42 and AOC 505

- SWMU 42 consists of the site of a former asphalt plant/boiler plant and AOC 505 consists of a former creosote cross-tie/railroad ballast storage area.

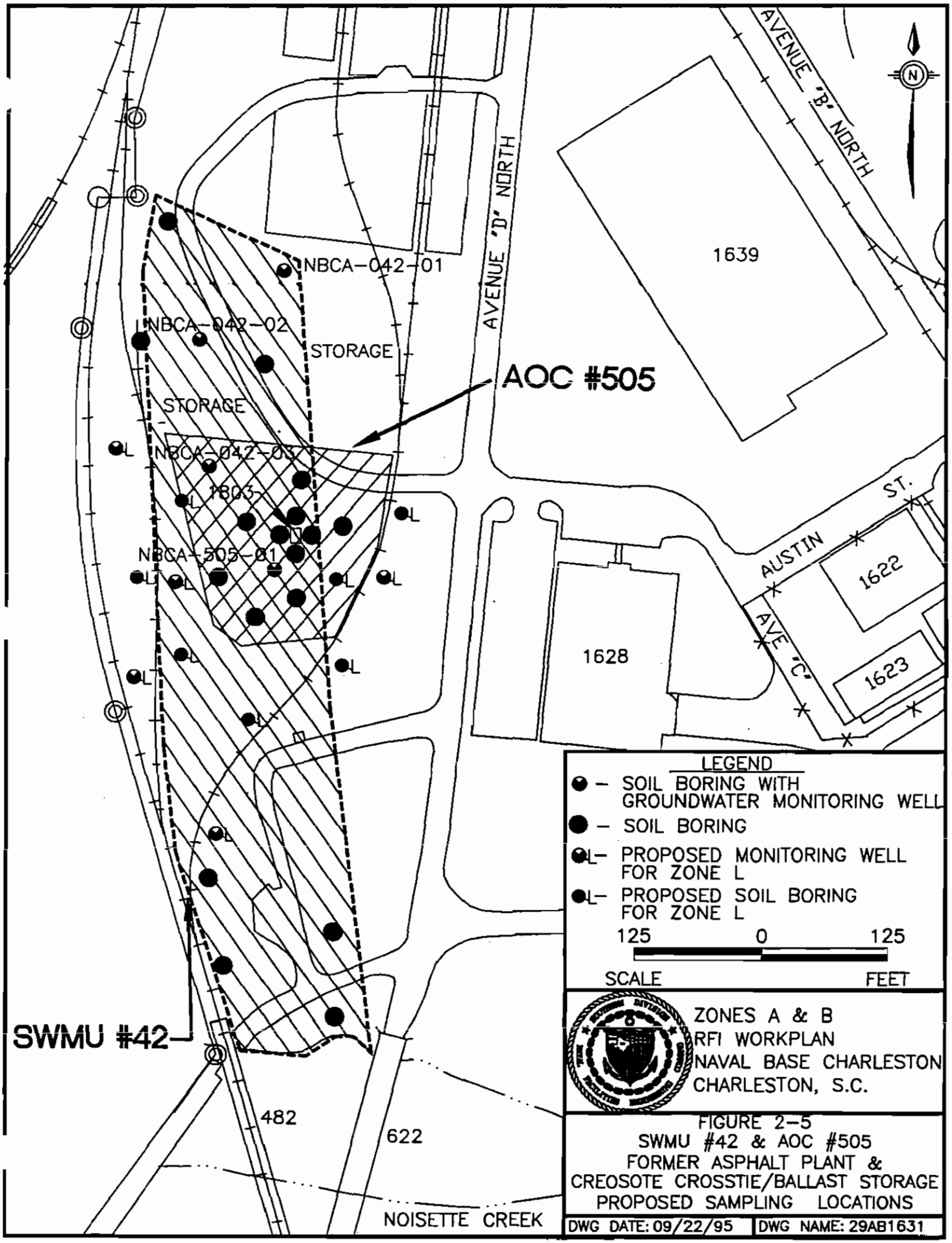
- The site is mostly grassed with some gravel areas and concrete slab patches.

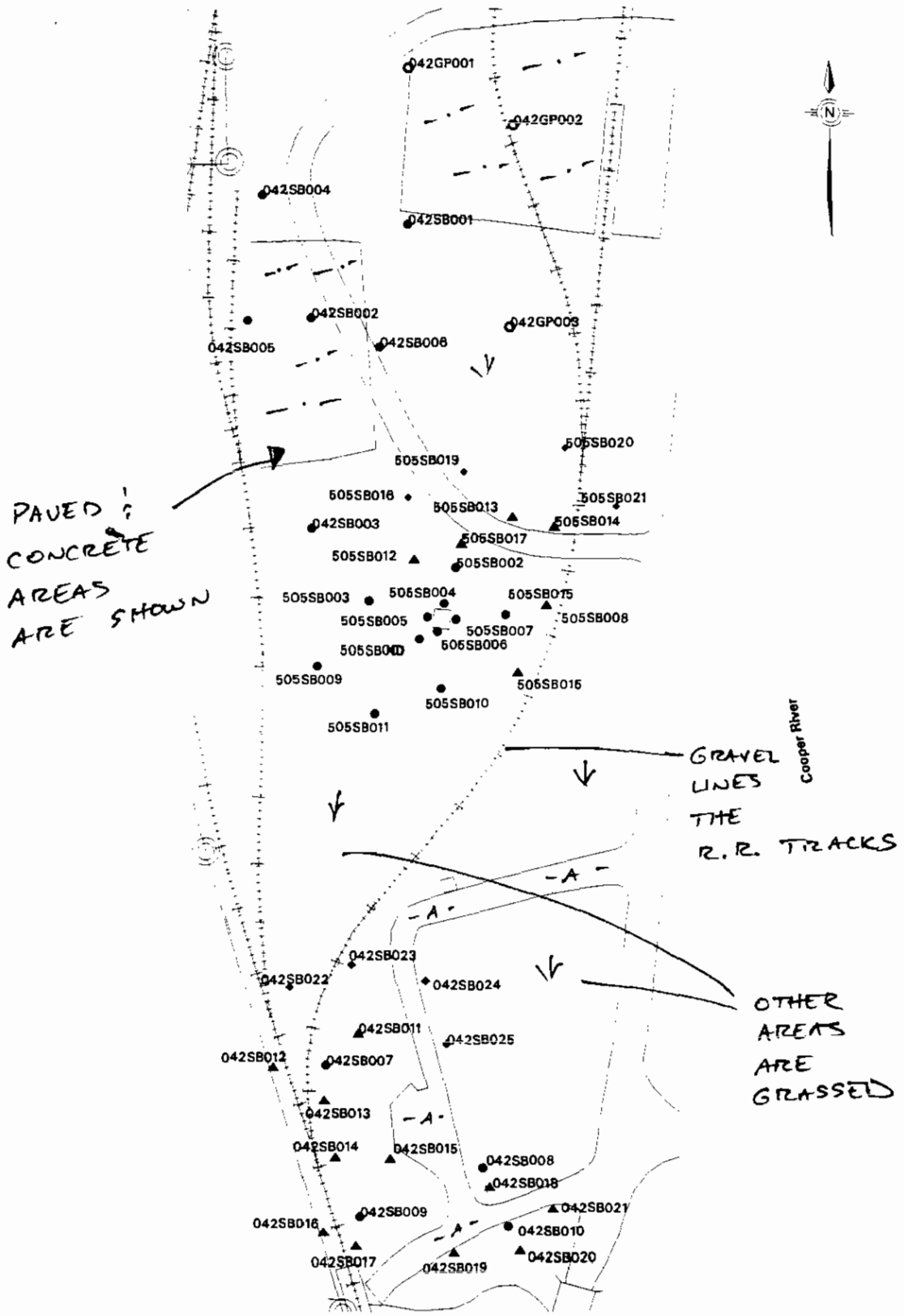
- Soil COCs = As, Be, PCBs, BEQs. Site residential risk values for both soil and GW ranged from 1E-6 to 1E-4. Shallow GW COCs = chlorinated solvents (PCE, TCA, DCE, chloromethane) and Mn. However, it is evidenced that over four quarters of sampling events that the chlorinated solvent constituents have continuously decreased from a detect level to ND and < MCL levels.

- CMS:

  1) Comment - potential treatment alternative consists of source removal and/or containment.

  2) Opinion - Potential CMS candidate based on results of risk assessment. Risk management decision required.


AVENUE 'B' NORTH
AVENUE 'D' NORTH
1639
NBCA-042-01
NBCA-042-02
STORAGE
STORAGE
AOC #505
NBCA-042-03
1803
NBCA-505-01
AUSTIN ST.
1622
AVE 'C'
1628
1623
SWMU #42
482
622
NOISETTE CREEK
LEGEND
● – SOIL BORING WITH GROUNDWATER MONITORING WELL
● – SOIL BORING
●L– PROPOSED MONITORING WELL FOR ZONE L
●L– PROPOSED SOIL BORING FOR ZONE L
125 0 125
SCALE FEET
ZONES A & B
RFI WORKPLAN
NAVAL BASE CHARLESTON
CHARLESTON, S.C.
FIGURE 2-5
SWMU #42 & AOC #505
FORMER ASPHALT PLANT &
CREOSOTE CROSSTIE/BALLAST STORAGE
PROPOSED SAMPLING LOCATIONS
DWG DATE: 09/22/95
DWG NAME: 29AB1631

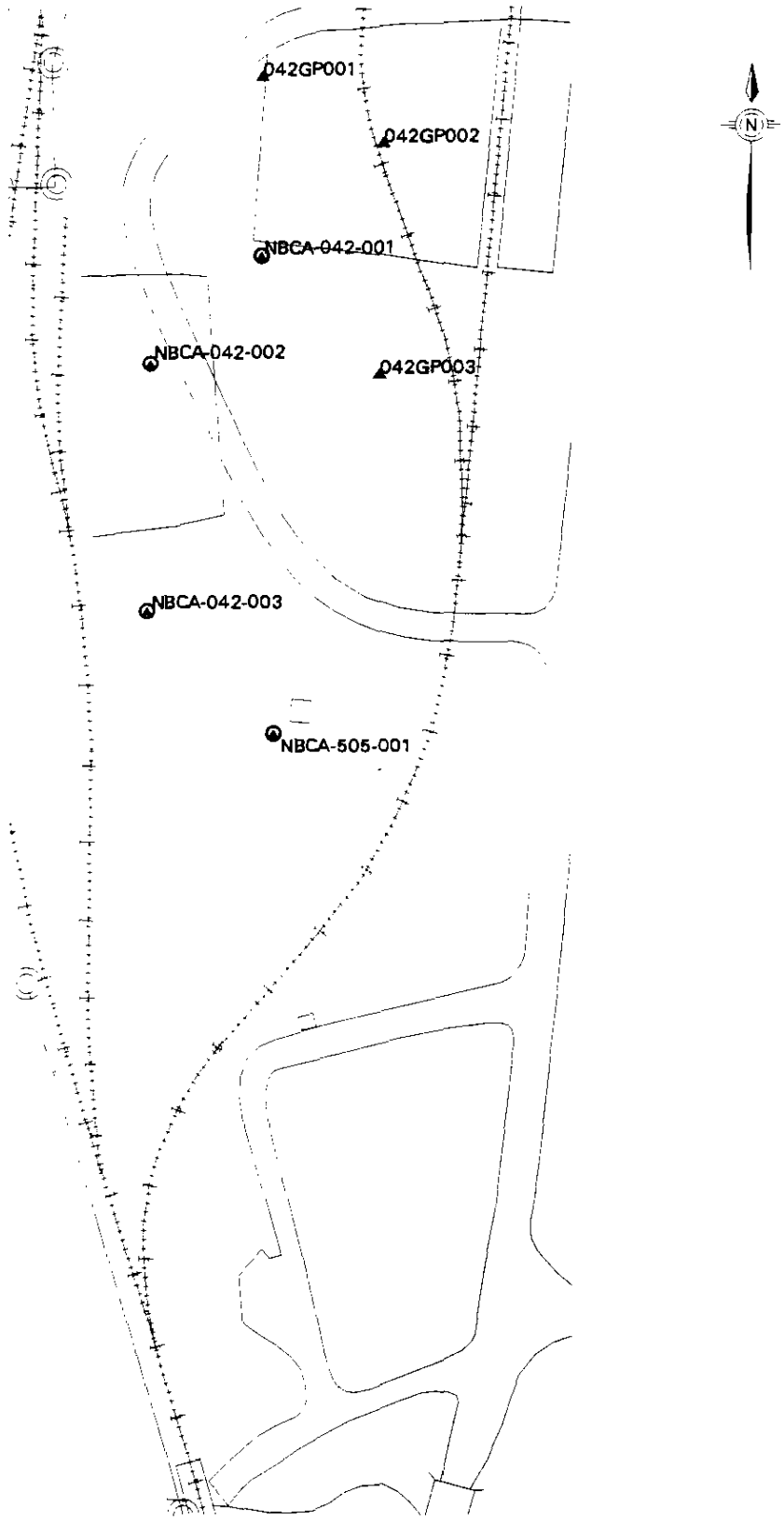


LEGEND

- 1st Round Soil Borings
- 2nd Round Soil Borings
- 3rd Round Soil Borings
- Geoprobe Soil Borings

Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.4.1 - SWMU 42 and AOC 505 Soil Sample Locations



LEGEND

- Shallow Monitoring Wells
- Geoprobe Locations

0 100 feet

Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.4.3 - SWMU 42 and AOC 505
Groundwater Sample Locations

SWMU 43

- SWMU 43 consists of the publications and printing plant (Building 1628). which was not affected by the base closing process (eg, it remains in operation). Area investigated consisted of two HM storage sheds behind the main building.

- The storage sheds are located on a concrete pad surrounded by grass. Both sheds face an area that is of asphalt material. Most sampling points occurred in the surrounding grassed area.

- No COCs were identified at the site.

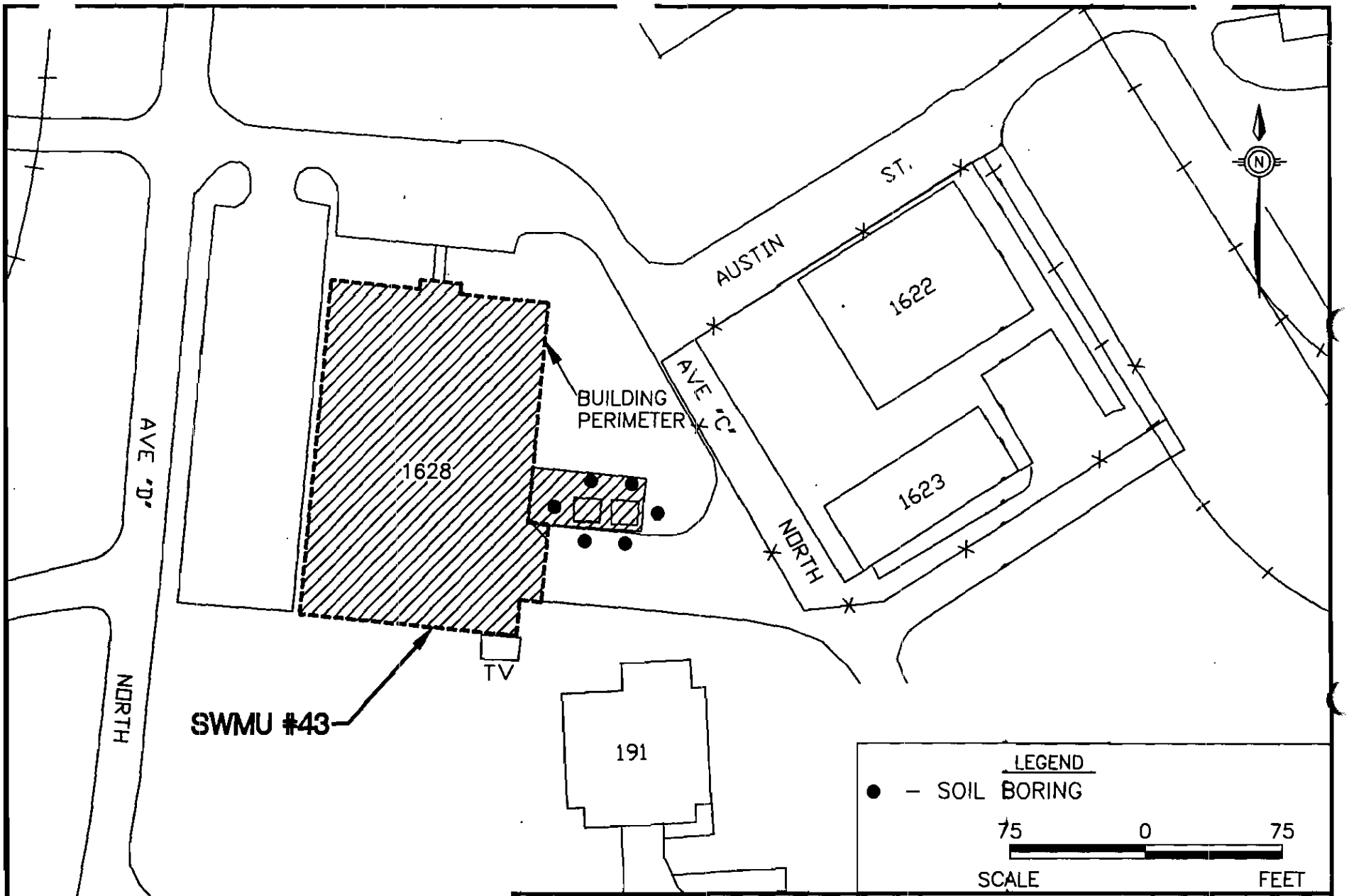
- VOC detections in surface and subsurface soil warranted including this site in the GeoProbe investigation that was conducted for SWMU 39 (eg, because of the known solvent contamination at SWMU 39). A single confirmatory MW was installed. First quarter sampling did not yield evidence of VOCs of concern, though one SVOC (bis (2-ethylhexl) phythalate) and two inorganics (As and Tl) were detected > RBC. Thallium was the only compound to exceed its MCL (4.8 ppm vs 2 ppm = MCL) in the first sampling round. Arsenic exceeded its RBC but was less than its UTL and MCL. This well was recently installed at the site and therefore no additional quarters of GW sampling have occurred.

- Data from the single well has yet to be incorporated into a risk assessment.

- CMS:

    1) Comment - Complete all four rounds of GW sampling to ascertain trend data.

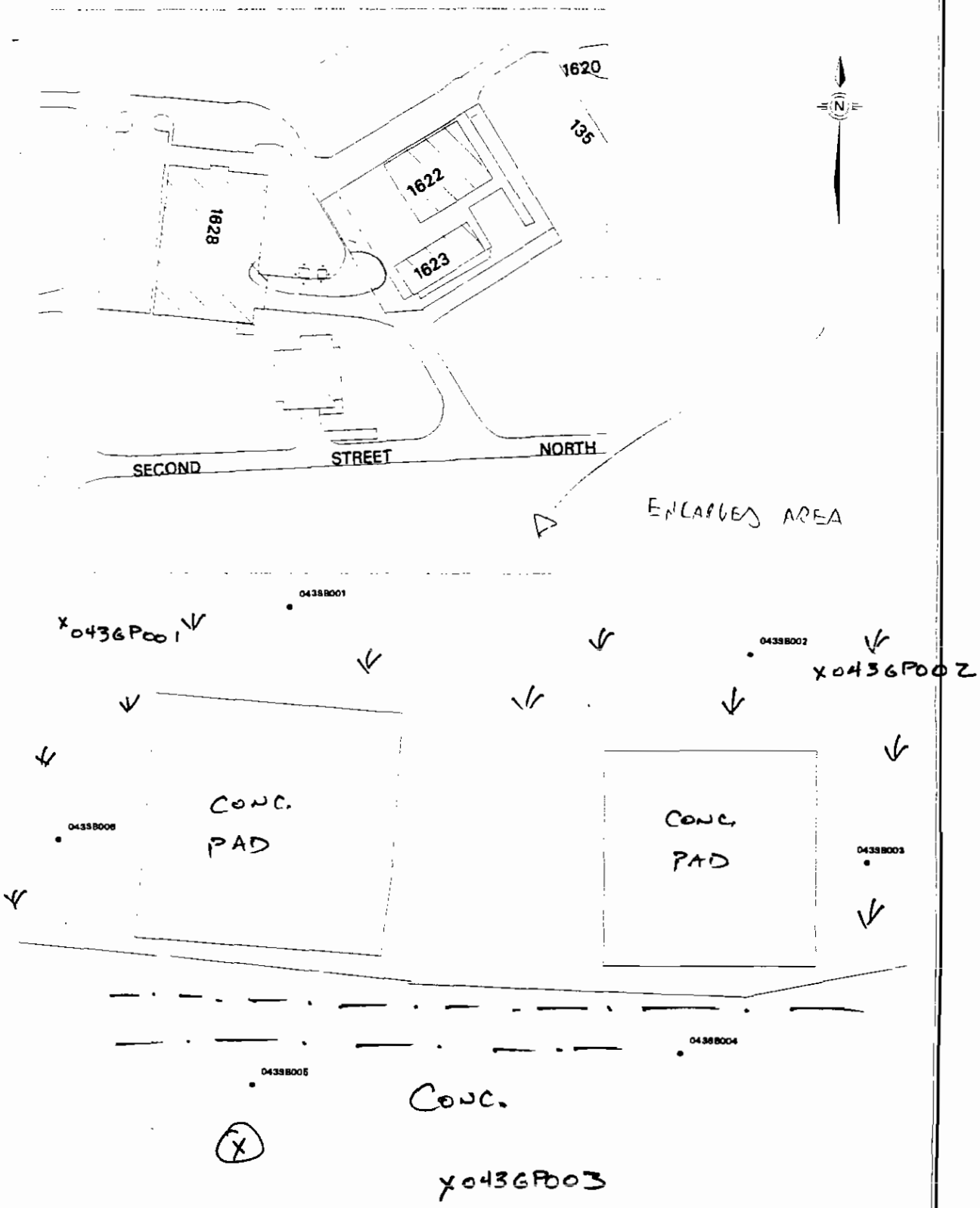
    2) Opinion - nonCMS site.



ZONES A & B
RFI WORKPLAN
NAVAL BASE CHARLESTON
CHARLESTON, S.C.

FIGURE 2-6
SWMU #43
PUBLICATIONS & PRINTING
PLANT, BUILDING 1628
PROPOSED SAMPLING LOCATIONS

DWG DATE: 04/28/95 | DWG NAME: 29AB1628



LEGEND

- • Soil Boring
- x Geoprobe Location
- (x) MONITORING WELL

0 25 feet

Note: The location and dimensions of the storage sheds is approximate

Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.5.1 - SWMU 43
Soil Sample Locations

AOC 506

- AOC 506 (Building 1629) is the site of a former flammable storage shelter. No known or documented releases are associated with the site.

- The storage shed was located over an asphalt pad that is surrounded by grass on three sides and an asphalt road (Avenue A) on one side.

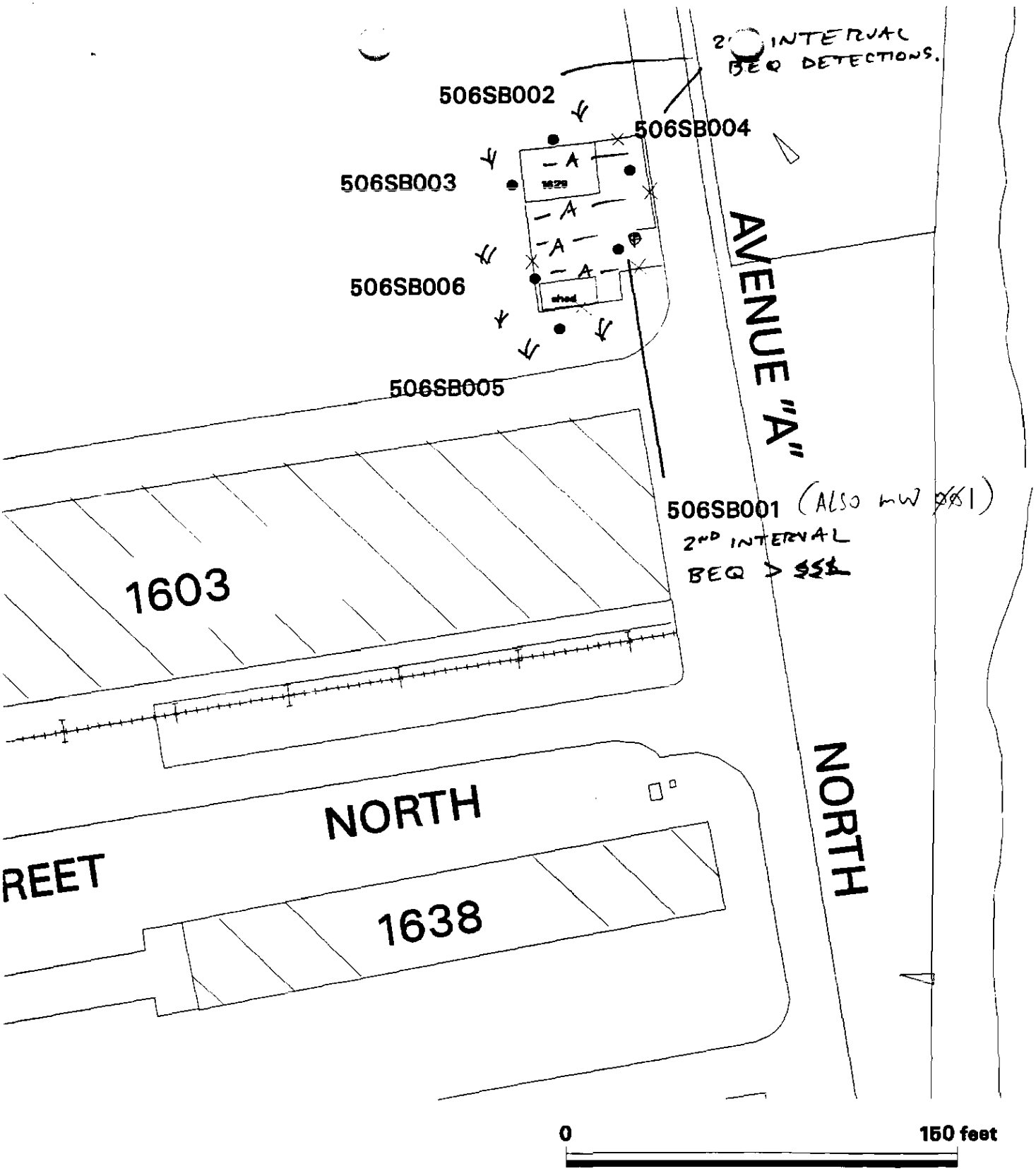
- No COCs were identified at the site.

- BEQs were detected, yet only in three of six subsurface soil samples and only one sample contained BEQs > SSL. Two of three sampling activities occurred through the asphalt pad (including boring 001 > SSL).

- Chlorinated solvent (DCE) was detected in rounds 1 to 3 for shallow GW yet < RBC (by a factor of 25 at its greatest concentration) and no detections occurred in the fourth round. Only one confirmatory type monitoring well (constructed subsequent soil boring 001) was installed at the site.

- CMS:

  1) **Opinion - nonCMS site.**



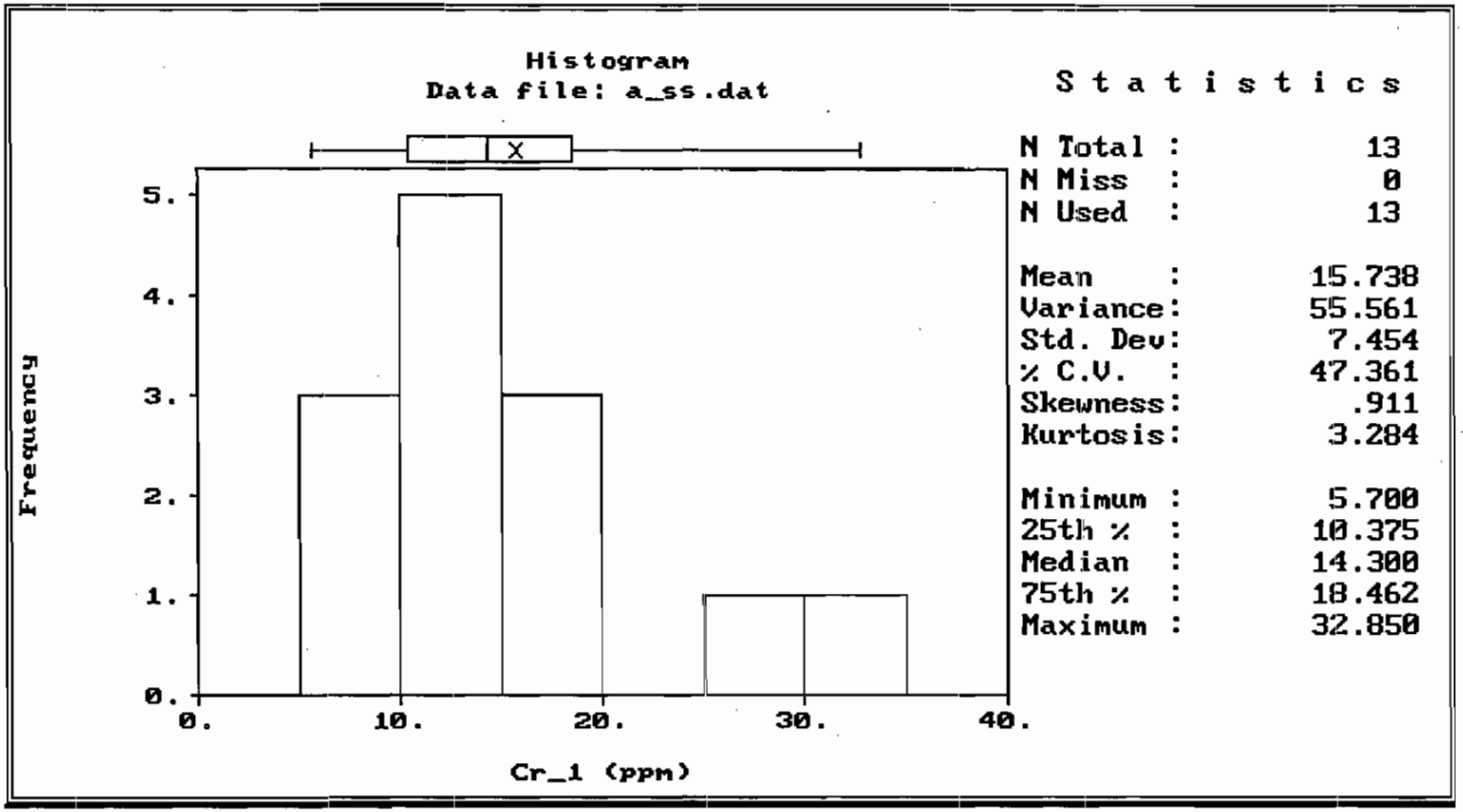
g

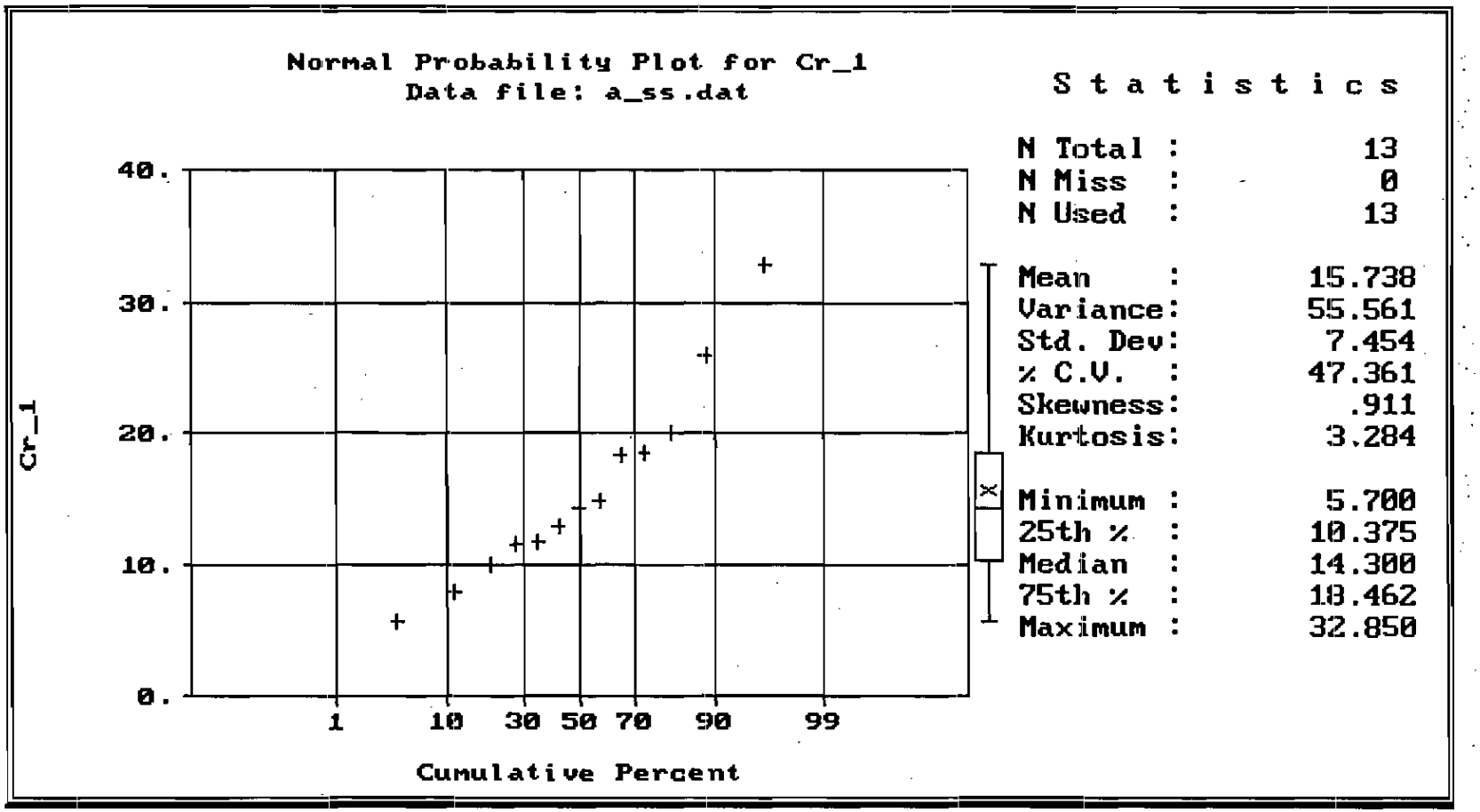
Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.6.1 - AOC 506
Soil Sample Locations

Zone A
Chromium in surface soil grid samples
Original dataset (N=13)
Original values

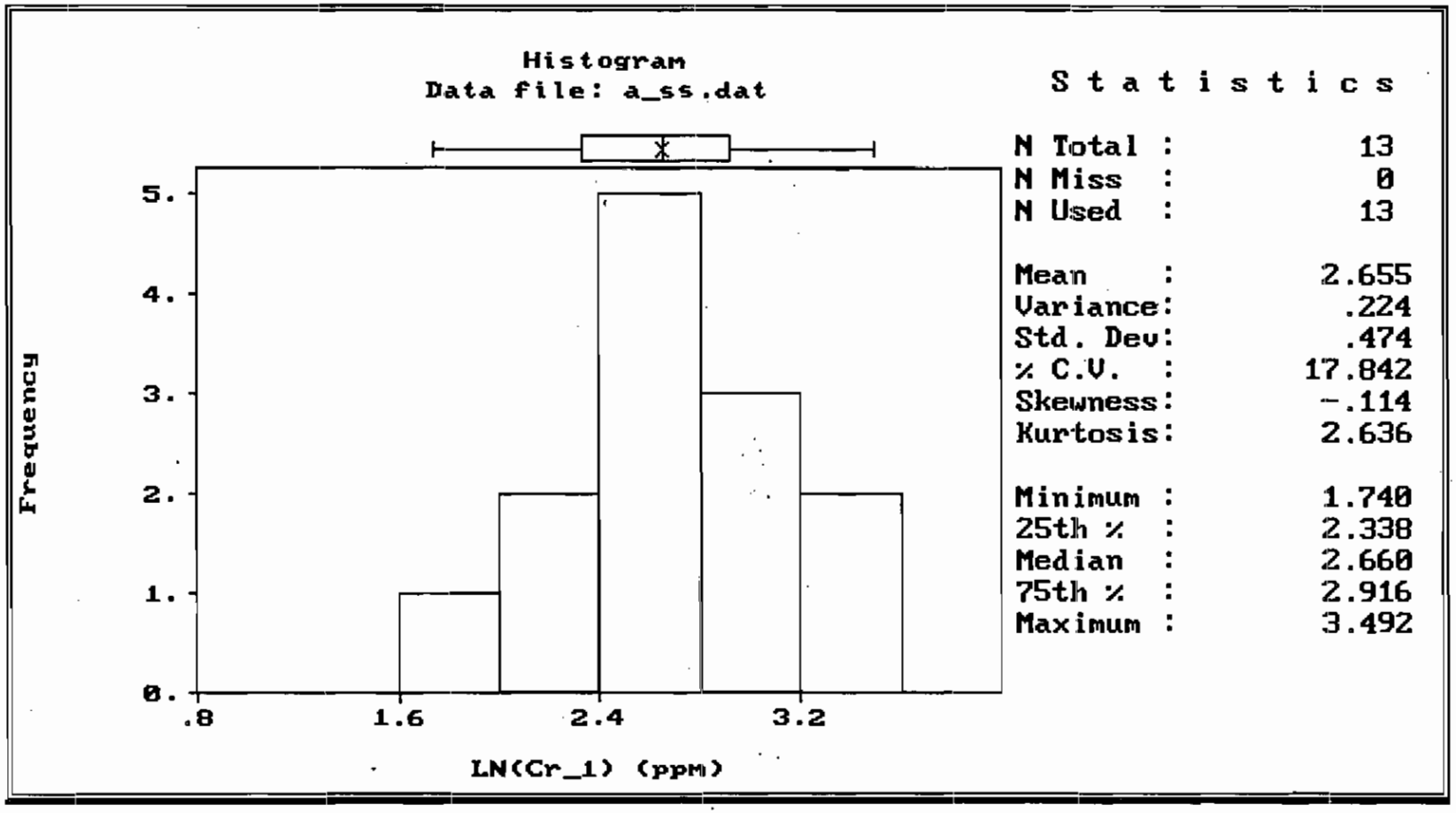
1a



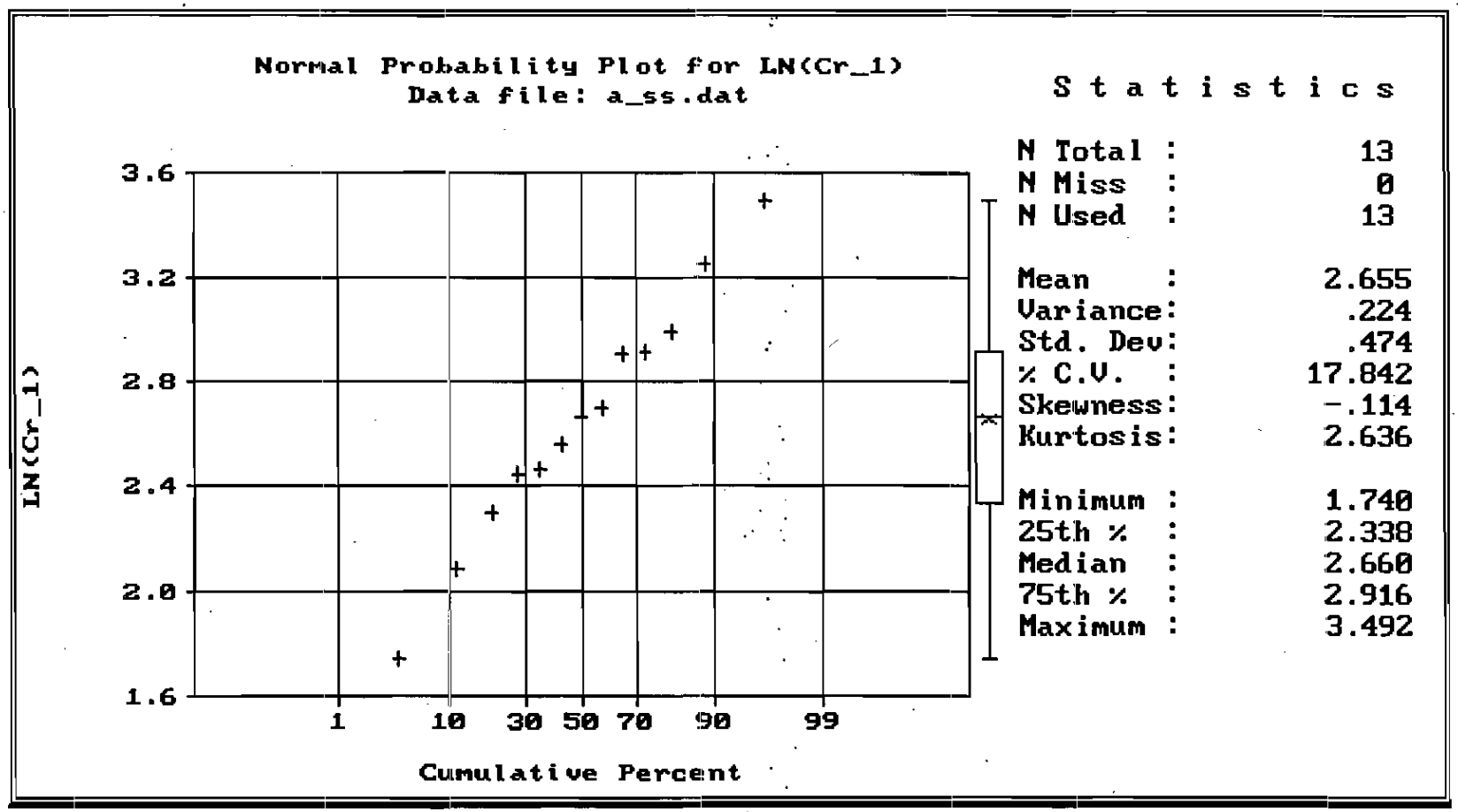

Normal Probability Plot for Cr_1
Data file: a_ss.dat
Cr_1
40.
30.
20.
10.
0.
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 13
N Miss : 0
N Used : 13
Mean : 15.738
Variance: 55.561
Std. Dev: 7.454
% C.V. : 47.361
Skewness: .911
Kurtosis: 3.284
Minimum : 5.700
25th % : 10.375
Median : 14.300
75th % : 18.462
Maximum : 32.850

Zone A
Chromium in surface soil grid samples
Original dataset (N = 13)
LN- transformed values

2a



2b


Normal Probability Plot for LN(Cr_1)
Data file: a_ss.dat
LN(Cr_1)
3.6
3.2
2.8
2.4
2.0
1.6
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 13
N Miss : 0
N Used : 13
Mean : 2.655
Variance: .224
Std. Dev: .474
% C.V. : 17.842
Skewness: -.114
Kurtosis: 2.636
Minimum : 1.740
25th % : 2.338
Median : 2.660
75th % : 2.916
Maximum : 3.492

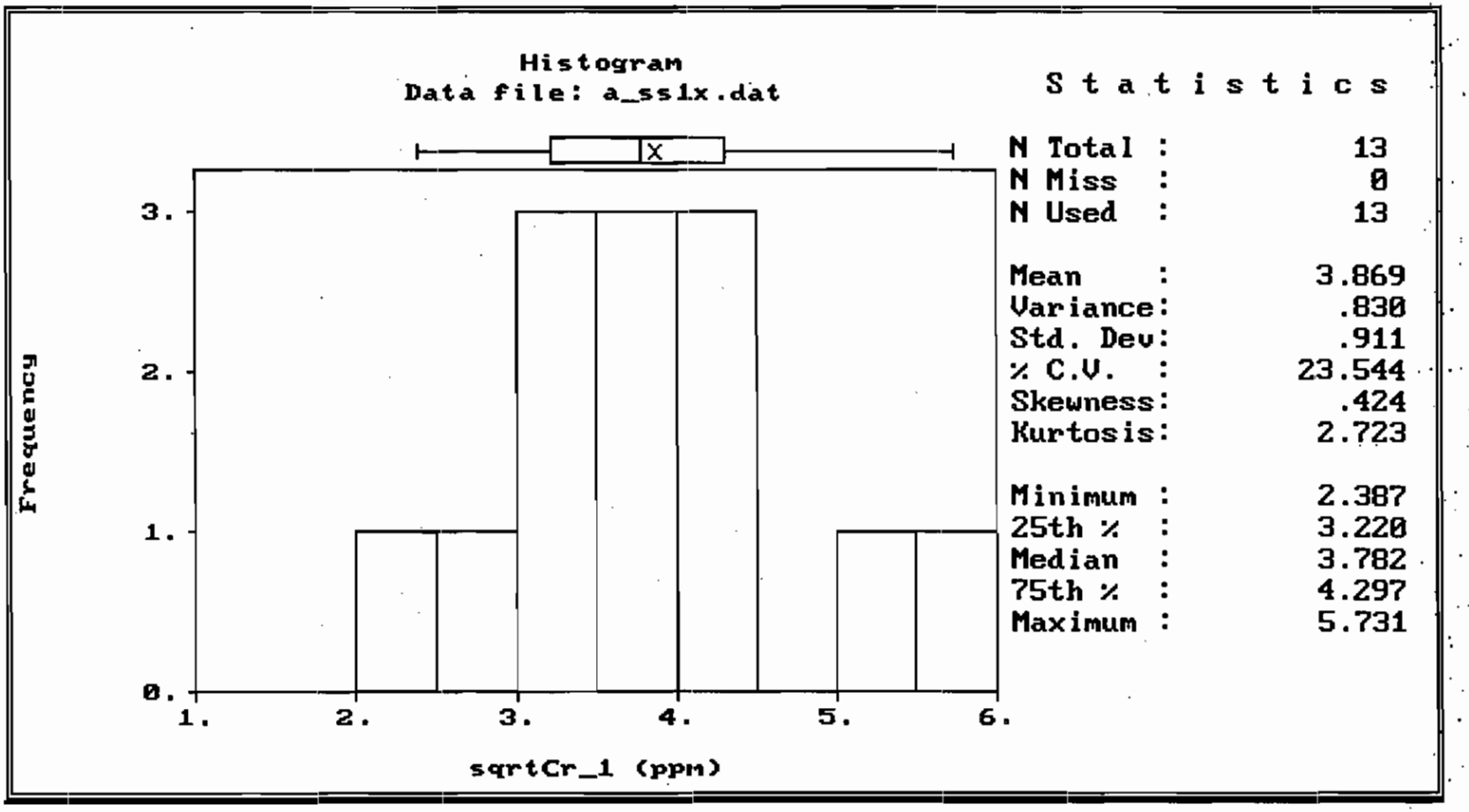
Zone A

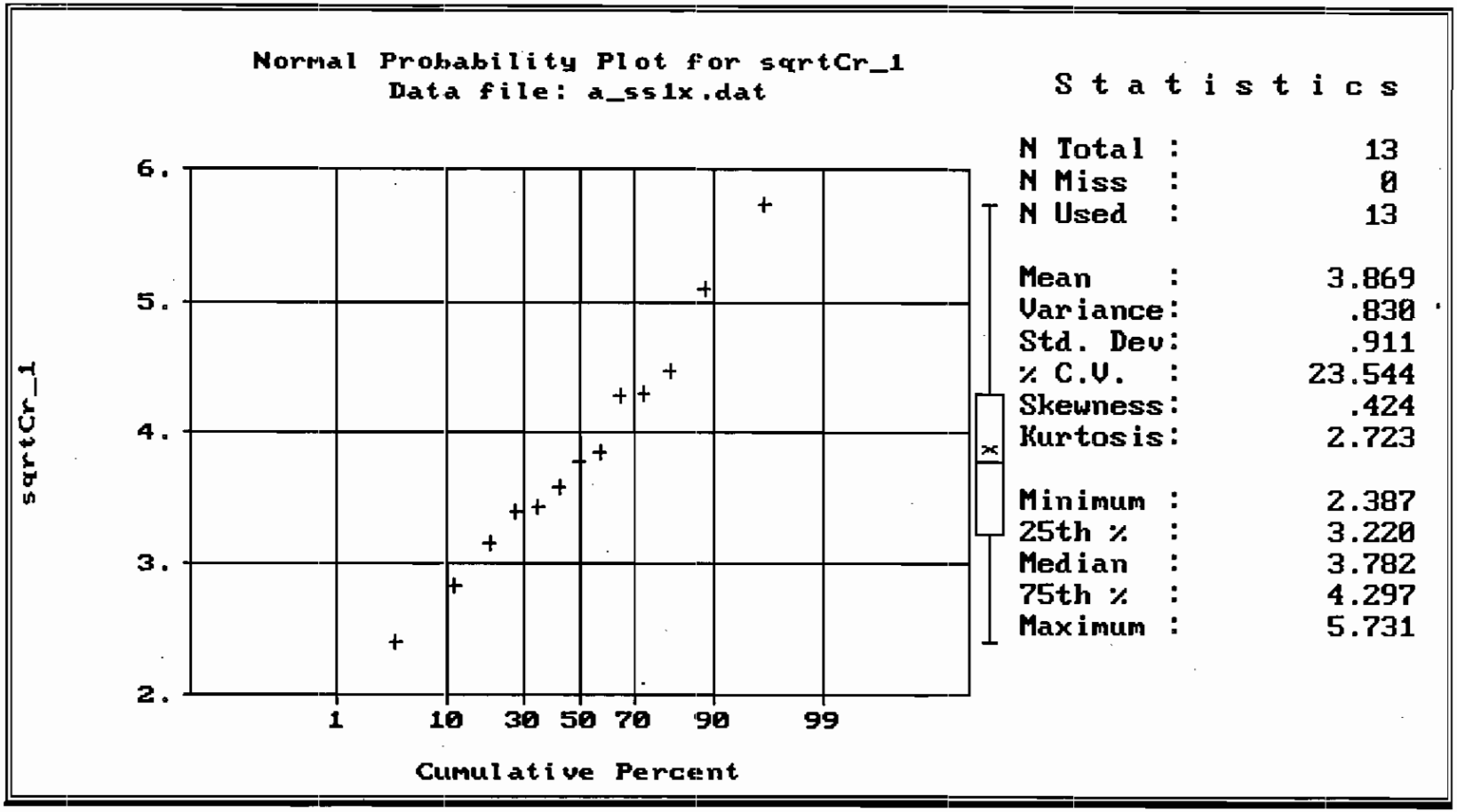
Chromium in surface soil grid samples

Original dataset (N=13)

Square-root transformed values

3a




Normal Probability Plot for sqrtCr_1
Data file: a_ss1x.dat
sqrtCr_1
6.
5.
4.
3.
2.
1
10
30
50
70
90
99
Cumulative Percent
x
Statistics
N Total : 13
N Miss : 0
N Used : 13
Mean : 3.869
Variance: .830
Std. Dev: .911
% C.V. : 23.544
Skewness: .424
Kurtosis: 2.723
Minimum : 2.387
25th % : 3.220
Median : 3.782
75th % : 4.297
Maximum : 5.731

E N V I R O N M E N T A L S A F E T Y & D E S I G N S

2901-00001 - CHARLESTON ZONE A - SOIL & 1ST GW

Samples by Chemical Report

18540-29-9 - Chromium (Hexavalent)

>= 0.0000 for MG/KG

Sample ID	Ext. Orig. ID	Type	Date	Result	VQual	Units	SDG #	
002-M-0004-01	002M000401	Soil	03/29/96	0.0490	U	MG/KG	25106	VAL
002-C-B001-01	002CB00101	Soil	10/10/95	0.0590	J	MG/KG	L5568I	VAL
002-C-B002-01	002CB00201	Soil	10/10/95	0.0270	J	MG/KG	L5568I	VAL
002-C-B007-01	002CB00701	Soil	10/10/95	0.1000	J	MG/KG	L5568I	VAL
002-C-B011-02	002CB01102	Soil	10/10/95	0.0240	U	MG/KG	L5568I	VAL
002-C-B013-01	002CB01301	Soil	10/10/95	0.0260	J	MG/KG	L5568I	VAL
002-C-B024-02	002CB02402	Soil	10/10/95	0.0700	J	MG/KG	L5568I	VAL
038-C-B002-01	038CB00201	Soil	10/03/95	0.0740	J	MG/KG	L5509I	VAL
038-C-B006-01	038CB00601	Soil	10/03/95	0.0240	U	MG/KG	L5509I	VAL
039-C-B003-01	039CB00301	Soil	10/03/95	0.0230	U	MG/KG	L5509I	VAL
039-C-B014-01	039CB01401	Soil	10/03/95	0.0230	U	MG/KG	L5509I	VAL
042-C-B004-01	042CB00401	Soil	10/06/95	0.0220	U	MG/KG	L5552I	VAL
042-C-B009-02	042CB00902	Soil	10/06/95	0.1200	J	MG/KG	L5552I	VAL
506-C-B002-02	506CB00202	Soil	10/11/95	0.0200	U	MG/KG	L5583I	VAL
GDA-C-B003-02	GDACB00302	Soil	10/05/95	0.0250	U	MG/KG	L5542I	VAL
GDA-C-B005-01	GDACB00501	Soil	10/09/95	0.0230	U	MG/KG	L5557I	VAL
GDA-C-B007-01	GDACB00701	Soil	10/09/95	0.0230	U	MG/KG	L5557I	VAL
GDA-C-B011-01	GDACB01101	Soil	10/09/95	0.0230	U	MG/KG	L5557I	VAL

*** End of Report ***

CHARLESTON - ZONE A
Surface Soil Grid Samples
Metals

SW846-META													
	SAMPLE ID ------->	GDA-S-B001-01		GDA-S-B002-01		GDA-S-B003-01		GDA-S-B005-01		GDA-C-B005-01		GDA-S-B006-01	
	ORIGINAL ID ----->	GDASB00101		GDASB00201		GDASB00301		GDASB00501		GDACB00501		GDASB00601	
	LAB SAMPLE ID --->	L5545-23		L5545-29		L5545-25		L5563-98		L5557-8		L5563-100	
	ID FROM REPORT -->	GDASB00101		GDASB00201		GDASB00301		GDASB00501		GDACB00501		GDASB00601	
	SAMPLE DATE ----->	10/05/95		10/05/95		10/05/95		10/09/95		10/09/95		10/09/95	
	DATE EXTRACTED -->	10/14/95		10/14/95		10/14/95		10/16/95		10/16/95		10/16/95	
	DATE ANALYZED --->	10/21/95		10/21/95		10/21/95		10/25/95		10/25/95		10/25/95	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A
CAS #	Parameter	L5545S	VAL	L5545S	VAL	L5545S	VAL	L5563S	VAL	L5557S	VAL	L5563S	VAL
7429-90-5	Aluminum (Al)	6010.		3640.		7470.		10900.		9440.		5650.	
7440-36-0	Antimony (Sb)	11.6	U	13.1	U	11.9	U	12.3	U	11.7	UJ	13.6	U
7440-38-2	Arsenic (As)	6.6		1.7	J	4.		5.2		6.	J	30.1	
7440-39-3	Barium (Ba)	19.3	J	6.5	J	22.4	J	24.	J	20.7	J	46.5	J
7440-41-7	Beryllium (Be)	0.23	U	0.26	U	0.23	U	0.24	U	0.23	U	0.32	J
7440-43-9	Cadmium (Cd)	1.1	U	1.3	U	1.2	U	1.2	U	1.1	U	1.3	U
7440-70-2	Calcium (Ca)	3360.		4410.		44400.		78900.	J	51600.		5160.	J
7440-47-3	Chromium (Cr)	8.		5.7		18.5		34.4	J	31.3		20.	J
7440-48-4	Cobalt (Co)	1.4	U	1.5	U	1.7	J	1.4	U	1.4	U	4.4	J
7440-50-8	Copper (Cu)	6.2		2.2	J	24.8		7.6		8.4		70.9	
7439-89-6	Iron (Fe)	4560.		1530.		7570.		7090.	J	6470.		13700.	J
7439-92-1	Lead (Pb)	19.2		4.1		57.9		14.5		14.6		93.1	
7439-95-4	Magnesium (Mg)	231.	J	231.	J	955.	J	3150.	J	2100.		443.	J
7439-96-5	Manganese (Mn)	26.1		8.7		66.1		44.9	J	32.7		62.2	J
7439-97-6	Mercury (Hg)	0.11	U	0.13	U	0.12	U	0.12	UJ	0.12	U	0.3	J
7440-02-0	Nickel (Ni)	3.2	U	3.6	U	9.6		13.7		10.1		14.1	
7440-09-7	Potassium (K)	128.	J	133.	UJ	313.	J	675.	J	535.	J	213.	J
7782-49-2	Selenium (Se)	0.67	U	0.78	U	0.7	J	0.74	U	1.2	J	0.79	UJ
7440-22-4	Silver (Ag)	0.68	U	0.77	U	0.7	U	0.72	U	0.69	U	0.8	U
7440-23-5	Sodium (Na)	207.	J	255.	J	315.	J	653.	J	574.	J	269.	J
7440-28-0	Thallium (Tl)	0.89	U	1.	U	0.93	UJ	0.98	U	0.92	U	1.1	U
7440-62-2	Vanadium (V)	10.4	J	4.9	J	13.5		22.3		18.		19.7	
7440-66-6	Zinc (Zn)	37.5		4.5	J	130.		58.		80.1		94.7	
7440-31-5	Tin (Sn)	8.4	U	9.5	U	8.6	U	8.9	U	8.5	U	9.9	U

*** Validation Complete ***

CHARLESTON - ZONE A
Surface Soil Grid Samples
Metals

SW846-META															
	SAMPLE ID ------->	GDA-S-B007-01		GDA-C-B007-01		GDA-S-B008-01		GDA-S-B009-01		GDA-S-B010-01		GDA-S-B011-01	
	ORIGINAL ID ----->	GDASB00701		GDACB00701		GDASB00801		GDASB00901		GDASB01001		GDASB01101	
	LAB SAMPLE ID --->	L5563-96		L5557-7		L5563-102		L5563-104		L5563-107		L5563-114	
	ID FROM REPORT -->	GDASB00701		GDACB00701		GDASB00801		GDASB00901		GDASB01001		GDASB01101	
	SAMPLE DATE ----->	10/09/95		10/09/95		10/09/95		10/09/95		10/09/95		10/09/95	
	DATE EXTRACTED -->	10/16/95		10/16/95		10/16/95		10/16/95		10/16/95		10/17/95	
	DATE ANALYZED --->	10/25/95		10/25/95		10/25/95		10/25/95		10/25/95		10/25/95	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A
CAS #	Parameter	L5563S	VAL	L5557S	VAL	L5563S	VAL	L5563S	VAL	L5563S	VAL	L5563S	VAL
7429-90-5	Aluminum (Al)	5260.		5270.		6850.		7270.		9020.		11800.	
7440-36-0	Antimony (Sb)	12.1	U	11.5	UJ	11.6	U	11.3	U	11.1	U	11.3	U
7440-38-2	Arsenic (As)	8.2		6.7		3.9		4.5		3.6		3.8	
7440-39-3	Barium (Ba)	21.6	J	23.2	J	18.5	J	34.2	J	25.3	J	22.9	J
7440-41-7	Beryllium (Be)	0.24	U	0.23	U	0.23	U	0.22	U	0.22	U	0.22	U
7440-43-9	Cadmium (Cd)	1.2	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
7440-70-2	Calcium (Ca)	22400.	J	26700.		804.	J	1390.	J	9450.	J	5120.	J
7440-47-3	Chromium (Cr)	13.2	J	15.4		11.5	J	14.8	J	12.9	J	20.6	J
7440-48-4	Cobalt (Co)	1.6	J	1.5	J	1.4	U	1.3	U	1.3	U	2.7	J
7440-50-8	Copper (Cu)	39.3		42.		30.		17.4		4.	J	15.9	
7439-89-6	Iron (Fe)	6320.	J	7450.		5810.	J	8740.	J	7040.	J	15700.	J
7439-92-1	Lead (Pb)	72.3		65.7		51.2		67.4		14.1		11.4	
7439-95-4	Magnesium (Mg)	774.	J	729.	J	279.	J	421.	J	628.	J	806.	J
7439-96-5	Manganese (Mn)	53.9	J	60.5		24.5	J	40.1	J	23.7	J	25.5	J
7439-97-6	Mercury (Hg)	0.23	J	0.29		0.19	J	0.12	J	0.11	UJ	0.11	UJ
7440-02-0	Nickel (Ni)	7.5	J	7.9	J	4.8	J	5.2	J	6.8	J	5.9	J
7440-09-7	Potassium (K)	323.	J	294.	J	149.	J	213.	J	241.	J	418.	J
7782-49-2	Selenium (Se)	0.71	UJ	0.68	UJ	0.68	U	0.68	UJ	0.88	J	0.66	U
7440-22-4	Silver (Ag)	0.71	U	0.68	U	0.68	U	0.67	U	0.65	U	0.66	U
7440-23-5	Sodium (Na)	239.	J	239.	J	208.	J	212.	J	261.	J	313.	J
7440-28-0	Thallium (Tl)	0.95	U	0.91	U	0.91	U	0.91	U	0.88	U	0.88	U
7440-62-2	Vanadium (V)	14.7		16.7		16.5		18.9		18.2		28.1	
7440-66-6	Zinc (Zn)	89.9		92.7		116.		58.5		17.3		32.1	
7440-31-5	Tin (Sn)	8.8	U	8.4	U	8.4	U	8.2	U	8.	U	8.2	U

*** Validation Complete ***

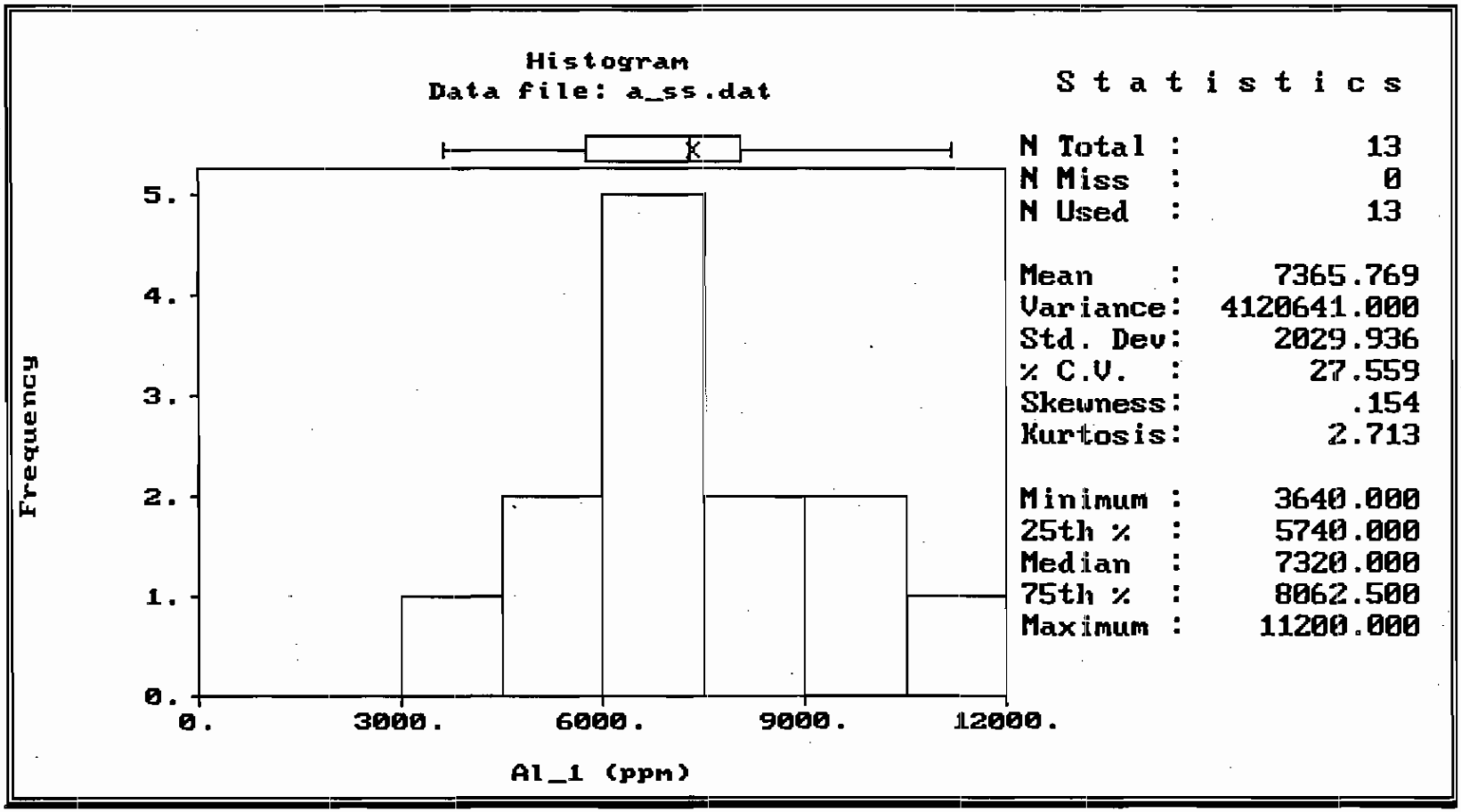
CHARLESTON - ZONE A
Surface Soil Grid Samples
Metals

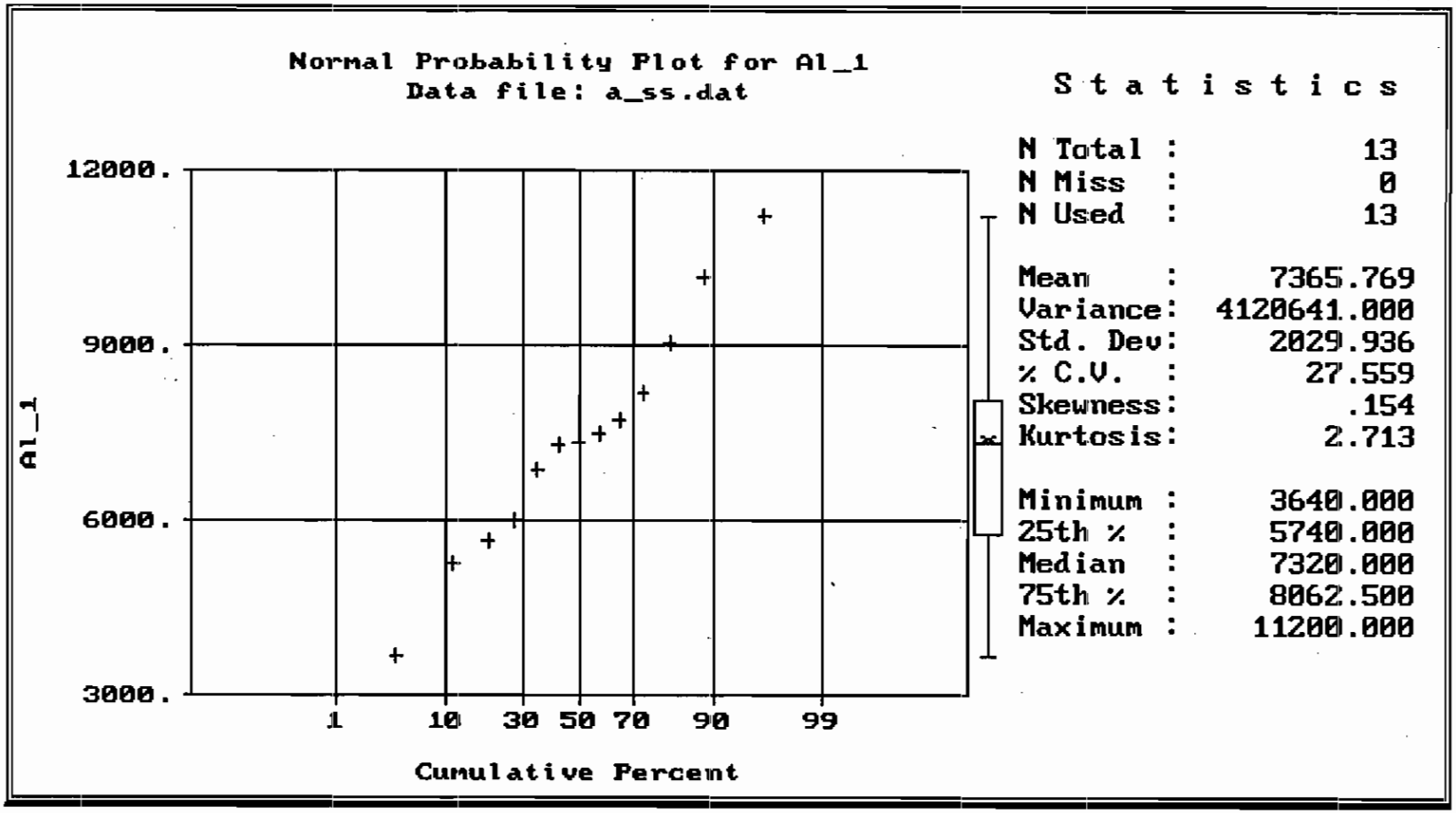
SW846-META									
	SAMPLE ID ------->	GDA-C-B011-01		GDA-S-B012-01		GDA-S-B013-01		GDA-S-B014-01	
	ORIGINAL ID ----->	GDACB01101		GDASB01201		GDASB01301		GDASB01401	
	LAB SAMPLE ID --->	L5557-9		L5563-108		L5563-117		L5586-31	
	ID FROM REPORT -->	GDACB01101		GDASB01201		GDASB01301		GDASB01401	
	SAMPLE DATE ----->	10/09/95		10/09/95		10/09/95		10/11/95	
	DATE EXTRACTED -->	10/16/95		10/16/95		10/17/95		10/21/95	
	DATE ANALYZED --->	10/25/95		10/25/95		10/25/95		10/27/95	
	MATRIX ---------->	Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A
CAS #	Parameter	L5557S	VAL	L5563S	VAL	L5563S	VAL	L5586S	VAL
7429-90-5	Aluminum (Al)	10600.		7320.		7710.		8180.	
7440-36-0	Antimony (Sb)	11.5	UJ	12.1	U	11.6	U	11.3	U
7440-38-2	Arsenic (As)	4.4		4.		3.8		3.2	
7440-39-3	Barium (Ba)	20.1	J	15.6	J	18.9	J	21.4	J
7440-41-7	Beryllium (Be)	0.23	U	0.24	U	0.23	U	0.22	U
7440-43-9	Cadmium (Cd)	1.1	U	1.2	U	2.8		1.1	U
7440-70-2	Calcium (Ca)	14900.		49300.	J	4260.	J	797.	J
7440-47-3	Chromium (Cr)	16.1		25.9	J	11.8	J	10.	
7440-48-4	Cobalt (Co)	4.4	J	1.6	J	1.4	U	1.3	U
7440-50-8	Copper (Cu)	8.6		9.3		5.	J	7.	
7439-89-6	Iron (Fe)	9120.		6420.	J	5860.	J	6650.	J
7439-92-1	Lead (Pb)	17.4		19.2		31.4		15.7	
7439-95-4	Magnesium (Mg)	956.	J	2040.	J	442.	J	288.	J
7439-96-5	Manganese (Mn)	22.4		48.	J	25.4	J	17.9	
7439-97-6	Mercury (Hg)	0.12	U	0.12	UJ	0.11	UJ	0.11	U
7440-02-0	Nickel (Ni)	8.3	J	15.4		3.2	J	5.2	J
7440-09-7	Potassium (K)	387.	J	420.	J	267.	J	242.	J
7782-49-2	Selenium (Se)	0.97	J	0.69	U	0.67	UJ	0.67	U
7440-22-4	Silver (Ag)	0.68	U	0.71	U	0.68	U	0.67	U
7440-23-5	Sodium (Na)	352.	J	411.	J	227.	J	195.	J
7440-28-0	Thallium (Tl)	0.92	U	0.92	U	0.9	U	0.89	U
7440-62-2	Vanadium (V)	20.4		18.4		11.7		13.9	
7440-66-6	Zinc (Zn)	27.6		50.4		168.		124.	
7440-31-5	Tin (Sn)	8.3	U	8.8	U	8.4	U	8.2	U

*** Validation Complete ***

Zone A
Aluminum in surface soil grid samples
Original dataset (n=13)
Original values

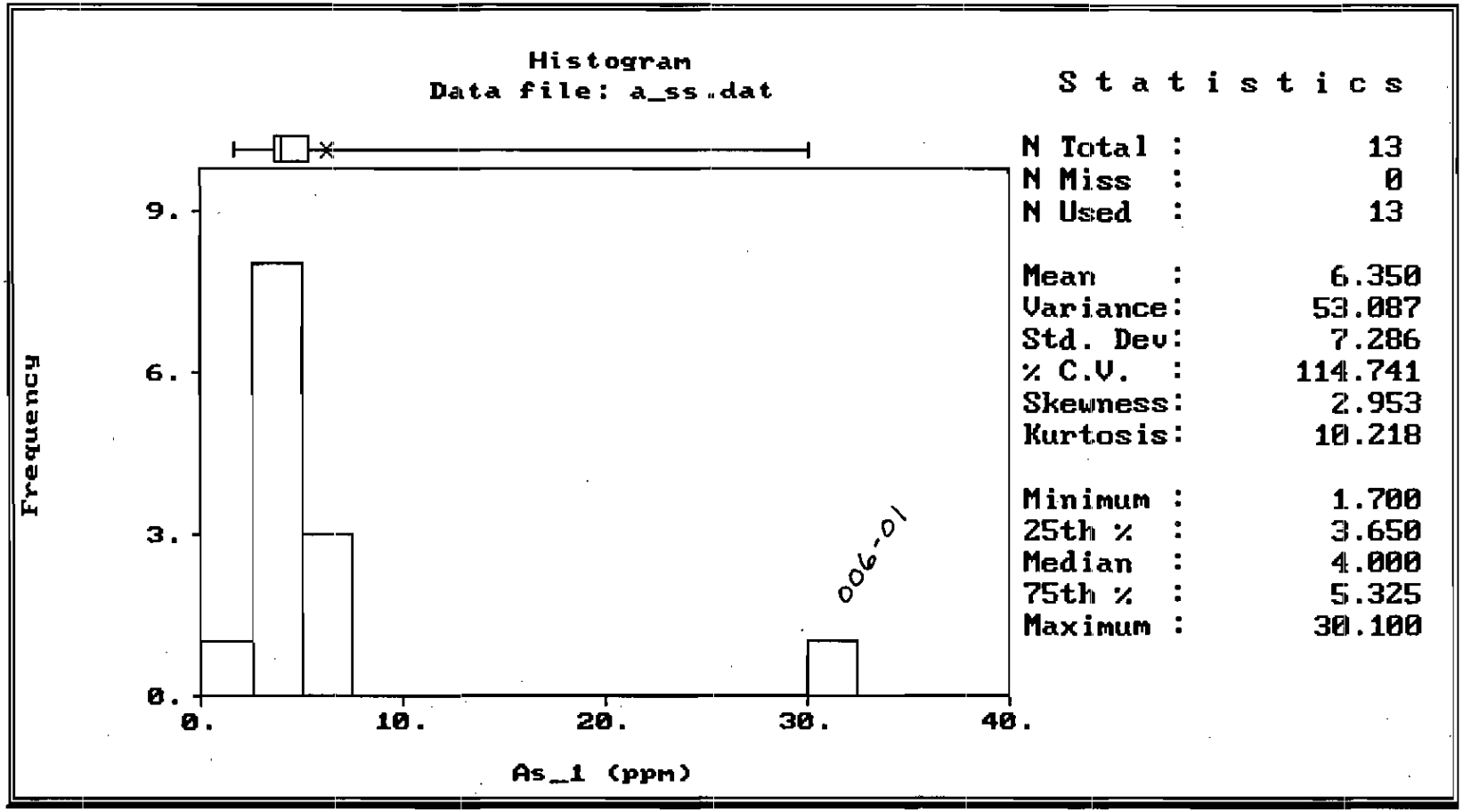
1a

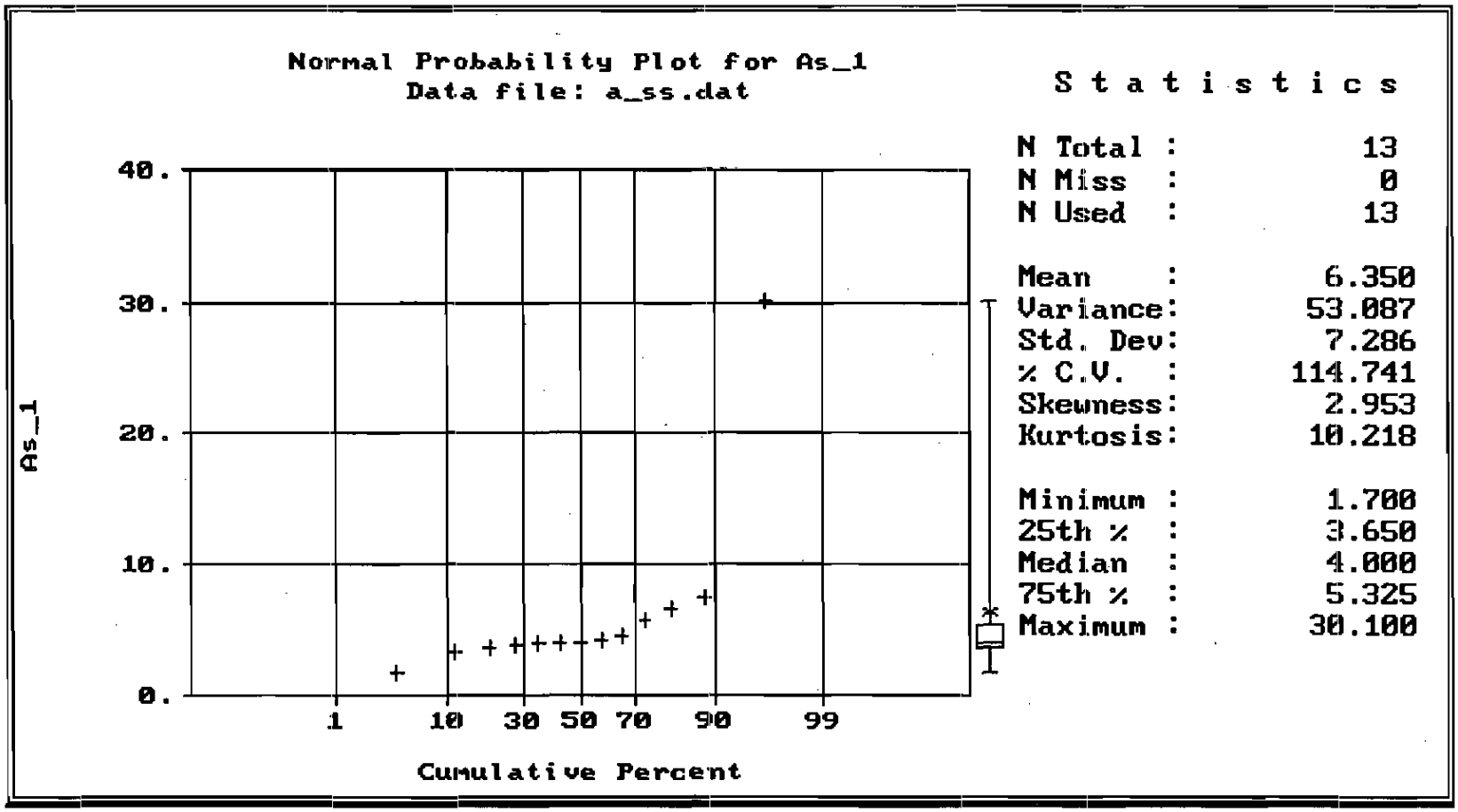



Normal Probability Plot for Al_1
Data file: a_ss.dat
12000.
9000.
6000.
3000.
Al_1
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 13
N Miss : 0
N Used : 13
Mean : 7365.769
Variance: 4120641.000
Std. Dev: 2029.936
% C.V. : 27.559
Skewness: .154
Kurtosis: 2.713
Minimum : 3640.000
25th % : 5740.000
Median : 7320.000
75th % : 8062.500
Maximum : 11200.000

Zone A
Arsenic in surface soil grid samples
Original dataset (N = 13)
Original values

1a



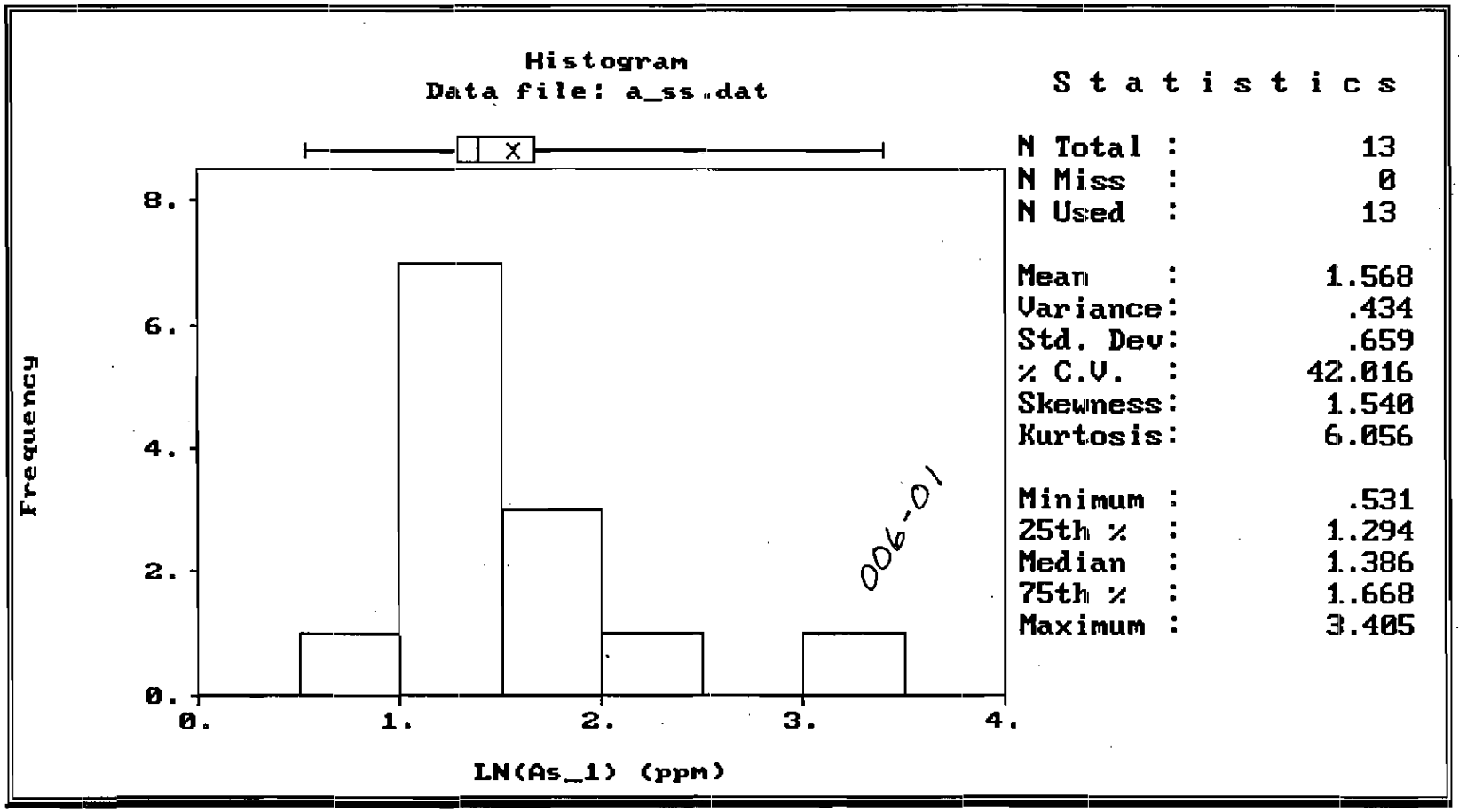


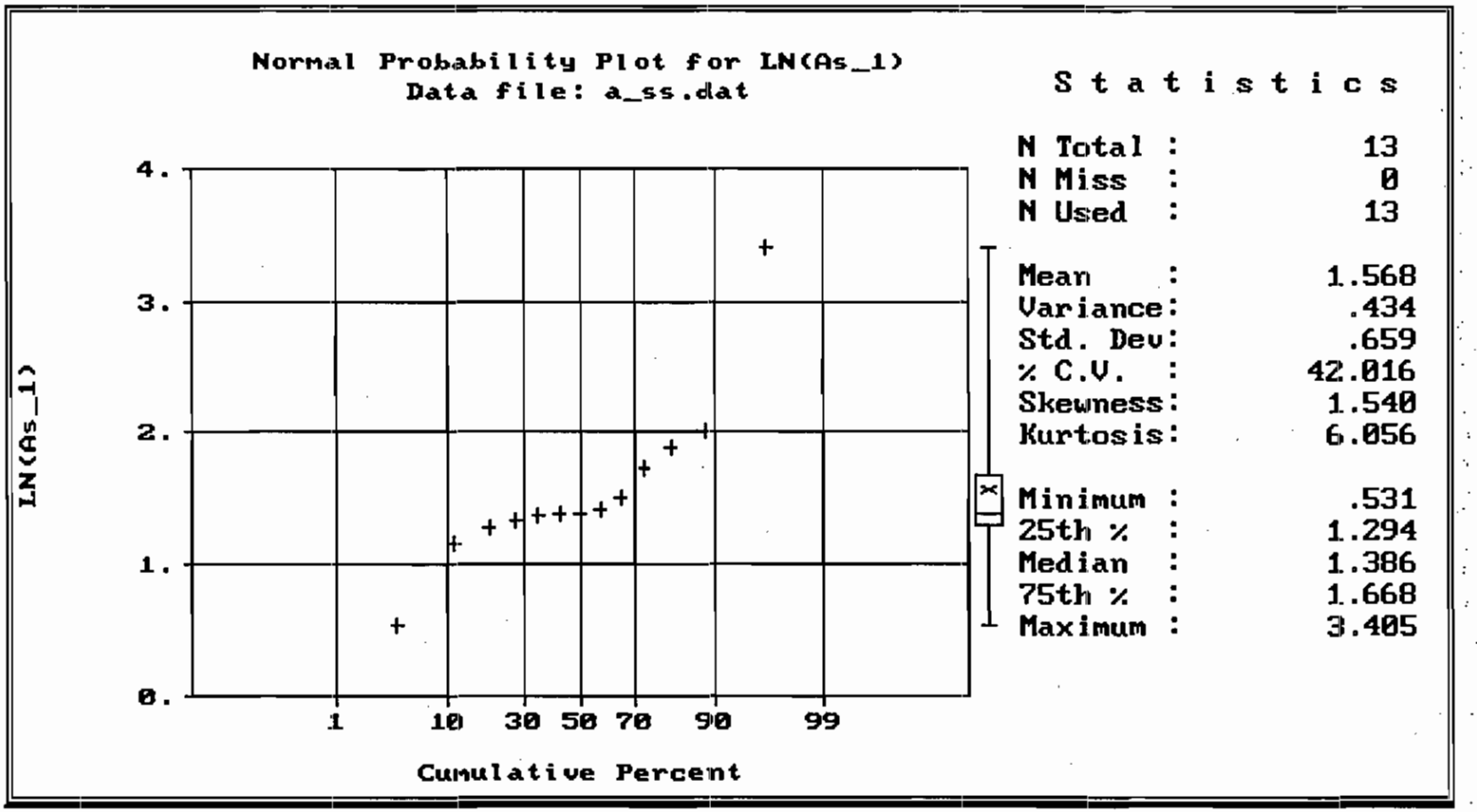
Statistics

N Total :	13
N Miss :	0
N Used :	13
Mean :	6.350
Variance:	53.087
Std. Dev:	7.286
% C.V. :	114.741
Skewness:	2.953
Kurtosis:	10.218
Minimum :	1.700
25th % :	3.650
Median :	4.000
75th % :	5.325
Maximum :	30.100

Zone A
Arsenic in surface soil grid samples
Original dataset (N = 13)
LN-transformed values

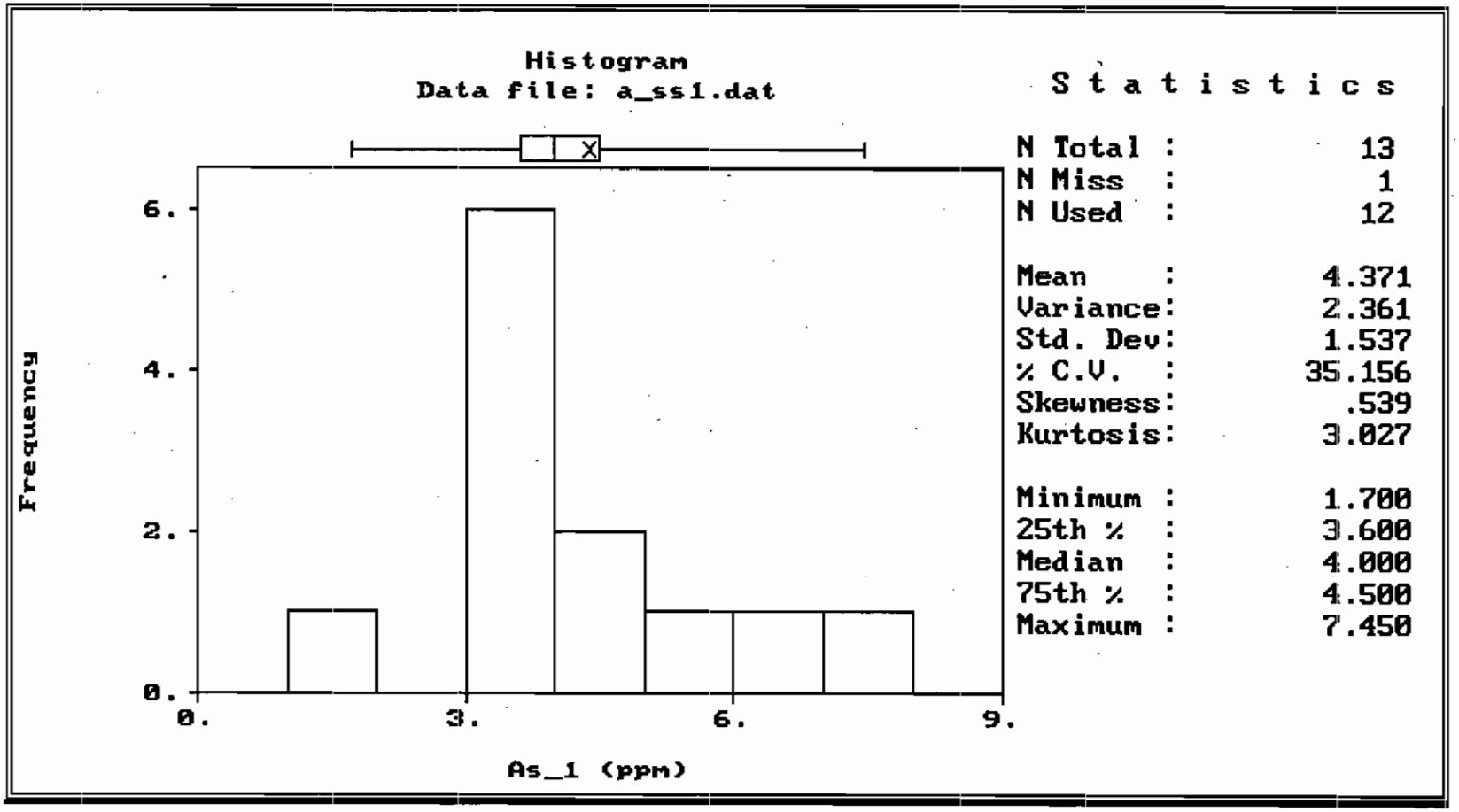
2a

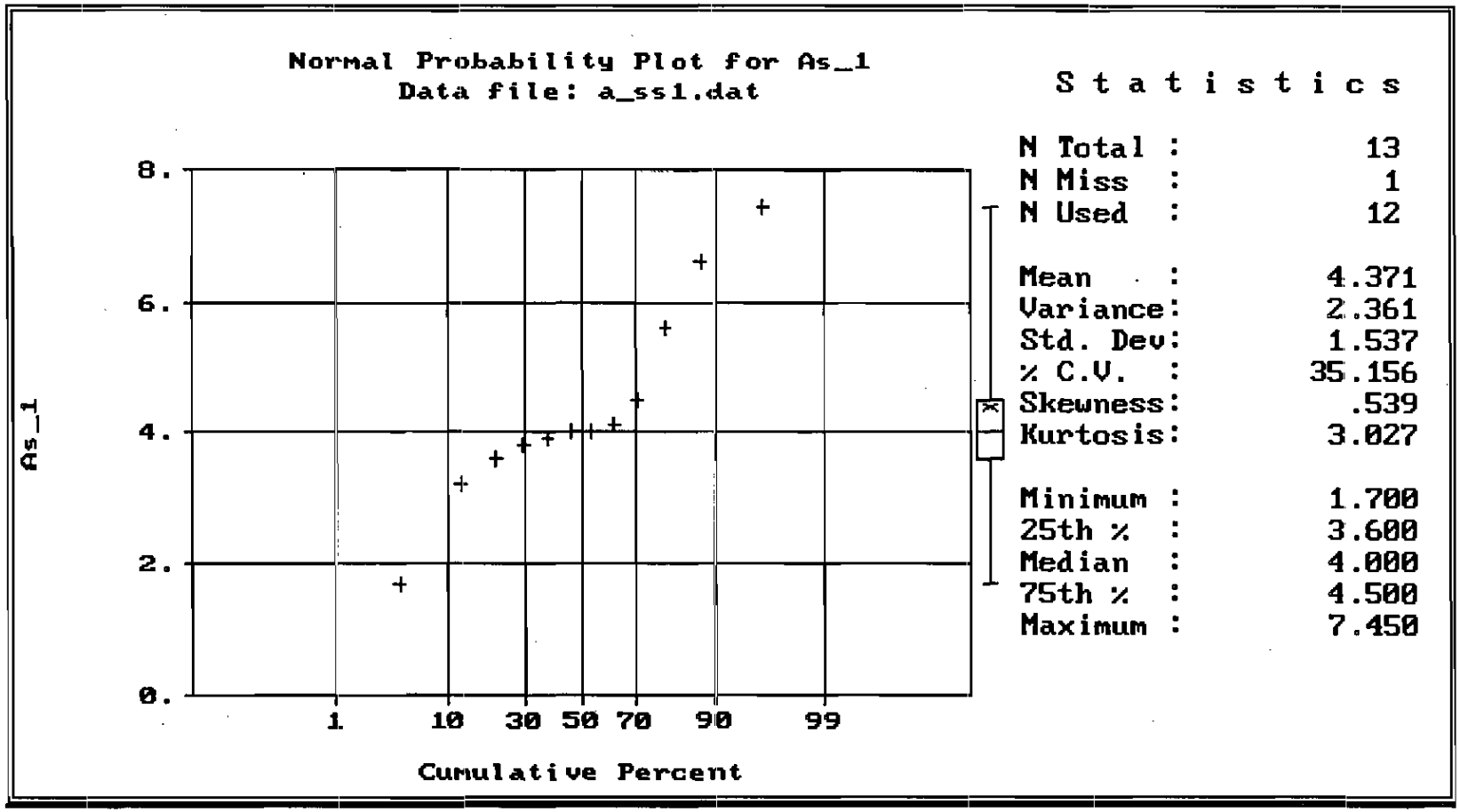



Normal Probability Plot for LN(As_1)
Data file: a_ss.dat
LN(As_1)
4.
3.
2.
1.
0.
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 13
N Miss : 0
N Used : 13
Mean : 1.568
Variance: .434
Std. Dev: .659
% C.V. : 42.016
Skewness: 1.540
Kurtosis: 6.056
Minimum : .531
25th % : 1.294
Median : 1.386
75th % : 1.668
Maximum : 3.405

Zone A
Arsenic in surface soil grid samples
Sample #006-01 removed from dataset (N=12)
Original values

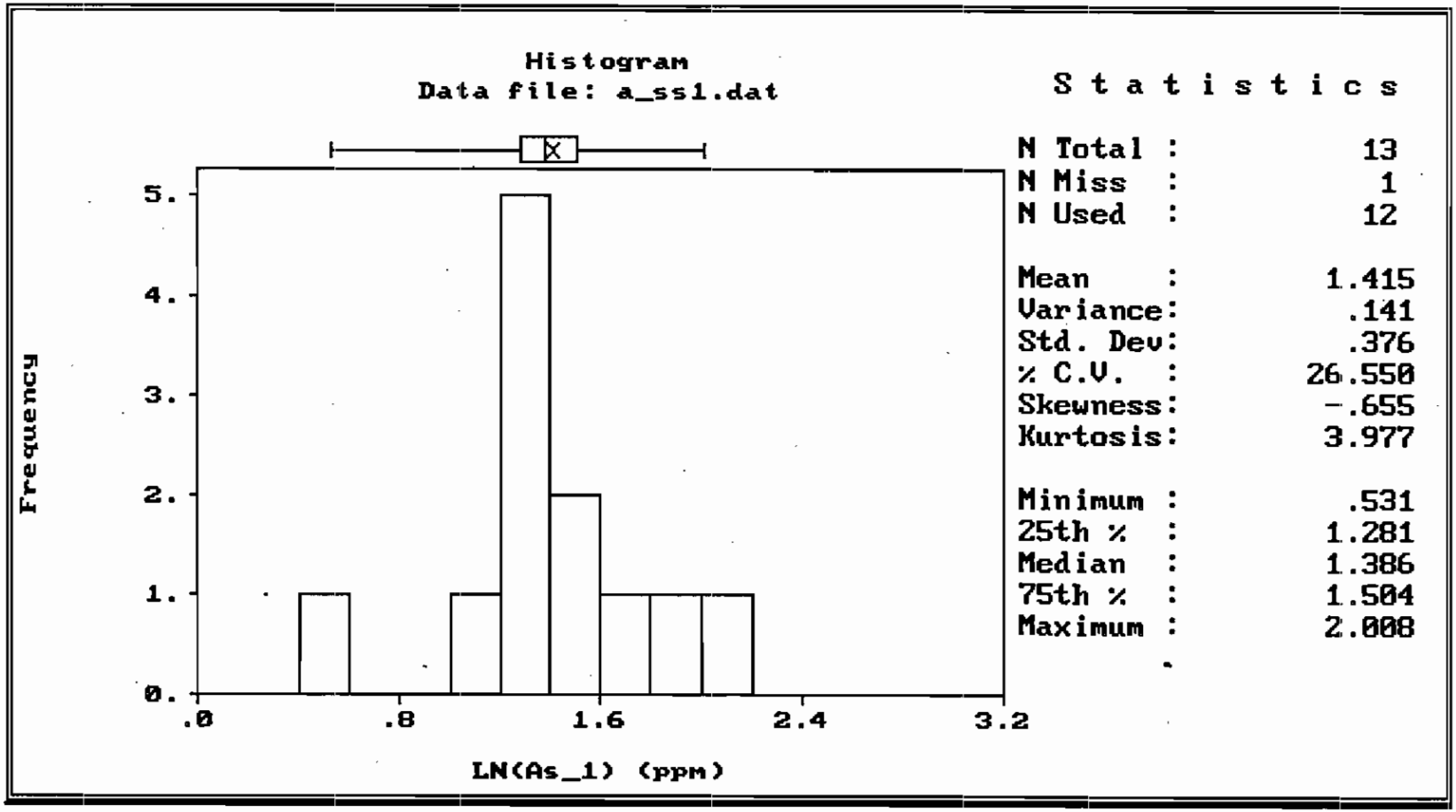
3a

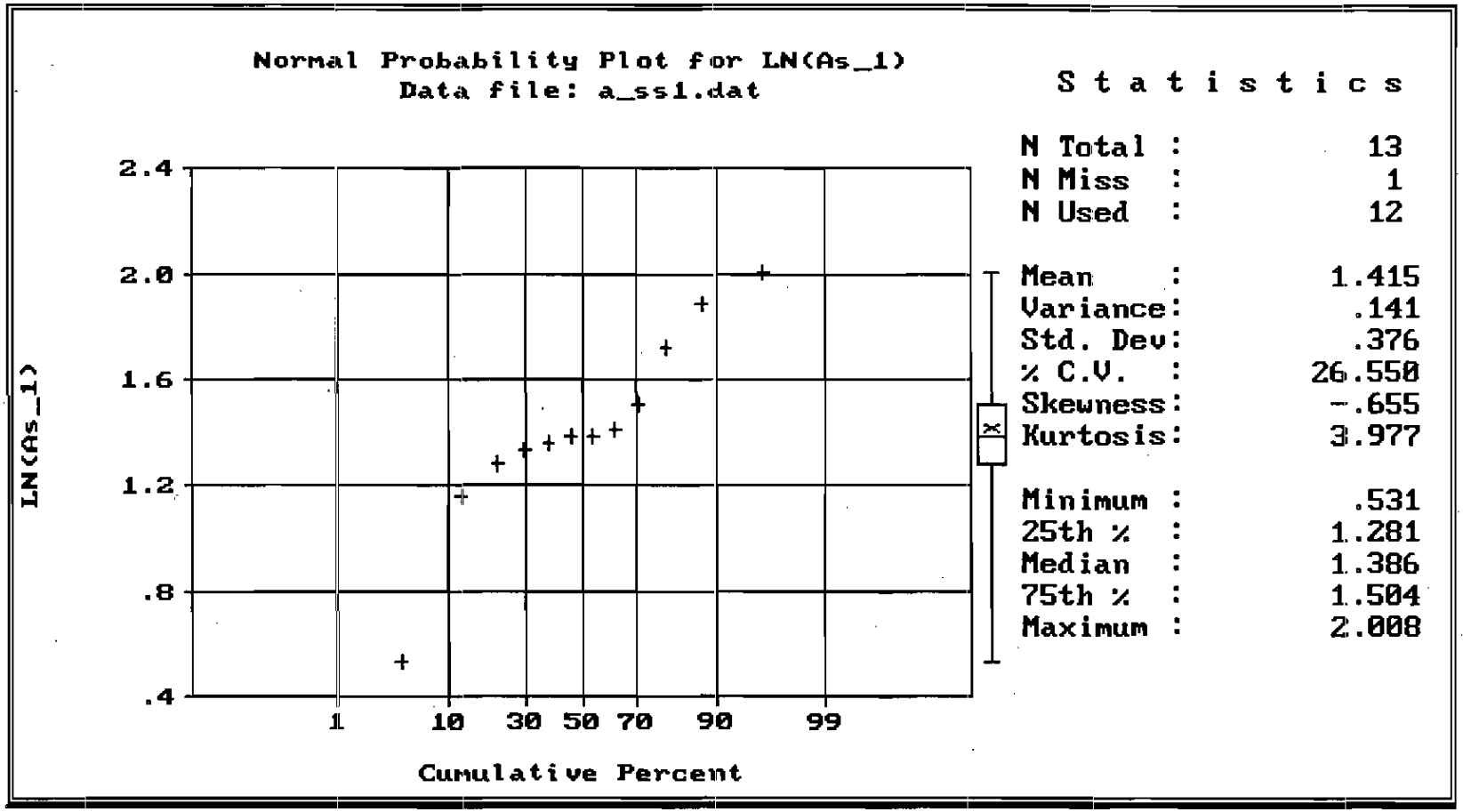



Normal Probability Plot for As_1
Data file: a_ss1.dat
8.
6.
4.
2.
0.
As_1
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 13
N Miss : 1
N Used : 12
Mean : 4.371
Variance: 2.361
Std. Dev: 1.537
% C.V. : 35.156
Skewness: .539
Kurtosis: 3.027
Minimum : 1.700
25th % : 3.600
Median : 4.000
75th % : 4.500
Maximum : 7.450

Zone A
Arsenic in surface soil grid samples
Sample #006-01 removed from dataset (N=12)
LN- transformed values

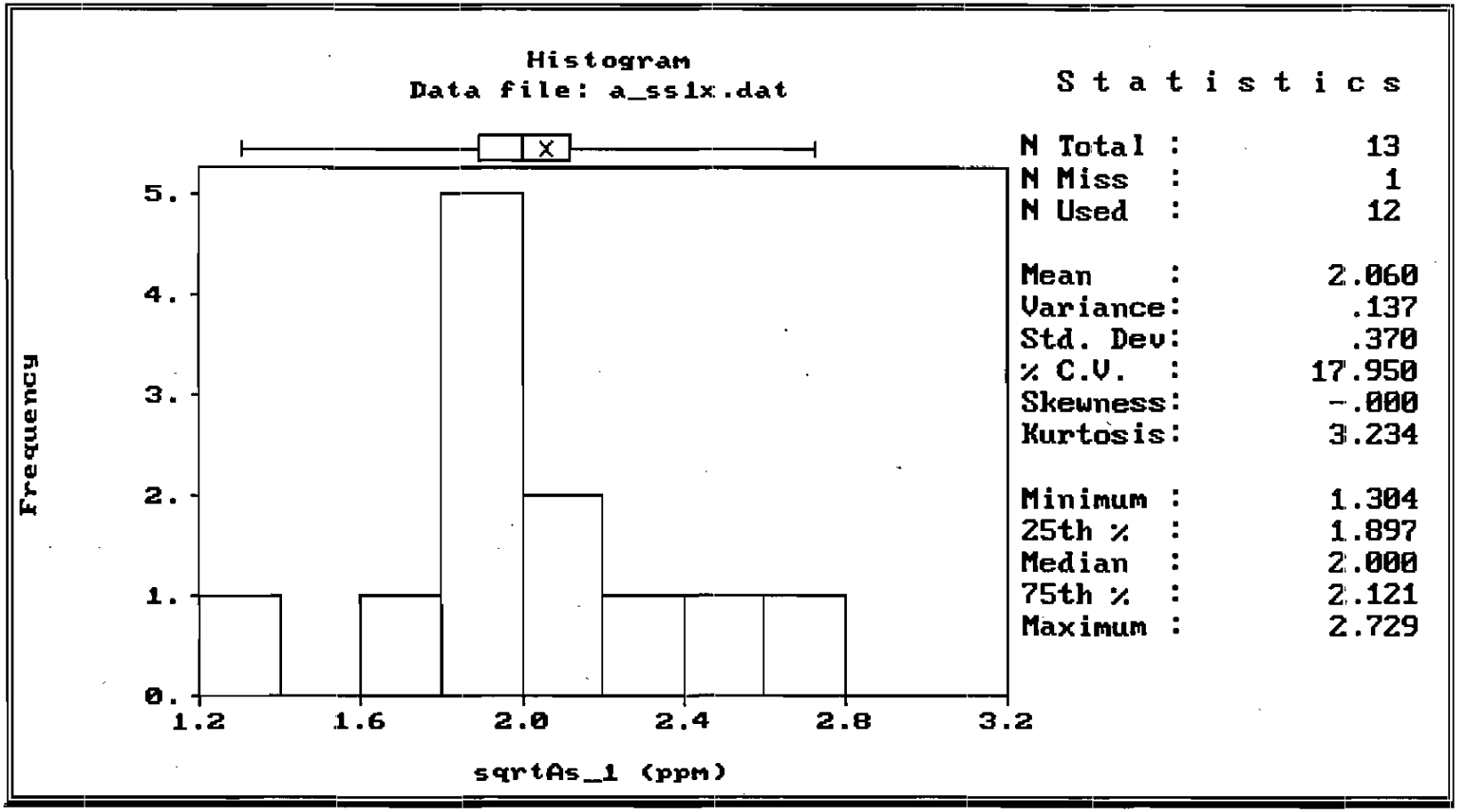
4a

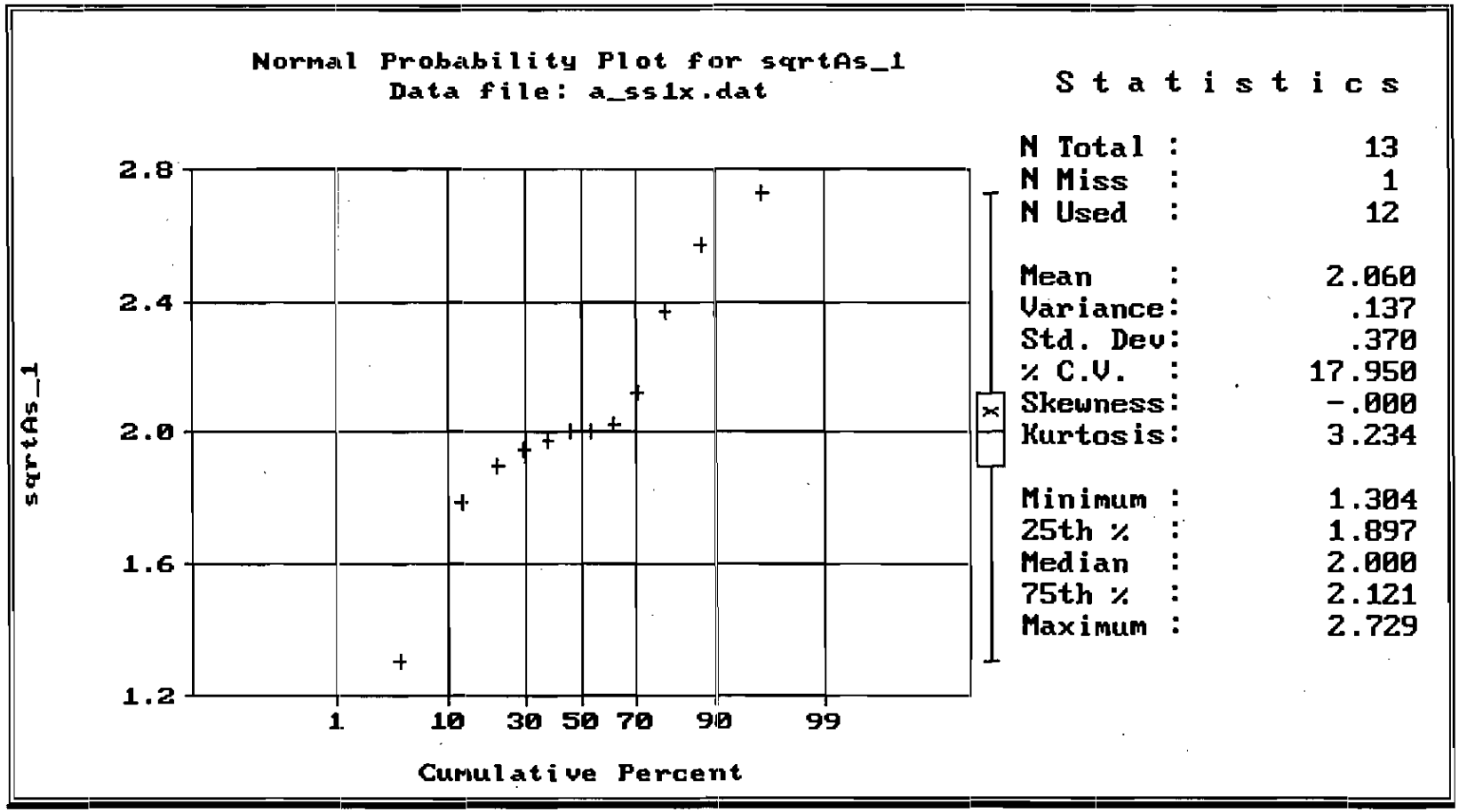



Normal Probability Plot for LN(As_1)
Data file: a_ss1.dat
LN(As_1)
2.4
2.0
1.6
1.2
.8
.4
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 13
N Miss : 1
N Used : 12
Mean : 1.415
Variance: .141
Std. Dev: .376
% C.V. : 26.550
Skewness: -.655
Kurtosis: 3.977
Minimum : .531
25th % : 1.281
Median : 1.386
75th % : 1.504
Maximum : 2.008

Zone A
Arsenic in surface soil grid samples
Sample # 006-01 removed from dataset (N=12)
Square-root transformed values

5a




Normal Probability Plot for sqrtAs_1
Data file: a_ss1x.dat
sqrtAs_1
2.8
2.4
2.0
1.6
1.2
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 13
N Miss : 1
N Used : 12
Mean : 2.060
Variance: .137
Std. Dev: .370
% C.V. : 17.950
Skewness: -.000
Kurtosis: 3.234
Minimum : 1.304
25th % : 1.897
Median : 2.000
75th % : 2.121
Maximum : 2.729

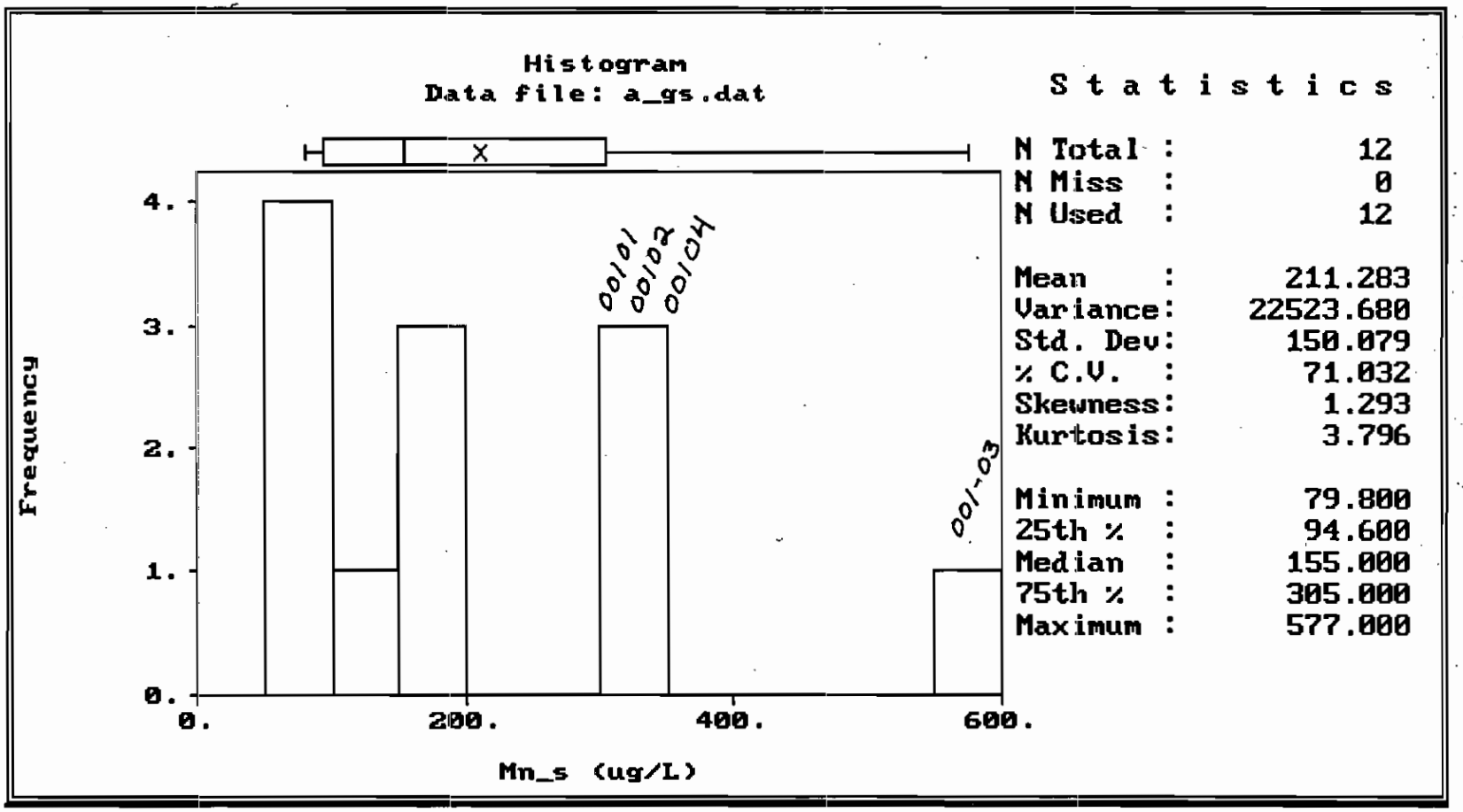
0 400 feet

Zone A RCRA Facility Investigation Report
Naval Base Charleston
Charleston, SC

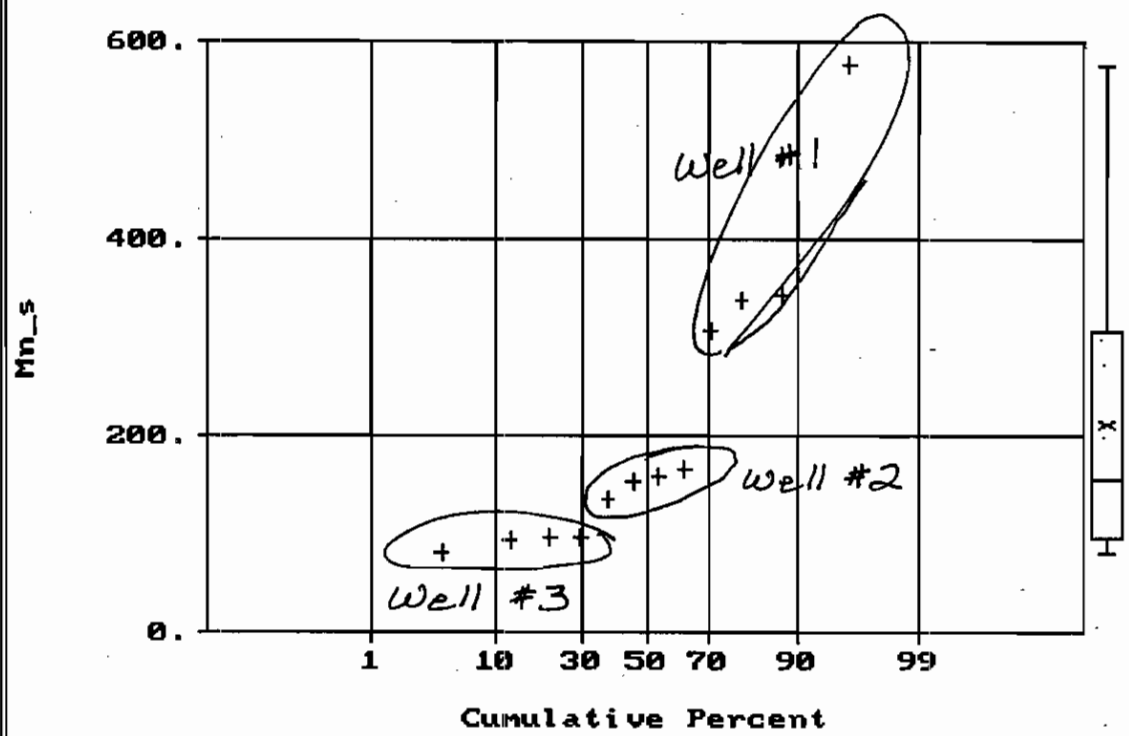
FIGURE 10.7.1 - Grid-Based Soil Sample Locations

Zone A
Manganese in shallow GW grid samples (4 rounds)
Original dataset (N = 12)
Original values

1a



Normal Probability Plot for Mn_s
Data file: a_gs.dat

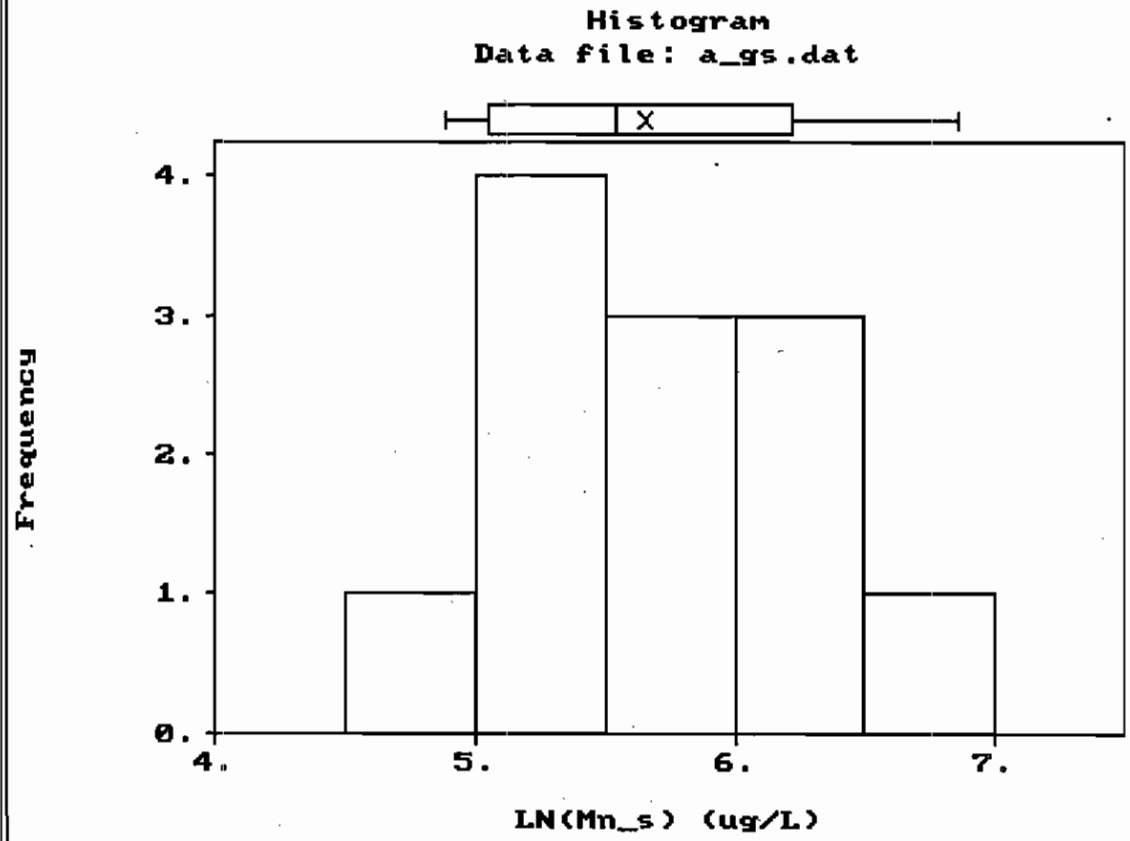


Statistics

N Total :	12
N Miss :	0
N Used :	12
Mean :	211.283
Variance:	22523.680
Std. Dev:	150.079
% C.V. :	71.032
Skewness:	1.293
Kurtosis:	3.796
Minimum :	79.800
25th % :	94.600
Median :	155.000
75th % :	305.000
Maximum :	577.000

Zone A
Manganese in shallow GW grid samples (4 rounds)
Original dataset (N=12)
LN-transformed values

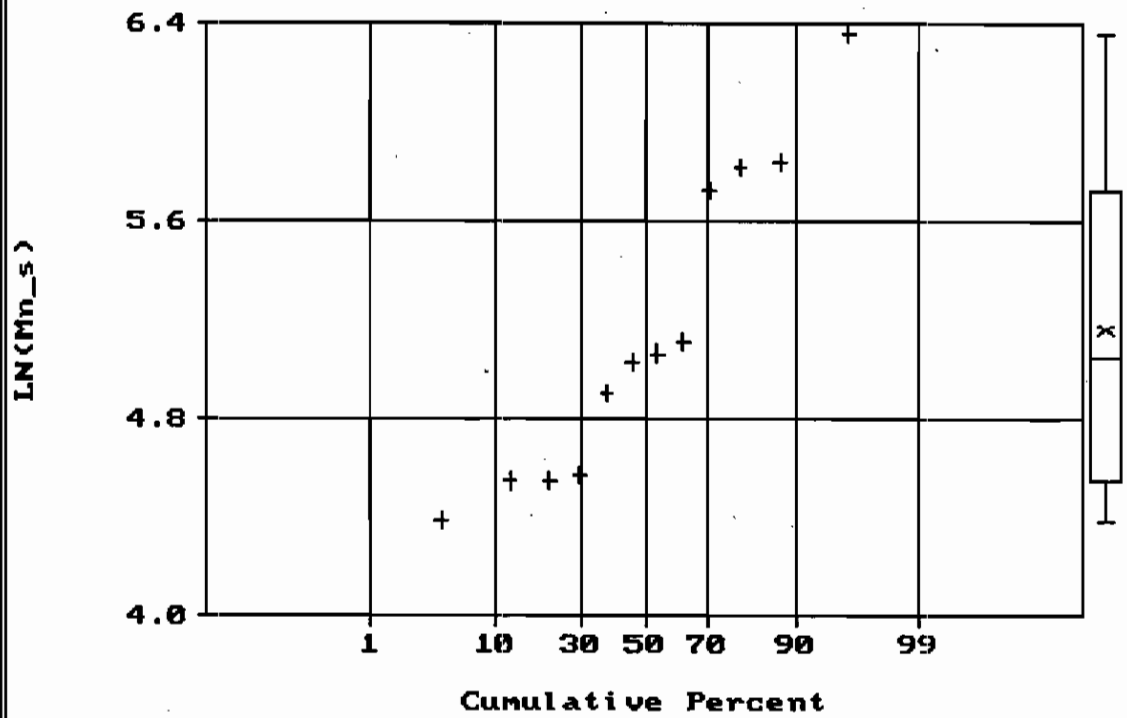
2a



Statistics

N Total :	12
N Miss :	0
N Used :	12
Mean :	5.156
Variance:	.405
Std. Dev:	.636
% C.V. :	12.345
Skewness:	.508
Kurtosis:	2.034
Minimum :	4.380
25th % :	4.550
Median :	5.043
75th % :	5.720
Maximum :	6.358

Normal Probability Plot for LN(Mn_s)
Data file: a_gs.dat

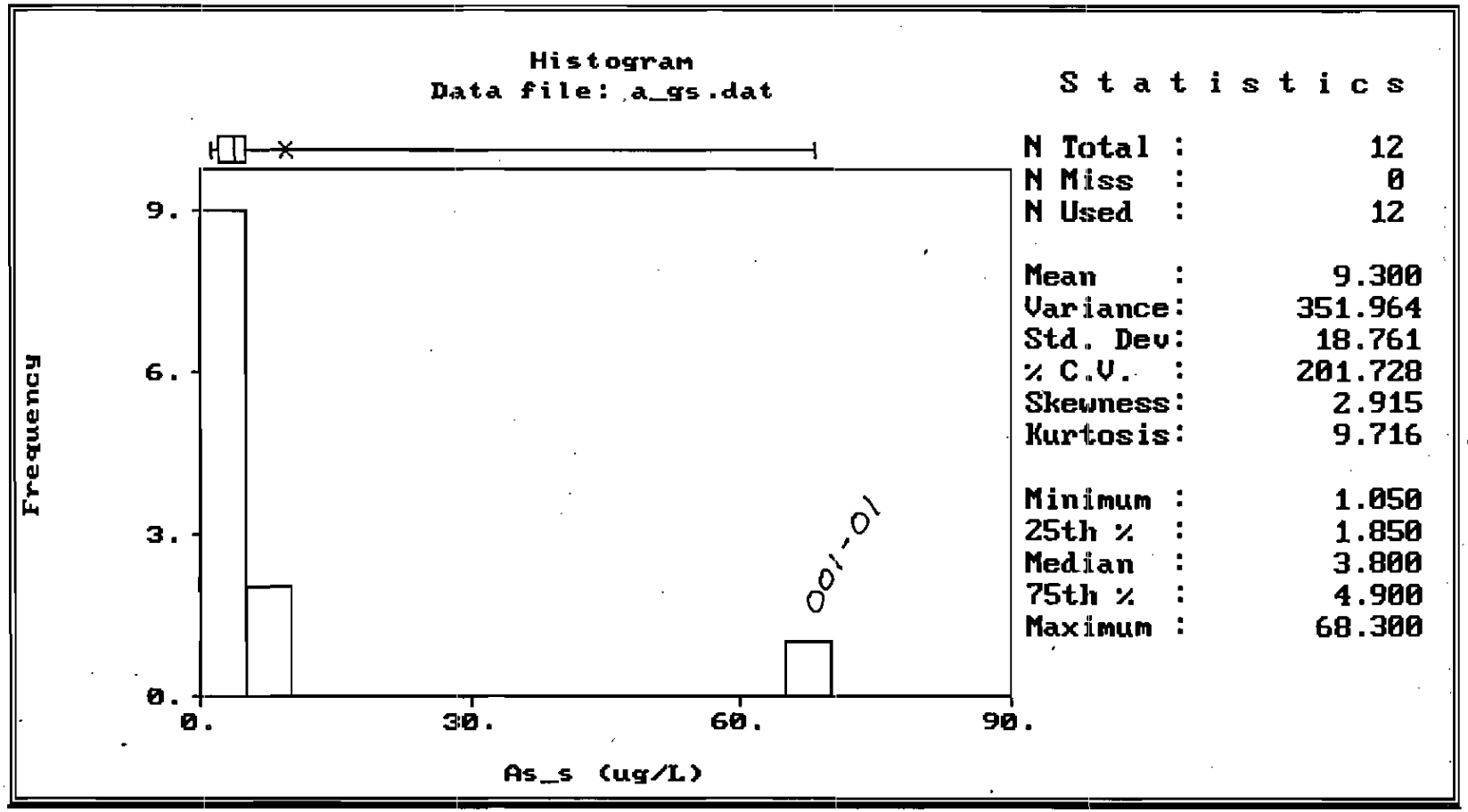


Statistics

N Total :	12
N Miss :	0
N Used :	12
Mean :	5.156
Variance:	.405
Std. Dev:	.636
% C.V. :	12.345
Skewness:	.508
Kurtosis:	2.034
Minimum :	4.380
25th % :	4.550
Median :	5.043
75th % :	5.720
Maximum :	6.358

Zone A
Arsenic in shallow GW grid samples (4 rounds)
Original dataset (N=12)
Original values

1a

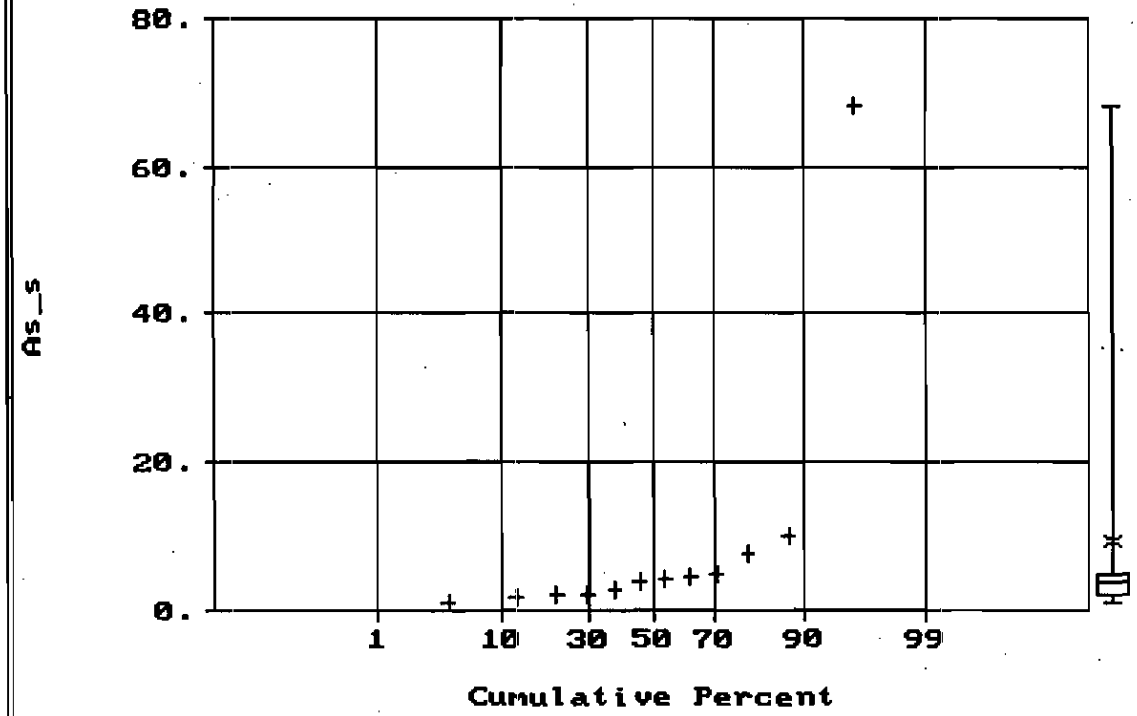


Statistics

N Total :	12
N Miss :	0
N Used :	12
Mean :	9.300
Variance:	351.964
Std. Dev:	18.761
% C.V. :	201.728
Skewness:	2.915
Kurtosis:	9.716
Minimum :	1.050
25th % :	1.850
Median :	3.800
75th % :	4.900
Maximum :	68.300

16

Normal Probability Plot for As_s
Data file: a_gs.dat

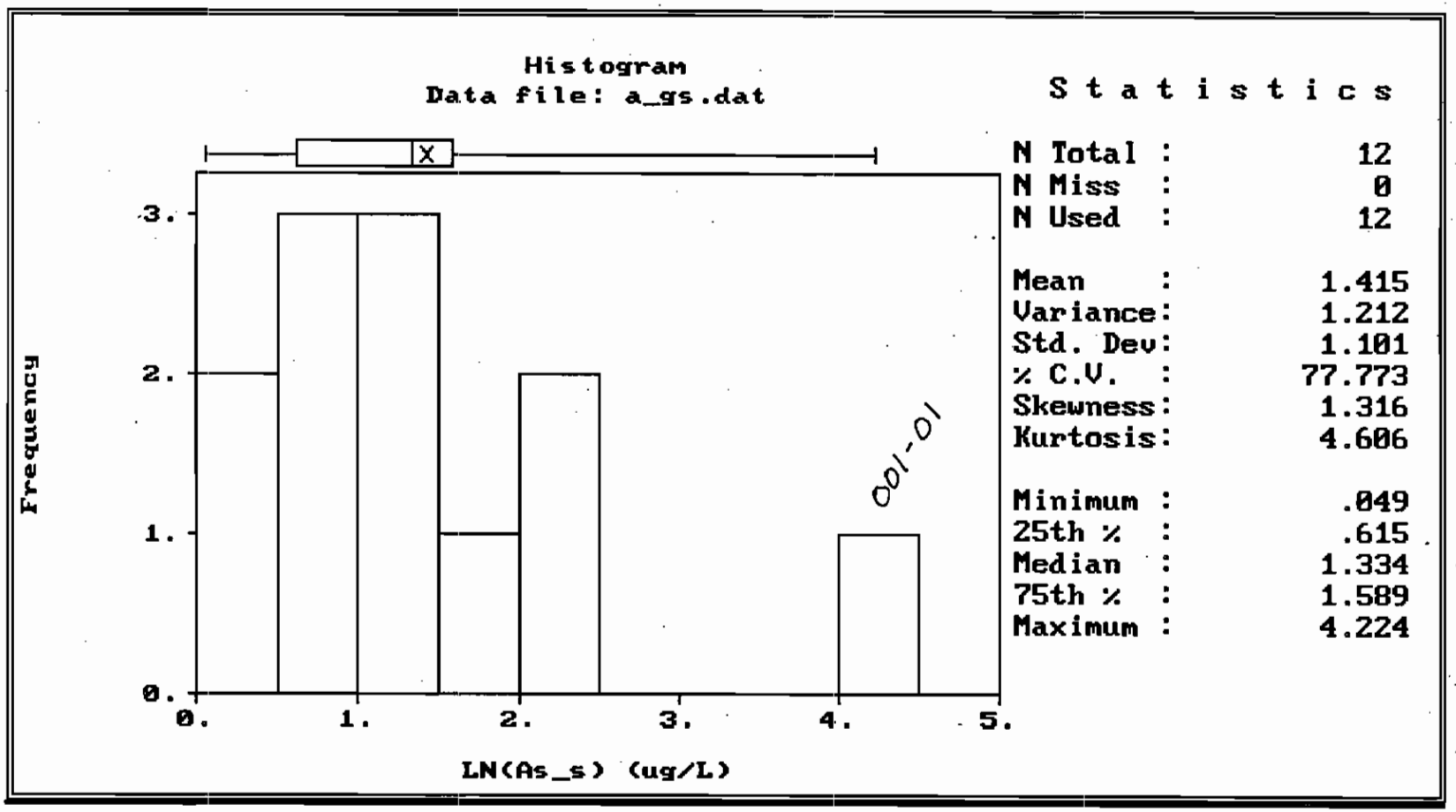


Statistics

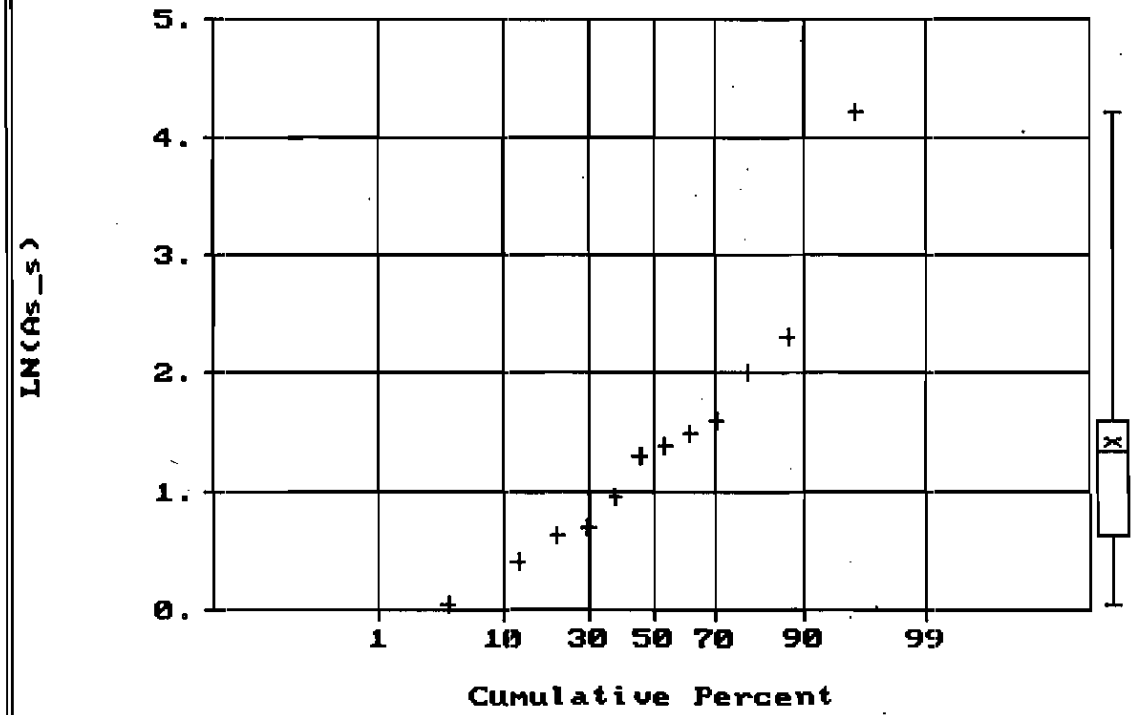
N Total :	12
N Miss :	0
N Used :	12
Mean :	9.300
Variance:	351.964
Std. Dev:	18.761
% C.V. :	201.728
Skewness:	2.915
Kurtosis:	9.716
Minimum :	1.050
25th % :	1.850
Median :	3.800
75th % :	4.900
Maximum :	68.300

Zone A
Arsenic in shallow GW grid samples (4 rounds)
Original dataset (N = 12)
LN-transformed values

2a



Normal Probability Plot for LN(As_s)
Data file: a_gs.dat



Statistics

N Total :	12
N Miss :	0
N Used :	12
Mean :	1.415
Variance:	1.212
Std. Dev:	1.101
% C.V. :	77.773
Skewness:	1.316
Kurtosis:	4.606
Minimum :	.049
25th % :	.615
Median :	1.334
75th % :	1.589
Maximum :	4.224

CHARLESTON - ZONE A
Shallow Groundwater Grid Samples
Metals - Sampling Round 1

SW846-META											
	SAMPLE ID ------->	GDA-G-W001-01		GDA-G-W002-01		GDA-G-W003-01					
	ORIGINAL ID ------>	GDAGW00101		GDAGW00201		GDAGW00301					
	LAB SAMPLE ID --->	L5997-62		L6008-59		L6008-41					
	ID FROM REPORT -->	GDAGW00101		GDAGW00201		GDAGW00301					
	SAMPLE DATE ----->	12/07/95		12/08/95		12/08/95					
	DATE EXTRACTED -->	12/13/95		12/22/95		12/22/95					
	DATE ANALYZED --->	12/15/95		12/26/95		12/26/95					
	MATRIX ---------->	Water		Water		Water					
	UNITS ---------->	UG/L	A	UG/L	A	UG/L	A				
CAS #	Parameter	L5997	VAL	L6008	VAL	L6008	VAL				
7429-90-5	Aluminum (Al)	1020.		2840.		955.					
7440-36-0	Antimony (Sb)	51.	U	51.	U	51.	U				
7440-38-2	Arsenic (As)	68.3		20.	U	4.	U				
7440-39-3	Barium (Ba)	33.3	J	102.	J	21.3	J				
7440-41-7	Beryllium (Be)	1.	U	1.	UJ	1.	UJ				
7440-43-9	Cadmium (Cd)	5.	U	5.	U	5.	U				
7440-70-2	Calcium (Ca)	77400.		151000.	J	43100.	J				
7440-47-3	Chromium (Cr)	5.	J	6.1	J	4.	UJ				
7440-48-4	Cobalt (Co)	6.	U	6.	UJ	6.	UJ				
7440-50-8	Copper (Cu)	10.1	J	10.1	J	3.4	J				
7439-89-6	Iron (Fe)	72100.	J	21800.	J	8230.	J				
7439-92-1	Lead (Pb)	3.	U	3.2	J	3.	UR				
7439-95-4	Magnesium (Mg)	17600.		38300.		25300.					
7439-96-5	Manganese (Mn)	336.		152.	J	79.8	J				
7439-97-6	Mercury (Hg)	0.2	U	0.2	U	0.2	U				
7440-02-0	Nickel (Ni)	14.	U	14.	UJ	14.	UJ				
7440-09-7	Potassium (K)	4130.	J	18400.		14500.					
7782-49-2	Selenium (Se)	3.	U	3.	UR	3.	UR				
7440-22-4	Silver (Ag)	3.	U	3.	U	3.	U				
7440-23-5	Sodium (Na)	10600.	J	59700.	J	215000.	J				
7440-28-0	Thallium (Tl)	4.	UJ	4.	UR	4.	UR				
7440-62-2	Vanadium (V)	4.	U	4.1	J	4.	U				
7440-66-6	Zinc (Zn)	89.		28.3		7.5	J				
7440-31-5	Tin (Sn)	??????????		??????????		??????????					

*** Validation Complete ***

CHARLESTON - ZONE A
Shallow Groundwater Grid Samples
Metals - Sampling Rounds 2, 3, and 4

SW846-META													
	SAMPLE ID ------->	GDA-G-W001-02		GDA-G-W001-03		GDA-G-W001-04		GDA-G-W002-02		GDA-G-W002-03		GDA-G-W003-02	
	ORIGINAL ID ----->	GDAGW00102		GDAGW00103		GDAGW00104		GDAGW00202		GDAGW00203		GDAGW00302	
	LAB SAMPLE ID --->	L6916-12		L7310-20		6450-01		L6926-1		L7310-22		L6926-5	
	ID FROM REPORT -->	GDAGW00102		GDAGW00103		GDAGW00104		GDAGW00202		GDAGW00203		GDAGW00302	
	SAMPLE DATE ----->	04/25/96		06/24/96		10/15/96		04/29/96		06/24/96		04/29/96	
	DATE EXTRACTED -->	05/07/96		07/09/96		10/25/96		05/10/96		07/09/96		05/10/96	
	DATE ANALYZED --->	05/09/96		07/11/96		10/30/96		05/16/96		07/11/96		05/16/96	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L	A	UG/L	A	UG/L	A	UG/L	A	UG/L	A	UG/L	A
CAS #	Parameter	L6916W	VAL	L7310	VAL	6434	VAL	L6926W	VAL	L7310	VAL	L6926W	VAL
7429-90-5	Aluminum (Al)	491.	U	65.6	J	235.	UJ	1600.		451.		1850.	
7440-36-0	Antimony (Sb)	4.	U	9.	U	2.	UR	4.	U	9.	U	4.	U
7440-38-2	Arsenic (As)	7.9	UJ	3.	U	2.6	J	3.7	U	4.4	J	7.3	U
7440-39-3	Barium (Ba)	19.7	U	24.9	J	74.2	J	76.	U	71.1	J	21.8	U
7440-41-7	Beryllium (Be)	1.	U	1.	U	0.98	UJ	1.	U	1.	U	1.	U
7440-43-9	Cadmium (Cd)	5.	U	3.	U	1.2	J	5.	U	3.	U	5.	U
7440-70-2	Calcium (Ca)	79500.		98500.		85400.		150000.	J	121000.		60600.	J
7440-47-3	Chromium (Cr)	6.	U	6.	U	7.4	J	6.	U	6.	U	6.	U
7440-48-4	Cobalt (Co)	7.	U	4.	U	10.3	J	7.	U	4.	U	7.	U
7440-50-8	Copper (Cu)	8.8	J	6.	U	11.2	UR	7.	U	6.	U	7.	U
7439-89-6	Iron (Fe)	18300.		7320.		8960.	J	13900.		16900.		8880.	
7439-92-1	Lead (Pb)	2.	U	2.	U	1.4	UR	2.	U	2.	U	2.	U
7439-95-4	Magnesium (Mg)	19000.		25300.		48400.		37300.		41600.		91900.	
7439-96-5	Manganese (Mn)	343.		577.		305.	J	158.	J	134.		96.	J
7439-97-6	Mercury (Hg)	0.2	U	0.2	U	0.11	UJ	0.2	U	0.2	U	0.2	U
7440-02-0	Nickel (Ni)	13.	U	12.	U	9.4	J	13.	UJ	12.	U	13.	UJ
7440-09-7	Potassium (K)	4350.	J	5140.		23600.	J	19400.		23500.		36800.	
7782-49-2	Selenium (Se)	3.	UJ	3.	U	2.2	U	3.	U	3.	U	3.	U
7440-22-4	Silver (Ag)	7.	UJ	6.	U	1.3	J	7.	UJ	6.	U	7.	UJ
7440-23-5	Sodium (Na)	12400.	U	15500.		229000.		61000.	U	71700.		698000.	
7440-28-0	Thallium (Tl)	3.	U	3.	U	3.1	UR	3.	U	3.	U	3.	U
7440-62-2	Vanadium (V)	7.	U	6.	U	13.6	J	7.	U	6.	U	7.7	J
7440-66-6	Zinc (Zn)	16.1	U	6.5	U	48.5	UR	13.7	U	7.3	U	16.7	U
7440-31-5	Tin (Sn)	33.	U	15.	U	54.8	UJ	33.	U	15.	U	33.	U

*** Validation Complete ***

CHARLESTON - ZONE A
Shallow Groundwater Grid Samples
Metals - Sampling Rounds 2, 3, and 4

SW846 META

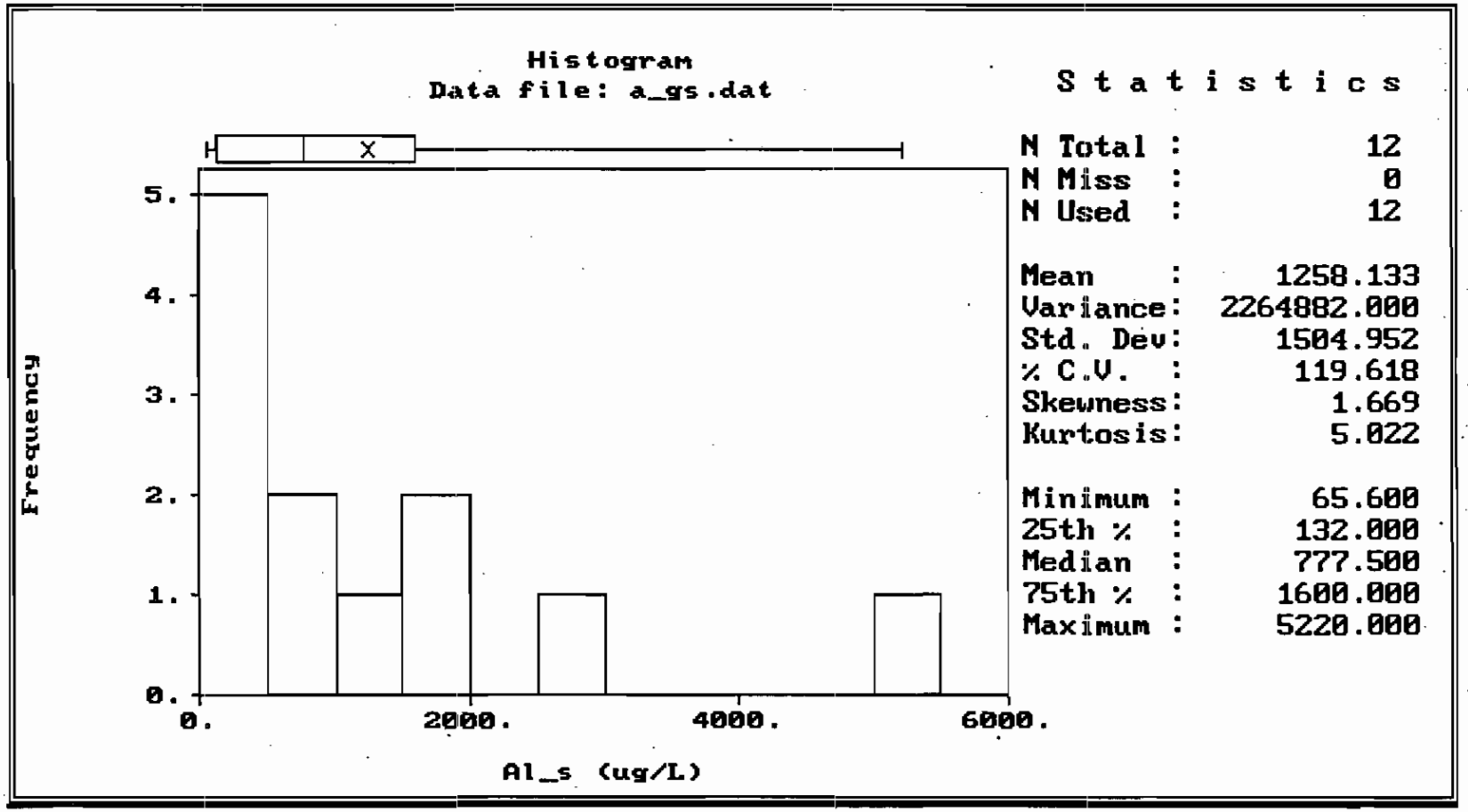
SAMPLE ID ------->	GDA-G-W002-04
ORIGINAL ID ----->	GDAGW00204
LAB SAMPLE ID --->	6468-01
ID FROM REPORT -->	GDAGW00204
SAMPLE DATE ----->	10/17/96
DATE EXTRACTED -->	11/08/96
DATE ANALYZED --->	11/12/96
MATRIX ---------->	Water
UNITS ----------->	UG/L A

CAS #	Parameter	6414	VAL
7440-36-0	Antimony (Sb)	4.	J
7440-38-2	Arsenic (As)	2.1	UJ
7440-39-3	Barium (Ba)	98.1	J
7440-41-7	Beryllium (Be)	0.16	U
7440-43-9	Cadmium (Cd)	0.22	U
7440-47-3	Chromium (Cr)	9.6	J
7440-48-4	Cobalt (Co)	0.67	U
7440-50-8	Copper (Cu)	7.1	U
7439-92-1	Lead (Pb)	3.2	J
7439-97-6	Mercury (Hg)	0.1	U
7440-02-0	Nickel (Ni)	0.67	U
7782-49-2	Selenium (Se)	2.1	U
7440-22-4	Silver (Ag)	1.	U
7440-28-0	Thallium (Tl)	3.1	U
7440-62-2	Vanadium (V)	8.1	J
7440-66-6	Zinc (Zn)	15.4	UJ
7440-31-5	Tin (Sn)	54.8	U
7429-90-5	Aluminum (Al)	5220.	J
7440-70-2	Calcium (Ca)	150000.	
7439-89-6	Iron (Fe)	14400.	
7439-95-4	Magnesium (Mg)	32900.	
7439-96-5	Manganese (Mn)	166.	
7440-09-7	Potassium (K)	26800.	
7440-23-5	Sodium (Na)	60600.	J

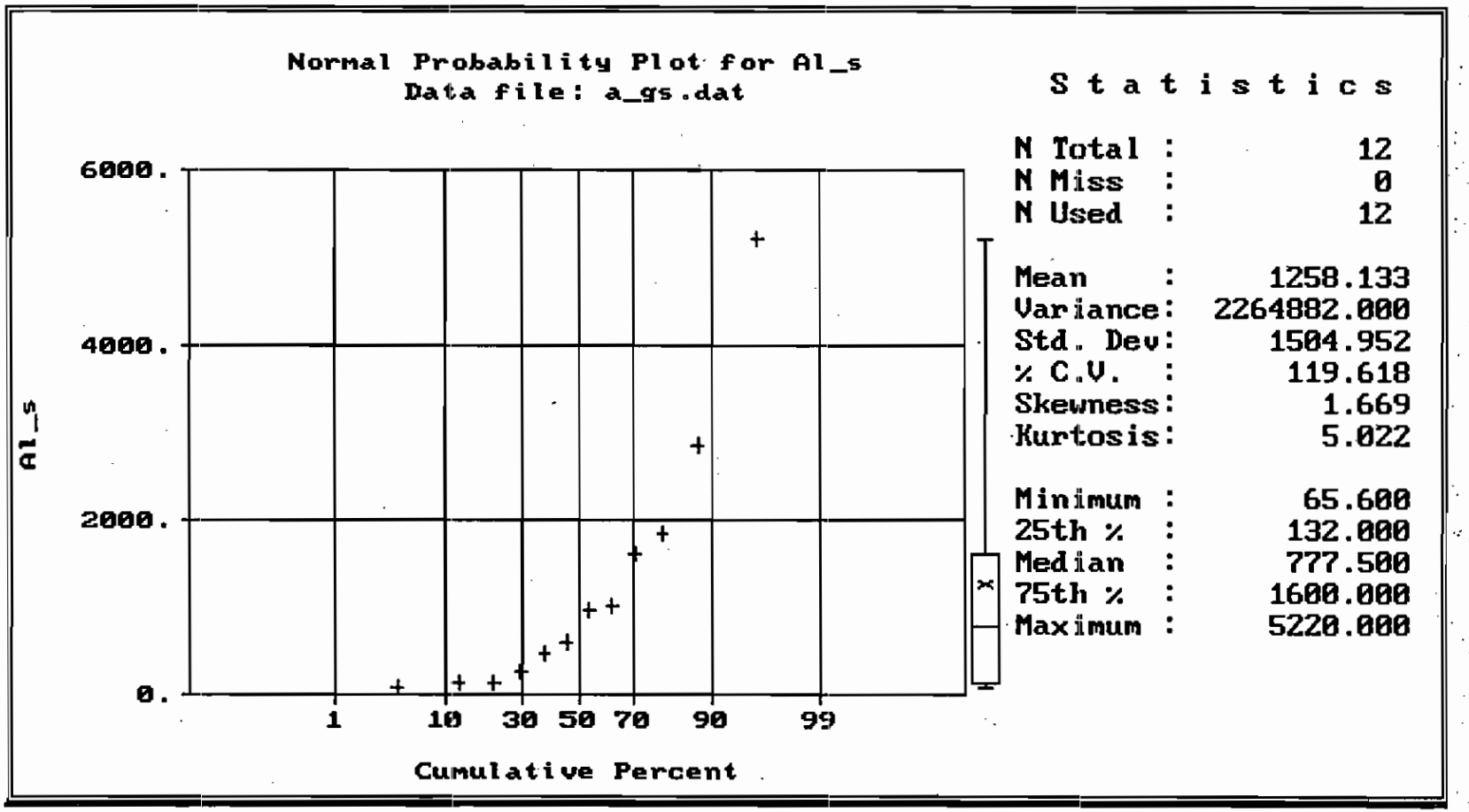
*** Validation Complete ***

Zone A
Aluminum in shallow GW grid samples (4 rounds)
Original dataset (N = 12)
Original values

1a

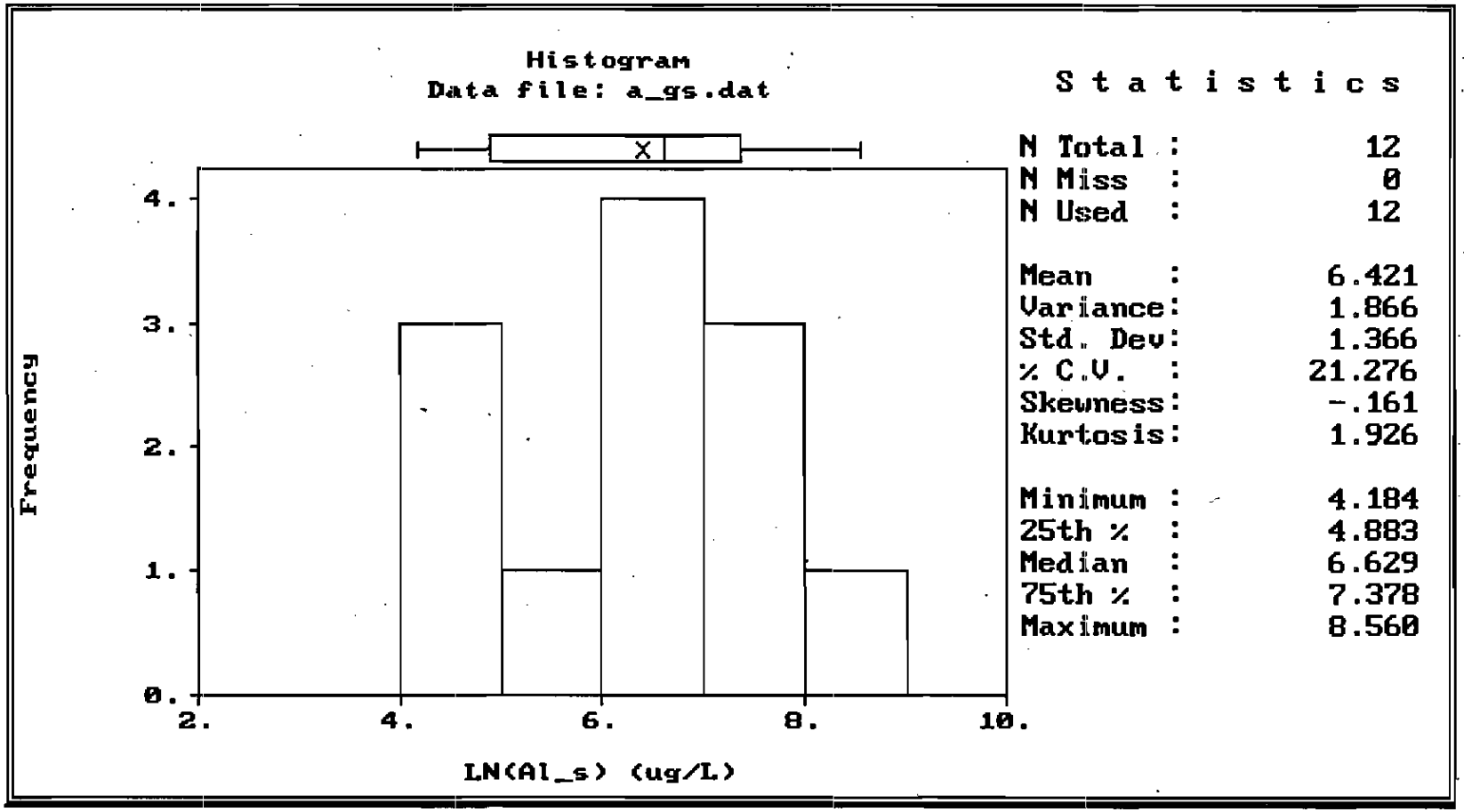


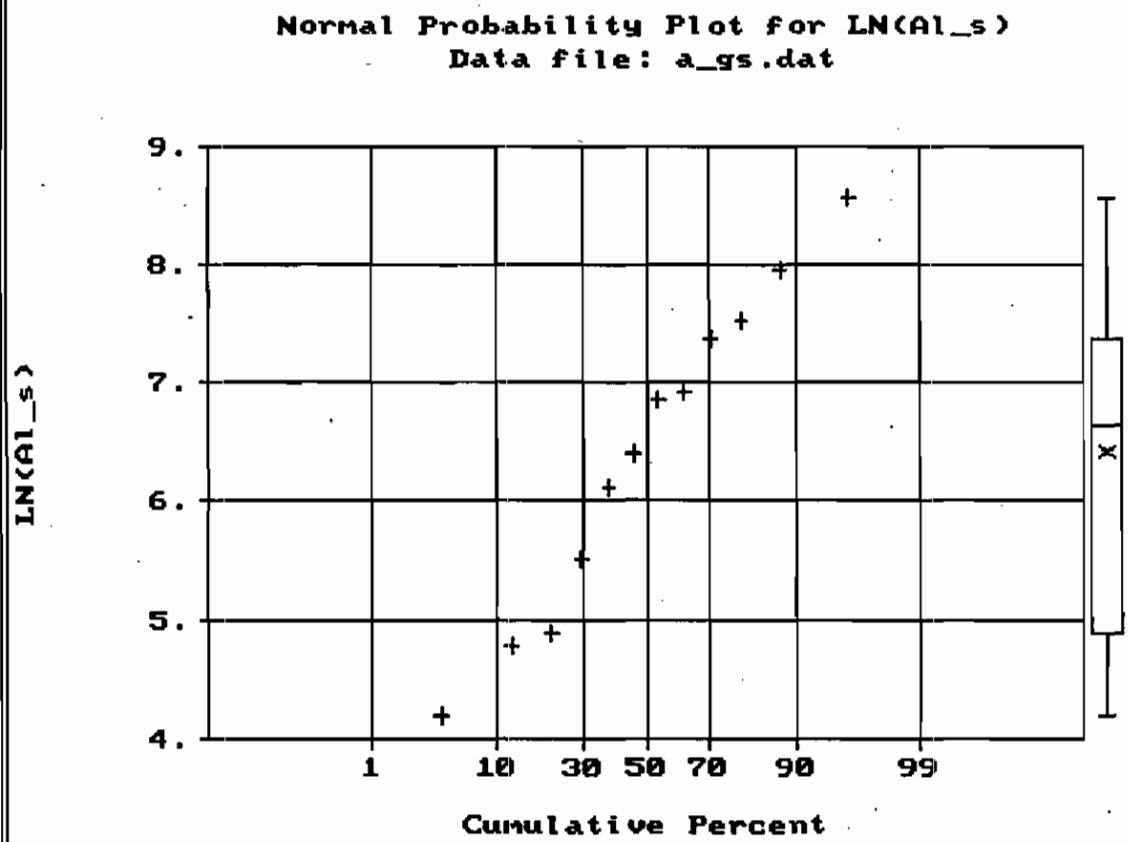
1b


Normal Probability Plot for Al_s
Data file: a_gs.dat
6000.
4000.
2000.
0.
Al_s
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 12
N Miss : 0
N Used : 12
Mean : 1258.133
Variance: 2264882.000
Std. Dev: 1504.952
% C.V. : 119.618
Skewness: 1.669
Kurtosis: 5.022
Minimum : 65.600
25th % : 132.000
Median : 777.500
75th % : 1600.000
Maximum : 5220.000

Zone A
Aluminum in shallow GW grid samples (4 rounds)
Original dataset (N=12)
LN-transformed values

2a



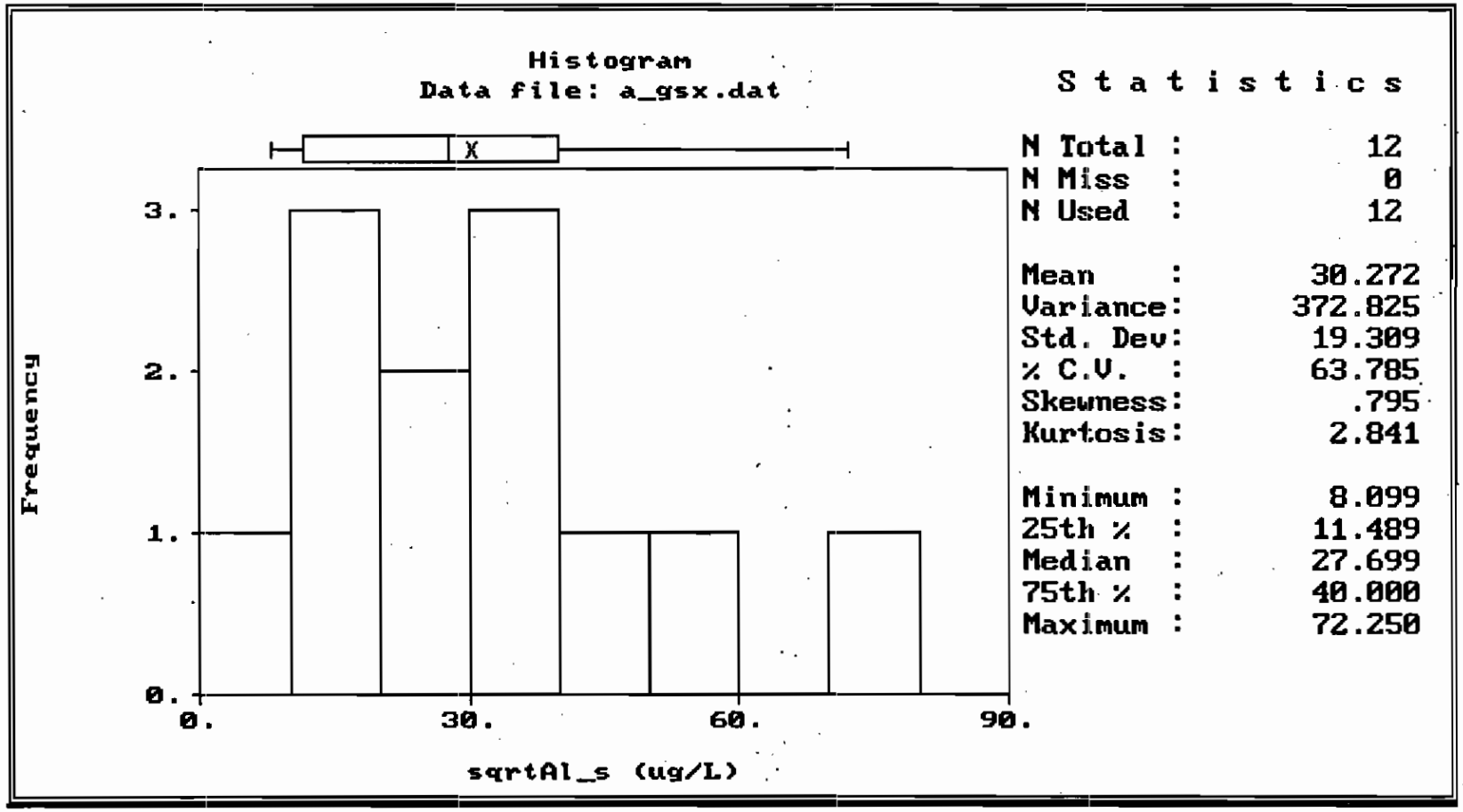


Statistics

N Total :	12
N Miss :	0
N Used :	12
Mean :	6.421
Variance:	1.866
Std. Dev:	1.366
% C.V. :	21.276
Skewness:	-.161
Kurtosis:	1.926
Minimum :	4.184
25th % :	4.883
Median :	6.629
75th % :	7.378
Maximum :	8.560

Zone A
Aluminum in shallow GW grid samples (4 rounds)
Original dataset (N = 12)
Square-root transformed values

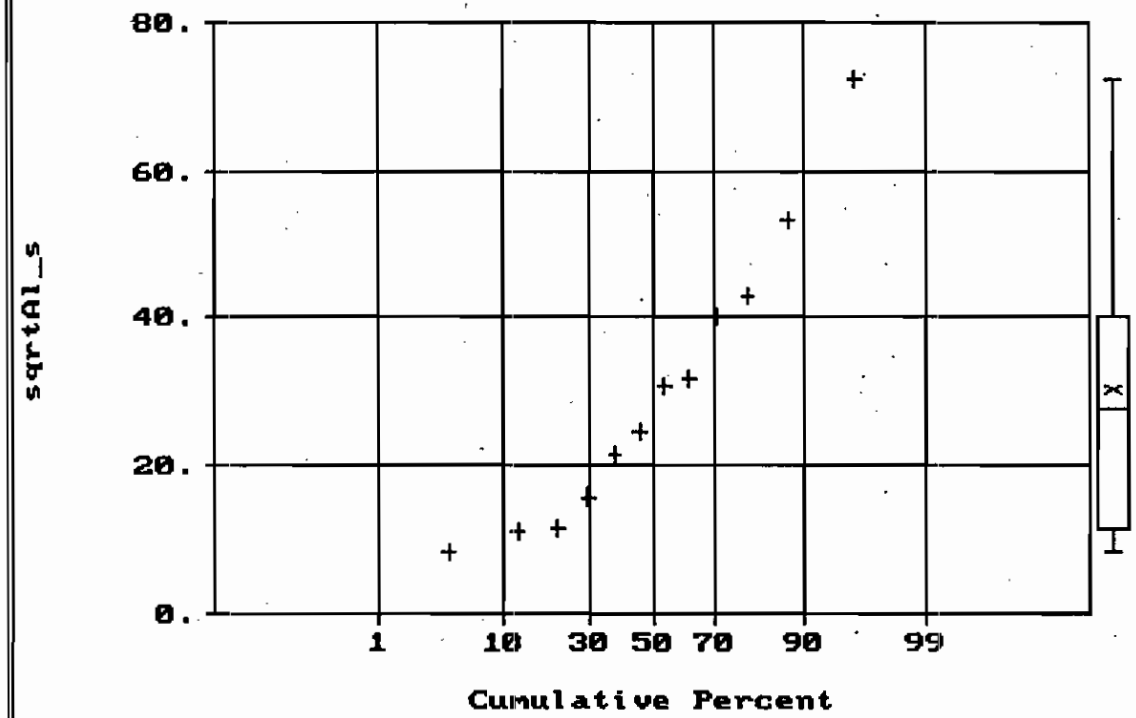
3a



Statistics

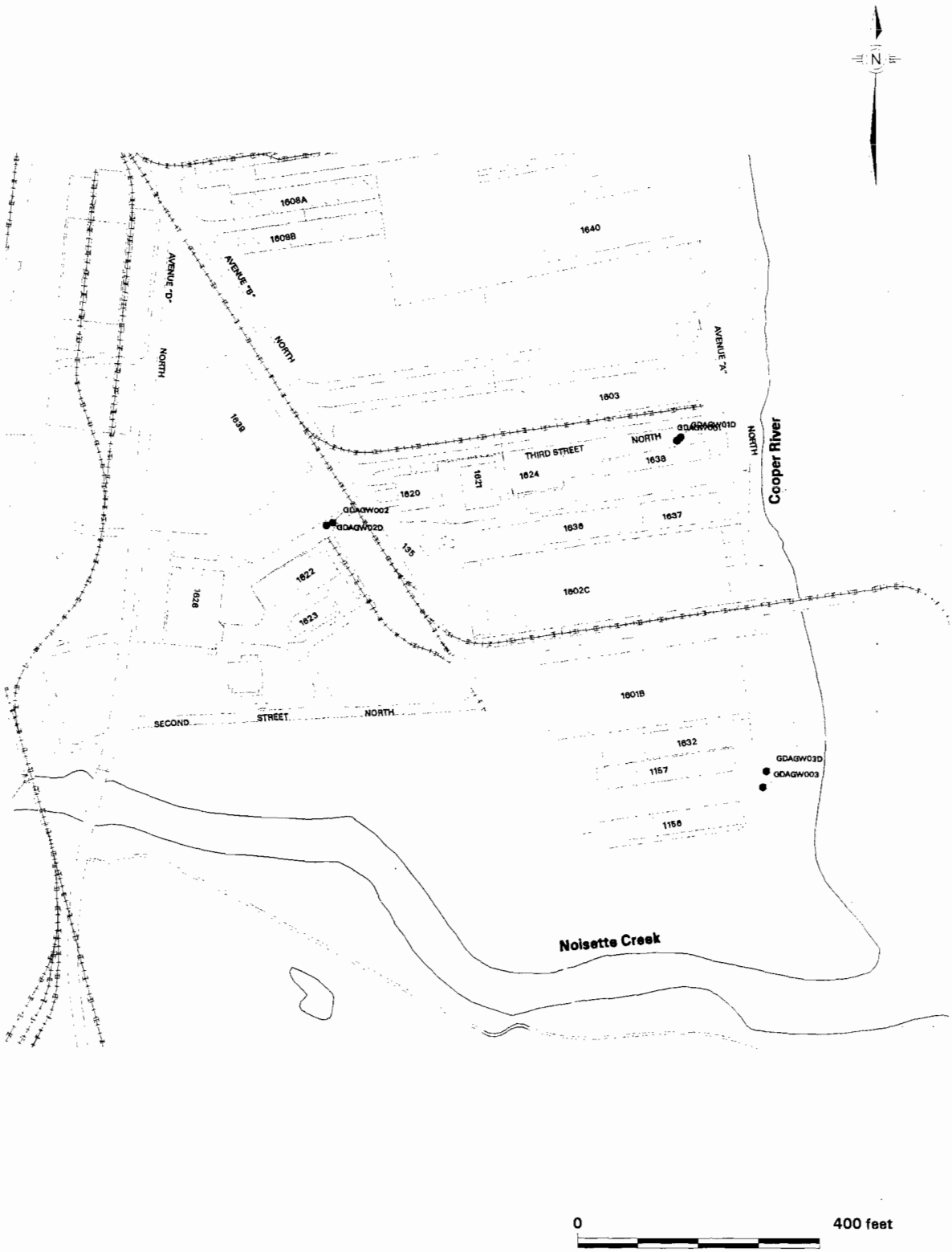
N Total :	12
N Miss :	0
N Used :	12
Mean :	30.272
Variance:	372.825
Std. Dev:	19.309
% C.V. :	63.785
Skewness:	.795
Kurtosis:	2.841
Minimum :	8.099
25th % :	11.489
Median :	27.699
75th % :	40.000
Maximum :	72.250

Normal Probability Plot for sqrtAl_s
Data file: a_gsx.dat



Statistics

N Total :	12
N Miss :	0
N Used :	12
Mean :	30.272
Variance:	372.825
Std. Dev:	19.309
% C.V. :	63.785
Skewness:	.795
Kurtosis:	2.841
Minimum :	8.099
25th % :	11.489
Median :	27.699
75th % :	40.000
Maximum :	72.250



Zone A RCRA Facility
Investigation Report
Naval Base Charleston
Charleston, SC

FIGURE 10.7.2 - Grid-Based Groundwater Sample Locations

CHARLESTON - ZONE A
Deep Groundwater Grid Samples
Metals - Sampling Round 1

SW846-META									
	SAMPLE ID ------->	GDA-G-W01D-01		GDA-G-W02D-01		GDA-H-W02D-01		GDA-G-W03D-01	
	ORIGINAL ID ----->	GDAGW01D01		GDAGW02D01		GDAHW02D01		GDAGW03D01	
	LAB SAMPLE ID --->	L5997-63		L6008-60		L6007-8		L6008-43	
	ID FROM REPORT -->	GDAGW01D01		GDAGW02D01		GDAHW02D01		GDAGW03D01	
	SAMPLE DATE ----->	12/07/95		12/08/95		12/08/95		12/08/95	
	DATE EXTRACTED -->	12/13/95		12/22/95		12/22/95		12/26/95	
	DATE ANALYZED --->	12/15/95		12/26/95		12/26/95		12/27/95	
	MATRIX ---------->	Water		Water		Water		Water	
	UNITS ---------->	UG/L	A	UG/L	A	UG/L	A	UG/L	A
CAS #	Parameter	L5997	VAL	L6008	VAL	L6007	VAL	L6008	VAL
7429-90-5	Aluminum (Al)	316.		49.3	J	31.9	J	21.	U
7440-36-0	Antimony (Sb)	51.	U	51.	U	51.	U	255.	U
7440-38-2	Arsenic (As)	4.	J	4.	U	4.	U	20.	U
7440-39-3	Barium (Ba)	65.6	J	153.	J	159.	J	59.9	J
7440-41-7	Beryllium (Be)	1.	U	1.	UJ	1.	UJ	1.	UJ
7440-43-9	Cadmium (Cd)	5.	U	5.	U	5.	U	5.	U
7440-70-2	Calcium (Ca)	78300.		177000.	J	181000.	J	410000.	J
7440-47-3	Chromium (Cr)	4.	U	4.	UJ	7.3	J	4.	UJ
7440-48-4	Cobalt (Co)	6.	U	10.3	J	13.9	J	6.	UJ
7440-50-8	Copper (Cu)	5.7	J	3.	U	3.	U	3.	U
7439-89-6	Iron (Fe)	12500.	J	17200.	J	17700.	J	187.	J
7439-92-1	Lead (Pb)	15.	U	30.	UR	3.	UR	60.	UR
7439-95-4	Magnesium (Mg)	111000.		426000.		437000.		1610000.	
7439-96-5	Manganese (Mn)	344.		2340.	J	2390.	J	1470.	J
7439-97-6	Mercury (Hg)	0.2	U	0.2	U	0.2	U	0.2	U
7440-02-0	Nickel (Ni)	14.	U	20.1	J	15.2	J	14.	UJ
7440-09-7	Potassium (K)	26400.		118000.		122000.		370000.	
7782-49-2	Selenium (Se)	3.	UJ	3.	UR	3.	UR	30.	UR
7440-22-4	Silver (Ag)	3.	U	3.	U	3.	U	3.	U
7440-23-5	Sodium (Na)	801000.	J	3650000.	J	3780000.	J	11100000.	J
7440-28-0	Thallium (Tl)	4.	UJ	4.	UR	40.	UR	163.	J
7440-62-2	Vanadium (V)	4.	U	4.	U	4.4	J	9.9	J
7440-66-6	Zinc (Zn)	86.8		6.	J	5.1	J	6.9	J
7440-31-5	Tin (Sn)	??????????		??????????		??????????		??????????	

*** Validation Complete ***

CHARLESTON - ZONE A
Deep Groundwater Grid Samples
Metals - Sampling Rounds 2, 3, and 4

SW846-META	SAMPLE ID ------->	GDA-G-W01D-02		GDA-G-W01D-03		GDA-G-W01D-04		GDA-G-W02D-02		GDA-H-W02D-02		GDA-G-W02D-03	
	ORIGINAL ID ----->	GDAGW01D02		GDAGW01D03		GDAGW01D04		GDAGW02D02		GDAHW02D02		GDAGW02D03	
	LAB SAMPLE ID --->	L6916-13		L7310-21		6450-02		L6916-14		L6914-2		L7310-23	
	ID FROM REPORT -->	GDAGW01D02		GDAGW01D03		GDAGW01D04		GDAGW02D02		GDAHW02D02		GDAGW02D03	
	SAMPLE DATE ----->	04/25/96		06/24/96		10/15/96		04/25/96		04/25/96		06/24/96	
	DATE EXTRACTED -->	05/07/96		07/09/96		10/25/96		05/07/96		05/07/96		07/09/96	
	DATE ANALYZED --->	05/09/96		07/11/96		10/30/96		05/09/96		05/09/96		07/11/96	
	MATRIX --------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L	A	UG/L	A	UG/L	A	UG/L	A	UG/L	A	UG/L	A
CAS #	Parameter	L6916W	VAL	L7310	VAL	6434	VAL	L6916W	VAL	L6914W	VAL	L7310	VAL
7429-90-5	Aluminum (Al)	54.9	U	114.	J	19.2	UJ	51.	U	58.9	U	73.2	J
7440-36-0	Antimony (Sb)	13.1	U	9.	U	2.	UR	6.4	U	12.1	U	9.	U
7440-38-2	Arsenic (As)	10.5	UJ	8.	J	11.1	J	2.	UJ	2.	UJ	3.	U
7440-39-3	Barium (Ba)	55.1	U	38.8	J	35.9	J	167.	U	173.	U	182.	J
7440-41-7	Beryllium (Be)	1.	U	1.	U	0.11	UJ	1.	U	1.	U	1.	U
7440-43-9	Cadmium (Cd)	5.	U	3.	U	0.22	U	5.	U	5.	U	3.	U
7440-70-2	Calcium (Ca)	74500.		47400.		45100.		171000.		176000.		177000.	
7440-47-3	Chromium (Cr)	6.	U	6.	U	1.6	J	6.	U	6.	U	6.	U
7440-48-4	Cobalt (Co)	7.	U	4.	U	0.67	UJ	19.5	J	13.7	J	18.6	J
7440-50-8	Copper (Cu)	7.6	J	6.	U	1.3	UR	7.	U	7.	U	7.8	J
7439-89-6	Iron (Fe)	7760.		7040.		5120.	J	22300.		22900.		22700.	
7439-92-1	Lead (Pb)	2.	U	2.	U	1.4	UR	10.	U	10.	U	10.	U
7439-95-4	Magnesium (Mg)	141000.		93200.		96500.		423000.		436000.		438000.	
7439-96-5	Manganese (Mn)	301.		204.		183.	J	2310.		2380.		2480.	
7439-97-6	Mercury (Hg)	0.2	U	0.2	U	0.1	UJ	0.2	U	0.2	U	0.2	U
7440-02-0	Nickel (Ni)	16.2	U	12.	U	0.67	UJ	13.	U	20.4	U	12.	U
7440-09-7	Potassium (K)	36600.		23500.		63100.	J	127000.		131000.		130000.	
7782-49-2	Selenium (Se)	3.	UJ	3.	U	2.1	U	3.	UJ	3.	UJ	15.	U
7440-22-4	Silver (Ag)	7.	UJ	6.	U	6.	J	7.	UJ	7.	U	9.6	J
7440-23-5	Sodium (Na)	978000.		672000.		642000.		3700000.		3660000.		3950000.	
7440-28-0	Thallium (Tl)	3.	U	3.	U	3.1	UR	15.	U	15.	U	15.	U
7440-62-2	Vanadium (V)	7.	U	6.	U	0.44	U	7.	U	7.	U	6.	U
7440-66-6	Zinc (Zn)	12.5	U	6.8	U	30.	UR	16.4	U	13.4	U	3.5	U
7440-31-5	Tin (Sn)	33.	U	15.	U	54.8	UJ	33.	U	33.	U	22.3	U

*** Validation Complete ***

CHARLESTON - ZONE A
Deep Groundwater Grid Samples
Metals - Sampling Rounds 2, 3, and 4

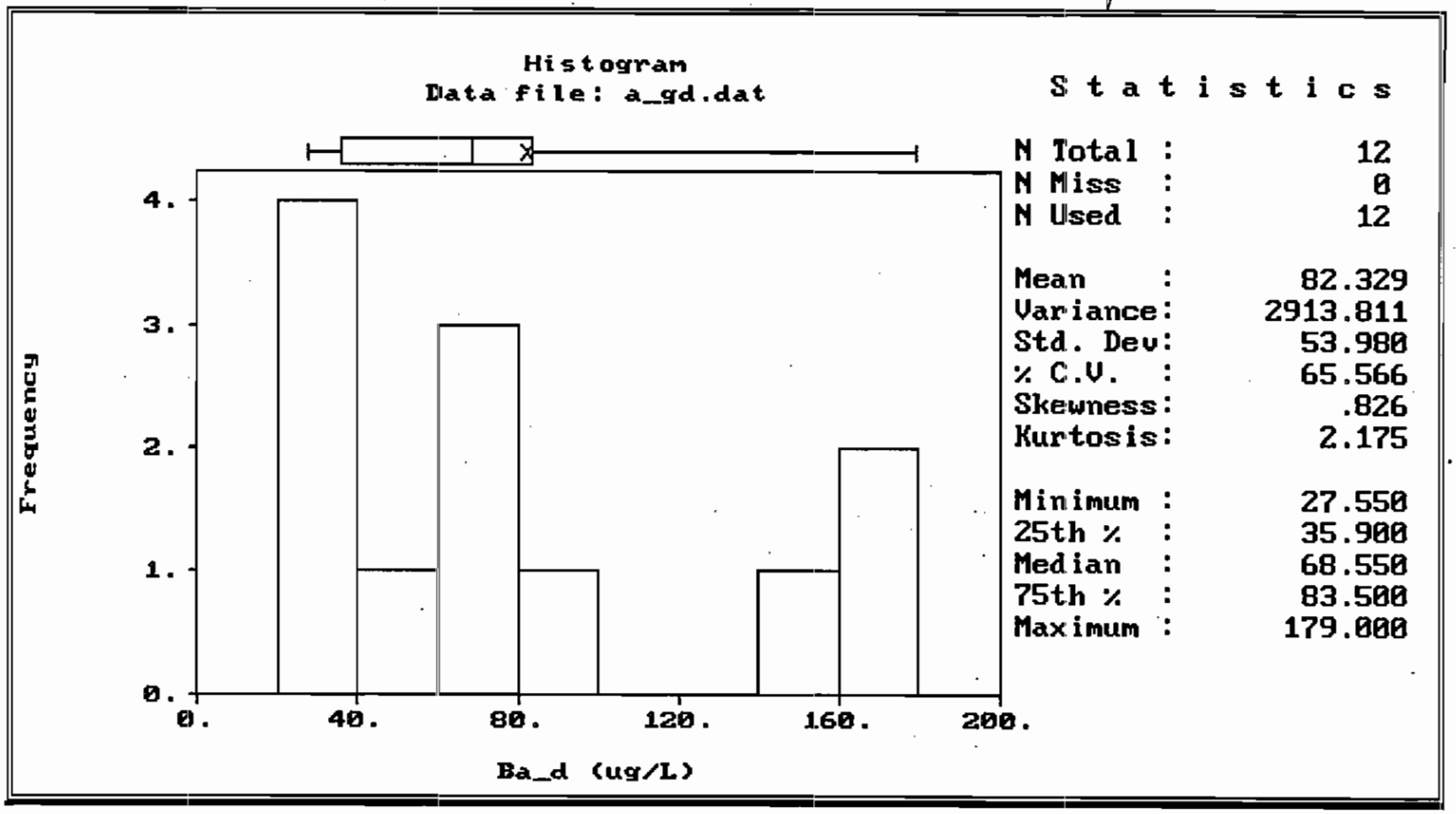
SW846-META																	
	SAMPLE ID ------->	GDA-H-W02D-03		GDA-G-W02D-04		GDA-H-W02D-04		GDA-G-W03D-02		GDA-G-W03D-03		GDA-G-W03D-04	
	ORIGINAL ID ----->	GDAHW02D03		GDAGW02D04		GDAHW02D04		GDAGW03D02		GDAGW03D03		GDAGW03D04	
	LAB SAMPLE ID --->	L7309-5		6468-02		6468-03		L6926-2		L7317-29		6458-02	
	ID FROM REPORT -->	GDAHW02D03		GDAGW02D04		GDAHW02D04		GDAGW03D02		GDAGW03D03		GDAGW03D04	
	SAMPLE DATE ----->	06/24/96		10/17/96		10/17/96		04/29/96		06/25/96		10/16/96	
	DATE EXTRACTED -->	07/09/96		11/08/96		11/08/96		05/10/96		07/09/96		10/25/96	
	DATE ANALYZED --->	07/11/96		11/12/96		11/12/96		05/16/96		07/11/96		10/31/96	
	MATRIX ---------->	Water		Water		Water		Water		Water		Water	
	UNITS ---------->	UG/L	A	UG/L	A	UG/L	A	UG/L	A	UG/L	A	UG/L	A
CAS #	Parameter	L7309M	VAL	6468	VAL	6468	VAL	L6926W	VAL	L7317M	VAL	6434	VAL
7429-90-5	Aluminum (Al)	48.	U	1580.	J	1530.	J	36.	U	48.	U	1180.	J
7440-36-0	Antimony (Sb)	9.	U	20.	U	20.	U	7.1	J	9.	U	100.	UR
7440-38-2	Arsenic (As)	3.	U	21.1	U	21.1	U	10.	U	15.	UJ	106.	UR
7440-39-3	Barium (Ba)	176.	J	161.	J	168.	J	64.8	U	71.5	J	73.3	J
7440-41-7	Beryllium (Be)	1.	U	3.3	J	1.1	UJ	1.	U	1.	U	5.6	UJ
7440-43-9	Cadmium (Cd)	3.	U	2.2	U	2.2	U	5.	U	3.	U	11.1	U
7440-70-2	Calcium (Ca)	174000.		192000.		196000.		411000.	J	442000.	J	524000.	
7440-47-3	Chromium (Cr)	6.	U	55.4	J	42.3	J	6.	U	6.	U	136.	J
7440-48-4	Cobalt (Co)	17.2	J	28.7	J	18.1	J	7.	U	4.	U	33.3	UJ
7440-50-8	Copper (Cu)	6.	U	21.4	J	23.6	J	7.	J	6.	U	445.	J
7439-89-6	Iron (Fe)	22300.		21300.		21900.		87.6	U	119.	U	583.	UJ
7439-92-1	Lead (Pb)	10.	U	14.4	UJ	14.4	UJ	10.	U	18.5		72.2	UR
7439-95-4	Magnesium (Mg)	431000.		479000.	J	490000.	J	1540000.		1410000.		1590000.	
7439-96-5	Manganese (Mn)	2430.		2660.	J	2720.	J	1220.	J	1310.	J	1700.	J
7439-97-6	Mercury (Hg)	0.2	U	0.1	U	0.1	U	0.2	U	0.2	U	0.11	UJ
7440-02-0	Nickel (Ni)	12.	U	6.7	UJ	6.7	UJ	13.	UJ	12.	U	74.4	J
7440-09-7	Potassium (K)	127000.		261000.	J	272000.	J	369000.		360000.		606000.	J
7782-49-2	Selenium (Se)	15.	U	21.1	U	21.1	U	30.	U	30.	UJ	106.	U
7440-22-4	Silver (Ag)	6.	U	30.9	J	10.3	J	7.	UJ	6.	UJ	50.	UJ
7440-23-5	Sodium (Na)	3830000.		3580000.		3950000.		11100000.		9970000.		8970000.	
7440-28-0	Thallium (Tl)	15.	U	31.1	U	31.1	U	23.	J	17.	J	156.	UR
7440-62-2	Vanadium (V)	6.	U	4.4	UJ	4.4	UJ	7.	U	6.	U	22.2	U
7440-66-6	Zinc (Zn)	10.3	U	8.9	UJ	8.9	UJ	7.8	U	5.5	U	1440.	J
7440-31-5	Tin (Sn)	15.9	U	81.5	J	118.		33.	U	22.9	U	111.	J

*** Validation Complete ***

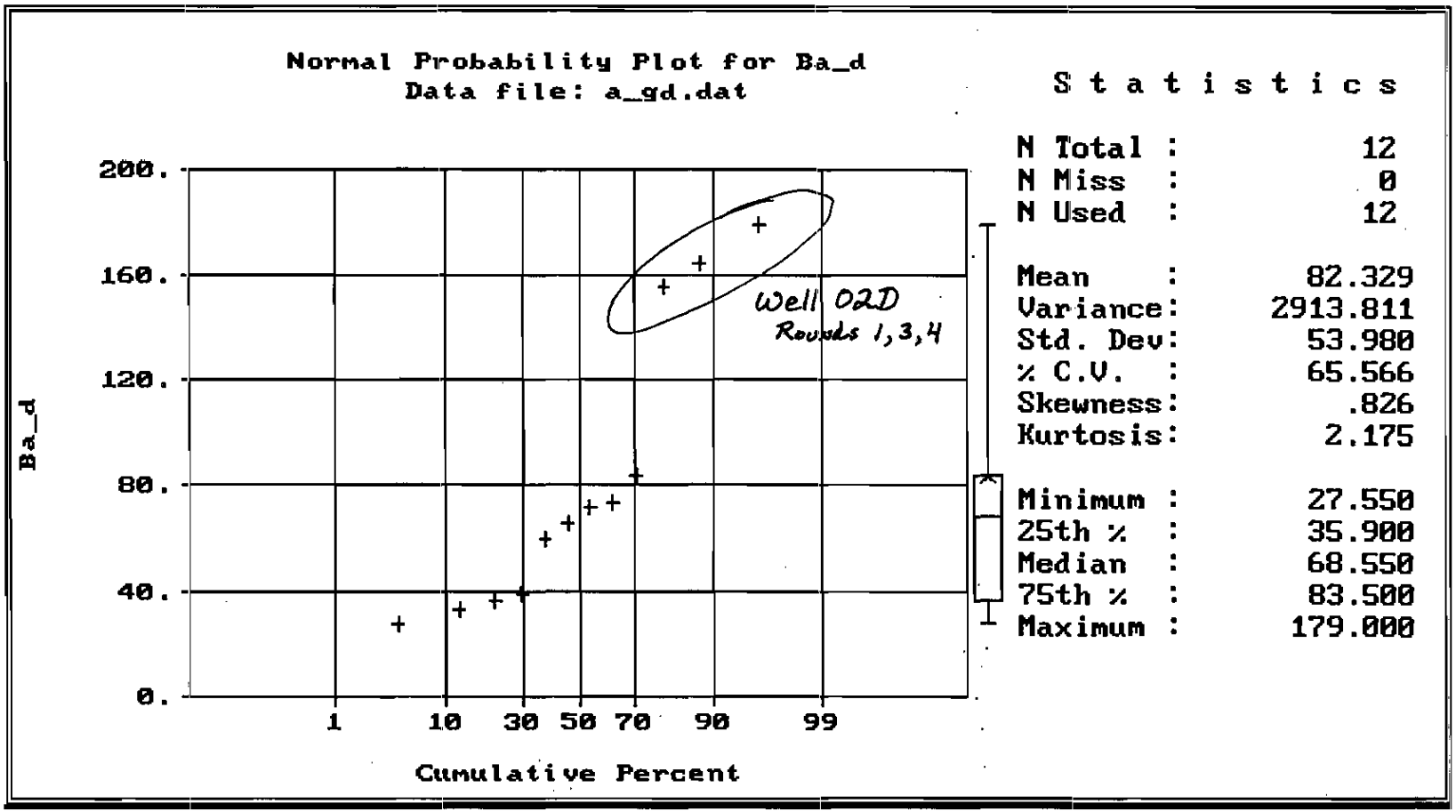
Zone A
Barium in deep GW grid samples (4 rounds)
Original dataset (N=12)
Original values

1a

9 of 12 are hits

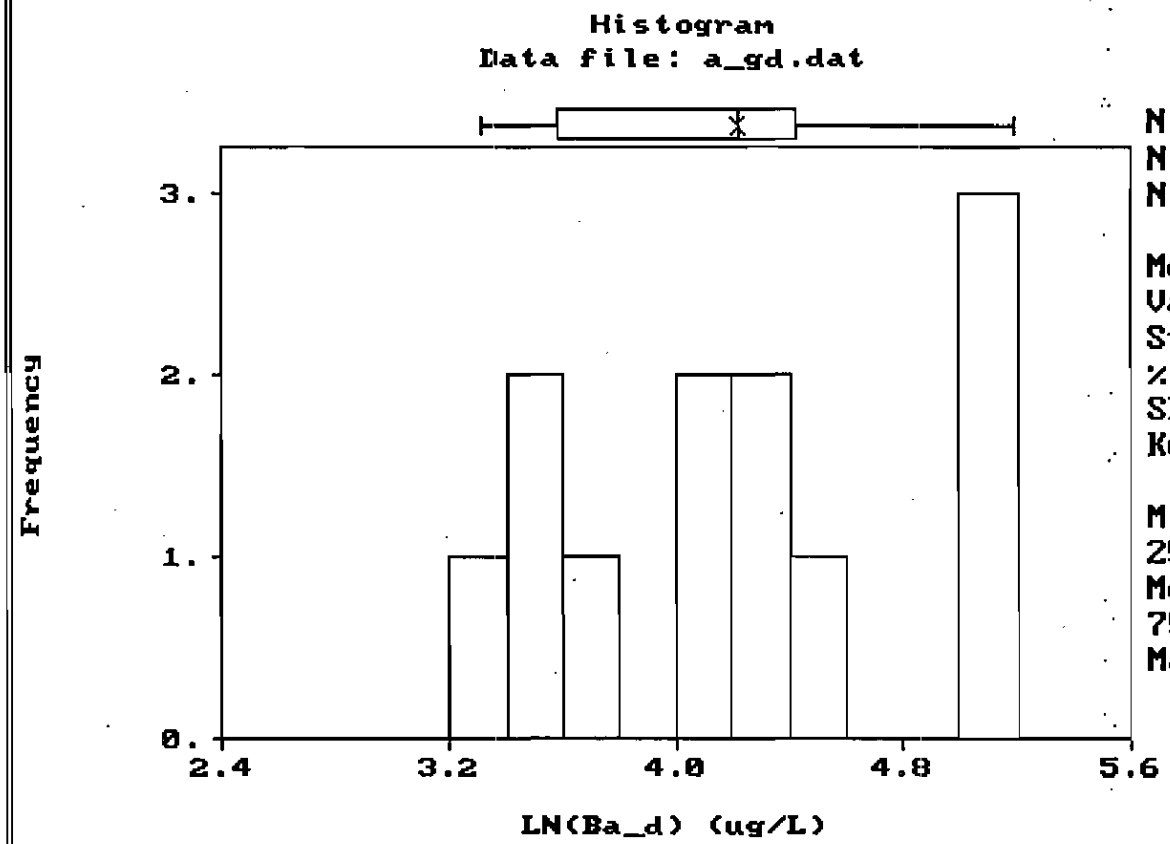


1b


Normal Probability Plot for Ba_d
Data file: a_gd.dat
Ba_d
200.
160.
120.
80.
40.
0.
1
10
30
50
70
90
99
Cumulative Percent
Well 02D
Rounds 1,3,4
Statistics
N Total : 12
N Miss : 0
N Used : 12
Mean : 82.329
Variance: 2913.811
Std. Dev: 53.980
% C.V. : 65.566
Skewness: .826
Kurtosis: 2.175
Minimum : 27.550
25th % : 35.900
Median : 68.550
75th % : 83.500
Maximum : 179.000

Zone A
Barium in deep GW grid samples (4 rounds)
Original dataset (N=12)
LN-transformed values

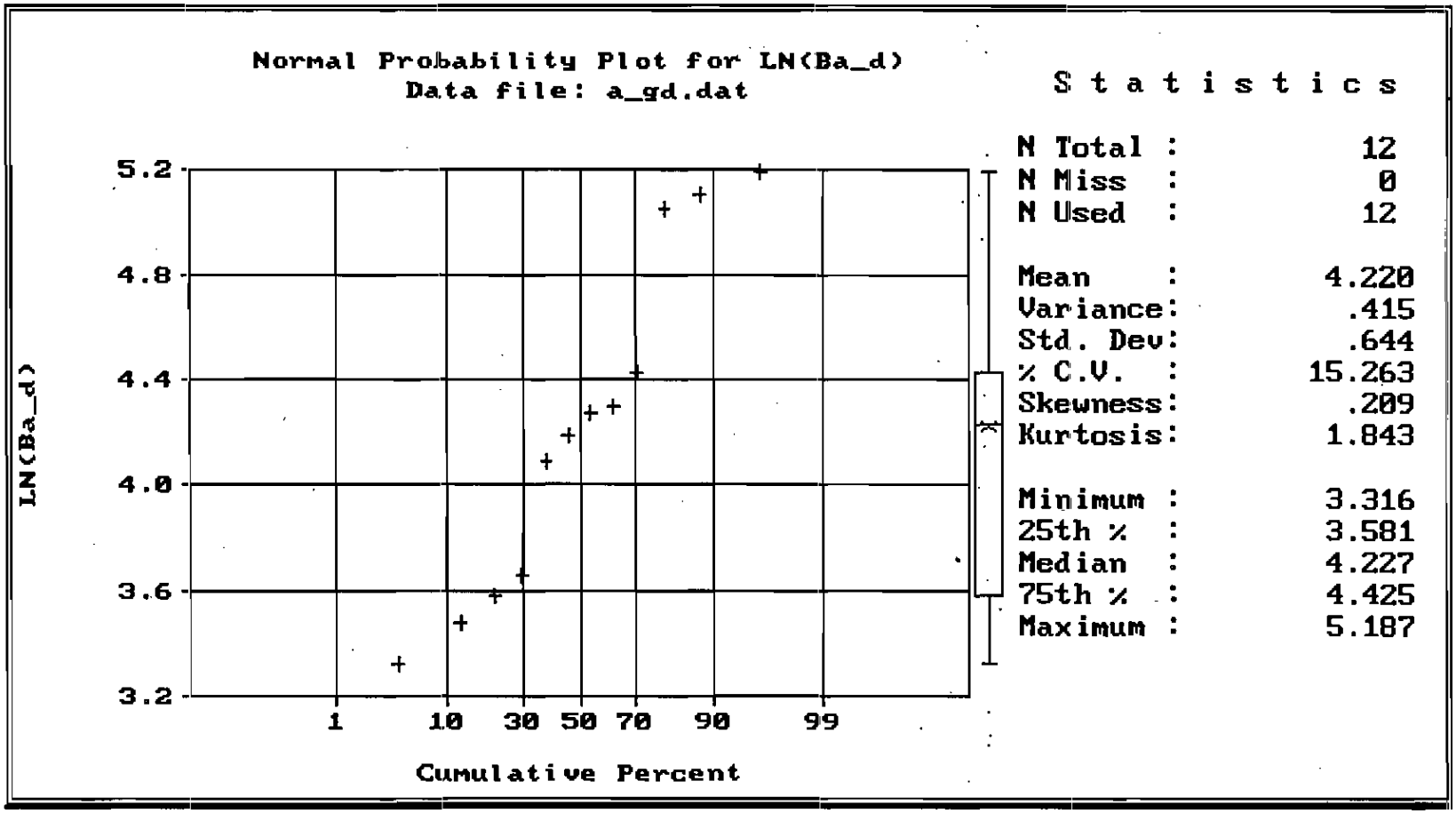
2a



Statistics

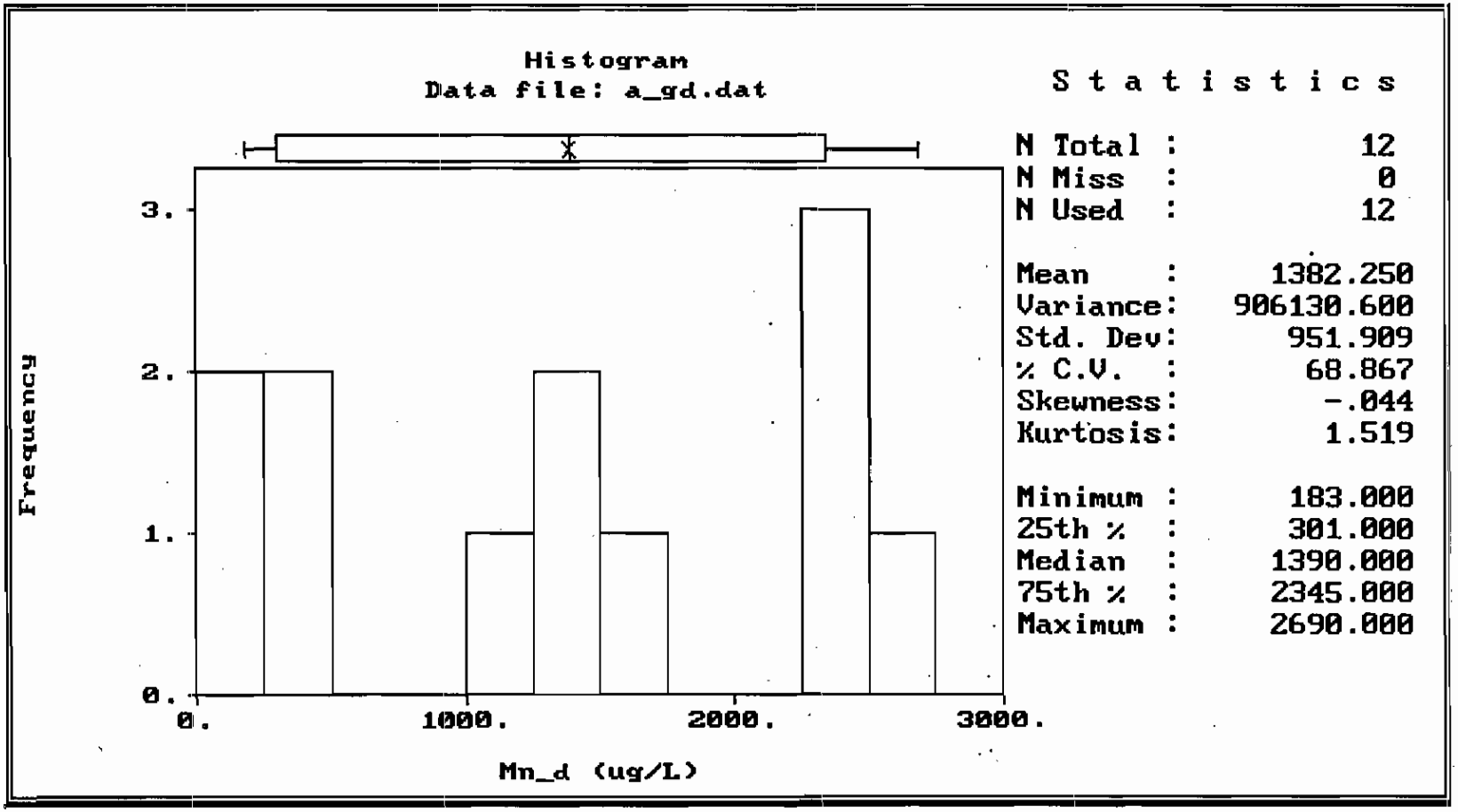
N Total :	12
N Miss :	0
N Used :	12
Mean :	4.220
Variance:	.415
Std. Dev:	.644
% C.V. :	15.263
Skewness:	.209
Kurtosis:	1.843
Minimum :	3.316
25th % :	3.581
Median :	4.227
75th % :	4.425
Maximum :	5.187

2b


Normal Probability Plot for LN(Ba_d)
Data file: a_gd.dat
LN(Ba_d)
5.2
4.8
4.4
4.0
3.6
3.2
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 12
N Miss : 0
N Used : 12
Mean : 4.220
Variance: .415
Std. Dev: .644
% C.V. : 15.263
Skewness: .209
Kurtosis: 1.843
Minimum : 3.316
25th % : 3.581
Median : 4.227
75th % : 4.425
Maximum : 5.187

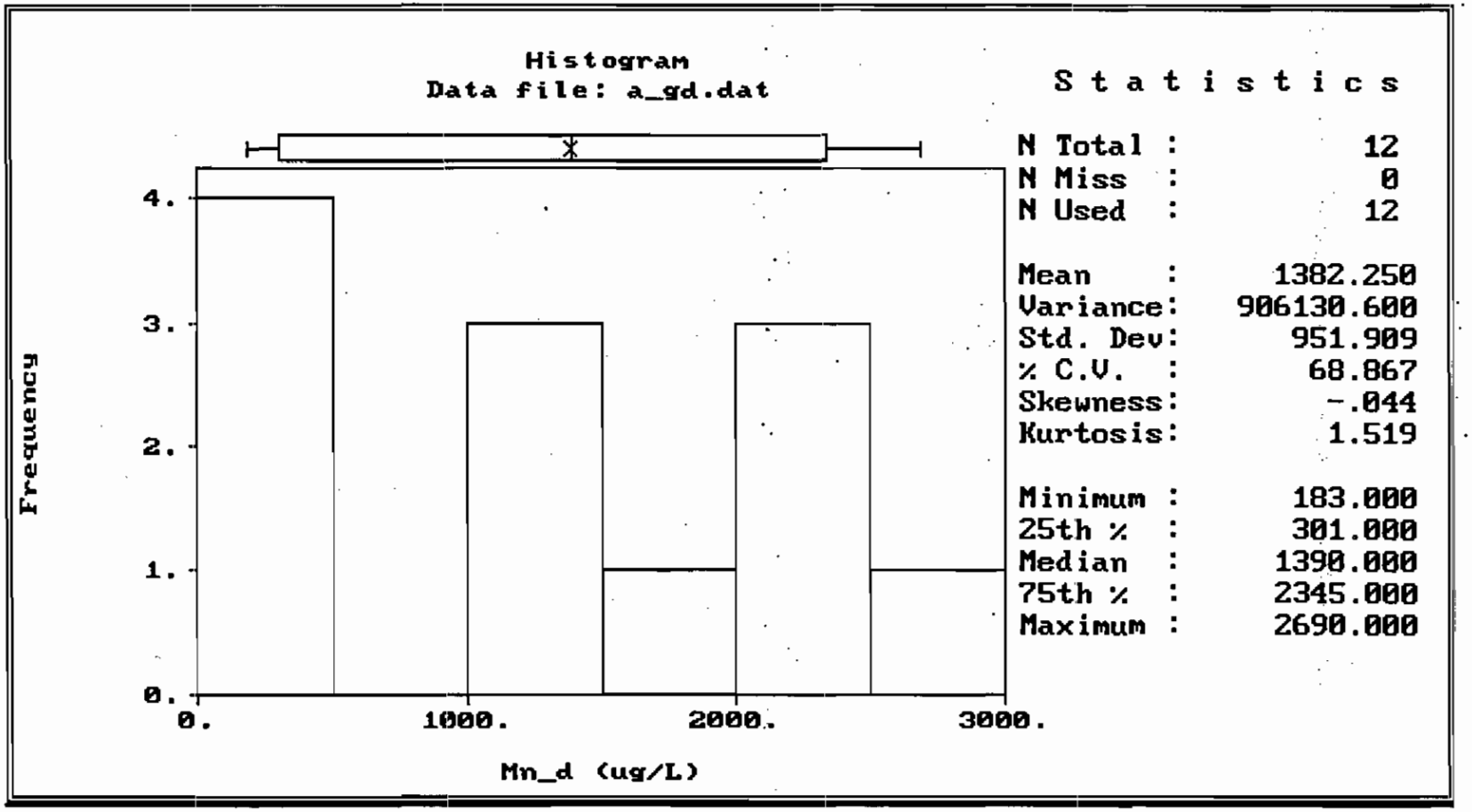
Zone A
Manganese in deep GW grid samples (4 rounds)
Original dataset (N=12)
Original values

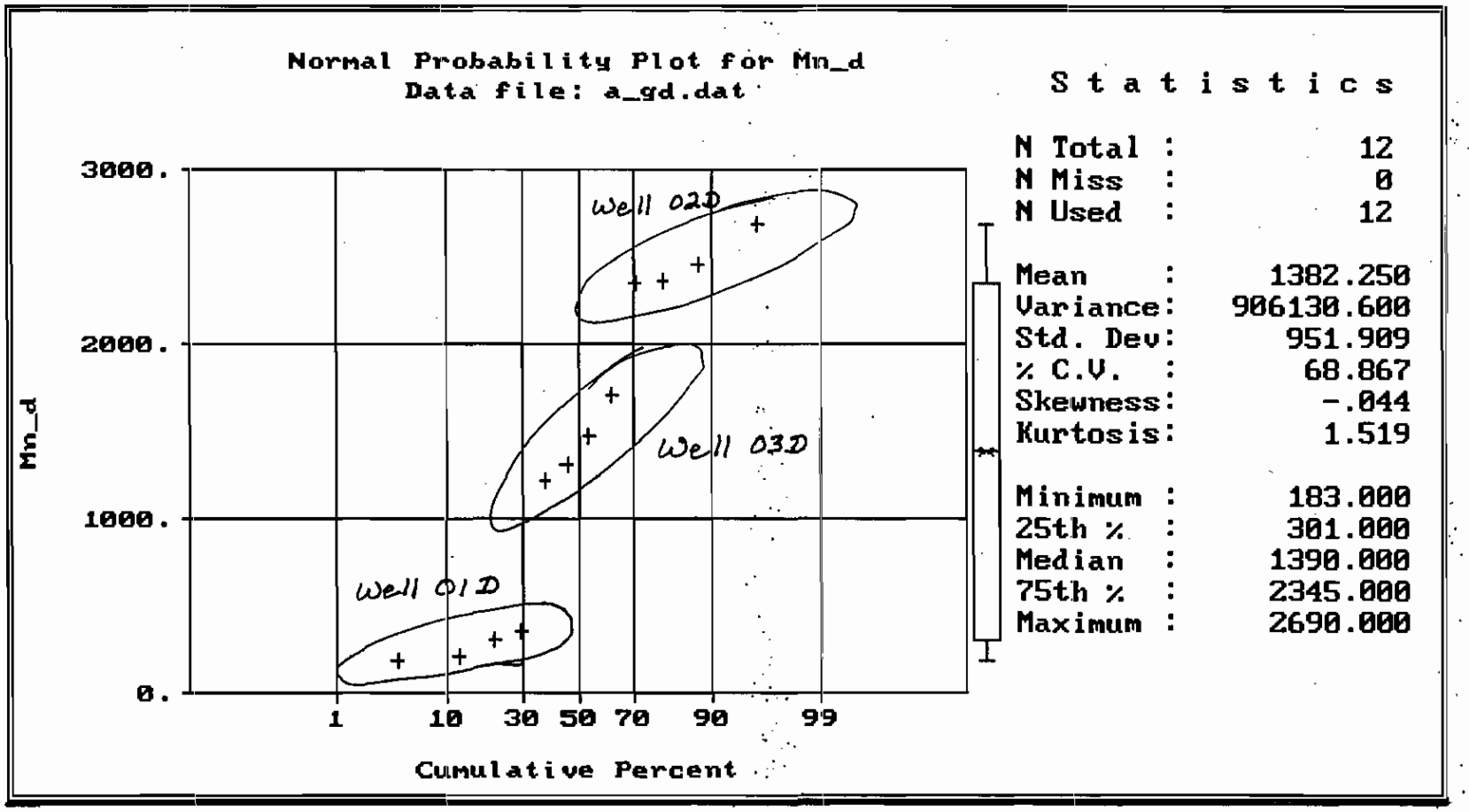
1a,



Zone A
Manganese in deep GW grid samples (4 rounds) – generalized view
Original dataset (N = 12)
Original values

1a2




Normal Probability Plot for Mn_d
Data file: a_gd.dat
Mn_d
3000.
2000.
1000.
0.
1
10
30
50
70
90
99
Cumulative Percent
Well 02D
Well 03D
Well 01D
Statistics
N Total : 12
N Miss : 0
N Used : 12
Mean : 1382.250
Variance: 906130.600
Std. Dev: 951.909
% C.V. : 68.867
Skewness: -.044
Kurtosis: 1.519
Minimum : 183.000
25th % : 301.000
Median : 1390.000
75th % : 2345.000
Maximum : 2690.000

E N V I R O N M E N T A L S A F E T Y & D E S I G N S

2901-00001 - CHARLESTON ZONE A - SOIL & 1ST GW

Samples by Chemical Report

7439-96-5 - Manganese (Mn)

>= 1000.0000 for UG/L - Hits Only

Sample ID	Ext.	Orig. ID	Type	Date	Result	VQual	Units	SDG #	
039-G-W002-01		039GW00201	Water	12/05/95	1240.0000		UG/L	L5970	VAL
039-G-W004-01		039GW00401	Water	12/06/95	2020.0000		UG/L	L5991	VAL
039-G-W005-01		039GW00501	Water	12/06/95	2050.0000		UG/L	L5991	VAL
CNS-G-W002-01		CNSGW00201	Water	09/29/95	3210.0000		UG/L	L5486W	VAL
GDA-G-W02D-01		GDAGW02D01	Water	12/08/95	2340.0000	J	UG/L	L6008	VAL
GDA-H-W02D-01		GDAHW02D01	Water	12/08/95	2390.0000	J	UG/L	L6007	VAL
GDA-G-W03D-01		GDAGW03D01	Water	12/08/95	1470.0000	J	UG/L	L6008	VAL
S02-G-0002-01		S02W0201	Water	11/15/93	3370.0000	J	ug/l	CNS23	VAL
S02-H-0002-01		S02W021D	Water	11/15/93	3300.0000	J	ug/l	CNS23	VAL

*** End of Report ***

Round 1

E N V I R O N M E N T A L S A F E T Y & D E S I G N S

2901-00002 - CHARLESTON ZONE A - QUARTERLY GW

Samples by Chemical Report

7439-96-5 - Manganese (Mn)

>= 1000.0000 for All Concentration Units - Hits Only

Sample ID	Ext. Orig. ID	Type	Date	Result	VQual	Units	SDG #	
039-G-W002-03	039GW00203	Water	06/20/96	1070.0000		UG/L	L7287M	VAL
039-G-W002-04	039GW00204	Water	10/08/96	1100.0000		UG/L	6382	VAL
039-G-W002-02	039GW00202	Water	04/23/96	1120.0000		UG/L	L6891W	VAL
GDA-G-W03D-02	GDAGW03D02	Water	04/29/96	1220.0000	J	UG/L	L6926W	VAL
GDA-G-W03D-03	GDAGW03D03	Water	06/25/96	1310.0000	J	UG/L	L7317M	VAL
GDA-G-W03D-04	GDAGW03D04	Water	10/16/96	1700.0000	J	UG/L	6434	VAL
039-G-W004-04	039GW00404	Water	10/09/96	1810.0000		UG/L	6382	VAL
039-G-W005-04	039GW00504	Water	10/09/96	1840.0000		UG/L	6382	VAL
039-G-W004-02	039GW00402	Water	04/24/96	1880.0000		UG/L	L6904W	VAL
039-G-W005-03	039GW00503	Water	06/21/96	1890.0000		UG/L	L7294M	VAL
039-G-W004-03	039GW00403	Water	06/21/96	1910.0000		UG/L	L7294M	VAL
002-G-W001-03	002GW00103	Water	06/20/96	1990.0000		UG/L	L7287M	VAL
039-G-W005-02	039GW00502	Water	04/24/96	2040.0000		UG/L	L6904W	VAL
039-G-W08D-04	039GW08D04	Water	10/15/96	2180.0000	J	UG/L	6434	VAL
039-G-W012-04	039GW01204	Water	10/16/96	2230.0000	J	UG/L	6434	VAL
GDA-G-W02D-02	GDAGW02D02	Water	04/25/96	2310.0000		UG/L	L6916W	VAL
GDA-H-W02D-02	GDAHW02D02	Water	04/25/96	2380.0000		UG/L	L6914W	VAL
GDA-H-W02D-03	GDAHW02D03	Water	06/24/96	2430.0000		UG/L	L7309M	VAL
GDA-G-W02D-03	GDAGW02D03	Water	06/24/96	2480.0000		UG/L	L7310	VAL
GDA-G-W02D-04	GDAGW02D04	Water	10/17/96	2660.0000	J	UG/L	6468	VAL
GDA-H-W02D-04	GDAHW02D04	Water	10/17/96	2720.0000	J	UG/L	6468	VAL
002-G-W002-03	02GW00203	Water	06/19/96	3000.0000		UG/L	L7276M	VAL
002-G-W002-02	002GW00202	Water	04/23/96	3350.0000		UG/L	L6891W	VAL
002-G-W002-04	002GW00204	Water	10/04/96	3410.0000		UG/L	6382	VAL

*** End of Report ***

Rounds 2, 3, 4

CHARLESTON - ZONE A
Subsurface Soil Grid Samples
Metals

SW846-META															
	SAMPLE ID ------->	GDA-S-B001-02		GDA-S-B002-02		GDA-S-B003-02		GDA-C-B003-02		GDA-S-B005-02		GDA-S-B006-02	
	ORIGINAL ID ----->	GDASB00102		GDASB00202		GDASB00302		GDACB00302		GDASB00502		GDASB00602	
	LAB SAMPLE ID --->	L5545-24		L5545-30		L5545-28		L5542-1		L5563-99		L5563-101	
	ID FROM REPORT -->	GDASB00102		GDASB00202		GDASB00302		GDACB00302		GDASB00502		GDASB00602	
	SAMPLE DATE ----->	10/05/95		10/05/95		10/05/95		10/05/95		10/09/95		10/09/95	
	DATE EXTRACTED -->	10/14/95		10/14/95		10/14/95		10/14/95		10/16/95		10/16/95	
	DATE ANALYZED --->	10/21/95		10/21/95		10/21/95		10/21/95		10/25/95		10/25/95	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A
CAS #	Parameter	L5545S	VAL	L5545S	VAL	L5545S	VAL	L5542S	VAL	L5563S	VAL	L5563S	VAL
429-90-5	Aluminum (Al)	8180.		7750.		11700.		12900.		5780.		9430.	
7440-36-0	Antimony (Sb)	14.5	U	11.7	U	12.6	U	12.3	U	15.2	U	12.3	U
7440-38-2	Arsenic (As)	6.9		1.1	J	4.		3.3		5.6		3.3	
7440-39-3	Barium (Ba)	16.2	J	20.2	J	13.1	J	13.8	J	10.9	J	22.6	J
7440-41-7	Beryllium (Be)	0.28	U	0.23	U	0.25	U	0.24	U	0.3	U	0.24	U
7440-43-9	Cadmium (Cd)	1.4	U	1.2	U	1.2	U	1.2	U	1.5	U	1.2	U
7440-70-2	Calcium (Ca)	166000.		1090.	J	2740.		1740.		262000.	J	837.	J
7440-47-3	Chromium (Cr)	36.3		7.4		13.4		12.9		55.4	J	13.3	J
7440-48-4	Cobalt (Co)	1.7	U	1.4	U	1.5	U	1.6	J	1.8	U	1.4	U
7440-50-8	Copper (Cu)	8.8		2.3	J	2.7	J	1.9	J	11.2		3.2	J
7439-89-6	Iron (Fe)	8170.		2610.		9870.		9390.		5180.	J	8550.	J
7439-92-1	Lead (Pb)	4.2		4.3		5.6		8.3		2.8		12.2	
7439-95-4	Magnesium (Mg)	4270.		269.	J	356.	J	360.	J	10200.	J	474.	J
7439-96-5	Manganese (Mn)	30.3		10.4		12.1		11.2		40.7	J	15.7	J
7439-97-6	Mercury (Hg)	0.15	U	0.12	U	0.12	U	0.12	U	0.15	UJ	0.12	UJ
7440-02-0	Nickel (Ni)	15.1		3.4	J	3.5	U	3.4	U	28.5		3.4	U
7440-09-7	Potassium (K)	566.	J	120.	UJ	248.	J	322.	J	1100.	J	279.	J
7782-49-2	Selenium (Se)	2.6		0.71	U	0.83	J	0.72	U	0.95	J	0.77	J
7440-22-4	Silver (Ag)	0.85	U	1.	J	0.74	U	0.72	U	0.89	U	0.72	U
40-23-5	Sodium (Na)	823.	J	259.	J	261.	J	238.	J	1550.		248.	J
7440-28-0	Thallium (Tl)	1.2	U	0.95	U	0.97	U	0.97	U	1.2	U	0.93	U
7440-62-2	Vanadium (V)	24.		9.3	J	18.7		21.3		33.4		18.6	
7440-66-6	Zinc (Zn)	39.1		6.		9.2		8.2		60.7		14.7	
7440-31-5	Tin (Sn)	10.5	U	8.5	U	9.1	U	8.9	U	11.	U	8.9	U

*** Validation Complete ***

CHARLESTON - ZONE A
Subsurface Soil Grid Samples
Metals

SW846-META													
	SAMPLE ID ------->	GDA-S-B007-02		GDA-S-B008-02		GDA-S-B009-02		GDA-S-B011-02		GDA-S-B012-02		GDA-S-B013-02	
	ORIGINAL ID ----->	GDASB00702		GDASB00802		GDASB00902		GDASB01102		GDASB01202		GDASB01302	
	LAB SAMPLE ID --->	L5563-97		L5563-103		L5563-105		L5563-115		L5563-109		L5563-119	
	ID FROM REPORT -->	GDASB00702		GDASB00802		GDASB00902		GDASB01102		GDASB01202		GDASB01302	
	SAMPLE DATE ----->	10/09/95		10/09/95		10/09/95		10/09/95		10/09/95		10/09/95	
	DATE EXTRACTED -->	10/16/95		10/16/95		10/16/95		10/17/95		10/16/95		10/17/95	
	DATE ANALYZED --->	10/25/95		10/25/95		10/25/95		10/25/95		10/25/95		10/25/95	
	MATRIX ---------->	Soil		Soil		Soil		Soil		Soil		Soil	
	UNITS ---------->	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A	MG/KG	A
CAS #	Parameter	L5563S	VAL	L5563S	VAL	L5563S	VAL	L5563S	VAL	L5563S	VAL	L5563S	VAL
429-90-5	Aluminum (Al)	11000.		3850.		14200.		7570.		17500.		4630.	
7440-36-0	Antimony (Sb)	12.2	U	11.9	U	13.	U	15.4	U	12.8	U	12.4	U
7440-38-2	Arsenic (As)	4.1		1.6	J	6.2		5.5		6.		0.94	U
7440-39-3	Barium (Ba)	15.4	J	5.7	J	13.	J	13.8	J	24.5	J	10.7	J
7440-41-7	Beryllium (Be)	0.24	U	0.23	U	0.25	U	0.3	U	0.25	U	0.24	U
7440-43-9	Cadmium (Cd)	1.2	U	1.2	U	1.3	U	1.5	U	1.3	U	1.2	U
7440-70-2	Calcium (Ca)	1010.	J	3500.	J	491.	J	233000.	J	4580.	J	2630.	J
7440-47-3	Chromium (Cr)	13.8	J	6.3	J	31.8	J	63.4	J	41.6	J	7.6	J
7440-48-4	Cobalt (Co)	1.4	U	1.6	J	1.5	U	1.8	U	1.5	U	1.5	U
7440-50-8	Copper (Cu)	2.7	J	1.1	J	2.9	J	12.9		4.1	J	2.1	J
7439-89-6	Iron (Fe)	7810.	J	2550.	J	20900.	J	7180.	J	37400.	J	2560.	J
7439-92-1	Lead (Pb)	8.5		2.6		13.8		2.4		9.6		8.5	
7439-95-4	Magnesium (Mg)	307.	J	438.	J	1380.	J	9520.	J	1300.	J	245.	J
7439-96-5	Manganese (Mn)	7.5	J	16.5	J	21.7	J	38.9	J	21.2	J	11.1	J
7439-97-6	Mercury (Hg)	0.12	UJ	0.12	UJ	0.13	UJ	0.15	UJ	0.13	UJ	0.12	UJ
7440-02-0	Nickel (Ni)	3.3	U	3.8	J	3.6	U	35.		4.5	J	3.6	J
7440-09-7	Potassium (K)	291.	J	121.	U	804.	J	1470.	J	593.	J	126.	U
7782-49-2	Selenium (Se)	1.1	J	0.86	J	0.76	U	1.3	J	1.2	J	0.71	UJ
7440-22-4	Silver (Ag)	0.72	U	0.7	U	0.76	U	0.91	U	0.75	U	0.73	U
440-23-5	Sodium (Na)	256.	J	205.	J	1460.		1220.	J	259.	J	195.	J
7440-28-0	Thallium (Tl)	0.94	U	0.93	U	1.	U	1.2	U	1.	U	0.94	U
7440-62-2	Vanadium (V)	22.9		5.6	J	41.4		35.		48.8		5.5	J
7440-66-6	Zinc (Zn)	8.		12.9		16.6		65.6		15.5		31.3	
7440-31-5	Tin (Sn)	8.9	U	8.6	U	9.4	U	11.2	U	9.3	U	9.2	J

*** Validation Complete ***

CHARLESTON - ZONE A
Subsurface Soil Grid Samples
Metals

SW846-META

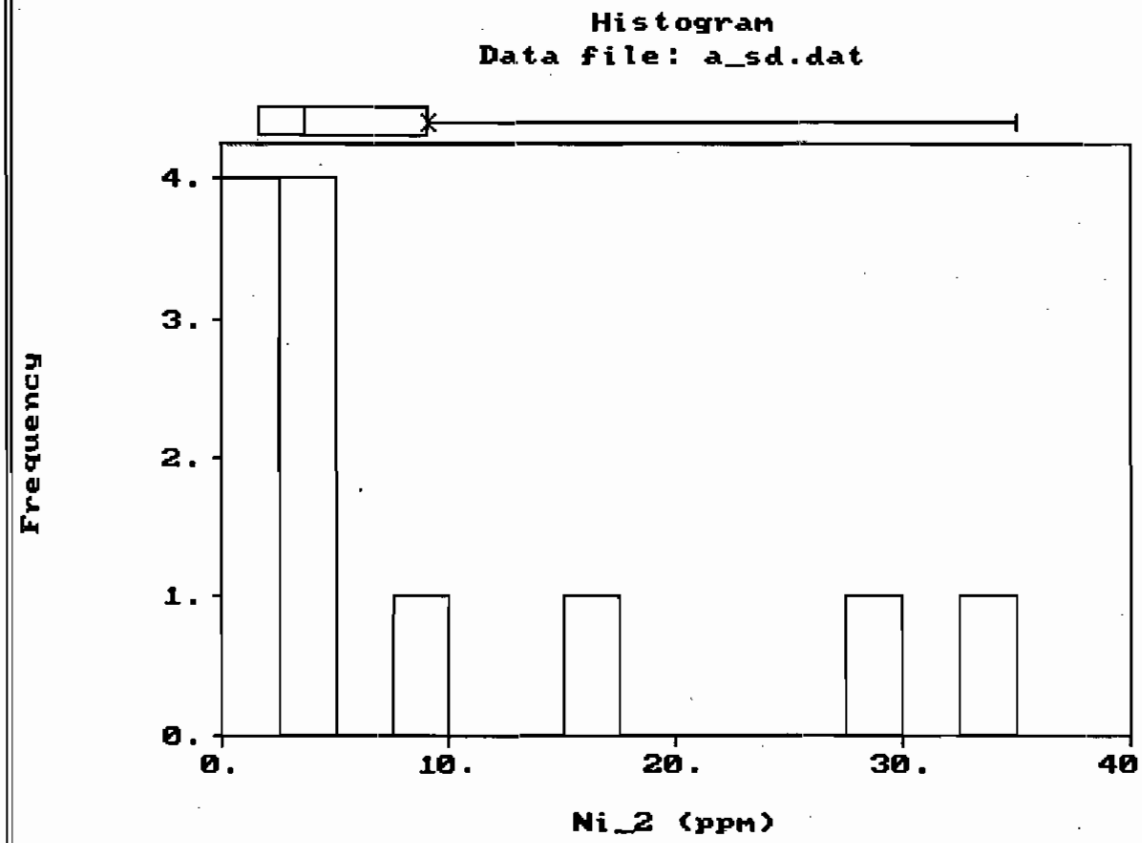
SAMPLE ID ------->	GDA-S-B014-02
ORIGINAL ID ----->	GDASB01402
LAB SAMPLE ID --->	L5586-32
ID FROM REPORT -->	GDASB01402
SAMPLE DATE ----->	10/11/95
DATE EXTRACTED -->	10/21/95
DATE ANALYZED --->	10/27/95
MATRIX ---------->	Soil
UNITS ---------->	MG/KG A

CAS #	Parameter	L5586S	VAL
7429-90-5	Aluminum (Al)	7400.	
7440-36-0	Antimony (Sb)	11.7	U
7440-38-2	Arsenic (As)	2.4	
7440-39-3	Barium (Ba)	31.	J
7440-41-7	Beryllium (Be)	0.23	U
7440-43-9	Cadmium (Cd)	1.1	U
7440-70-2	Calcium (Ca)	31700.	
7440-47-3	Chromium (Cr)	12.6	
7440-48-4	Cobalt (Co)	1.7	J
7440-50-8	Copper (Cu)	9.2	
7439-89-6	Iron (Fe)	9060.	J
7439-92-1	Lead (Pb)	25.6	
7439-95-4	Magnesium (Mg)	859.	J
7439-96-5	Manganese (Mn)	91.	
7439-97-6	Mercury (Hg)	0.11	U
7440-02-0	Nickel (Ni)	9.1	
7440-09-7	Potassium (K)	312.	J
7782-49-2	Selenium (Se)	0.75	J
7440-22-4	Silver (Ag)	0.69	U
7440-23-5	Sodium (Na)	353.	J
7440-28-0	Thallium (Tl)	0.91	U
7440-62-2	Vanadium (V)	10.9	J
7440-66-6	Zinc (Zn)	27.1	
7440-31-5	Tin (Sn)	8.5	U

*** Validation Complete ***

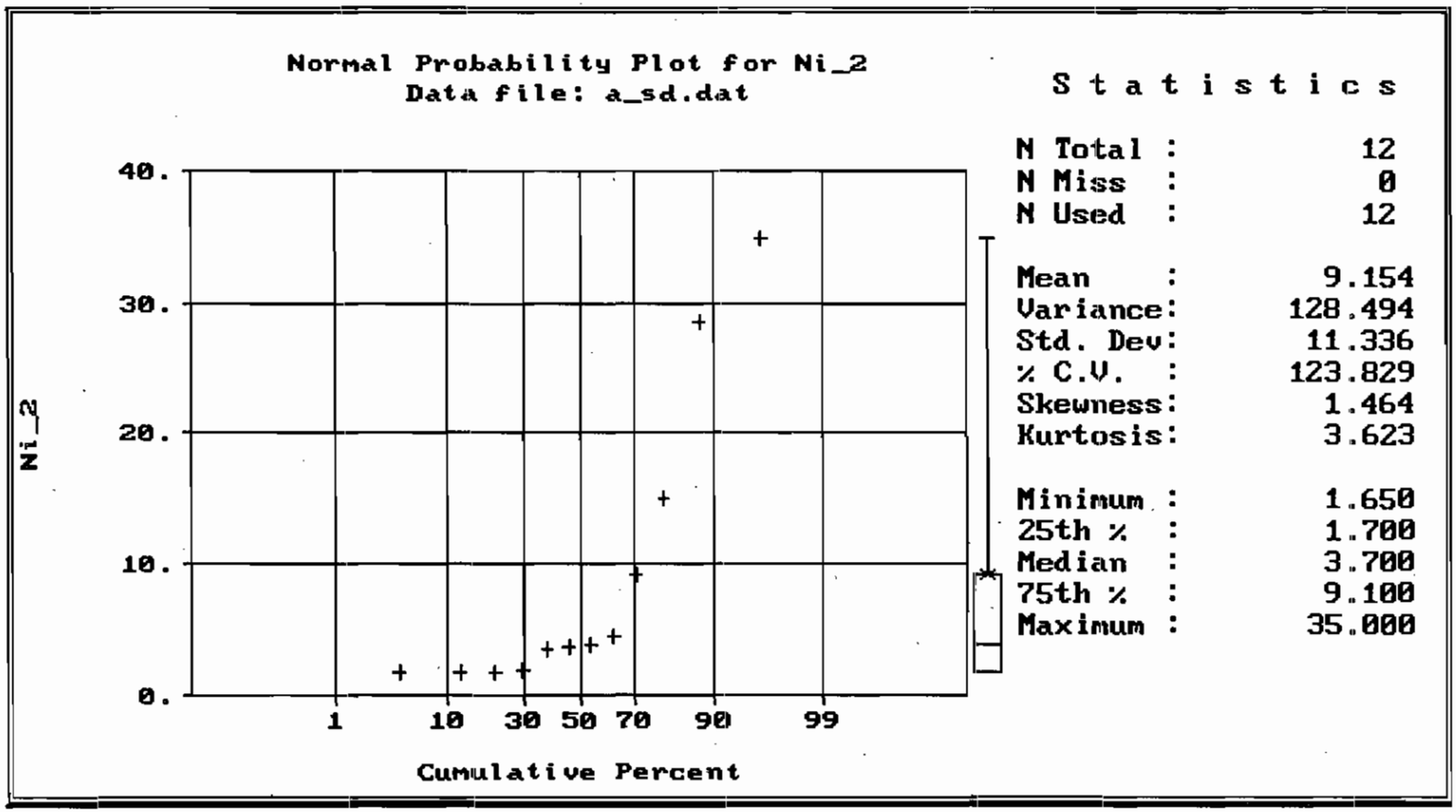
Zone A
Nickel in subsurface soil grid samples
Original dataset (N = 12)
Original values

1a



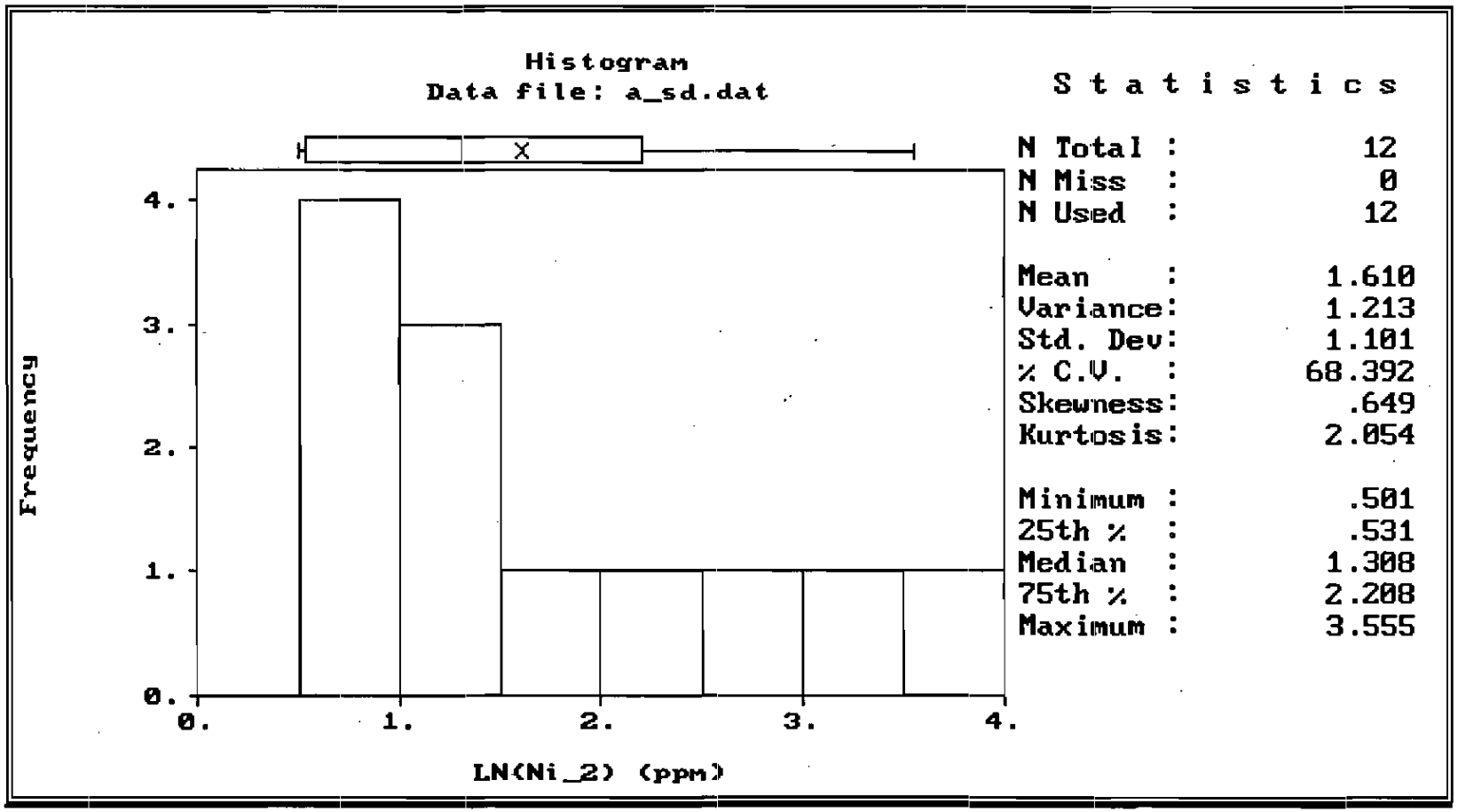
Statistics

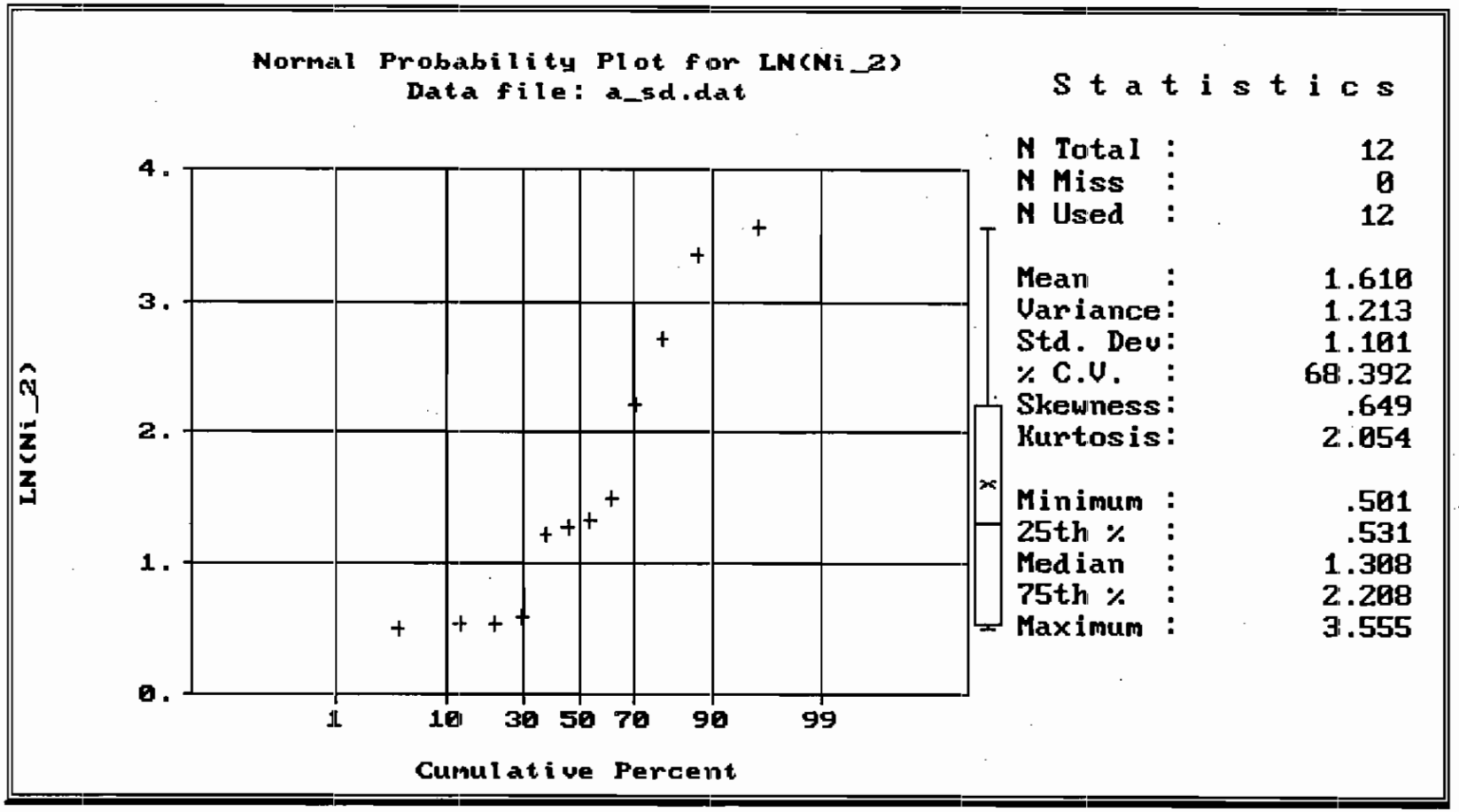
N Total :	12
N Miss :	0
N Used :	12
Mean :	9.154
Variance:	128.494
Std. Dev:	11.336
% C.V. :	123.829
Skewness:	1.464
Kurtosis:	3.623
Minimum :	1.650
25th % :	1.700
Median :	3.700
75th % :	9.100
Maximum :	35.000


Normal Probability Plot for Ni_2
Data file: a_sd.dat
Ni_2
40.
30.
20.
10.
0.
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 12
N Miss : 0
N Used : 12
Mean : 9.154
Variance: 128.494
Std. Dev: 11.336
% C.V. : 123.829
Skewness: 1.464
Kurtosis: 3.623
Minimum : 1.650
25th % : 1.700
Median : 3.700
75th % : 9.100
Maximum : 35.000

Zone A
Nickel in subsurface soil grid samples
Original dataset (N = 12)
LN-transformed values

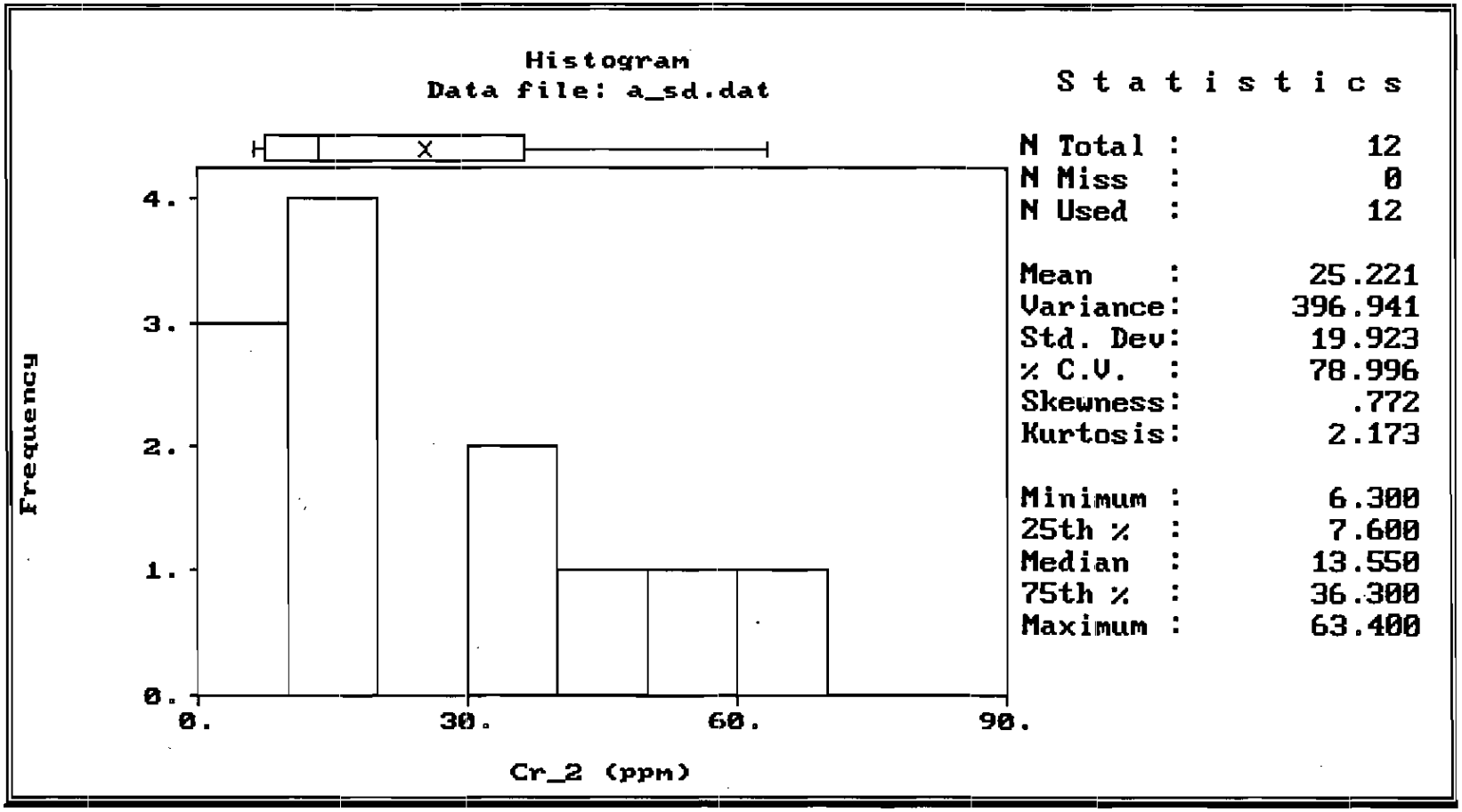
2a



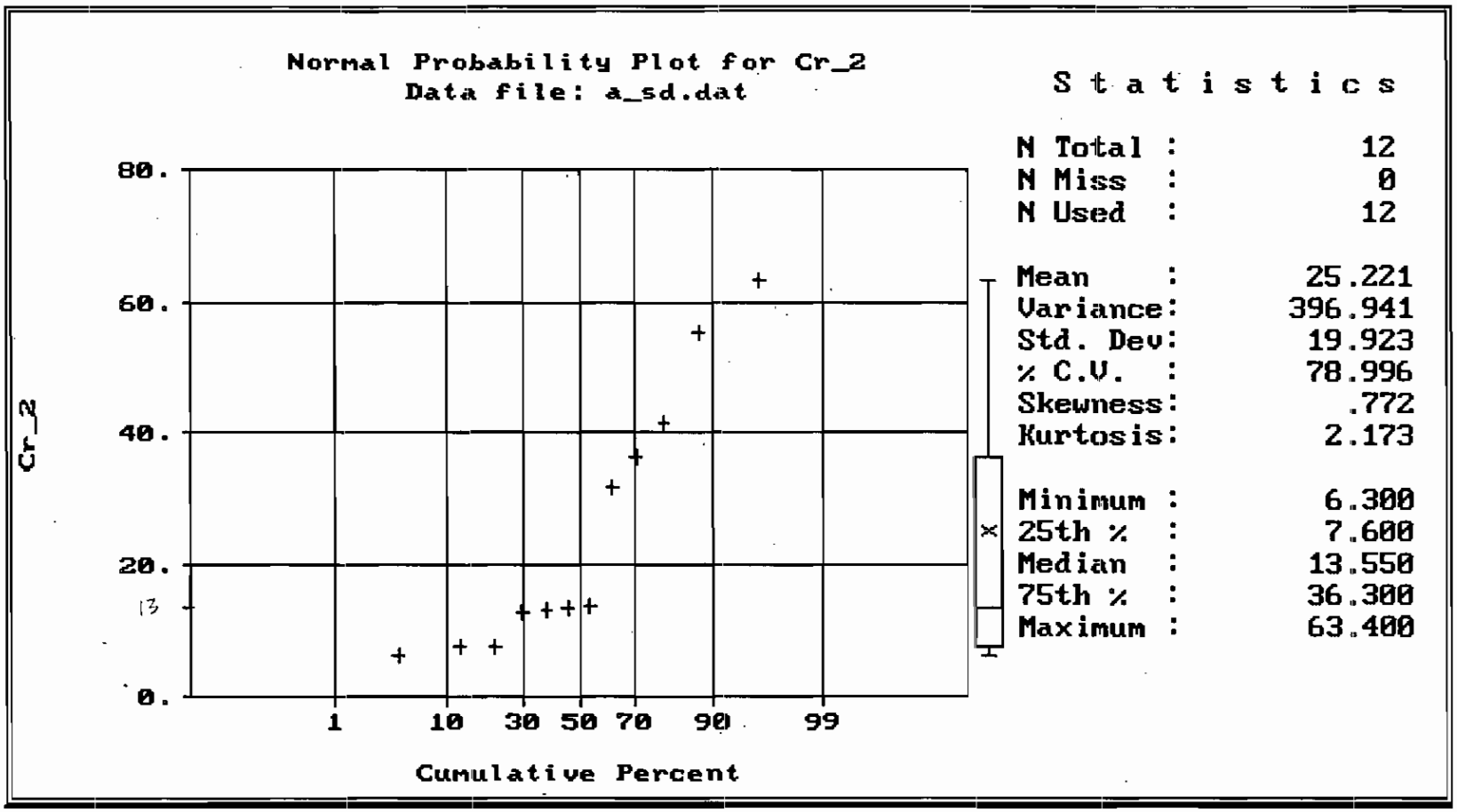

Normal Probability Plot for LN(Ni_2)
Data file: a_sd.dat
LN(Ni_2)
4.
3.
2.
1.
0.
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 12
N Miss : 0
N Used : 12
Mean : 1.610
Variance: 1.213
Std. Dev: 1.101
% C.V. : 68.392
Skewness: .649
Kurtosis: 2.054
Minimum : .501
25th % : .531
Median : 1.308
75th % : 2.208
Maximum : 3.555

Zone A
Chromium in subsurface soil grid samples
Original dataset (N=12)
Original values

1a

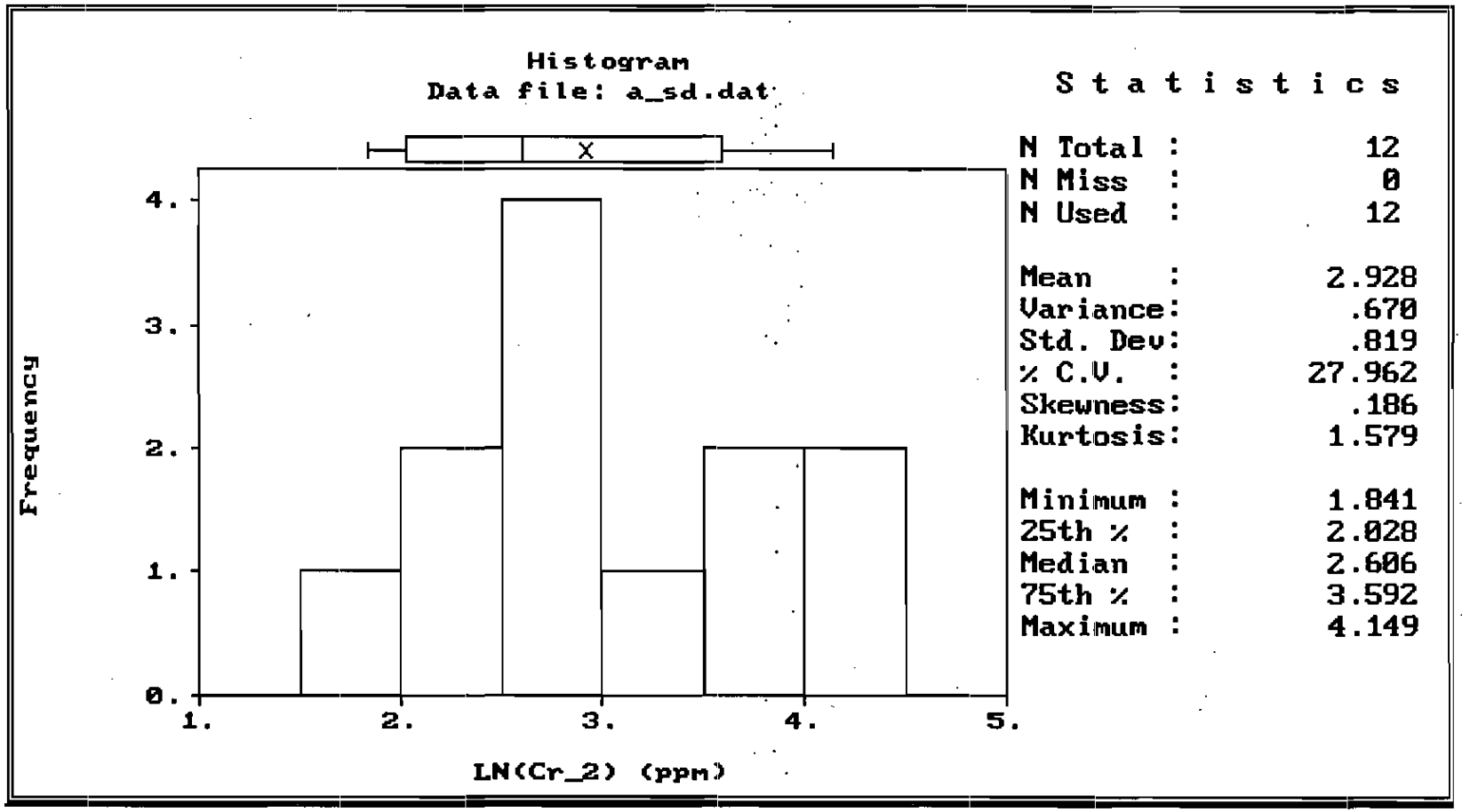


16

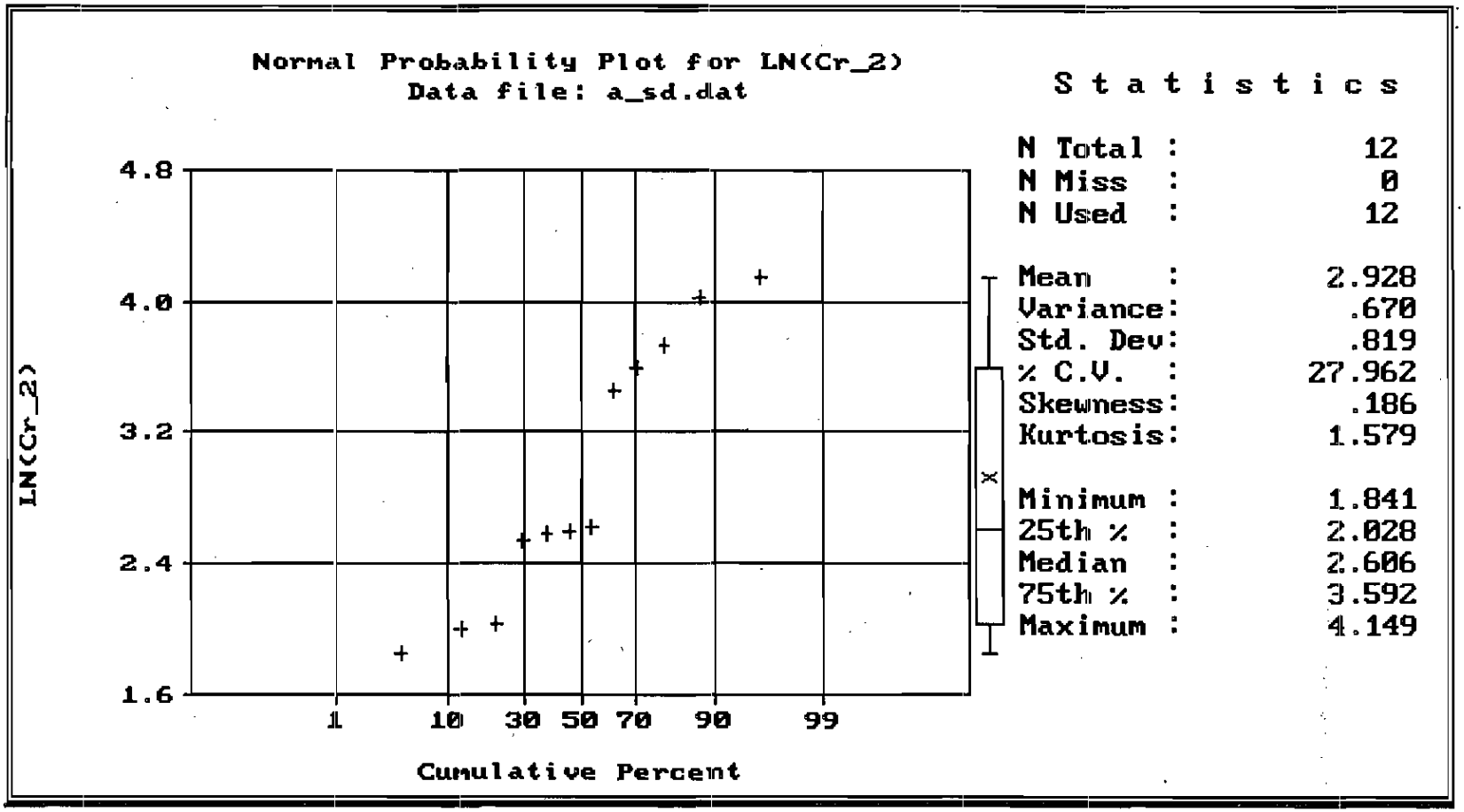

Normal Probability Plot for Cr_2
Data file: a_sd.dat
Cr_2
80.
60.
40.
20.
13
0.
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 12
N Miss : 0
N Used : 12
Mean : 25.221
Variance: 396.941
Std. Dev: 19.923
% C.V. : 78.996
Skewness: .772
Kurtosis: 2.173
Minimum : 6.300
25th % : 7.600
Median : 13.550
75th % : 36.300
Maximum : 63.400

Zone A
Chromium in subsurface soil grid samples
Original dataset (N=12)
LN-transformed values

2a



2b


Normal Probability Plot for LN(Cr_2)
Data file: a_sd.dat
LN(Cr_2)
4.8
4.0
3.2
2.4
1.6
1
10
30
50
70
90
99
Cumulative Percent
Statistics
N Total : 12
N Miss : 0
N Used : 12
Mean : 2.928
Variance: .670
Std. Dev: .819
% C.V. : 27.962
Skewness: .186
Kurtosis: 1.579
Minimum : 1.841
25th % : 2.028
Median : 2.606
75th % : 3.592
Maximum : 4.149

E N V I R O N M E N T A L S A F E T Y & D E S I G N S

2901-00002 - CHARLESTON ZONE A - QUARTERLY GW

Samples by Chemical Report

18540-29-9 - Chromium (Hexavalent)

>= 0.0000 for All Concentration Units

Sample ID	Ext. Orig. ID	Type	Date	Result	VQual	Units	SDG #	
039-G-W001-02	039GW00102	Water	04/23/96	0.0030	U	MG/L	L6891I	VAL
039-G-W001-03	039GW00103	Water	06/20/96	0.0030	U	MG/L	L7287I	VAL
039-G-W002-02	039GW00202	Water	04/23/96	0.0030	U	MG/L	L6891I	VAL
039-G-W002-03	039GW00203	Water	06/20/96	0.0030	U	MG/L	L7287I	VAL
039-G-W003-02	039GW00302	Water	04/24/96	0.0080	J	MG/L	L6904I	VAL
039-H-W003-02	039HW00302	Water	04/24/96	0.0120	J	MG/L	L6904I	VAL
039-G-W003-03	039GW00303	Water	06/20/96	0.0030	U	MG/L	L7287I	VAL
039-H-W003-03	039HW00303	Water	06/20/96	0.0030	U	MG/L	L7288I	VAL
039-G-W004-02	039GW00402	Water	04/24/96	0.0030	U	MG/L	L6904I	VAL
039-G-W004-03	039GW00403	Water	06/21/96	0.0030	U	MG/L	L7294I	VAL
039-G-W005-02	039GW00502	Water	04/24/96	0.0030	U	MG/L	L6904I	VAL
039-G-W005-03	039GW00503	Water	06/21/96	0.0030	U	MG/L	L7294I	VAL
039-G-W04D-02	039GW04D02	Water	04/25/96	0.0030	U	MG/L	L6916I	VAL
039-G-W04D-03	039GW04D03	Water	06/21/96	0.0030	U	MG/L	L7294I	VAL
GDA-G-W001-03	GDAGW00103	Water	06/24/96	0.0030	U	MG/L	L7310I	VAL
GDA-G-W001-04	GDAGW00104	Water	10/15/96	0.0200	U	MG/L	6434	VAL
GDA-G-W002-03	GDAGW00203	Water	06/24/96	0.0030	U	MG/L	L7310I	VAL
GDA-G-W002-04	GDAGW00204	Water	10/17/96	0.0200	U	MG/L	6414	VAL
GDA-G-W003-03	GDAGW00303	Water	06/25/96	0.0030	U	MG/L	L7317I	VAL
GDA-G-W003-04	GDAGW00304	Water	10/16/96	0.0200	U	MG/L	6434	VAL
GDA-G-W01D-03	GDAGW01D03	Water	06/24/96	0.0030	U	MG/L	L7310I	VAL
GDA-G-W01D-04	GDAGW01D04	Water	10/15/96	0.0200	U	MG/L	6434	VAL
GDA-H-W02D-02	GDAHW02D02	Water	04/25/96	0.0040	J	MG/L	L6914I	VAL
GDA-G-W02D-03	GDAGW02D03	Water	06/24/96	0.0030	U	MG/L	L7310I	VAL
GDA-H-W02D-03	GDAHW02D03	Water	06/24/96	0.0030	U	MG/L	L7309I	VAL
GDA-G-W02D-04	GDAGW02D04	Water	10/17/96	0.0200	U	MG/L	6468	VAL
GDA-H-W02D-04	GDAHW02D04	Water	10/17/96	0.0200	U	MG/L	6468	VAL
GDA-G-W03D-03	GDAGW03D03	Water	06/25/96	0.0030	U	MG/L	L7317I	VAL
GDA-G-W03D-04	GDAGW03D04	Water	10/16/96	0.0200	U	MG/L	6434	VAL

*** End of Report ***