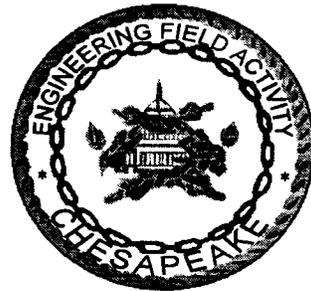


N00174.AR.001121  
NSWC INDIAN HEAD  
5090.3a

RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION/  
CERTIFICATION INVESTIGATION REPORT STUMP NECK ANNEX VOLUME 3 OF 4  
APPENDICES O - P NSWC INDIAN HEAD MD  
1/1/1998  
BROWN AND ROOT ENVIRONMENTAL

**RCRA Facility Investigation/  
Verification Investigation Report**  
for  
**Stump Neck Annex  
Indian Head Division  
Naval Surface Warfare Center**  
Indian Head, Maryland

Volume III of IV - Appendices I - N



**Engineering Field Activity Chesapeake  
Naval Facilities Engineering Command**  
Northern Division Contract Number N62472-90-D-1298

**Contract Task Order 0287**

January 1998



**Brown & Root Environmental**

A Division of Halliburton NUS Corporation

## **APPENDICES**

- A Soil Gas Survey Results
- B Field Test Kits Literature
- C Field Test Kits Results
- D Surface Soil Sample Log Sheets
- E Subsurface Soil Sample Log Sheets
- F Groundwater Sample Log Sheets
- G Surface Water/Sediment Sample Log Sheets
- H Boring Log Sheets
- I Monitoring Well Construction/Development Sheets/Groundwater Level Data
- J Standard Operating Procedures
- K Land Survey Data
- L Chains-of-Custody
- M Analytical Database
- N Data Validation Memoranda
- O Statistical Analysis of Environmental Data
- P Supporting Information for Human Health Risk Assessment

**APPENDIX I**  
**MONITORING WELL CONSTRUCTION AND DEVELOPMENT DATA**

**I.1 STATE WELL COMPLETION REPORTS AND MONITORING WELL  
CONSTRUCTION SHEETS**

**I.2 MONITORING WELL DEVELOPMENT SHEETS**

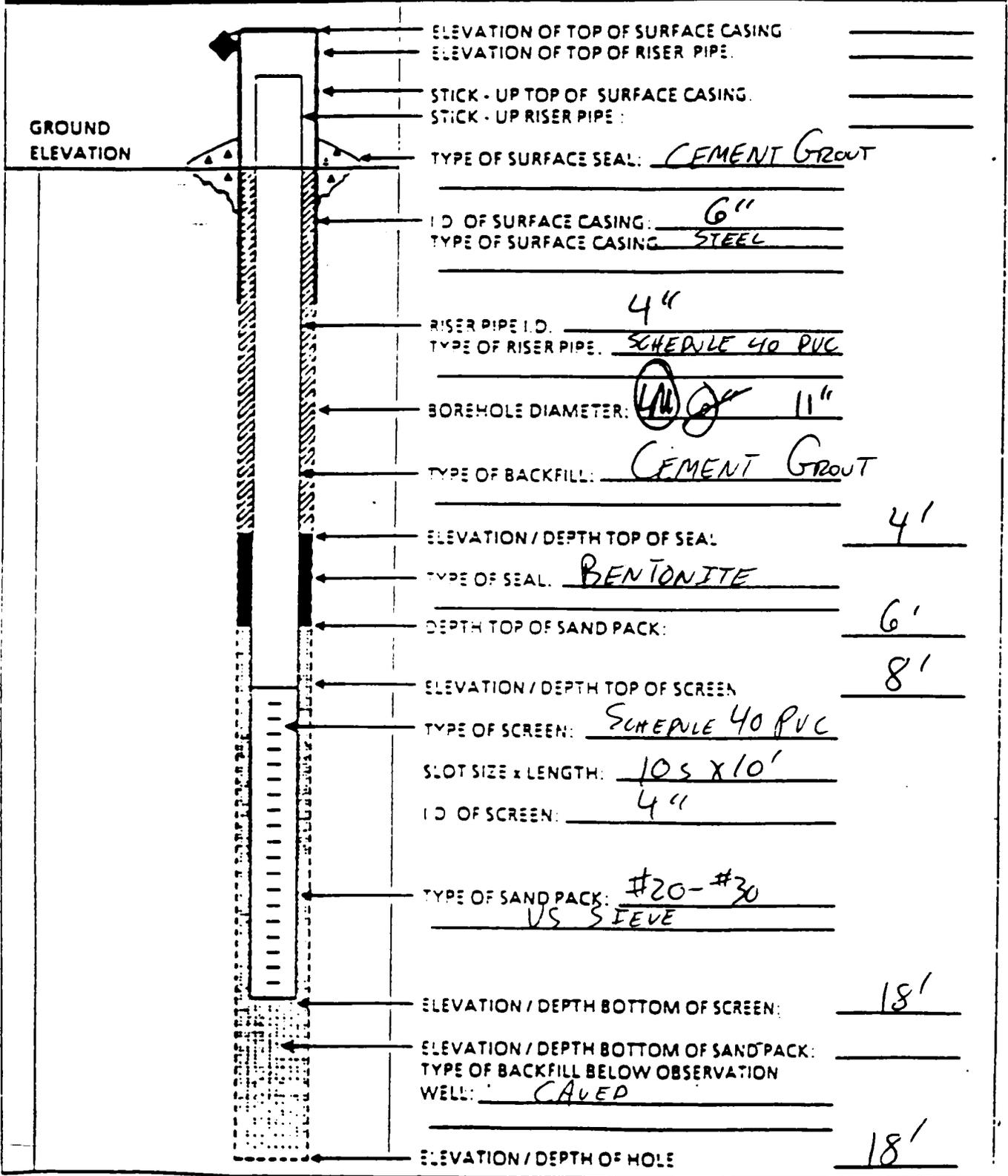
**I.1 STATE WELL COMPLETION REPORTS AND MONITORING WELL  
CONSTRUCTION SHEETS**

**SWMU 5 RANGE 6**



# MONITORING WELL SHEET

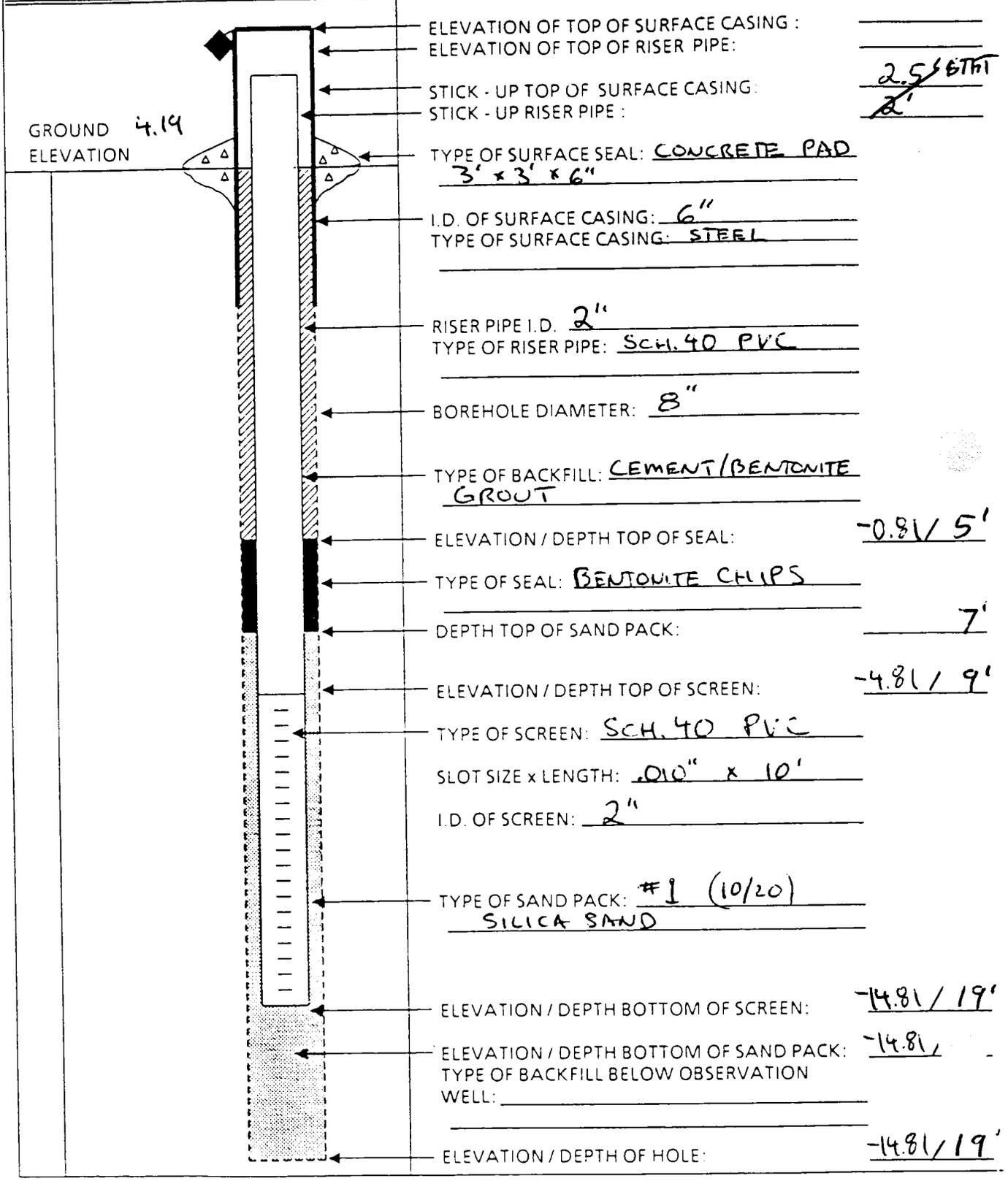
PROJECT <u>INDIAN HEAD</u>	LOCATION <u>RANGE 6</u>	DRILLER <u>TLB Assoc. INC</u>
PROJECT NO. <u>5290</u>	BORING <u>S05-MW01</u>	DRILLING METHOD <u>HSA</u>
ELEVATION _____	DATE <u>9/20/95</u>	DEVELOPMENT METHOD <u>BAILER</u>
FIELD GEOLOGIST <u>MARSHALL YOST</u>		





# OVERBURDEN MONITORING WELL SHEET

PROJECT <u>STUMP NECK RI/VI</u> PROJECT NO. <u>7581</u> ELEVATION _____ FIELD GEOLOGIST <u>FLW RAMSER</u>	LOCATION <u>PAVLE G</u> BORING <u>RNG6MW02</u> DATE <u>7-10-97</u>	DRILLER <u>DAVE TAYL</u> DRILLING METHOD <u>4 1/4 HSA</u> DEVELOPMENT METHOD <u>SURGE BIT + PUMP</u>
--	--	--



GROUND ELEVATION 4.19

- ELEVATION OF TOP OF SURFACE CASING : \_\_\_\_\_
- ELEVATION OF TOP OF RISER PIPE : \_\_\_\_\_
- STICK - UP TOP OF SURFACE CASING : \_\_\_\_\_
- STICK - UP RISER PIPE : 2.5' 6TH  
2'
- TYPE OF SURFACE SEAL: CONCRETE PAD  
3' x 3' x 6"
- I.D. OF SURFACE CASING: 6"
- TYPE OF SURFACE CASING: STEEL
- RISER PIPE I.D. 2"
- TYPE OF RISER PIPE: SCH. 40 PVC
- BOREHOLE DIAMETER: 8"
- TYPE OF BACKFILL: CEMENT/BENTONITE GROUT
- ELEVATION / DEPTH TOP OF SEAL: -0.81 / 5'
- TYPE OF SEAL: BENTONITE CHIPS
- DEPTH TOP OF SAND PACK: 7'
- ELEVATION / DEPTH TOP OF SCREEN: -4.81 / 9'
- TYPE OF SCREEN: SCH. 40 PVC
- SLOT SIZE x LENGTH: .010" x 10'
- I.D. OF SCREEN: 2"
- TYPE OF SAND PACK: #1 (10/20)  
SILICA SAND
- ELEVATION / DEPTH BOTTOM OF SCREEN: -14.81 / 19'
- ELEVATION / DEPTH BOTTOM OF SAND PACK: -14.81
- TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_
- ELEVATION / DEPTH OF HOLE: -14.81 / 19'

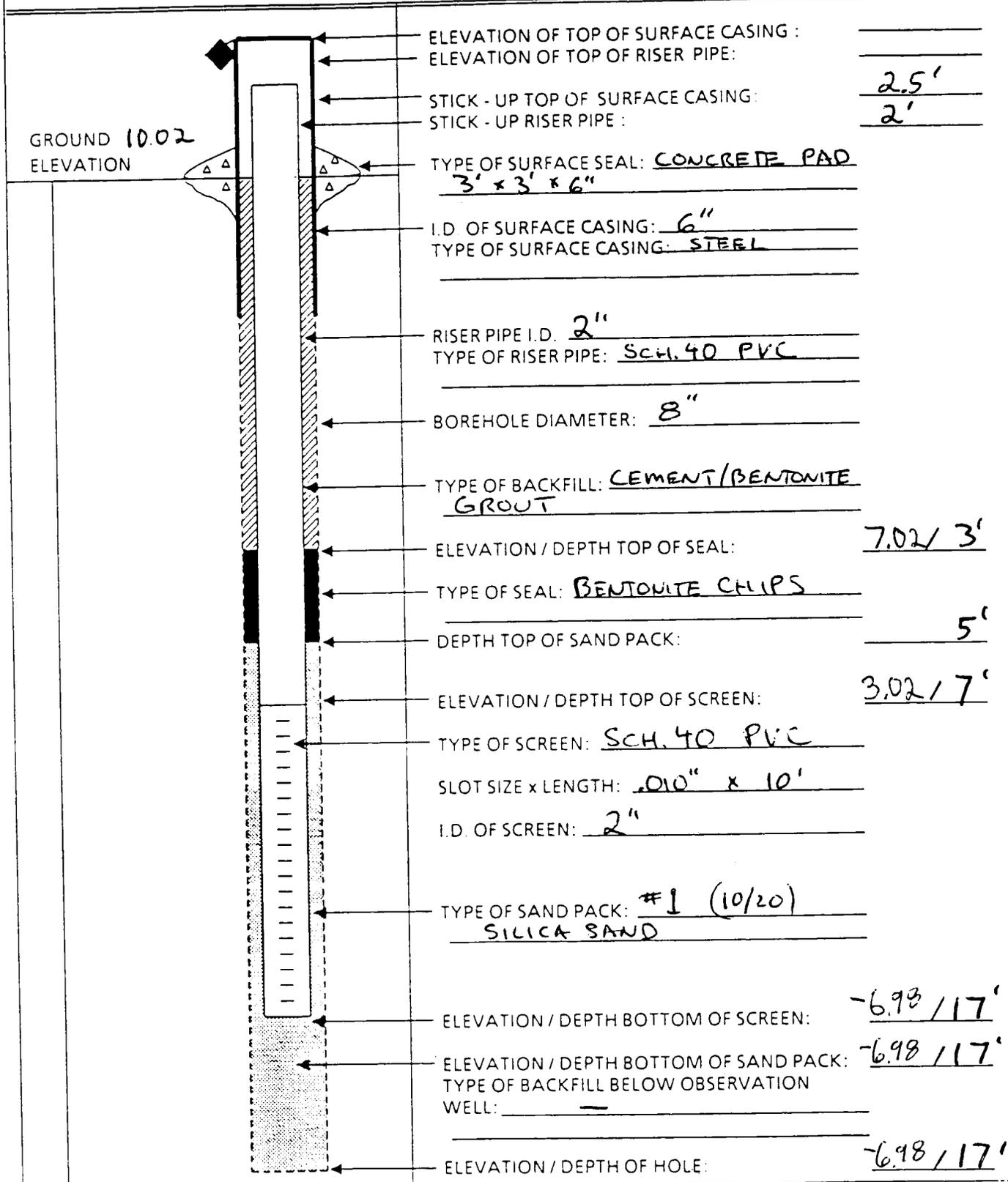


# OVERBURDEN MONITORING WELL SHEET

PROJECT STUMP NECK RI/VI  
 PROJECT NO. 7581  
 ELEVATION \_\_\_\_\_  
 FIELD GEOLOGIST F.W. RIMSER

LOCATION RANGE 6  
 BORING RNG6MW03  
 DATE 7-10-97

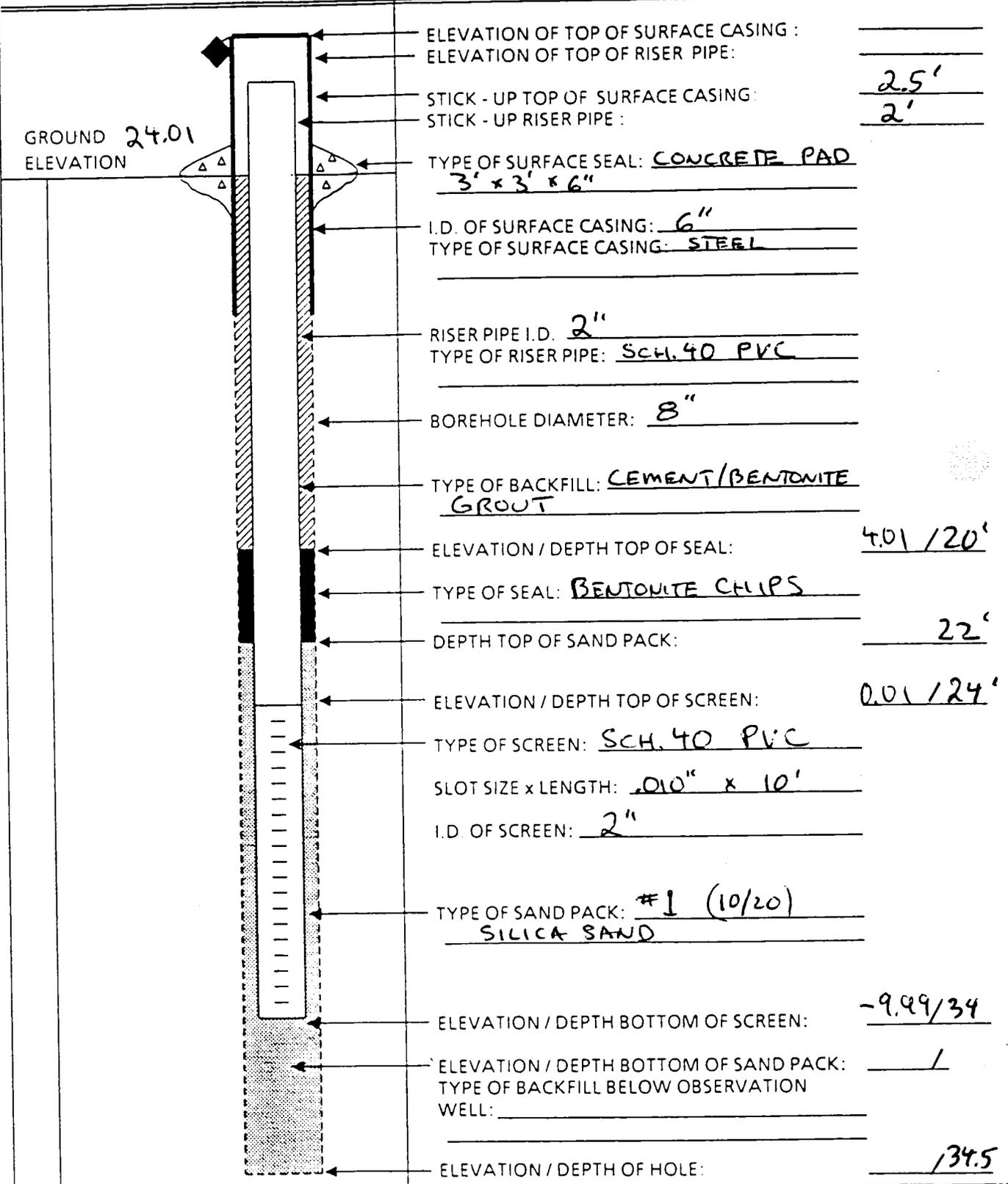
DRILLER DAVE TAYLOR  
 DRILLING METHOD 4 1/4 HSA  
 DEVELOPMENT METHOD SURGE BLE + PUMP





# OVERBURDEN MONITORING WELL SHEET

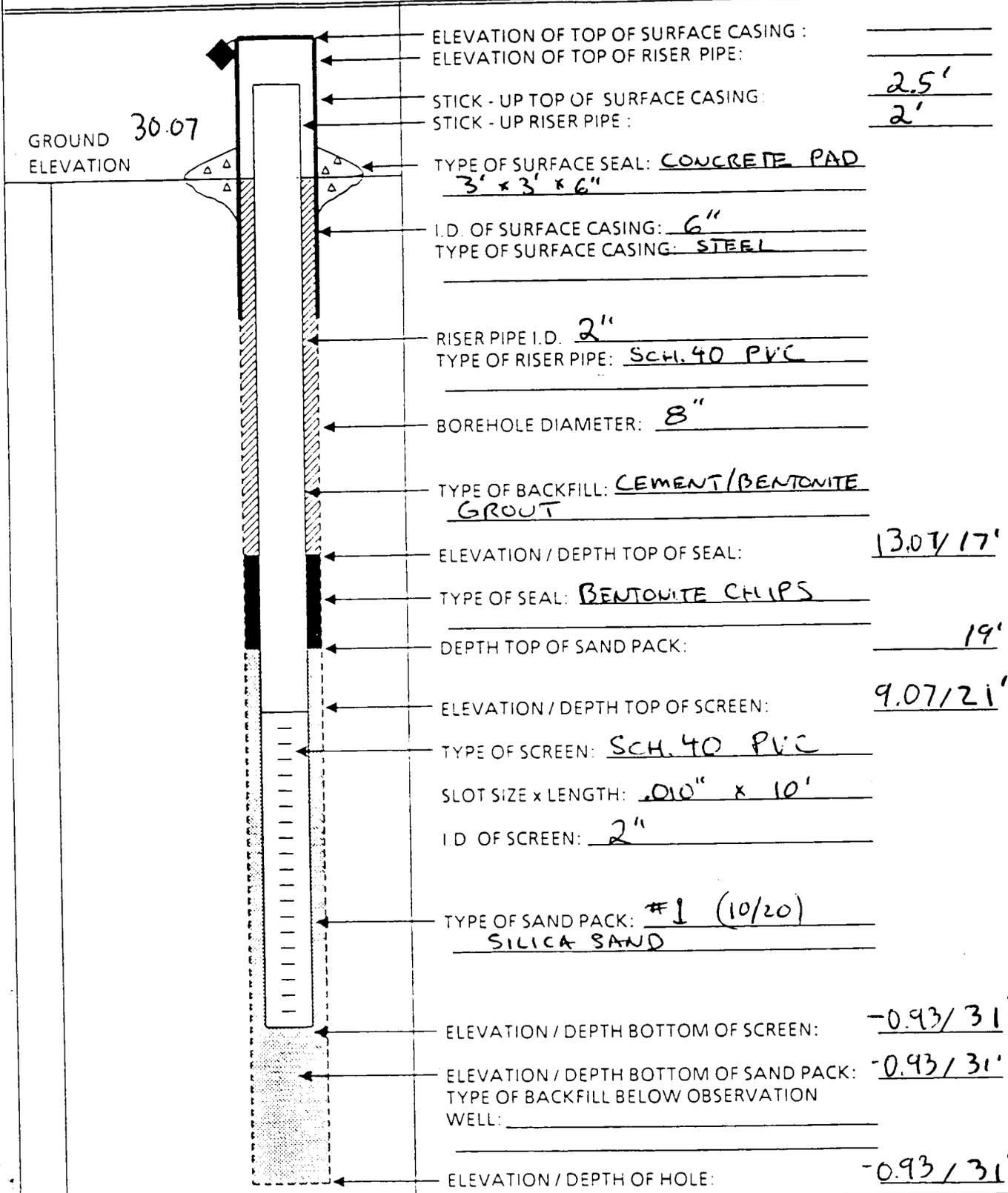
PROJECT <u>STUMP NECK RI/VI</u>	LOCATION <u>RANGE 6</u>	DRILLER <u>D. TAYLOR</u>
PROJECT NO. <u>7581</u>	BORING <u>BN6RW04</u>	DRILLING METHOD <u>4 1/4 HSA</u>
ELEVATION _____	DATE <u>7-9-97</u>	DEVELOPMENT METHOD <u>SURFACE BLK + PUMP</u>
FIELD GEOLOGIST <u>FRED W RAMSER</u>		





# OVERBURDEN MONITORING WELL SHEET

PROJECT <u>STUMP NECK RI/VI</u>	LOCATION <u>RANGE 6</u>	DRILLER <u>M. CORRON</u>
PROJECT NO. <u>7581</u>	BORING <u>RNL MW05</u>	DRILLING METHOD <u>4 1/4 HSA</u>
ELEVATION _____	DATE <u>7-10-97</u>	DEVELOPMENT METHOD _____
FIELD GEOLOGIST <u>F. WUDKOWYCH</u>		



C1 3224

SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER 97-326-W(M)

1 2 3 6 (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

FILL IN THIS FORM COMPLETELY PLEASE PRINT OR TYPE

ST/CO USE ONLY DATE Received MM DD YY 8 13

DATE WELL COMPLETED MM DD YY 07 10 97

Depth of Well 22 19 26 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CH 94 28 29 30 31 32 33

OWNER Naval Surface Warfare Center 6289 STREET OR RFD Stump Neck Annex TOWN Indian Head SUBDIVISION SECTION LOT

WELL LOG Not required for driven wells STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

GROUTING RECORD WELL HAS BEEN GROUTED (Circle Appropriate Box) TYPE OF GROUTING MATERIAL (Circle one) CEMENT [CM] BENTONITE CLAY [BC] NO. OF BAGS 2 NO. OF POUNDS 300 GALLONS OF WATER 14 DEPTH OF GROUT SEAL (to nearest foot) from 0 ft. to 7 ft.

CASING RECORD casing types insert appropriate code below [ST] STEEL [CO] CONCRETE [PL] PLASTIC [OT] OTHER MAIN CASING TYPE [PL] Nominal diameter top (main) casing (nearest inch)! 2 Total depth of main casing (nearest foot) 9

OTHER CASING (if used) diameter inch depth (feet) from to

SCREEN RECORD screen type or open hole (insert appropriate code below) [ST] STEEL [BR] BRASS [HO] OPEN HOLE [PL] PLASTIC [OT] OTHER

PUMPING TEST PUMPING TEST N/A HOURS PUMPED (nearest hour) 8 9 PUMPING RATE (gal. per min.) 11 METHOD USED TO MEASURE PUMPING RATE WATER LEVEL (distance from land surface) BEFORE PUMPING 17 20 ft. WHEN PUMPING 22 25 ft. TYPE OF PUMP USED (for test) [A] air [P] piston [T] turbine [C] centrifugal [R] rotary [O] other [J] jet [S] submersible

MONITORING PUMP INSTALLED DRILLER WILL INSTALL PUMP YES NO (CIRCLE) (YES or NO) IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS. TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29. CAPACITY: GALLONS PER MINUTE (to nearest gallon) 31 PUMP HORSE POWER 37 PUMP COLUMN LENGTH (nearest ft.) 43 CASING HEIGHT (circle appropriate box and enter casing height) [+ ] above } LAND SURFACE [- ] below } 02 (nearest foot)

NUMBER OF UNSUCCESSFUL WELLS: WELL HYDROFRACTURED [Y] [N] N/A CIRCLE APPROPRIATE LETTER A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED E ELECTRIC LOG OBTAINED P TEST WELL CONVERTED TO PRODUCTION WELL

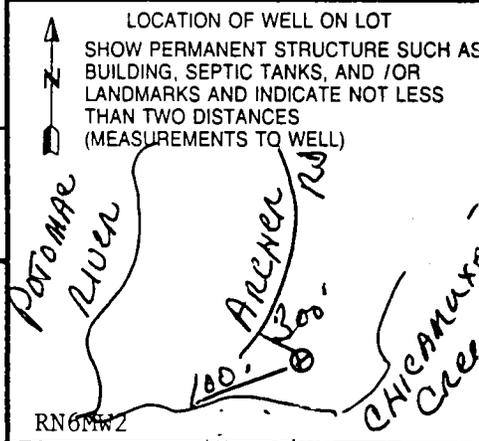
C 2 DEPTH (nearest ft.) 1 2 9 19 3 19 4 19 5 19 6 19 7 19 8 19 9 19 10 19 11 19 12 19 13 19 14 19 15 19 16 19 17 19 18 19 19 19 20 19 21 19 22 19 23 19 24 19 25 19 26 19 27 19 28 19 29 19 30 19 31 19 32 19 33 19 34 19 35 19 36 19 37 19 38 19 39 19 40 19 41 19 42 19 43 19 44 19 45 19 46 19 47 19 48 19 49 19 50 19 51 19 52 19 53 19 54 19 55 19 56 19 57 19 58 19 59 19 60 19 61 19 62 19 63 19 64 19 65 19 66 19 67 19 68 19 69 19 70 19 71 19 72 19 73 19 74 19 75 19 76 19 77 19 78 19 79 19 80 19 81 19 82 19 83 19 84 19 85 19 86 19 87 19 88 19 89 19 90 19 91 19 92 19 93 19 94 19 95 19 96 19 97 19 98 19 99 19 100 19

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26 04 04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE

DRILLERS LIC. NO. 1 M G D 046 DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION) LIC. NO. 1 M D AWD591

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68 7 19

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER) T (E.R.O.S.) W Q 70 72 74 75 76 TELESCOPE CASING LOG INDICATOR OTHER DATA



**C1** **3225** SEQUENCE NO. (MDE USE ONLY)

**STATE OF MARYLAND WELL COMPLETION REPORT**  
 FILL IN THIS FORM COMPLETELY PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER **97-327-W(M)**

T/CO USE ONLY  
 TE Received  
 AM DD YY  
 8 13

DATE WELL COMPLETED  
 MM DD YY  
 07 10 97

Depth of Well  
 22 17' 26  
 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL"  
 CH - 94 - 1528  
 28 29 30 31 32 33 34 35 36 37

OWNER **Naval Surface Warfare Center** (6290)  
 STREET OR RFD **Stump Neck Annex** TOWN **Indian Head**  
 SUBDIVISION SECTION LOT

**WELL LOG**  
 Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET		check if water bearing
	FROM	TO	
topsoil, yellow/brown sand	0	2	
dark brown sand & silt	2	6	
yellow/brown sand & gravel	6	17'	
water @ approx	10'		

**GROUTING RECORD** yes no  
 WELL HAS BEEN GROUTED (Circle Appropriate Box) **Y** **N**

TYPE OF GROUTING MATERIAL (Circle one)  
 CEMENT **CM** BENTONITE CLAY **BC**  
 NO. OF BAGS **2** NO. OF POUNDS **200**  
 GALLONS OF WATER **14**  
 DEPTH OF GROUT SEAL (to nearest foot)  
 from **0** ft. to **5** ft.  
 (enter 0 if from surface)

**CASING RECORD**  
 casing types insert appropriate code below  
**ST** STEEL **CO** CONCRETE  
**PL** PLASTIC **OT** OTHER

MAIN CASING TYPE **PL** Nominal diameter top (main) casing (nearest inch)! **2** Total depth of main casing (nearest foot) **7**  
 50 61 63 64 66 70

OTHER CASING (if used) diameter depth (feet) inch from to

**SCREEN RECORD**  
 screen type or open hole insert appropriate code below  
**ST** STEEL **BR** BRASS **HO** OPEN HOLE  
**PL** PLASTIC **OT** OTHER

NUMBER OF UNSUCCESSFUL WELLS

WELL HYDROFRACTURED **Y** **N**

**CIRCLE APPROPRIATE LETTER**  
**A** A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED  
**E** ELECTRIC LOG OBTAINED  
**P** TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

RILLERS LIC. NO. **M G D 046**  
 DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. **M D AWD591**

SITE SUPERVISOR (sign. of driller or journeyman)

**C2** DEPTH (nearest ft.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

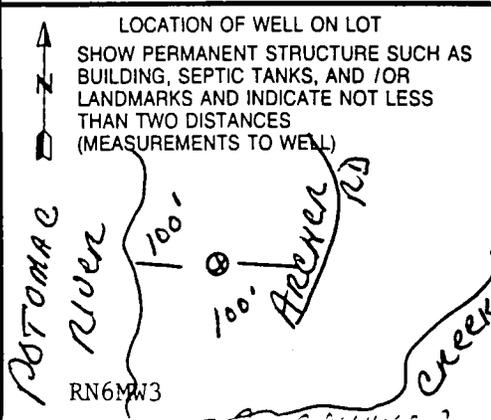
MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)  
 T (E.R.O.S.) W Q  
 70 72 74 75 76  
 TELESCOPE LOG

**C3** **PUMPING TEST** **N/A**

HOURS PUMPED (nearest hour) **8 9**  
 PUMPING RATE (gal. per min.) **11 15**  
 METHOD USED TO MEASURE PUMPING RATE  
 WATER LEVEL (distance from land surface)  
 BEFORE PUMPING **17 20** ft.  
 WHEN PUMPING **22 25** ft.  
 TYPE OF PUMP USED (for test)  
**A** air **P** piston **T** turbine  
**C** centrifugal **R** rotary **O** other (describe below)  
**J** jet **S** submersible

**PUMP INSTALLED**

DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES **NO**  
 IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.  
 TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29. **29**  
 CAPACITY: GALLONS PER MINUTE (to nearest gallon) **31 35**  
 PUMP HORSE POWER **37 41**  
 PUMP COLUMN LENGTH (nearest ft.) **43 47**  
 CASING HEIGHT (circle appropriate box and enter casing height)  
**+** above } LAND SURFACE  
**-** below } **02** (nearest foot)  
 49 50 51



**C 1** **3226** SEQUENCE NO. (MDE USE ONLY)

**STATE OF MARYLAND**  
**WELL COMPLETION REPORT**  
 FILL IN THIS FORM COMPLETELY  
 PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN  
 45 DAYS AFTER WELL IS COMPLETED.  
 COUNTY NUMBER **97-328-W(M)**

ST/CC USE ONLY  
 DATE RECEIVED  
 MM DD YY  
 8 13

DATE WELL COMPLETED  
 MM DD YY  
 07 09 97  
 Depth of Well  
 22 34 26  
 (TO NEAREST FOOT)

PERMIT NO.  
 FROM "PERMIT TO DRILL WELL"  
 C H - 94 -  
 28 29 30 31 32 33 34 35 36 37

OWNER **Naval Surface Warfare Center** (6291)  
 STREET OR RFD **Stump Neck Annex** TOWN **Indian Head**  
 SUBDIVISION \_\_\_\_\_ SECTION \_\_\_\_\_ LOT \_\_\_\_\_

**WELL LOG**  
 Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR  
 COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET		check if water bearing
	FROM	TO	
lt brown sand	0	18	
yellowish/brown silt & clay	18	25	
yellowish/brown clayey sand, some silt	25	27	
yellow/brown sand	27	32	
yellow/brown sand, tr silt	32	34'	
water @ approx	28'		

**GROUTING RECORD**

WELL HAS BEEN GROUTED (Circle Appropriate Box)  
 YES  NO   
 TYPE OF GROUTING MATERIAL (Circle one)  
 CEMENT  BENTONITE CLAY   
 NO. OF BAGS **7** NO. OF POUNDS **702**  
 GALLONS OF WATER **49**  
 DEPTH OF GROUT SEAL (to nearest foot)  
 from **0** ft. to **22** ft.  
 (enter 0 if from surface)

**CASING RECORD**

MAIN CASING TYPE **PL** Nominal diameter top (main) casing (nearest inch)! **2** Total depth of main casing (nearest foot) **24**  
 60 61 63 64 66 67 70

OTHER CASING (if used)  
 diameter inch \_\_\_\_\_ depth (feet) from \_\_\_\_\_ to \_\_\_\_\_

SCREEN RECORD  
 screen type or open hole     
 (insert appropriate code below)  
 STEEL BRASS OPEN HOLE  
 BRONZE PLASTIC OTHER

NUMBER OF UNSUCCESSFUL WELLS: \_\_\_\_\_

WELL HYDROFRACTURED YES  NO

CIRCLE APPROPRIATE LETTER  
 A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED  
 E ELECTRIC LOG OBTAINED  
 P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO. **MG 046**  
 DRILLERS SIGNATURE  
 (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. **M D AWD591**

SITE SUPERVISOR (sign of driller or journeyman responsible for sitework if different from permittee)

**C 2** DEPTH (nearest ft.)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)  
 T (E.R.O.S.) W Q

TELESCOPE CASING LOG INDICATOR OTHER DATA

**C 3** PUMPING TEST **N/A**

HOURS PUMPED (nearest hour) \_\_\_\_\_  
 PUMPING RATE (gal. per min.) \_\_\_\_\_  
 METHOD USED TO MEASURE PUMPING RATE \_\_\_\_\_  
 WATER LEVEL (distance from land surface)  
 BEFORE PUMPING \_\_\_\_\_ ft.  
 WHEN PUMPING \_\_\_\_\_ ft.  
 TYPE OF PUMP USED (for test)  
 A air P piston T turbine  
 C centrifugal R rotary O other (describe below)  
 J jet S submersible

**MONITORING**

PUMP INSTALLED  
 DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES  NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29

CAPACITY: GALLONS PER MINUTE (to nearest gallon) \_\_\_\_\_

PUMP HORSE POWER \_\_\_\_\_

PUMP COLUMN LENGTH (nearest ft.) \_\_\_\_\_

CASING HEIGHT (circle appropriate box and enter casing height)  
 (+) above } LAND SURFACE  
 (-) below } **02** (nearest foot)

LOCATION OF WELL ON LOT  
 SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND /OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



RN6MW4

<b>C 1</b>	<b>3223</b>	SEQUENCE NO. (MDE USE ONLY)	<b>STATE OF MARYLAND WELL COMPLETION REPORT</b> FILL IN THIS FORM COMPLETELY PLEASE PRINT OR TYPE	THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.
1 2 3 4 5 6 (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)				
ST/CO USE ONLY DATE RECEIVED MM DD YY 8 13		DATE WELL COMPLETED MM DD YY 07 10 97	Depth of Well 22 31' 26 (TO NEAREST FOOT)	PERMIT NO. FROM "PERMIT TO DRILL WE" CH - 94 - 1526 28 29 30 31 32 33 34 35 3

OWNER Naval Surface Warfare Cntr. (6288)  
 STREET OR RFD Stump NEck Annex TOWN Indian Head  
 SUBDIVISION \_\_\_\_\_ SECTION \_\_\_\_\_ LOT \_\_\_\_\_

WELL LOG			
Not required for driven wells			
STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING			
DESCRIPTION (Use additional sheets if needed)	FEET		check if water bearing
	FROM	TO	
brown fine sand	0	10	
gray/brown silty clay	10	12	
brown silty sand	12	16	
brown/gray clayey silt	16	24	
brown/gray sand	24	26	
red silt, sand and gravel	26	28	
dark red sand and gravel	28	31'	
water @ approx 24'			

GROUTING RECORD yes no

WELL HAS BEEN GROUTED (Circle Appropriate Box)  Y  N

TYPE OF GROUTING MATERIAL (Circle one) CEMENT  CM BENTONITE CLAY  BC

NO. OF BAGS 6 NO. OF POUNDS 600

GALLONS OF WATER 42

DEPTH OF GROUT SEAL (to nearest foot)  
 from 0 ft. to 19 ft.  
(enter 0 if from surface)

CASING RECORD

casing types insert appropriate code below

<input type="checkbox"/> ST STEEL	<input type="checkbox"/> CO CONCRETE
<input type="checkbox"/> PL PLASTIC	<input type="checkbox"/> OT OTHER

MAIN CASING TYPE PL Nominal diameter top (main) casing (nearest inch) 2 Total depth of main casing (nearest foot) 31

OTHER CASING (if used)  
 diameter inch \_\_\_\_\_ depth (feet) from \_\_\_\_\_ to \_\_\_\_\_

SCREEN RECORD

screen type or open hole (insert appropriate code below)

<input type="checkbox"/> ST STEEL	<input type="checkbox"/> BR BRASS	<input type="checkbox"/> HO OPEN HOLE
<input type="checkbox"/> PL PLASTIC	<input type="checkbox"/> OT OTHER	

DEPTH (nearest ft.)

1	2	3	4	5	6
8	9	11	15	17	21
23	24	26	30	32	36
38	39	41	45	47	51

SLOT SIZE 1 10 2 1 3 0

DIAMETER OF SCREEN 2 (NEAREST INCH)  
 from 19 to 31

NUMBER OF UNSUCCESSFUL WELLS \_\_\_\_\_

WELL HYDROFRACTURED  Y  N

N/A CIRCLE APPROPRIATE LETTER  
**A** A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED  
**E** ELECTRIC LOG OBTAINED  
**P** TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE

DRILLERS NO. MG 046  
 DRILLERS SIGNATURE Michael G. Gable  
 (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. 1 M D JGD049

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

C 2

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68 19 31

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)  
 T (E.R.O.S.) W Q

70 \_\_\_\_\_ 72 \_\_\_\_\_ 74 75 76 =

TELESCOPE LOG INDICATOR OTHER DATA

C 3

PUMPING TEST N/A

HOURS PUMPED (nearest hour) 8 9

PUMPING RATE (gal. per min.) \_\_\_\_\_

METHOD USED TO MEASURE PUMPING RATE \_\_\_\_\_

WATER LEVEL (distance from land surface)  
 BEFORE PUMPING \_\_\_\_\_ ft.  
 WHEN PUMPING \_\_\_\_\_ ft.

TYPE OF PUMP USED (for test)  
 A air  P piston  T turb  
 C centrifugal  R rotary  O other (describe)  
 J jet  S submersible

MONITORING

PUMP INSTALLED

DRILLER WILL INSTALL PUMP (YES OR NO) YES

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

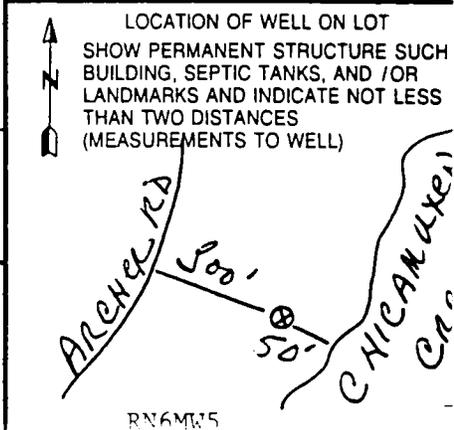
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29 29

CAPACITY: GALLONS PER MINUTE (to nearest gallon) \_\_\_\_\_

PUMP HORSE POWER \_\_\_\_\_

PUMP COLUMN LENGTH (nearest ft.) \_\_\_\_\_

CASING HEIGHT (circle appropriate box and enter casing height)  
 + above } LAND SURFACE  
 - below } 02 (nearest foot)

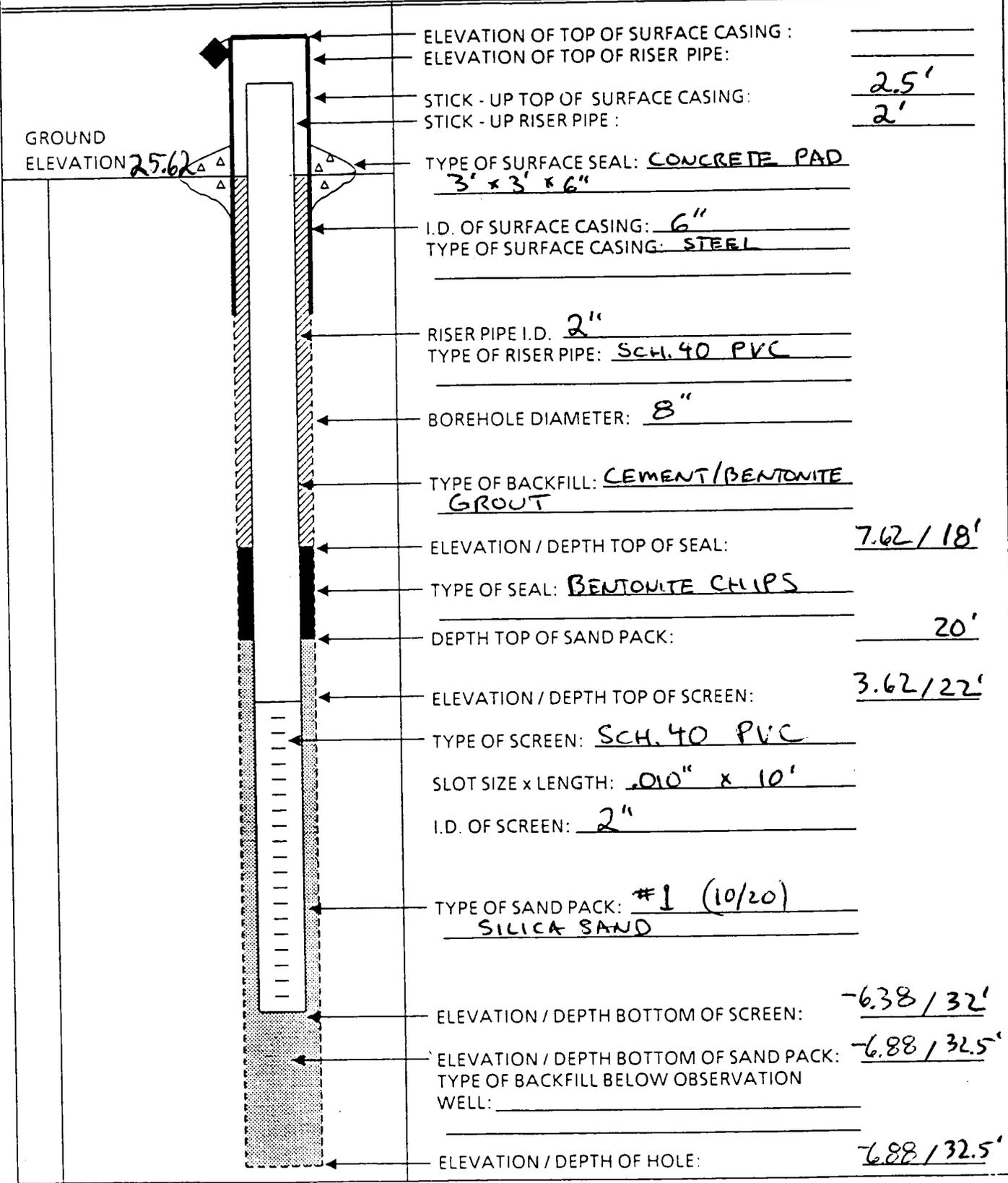


**SWMU 2/3 RANGE 3/CHICAMUXEN CREEK'S EDGE DUMP SITE A**



# OVERBURDEN MONITORING WELL SHEET

PROJECT <u>STUMP NECK RI/VI</u>	LOCATION <u>RANGE 3</u>	DRILLER <u>D. TAYLOR</u>
PROJECT NO. <u>7581</u>	BORING <u>RN3mw01</u>	DRILLING METHOD <u>4 1/4 HSA</u>
ELEVATION _____	DATE <u>7-8-97</u>	DEVELOPMENT METHOD <u>PUMP/SURGE</u>
FIELD GEOLOGIST <u>F.W. RAMSER</u>		



- ELEVATION OF TOP OF SURFACE CASING: \_\_\_\_\_
- ELEVATION OF TOP OF RISER PIPE: \_\_\_\_\_
- STICK - UP TOP OF SURFACE CASING: 2.5'
- STICK - UP RISER PIPE: 2'
- TYPE OF SURFACE SEAL: CONCRETE PAD  
3' x 3' x 6"
- I.D. OF SURFACE CASING: 6"
- TYPE OF SURFACE CASING: STEEL
- RISER PIPE I.D. 2"
- TYPE OF RISER PIPE: SCH. 40 PVC
- BOREHOLE DIAMETER: 8"
- TYPE OF BACKFILL: CEMENT/BENTONITE GROUT
- ELEVATION / DEPTH TOP OF SEAL: 7.62 / 18'
- TYPE OF SEAL: BENTONITE CHIPS
- DEPTH TOP OF SAND PACK: 20'
- ELEVATION / DEPTH TOP OF SCREEN: 3.62 / 22'
- TYPE OF SCREEN: SCH. 40 PVC
- SLOT SIZE x LENGTH: .010" x 10'
- I.D. OF SCREEN: 2"
- TYPE OF SAND PACK: #1 (10/20)  
SILICA SAND
- ELEVATION / DEPTH BOTTOM OF SCREEN: -6.38 / 32'
- ELEVATION / DEPTH BOTTOM OF SAND PACK: -6.88 / 32.5'
- TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_
- ELEVATION / DEPTH OF HOLE: -6.88 / 32.5'

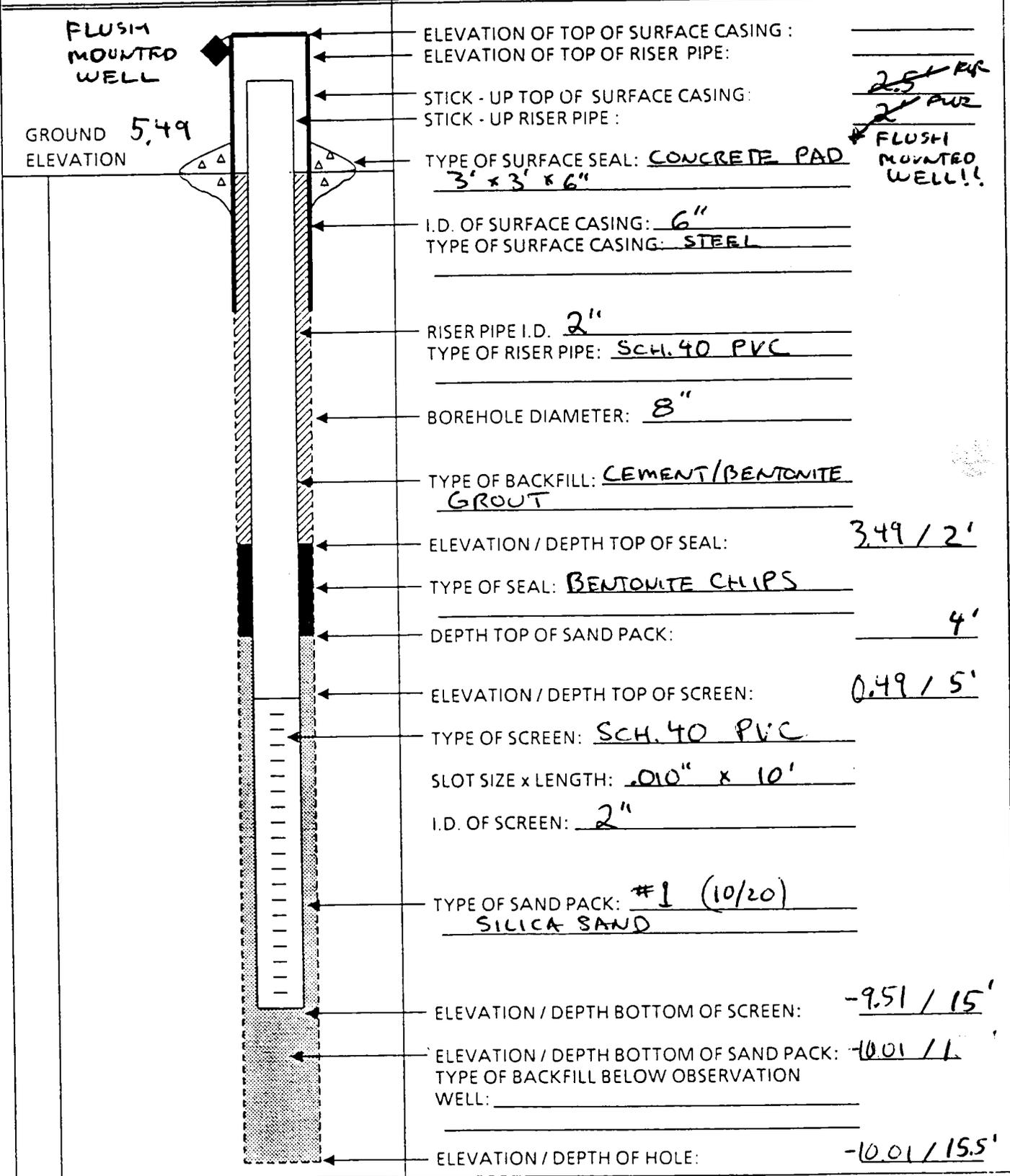
GROUND  
ELEVATION 25.62



# OVERBURDEN MONITORING WELL SHEET

PROJECT STUMP NECK RI/VI LOCATION RANGE 3  
 PROJECT NO. 7581 BORING RN3MW02  
 ELEVATION \_\_\_\_\_ DATE 7-8-97  
 FIELD GEOLOGIST F. WUDKWYCH

DRILLER M. CORRON  
 DRILLING METHOD 4 1/4 HSA  
 DEVELOPMENT METHOD PUMP + SURGE



ELEVATION OF TOP OF SURFACE CASING: \_\_\_\_\_  
 ELEVATION OF TOP OF RISER PIPE: \_\_\_\_\_  
 STICK - UP TOP OF SURFACE CASING: \_\_\_\_\_  
 STICK - UP RISER PIPE: \_\_\_\_\_  
 TYPE OF SURFACE SEAL: CONCRETE PAD  
3' x 3' x 6"  
 I.D. OF SURFACE CASING: 6"  
 TYPE OF SURFACE CASING: STEEL  
 RISER PIPE I.D. 2"  
 TYPE OF RISER PIPE: SCH. 40 PVC  
 BOREHOLE DIAMETER: 8"  
 TYPE OF BACKFILL: CEMENT/BENTONITE GROUT  
 ELEVATION / DEPTH TOP OF SEAL: 3.49 / 2'  
 TYPE OF SEAL: BENTONITE CHIPS  
 DEPTH TOP OF SAND PACK: 4'  
 ELEVATION / DEPTH TOP OF SCREEN: 0.49 / 5'  
 TYPE OF SCREEN: SCH. 40 PVC  
 SLOT SIZE x LENGTH: .010" x 10'  
 I.D. OF SCREEN: 2"  
 TYPE OF SAND PACK: #1 (10/20)  
SILICA SAND  
 ELEVATION / DEPTH BOTTOM OF SCREEN: -9.51 / 15'  
 ELEVATION / DEPTH BOTTOM OF SAND PACK: -10.01 / 11'  
 TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_  
 ELEVATION / DEPTH OF HOLE: -10.01 / 15.5'

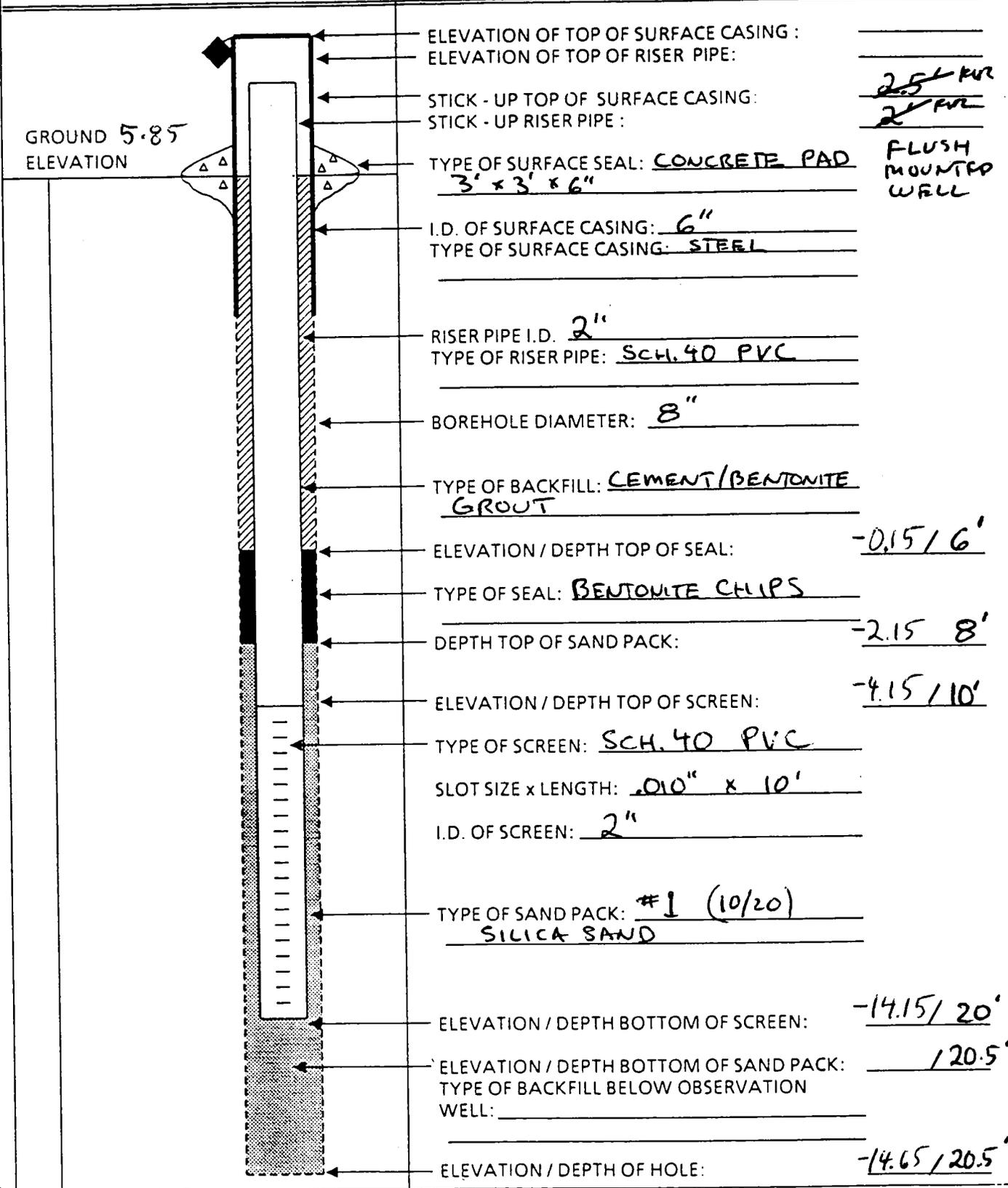
~~2.5' PER~~  
~~2' PER~~  
 FLUSH MOUNTED WELL!!



BORING NO.: RN3SB03  
RN3MW03

# OVERBURDEN MONITORING WELL SHEET

PROJECT <u>STUMP NECK RI/VI</u>	LOCATION <u>RANGE 3</u>	DRILLER <u>M. CORRON</u>
PROJECT NO. <u>7581</u>	BORING <u>RN3MW03</u>	DRILLING METHOD <u>4 1/4 HSA</u>
ELEVATION _____	DATE <u>7-8-97</u>	DEVELOPMENT METHOD <u>PUMP + SURGE</u>
FIELD GEOLOGIST <u>F. WURK WYCH</u>		

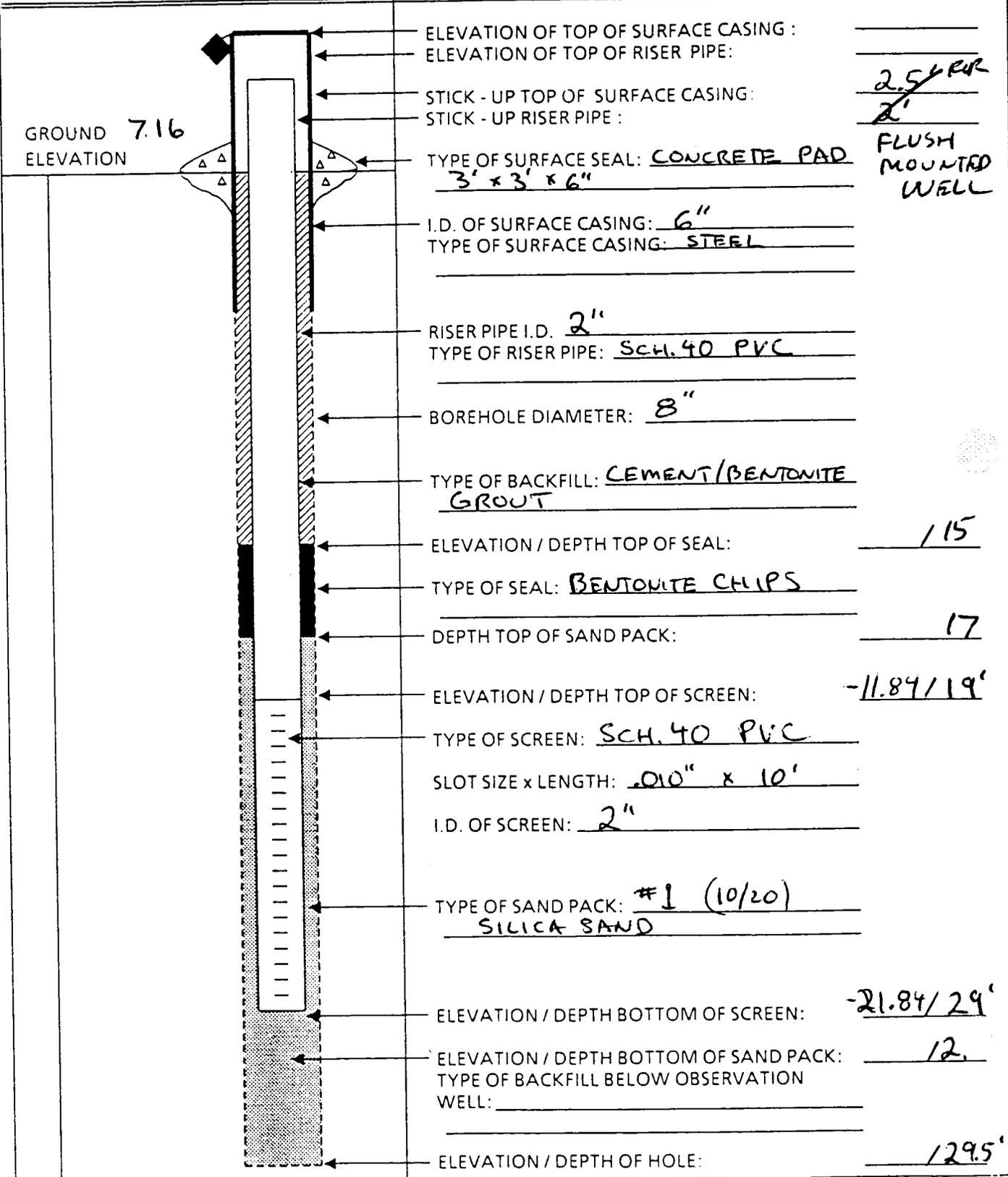




# OVERBURDEN MONITORING WELL SHEET

PROJECT STUMP NECK RI/VI LOCATION RANGE 3  
 PROJECT NO. 7581 BORING RN3MW04  
 ELEVATION \_\_\_\_\_ DATE 7-8-97  
 FIELD GEOLOGIST F. WUDKWCIT

DRILLER D. TAYLOR  
 DRILLING METHOD 4 1/4 HSA  
 DEVELOPMENT METHOD PUMP+SURGE



ELEVATION OF TOP OF SURFACE CASING : \_\_\_\_\_  
 ELEVATION OF TOP OF RISER PIPE : \_\_\_\_\_  
 STICK - UP TOP OF SURFACE CASING : 2.54 PER  
 STICK - UP RISER PIPE : 2'  
 TYPE OF SURFACE SEAL: CONCRETE PAD FLUSH MOUNTED WELL  
3' x 3' x 6"  
 I.D. OF SURFACE CASING: 6"  
 TYPE OF SURFACE CASING: STEEL  
 RISER PIPE I.D. 2"  
 TYPE OF RISER PIPE: SCH. 40 PVC  
 BOREHOLE DIAMETER: 8"  
 TYPE OF BACKFILL: CEMENT/BENTONITE GROUT  
 ELEVATION / DEPTH TOP OF SEAL: 15  
 TYPE OF SEAL: BENTONITE CHIPS  
 DEPTH TOP OF SAND PACK: 17  
 ELEVATION / DEPTH TOP OF SCREEN: -11.84 / 19'  
 TYPE OF SCREEN: SCH. 40 PVC  
 SLOT SIZE x LENGTH: .010" x 10'  
 I.D. OF SCREEN: 2"  
 TYPE OF SAND PACK: #1 (10/20)  
SILICA SAND  
 ELEVATION / DEPTH BOTTOM OF SCREEN: -21.84 / 29'  
 ELEVATION / DEPTH BOTTOM OF SAND PACK: 12.  
 TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_  
 ELEVATION / DEPTH OF HOLE: 129.5'



C1 3231 SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT FILL IN THIS FORM COMPLETELY PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

1 2 3 6 (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

COUNTY NUMBER 97-317-W(M)

ST/CO USE ONLY DATE RECEIVED MM DD YY

DATE WELL COMPLETED MM DD YY 07 08 97 Depth of Well 22 15' 26 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CH - 94 - 1518

OWNER Naval Surface Warfare Center (6292) last name first name TOWN Indian Head STREET OR RFD Stump Neck Annex SUBDIVISION SECTION LOT

WELL LOG Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

Table with columns: DESCRIPTION (Use additional sheets if needed), FEET (FROM, TO), check if water bearing. Rows: red sand & gravelly clay, tr silt; gray clay and silt; water @ approx 4'

GROUTING RECORD WELL HAS BEEN GROUTED (Circle Appropriate Box)

YES (Y) NO (N) TYPE OF GROUTING MATERIAL (Circle one) CEMENT (CM) BENTONITE CLAY (BC) NO. OF BAGS 2 NO. OF POUNDS 200 GALLONS OF WATER 14 DEPTH OF GROUT SEAL (to nearest foot) from 0 ft. to 4 ft.

CASING RECORD casing types insert appropriate code below

MAIN CASING TYPE PL Nominal diameter top (main) casing (nearest inch)! 2 Total depth of main casing (nearest foot) 5

OTHER CASING (if used) diameter inch depth (feet) from to

SCREEN RECORD screen type or open hole (insert appropriate code below) STEEL (ST) BRASS (BR) OPEN HOLE (HO) PLASTIC (PL) OTHER (OT)

NUMBER OF UNSUCCESSFUL WELLS:

WELL HYDROFRACTURED yes (Y) no (N)

CIRCLE APPROPRIATE LETTER A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED E ELECTRIC LOG OBTAINED P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO. 1 M G D 046 DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION) LIC. NO. 1 M D JGD049

DEPTH (nearest ft.)

Table with columns: A, C, H, S, R, E, N and rows for depth measurements. Includes slot size and diameter of screen.

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER) T (E.R.O.S.) W Q

TELESCOPE CASING LOG INDICATOR OTHER DATA

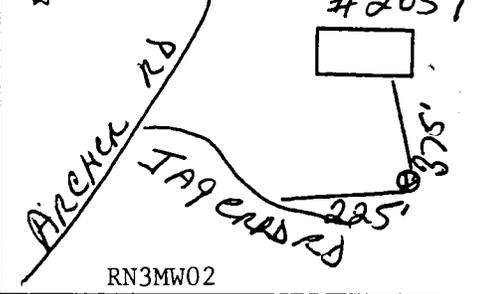
C 3 PUMPING TEST

HOURS PUMPED (nearest hour) 8 9 PUMPING RATE (gal. per min.) 11 15 METHOD USED TO MEASURE PUMPING RATE WATER LEVEL (distance from land surface) BEFORE PUMPING 17 20 ft. WHEN PUMPING 22 25 ft. TYPE OF PUMP USED (for test) A air P piston T turbine C centrifugal R rotary O other (describe below) J jet S submersible

PUMP INSTALLED

DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES (NO) IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS. TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29. CAPACITY: GALLONS PER MINUTE (to nearest gallon) 31 35 PUMP HORSE POWER 37 41 PUMP COLUMN LENGTH (nearest ft.) 43 47 CASING HEIGHT (circle appropriate box and enter casing height) + above - below LAND SURFACE 00 (nearest foot)

LOCATION OF WELL ON LOT SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND /OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL) #2057



RN3MW02



**C 1** **3234** SEQUENCE NO. (MDE USE ONLY) **STATE OF MARYLAND WELL COMPLETION REPORT** THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS) FILL IN THIS FORM COMPLETELY PLEASE PRINT OR TYPE

ST/CO USE ONLY DATE RECEIVED MM DD YY DATE WELL COMPLETED MM DD YY Depth of Well 22 29' 26 (TO NEAREST FOOT) PERMIT NO. FROM "PERMIT TO DRILL WELL" CH 94 1 28 29 30 31 32 33 34 35 37

OWNER Naval Surface Warfare Center (6295) STREET OR RFD Stump Neck Annex TOWN Indian Head SUBDIVISION \_\_\_\_\_ SECTION \_\_\_\_\_ LOT \_\_\_\_\_

**WELL LOG**  
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET		check if water bearing
	FROM	TO	
red silty sand, tr gravel	0	4	
gray silty clay, some gravel	4	6	
gray clayey sand, some gravel	6	10	
dark gray sandy clay	10	12	
gray clay and silt	12	18	
gray silty sand	18	27	
dark gray silty clay	27	29'	
water @ approx 19'			

**GROUTING RECORD**  YES  NO

WELL HAS BEEN GROUTED (Circle Appropriate Box) **Y** **N**

TYPE OF GROUTING MATERIAL (Circle one) CEMENT **CM** BENTONITE CLAY **BC**

NO. OF BAGS 6 NO. OF POUNDS 600

GALLONS OF WATER 42

DEPTH OF GROUT SEAL (to nearest foot) from 0 ft. to 17 ft.

**CASING RECORD**

casings types insert appropriate code below

**ST** STEEL **CO** CONCRETE **PL** PLASTIC **OT** OTHER

MAIN CASING TYPE PL Nominal diameter top (main) casing (nearest inch)! 2 Total depth of main casing (nearest foot) 19

**OTHER CASING (if used)**

EACH CASING	diameter inch		depth (feet) from to	
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**SCREEN RECORD**

screen type or open hole insert appropriate code below

**ST** STEEL **BR** BRASS **HO** OPEN HOLE **PL** PLASTIC **OT** OTHER

NUMBER OF UNSUCCESSFUL WELLS: \_\_\_\_\_

WELL HYDROFRACTURED  YES  NO

- CIRCLE APPROPRIATE LETTER
- A** A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
  - E** ELECTRIC LOG OBTAINED
  - P** TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO. M G D 046

DRILLERS SIGNATURE [Signature]

LIC. NO. M D AWD591

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

**C 2** DEPTH (nearest ft.)

EACH CASING	diameter inch		depth (feet) from to	
1	<u>PL</u>	<u>19</u>	<u>29</u>	
2				
3				
4				
5				
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46				
47				
48				
49				
50				
51				

SLOT SIZE 1 0 2 1 3 0

DIAMETER OF SCREEN 2 (NEAREST INCH) from \_\_\_\_\_ to \_\_\_\_\_

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68 17 29

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER) T (E.R.O.S.) W Q

70 \_\_\_\_\_ 72 \_\_\_\_\_ 74 75 76 \_\_\_\_\_

TELESCOPE CASING LOG INDICATOR OTHER DATA

**C 3** PUMPING TEST N/A

HOURS PUMPED (nearest hour) 8 9

PUMPING RATE (gal. per min.) 11 15

METHOD USED TO MEASURE PUMPING RATE \_\_\_\_\_

WATER LEVEL (distance from land surface) BEFORE PUMPING 17 20 ft. WHEN PUMPING 22 25 ft.

TYPE OF PUMP USED (for test) **A** air **P** piston **T** turbine **C** centrifugal **R** rotary **O** other (describe below) **J** jet **S** submersible

MONITORING \_\_\_\_\_

**PUMP INSTALLED**

DRILLER WILL INSTALL PUMP (CIRCLE) (YES OR NO) YES  NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

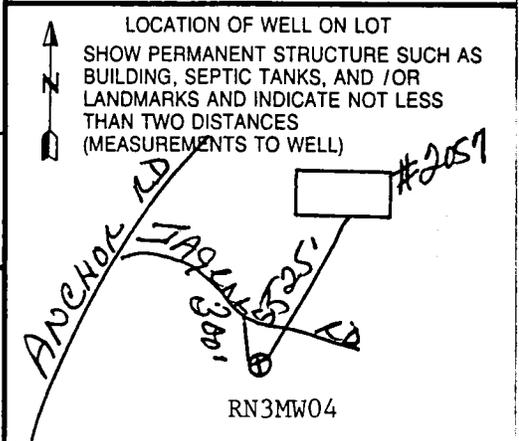
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29. 29

CAPACITY: GALLONS PER MINUTE (to nearest gallon) 31 35

PUMP HORSE POWER 37 41

PUMP COLUMN LENGTH (nearest ft.) 43 47

CASING HEIGHT (circle appropriate box and enter casing height) **+** above **-** below 00 (nearest foot)



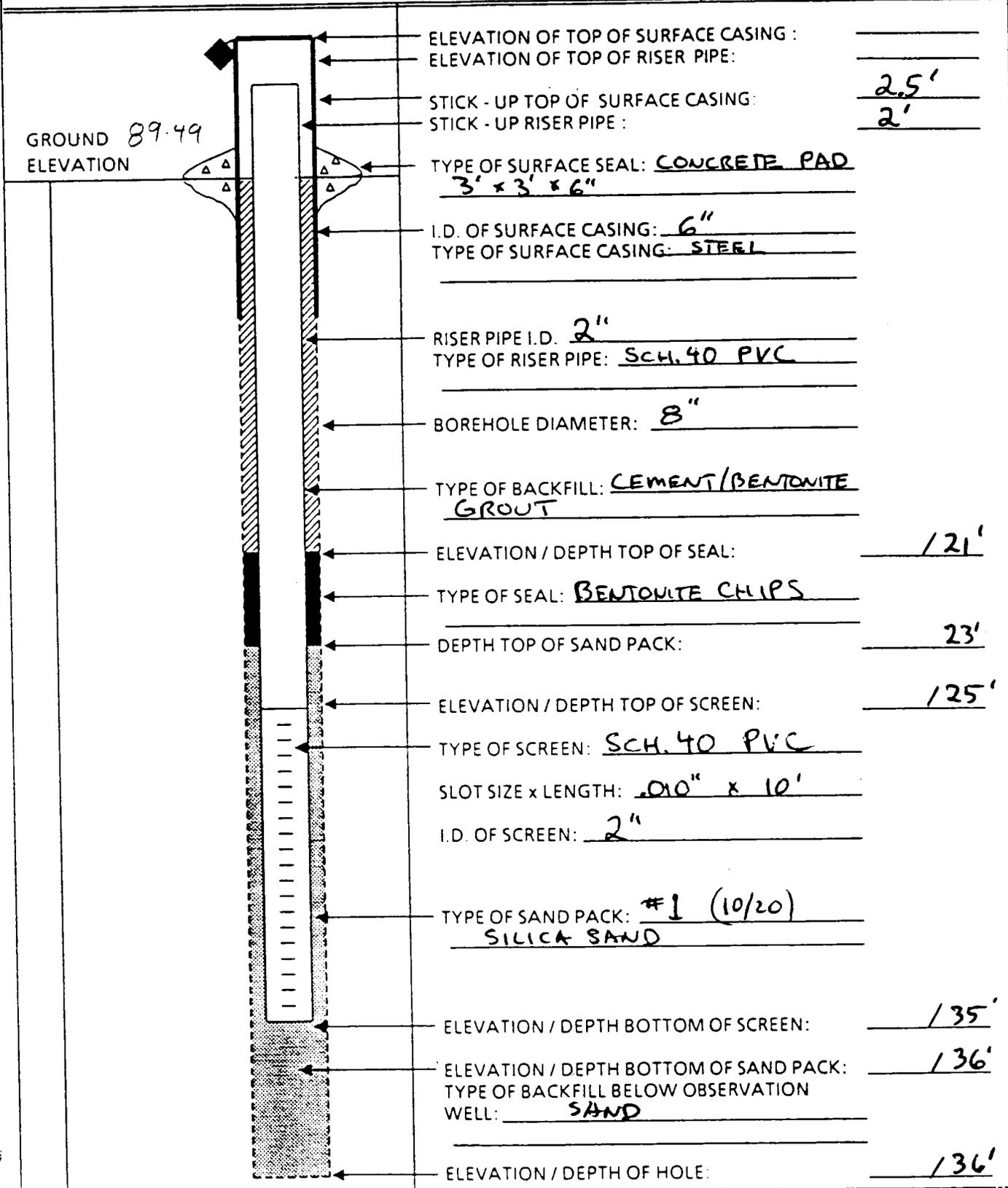
**SWMU 1 RUM POINT LANDFILL**



# OVERBURDEN MONITORING WELL SHEET

PROJECT STUMP NECK RI/VI LOCATION Pumpout Landfill  
 PROJECT NO. 7581 BORING RPLMW01  
 ELEVATION \_\_\_\_\_ DATE 7-13-97  
 FIELD GEOLOGIST F.W. RUMSER

DRILLER MIKE M. HAH  
 DRILLING METHOD 4 1/4 HSA  
 DEVELOPMENT SURGE +  
 METHOD PUMP

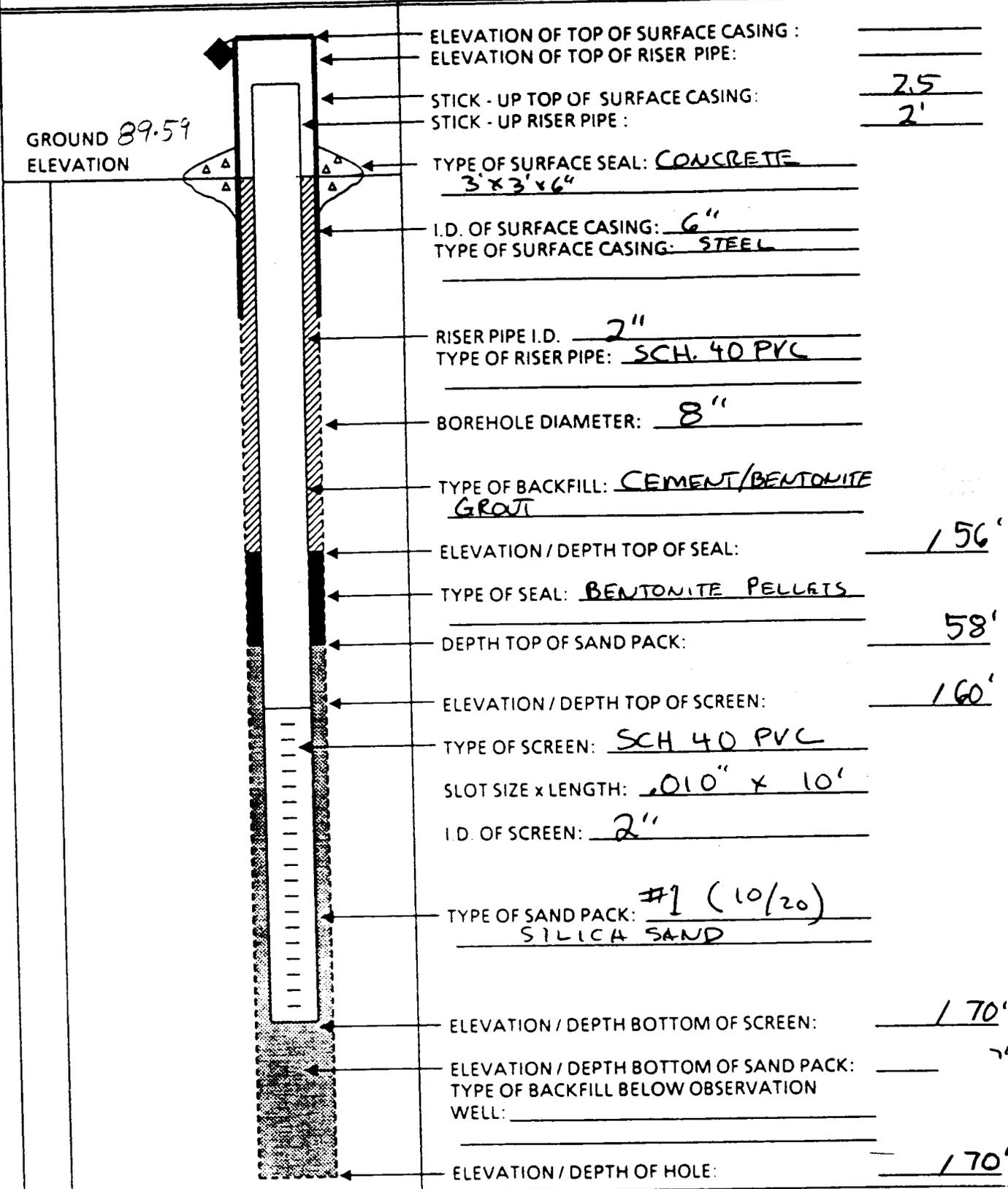




# OVERBURDEN MONITORING WELL SHEET

PROJECT STUMPNECK RI/VI LOCATION RUMPOINT LANDFILL  
 PROJECT NO. 7581 BORING RPLSB05  
 ELEVATION \_\_\_\_\_ DATE 7-25-97  
 FIELD GEOLOGIST F. WUDKUTCH

DRILLER DAVE TAYLOR  
 DRILLING METHOD 4 1/4 HSA  
 DEVELOPMENT METHOD SURGE + PUMP



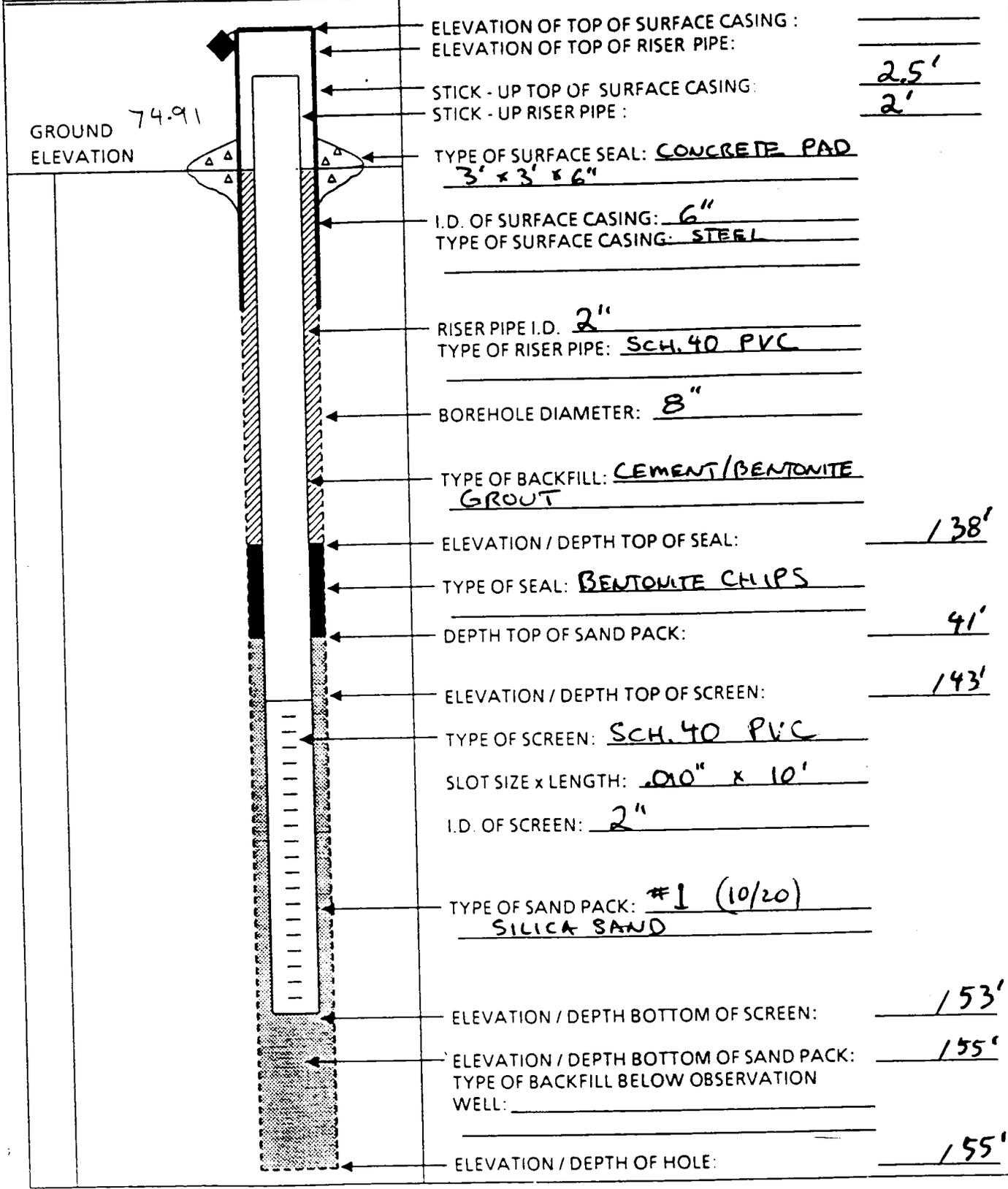
GROUND 89.59  
 ELEVATION

- ELEVATION OF TOP OF SURFACE CASING: \_\_\_\_\_
- ELEVATION OF TOP OF RISER PIPE: \_\_\_\_\_
- STICK - UP TOP OF SURFACE CASING: 2.5
- STICK - UP RISER PIPE: 2'
- TYPE OF SURFACE SEAL: CONCRETE  
3' x 3' x 6"
- I.D. OF SURFACE CASING: 6"
- TYPE OF SURFACE CASING: STEEL
- RISER PIPE I.D. 2"
- TYPE OF RISER PIPE: SCH. 40 PVC
- BOREHOLE DIAMETER: 8"
- TYPE OF BACKFILL: CEMENT/BENTONITE  
GROUT
- ELEVATION / DEPTH TOP OF SEAL: 156'
- TYPE OF SEAL: BENTONITE PELLETS
- DEPTH TOP OF SAND PACK: 58'
- ELEVATION / DEPTH TOP OF SCREEN: 160'
- TYPE OF SCREEN: SCH 40 PVC
- SLOT SIZE x LENGTH: .010" x 10'
- I.D. OF SCREEN: 2"
- TYPE OF SAND PACK: #1 (10/20)  
SILICA SAND
- ELEVATION / DEPTH BOTTOM OF SCREEN: 170'
- ELEVATION / DEPTH BOTTOM OF SAND PACK: \_\_\_\_\_
- TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_
- ELEVATION / DEPTH OF HOLE: 170'



# OVERBURDEN MONITORING WELL SHEET

PROJECT <u>STUMP NECK RI/VI</u>	LOCATION <u>PUMPPOINT LINNELL</u>	DRILLER <u>D. TAYLOR</u>
PROJECT NO. <u>7581</u>	BORING <u>RPLMW02</u>	DRILLING METHOD <u>4 1/4 HSA</u>
ELEVATION <u>~80'</u>	DATE <u>7-13-97</u>	DEVELOPMENT METHOD <u>PUMP + SURGE</u>
FIELD GEOLOGIST <u>F. WUDKOWYCH</u>		



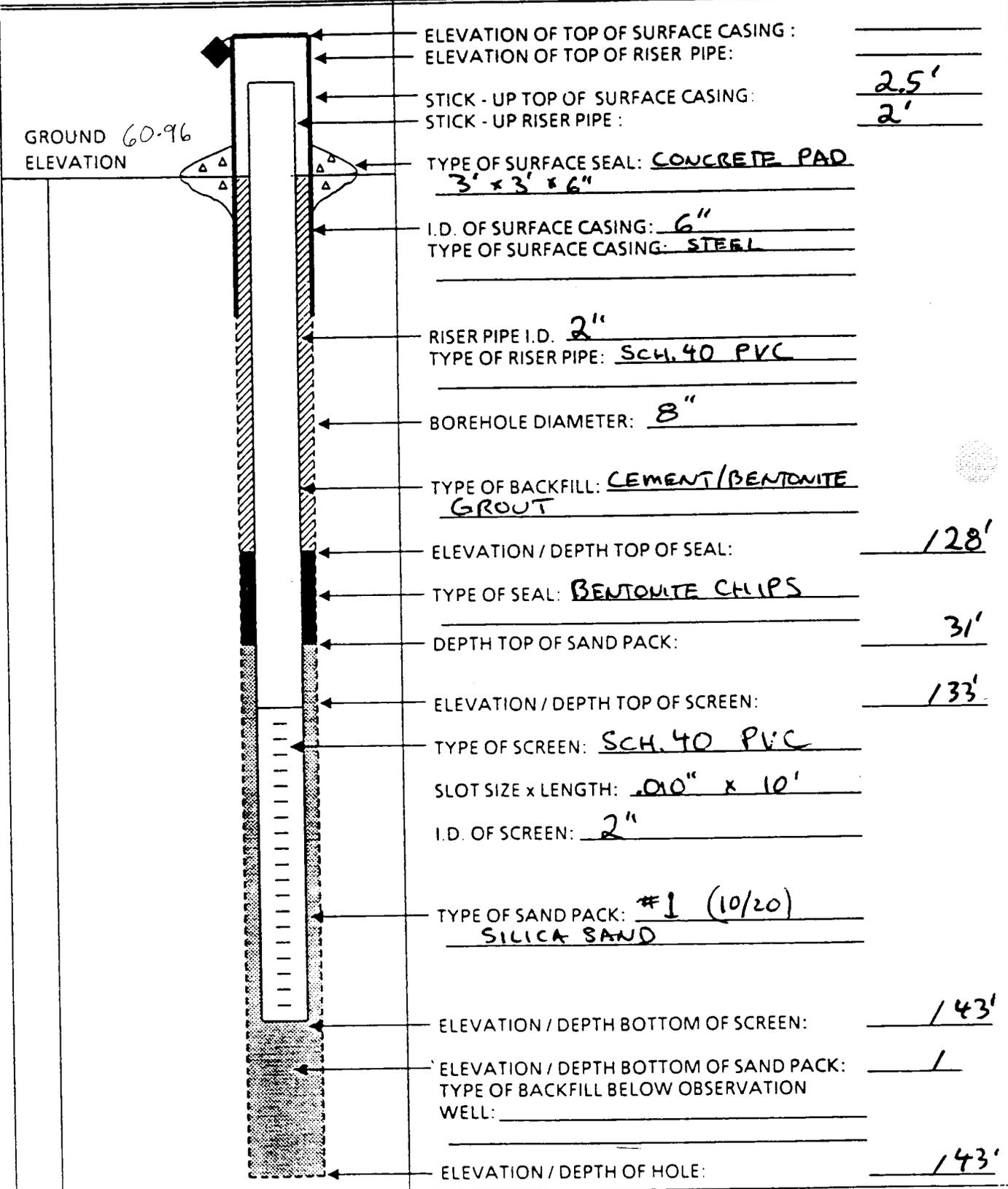


# OVERBURDEN MONITORING WELL SHEET

PROJECT STUMP NECK RI/VI  
 PROJECT NO. 7581  
 ELEVATION ~80  
 FIELD GEOLOGIST F. WURKOWYCH

LOCATION Remnant Landfill  
 BORING RPLMW03  
 DATE 7-12-97

DRILLER D. TAYLOR  
 DRILLING METHOD 4 1/4 HSA  
 DEVELOPMENT Surge +  
 METHOD Pump

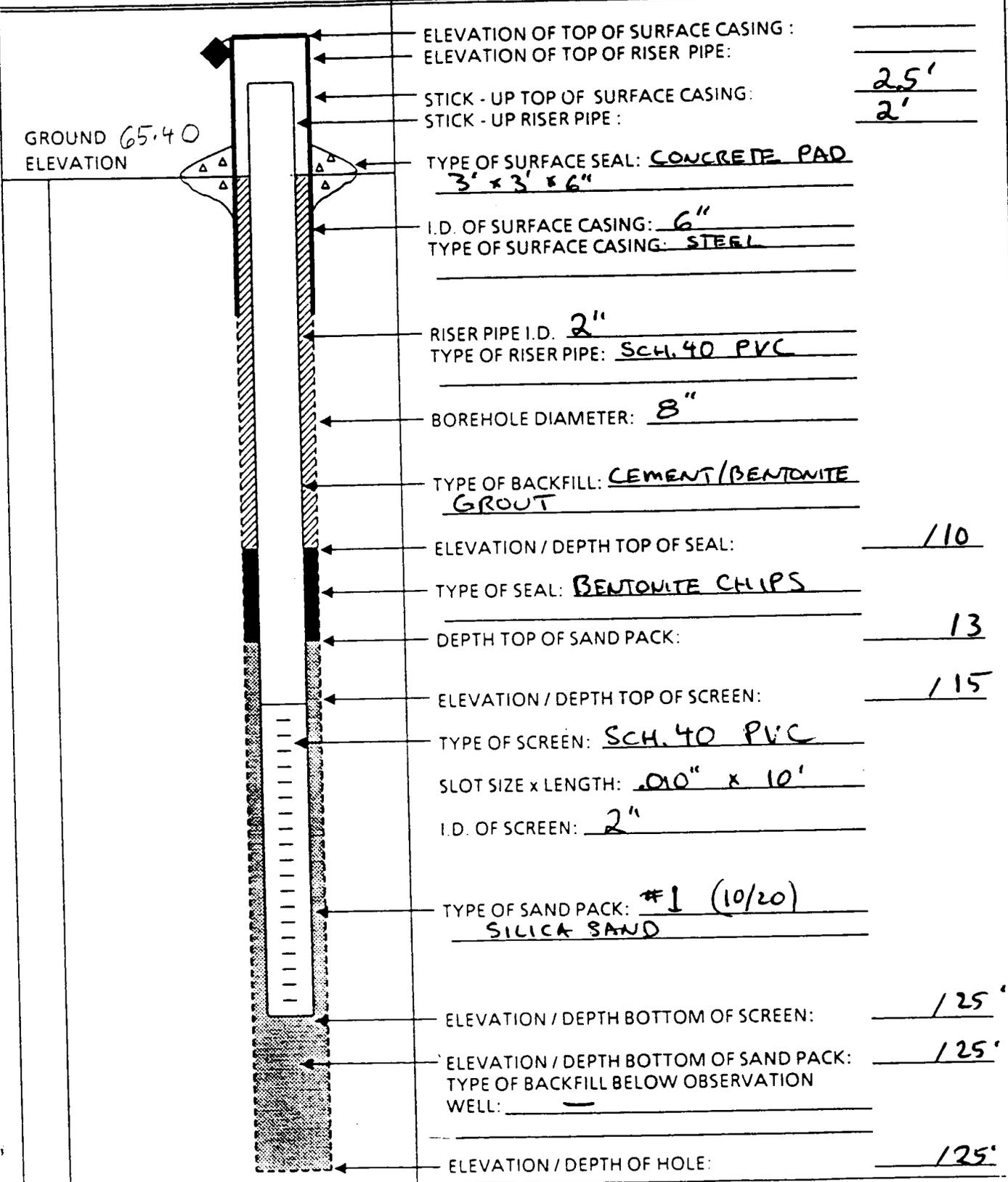




# OVERBURDEN MONITORING WELL SHEET

PROJECT STUMP NECK RI/VI LOCATION RPL  
 PROJECT NO. 7581 BORING RPLMWO4(S)  
 ELEVATION ~ 80' DATE 7-15-97  
 FIELD GEOLOGIST F. WUDKOWYCH

DRILLER D. TAYLOR  
 DRILLING METHOD 4 1/4 HSA  
 DEVELOPMENT METHOD SURFACE + SUB. PUMP



ELEVATION OF TOP OF SURFACE CASING: \_\_\_\_\_  
 ELEVATION OF TOP OF RISER PIPE: \_\_\_\_\_  
 STICK - UP TOP OF SURFACE CASING: 2.5'  
 STICK - UP RISER PIPE: 2'  
 TYPE OF SURFACE SEAL: CONCRETE PAD  
3' x 3' x 6"  
 I.D. OF SURFACE CASING: 6"  
 TYPE OF SURFACE CASING: STEEL  
 RISER PIPE I.D. 2"  
 TYPE OF RISER PIPE: SCH. 40 PVC  
 BOREHOLE DIAMETER: 8"  
 TYPE OF BACKFILL: CEMENT/BENTONITE  
GROUT  
 ELEVATION / DEPTH TOP OF SEAL: 10  
 TYPE OF SEAL: BENTONITE CHIPS  
 DEPTH TOP OF SAND PACK: 13  
 ELEVATION / DEPTH TOP OF SCREEN: 15  
 TYPE OF SCREEN: SCH. 40 PVC  
 SLOT SIZE x LENGTH: .010" x 10'  
 I.D. OF SCREEN: 2"  
 TYPE OF SAND PACK: #1 (10/20)  
SILICA SAND  
 ELEVATION / DEPTH BOTTOM OF SCREEN: 25'  
 ELEVATION / DEPTH BOTTOM OF SAND PACK: 25'  
 TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_  
 ELEVATION / DEPTH OF HOLE: 25'



BORING NO.: RPL 6804  
RPLMW04(D)

# OVERBURDEN MONITORING WELL SHEET

PROJECT <u>STUMPNECK ANNEX</u>	LOCATION <u>RUM POINT LANDFILL</u>	DRILLER <u>TAYLOR</u>
PROJECT NO. <u>7581</u>	BORING <u>RPL SB 04</u>	DRILLING METHOD <u>HSA 4 1/4" ID</u>
ELEVATION _____	DATE <u>7-29-97</u>	DEVELOPMENT METHOD _____
FIELD GEOLOGIST <u>HALE</u>		

	ELEVATION OF TOP OF SURFACE CASING :	_____
	ELEVATION OF TOP OF RISER PIPE :	_____
	STICK - UP TOP OF SURFACE CASING :	<u>2.5'</u>
	STICK - UP RISER PIPE :	<u>2'</u>
	GROUND <u>64.01</u> ELEVATION	
	TYPE OF SURFACE SEAL: <u>cement</u>	_____
	I.D. OF SURFACE CASING: _____	
	TYPE OF SURFACE CASING: <u>6" diameter steel</u>	_____
	RISER PIPE I.D. _____	
	TYPE OF RISER PIPE: <u>SCH 40 PVC</u>	_____
	BOREHOLE DIAMETER: <u>8"</u>	_____
	TYPE OF BACKFILL: <u>cement-bentonite grout</u>	_____
	ELEVATION / DEPTH TOP OF SEAL: _____	<u>132</u>
	TYPE OF SEAL: <u>Bentonite Pellets</u>	_____
DEPTH TOP OF SAND PACK: _____	<u>34</u>	
ELEVATION / DEPTH TOP OF SCREEN: _____	<u>136</u>	
TYPE OF SCREEN: <u>SCH 40 PVC</u>	_____	
SLOT SIZE x LENGTH: <u>0.010" x 10'</u>	_____	
I.D. OF SCREEN: <u>2"</u>	_____	
TYPE OF SAND PACK: <u>#1 Valve</u>	_____	
ELEVATION / DEPTH BOTTOM OF SCREEN: _____	<u>146</u>	
ELEVATION / DEPTH BOTTOM OF SAND PACK: _____	<u>1</u>	
TYPE OF BACKFILL BELOW OBSERVATION WELL: <u>NA</u>	_____	
ELEVATION / DEPTH OF HOLE: _____	<u>146</u>	

C1, 3244 SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

1 2 3 6 (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

COUNTY NUMBER 97-331-W(M)

ST/CO USE ONLY DATE RECEIVED

DATE WELL COMPLETED

Depth of Well

PERMIT NO. FROM "PERMIT TO DRILL WELL"

OWNER Naval Surface Warfare Center (6298) STREET OR RFD Stump Neck Road TOWN Indian Head SUBDIVISION SECTION LOT

WELL LOG table with columns: DESCRIPTION, FEET (FROM, TO), check if water bearing. Rows include yellow/brown sand & gravel, olive gray fine sand, etc.

GROUTING RECORD form with fields: WELL HAS BEEN GROUTED (Y), TYPE OF GROUTING MATERIAL (CM), NO. OF BAGS (47), NO. OF POUNDS (700), DEPTH OF GROUT SEAL (0 to 23 ft).

CASING RECORD form with fields: MAIN CASING TYPE (PL), Nominal diameter (2), Total depth (25).

OTHER CASING (if used) form with fields: diameter, depth.

SCREEN RECORD form with fields: screen type (ST), diameter of screen (2), DEPTH (25, 35).

PUMPING TEST form with fields: PUMPING TEST (N/A), HOURS PUMPED (8.9), PUMPING RATE (11), TYPE OF PUMP USED (O), MONITORING.

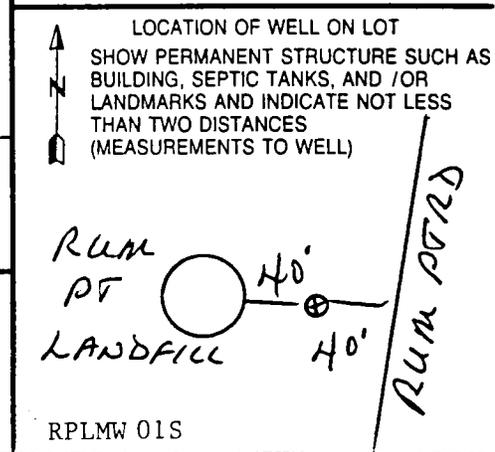
PUMP INSTALLED form with fields: DRILLER WILL INSTALL PUMP (NO), TYPE OF PUMP INSTALLED (29), CAPACITY: GALLONS PER MINUTE (31), PUMP HORSE POWER (37), PUMP COLUMN LENGTH (43), CASING HEIGHT (+), LAND SURFACE (0.2).

WELL HYDROFRACTURED (Y), CIRCLE APPROPRIATE LETTER (A, E, P), I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04.

DEPTH (nearest ft.) table with rows for casing sections and slot size (1, 2, 3).

DRILLERS LIC. NO. M G D 046, DRILLERS SIGNATURE, LIC. NO. M G D 081, SITE SUPERVISOR (sign. of driller or journeyman).

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL (68), MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER), TELESCOPE CASING, LOG INDICATOR, OTHER DATA.



<b>C1</b>	<b>3344</b>	SEQUENCE NO. (MDE USE ONLY)	<b>STATE OF MARYLAND WELL COMPLETION REPORT</b>	THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.
1 2 3 6 (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)			FILL IN THIS FORM COMPLETELY PLEASE PRINT OR TYPE	COUNTY NUMBER <b>97-375-W(M)</b>

ST/CO USE ONLY DATE Received MM DD YY <u>8</u> <u>13</u>	DATE WELL COMPLETED <u>08</u> <sup>MM</sup> <u>20</u> <sup>DD</sup> <u>97</u> <sup>YY</sup>	Depth of Well <u>22</u> <u>70</u> <u>26</u> (TO NEAREST FOOT)	PERMIT NO. FROM "PERMIT TO DRILL" <u>CH</u> <u>94</u> <u>1576</u> <small>28 29 30 31 32 33 34 35 36 37</small>
---	--	---	---

OWNER US NAVAL Surface Warfare Center TOWN Indian Head, mD 20640  
 STREET OR RFD Indian Head  
 SUBDIVISION \_\_\_\_\_ SECTION \_\_\_\_\_ LOT \_\_\_\_\_

WELL LOG			
Not required for driven wells			
STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING			
DESCRIPTION (Use additional sheets if needed)	FEET		check if water bearing
	FROM	TO	
dark gray sand	0	6	
orange/brown silty sand	6	10	
lt gray/brown silty sand	10	26	
dark gray silty sand	26	48	
gray clay and silty sand	48	50	
gray sand, silty	50	60	
green clay	60	65	
gray med sand	65	70'	
water @ approx	65'		

**GROUTING RECORD** yes no

WELL HAS BEEN GROUTED (Circle Appropriate Box)  Y  N

TYPE OF GROUTING MATERIAL (Circle one)  
 CEMENT  CM BENTONITE CLAY  BC

NO. OF BAGS 16 NO. OF POUNDS 1600  
 GALLONS OF WATER 112

DEPTH OF GROUT SEAL (to nearest foot)  
 from 0 ft. to 58 ft.  
(enter 0 if from surface)

**CASING RECORD**

casing types insert appropriate code below

<input checked="" type="checkbox"/> ST STEEL	<input type="checkbox"/> CO CONCRETE
<input type="checkbox"/> PL PLASTIC	<input type="checkbox"/> OT OTHER

MAIN CASING TYPE PL Nominal diameter top (main) casing (nearest inch)! 2 Total depth of main casing (nearest foot) 60

**OTHER CASING (if used)**

E A C H C A S I N G	diameter		depth (feet)	
	inch	from	to	

**SCREEN RECORD**

screen type or open hole (insert appropriate code below)

<input checked="" type="checkbox"/> ST STEEL	<input type="checkbox"/> BR BRASS	<input type="checkbox"/> HO OPEN HOLE
<input type="checkbox"/> PL PLASTIC	<input type="checkbox"/> PL BRONZE	<input type="checkbox"/> OT OTHER

NUMBER OF UNSUCCESSFUL WELLS: \_\_\_\_\_

WELL HYDROFRACTURED  Y  N

CIRCLE APPROPRIATE LETTER

**A** A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

**E** ELECTRIC LOG OBTAINED

**P** TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO. M G D 046

DRILLERS SIGNATURE \_\_\_\_\_  
 (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. M D AWD591

**C2** DEPTH (nearest ft.)

1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
E	1	2	3	4	5	6	7	8	9
A	10	11	12	13	14	15	16	17	18
C	19	20	21	22	23	24	25	26	27
H	28	29	30	31	32	33	34	35	36
S	37	38	39	40	41	42	43	44	45
C	46	47	48	49	50	51	52	53	54
R	55	56	57	58	59	60	61	62	63
E	64	65	66	67	68	69	70	71	72
E	73	74	75	76	77	78	79	80	81
N	82	83	84	85	86	87	88	89	90

SLOT SIZE 1 0 2 1 3 0

DIAMETER OF SCREEN 2 (NEAREST INCH)  
 from 58 to 70

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)

T \_\_\_\_\_ (E.R.O.S.) W Q \_\_\_\_\_

**C3**

**PUMPING TEST** NIA

HOURS PUMPED (nearest hour) 8 9

PUMPING RATE (gal. per min.) 11 15

METHOD USED TO MEASURE PUMPING RATE \_\_\_\_\_

WATER LEVEL (distance from land surface)

BEFORE PUMPING 17 20 ft.

WHEN PUMPING 22 25 ft.

TYPE OF PUMP USED (for test)

A air  P piston  T turbine

C centrifugal  R rotary  O other (describe below)

J jet  S submersible

**PUMP INSTALLED**

DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES  NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29. 29

CAPACITY: GALLONS PER MINUTE (to nearest gallon) 31 35

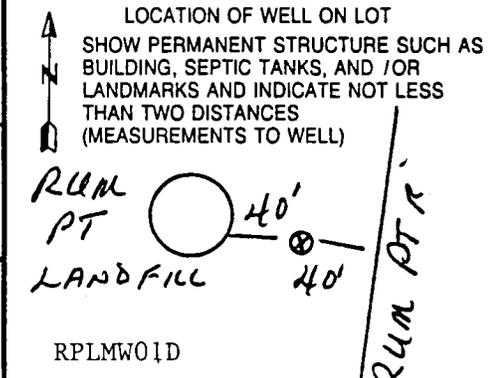
PUMP HORSE POWER 37 41

PUMP COLUMN LENGTH (nearest ft.) 43 47

CASING HEIGHT (circle appropriate box and enter casing height)

+ above } LAND SURFACE

- below } 02 (nearest foot)





<b>C 1</b>	<b>3243</b>	SEQUENCE NO. (MDE USE ONLY)	<b>STATE OF MARYLAND WELL COMPLETION REPORT</b> FILL IN THIS FORM COMPLETELY PLEASE PRINT OR TYPE	THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.
1 2 3 4 5 6 (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)				
ST/CO USE ONLY DATE Received MM DD YY 8 13		DATE WELL COMPLETED MM DD YY 07 12 97	Depth of Well 22 43' 26 (TO NEAREST FOOT)	PERMIT NO. FROM "PERMIT TO DRILL" CH - 94 -

OWNER Naval Surface Warfare Center (6297)  
 STREET OR RFD Stump Neck Annex TOWN Indian Head  
 SUBDIVISION \_\_\_\_\_ SECTION \_\_\_\_\_ LOT \_\_\_\_\_

**WELL LOG**  
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET		check if water bearing
	FROM	TO	
gray silt and sand	0	2	
brown/gray clay, silt, tr sand	2	4	
brown silty clay & sand	4	16	
dark gray silty sand	16	33	
silty clay and sand	33	43'	
water @ approx	40'		

**GROUTING RECORD**

WELL HAS BEEN GROUTED (Circle Appropriate Box)  
 YES  NO

TYPE OF GROUTING MATERIAL (Circle one)  
 CEMENT  BENTONITE CLAY

NO. OF BAGS 45 NO. OF POUNDS 900  
 GALLONS OF WATER \_\_\_\_\_  
 DEPTH OF GROUT SEAL (to nearest foot)  
 from 0 ft. to 31 ft.  
 (enter 0 if from surface)

**CASING RECORD**

(casing types insert appropriate code below)

<input checked="" type="checkbox"/> ST STEEL	<input type="checkbox"/> CO CONCRETE
<input type="checkbox"/> PL PLASTIC	<input type="checkbox"/> OT OTHER

MAIN CASING TYPE PL Nominal diameter top (main) casing (nearest inch)! 2 Total depth of main casing (nearest foot) 33

**OTHER CASING (if used)**

EACH CASING diameter inch depth (feet) from to

**SCREEN RECORD**

screen type or open hole (insert appropriate code below)

<input checked="" type="checkbox"/> ST STEEL	<input type="checkbox"/> BR BRASS	<input type="checkbox"/> HO OPEN HOLE
<input type="checkbox"/> PL PLASTIC	<input type="checkbox"/> OT OTHER	

NUMBER OF UNSUCCESSFUL WELLS: \_\_\_\_\_

WELL HYDROFRACTURED  YES  NO

N/A CIRCLE APPROPRIATE LETTER

**A** A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED  
**E** ELECTRIC LOG OBTAINED  
**P** TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO. MG D 046

DRILLERS SIGNATURE [Signature]  
(MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. M D AWD591

**C 2** DEPTH (nearest ft.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
E	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
C	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
H	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
S																				
R																				
E																				
E																				
N																				

DIAMETER OF SCREEN 2 (NEAREST INCH)  
 from 31 to 43

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68 68

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)  
 T \_\_\_\_\_ (E.R.O.S.) W Q \_\_\_\_\_

**C 3**

PUMPING TEST N/A

HOURS PUMPED (nearest hour) 8

PUMPING RATE (gal. per min.) 11

METHOD USED TO MEASURE PUMPING RATE \_\_\_\_\_

WATER LEVEL (distance from land surface)

BEFORE PUMPING 17 ft.

WHEN PUMPING 22 ft.

TYPE OF PUMP USED (for test)

A air  P piston  T turbine  
 C centrifugal  R rotary  O other (describe below)  
 J jet  S submersible

**MONITORING**

**PUMP INSTALLED**

DRILLER WILL INSTALL PUMP YES  NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29 29

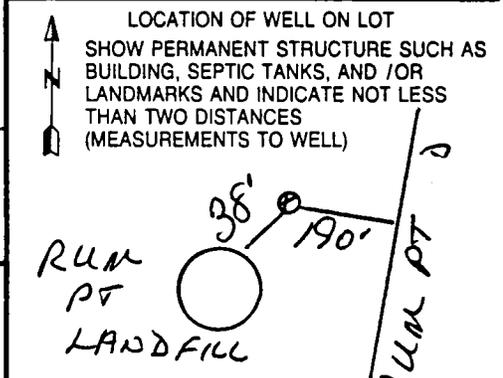
CAPACITY: GALLONS PER MINUTE (to nearest gallon) 31

PUMP HORSE POWER 37

PUMP COLUMN LENGTH (nearest ft.) 43

CASING HEIGHT (circle appropriate box and enter casing height)

+ above } LAND SURFACE 02 (nearest foot)  
 - below }



C 1 3245

SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

COUNTY NUMBER 97-332-W(M)

ST/CO USE ONLY DATE RECEIVED

DATE WELL COMPLETED

Depth of Well

PERMIT NO. FROM "PERMIT TO DRILL WELL" CH - 94 - 1533

OWNER Naval Surface Warfare Center (6299) STREET OR RFD Stump Neck Annex TOWN Indian Head SUBDIVISION SECTION LOT

WELL LOG table with columns: DESCRIPTION, FEET (FROM, TO), check if water bearing. Includes entries for topsoil & silt, orange/brown silt, clay and sand, orange silt, tr sand & clay, orange silty sand, and water @ approx 18'.

GROUTING RECORD form with fields: WELL HAS BEEN GROUTED (Y), TYPE OF GROUTING MATERIAL (CM, BC), NO. OF BAGS (4), NO. OF POUNDS (400), GALLONS OF WATER (28), DEPTH OF GROUT SEAL (13).

CASING RECORD form with fields: casing types (ST, CO, PL, OT), MAIN CASING TYPE (PL), Nominal diameter (2), Total depth (15).

OTHER CASING (if used) table with columns: diameter, depth (from, to).

SCREEN RECORD form with fields: screen type (ST, BR, HO, PL, OT), insert appropriate code below.

DEPTH (nearest ft.) table with columns: casing height (E, A, C, H, S, C, R, E, N), depth (8, 9, 11, 15, 17, 21, 23, 24, 26, 30, 32, 36, 38, 39, 41, 45, 47, 51).

Administrative fields: NUMBER OF UNSUCCESSFUL WELLS, WELL HYDROFRACTURED (Y), CIRCLE APPROPRIATE LETTER (A, E, P), LIC. NO. M D AWD591.

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT...

DRILLERS LIC. NO. M G D 046, DRILLERS SIGNATURE (M. G. D.), LIC. NO. M D AWD591.

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

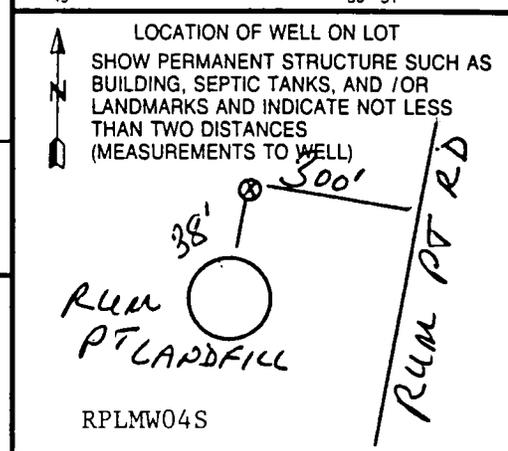
GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68. Values: 13, 25.

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER) T (E.R.O.S.) W Q

TELESCOPE CASING LOG INDICATOR OTHER DATA

PUMPING TEST form with fields: PUMPING TEST (N/A), HOURS PUMPED (8, 9), PUMPING RATE (11, 15), METHOD USED TO MEASURE PUMPING RATE, WATER LEVEL (distance from land surface) BEFORE PUMPING (17, 20) ft., WHEN PUMPING (22, 25) ft., TYPE OF PUMP USED (for test) (O) other (describe below).

PUMP INSTALLED form with fields: DRILLER WILL INSTALL PUMP (NO), TYPE OF PUMP INSTALLED (29), CAPACITY: GALLONS PER MINUTE (31, 35), PUMP HORSE POWER (37, 41), PUMP COLUMN LENGTH (43, 47), CASING HEIGHT (+) above LAND SURFACE (02) (nearest foot).



C1 3343

SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT

FILL IN THIS FORM COMPLETELY PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER 97-374-W(M)

ST/CO USE ONLY DATE Received MM DD YY

DATE WELL COMPLETED

Depth of Well

PERMIT NO. FROM "PERMIT TO DRILL WELL"

8 13

MM 08 DD 05 YY 97

22 46 26 (TO NEAREST FOOT)

CH 94 28 29 30 31 32 33 34 35 37

OWNER US NAVAL Warfare Center

STREET OR RFD Indian Head TOWN Indian Head, MD 20640

SUBDIVISION SECTION LOT

WELL LOG

Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed) FEET FROM TO check if water bearing

Table with 3 columns: Description, Feet (From/To), and Check if water bearing. Rows include: medium dark gray fine sand w/some clayey silt (0-37), pale green sand (37-40), pale green silty fine to med sand (40-44), gray/brown clayey silt (44-46').

GROUTING RECORD

WELL HAS BEEN GROUTED (Circle Appropriate Box)

TYPE OF GROUTING MATERIAL (Circle one)

CEMENT [C] BENTONITE CLAY [B]

NO. OF BAGS 70 NO. OF POUNDS 70

GALLONS OF WATER 70 DEPTH OF GROUT SEAL (to nearest foot) from 0 ft. to 34 ft.

CASING RECORD

Case types insert appropriate code below: [S] STEEL, [C] CONCRETE, [P] PLASTIC, [O] OTHER

MAIN CASING TYPE [P] Nominal diameter top (main) casing (nearest inch)! 2 Total depth of main casing (nearest foot) 36

OTHER CASING (if used)

Table for other casing with columns for diameter (inch) and depth (feet) from/to.

SCREEN RECORD

screen type or open hole (insert appropriate code below): [S] STEEL, [B] BRASS, [H] OPEN HOLE, [P] PLASTIC, [O] OTHER

NUMBER OF UNSUCCESSFUL WELLS:

WELL HYDROFRACTURED [Y] [N]

CIRCLE APPROPRIATE LETTER: A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED; E ELECTRIC LOG OBTAINED; P TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO. M 90 046 DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. M D AWD591

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

DEPTH (nearest ft.)

Table for casing depth with columns for casing height (1-6) and depth (ft.)

SLOT SIZE 1 0 2 1 3 0 DIAMETER OF SCREEN 2 (NEAREST INCH) from 34 to 46

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER) T (E.R.O.S.) W Q

70 72 TELESCOPE LOG INDICATOR 74 75 76 OTHER DATA

C 3

PUMPING TEST N/A

HOURS PUMPED (nearest hour) 8 9

PUMPING RATE (gal. per min.) 11 15

METHOD USED TO MEASURE PUMPING RATE

WATER LEVEL (distance from land surface)

BEFORE PUMPING 17 20 ft.

WHEN PUMPING 22 25 ft.

TYPE OF PUMP USED (for test)

[A] air, [P] piston, [T] turbine, [C] centrifugal, [R] rotary, [O] other (describe below), [J] jet, [S] submersible

MONITORING

PUMP INSTALLED

DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES NO

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29

CAPACITY: GALLONS PER MINUTE (to nearest gallon) 31 35

PUMP HORSE POWER 37 41

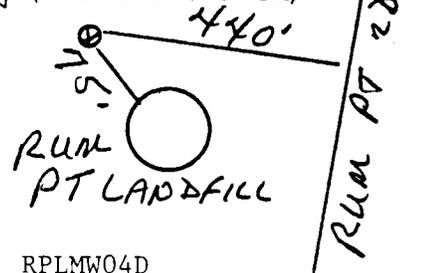
PUMP COLUMN LENGTH (nearest ft.) 43 47

CASING HEIGHT (circle appropriate box and enter casing height)

[+] above, [-] below LAND SURFACE 02 (nearest foot)

LOCATION OF WELL ON LOT

SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND /OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)



RPLMW04D

**SWMU 4 CHICAMUXEN CREEK'S EDGE DUMP SITE B**

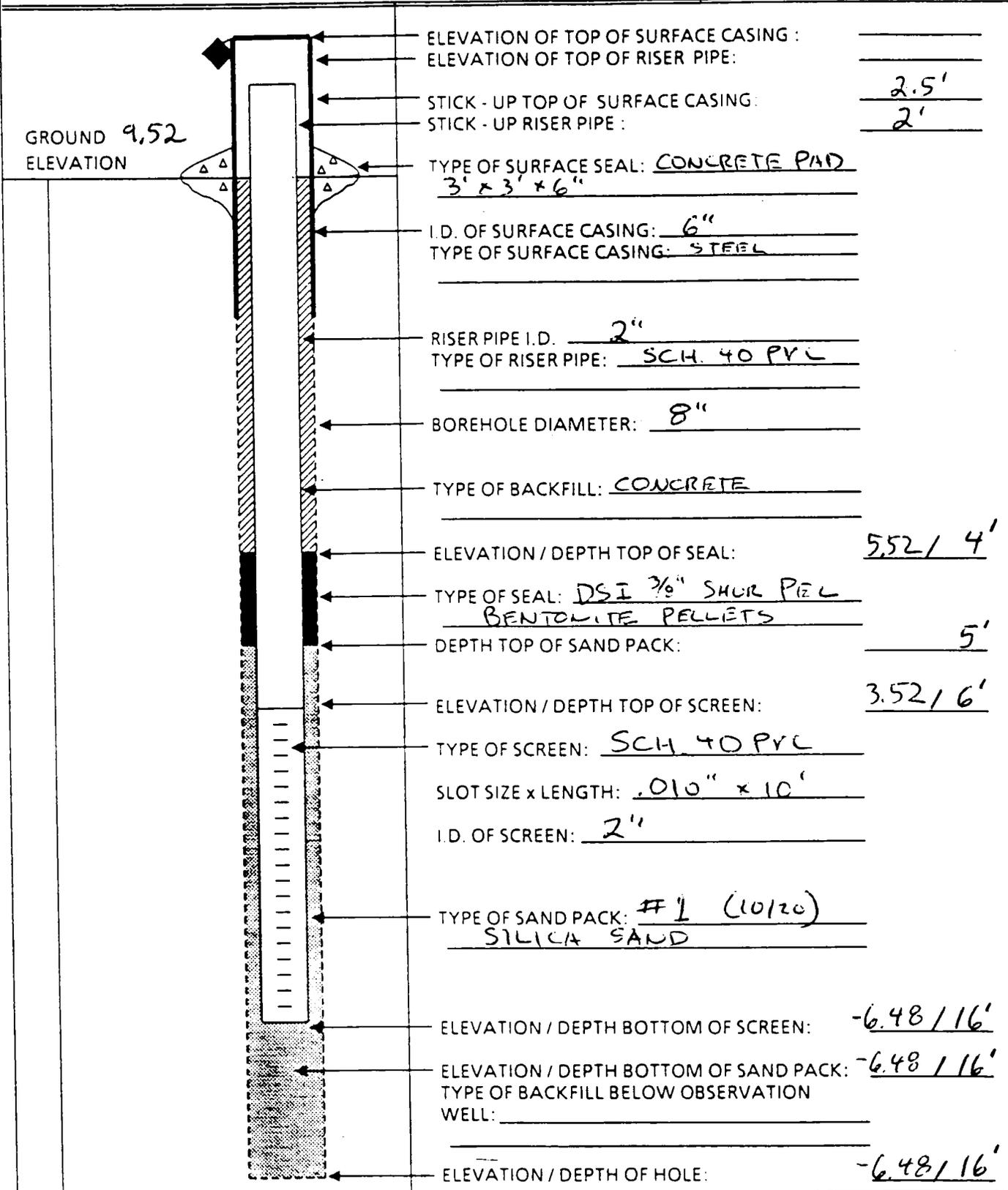


BORING NO.: DSB5B01  
DSB MWC1

# OVERBURDEN MONITORING WELL SHEET

PROJECT STUMPNECK RIVE LOCATION DUMPSITE B  
PROJECT NO. 7581 BORING DSB MWC1  
ELEVATION \_\_\_\_\_ DATE 7-10-97  
FIELD GEOLOGIST FRED W RAMSER

DRILLER DAVE TAYLOR  
DRILLING METHOD 4 1/4 HSI  
DEVELOPMENT METHOD 2" SUB PUMP

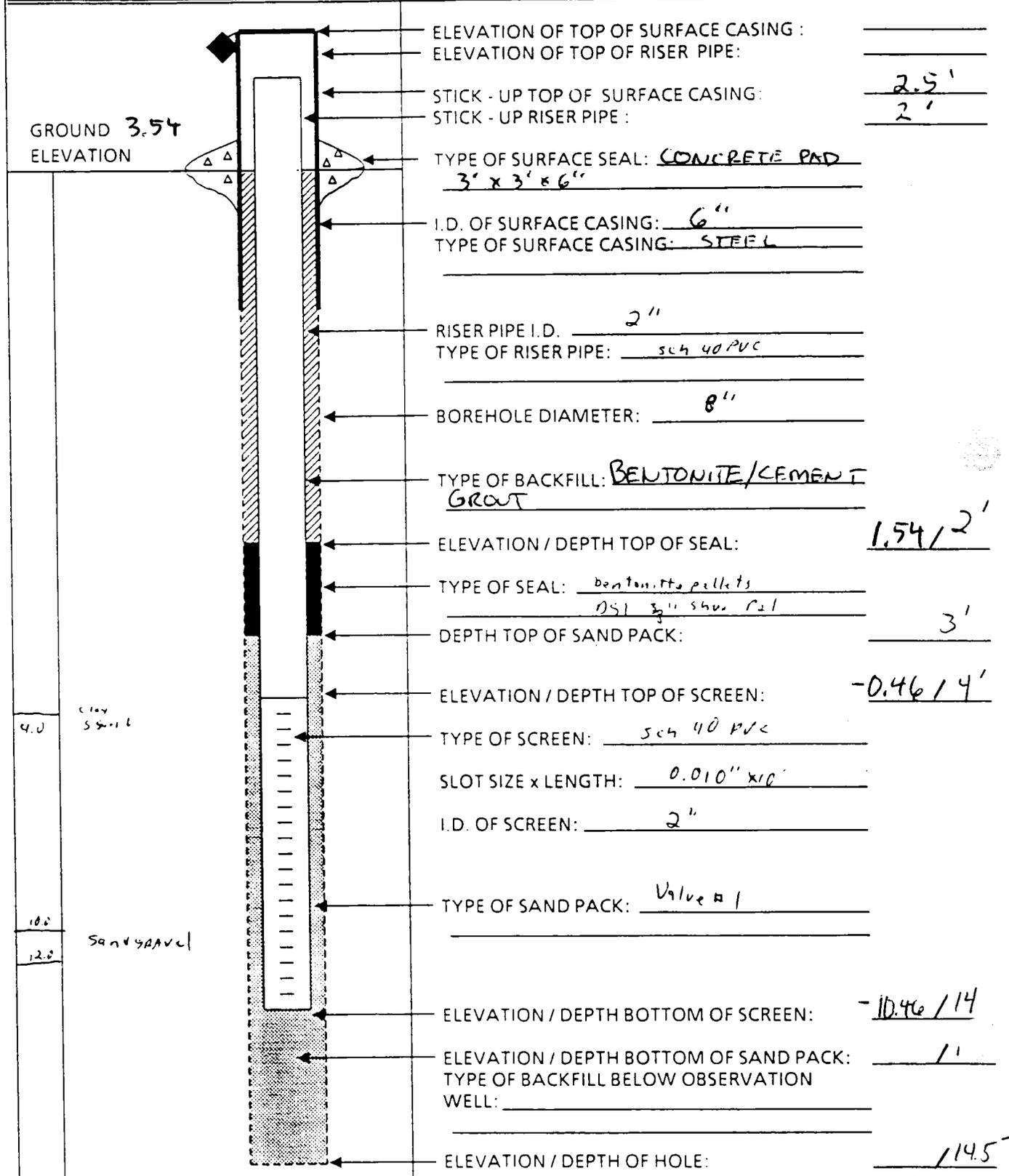




BORING NO.: DSB5302  
DSBMW02

# OVERBURDEN MONITORING WELL SHEET

PROJECT <u>Stump Creek</u>	LOCATION <u>Am. posit 13</u>	DRILLER <u>McKinney</u>
PROJECT NO. <u>7581</u>	BORING <u>DSB5302</u>	DRILLING METHOD <u>HSA</u>
ELEVATION _____	DATE <u>7-23-97</u>	DEVELOPMENT METHOD <u>BTLGR/SUB. PUMP</u>
FIELD GEOLOGIST <u>F. Wozniak</u>		

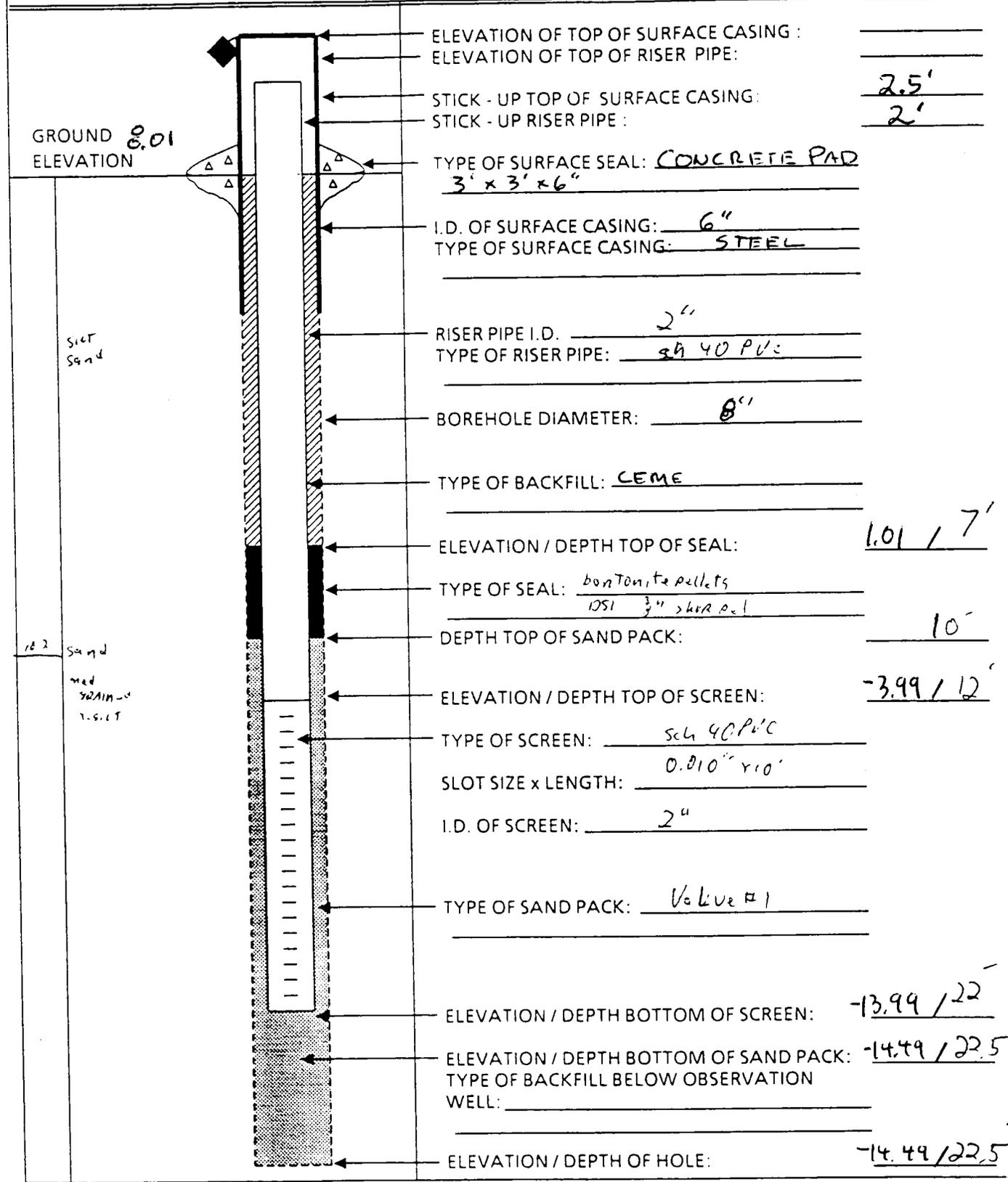




BORING NO.: DSB 51303  
DSBmw03

# OVERBURDEN MONITORING WELL SHEET

PROJECT <u>JUMP Neck</u>	LOCATION <u>WMP SITE 13</u>	DRILLER <u>M. MCKINNEY</u>
PROJECT NO. <u>7581</u>	BORING <u>DSB 51303</u>	DRILLING METHOD <u>HSA</u>
ELEVATION _____	DATE <u>7-22-97</u>	DEVELOPMENT METHOD <u>BAILER</u>
FIELD GEOLOGIST <u>F. WUNDERLICH</u>		



ELEVATION OF TOP OF SURFACE CASING: \_\_\_\_\_  
 ELEVATION OF TOP OF RISER PIPE: \_\_\_\_\_  
 STICK - UP TOP OF SURFACE CASING: 2.5'  
 STICK - UP RISER PIPE: 2'  
 TYPE OF SURFACE SEAL: CONCRETE PAD  
3' x 3' x 6"  
 I.D. OF SURFACE CASING: 6"  
 TYPE OF SURFACE CASING: STEEL  
 RISER PIPE I.D.: 2"  
 TYPE OF RISER PIPE: sch 40 PVC  
 BOREHOLE DIAMETER: 8"  
 TYPE OF BACKFILL: CEMENT  
 ELEVATION / DEPTH TOP OF SEAL: 1.01 / 7'  
 TYPE OF SEAL: bentonite pellets  
10SI 3/4" shaft seal  
 DEPTH TOP OF SAND PACK: 10'  
 ELEVATION / DEPTH TOP OF SCREEN: -3.99 / 12'  
 TYPE OF SCREEN: sch 40 PVC  
 SLOT SIZE x LENGTH: 0.010" x 10'  
 I.D. OF SCREEN: 2"  
 TYPE OF SAND PACK: 1/2" Lvs #1  
 ELEVATION / DEPTH BOTTOM OF SCREEN: -13.99 / 22'  
 ELEVATION / DEPTH BOTTOM OF SAND PACK: -14.49 / 22.5'  
 TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_  
 ELEVATION / DEPTH OF HOLE: -14.49 / 22.5'

GROUND ELEVATION 8.01

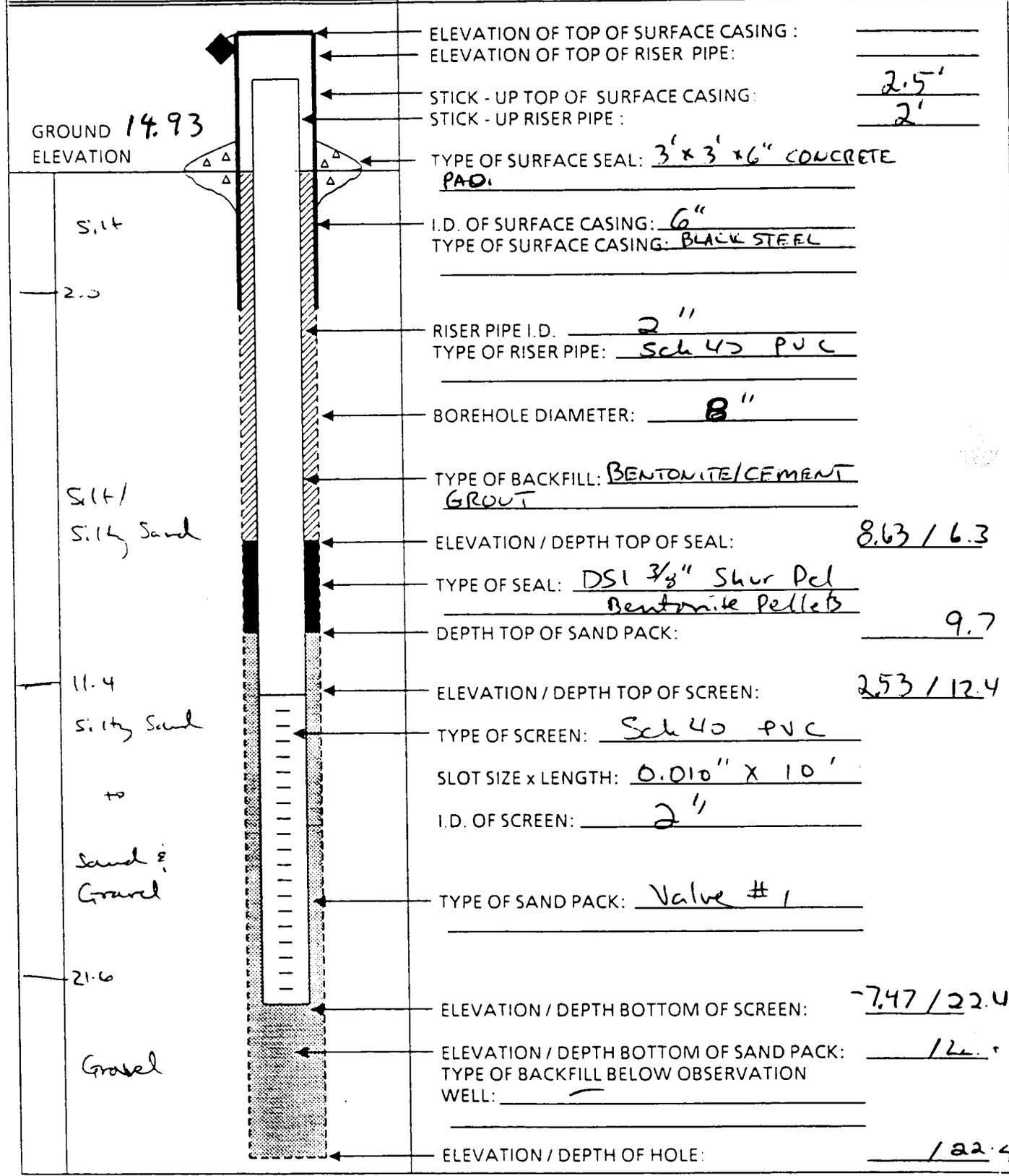
Silt Sand

med sand  
 2.5.15



# OVERBURDEN MONITORING WELL SHEET

PROJECT <u>REF/VI VI</u>	LOCATION <u>Stump Neck</u>	DRILLER <u>M. McKus</u>
PROJECT NO. <u>7581</u>	BORING <u>DSB-11W04</u>	DRILLING METHOD <u>HSA</u>
ELEVATION _____	DATE <u>7-22-97</u>	DEVELOPMENT METHOD <u>BAILER</u>
FIELD GEOLOGIST <u>T. Evans</u>		



GROUND ELEVATION 14.93

ELEVATION OF TOP OF SURFACE CASING : \_\_\_\_\_  
 ELEVATION OF TOP OF RISER PIPE : \_\_\_\_\_

STICK - UP TOP OF SURFACE CASING : 2.5'  
 STICK - UP RISER PIPE : 2'

TYPE OF SURFACE SEAL: 3' x 3' x 6" CONCRETE PAD.

I.D. OF SURFACE CASING: 6"  
 TYPE OF SURFACE CASING: BLACK STEEL

RISER PIPE I.D. 2"  
 TYPE OF RISER PIPE: Sch 40 PVC

BOREHOLE DIAMETER: 8"

TYPE OF BACKFILL: BENTONITE/CEMENT GROUT

ELEVATION / DEPTH TOP OF SEAL: 8.63 / 6.3

TYPE OF SEAL: DSI 3/8" Shur Pel Bentonite Pellets

DEPTH TOP OF SAND PACK: 9.7

ELEVATION / DEPTH TOP OF SCREEN: 25.3 / 12.4

TYPE OF SCREEN: Sch 40 PVC

SLOT SIZE x LENGTH: 0.010" x 10'

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: Value # 1

ELEVATION / DEPTH BOTTOM OF SCREEN: -7.47 / 22.4

ELEVATION / DEPTH BOTTOM OF SAND PACK: 12.0

TYPE OF BACKFILL BELOW OBSERVATION WELL: \_\_\_\_\_

ELEVATION / DEPTH OF HOLE: 122.4

Silt

Silt / Silty Sand

Silty Sand

Sand & Gravel

21.6

Gravel



C1 3230

SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

1 2 3 6 (THIS NUMBER IS TO BE PUNCHED IN COLS 3-6 ON ALL CARDS)

COUNTY NUMBER 97-324-W(M)

ST/CO USE ONLY DATE RECEIVED

DATE WELL COMPLETED

Depth of Well 22 14' 26 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CH 94 1'

OWNER Naval Surface Warfare Center (6303) STREET OR RFD Stump Neck Annex TOWN Indian Head SUBDIVISION SECTION LOT

WELL LOG table with columns: DESCRIPTION, FEET (FROM, TO), check if water bearing. Rows include roots, silt & sand; silt & sand, tr clay; clay & fine sand; sand & gravel; water @ approx 5'

GROUTING RECORD: WELL HAS BEEN GROUTED (Y), TYPE OF GROUTING MATERIAL (CM), CEMENT (CM), BENTONITE CLAY (BC), NO. OF BAGS 1, NO. OF POUNDS 700, DEPTH OF GROUT SEAL 3

CASING RECORD: casing types (PL), MAIN CASING TYPE (PL), Nominal diameter top (main) casing 2, Total depth of main casing 4

OTHER CASING (if used) table with columns: diameter inch, depth (feet) from, to

SCREEN RECORD: screen type or open hole (HO), insert appropriate code below

NUMBER OF UNSUCCESSFUL WELLS:

WELL HYDROFRACTURED (Y)

CIRCLE APPROPRIATE LETTER: A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION"

DRILLERS LIC. NO. M G D 046 DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. M D AWD591

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

DEPTH (nearest ft.) table with rows: A, C, H, S, C, R, E, N and columns: 1, 2, 4, 14

GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER) T (E.R.O.S.) W Q

TELESCOPE CASING LOG INDICATOR OTHER DATA

PUMPING TEST: PUMPING TEST N/A, HOURS PUMPED 8 9, PUMPING RATE 11 15, METHOD USED TO MEASURE PUMPING RATE, WATER LEVEL, BEFORE PUMPING 17 20, WHEN PUMPING 22 25, TYPE OF PUMP USED (for test) O

PUMP INSTALLED: DRILLER WILL INSTALL PUMP (YES or NO) YES

IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.

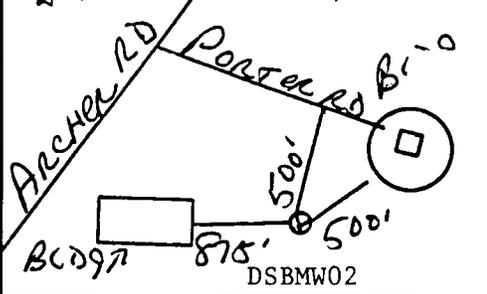
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29

CAPACITY: GALLONS PER MINUTE (to nearest gallon) 31 35

PUMP HORSE POWER 37 41

PUMP COLUMN LENGTH (nearest ft.) 43 47

CASING HEIGHT (circle appropriate box and enter casing height) + above, - below, LAND SURFACE 02 (nearest foot)



**C1** **3228** SEQUENCE NO. (MDE USE ONLY)

1 2 3 6  
 (THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

**STATE OF MARYLAND**  
**WELL COMPLETION REPORT**  
 FILL IN THIS FORM COMPLETELY  
 PLEASE PRINT OR TYPE

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

COUNTY NUMBER **97-322-W(M)**

ST/CO USE ONLY  
 DATE RECEIVED  
 MM DD YY  
 8 13

DATE WELL COMPLETED  
 MM DD YY  
 07 22 97

Depth of Well  
 22 22' 26  
 (TO NEAREST FOOT)

PERMIT NO.  
 FROM "PERMIT TO DRILL WELL"  
 CH - 94 - 1523

28 29 30 31 32 33 34 35 36 37

OWNER Naval Surface Warfare Center (6301)  
 STREET OR RFD Stump Neck Annex TOWN Indian Head  
 SUBDIVISION \_\_\_\_\_ SECTION \_\_\_\_\_ LOT \_\_\_\_\_

**WELL LOG**  
 Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

DESCRIPTION (Use additional sheets if needed)	FEET		check if water bearing
	FROM	TO	
silt, sand & roots	0	2	
silty sand	2	6	
silty sand & clay, lt brown	6	10	
lt brown/gray sand w/tr silt	10	20	
lt brown sand w/tr gravel	20	22'	
water @ approx	12'		

**GROUTING RECORD** (yes  no   
 WELL HAS BEEN GROUTED (Circle Appropriate Box) **Y** **N**  
 TYPE OF GROUTING MATERIAL (Circle one) CEMENT **CM** BENTONITE CLAY **BC**  
 NO. OF BAGS 3 NO. OF POUNDS 300  
 GALLONS OF WATER 21  
 DEPTH OF GROUT SEAL (to nearest foot) from 0 ft. to 10 ft.  
 (enter 0 if from surface)

**CASING RECORD**  
 casing types insert appropriate code below  
**ST** STEEL **CO** CONCRETE  
**PL** PLASTIC **OT** OTHER  
 MAIN CASING TYPE PL Nominal diameter top (main) casing (nearest inch)! 2 Total depth of main casing (nearest foot) 12  
 60 61 63 64 66 70

**OTHER CASING (if used)**  
 diameter inch depth (feet) from to  
 \_\_\_\_\_

**SCREEN RECORD**  
 screen type or open hole insert appropriate code below  
**ST** STEEL **BR** BRASS **HO** OPEN HOLE  
**PL** PLASTIC **OT** OTHER

NUMBER OF UNSUCCESSFUL WELLS: \_\_\_\_\_

WELL HYDROFRACTURED **Y** **N**

**A** CIRCLE APPROPRIATE LETTER  
**A** A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED  
**E** ELECTRIC LOG OBTAINED  
**P** TEST WELL CONVERTED TO PRODUCTION WELL

I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 26.04.04 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS LIC. NO. M G D 046  
 DRILLERS SIGNATURE \_\_\_\_\_  
 (MUST MATCH SIGNATURE ON APPLICATION)

LIC. NO. M G D 081  
 SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

**C2** DEPTH (nearest ft.)  
 1 2  
 8 9 11 15 17 21  
 23 24 26 30 32 36  
 38 39 41 45 47 51  
 SLOT SIZE 1 0 2 1 3 0  
 DIAMETER OF SCREEN 2 (NEAREST INCH)  
 56 60  
 from to

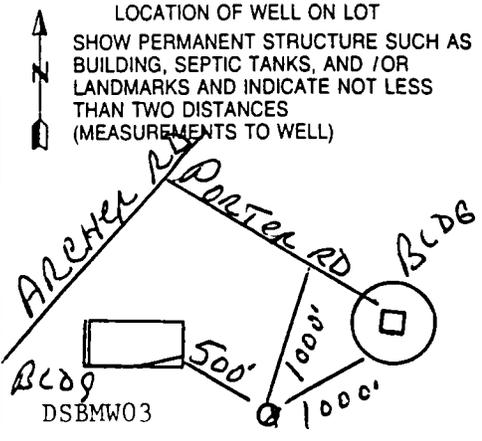
GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68  
10 22  
 68

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)  
 T (E.R.O.S.) W Q  
 70 72 74 75 76

TELESCOPE CASING LOG INDICATOR OTHER DATA

**C3** PUMPING TEST N/A  
 HOURS PUMPED (nearest hour) \_\_\_\_\_  
 PUMPING RATE (gal. per min.) \_\_\_\_\_  
 METHOD USED TO MEASURE PUMPING RATE \_\_\_\_\_  
 WATER LEVEL (distance from land surface)  
 BEFORE PUMPING \_\_\_\_\_ ft.  
 WHEN PUMPING \_\_\_\_\_ ft.  
 TYPE OF PUMP USED (for test)  
**A** air **P** piston **T** turbine  
**C** centrifugal **R** rotary **O** other (describe below)  
**J** jet **S** submersible  
 MONITORING

**PUMP INSTALLED**  
 DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES  NO   
 IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS.  
 TYPE OF PUMP INSTALLED \_\_\_\_\_  
 PLACE (A,C,J,P,R,S,T,O) IN BOX 29 \_\_\_\_\_  
 CAPACITY: GALLONS PER MINUTE (to nearest gallon) \_\_\_\_\_  
 PUMP HORSE POWER \_\_\_\_\_  
 PUMP COLUMN LENGTH (nearest ft.) \_\_\_\_\_  
 CASING HEIGHT (circle appropriate box and enter casing height)  
**+** above } LAND SURFACE  
**-** below } 02 (nearest foot)  
 49 50 51





## **I.2 MONITORING WELL DEVELOPMENT SHEETS**

SWMU 5 RANGE 6



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RI/VI SITE/LOCATION: RANGE 6  
 PROJECT NUMBER: 7581 WELL ID.: BN6MW02  
 WEATHER: CLEAR DATE: 8-2-97  
 STATIC WATER LEVEL: 5.46 PERSONNEL: FUR  
 TOTAL WELL DEPTH: 21.05 WELL TYPE: (PVC) [S.S.], or  
 ONE CASING VOLUME: 2.66 OTHER \_\_\_\_\_  
 START TIME: 1530 MEASURING DEVICE: M-SCOPE  
 END TIME: 1635 ADJUSTMENT FACTOR: N/A

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS SURGE/PUMP WELL CONT. TO GO DRY ALLOWED TO RECOVER.

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
1545	10 GAL	BRN	6.45	1.5	7999	-	20.5	.09
1600	15 GAL	BRN	6.61	2.1	7999	-	20.5	.09
1635	20 GAL	BRN	6.60	2.1	7999	-	20.7	.09

NOTE: All measurements to nearest 0.01 foot measured from top of well unless otherwise noted.

ADDITIONAL COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s): SU



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RI/VI SITE/LOCATION: RANGE 6  
 PROJECT NUMBER: 7581 WELL ID.: RNG MW03  
 WEATHER: CLEAR DATE: 8-2-97  
 STATIC WATER LEVEL: 3' PVC 11.42 PERSONNEL: PUR  
 TOTAL WELL DEPTH: 19.25 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: 1.3 gal OTHER \_\_\_\_\_  
 START TIME: 1400 MEASURING DEVICE: M-SCOPE  
 END TIME: 1440 ADJUSTMENT FACTOR: N/A

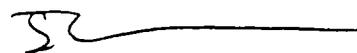
[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS SURGRD w/ BAILER + PUMP

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
5 gal	1407	YELBRN	6.00	.091	999	—	21.0	.00
10 gal	1430	YELBRN	6.62	.080	999	—	19.5	.00
15 gal	1440	YELBRN	6.60	.085	999	—	19.0	.00

NOTE: All measurements to nearest 0.01 foot measured from top of well insert pipe unless otherwise noted

ADDITIONAL COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s) 



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RIVER SITE/LOCATION: RANGE 6  
 PROJECT NUMBER: 7581 WELL ID.: RN6MW04  
 WEATHER: CLEAR DATE: 7-15-97  
 STATIC WATER LEVEL: 24.5 PERSONNEL: FUR  
 TOTAL WELL DEPTH: 35.2 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: 1.76 OTHER \_\_\_\_\_  
 START TIME: 1630 MEASURING DEVICE: M-SCOPE  
 END TIME: 1730 ADJUSTMENT FACTOR: N/A

[ ] DOMESTIC WELL. [] MONITORING WELL. [ ] OTHER \_\_\_\_\_

METHOD & REMARKS SURGED W/ BAILER + PUMP

Approximate Volume	Time	Color	pH (S.U.)	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
2	1645	YELBRN	6.81	.091	999	-	23.0	0.00
4	1710	YELBRN	6.07	.060	999	-	22.8	0.00
6	1730	YELBRN	5.99	.061	999	-	22.6	0.00

NOTE: All measurements to nearest 0.01 foot measured from top of well unless otherwise noted.

ADDITIONAL COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s): [Signature]

PAGE \_\_\_ OF \_\_\_



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RIVE SITE/LOCATION: RANGE 6  
 PROJECT NUMBER: 7581 WELL ID.: RNG6MW05  
 WEATHER: CLEAR DATE: 7-15-97  
 STATIC WATER LEVEL: 31.5 PERSONNEL: FUR  
 TOTAL WELL DEPTH: 33.2 WELL TYPE: (PVC) [S.S.] or OTHER \_\_\_\_\_  
 ONE CASING VOLUME: 236 GAL MEASURING DEVICE: M-SCOPE  
 START TIME: 1530 ADJUSTMENT FACTOR: N/A  
 END TIME: 1630

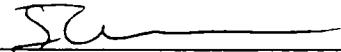
[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS SURGED + PUMPED, WELL PUMP DRY SEVERAL TIMES ALLOWED TO RECOVER IN ORDER TO LET PARAMETERS

Approximate Volume	Time	Color	pH (S.U.)	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
2 GAL	1545	YEL BRN	7.45	.053	>999	-	21.9	0.00
4 GAL	1610	YEL BRN	6.07	.050	>999	-	21.5	0.00
6 GAL	1630	YEL BRN	6.12	.045	>999	-	21.0	0.00

NOTE: All measurements to nearest 0.01 foot measured from top of well unless otherwise noted.

ADDITIONAL COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s): 

PAGE \_\_\_ OF \_\_\_

**SWMU 2/3 RANGE 3/CHICAMUXEN CREEK'S EDGE DUMP SITE A**



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RD/VI SITE/LOCATION: RANGE 3  
 PROJECT NUMBER: 7581 WELL ID.: RN3MW01  
 WEATHER: CLEAR DATE: 7-13-97  
 STATIC WATER LEVEL: 26.65 PERSONNEL: PUR  
 TOTAL WELL DEPTH: 34.00 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: - 1.3 OTHER \_\_\_\_\_  
 START TIME: 1400/1410 MEASURING DEVICE: M-SCOPE  
 END TIME: 1530/1535 ADJUSTMENT FACTOR: N/A

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS SURCED / SUB PUMP  
 \_\_\_\_\_  
 \_\_\_\_\_

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celcius)	Salinity (%)
30 GAL	1525	LT BRN CLEAR	5.44	.106	122	-	19.7°	0.00
35 GAL	1530	CLEAR	5.50	.070	72	-	18.8°	0.00
40	1535	CLEAR	5.50	.066	61	-	18.8°	0.00

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted.

ADDITIONAL COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(S): *[Signature]*

PAGE \_\_\_ OF \_\_\_



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RE/VI SITE/LOCATION: RANGE 3  
 PROJECT NUMBER: 7581 WELL ID.: RN3MW02  
 WEATHER: CLR/M DATE: 7-13-97  
 STATIC WATER LEVEL: 5.58 PERSONNEL: PUR  
 TOTAL WELL DEPTH: 14.55 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: 1.5 GALS OTHER \_\_\_\_\_  
 START TIME: 1730 HRS MEASURING DEVICE: M-SCOPE  
 END TIME: 1815 ADJUSTMENT FACTOR: N/A

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS SURGE / PUMP

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celcius)	Salinity (%)
5 GAL	1745	GRAY	6.2	.960	7999	-	24.6	.05
10 GAL	1800	"	6.3	1.10	7999	-	23.1	.07
15 GAL	1815	"	6.3	1.31	7999	-	19.8	.07

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted

ADDITIONAL COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s): 

PAGE \_\_\_ OF \_\_\_



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RD/VI SITE/LOCATION: RANGE 3  
 PROJECT NUMBER: 7581 WELL ID.: RN3MW03  
 WEATHER: CLEAR DATE: 7-13-97  
 STATIC WATER LEVEL: 2.2 PERSONNEL: RUC  
 TOTAL WELL DEPTH: 19.50 WELL TYPE: (PVC) [S.S.], or  
 ONE CASING VOLUME: 2.7 OTHER \_\_\_\_\_  
 START TIME: 1630 MEASURING DEVICE: M-SCOPE  
 END TIME: 1825 ADJUSTMENT FACTOR: N/A

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS: SURGE + PUMP PERIODICALLY, WELL CONT. TO GO DRY

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
5 GNL	1650	BRN	6.62	.083	>999	-	21.0	0.00
10 GNL	1730	RRN	6.02	.118	>999	-	20.5	0.00
15 GNL	1825	BRN/GRN	5.91	.119	>999	-	18.5	0.00

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted.

ADDITIONAL COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(S): [Signature]

PAGE \_\_\_ OF \_\_\_



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RE/VE SITE/LOCATION: RANGE 3  
 PROJECT NUMBER: 7581 WELL ID.: RN3MWO4  
 WEATHER: CLEAR DATE: 7-13-97  
 STATIC WATER LEVEL: 5.64 PERSONNEL: RUR  
 TOTAL WELL DEPTH: 28.60 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: 3.8 GAL OTHER \_\_\_\_\_  
 START TIME: 1600 MEASURING DEVICE: M-SCOPE  
 END TIME: 1700 ADJUSTMENT FACTOR: N/A

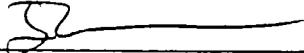
[ ] DOMESTIC WELL, [  ] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS SURGE PUMP  
 \_\_\_\_\_  
 \_\_\_\_\_

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
100 GALS	1640	GREY	5.71	2.17	620	-	19.6	0.1
110 GALS	1650	GREY	5.77	2.17	106	-	17.0	0.09
115 GALS	1700	GREY/TAN	5.72	2.17	100	-	16.0	0.10

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted

ADDITIONAL COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s): 

PAGE \_\_\_ OF \_\_\_

**SWMU 1 RUM POINT LANDFILL**



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RE/VI SITE/LOCATION: RUMPOINT LANDFILL  
 PROJECT NUMBER: 7581 WELL ID.: RPL MW01(S)  
 WEATHER: CLEAR DATE: 8-1-97  
 STATIC WATER LEVEL: 20.45 PERSONNEL: PAH/AR  
 TOTAL WELL DEPTH: 34.81 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: \_\_\_\_\_ OTHER \_\_\_\_\_  
 START TIME: 1420 MEASURING DEVICE: M-SCOPE  
 END TIME: 1630 ADJUSTMENT FACTOR: N/A

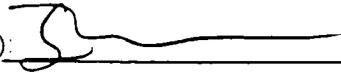
[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS BAILER  
 \_\_\_\_\_  
 \_\_\_\_\_

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
5 gal	1425	DK GRAY	7.4	526	999	-	18.2	0.01
7.5 gal	1630	DK GRAY	7.8	529	999	-	18.1	0.01

NOTE: All measurements to nearest 0.01 foot measured from top of well inser pipe unless otherwise noted

ADDITIONAL COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(S): 



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RIVER SITE/LOCATION: RUMPOINT LANDFILL  
 PROJECT NUMBER: 7581 WELL ID.: RPL MW 01 (D)  
 WEATHER: CLEAR DATE: 8-1-97  
 STATIC WATER LEVEL: 23.7 PERSONNEL: PAH/PLR  
 TOTAL WELL DEPTH: 69.5 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: \_\_\_\_\_ OTHER \_\_\_\_\_  
 START TIME: 1447 MEASURING DEVICE: M-SCOPE  
 END TIME: 1630 ADJUSTMENT FACTOR: -

[ ] DOMESTIC WELL, [ ] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
5	1455	DARK GRN	7.35	.512	999	-	16.2	.02
15	1615	LT. GRN	7.61	.542	999	-	16.0	.02

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted

ADDITIONAL COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s): *PLR*

PAGE \_\_\_ OF \_\_\_



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RI/VI SITE/LOCATION: RUM POINT LANDFILL  
 PROJECT NUMBER: 7581 WELL ID.: RPLMW02  
 WEATHER: CLEAR DATE: 8-2-97  
 STATIC WATER LEVEL: 27.00 PERSONNEL: FUR  
 TOTAL WELL DEPTH: 56.00 WELL TYPE: (PVC) [S.S.], or  
 ONE CASING VOLUME: 4.9 GAL OTHER \_\_\_\_\_  
 START TIME: 1020 MEASURING DEVICE: M-SCOPE  
 END TIME: 1300 ADJUSTMENT FACTOR: N/A

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS BAILER  
 \_\_\_\_\_  
 \_\_\_\_\_

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
B gal	1055	OLIVE GREY	8.60	.400	799	-	24.1	0.01
10 GAL	1130	"	8.48	.370	999	-	22.0	0.01
15 GAL	1300	"	8.31	.342	999	-	21.7	0.01

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted

ADDITIONAL COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s): [Signature]

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# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RI/VI SITE/LOCATION: RUMPOINT LANDFILL  
 PROJECT NUMBER: 7581 WELL ID.: RPL MW03  
 WEATHER: CLEAR DATE: 8-2-97  
 STATIC WATER LEVEL: 23.5 PERSONNEL: FUR  
 TOTAL WELL DEPTH: 45.5 WELL TYPE: (PVC) [S.S.], or  
 ONE CASING VOLUME: 3.6 GAL OTHER \_\_\_\_\_  
 START TIME: 0957 MEASURING DEVICE: M-SCOPE  
 END TIME: 1145 ADJUSTMENT FACTOR: \_\_\_\_\_

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS BAILER  
 \_\_\_\_\_  
 \_\_\_\_\_

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
8 GAL	1010	GREY	8.30	.295	999	-	17.1	.01
10 GAL	1115	GREY	8.17	.281	999	-	16.7	.01
12 GAL	1145	GREY	8.15	.279	999	-	16.5	.01

NOTE: All measurements to nearest 0.01 foot measured from top of well user pipe unless otherwise noted

ADDITIONAL COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(S): SC \_\_\_\_\_

PAGE \_\_\_ OF \_\_\_



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPHECK RI/VI SITE/LOCATION: RUMPOINT LANDFILL  
 PROJECT NUMBER: 7581 WELL ID.: RPLMW04 (S)  
 WEATHER: CLEAR DATE: 8-1-97  
 STATIC WATER LEVEL: 18.45 PERSONNEL: PAH/PVC  
 TOTAL WELL DEPTH: 23.54 WELL TYPE: (PVC), (S.S.), or  
 ONE CASING VOLUME: \_\_\_\_\_ OTHER \_\_\_\_\_  
 START TIME: 1645 MEASURING DEVICE: M-SCOPE  
 END TIME: 1730 ADJUSTMENT FACTOR: —

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS BAILER

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
<u>5 GAL</u>	<u>1700</u>	<u>YELLOW</u>	<u>7.58</u> <del>7.05</del>	<u>405</u>	<u>999</u>	<u>—</u>	<u>18.9</u>	<u>0.1</u>

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted

ADDITIONAL COMMENTS: WELL BAILED DRY AND RECOVERS TO SLOW, WATER DID BECOME CLEARER

SIGNATURE(s): [Signature]



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RI/VT SITE/LOCATION: RUMPOINT LANDFILL  
 PROJECT NUMBER: 7581 WELL ID.: RPL MW04(D)  
 WEATHER: CLEAR DATE: 8-1-97  
 STATIC WATER LEVEL: 26.72' PERSONNEL: PAH/RUR  
 TOTAL WELL DEPTH: 46.2' WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: \_\_\_\_\_ OTHER \_\_\_\_\_  
 START TIME: 1600 MEASURING DEVICE: M-SCOPE  
 END TIME: \_\_\_\_\_ ADJUSTMENT FACTOR: —

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS BALLER  
 \_\_\_\_\_  
 \_\_\_\_\_

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)
5	1610	<del>YEL GRAY</del> 600	7.70	.306	999	—	23.1	.01
12	1700	<del>NOV</del> CRAY	7.62	.301	999	—	20.9	.01

NOTE: All measurements to nearest 0.01 foot measured from top of well inner pipe unless otherwise noted

ADDITIONAL COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s): *GU* \_\_\_\_\_

PAGE \_\_\_ OF \_\_\_

**SWMU 4 CHICAMUXEN CREEK'S EDGE DUMP SITE B**



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RI/VI SITE/LOCATION: DUMP SITE B'  
 PROJECT NUMBER: 7581 WELL ID.: DSB MW 01  
 WEATHER: CLEAR DATE: 8-2-97  
 STATIC WATER LEVEL: 10.50 PERSONNEL: FUR  
 TOTAL WELL DEPTH: 18.5 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: 1.3 GAL OTHER \_\_\_\_\_  
 START TIME: 1705 MEASURING DEVICE: M-SCOPE  
 END TIME: 1800 ADJUSTMENT FACTOR: N/A

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS SURF W/BAILER + PUMP

Approximate Volume	Time	Color	pH (S.U.)	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (Celsius)	Salinity (%)
7.5 GAL	1735	YEL BRN	6.14	.178	999	-	21.5	.00
10 GAL	1745	4	6.10	.175	100	-	21.0	.00
15 GAL	1750	4	6.10	.185	40	-	21.0	.00
25 GAL	1800	LT. YEL BRN	6.08	.180	40	-	19.5	.00

NOTE: All measurements to nearest 0.01 foot, measured from top of well riser pipe unless otherwise noted

ADDITIONAL COMMENTS \_\_\_\_\_

SIGNATURE(s): [Signature]

PAGE \_\_\_ OF \_\_\_



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: <u>STUMPNECK RI/VI</u>	SITE/LOCATION: <u>Dump Site B</u>
PROJECT NUMBER: <u>7581</u>	WELL ID.: <u>DSBMW02</u>
WEATHER: <u>CLEAR</u>	DATE: <u>8-3-97</u>
STATIC WATER LEVEL: <u>4.70</u>	PERSONNEL: <u>PUR</u>
TOTAL WELL DEPTH: <u>16.50</u>	WELL TYPE: <u>(PVC)</u> [S.S.] or OTHER _____
ONE CASING VOLUME: <u>148<sup>+</sup> 1.8 gal</u>	MEASURING DEVICE: <u>M-SCOPE</u>
START TIME: <u>0910</u>	ADJUSTMENT FACTOR: <u>N/A</u>
END TIME: <u>0955</u>	

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS SURGE w/ PAILER + PUMP

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp. (Celcius)	Salinity (%)
2.5	0910	YELLOW	5.91	.181	999	-	18.4	0.00
7.5	0915	"	5.89	.181	999	-	18.4	0.00
10.0	0918	"	5.89	.175	999	-	18.4	0.00
20.0	0928	"	5.80	.170	812	-	18.0	0.00
30.0	0940	CLEAR YELLOW	5.75	.175	51	-	17.9	0.00
55.0	0955	CLEAR	5.75	.170	50	-	17.9	0.00

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted.

ADDITIONAL COMMENTS \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SIGNATURE(s): *Su* \_\_\_\_\_



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RE/VI SITE/LOCATION: DUMPSITE 'B'  
 PROJECT NUMBER: 7581 WELL ID.: DSBMW03  
 WEATHER: CLEAR DATE: 8-3-97  
 STATIC WATER LEVEL: 9.20 PERSONNEL: PUR  
 TOTAL WELL DEPTH: 23.91 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: 2.46 GAL OTHER \_\_\_\_\_  
 START TIME: 1120 MEASURING DEVICE: M-SCOPE  
 END TIME: 1200 ADJUSTMENT FACTOR: N/A

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER

METHOD & REMARKS BITILER + PUMP WELL PURGED DRY, ALLOWED TO RECOVER SEVERAL TIMES TO RECORD PARAMETERS.

Approximate Volume	Time	Color	pH (S.U.)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (Celcius)	Salinity (%)
4	1125	YEL BRN	5.52	.550	999	-	19.2	.02
8	1140	LI	5.48	.550	999	-	19.0	.02
12	1200	YEL BRN	5.46	.545	999	-	18.5	.02

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted

ADDITIONAL COMMENTS \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURE(s): SW

PAGE \_\_\_ OF \_\_\_



# WELL DEVELOPMENT SHEET

PROJECT SITE NAME: STUMPNECK RE/VI SITE/LOCATION: DSB <sup>ENC</sup> DUMPSITE B  
 PROJECT NUMBER: 7581 WELL ID.: DSBmw04  
 WEATHER: CLEAR DATE: 8-3-97  
 STATIC WATER LEVEL: 15.84 PERSONNEL: PKL  
 TOTAL WELL DEPTH: 23.62 WELL TYPE: (PVC) [S.S.] or  
 ONE CASING VOLUME: 1.3 GAL OTHER \_\_\_\_\_  
 START TIME: 1030 MEASURING DEVICE: M-SCOPE  
 END TIME: 1115 ADJUSTMENT FACTOR: N/A

[ ] DOMESTIC WELL, [] MONITORING WELL, [ ] OTHER \_\_\_\_\_

METHOD & REMARKS BATER + PUMP

Approximate Volume	Time	Color	pH (S.U.)	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (Celsius)	Salinity (%)
4 GALS	1030	YEL BRN	6.71	0.220	999	-	17.5	0.00
14 GAL	1040	TURBID	6.72	0.220	300	-	17.5	0.00
24 GAL	1050	YEL BRN CLEAR	6.51	0.230	102	-	16.5	0.00
34	1100	CLEAR	6.32	0.233	60	-	16.0	0.00
~45	1115	CLEAR	6.29	0.235	60	-	16.0	0.00

NOTE: All measurements to nearest 0.01 foot measured from top of well riser pipe unless otherwise noted

ADDITIONAL COMMENTS \_\_\_\_\_

SIGNATURE(s): JW

PAGE \_\_\_ OF \_\_\_

**(4 SITES) BASEWIDE (STUMP NECK ANNEX)**



# GROUNDWATER LEVEL MEASUREMENT SHEET

PROJECT NAME: STUMPNECK RI/VE LOCATION: STUMPNECK MD.  
 PROJECT NUMBER: 7581 MEASURING DEVICE: M-SCOPE  
 PERSONNEL: FRED W RAMSBERG/RAY WILSON ADJUSTMENT FACTOR: —  
 DATE: 8-17-97 REMARKS: ALL MEASUREMENTS FROM TPVC  
 WEATHER CONDITIONS: CLEAR HOT 95°F

Well or Piezometer Number	Time	Elevation of Reference Point (Feet)*	Water Level Indicator Reading (Feet)*	Groundwater Elevation (Feet)*	Comments
DSBMW01	737	11.73	10.49	1.24	
DSBMW02	739	5.93	4.69	1.24	
DSBMW03	743	10.40	9.27	1.13	
DSBMW04	746	16.83	15.83	1.00	
RN3MW01	752	27.76	26.54	1.22	
RN3MW02	800	5.03	4.36	0.67	
RN3MW03	815	5.56	7.48	-1.92	CAP ON AIR TIGHT FELT AIR UNDER PRESS
RN3MW04	822	6.74	5.37	1.37	
56W01	836	9.55	8.04	1.51	NO LOCK
RN6MW02	839	6.28	4.64	1.64	
RN6MW03	850	12.27	10.93	1.34	
RN6MW04	833	26.23	24.89	1.34	
RN6MW05	830	32.17	30.94	1.23	
RPLMW01(D)	920	91.23	24.92	66.31	
RPLMW01(S)	918	91.55	22.74	68.81	
RPLMW02	936	77.12	25.39	51.73	
RPLMW03	925	63.30	22.68	40.62	
RPLMW04(D)	930	66.05	20.98	45.07	
RPLMW04(S)	933	67.89	20.81	47.08	
BGDW01	0911	88.43	13.62	74.71	

\*Measurements to nearest 0.01 foot.

Signature(s): \_\_\_\_\_

**APPENDIX J**  
**STANDARD OPERATING PROCEDURES**

**CT-04**  
**SA-1.1**  
**SA-6.1**

**STANDARD OPERATING PROCEDURE CT-04**



**BROWN & ROOT ENVIRONMENTAL**

# STANDARD OPERATING PROCEDURES

Number CT-04	Page 1 of 6
Effective Date 03/01/96	Revision 0
Applicability B&R Environmental, NE	
Prepared Risk Assessment Department	
Approved D. Senovich <i>DS</i>	

Subject  
SAMPLE NOMENCLATURE

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## 1.0 PURPOSE

The purpose of this document is to specify a consistent sample nomenclature system that will facilitate subsequent data management in a cost-effective manner. The sample nomenclature system has been devised such that the following objectives can be attained:

- Sorting of data by matrix.
- Sorting of data by depth.
- Maintenance of consistency (field, laboratory, and data base sample numbers).
- Accommodation of all project-specific requirements on a global basis.
- Accommodation of laboratory sample number length constraints (10 characters).

## 2.0 SCOPE

The methods described in this procedure shall be used consistently for all projects requiring electronic data handling managed by personnel located in the Northeast Region of Brown & Root Environmental (Pittsburgh, Wayne, Holt, and Wilmington) and for any large contracts managed by the Northeast Region (e.g., NORTHDIV CLEAN, SOUTHDIV CLEAN, ARCS I, ARCS III, etc.). Smaller projects (as determined by Project Manager) are outside the scope of this SOP.

## 3.0 GLOSSARY

None.

## 4.0 RESPONSIBILITIES

**Program Manager** - It shall be the responsibility of the Program Manager (or designee) to inform contract-specific Project Managers of the existence and requirements of this Standard Operating Procedure.

**Project Manager** - It shall be the responsibility of the Project Manager to determine the applicability of this Standard Operating Procedure based on: (1) program-specific requirements, and (2) project size and objectives. It shall be the responsibility of the Project Manager (or designee) to ensure that the sample nomenclature is thoroughly specified in the relevant project planning document (e.g., sampling and analysis plan) and is consistent with this Standard Operating Procedure if relevant. It shall be the responsibility of the project manager to ensure that the Field Operations Leader is familiar with the sample nomenclature system.

**Field Operations Leader** - It shall be the responsibility of the Field Operations Leader to ensure that all field technicians or sampling personnel are thoroughly familiar with this Standard Operating Procedure and the project-specific sample nomenclature system. It shall be the responsibility of the Field Operations Leader to ensure that the sample nomenclature system is used during all project-specific sampling efforts.

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## 5.0 PROCEDURES

### 5.1 Introduction

The sample numbering system consists of 12 distinct alpha-numeric characters, only 10 of which will be provided to the laboratory on the sample labels and chain-of-custody forms. The sample number provided to the lab shall be as follows where "A" indicates "alpha," "N" indicates "numeric," and "E" indicates "either"):

E E E A A E E E N N

Once the analytical results are received from the laboratory the sample number will be revised by a subroutine such that the sample number is more user friendly (i.e., dashes will be inserted). The sample number will then appear as follows:

E E E - A A - E E E - N N

If multiple sampling events occur (or are planned) for a given matrix, a subroutine within the database will be used to append two additional characters such that the sample number will appear as follows:

E E E - A A - E E E - N N - N N

Site                      Type                      Location                      Depth                      Round

### 5.2 Sample Number Field Requirements

The various fields in the sample number will include the following:

- Site Identifier
- Sample Type
- Sample Location
- Sample Depth Indicator
- Sampling Round

The site identifier must be a three-character field (numeric characters, alpha characters, or a mixture of alpha and numeric characters may be used). A site number is necessary since many facilities/sites have multiple individual sites, SWMUs, operable units, etc.

The sample type must be a two-character alpha field. Suggested codes are provided in Section 5.3 of this SOP.

The sample location must be a three-character field (alpha, numeric, or a mixture).

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The depth field must be provided for all samples, regardless if it is strictly applicable (as discussed in Section 5.3).

The sampling round is optional, but, if provided, must be two numeric characters.

### 5.3 Example Sample Field Designations

Examples of each of the fields are as follows:

Site Number - Examples of site numbers/designations are as follows:

- A01 - Area of Concern Number 1
- 125 - Solid Waste Management Unit Number 125
- 000 - Base or Facility Wide Sample (e.g., upgradient well)
- BBG - Base Background

The examples cited are only suggestions. Each Project Manager (or designee) must designate appropriate (and consistent) site designations for their individual project.

Sample Type - Examples of sample types are as follows:

- AS - Air Sample
- BS - Biota Sample (See Note)
- CP - Composite Sample
- CS - Chip Sample
- DS - Drum Sample
- DU - Dust Sample
- FP - Free Product
- ID - Investigation Derived Waste Sample
- LT - Leachate Sample
- MW - Monitoring Well
- OF - Outfall Sample
- RW - Residential Well Sample
- SB - Soil Boring Sample
- SD - Sediment Sample
- SC - Scrape Sample
- SG - Soil Gas Sample
- SP - Seep Sample
- SS - Surface Soil Sample
- SU - Subsurface Soil Sample
- SW - Surface Water Sample
- TP - Test Pit Sample
- TW - Temporary Well Sample
- WC - Well Construction Material Sample
- WI - Wipe Sample
- WP - Well Point Sample
- WS - Waste/Sludge Sample

Note: The biota sample designation may be contingent upon the type of biota sampled (e.g., BL - Lobster; BF - Finfish; BC - Clam; BO - Oyster). Numerous other examples can be cited but will be site-specific.

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This field will also be used to designate field Quality Control Samples, as follows:

- TB - Trip Blank
- FB - Field Blank
- RB - Rinsate Blank (Equipment Blank)
- BB - Bottle Blank
- AB - Ambient Condition Blank

Field quality control samples should be numbered sequentially (e.g., RB-001; FB-010, etc.).

Filtered/unfiltered surface water or groundwater samples shall be handled in an separate manner, as subsequently discussed.

Location - Examples of the location field are as follows:

- A01 - Grid node A1
- 001 - Monitoring Well 1

It is important that consistency be maintained with respect to the use of the characters "0" and O. Data base subroutines will not sort correctly if a mixture are used (e.g, AO1 and A02).

Depth - Formerly, depth specifications were indicated with a four digit field (e.g., 0002 - 0 to 2 feet). While this is effective for depth sorting, it is difficult to include this level of detail in a 10-character lab number (FormMaster limitations). In addition, this approach will not accommodate non-integer depths (e.g., 2.5 feet to 4.5 feet).

Based on such potential problems, the following approach shall be used: Sample depths will simply represent the horizon from which the sample was obtained: For example, if ten split-spoon samples are collected from a boring, they will be numbered 01 through 10. The sample log sheet will be used to record the specific depth of the sample, and this information will be entered in a separator field in the data base.

Similar nomenclature will be used for depth-specific surface water and sediment samples, etc. If no depth information is required (e.g., groundwater samples), the field must still be filled (e.g., Ø, Ø).

This field will also be used for the designation of filtered and unfiltered samples. An unfiltered groundwater sample shall be designated as U0, if and only if, a corresponding filtered sample is collected. Such as sample shall be designated as F0.

Sampling Round - The sampling round field is straightforward. It can range from 01 to 99.

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#### 5.4 Example Sample Numbers

Examples of complete sample numbers (field/data base versus laboratory) are as follows:

Field/Data Base ID	Lab ID	Description
101-SB-A01-01	101SBA0101	The first sample (e.g., 0 to 2 feet) from soil boring A01 (grid) at Site 101.
101-SB-A01-02	101SBA0102	The second sample from boring A01 (could be the next depth interval or a duplicate of 101-SB-A01-01).
125-MW-001-01-01	125MW00101	A groundwater sample from monitoring well MW001 (first sampling round)
125-MW-001-02-01	125MW00102	A duplicate groundwater sample from monitoring well MW001 (first sampling round)
130-MW-003-U1-01	130MW003U1	An unfiltered groundwater sample from monitoring well MW003 (first sampling round)
130-MW-003-F1-01	130MW003F1	A filtered groundwater sample from monitoring well MW003 (first sampling round)
137-RB-001-00-01	137RB00100	The first rinsate blank collected at site 137.
137-TB-004-00-02	137TB00400	The fourth trip blank collected during the second sampling event at Site 137.
155-SW-003-01-01	155SW00301	A surface water sample collected from the surface of a pond at Site 155.
155-SW-003-02-01	155SW00302	A surface water sample collected from the bottom of the water column in a pond at Site 155.

**STANDARD OPERATING PROCEDURE SA-1.1**



**BROWN & ROOT ENVIRONMENTAL**

# STANDARD OPERATING PROCEDURES

Number  
SA-1.1

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Effective Date  
03/01/96

Revision  
3

Applicability  
B&R Environmental, NE

Prepared  
Earth Sciences Department

Subject  
GROUNDWATER SAMPLE ACQUISITION AND ONSITE WATER  
QUALITY TESTING

Approved  
D. Senovich *DS*

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## 1.0 PURPOSE

The purpose of this procedure is to provide general reference information regarding the sampling of groundwater wells.

## 2.0 SCOPE

This procedure provides information on proper sampling equipment, onsite water quality testing, and techniques for groundwater sampling. Review of the information contained herein will facilitate planning of the field sampling effort by describing standard sampling techniques. The techniques described shall be followed whenever applicable, noting that site-specific conditions or project-specific plans may require modifications to methodology.

## 3.0 GLOSSARY

Conductance - The conductance of a conductor 1 centimeter long and 1 square centimeter in cross-sectional area. For groundwater measurements, a volume of water contained in a 1 cm x 1 cm sample container (the water acts as the conductor). Conductivity and specific conductance are used synonymously.

Electrolytic Cell - An electrochemical cell in which electrical energy is supplied from an external source. This cell functions in much the same way as a galvanic cell, only the current flows in the opposite direction due to the external source of applied voltage. Electrolytic cells are used in dissolved oxygen measurement.

Galvanic Cell - A electrochemical cell in which chemical energy is spontaneously converted to electrical energy. The electrical energy produced is supplied to an external circuit. Galvanic cells are used in dissolved oxygen measurement.

Ohm - Standard unit of electrical resistance (R). Used in specific conductance measurement. A siemen (or umho) is the standard unit of electrical conductance, the inverse of the ohm.

Oxidation-Reduction Potential (ORP) - A measure of the activity ratio of oxidizing and reducing species as determined by the electromotive force developed by a noble metal electrode, immersed in water, as referenced against a standard hydrogen electrode.

pH - The negative logarithm (base 10) of the hydrogen ion activity. The hydrogen ion activity is related to the hydrogen ion concentration, and, in a relatively weak solution, the two are nearly equal. Thus, for all practical purposes, pH is a measure of the hydrogen ion concentration.

pH Paper - Indicator paper that turns different colors depending on the pH of the solution to which it is exposed. Comparison with color standards supplied by the manufacturer will then give an indication of the solution's pH.

Resistance - A measure of the solution's ability to oppose the passage of electrical current. For metals and solutions, resistance is defined by Ohm's Law,  $E = IR$ , where E is the potential difference, I is the current, and R is the resistance. Used in measurement of specific conductance.

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#### 4.0 RESPONSIBILITIES

Project Hydrogeologist - Responsible for selecting and detailing the specific groundwater sampling techniques, onsite water quality testing (type, frequency, and location), and equipment to be used, and providing detailed input in this regard to the project plan documents. The project hydrogeologist is also responsible for properly briefing and overseeing the performance of the site sampling personnel.

Project Geologist - is primarily responsible for the proper acquisition of the groundwater samples. He/she is also responsible for the actual analyses of onsite water quality samples, as well as instrument calibration, care, and maintenance. When appropriate, such responsibilities may be performed by other qualified personnel (e.g., field technicians).

#### 5.0 PROCEDURES

##### 5.1 General

To be useful and accurate, a groundwater sample must be representative of the particular zone of the water being sampled. The physical, chemical, and bacteriological integrity of the sample must be maintained from the time of sampling to the time of analysis in order to keep any changes in water quality parameters to a minimum.

Methods for withdrawing samples from completed wells include the use of pumps, compressed air, bailers, and various types of samplers. The primary considerations in obtaining a representative sample of the groundwater are to avoid collection of stagnant (standing) water in the well and to avoid physical or chemical alteration of the water due to sampling techniques. In a non-pumping well, there will be little or no vertical mixing of water in the well pipe or casing, and stratification will occur. The well water in the screened section will mix with the groundwater due to normal flow patterns, but the well water above the screened section will remain isolated and become stagnant. To safeguard against collecting non-representative stagnant water in a sample, the following approach shall be followed prior to sample acquisition:

1. All monitoring wells shall be purged prior to obtaining a sample. Evacuation of three to five volumes is recommended prior to sampling. In a high-yielding groundwater formation and where there is no stagnant water in the well above the screened section, extensive evacuation prior to sample withdrawal is not as critical.
2. For wells that can be purged dry, the well shall be evacuated and allowed to recover prior to sample acquisition. If the recovery rate is fairly rapid, evacuation of more than one volume of water is required.
3. For high-yielding monitoring wells which cannot be evacuated to dryness, there is no absolute safeguard against contaminating the sample with stagnant water. One of the following techniques shall be used to minimize this possibility:
  - A submersible pump or the intake line of a surface pump or bailer shall be placed just below the water surface when removing the stagnant water and lowered as the water level drops. Three to five volumes of water shall be removed to provide reasonable assurance that all stagnant water has been evacuated. Once this is accomplished, a bailer or other approved device may be used to collect the sample for analysis.

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- The intake line of the sampling pump (or the submersible pump itself) shall be placed near the bottom of the screened section, and approximately one casing volume of water shall be pumped from the well at a low purge rate, equal to the well's recovery rate (low flow sampling).

Stratification of contaminants may exist in the aquifer. Concentration gradients as a result of mixing and dispersion processes, layers of variable permeability, and the presence of separate-phase product (i.e., floating hydrocarbons) may cause stratification. Excessive pumping or improper sampling methods can dilute or increase the contaminant concentrations in the recovered sample compared to what is representative of the integrated water column as it naturally occurs at that point, thus the result is the collection of a non-representative sample.

## 5.2 Sampling, Monitoring, and Evacuation Equipment

Sample containers shall conform with the guidelines expressed in SOP SA-6.1.

The following equipment shall be on hand when sampling ground water wells (reference SOPs SA-6.1 and SA-7.1):

- Sample packaging and shipping equipment - Coolers for sample shipping and cooling, chemical preservatives, appropriate sampling containers and filler, ice, labels and chain-of-custody documents.
- Field tools and instrumentation - Thermometer, pH paper/meter, camera and film (if appropriate), appropriate keys (for locked wells), engineer's rule, water level indicator, specific conductivity meter, and turbidity meter (as applicable).
- Pumps
  - Shallow-well pumps: Centrifugal, pitcher, suction, or peristaltic pumps with droplines, air-lift apparatus (compressor and tubing) where applicable.
  - Deep-well pumps: Submersible pump and electrical power-generating unit, or air-lift apparatus where applicable
- Other sampling equipment - Bailers and inert line with tripod-pulley assembly (if necessary). Bailers or submersible centrifugal pumps shall be used to obtain samples for volatile organics from shallow and deep groundwater wells.
- Pails - Plastic, graduated.
- Decontamination solutions - Deionized water, laboratory detergents, 10% nitric acid solution (as required), and analytical-grade solvents (e.g., methanol, acetone, hexane), as required.

Ideally, sample withdrawal equipment shall be completely inert, economical, easily cleaned, cleaned prior to use, reusable, able to operate at remote sites in the absence of power sources, and capable of delivering variable rates for well flushing and sample collection.

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### 5.3 Calculations of Well Volume

To insure that the proper volume of water has been removed from the well prior to sampling it is first necessary to know the volume of standing water in the well pipe. This volume can be easily calculated by the following method. Calculations shall be entered in the site logbook or field notebook or on a sample log sheet form (see SOP SA-6.3):

- Obtain all available information on well construction (location, casing, screens, etc.).
- Determine well or casing diameter.
- Measure and record static water level (depth below ground level or top of casing reference point).
- Determine depth of well by sounding using a clean, decontaminated, weighted tape measure.
- Calculate number of linear feet of static water (total depth or length of well pipe minus the depth to static water level).
- Calculate one static well volume in gallons  $V = (0.163)(T)(r^2)$

where:

V	=	Static volume of well in gallons.
T	=	Thickness of water table in the well measured in feet (i.e., linear feet of static water).
r	=	Inside radius of well casing in inches.
0.163	=	A constant conversion factor which compensates for the conversion of the casing radius from inches to feet, the conversion of cubic feet to gallons, and pi.

- Per evacuation volumes discussed above, determine the minimum amount to be evacuated before sampling.

### 5.4 Evacuation of Static Water (Purging)

#### 5.4.1 General

The amount of purging a well shall receive prior to sample collection will depend on the intent of the monitoring program and the hydrogeologic conditions. Programs to determine overall quality of water resources may require long pumping periods to obtain a sample that is representative of a large volume of that aquifer. The pumped volume may be specified prior to sampling so that the sample can be a composite of a known volume of the aquifer. Alternately the well can be pumped until the parameters such as temperature, electrical conductance, pH, and turbidity (as applicable), have stabilized. Onsite measurements of these parameters shall be recorded in the site logbook, field notebook, or on standardized data sheets.

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#### 5.4.2 Evacuation Devices

The following discussion is limited to those devices commonly used at hazardous waste sites. Attachment A provides guidance on the proper evacuation device to use for given sampling situations. Note that all of these techniques involve equipment which is portable and readily available.

##### Bailers

Bailers are the simplest evacuation devices used and have many advantages. They generally consist of a length of pipe with a sealed bottom (bucket-type bailer) or, as is more useful and favored, with a ball check-valve at the bottom. An inert line is used to lower the bailer and retrieve the sample.

Advantages of bailers include:

- Few limitations on size and materials used for bailers.
- No external power source needed.
- Bailers are inexpensive, and can be dedicated and hung in a well to reduce the chances of cross-contamination.
- There is minimal outgassing of volatile organics while the sample is in the bailer.
- Bailers are relatively easy to decontaminate.

Limitations on the use of bailers include the following:

- It is time consuming to remove stagnant water using a bailer.
- Transfer of sample may cause aeration.
- Use of bailers is physically demanding, especially in warm temperatures at protection levels above Level D.

##### Suction Pumps

There are many different types of inexpensive suction pumps including centrifugal, diaphragm, peristaltic, and pitcher pumps. Centrifugal and diaphragm pumps can be used for well evacuation at a fast pumping rate and for sampling at a low pumping rate. The peristaltic pump is a low volume pump that uses rollers to squeeze a flexible tubing, thereby creating suction. This tubing can be dedicated to a well to prevent cross contamination. The pitcher pump is a common farm hand-pump.

These pumps are all portable, inexpensive and readily available. However, because they are based on suction, their use is restricted to areas with water levels within 20 to 25 feet of the ground surface. A significant limitation is that the vacuum created by these pumps can cause significant loss of dissolved gases and volatile organics.

##### Air-Lift Samplers

This group of pump samplers uses gas pressure either in the annulus of the well or in a venturi to force the water up a sampling tube. These pumps are also relatively inexpensive. Air (or gas)-lift samplers are more suitable for well development than for sampling because the samples may be aerated, leading to pH changes and subsequent trace metal precipitation, or loss of volatile organics.

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### Submersible Pumps

Submersible pumps take in water and push the sample up a sample tube to the surface. The power sources for these samplers may be compressed gas or electricity. The operation principles vary and the displacement of the sample can be by an inflatable bladder, sliding piston, gas bubble, or impeller. Pumps are available for 2-inch-diameter wells and larger. These pumps can lift water from considerable depths (several hundred feet).

Limitations of this class of pumps include:

- They may have low delivery rates.
- Many models of these pumps are expensive.
- Compressed gas or electric power is needed.
- Sediment in water may cause clogging of the valves or eroding the impellers with some of these pumps.
- Decontamination of internal components can be difficult and time-consuming.

### **5.5 Onsite Water Quality Testing**

This section describes the procedures and equipment required to measure the following parameters of an aqueous sample in the field:

- pH
- Specific Conductance
- Temperature
- Dissolved Oxygen (DO) Concentration
- Oxidation Reduction Potential
- Certain Dissolved Constituents Using Specific Ion Elements
- Turbidity

This section is applicable for use in an onsite groundwater quality monitoring program to be conducted at a hazardous or nonhazardous site. The procedures and equipment described are applicable to groundwater samples and are not, in general, subject to solution interferences from color, turbidity, and colloidal material or suspended matter.

This section provides general information for measuring the parameters listed above with instruments and techniques in common use. Since instruments from different manufacturers may vary, review of the manufacturer's literature pertaining to the use of a specific instrument is required before use.

#### **5.5.1 Measurement of pH**

##### **5.5.1.1 General**

Measurement of pH is one of the most important and frequently used tests in water chemistry. Practically every phase of water supply and wastewater treatment such as acid-base neutralization, water softening, and corrosion control is pH dependent. Likewise, the pH of leachate can be correlated with other chemical analyses to determine the probable source of contamination. It is therefore important that reasonably accurate pH measurements be taken.

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Two methods are given for pH measurement: the pH meter and pH indicator paper. The indicator paper is used when only a rough estimate of the pH is required, and the pH meter when a more accurate measurement is needed. The response of a pH meter can be affected to a slight degree by high levels of colloidal or suspended solids, but the effect is usually small and generally of little significance. Consequently, specific methods to overcome this interference are not described. The response of pH paper is unaffected by solution interferences from color, turbidity, colloidal or suspended materials unless extremely high levels capable of coating or masking the paper are encountered. In such cases, use of a pH meter is recommended.

#### 5.5.1.2 Principles of Equipment Operation

Use of pH papers for pH measurement relies on a chemical reaction caused by the acidity or basicity of the solution created by the addition of the water sample reacting with the indicator compound on the paper. Various types of pH papers are available, including litmus (for general acidity or basicity determination) and specific pH range hydriion paper.

Use of a pH meter relies on the same principle as other ion-specific electrodes. Measurement relies on establishment of a potential difference across a glass or other type of membrane in response to (in this instance, hydrogen) ion concentration across that membrane. The membrane is conductive to ionic species and, in combination with a standard or reference electrode, a potential difference proportional to the ion concentration is generated and measured.

#### 5.5.1.3 Equipment

The following equipment is needed for taking pH measurements:

- Stand-alone 150 portable pH meter, or combination meter (e.g., Horiba U-10), or combination meter equipped with an in-line sample chamber.
- Combination electrode with polymer body to fit the above meter (alternately a pH electrode and a reference electrode can be used if the pH meter is equipped with suitable electrode inputs).
- Buffer solutions, as specified by the manufacturer.
- pH indicator paper, to cover the pH range 2 through 12.
- Manufacturer's operation manual.

#### 5.5.1.4 Measurement Techniques for Field Determination of pH

##### **pH Meter**

The following procedure is used for measuring pH with a pH meter (meter standardization is according to manufacturer's instructions):

- Inspect the instrument and batteries prior to initiation of the field effort.
- Check the integrity of the buffer solutions used for field calibration. Buffer solutions need to be changed often as a result of degradation upon exposure to the atmosphere.

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- Immerse the tip of the electrodes in water overnight. If this is not possible due to field conditions, immerse the electrode tip in water for at least an hour before use. The electrode tip may be immersed in a rubber or plastic sack containing buffer solution for field transport or storage. This is not applicable for all electrodes as some must be stored dry.
- If applicable, make sure all electrolyte solutions within the electrode(s) are at their proper levels and that no air bubbles are present within the electrode(s).
- Calibrate on a daily use basis following manufacturer's instructions. Record calibration data on an equipment calibration log sheet.
- Immerse the electrode(s) in the unknown solution, slowly stirring the probe until the pH stabilizes. Stabilization may take several seconds to minutes. If the pH continues to drift, the sample temperature may not be stable, a physical reaction (e.g., degassing) may be taking place in the sample, or the meter or electrode may be malfunctioning. This must be clearly noted in the logbook.
- Read and record the pH of the solution. pH shall be recorded to the nearest 0.1 pH unit. Also record the sample temperature.
- Rinse the electrode(s) with deionized water.
- Store the electrode(s) in an appropriate manner when not in use.

Any visual observation of conditions which may interfere with pH measurement, such as oily materials, or turbidity, shall be noted.

#### **pH Paper**

Use of pH paper is very simple and requires no sample preparation, standardization, etc. pH paper is available in several ranges, including wide-range (indicating approximately pH 1 to 12), mid-range (approximately pH 0 to 6, 6 to 9, 8 to 14) and narrow-range (many available, with ranges as narrow as 1.5 pH units). The appropriate range of pH paper shall be selected. If the pH is unknown the investigation shall start with wide-range paper and proceed with successively narrower range paper until the sample pH is adequately determined.

#### **5.5.2 Measurement of Specific Conductance**

##### **5.5.2.1 General**

Conductance provides a measure of dissolved ionic species in water and can be used to identify the direction and extent of migration of contaminants in groundwater or surface water. It can also be used as a measure of subsurface biodegradation or to indicate alternate sources of groundwater contamination.

Conductivity is a numerical expression of the ability of a water sample to carry an electric current. This value depends on the total concentration of the ionized substances dissolved in the water and the temperature at which the measurement is made. The mobility of each of the various dissolved ions, their valences, and their actual and relative concentrations affect conductivity.

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It is important to obtain a specific conductance measurement soon after taking a sample, since temperature changes, precipitation reactions, and absorption of carbon dioxide from the air all affect the specific conductance.

#### 5.5.2.2 Principles of Equipment Operation

An aqueous system containing ions will conduct an electric current. In a direct-current field, the positive ions migrate toward the negative electrode, while the negatively charged ions migrate toward the positive electrode. Most inorganic acids, bases and salts (such as hydrochloric acid, sodium carbonate, or sodium chloride, respectively) are relatively good conductors. Conversely, organic compounds such as sucrose or benzene, which do not disassociate in aqueous solution, conduct a current very poorly, if at all.

A conductance cell and a Wheatstone Bridge (for the measurement of potential difference) may be used for measurement of electrical resistance. The ratio of current applied to voltage across the cell may also be used as a measure of conductance. The core element of the apparatus is the conductivity cell containing the solution of interest. Depending on ionic strength of the aqueous solution to be tested, a potential difference is developed across the cell which can be converted directly or indirectly (depending on instrument type) to a measurement of specific conductance.

#### 5.5.2.3 Equipment

The following equipment is needed for taking specific conductance (SC) measurements:

- Stand alone portable conductivity meter, or combination meter (e.g., Horiba U-10), or combination meter equipped with an in-line sample chamber.
- Calibration solution, as specified by the manufacturer.
- Manufacturer's operation manual.

A variety of conductivity meters are available which may also be used to monitor salinity and temperatures. Probe types and cable lengths vary, so equipment must be obtained to meet the specific requirement of the sampling program.

#### 5.5.2.4 Measurement Techniques for Specific Conductance

The steps involved in taking specific conductance measurements are listed below (standardization is according to manufacturer's instructions):

- Check batteries and calibrate instrument before going into the field.
- Calibrate on a daily use basis, according to the manufacturer's instructions and record all pertinent information on an equipment calibration log sheet. Potassium chloride solutions with a SC closest to the values expected in the field shall be used for calibration. Attachment B provides guidance in this regard.
- Rinse the cell with one or more portions of the sample to be tested or with deionized water.

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- Immerse the electrode in the sample and measure the conductivity. Adjust the temperature setting to the sample temperature (if applicable).
- Read and record the results in a field logbook or sample log sheet.
- Rinse the electrode with deionized water.

If the specific conductance measurements become erratic, recalibrate the instrument and see the manufacturer's instructions for details.

### 5.5.3 Measurement of Temperature

#### 5.5.3.1 General

In combination with other parameters, temperature can be a useful indicator of the likelihood of biological action in a water sample. It can also be used to trace the flow direction of contaminated groundwater. Temperature measurements shall be taken in-situ, or as quickly as possible in the field. Collected water samples may rapidly equilibrate with the temperature of their surroundings.

#### 5.5.3.2 Equipment

Temperature measurements may be taken with alcohol-toluene, mercury filled or dial-type thermometers. In addition, various meters such as specific conductance or dissolved oxygen meters, which have temperature measurement capabilities, may also be used. Using such instrumentation along with suitable probes and cables, in-situ measurements of temperature at great depths can be performed.

#### 5.5.3.3 Measurement Techniques for Water Temperature

If a thermometer is used to determine the temperature for a water sample:

- Immerse the thermometer in the sample until temperature equilibrium is obtained (1-3 minutes). To avoid the possibility of cross-contamination, the thermometer shall not be inserted into samples which will undergo subsequent chemical analysis.
- Record values in a field logbook or sample log sheet.

If a temperature meter or probe is used, the instrument shall be calibrated according to manufacturer's recommendations.

### 5.5.4 Measurement of Dissolved Oxygen Concentration

#### 5.5.4.1 General

Dissolved oxygen (DO) levels in natural water and wastewater depend on the physical, chemical and biochemical activities in the water body. Conversely, the growth of many aquatic organisms as well as the rate of corrosivity, are dependent on the dissolved oxygen concentration. Thus, analysis for dissolved oxygen is a key test in water pollution and waste treatment process control. If at all possible, DO measurements shall be taken in-situ, since concentration may show a large change in a short time if the sample is not adequately preserved.

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The monitoring method discussed herein is limited to the use of dissolved oxygen meters only. Chemical methods of analysis (i.e., Winkler methods) are available, but require more equipment and greater sample manipulation. Furthermore, DO meters, using a membrane electrode, are suitable for highly polluted waters, because the probe is completely submersible, and is not susceptible to interference caused by color, turbidity, colloidal material or suspended matter.

#### 5.5.4.2 Principles of Equipment Operation

Dissolved oxygen probes are normally electrochemical cells that have two solid metal electrodes of different nobility immersed in an electrolyte. The electrolyte is retained by an oxygen-permeable membrane. The metal of highest nobility (the cathode) is positioned at the membrane. When a suitable potential exists between the two metals, reduction of oxygen to hydroxide ion (OH<sup>-</sup>) occurs at the cathode surface. An electrical current is developed that is directly proportional to the rate of arrival of oxygen molecules at the cathode.

Since the current produced in the probe is directly proportional to the rate of arrival of oxygen at the cathode, it is important that a fresh supply of sample always be in contact with the membrane. Otherwise, the oxygen in the aqueous layer along the membrane is quickly depleted and false low readings are obtained. It is therefore necessary to stir the sample (or the probe) constantly to maintain fresh solution near the membrane interface. Stirring, however, shall not be so vigorous that additional oxygen is introduced through the air-water interface at the sample surface. To avoid this possibility, some probes are equipped with stirrers to agitate the solution near the probe, while leaving the surface of the solution undisturbed.

Dissolved oxygen probes are relatively unaffected by interferences. Interferences that can occur are reactions with oxidizing gases (such as chlorine) or with gases such as hydrogen sulfide, which are not easily depolarized from the indicating electrode. If a gaseous interference is suspected, it shall be noted in the field log book and checked if possible. Temperature variations can also cause interference because probes exhibit temperature sensitivity. Automatic temperature compensation is normally provided by the manufacturer.

#### 5.5.4.3 Equipment

The following equipment is needed to measure dissolved oxygen concentration:

- Stand alone portable dissolved oxygen meter, or combination meter (e.g., Horiba U-10), or combination meter equipped with an in-line sample chamber.
- Sufficient cable to allow the probe to contact the sample.
- Manufacturer's operation manual.

#### 5.5.4.4 Measurement Techniques for Dissolved Oxygen Determination

Probes differ as to specifics of use. Follow the manufacturer's instructions to obtain an accurate reading. The following general steps shall be used to measure the dissolved oxygen concentration:

- The equipment shall be calibrated and have its batteries checked in the warehouse before going to the field.

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- The probe shall be conditioned in a water sample for as long a period as practical before use in the field. Long periods of dry storage followed by short periods of use in the field may result in inaccurate readings.
- The instrument shall be calibrated in the field according to manufacturer's recommendations or in a freshly air-saturated water sample of known temperature. Dissolved oxygen values for air-saturated water can be determined by consulting a table listing oxygen solubilities as a function of temperature and salinity (see Attachment C).
- Record all pertinent information on an equipment calibration sheet.
- Rinse the probe with deionized water.
- Immerse the probe in the sample. Be sure to provide for sufficient flow past the membrane by stirring the sample. Probes without stirrers placed in wells can be moved up and down.
- Record the dissolved oxygen content and temperature of the sample in a field logbook or sample log sheet.
- Rinse the probe with deionized water.
- Recalibrate the probe when the membrane is replaced, or as needed. Follow the manufacturer's instructions.

Note that in-situ placement of the probe is preferable, since sample handling is not involved. This however, may not always be practical. Be sure to record whether the liquid was analyzed in-situ, or if a sample was taken.

Special care shall be taken during sample collection to avoid turbulence which can lead to increased oxygen solubilization and positive test interferences.

### 5.5.5 Measurement of Oxidation-Reduction Potential

#### 5.5.5.1 General

The oxidation-reduction potential (ORP) provides a measure of the tendency of organic or inorganic compounds to exist in an oxidized state. The ORP parameter therefore provides evidence of the likelihood of anaerobic degradation of biodegradable organics or the ratio of activities of oxidized to reduced species in the sample.

#### 5.5.5.2 Principles of Equipment Operation

When an inert metal electrode, such as platinum, is immersed in a solution, a potential is developed at that electrode depending on the ions present in the solution. If a reference electrode is placed in the same solution, an ORP electrode pair is established. This electrode pair allows the potential difference between the two electrodes to be measured and is dependent on the concentration of the ions in solution. By this measurement, the ability to oxidize or reduce species in solution may be determined. Supplemental measurements, such as dissolved oxygen, may be correlated with ORP to provide a knowledge of the quality of the solution, water, or wastewater.

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### 5.5.5.3 Equipment

The following equipment is needed for measuring the oxidation-reduction potential of a solution:

- Portable pH meter or equivalent, with a millivolt scale.
- Platinum electrode to fit above pH meter.
- Reference electrode such as a calomel, silver-silver chloride, or equivalent.
- Reference solution as specified by the manufacturer.
- Manufacturer's operation manual.

### 5.5.5.4 Measurement Techniques for Oxidation-Reduction Potential

The following procedure is used for measuring oxidation-reduction potential:

- The equipment shall be calibrated and have its batteries checked before going to the field.
- Check that the platinum probe is clean and that the platinum bond or tip is unoxidized. If dirty, polish with emery paper or, if necessary, clean the electrode using aqua regia, nitric acid, or chromic acid, in accordance with manufacturer's instructions.
- Thoroughly rinse the electrode with deionized water.
- Verify the sensitivity of the electrodes by noting the change in millivolt reading when the pH of the test solution is altered. The ORP will increase when the pH of the test solution decreases and the ORP will decrease if the test solution pH is increased. Place the sample in a clean container and agitate the sample. Insert the electrodes and note the ORP drops sharply when the caustic is added (i.e., pH is raised) thus indicating the electrodes are sensitive and operating properly. If the ORP increases sharply when the caustic is added, the polarity is reversed and must be corrected in accordance with the manufacturer's instructions. If the ORP does not respond as above when the caustic is added, the electrodes shall be cleaned and the above procedure repeated.
- After the assembly has been checked for sensitivity, wash the electrodes with three changes of water or by means of a flowing stream of deionized water from a wash bottle. Place the sample in a clean container and insert the electrodes. Set temperature compensator throughout the measurement period. Read the millivolt potential of the solution, allowing sufficient time for the system to stabilize and reach temperature equilibrium. Measure successive portions of the sample until readings on two successive portions differ by no more than 10 mV. A system that is very slow to stabilize properly will not yield a meaningful ORP. Record all results in a field logbook or sample logsheet, including ORP (to nearest 10 mV), sample temperature and pH at the time of measurement.

### 5.5.6 **Measurement of Turbidity**

#### 5.5.6.1 General

Turbidity in water is caused by suspended matter, such as clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, and microscopic organisms, including plankton. Turbidity is an expression of the optical property that causes light to be scattered and absorbed rather than transmitted in a straight line through the sample.

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It is important to obtain a turbidity reading immediately after taking a sample, since irreversible changes in turbidity may occur if the sample is stored too long.

#### 5.5.6.2 Principles of Equipment Operation

Turbidity is measured by the Nephelometric Method. This method is based on a comparison of the intensity of light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. The higher the scattered light intensity, the higher the turbidity.

Formazin polymer is used as the reference turbidity standard suspension because of its ease of preparation combined with a higher reproducibility of its light-scattering properties than clay or turbid natural water. The turbidity of a specified concentration of formazin suspension is defined as 40 nephelometric units. This same suspension has an approximate turbidity of 40 Jackson units when measured on the candle turbidimeter. Therefore, nephelometric turbidity units (NTU) based on the formazin preparation will approximate units derived from the candle turbidimeter but will not be identical to them.

#### 5.5.6.3 Equipment

The following equipment is needed for turbidity measurement:

- Stand alone portable turbidity meter, or combination meter (e.g., Horiba U-10), or combination meter equipped with an in-line sample chamber.
- Calibration solution, as specified by the manufacturer.
- Manufacturer's operation manual.

#### 5.5.6.4 Measurements Techniques for Specific Conductance

The steps involved in taking turbidity measurements are listed below (standardization is according to manufacturer's instructions):

- Check batteries and calibrate instrument before going into the field.
- Check the expiration date (etc.) of the solutions used for field calibration.
- Calibrate on a daily use basis, according to the manufacturer's instructions and record all pertinent information on an equipment calibration log sheet.
- Rinse the cell with one or more portions of the sample to be tested or with deionized water.
- Immerse the probe in the sample and measure the turbidity. The reading must be taken immediately as suspended solids will settle over time resulting in a lower, inaccurate turbidity reading.

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- Read and record the results in a field logbook or sample log sheet. Include a physical description of the sample, including color, qualitative estimate of turbidity, etc.
- Rinse the electrode with deionized water.

## 5.6 Sampling

### 5.6.1 **Sampling Plan**

The sampling approach consisting of the following, shall be developed as part of the project plan documents which are approved prior to beginning work in the field:

- Background and objectives of sampling.
- Brief description of area and waste characterization.
- Identification of sampling locations, with map or sketch, and applicable well construction data (well size, depth, screened interval, reference elevation).
- Intended number, sequence volumes, and types of samples. If the relative degrees of contamination between wells is unknown or insignificant, a sampling sequence which facilitates sampling logistics may be followed. Where some wells are known or strongly suspected of being highly contaminated, these shall be sampled last to reduce the risk of cross-contamination between wells as a result of the sampling procedures.
- Sample preservation requirements.
- Work schedule.
- List of team members.
- List of observers and contacts.
- Other information, such as the necessity for a warrant or permission of entry, requirement for split samples, access problems, location of keys, etc.

### 5.6.2 **Sampling Methods**

The collection of a groundwater sample consists of the following steps:

1. The site Health & Safety Officer (or designee) will first open the well cap and use volatile organic detection equipment (PID or FID) on the escaping gases at the well head to determine the need for respiratory protection.
2. When proper respiratory protection has been donned, sound the well for total depth and water level (using clean equipment) and record these data on a groundwater sampling log sheet (see SOP SA-6.3); then calculate the fluid volume in the well pipe (as previously described in this SOP).
3. Calculate well volume to be removed as stated in Section 5.3.

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4. Select the appropriate purging equipment (see Attachment A). If an electric submersible pump with packer is chosen, go to Step 10.
5. Lower the purging equipment or intake into the well to a short distance below the water level and begin water removal. Collect the purged water and dispose of it in an acceptable manner (as applicable). Lower the purging device, as required, to maintain submergence.
6. Measure the rate of discharge frequently. A graduated bucket and stopwatch are most commonly used; other techniques include use of pipe trajectory methods, weir boxes or flow meters.
7. Observe the peristaltic pump intake for degassing "bubbles." If bubbles are abundant and the intake is fully submerged, this pump is not suitable for collecting samples for volatile organics. Never collect volatile organics samples using a vacuum pump.
8. Purge a minimum of three to five casing volumes before sampling. In low-permeability strata (i.e., if the well is pumped to dryness), one volume will suffice. Purged water shall be collected in a designated container and disposed in an acceptable manner.
9. If sampling using a pump, lower the pump intake to midscreen (or the middle of the open section in uncased wells) and collect the sample. If sampling with a bailer, lower the bailer to the sampling level before filling.
10. (For pump and packer assembly only). Lower the assembly into the well so that the packer is positioned just above the screen or open section. Inflate the packer. Purge a volume equal to at least twice the screened interval (or unscreened open section volume below the packer) before sampling. Packers shall always be tested in a casing section above ground to determine proper inflation pressures for good sealing.
11. In the event that recovery time of the well is very slow (e.g., 24 hours or greater), sample collection can be delayed until the following day. If the well has been purged early in the morning, sufficient water may be standing in the well by the day's end to permit sample collection. If the well is incapable of producing a sufficient volume of sample at any time, take the largest quantity available and record this occurrence in the site logbook.
12. Fill sample containers (preserve and label as described in SOP SA-6.1).
13. Replace the well cap and lock as appropriate. Make sure the well is readily identifiable as the source of the samples.
14. Process sample containers as described in SOP SA-6.1.
15. Decontaminate equipment as described in SOP SA-7.1.

## **5.7 Low Flow Purging and Sampling**

### **5.7.1 Scope & Application**

Low flow purging and sampling techniques are sometimes required for groundwater sampling activities. The purpose of low flow purging and sampling is to collect groundwater samples that contain

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"representative" amounts of mobile organic and inorganic constituents in the vicinity of the selected open well interval, at near natural flow conditions. The minimum stress procedure emphasizes negligible water level drawdown and low pumping rates in order to collect samples with minimal alterations in water chemistry. This procedure is designed primarily to be used in wells with a casing diameter of 2 inches or more and a saturated screen, or open interval, length of ten feet or less. Samples obtained are suitable for analyses of common types of groundwater contaminants (volatile and semi-volatile organic compounds, pesticides, PCBs, metals and other inorganic ions [cyanide, chloride, sulfate, etc.]). This procedure is not designed to collect non-aqueous phase liquids samples from wells containing light or dense non-aqueous phase liquids (LNAPLs or DNAPLs), using the low flow pumps.

The procedure is flexible for various well construction types and groundwater yields. The goal of the procedure is to obtain a turbidity level of less than 5 NTU and to achieve a water level drawdown of less than 0.3 feet during purging and sampling. If these goals cannot be achieved, sample collection can take place provided the remaining criteria in this procedure are met.

### 5.7.2 Equipment

The following equipment is required (as applicable) for low flow purging and sampling:

- Adjustable rate, submersible pump (e.g., centrifugal or bladder pump constructed of stainless steel or Teflon). Peristaltic pumps may be used only for inorganic sample collection.
- Disposable clear plastic bottom filling bailers may be used to check for and obtain samples of LNAPLs or DNAPLs.
- Tubing - Teflon, Teflon lined polyethylene, polyethylene, PVC, tygon steel tubing can be used to collect samples for analysis, depending on the analyses to be performed and regulatory requirements.
- Water level measuring device, 0.01 foot accuracy. (electronic devices are preferred for tracking water level drawdown during all pumping operations).
- Flow measurement supplies.
- Interface probe, if needed.
- Power source (generator, nitrogen tank, etc.). If a gasoline generator is used, it must be located downwind and at a safe distance from the well so that the exhaust fumes do not contaminate the samples.
- Indicator parameter monitoring instruments - pH, turbidity, specific conductance, and temperature. Use of a flow-through cell is recommended. Optional Indicators - eH and dissolved oxygen, flow-through cell is required. Standards to perform field calibration of instruments.
- Decontamination supplies.
- Logbook(s), and other forms (e.g., well purging forms).
- Sample Bottles.

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- Sample preservation supplies (as required by the analytical methods).
- Sample tags or labels.
- Well construction data, location map, field data from last sampling event.
- Field Sampling Plan.
- PID or FID instrument for measuring VOCs (volatile organic compounds).

### 5.7.3 Purging and Sampling Procedure

Use a submersible pump to purge and sample monitoring wells which have a 2.0 inch or greater well casing diameter.

Measure and record the water level immediately prior to placing the pump in the well.

Lower pump, safety cable, tubing and electrical lines slowly into the well so that the pump intake is located at the center of the saturated screen length of the well. If possible keep the pump intake at least two feet above the bottom of the well, to minimize mobilization of sediment that may be present in the bottom of the well. Collection of turbid free water samples may be difficult if there is three feet or less of standing water in the well.

When starting the pump, slowly increase the pump speed until a discharge occurs. Check water level. Adjust pump speed to maintain little or no water level drawdown. The target drawdown should be less than 0.3 feet and it should stabilize. If the target of less than 0.3 feet cannot be achieved or maintained, the sampling is acceptable if remaining criteria in the procedure are met. Subsequent sampling rounds will probably have intake settings and extraction rates that are comparable to those used in the initial sampling rounds.

Monitor water level and pumping rate every three to five minutes (or as appropriate) during purging. Record pumping rate adjustments and depths to water. Pumping rates should, as needed, be reduced to the minimum capabilities of the pump (e.g., 0.1-0.2 l/min) to ensure stabilization of indicator parameters. Adjustments are best made in the first fifteen minutes of pumping in order to help minimize purging time. During initial pump start-up, drawdown may exceed the 0.3 feet target and then recover as pump flow adjustments are made (minimum purge volume calculations should utilize stabilized drawdown values, not the initial drawdown). If the recharge rate of the well is less than minimum capability of the pump do not allow the water level to fall to the intake level (if the static water level is above the screen, avoid lowering the water level into the screen). Shut off the pump if either of the above is about to occur and allow the water level to recover. Repeat the process until field indicator parameters stabilize and the minimum purge volume is removed. The minimum purge volume with negligible drawdown (0.3 feet or less) is two saturated screen length volumes. In situations where the drawdown is greater than 0.3 feet and has stabilized, the minimum purge volume is two times the saturated screen volume plus the stabilized drawdown volume. After the minimum purge volume is attained (and field parameters have stabilized) begin sampling. For low yields wells, commence sampling as soon as the well has recovered sufficiently to collect the appropriate volume for all anticipated samples.

During well purging, monitor field indicator parameters (turbidity, temperature, specific conductance, pH, etc.) every three to five minutes (or as appropriate). Purging is complete and sampling may begin when

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all field indicator parameters have stabilized (variations in values are within ten percent of each other, pH +/- 0.2 units, for three consecutive readings taken at three to five minute intervals). If the parameters have stabilized, but turbidity remains above 5 NTU goal, decrease pump flow rate, and continue measurement of parameters every three to five minutes. If pumping rate cannot be decreased any further and stabilized turbidity values remain above 5 NTU goal record this information. Measurements of field parameters should be obtained (as per Section 5.5) and recorded.

VOC samples are preferably collected first and directly into pre-preserved sample containers. Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence.

If the water column in the pump tubing collapses (water does not completely fill the tubing) before exiting the tubing, use one of the following procedures to collect VOC samples: (1) Collect the non-VOCs samples first, then increase the flow rate incrementally until the water column completely fills the tubing, collect the sample and record the new flow rate; (2) reduce the diameter of the existing tubing until the water column fills the tubing either by adding a connector (Teflon or stainless steel), or clamp which should reduce the flow rate by constricting the end of the tubing; (3) insert a narrow diameter Teflon tube into the pump's tubing so that the end of the tubing is in the water column and the other end of the tubing protrudes beyond the pump's tubing, collect sample from the narrow diameter tubing.

Prepare samples for shipping as per SOP SA-6.1.

## 6.0 REFERENCES

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**ATTACHMENT A**

**PURGING EQUIPMENT SELECTION**

Diameter Casing		Bailer	Peristaltic Pump	Vacuum Pump	Air-lift	Diaphragm "Trash" Pump	Submersible Diaphragm Pump	Submersible Electric Pump	Submersible Electric Pump w/Packer
1.25-Inch	Water level < 25 feet		X	X	X	X			
	Water Level > 25 feet				X				
2-Inch	Water level < 25 feet	X	X	X	X	X	X		
	Water Level > 25 feet	X			X		X		
4-Inch	Water level < 25 feet	X	X	X	X	X	X	X	X
	Water Level > 25 feet	X			X		X	X	X
6-Inch	Water level < 25 feet				X	X		X	X
	Water Level > 25 feet				X			X	X
8-Inch	Water level < 25 feet				X	X		X	X
	Water Level > 25 feet				X			X	X

**ATTACHMENT A  
PURGING EQUIPMENT SELECTION  
PAGE 2**

Manufacturer	Model Name/Number	Principle of Operation	Maximum Outside Diameter/Length (Inches)	Construction Materials (w/Lines and Tubing)	Lift Range (ft)	Delivery Rates or Volumes	1982 Price (Dollars)	Comments
BarCad Systems, Inc.	BarCad Sampler	Dedicated; gas drive (positive displacement)	1.5/16	PE, brass, nylon, aluminum oxide	0-150 with std. tubing	1 liter for each 10-15 feet of submergence	\$220-350	Requires compressed gas; custom sizes and materials available; acts as piezometer.
Cole-Parmer Inst. Co.	Master Flex 7570 Portable Sampling Pump	Portable; peristaltic (suction)	< 1.0/NA	(not submersible) Tygon®, silicone Viton®	0-30	670 mL/min with 7015-20 pump head	\$500-600	AC/DC; variable speed control available; other models may have different flow rates.
ECO Pump Corp.	SAMPLifier	Portable, venturi	< 1.5 or < 2.0/NA	PP, PE, PVC, SS, Teflon®, Tefzel®	0-100	0-500 mL/min depending on lift	\$400-700	AC, DC, or gasoline-driven motors available; must be primed.
Geltek Corp.	Bailer 219-4	Portable; grab (positive displacement)	1.66/38	Teflon®	No limit	1,075 mL	\$120-135	Other sizes available.
GeoEngineering, Inc.	GEO-MONITOR	Dedicated, gas drive (positive displacement)	1.5/16	PE, PP, PVC, Viton®	Probably 0-150	Approximately 1 liter for each 10 feet of submergence	\$185	Acts as piezometer; requires compressed gas.
Industrial and Environmental Analysts, Inc. (IEA)	Aquarius	Portable; bladder (positive displacement)	1.75/43	SS, Teflon®, Viton®	0-250	0-2,800 mL/min	\$1,500-3,000	Requires compressed gas; other models available; AC, DC, manual operation possible.
IEA	Syringe Sampler	Portable; grab (positive displacement)	1.75/43	SS, Teflon®	No limit	850 mL sample volume	\$1,100	Requires vacuum and/or pressure from hand pump.
Instrument Specialties Co. (ISCO)	Model 2600 Well Sampler	Portable; bladder (positive displacement)	1.75/50	PC, silicone, Teflon®, PP, PE, Detrin®, acetal	0-150	0-7,500 mL/min	\$990	Requires compressed gas (40 psi minimum).
Keck Geophysical Instruments, Inc.	SP-81 Submersible Sampling Pump	Portable; helical rotor (positive displacement)	1.75/25	SS, Teflon®, PP, EPDM, Viton®	0-160	0-4,500 mL/min	\$3,500	DC operated.
Leonard Mold and Die Works, Inc.	GeoFilter Small Diameter Well Pump (#0500)	Portable; bladder (positive displacement)	1.75/38	SS, Teflon®, PC, Neoprene®	0-400	0-3,500 mL/min	\$1,400-1,500	Requires compressed gas (55 psi minimum); pneumatic or AC/DC control module.
Oil Recovery Systems, Inc.	Surface Sampler	Portable; grab (positive displacement)	1.75/12	acrylic, Detrin®	No limit	Approximately 250 mL	\$125-160	Other materials and models available; for measuring thickness of "floating" contaminants.
Q.E.D. Environmental Systems, Inc.	Well Wizard® Monitoring System (P-100)	Dedicated; bladder (positive displacement)	1.66/36	PVC	0-230	0-2,000 mL/min	\$300-400	Requires compressed gas; piezometric level indicator; other materials available.

**ATTACHMENT A  
PURGING EQUIPMENT SELECTION  
PAGE 3**

Manufacturer	Model Name/Number	Principle of Operation	Maximum Outside Diameter/Length (Inches)	Construction Materials (w/Lines and Tubing)	Lift Range (ft)	Delivery Rates or Volumes	1982 Price (Dollars)	Comments
Randolph Austin Co.	Model 500 Vari-Flow Pump	Portable; peristaltic (suction)	<0.5/NA	(Not submersible) Rubber, Tygon®, or Neoprene®	0-30	See comments	\$1,200-1,300	Flow rate dependent on motor and tubing selected; AC operated; other models available.
Robert Bennett Co.	Model 180	Portable; piston (positive displacement)	1.8/22	SS, Teflon®, Delrin®, PP, Viton®, acrylic, PE	0-500	0-1,800 mL/min	\$2,600-2,700	Requires compressed gas; water level indicator and flow meter; custom models available.
Slope Indicator Co. (SINCO)	Model 514124 Pneumatic Water Sampler	Portable; gas drive (positive displacement)	1.9/18	PVC, nylon	0-1,100	250 mL/flushing cycle	\$250-350	Requires compressed gas; SS available; piezometer model available; dedicated model available.
Solinst Canada Ltd.	5W Water Sampler	Portable; grab (positive displacement)	1.9/27	PVC, brass, nylon, Neoprene®	0-330	500 mL	\$1,300-1,800	Requires compressed gas; custom models available.
TIMCO Mfg. Co., Inc.	Std. Bailer	Portable; grab (positive displacement)	1.66/Custom	PVC, PP	No limit	250 mL/ft of bailer	\$20-60	Other sizes, materials, models available; optional bottom-emptying device available; no solvents used.
TIMCO	Air or Gas Lift Sampler	Portable; gas drive (positive displacement)	1.66/30	PVC, Tygon®, Teflon®	0-150	350 mL/flushing cycle	\$100-200	Requires compressed gas; other sizes, materials, models available; no solvents used.
Tole Devices Co.	Sampling Pump	Portable; bladder (positive displacement)	1.38/48	SS, silicone, Delrin®, Tygon®	0-125	0-4,000 mL/min	\$800-1,000	Compressed gas required; DC control module; custom built.

## Construction Material Abbreviations:

PE	Polyethylene
PP	Polypropylene
PVC	Polyvinyl chloride
SS	Stainless steel
PC	Polycarbonate
EPDM	Ethylene-propylene diene (synthetic rubber)

## Other Abbreviations:

NA	Not applicable
AC	Alternating current
DC	Direct current

**NOTE:** Other manufacturers market pumping devices which could be used for groundwater sampling, though not expressly designed for this purpose. The list is not meant to be all-inclusive and listing does not constitute endorsement for use. Information in the table is from sales literature and/or personal communication. No skimmer, scavenger-type, or high-capacity pumps are included.

Source: Barcelona et al., 1983.

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**ATTACHMENT B**

**SPECIFIC CONDUCTANCE OF 1 MOLAR KCl  
AT VARIOUS TEMPERATURES<sup>1</sup>**

Temperature (°C)	Specific Conductance (umhos/cm)
15	1,147
16	1,173
17	1,199
18	1,225
19	1,251
20	1,278
21	1,305
22	1,332
23	1,359
24	1,368
25	1,413
26	1,441
27	1,468
28	1,496
29	1,524
30	1,552

<sup>1</sup> Data derived from the International Critical Tables 1-3-8.

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**ATTACHMENT C**

**VARIATION OF DISSOLVED OXYGEN CONCENTRATION IN WATER  
AS A FUNCTION OF TEMPERATURE AND SALINITY**

Temperature (°C)	Dissolved Oxygen (mg/L)					
	Chloride Concentration in Water					Difference/ 100 mg Chloride
	0	5,000	10,000	15,000	20,000	
0	14.6	13.8	13.0	12.1	11.3	0.017
1	14.2	13.4	12.6	11.8	11.0	0.016
2	13.8	13.1	12.3	11.5	10.8	0.015
3	13.5	12.7	12.0	11.2	10.5	0.015
4	13.1	12.4	11.7	11.0	10.3	0.014
5	12.8	12.1	11.4	10.7	10.0	0.014
6	12.5	11.8	11.1	10.5	9.8	0.014
7	12.2	11.5	10.9	10.2	9.6	0.013
8	11.9	11.2	10.6	10.0	9.4	0.013
9	11.6	11.0	10.4	9.8	9.2	0.012
10	11.3	10.7	10.1	9.6	9.0	0.012
11	11.1	10.5	9.9	9.4	8.8	0.011
12	10.8	10.3	9.7	9.2	8.6	0.011
13	10.6	10.1	9.5	9.0	8.5	0.011
14	10.4	9.9	9.3	8.8	8.3	0.010
15	10.2	9.7	9.1	8.6	8.1	0.010
16	10.0	9.5	9.0	8.5	8.0	0.010
17	9.7	9.3	8.8	8.3	7.8	0.010
18	9.5	9.1	8.6	8.2	7.7	0.009
19	9.4	8.9	8.5	8.0	7.6	0.009
20	9.2	8.7	8.3	7.9	7.4	0.009
21	9.0	8.6	8.1	7.7	7.3	0.009
22	8.8	8.4	8.0	7.6	7.1	0.008
23	8.7	8.3	7.9	7.4	7.0	0.008
24	8.5	8.1	7.7	7.3	6.9	0.008
25	8.4	8.0	7.6	7.2	6.7	0.008

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**ATTACHMENT C  
 VARIATION OF DISSOLVED OXYGEN CONCENTRATION IN WATER  
 AS A FUNCTION OF TEMPERATURE AND SALINITY  
 PAGE TWO**

Temperature (°C)	Dissolved Oxygen (mg/L)					
	Chloride Concentration in Water					Difference/ 100 mg Chloride
	0	5,000	10,000	15,000	20,000	
26	8.2	7.8	7.4	7.0	6.6	0.008
27	8.1	7.7	7.3	6.9	6.5	0.008
28	7.9	7.5	7.1	6.8	6.4	0.008
29	7.8	7.4	7.0	6.6	6.3	0.008
30	7.6	7.3	6.9	6.5	6.1	0.008
31	7.5					
32	7.4					
33	7.3					
34	7.2					
35	7.1					
36	7.0					
37	6.9					
38	6.8					
39	6.7					
40	6.6					
41	6.5					
42	6.4					
43	6.3					
44	6.2					
45	6.1					
46	6.0					
47	5.9					
48	5.8					
49	5.7					
50	5.6					

Note: In a chloride solution, conductivity can be roughly related to chloride concentration (and therefore, used to correct measured D.O. concentration) using Attachment B.

**STANDARD OPERATING PROCEDURE SA-6.1**



**BROWN & ROOT ENVIRONMENTAL**

# STANDARD OPERATING PROCEDURES

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Applicability B&R Environmental, NE	
Prepared Earth Sciences Department	
Approved D. Senovich <i>DS</i>	

Subject  
NON-RADIOLOGICAL SAMPLE HANDLING

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## 1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide information on sample preservation, packaging, and shipping procedures to be used in handling environmental samples submitted for chemical constituent, biological, or geotechnical analysis. Sample chain-of-custody procedures and other aspects of field documentation are addressed in SOP SA-6.3. Sample identification is addressed in SOP CT-04.

## 2.0 SCOPE

This procedure:

- Describes the appropriate containers to be used for samples depending on the analyses to be performed, and the steps necessary to preserve the samples when shipped off site for chemical analysis.
- Provides instruction for sample packaging and shipping in accordance with current U.S. Department of Transportation (DOT) regulations.

## 3.0 GLOSSARY

Hazardous Material - A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated. Under 49 CFR, the term includes hazardous substances, hazardous wastes, marine pollutants, and elevated temperature materials, as well as materials designated as hazardous under the provisions of §172.101 and §172.102 and materials that meet the defining criteria for hazard classes and divisions in Part 173.

Hazardous Waste - Any substance listed in 40 CFR, Subpart D (y261.30 et seq.), or otherwise characterized as ignitable, corrosive, reactive, or toxic (as defined by Toxicity Characteristic Leaching Procedure, TCLP, analysis) as specified under 40 CFR, Subpart C (y261.20 et seq.), that would be subject to manifest requirements specified in 40 CFR 262. Such substances are defined and regulated by EPA.

Marking - A descriptive name, identification number, instructions, cautions, weight, specification or UN marks, or combination thereof required on outer packaging of hazardous materials.

n.o.i - Not otherwise indicated (may be used interchangeably with n.o.s.).

n.o.s. - Not otherwise specified.

ORM - Other regulated material (see DOT 49 CFR 173.144).

Packaging - A receptacle and any other components or materials necessary for compliance with the minimum packaging requirements of 49 CFR 174, including containers (other than freight containers or overpacks), portable tanks, cargo tanks, tank cars, and multi-unit tank-car tanks to perform a containment function in conformance with the minimum packaging requirements of 49 CFR 173.24(a) & (b).

Placard - Color-coded, pictorial sign which depicts the hazard class symbol and name and which is placed on the side of a vehicle transporting certain hazardous materials.

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Common Preservatives:

- Hydrochloric Acid - HCl
- Sulfuric Acid - H<sub>2</sub>SO<sub>4</sub>
- Nitric Acid - HNO<sub>3</sub>
- Sodium Hydroxide - NaOH

Other Preservatives

- Zinc Acetate
- Sodium Thiosulfate - Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>

Normality (N) - Concentration of a solution expressed as equivalent per liter, an equivalent being the amount of a substance containing 1 gram-atom of replaceable hydrogen or its equivalent. Thus, a one-molar solution of HCl, containing 1 gram-atom of H, is "one normal," whereas a one-molar solution of H<sub>2</sub>SO<sub>4</sub>, containing 2 gram-atoms of H, is "two normal."

Reportable Quantity (RQ) - For the purposes of this SOP, means the quantity specified in column 3 of the Appendix to DOT 49 CFR §172.101 for any material identified in column 1 of the appendix. A spill greater than the amount specified must be reported to the National Response Center.

Sample - A sample is physical evidence collected from a facility or the environment, which is representative of conditions at the location and time of collection.

**4.0 RESPONSIBILITIES**

Field Operations Leader - Directly responsible for the bottling, preservation, labeling, packaging, shipping, and custody of samples up to and including release to the shipper.

Field Samplers - Responsible for initiating the Chain-of-Custody Record (per SOP SA-6.3), implementing the packaging and shipping requirements, and maintaining custody of samples until they are relinquished to another custodian or to the common carrier.

**5.0 PROCEDURES**

Sample identification, labeling, documentation, and chain-of-custody are addressed by SOP SA-6.3.

**5.1 Sample Containers**

Different types of chemicals react differently with sample containers made of various materials. For example, trace metals adsorb more strongly to glass than to plastic, whereas many organic chemicals may dissolve various types of plastic containers. Attachments A and B show proper containers (as well as other information) per 40 CFR 136. In general, the sample container shall allow approximately 5-10 percent air space ("ullage") to allow for expansion/vaporization if the sample warms during transport. However, for collection of volatile organic compounds, head space shall be omitted. The analytical laboratory will generally provide certified-clean containers for samples to be analyzed for chemical constituents. Shelby tubes or other sample containers are generally provided by the driller for samples requiring geotechnical analysis. Sufficient lead time shall be allowed for a delivery of bottle orders. Therefore, it is critical to use the correct container to maintain the integrity of the sample prior to analysis.

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Once opened, the container must be used at once for storage of a particular sample. Unused but opened containers are to be considered contaminated and must be discarded; because of the potential for introduction of contamination, they cannot be reclosed and saved for later use. Likewise, any unused containers which appear contaminated upon receipt, or which are found to have loose caps or a missing Teflon liner (if required for the container), shall be discarded.

## 5.2 Sample Preservation

Many water and soil samples are unstable and therefore require preservation to prevent changes in either the concentration or the physical condition of the constituent(s) requiring analysis. Although complete and irreversible preservation of samples is not possible, preservation does retard the chemical and biological changes that inevitably take place after the sample is collected. Preservation techniques are usually limited to pH control, chemical addition(s), and refrigeration/ freezing (certain biological samples only).

### 5.2.1 Overview

The preservation techniques to be used for various analytes are listed in Attachments A and B. Reagents required for sample preservation will either be added to the sample containers by the laboratory prior to their shipment to the field or be added in the field (in a clean environment). Only high purity reagents shall be used for preservation. In general, aqueous samples of low-concentration organics (or soil samples of low- or medium-concentration organics) are cooled to 4°C. Medium-concentration aqueous samples and high-hazard organics samples are typically not preserved. Low-concentration aqueous samples for metals are acidified with HNO<sub>3</sub>, whereas medium-concentration and high-hazard aqueous metal samples are not preserved. Low- or medium-concentration soil samples for metals are cooled to 4°C, whereas high-hazard samples are not preserved.

The following subsections describe the procedures for preparing and adding chemical preservatives. Attachments A and B indicate the specific analytes which require these preservatives.

### 5.2.2 Preparation and Addition of Reagents

Addition of the following acids or bases may be specified for sample preservation; these reagents shall be analytical reagent (AR) grade or purer and shall be diluted to the required concentration with deionized water before field sampling commences. To avoid uncontrolled reactions, be sure to Add Acid to water (not vice versa). A dilutions guide is provided below.

Acid/Base	Dilution	Concentration	Estimated Amount Required for Preservation
Hydrochloric Acid (HCl)	1 part concentrated HCl: 1 part double-distilled, deionized water	6N	5-10 mL
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	1 part concentrated H <sub>2</sub> SO <sub>4</sub> : 1 part double-distilled, deionized water	18N	2 - 5 mL
Nitric Acid (HNO <sub>3</sub> )	Undiluted concentrated HNO <sub>3</sub>	16N	2 - 5 mL
Sodium Hydroxide (NaOH)	400 grams solid NaOH dissolved in 870 mL double-distilled, deionized water; yields 1 liter of solution	10N	2 mL

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The amounts required for preservation shown in the above table assumes proper preparation of the preservative and addition of the preservative to one liter of aqueous sample (assuming that the sample is initially at pH 7, is poorly buffered, and does not contain particulate matter; as these conditions vary, more preservative may be required). Consequently, the final sample pH must be checked using narrow-range pH paper, as described in the generalized procedure detailed below:

- Pour off 5-10 mL of sample into a dedicated, clean container. Use some of this sample to check the initial sample pH using wide range (0-14) pH paper. Never dip the pH paper into the sample; always apply a drop of sample to the pH paper using a clean stirring rod or pipette.
- Add about one-half of the estimated preservative required to the original sample bottle. Cap and invert gently several times to mix. Check pH (as described above) using medium range pH paper (pH 0-6 or pH 7.5-14, as applicable).
- Cap sample bottle and seal securely.

Additional considerations are discussed below:

- To test if ascorbic acid must be used to remove oxidizing agents present in the sample before it can be properly preserved, place a drop of sample on KI-starch paper. A blue color indicates the need for ascorbic acid addition.

If required, add a few crystals of ascorbic acid to the sample and retest with the KI-starch paper. Repeat until a drop of sample produces no color on the KI-starch paper. Then add an additional 0.6 grams of ascorbic acid per each liter of sample volume.

Continue with proper base preservation of the sample as described, generally, above.

- Samples for sulfide analysis must be treated by the addition of 4 drops (0.2 mL) of 2N zinc acetate solution per 100 ml of sample.

The 2N zinc acetate solution is made by dissolving 220 grams of zinc acetate in 870 mL of double-distilled, deionized water to make 1 liter of solution.

The sample pH is then raised to 9 using the NaOH preservative.

- To test if sodium thiosulfate must be added to remove residual chlorine from a sample, test the sample for residual chlorine using a field test kit especially made for this purpose.

If residual chlorine is present, add 0.08 grams of sodium thiosulfate per liter of sample to remove the residual chlorine.

Continue with proper acidification of the sample as described, generally, above.

For biological samples, 10% buffered formalin or isopropanol may also be required for preservation. Questions regarding preservation requirements should be resolved through communication with the laboratory before sampling begins.

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### 5.3 Field Filtration

At times, field-filtration may be required to provide for the analysis of dissolved chemical constituents. Field-filtration must be performed prior to the preservation of samples as described above. General procedures for field filtration are described below:

- The sample shall be filtered through a non-metallic, 0.45-micron membrane filter, immediately after collection. The filtration system shall consist of dedicated filter canister, dedicated silicon tubing, and a peristaltic pump with pressure or vacuum pumping squeeze action (since the sample is filtered by mechanical peristalsis, the sample travels only through the tubing).
- To perform filtration, thread the silicon tubing through the peristaltic pump head. Attach the filter canister to the discharge end of the silicon tubing (note flow direction arrow); attach the aqueous sample container to the intake end of the silicon tubing. Turn the peristaltic pump on and perform filtration.
- Continue by preserving the filtrate (contained in the filter canister), as applicable and generally described above.

### 5.4 Sample Packaging and Shipping

Samples collected for shipment from a site shall be classified as either environmental or hazardous material samples. Samples from drums containing materials other than Investigative Derived Waste (IDW) and samples obtained from waste piles or bulk storage tanks are generally shipped as hazardous materials. A distinction must be made between the two types of samples in order to:

- Determine appropriate procedures for transportation of samples (if there is any doubt, a sample shall be considered hazardous and shipped accordingly.)
- Protect the health and safety of transport and laboratory personnel receiving the samples (special precautions are used by the shipper and at laboratories when hazardous materials are received.)

Detailed procedures for packaging environmental and hazardous material samples are outlined in the remainder of this section.

#### 5.4.1 Environmental Samples

Environmental samples are packaged as follows:

- Place sample container, properly identified and with lid securely fastened in a plastic bag (e.g. Ziploc baggie), and seal the bag.
- Place sample in a cooler constructed of sturdy material which has been lined with a large, plastic (e.g. "garbage" bag).
- Pack with enough noncombustible, absorbent, cushioning materials such as vermiculite (shoulders of bottles must be iced if required) to minimize the possibility of the container breaking.

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- If cooling is required (see Attachments A and B), double-bag ice in Ziploc baggies and place around container shoulders, and on top of absorbent packing material (minimum of 8 pounds of ice for a medium-size cooler).
- Seal (i.e., tape or tie top in knot) large liner bag.
- The original (top, signed copy) and extra carbonless copies of the COC form shall be placed inside a large Ziploc-type bag and taped inside the lid of the shipping cooler. If multiple coolers are sent but are included on one COC form, the COC form should be sent with the first cooler. The COC form should then state how many coolers are included with that shipment.
- Close and seal outside of cooler as described in SOP SA-6.3. Signed custody seals must be used.

Coolers must be marked as containing "Environmental Samples." The appropriate side of the container must be marked "This End Up" and arrows placed appropriately. No DOT marking or labeling is required; there are no DOT restrictions on mode of transportation.

#### 5.4.2 Determination of Shipping Classification for Hazardous Material Samples

Samples not determined to be environmental samples, or samples known or expected to contain hazardous materials, must be considered hazardous material samples and transported according to the requirements listed below.

##### 5.4.2.1 Known Substances

If the substance in the sample is known or can be identified, package, mark, label, and ship according to the specific instructions for that material (if it is listed) in the DOT Hazardous Materials Table, 49 CFR 172.101. (DOT Guide for shippers can be found in Attachment D of this document.)

To determine the proper shipping name, use the following steps to help locate the shipping name on the Hazardous Materials Table, DOT 49 CFR 172.101.

1. Look first for the chemical or technical name of the material, for example, ethyl alcohol. Note that many chemicals have more than one technical name, for example, perchloroethylene (not listed in 172.101) is listed as tetrachloroethylene (listed 172.101). It may be useful to consult a chemist for all possible technical names a material can have. If your material is not listed by its technical name, then . . .
2. Look for the chemical family name. For example, pentyl alcohol is not listed but the chemical family name is: alcohol, n.o.s. (not otherwise specified). If the chemical family name is not listed, then . . .
3. Look for a generic name based on end use. For example, Paint, n.o.s or Fireworks, n.o.s. If a generic name based on end use is not listed, then . . .
4. Look for a generic family name based on end use, for example, drugs, n.o.s. or cosmetics, n.o.s. Finally, if your material is not listed by a generic family name but you suspect or know the material is hazardous because it meets the definition of one or more hazardous classes, then . . .

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5. You will have to use the general hazard class for a proper shipping name. For example, Flammable Liquid, n.o.s, or Oxidizer, n.o.s.

#### 5.4.2.2 Unknown Substances

For samples of hazardous substances of unknown content, select the appropriate transportation category according to the DOT hazardous materials classification of a material having more than one hazard. This procedure is outlined in DOT Regulation 49 CFR 173.2a. (This can be found in Attachment C of this SOP.)

The correct shipping classification for an unknown sample is selected through a process of elimination, as outlined in DOT Regulation 49 CFR 172.101(c)(11). By using the provisions in this paragraph, the proper shipping name and description will be determined. A step-by-step guide is provided by the Department of Transportation (DOT) and can be found in Attachment D of this SOP.

#### 5.4.3 **Packaging and Shipping of Samples Classified as Flammable Liquid (or Solid)**

##### 5.4.3.1 Packaging

Applying the word "flammable" to a sample does not imply that it is in fact flammable. The word prescribes the class of packaging according to DOT regulations.

1. Containerize sample as required (see Attachments A and B). To prevent leakage, fill container no more than 90 percent full. Seal lid with teflon tape or wire.
2. Complete sample label and attach securely to sample container.
3. Seal container and place in 2-mil-thick (or thicker) polyethylene bag (e.g., Ziploc baggie), one sample per bag. Position sample identification label so that it can be read through bag. Seal bag.
4. For soil jars, place sealed bag inside metal can (available from laboratory or laboratory supplier) and cushion it with enough noncombustible, absorbent material (for example, vermiculite or diatomaceous earth) between the bottom and sides of the can and bag to prevent breakage and absorb leakage. Pack one bag per can. Use clips, tape, or other positive means to hold can lid securely, tightly and permanently. Mark can as indicated in Paragraph 1 of Section 5.3.4.2, below. Single 1-gallon bottles do not need to be placed in metal cans.
5. Place one or more metal cans (or a single 1-gallon bottle) into a strong outside container, such as a metal picnic cooler or a DOT-approved fiberboard box. Surround cans (or bottle) with noncombustible, absorbent cushioning materials for stability during transport. The absorbent material should be able to absorb the entire contents of the container. Mark container as indicated in Paragraph 2 below.

##### 5.4.3.2 Marking/Labeling

1. Use abbreviations only where specified. Place the following information, either hand-printed or in label form, on the metal can (or 1-gallon bottle):
  - Laboratory name and address.

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- Proper shipping name from the hazardous materials table (DOT Regulation CFR 49 172.101). Example: "Flammable Liquid, n.o.s. UN1993" or "Flammable Solid, n.o.s. UN1325." This will include packing group (see Section 5.3.4.2, No. 2.)

Not otherwise specified (n.o.s) is not used if the flammable liquid (or solid) is identified. If identified, the name of the specific material is listed before the category (for example, Acetone, Flammable Liquid), followed by its appropriate UN number found in the DOT Hazardous Materials table (49 CFR 172.101).

2. Determine packing group. The packing group is part of the proper shipping name and must be included on the shipping papers in the description section.

- I. Most Hazardous
- II. Medium Hazard
- III. Least Hazardous

The packing group will be listed in the hazardous materials table, column 5.

3. Place all information on outside shipping container as on can (or bottle), specifically:

- Proper shipping name
- UN or NA number
- Proper label(s)
- Addressee and sender

Place the following labels on the outside shipping container: "Cargo Aircraft Only" and DOT label such as: "Flammable Liquid" (or "Flammable Solid"). "Dangerous When Wet" label shall be used if the Flammable Solid has not been exposed to a wet environment. "Laboratory Samples" and "THIS SIDE UP" or "THIS END UP" shall also be marked on the top of the outside container, and upward-pointing arrows shall be placed on all four sides of the container.

#### 5.4.3.3 Shipping Papers

1. Use abbreviations only where specified. Complete the carrier-provided bill of lading and sign certification statement. Provide the following information in the order listed (one form may be used for more than one exterior container):

- Proper shipping name. (Example: "Flammable Liquid, n.o.s. UN1993" or "Flammable Solid, n.o.s. UN1325 Packing Group I, II, III").
- "Limited Quantity" (or "Ltd. Qty."). (See No. 3, below.)
- "Cargo Aircraft Only."
- Net weight (wt) or net volume (vol), just before or just after "Flammable Liquid, n.o.s." or "Flammable Solid, n.o.s.," by item, if more than one metal can is inside an exterior container.
- "Laboratory Samples" (if applicable).

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2. Include Chain-of-Custody Record, properly executed in outside container; use custody seals.
3. "Limited Quantity" means the maximum amount of a hazardous material for which there is a specific labeling or packaging exception (DOT CFR 49 171.8). This may mean that packages are exempted from labeling requirements. To determine if your sample meets the Limited Quantity Exception, refer to DOT Regulation CFR 49 Subpart C 173.50 through 173.156. First, determine the proper classification and shipping name for the material; then refer to the exception requirements for that particular class of material beginning with 173.50.

Example: "Flammable Liquid n.o.s. UN1993 Packing Group 1." The outer package can weigh no more than 66 pounds gross weight. The inner package or container can weigh no more than 0.1 gallon net capacity for each container.

To determine whether the material can be shipped as a "Limited Quantity," you must check the specific requirement for that class of material.

#### 5.4.3.4 Transportation

1. The majority of unknown hazardous substance samples will be classified as flammable liquids. The samples will be transported by rented or common carrier truck, railroad, or express overnight package services. Do not transport samples on any passenger-carrying air transport system, even if the system has cargo-only aircraft. DOT regulations permit regular airline cargo-only aircraft, but difficulties with most suggest avoiding them. Instead, ship by airline carriers that carry only cargo. If unsure of what mode of transportation to use, consult the FOL or Project Manager.<sup>1</sup>
2. For transport by government-owned vehicle, including aircraft, DOT regulations do not apply. However, procedures described above, with the exception of execution of the bill of lading with certification, shall still be followed.
3. Use the hazardous materials shipping check list (Attachment E) as a guidance to ensure that all sample-handling requirements are satisfied.
4. In some cases, various materials may react if they break during shipment. To determine if you are shipping such materials, refer to the DOT compatibility chart in Attachment F.

#### 5.5 Shipment of Lithium Batteries

Monitoring well data are analyzed using either the Hermit SE 1000 or the Hermit SE 2000 environmental data logger. These instruments are powered by lithium batteries. The Department of Transportation has determined that lithium batteries are a hazardous material and are to be shipped using the following information:

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<sup>1</sup> Note: If you are unsure as how to ship the sample (hazardous or environmental sample), contact the FOL or Project Manager so that a decision can be made as to the proper shipping practices. The DOT penalties for improper shipment of a hazardous material are stringent and may include a prison term for intentional violations.

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- Product Designation
  - Hermit SE 1000
  - Hermit SE 2000
- DOT Proper Shipping Name
  - Lithium batteries, contained in equipment, UN3091
- Classification or Division
  - Class 9

Shipment of equipment containing lithium batteries must be accompanied by shipping papers completed as indicated in Attachment G. The instrument will be shipped by Federal Express as a Hazardous Material. Place the instrument in the same container in which it was received. This container or case is a DOT-approved shipping container. For Federal Express procedures to ship hazardous materials, call 1-800-238-5355, extension 922-1666. In most cases, the return shipping papers and DOT labels will be shipped to you from the company warehouse or the vendor. An example of the types of labels used for shipment and the wording are shown in Attachment G. These labels will be attached to the outside container with the following wording:

- Lithium Batteries Contained in Equipment
  - UN-3091
  - Shipped Under CA-9206009

## 6.0 REFERENCES

American Public Health Association, 1981. Standard Methods for the Examination of Water and Wastewater, 15th Edition. APHA, Washington, D.C.

U.S. Department of Transportation, 1993. Hazardous Materials Regulations, 49 CFR 171-177.

U.S. EPA, 1984. "Guidelines Establishing Test Procedures for the Analysis of Pollutants under Clean Water Act." Federal Register, Volume 49 (209), October 26, 1984, p. 43234.

U.S. EPA, 1979. Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020, U.S. EPA-EMSL, Cincinnati, Ohio.

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**ATTACHMENT A**

**GENERAL SAMPLE CONTAINER AND PRESERVATION REQUIREMENTS**

Sample Type and Concentration	Container <sup>(1)</sup>	Sample Size	Preservation <sup>(2)</sup>	Holding Time <sup>(2)</sup>
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**WATER**

Organics (GC&GC/MS)	VOC	Low	Borosilicate glass	2 x 40 mL	Cool to 4°C HCl to ≤ 2	14 days <sup>(8)</sup>
	Extractables SVOCs and pesticide/PCBs	(Low)	Amber glass	2x2 L or 4x1 L	Cool to 4°C	7 days to extraction; 40 days after extraction
	Extractables SVOCs and pesticide/PCBs	(Medium)	Amber glass	2x2 L or 4x1 L	None	7 days to extraction; 40 days after extraction
Inorganics	Metals	Low	High-density polyethylene	1 L	HNO <sub>3</sub> to pH ≤ 2	6 months (Hg-28 days)
		Medium	Wide-mouth glass	16 oz.	None	6 months
	Cyanide	Low	High-density polyethylene	1 L	NaOH to pH > 12	14 days
	Cyanide	Medium	Wide-mouth glass	16 oz.	None	14 days
Organic/ Inorganic	High Hazard		Wide-mouth glass	8 oz.	None	14 days

**SOIL**

Organics (GC&GC/MS)	VOC		Wide-mouth glass with teflon liner	2 x 4 oz.	Cool to 4°C	14 days
	Extractables SVOCs and pesticides/PCBs	(Low)	Wide-mouth glass	8 oz.	Cool to 4°C	14 days to extraction; 40 days after extraction
	Extractables SVOCs and pesticides/PCBs	(Medium)	Wide-mouth glass	8 oz.	Cool to 4°C	14 days to extraction; 40 days after extraction
Inorganics	Low/Medium		Wide-mouth glass	8 oz.	Cool to 4°C	6 months (Hg - 28 days) Cyanide (14 days)
Organic/ Inorganic	High Hazard		Wide-mouth glass	8 oz.	None	NA
Dioxin/Furan	All		Wide-mouth glass	4 oz.	None	7 days until extraction; 40 days after extraction
TCLP	All		Wide-mouth glass	8 oz.	None	7 days until preparation; analysis as per fraction

**AIR**

Volatile Organics	Low/Medium		Charcoal tube – 7 cm long, 6 mm OD, 4 mm ID	100 L air	Cool to 4°C	5 days recommended
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<sup>(1)</sup> All glass containers should have Teflon cap liners or septa.

<sup>(2)</sup> See Attachment E. Preservation and maximum holding time allowances per 40 CFR 136.

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**ATTACHMENT B**

**ADDITIONAL REQUIRED CONTAINERS, PRESERVATION TECHNIQUES,  
AND HOLDING TIMES**

Parameter Number/Name	Container <sup>(1)</sup>	Preservation <sup>(2)(3)</sup>	Maximum Holding Time <sup>(4)</sup>
<b>INORGANIC TESTS:</b>			
Acidity	P, G	Cool, 4°C	14 days
Alkalinity	P, G	Cool, 4°C	14 days
Ammonia - Nitrogen	P, G	Cool, 4°C; H <sub>2</sub> SO <sub>4</sub> to pH 2	28 days
Biochemical Oxygen Demand (BOD)	P, G	Cool, 4°C	48 hours
Bromide	P, G	None required	28 days
Chemical Oxygen Demand (COD)	P, G	Cool, 4°C; H <sub>2</sub> SO <sub>4</sub> to pH 2	28 days
Chloride	P, G	None required	28 days
Chlorine, Total Residual	P, G	None required	Analyze immediately
Color	P, G	Cool, 4°C	48 hours
Cyanide, Total and Amenable to Chlorination	P, G	Cool, 4°C; NaOH to pH 12; 0.6 g ascorbic acid <sup>(5)</sup>	14 days <sup>(6)</sup>
Fluoride	P	None required	28 days
Hardness	P, G	HNO <sub>3</sub> to pH 2; H <sub>2</sub> SO <sub>4</sub> to pH 2	6 months
Total Kjeldahl and Organic Nitrogen	P, G	Cool, 4°C; H <sub>2</sub> SO <sub>4</sub> to pH 2	28 days
Nitrate - Nitrogen	P, G	None required	48 hours
Nitrate-Nitrite - Nitrogen	P, G	Cool, 4°C; H <sub>2</sub> SO <sub>4</sub> to pH 2	28 days
Nitrite - Nitrogen	P, G	Cool, 4°C	48 hours
Oil & Grease	G	Cool, 4°C; H <sub>2</sub> SO <sub>4</sub> to pH 2	28 days
Total Organic Carbon (TOC)	P, G	Cool, 4°C; HCl or H <sub>2</sub> SO <sub>4</sub> to pH 2	28 days
Orthophosphate	P, G	Filter immediately; Cool, 4°C	48 hours
Oxygen, Dissolved-Probe	G Bottle & top	None required	Analyze immediately
Oxygen, Dissolved-Winkler	G Bottle & top	Fix on site and store in dark	8 hours
Phenols	G	Cool, 4°C; H <sub>2</sub> SO <sub>4</sub> to pH 2	28 days
Phosphorus, Total	P, G	Cool, 4°C; H <sub>2</sub> SO <sub>4</sub> to pH 2	28 days
Residue, Total	P, G	Cool, 4°C	7 days
Residue, Filterable (TDS)	P, G	Cool, 4°C	7 days
Residue, Nonfilterable (TSS)	P, G	Cool, 4°C	7 days
Residue, Settleable	P, G	Cool, 4°C	48 hours
Residue, Volatile (Ash Content)	P, G	Cool, 4°C	7 days
Silica	P	Cool, 4°C	28 days
Specific Conductance	P, G	Cool, 4°C	28 days
Sulfate	P, G	Cool, 4°C	28 days

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**ATTACHMENT B  
ADDITIONAL REQUIRED CONTAINERS, PRESERVATION TECHNIQUES,  
AND HOLDING TIMES  
PAGE TWO**

Parameter Number/Name	Container <sup>(1)</sup>	Preservation <sup>(2)(3)</sup>	Maximum Holding Time <sup>(4)</sup>
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**INORGANIC TESTS (Cont'd):**

Sulfide	P, G	Cool, 4°C; add zinc acetate plus sodium hydroxide to pH 9	7 days
Sulfite	P, G	None required	Analyze immediately
Turbidity	P, G	Cool, 4°C	48 hours

**METALS:<sup>(7)</sup>**

Chromium VI (Hexachrome)	P, G	Cool, 4°C	24 hours
Mercury (Hg)	P, G	HNO <sub>3</sub> to pH 2	28 days
Metals, except Chromium VI and Mercury	P, G	HNO <sub>3</sub> to pH 2	6 months

**ORGANIC TESTS:<sup>(8)</sup>**

Purgeable Halocarbons	G, Teflon-lined septum	Cool, 4°C; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup>	14 days
Purgeable Aromatic Hydrocarbons	G, Teflon-lined septum	Cool, 4°C; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup> HCl to pH 2 <sup>(8)</sup>	14 days
Acrolein and Acrylonitrile	G, Teflon-lined septum	Cool, 4°C; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup> adjust pH to 4-5 <sup>(10)</sup>	14 days
Phenols <sup>(11)</sup>	G, Teflon-lined cap	Cool, 4°C; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup>	7 days until extraction; 40 days after extraction
Benzidines <sup>(11), (12)</sup>	G, Teflon-lined cap	Cool, 4°C; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup>	7 days until extraction <sup>(13)</sup>
Phthalate esters <sup>(11)</sup>	G, Teflon-lined cap	Cool, 4°C	7 days until extraction; 40 days after extraction
Nitrosamines <sup>(11), (14)</sup>	G, Teflon-lined cap	Cool, 4°C; store in dark; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup>	7 days until extraction; 40 days after extraction
PCBs <sup>(11)</sup>	G, Teflon-lined cap	Cool, 4°C	7 days until extraction; 40 days after extraction
Nitroaromatics & Isophorone <sup>(11)</sup>	G, Teflon-lined cap	Cool, 4°C; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup> ; store in dark	7 days until extraction; 40 days after extraction
Polynuclear Aromatic Hydrocarbons (PAHs) <sup>(11), (14)</sup>	G, Teflon-lined cap	Cool, 4°C; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup> ; store in dark	7 days until extraction; 40 days after extraction
Haloethers <sup>(11)</sup>	G, Teflon-lined cap	Cool, 4°C; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup>	7 days until extraction; 40 days after extraction
Dioxin/Furan (TCDD/TCDF) <sup>(11)</sup>	G, Teflon-lined cap	Cool, 4°C; 0.008% Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> <sup>(5)</sup>	7 days until extraction; 40 days after extraction

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**ATTACHMENT B  
ADDITIONAL REQUIRED CONTAINERS, PRESERVATION TECHNIQUES,  
AND HOLDING TIMES  
PAGE THREE**

Parameter Number/Name	Container <sup>(1)</sup>	Preservation <sup>(2)(3)</sup>	Maximum Holding Time <sup>(4)</sup>
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**RADIOLOGICAL TESTS:**

1-5 Alpha, beta and radium	P, G	HNO <sub>3</sub> to pH 2	6 months
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- (1) Polyethylene (P): generally 500 ml or Glass (G): generally 1L.
- (2) Sample preservation should be performed immediately upon sample collection. For composite chemical samples each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then chemical samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.
- (3) When any sample is to be shipped by common carrier or sent through the United States Mail, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR Part 172).
- (4) Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still be considered valid. Samples may be held for longer periods only if the permittee, or monitoring laboratory, has data on file to show that the specific types of samples under study are stable for the longer periods, and has received a variance from the Regional Administrator.
- (5) Should only be used in the presence of residual chlorine.
- (6) Maximum holding time is 24 hours when sulfide is present. Optionally, all samples may be tested with lead acetate paper before pH adjustments are made to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.
- (7) Samples should be filtered immediately on site before adding preservative for dissolved metals.
- (8) Guidance applies to samples to be analyzed by GC, LC, or GC/MS for specific compounds.
- (9) Sample receiving no pH adjustment must be analyzed within 7 days of sampling.
- (10) The pH adjustment is not required if acrolein will not be measured. Samples for acrolein receiving no pH adjustment must be analyzed within 3 days of sampling.
- (11) When the extractable analytes of concern fall within a single chemical category, the specified preservative and maximum holding times should be observed for optimum safeguard of sample integrity. When the analytes of concern fall within two or more chemical categories, the sample may be preserved by cooling to 4°C, reducing residual chlorine with 0.008% sodium thiosulfate, storing in the dark, and adjusting the pH to 6-9; samples preserved in this manner may be held for 7 days before extraction and for 40 days after extraction. Exceptions to this optional preservation and holding time procedure are noted in footnote 5 (re: the requirement for thiosulfate reduction of residual chlorine) and footnotes 12, 13 (re: the analysis of benzidine).
- (12) If 1,2-diphenylhydrazine is likely to be present, adjust the pH of the sample to 4.0±0.2 to prevent rearrangement to benzidine.
- (13) Extracts may be stored up to 7 days before analysis if storage is conducted under an inert (oxidant-free) atmosphere.
- (14) For the analysis of diphenylnitrosamine, add 0.008% Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> and adjust pH to 7-10 with NaOH within 24 hours of sampling.
- (15) The pH adjustment may be performed upon receipt at the laboratory and may be omitted if the samples are extracted within 72 hours of collection. For the analysis of aldrin, add 0.008% Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>.

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**ATTACHMENT C**

**DOT HAZARDOUS MATERIAL CLASSIFICATION  
(49 CFR 173.2a)**

1. Radioactive material (except a limited quantity)
2. Division 2.3, Poisonous Gases
3. Division 2.1, Flammable Gas
4. Division 2.2, Nonflammable gas
5. Division 6.1, Poisonous Liquids, Packing Group 1 (poison by inhalation only)
6. Division 4.2, Pyrophoric Material
7. Division 4.1, Self-Reactive Material
8. Class 3, Flammable Liquids\*
9. Class 8, Corrosive Material
10. Division 4.1, Flammable Solid\*
11. Division 4.2, Spontaneously Combustible Materials\*
12. Division 4.3, Dangerous When Wet Materials\*
13. Division 5.1, Oxidizers\*
14. Division 6.1, Poisonous Liquids or Solids (other than Packing Group 1)\*
15. Combustible liquid
16. Class 9, Miscellaneous Hazardous Materials

\* If a material has or meets the criteria for more than one hazard class, use the precedence of hazardous table on the following page for Classes 3 and 8 and Divisions 4.1, 4.2, 4.3, 5.1, and 6.1. The following table ranks those materials that meet the definition of Classes 3 and 8 and Divisions 4.1, 4.2, 4.3, 5.1, and 6.1.

## PRECEDENCE OF HAZARD TABLE

(Hazard Class and Packing Group)

Class	Packing Group	4.2	4.3	5.1 I <sup>(a)</sup>	5.1 II <sup>(a)</sup>	5.1 III <sup>(a)</sup>	6.1 I (Dermal)	6.1 I (Oral)	6.1 II	6.1 III	8 I (Liquid)	8 I (Solid)	8 II (Liquid)	8 II (Solid)	8 III (Liquid)	8 III (Solid)
3	I						3	3	3	3	3	(c)	3	(c)	3	(c)
3	II						3	3	3	3	8	(c)	3	(c)	3	(c)
3	III						6.1	6.1	6.1	3 <sup>(d)</sup>	8	(c)	8	(c)	3	(c)
4.1	II <sup>b</sup>	4.2	4.3	5.1	4.1	4.1	6.1	6.1	4.1	4.1	(c)	8	(c)	4.1	(c)	4.1
4.1	III <sup>b</sup>	4.2	4.3	5.1	4.1	4.1	6.1	6.1	6.1	4.1	(c)	8	(c)	8	(c)	4.1
4.2	II		4.3	5.1	4.2	4.2	6.1	6.1	4.2	4.2	(c)	8	(c)	4.2	(c)	4.2
4.2	III		4.3	5.1	4.2	4.2	6.1	6.1	6.1	4.2	(c)	8	(c)	8	(c)	4.2
4.3	I			5.1	4.3	4.3	6.1	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
4.3	II			5.1	4.3	4.3	6.1	4.3	4.3	4.3	8	8	8	4.3	4.3	4.3
4.3	III			5.1	4.3	4.3	6.1	6.1	6.1	4.3	8	8	8	8	4.3	4.3
5.1	I <sup>a</sup>						5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
5.1	II <sup>a</sup>						6.1	5.1	5.1	5.1	8	8	8	5.1	5.1	5.1
5.1	III <sup>a</sup>						6.1	6.1	6.1	5.1	8	8	8	8	5.1	5.1
6.1	I, Dermal										8	6.1	6.1	6.1	6.1	6.1
6.1	I, Oral										8	6.1	6.1	6.1	6.1	6.1
6.1	II, Inhalation										8	6.1	6.1	6.1	6.1	6.1
6.1	II, Dermal										8	6.1	8	6.1	6.1	6.1
6.1	II, Oral										8	8	8	6.1	6.1	6.1
6.1	III										8	8	8	8	8	8

(a) There are at present no established criteria for determining Packing Groups for liquids in Division 5.1. At present, the degree of hazard is to be assessed by analogy with listed substances, allocating the substances to Packing Group I, Great; Group II, Medium; or Group III, Minor Danger.

(b) Substances of Division 4.1 other than self-reactive substances.

(c) Denotes an impossible combination.

(d) For pesticides only, where a material has the hazards of Class 3, Packing Group III, and Division 6.1, Packing Group III, the primary hazard is Division 6.1, Packing Group III.

ATTACHMENT C (Continued)

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## ATTACHMENT D

### GUIDE FOR HAZARDOUS MATERIALS SHIPPERS

USE OF GUIDE - This guide is presented as an aid to shippers of hazardous materials. It does not contain or refer to all of the DOT requirements for shipping hazardous materials. For specific details, refer to all of the DOT requirements for shipping hazardous materials, as provided in the Code of Federal Regulations (CFR), Title 49, Transportation, Parts 100-199.

The following is offered as a step-by-step procedure to aid in compliance with the applicable DOT regulations.

**STEP 1 - DETERMINE THE PROPER SHIPPING NAME.** The shipper must determine the proper shipping name of the materials as listed in the Hazardous Materials Table, 49 CFR 172.101, Column (2).

**STEP 2 - DETERMINE THE HAZARD CLASS OR CLASSES.**

- a. Refer to the Table, 49 CFR 172.101, Column (3), and locate the hazard class of the material.
- b. If more than one class is shown for the proper shipping name, determine the proper class by definition.
- c. If the materials have more than one hazard, classify the material based on the order of hazards in 49 CFR 173.2.

**STEP 3 - SELECT THE PROPER IDENTIFICATION NUMBERS.**

- a. Refer to the Table, 49 CFR 172.101, Column (3a), and select the Identification Number (ID) that corresponds to the proper shipping name and hazard class.
- b. Enter the ID number(s) on the shipping papers and display them, as required, on packagings, placards and/or orange panels.

**STEP 4 - DETERMINE THE MODE(S) OF TRANSPORT TO ULTIMATE DESTINATION.**

- a. As a shipper, you must assure yourself that the shipment complies with various modal requirements.
- b. The modal requirements may affect the following: (1) Packaging; (2) Quantity per Package; (3) Marking; (4) Labeling; (5) Shipping Papers; and (6) Certification.

**STEP 5 - SELECT THE PROPER LABEL(S) AND APPLY AS REQUIRED.**

- a. Refer to the Table, 49 CFR 172.101, Column (4) for required labels.
- b. For details on labeling refer to (1) Additional Labels, 49 CFR 172.402; (2) Placement of Labels, 49 CFR 172.406; (3) Packagings (Mixed or Consolidated), 49 CFR 172.404(a) and (h); (4) Packages Containing Samples, 49 CFR 172.402(h); (5) Radioactive Materials, 49 CFR 172.403; and (6) Authorized Label Modifications, 49 CFR 172.405.

**STEP 6 - DETERMINE AND SELECT THE PROPER PACKAGES.**

- a. Refer to the Table, 49 CFR 172.101, Column (5a) for exceptions and Column (5b) for specification packagings. Consider the following when selecting an authorized package: Quantity per Package; Cushioning Material, if required; Proper Closure and Reinforcement; Proper Pressure; Outage; etc., as required.
- b. If packaged by a prior shipper, make sure the packaging is correct and in proper condition for transportation.

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**ATTACHMENT D (Continued)  
GUIDE FOR HAZARDOUS MATERIALS SHIPPERS**

**STEP 7 - MARK THE PACKAGING (INCLUDING OVERPACKS).**

- a. Apply the required markings (49 CFR 172.300); Proper shipping name and ID number, when required (49 CFR 172.301); Name and address of Consignee or Consignor (49 CFR 172.306).
- b. For details and other required markings, see 49 CFR 172.300 through 172.338.

**STEP 8 - PREPARE THE SHIPPING PAPERS.**

- a. The basic requirements for preparing shipping papers include Proper Shipping Name; Hazard Class; ID Number; Total Quantity; Shipper's Certification; and Emergency Response Telephone Number.
- b. Make all entries on the shipping papers using the information required and in proper sequence (49 CFR 172.202).

**STEP 9 - CERTIFICATION.**

- a. Each shipper must certify by printing (manually or mechanically) on the shipping papers that the materials being offered for shipment are properly classified, described, packaged, marked and labeled, and in proper condition for transportation according to the applicable DOT Regulations (49 CFR 172.202).

**STEP 10 - LOADING, BLOCKING, AND BRACING.** When hazardous materials are loaded into the transport vehicle or freight container, each package must be loaded, blocked, and braced in accordance with the requirements for mode of transport.

- a. If the shipper loads the freight container or transport vehicle, the shipper is responsible for the proper loading, blocking, and bracing of the materials.
- b. If the carrier does the loading, the carrier is responsible.

**STEP 11 - DETERMINE THE PROPER PLACARD(S).** Each person who offers hazardous materials for transportation must determine that the placarding requirements have been met.

- a. For Highway, unless the vehicle is already correctly placarded, the shipper must provide the required placard(s) and required ID number(s) (49 CFR 172.506).
- b. For Rail, if loaded by the shipper, the shipper must placard the rail car if placards are required (49 CFR 172.508).
- c. For Air and Water shipments, the shipper has the responsibility to apply the proper placards.

**STEP 12 - HAZARDOUS WASTE/HAZARDOUS SUBSTANCE.**

- a. If the material is classed as a hazardous waste or hazardous substance, most of the above steps will be applicable.
- b. Pertinent Environmental Protection Agency regulations are found in the Code of Federal Regulations, Title 40, Part 262.

**As a final check and before offering the shipment for transportation, visually inspect your shipment. The shipper should ensure that emergency response information is on the vehicle for transportation of hazardous materials.**

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Revised March 1995.

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## ATTACHMENT E

### HAZARDOUS MATERIALS SHIPPING CHECK LIST

#### PACKAGING

1. Check DOT 173.24 for appropriate type of package for hazardous substance.
2. Check for container integrity, especially the closure.
3. Check for sufficient absorbent material in package.
4. Check for sample tags and log sheets for each sample and for chain-of-custody record.

#### SHIPPING PAPERS

1. Check that entries contain only approved DOT abbreviations.
2. Check that entries are in English.
3. Check that hazardous material entries are specially marked to differentiate them from any nonhazardous materials being sent using same shipping paper.
4. Be careful that all hazardous classes are shown for multiclass materials.
5. Check total amounts by weight, quantity, or other measures used.
6. Check that any limited-quantity exemptions are so designated on the shipping paper.
7. Check that certification is signed by shipper.
8. Make certain driver signs for shipment.

#### RCRA MANIFEST

1. Check that approved state/federal manifests are prepared.
2. Check that transporter has the following: valid EPA identification number, valid driver's license, valid vehicle registration, insurance protection, and proper DOT labels for materials being shipped.
3. Check that destination address is correct.
4. Check that driver knows where shipment is going.
5. Check that the driver is aware of emergency procedures for spills and accidents.
6. Make certain driver signs for shipment.
7. Make certain one copy of executed manifest and shipping document is retained by shipper.

ATTACHMENT F

DOT SEGREGATION AND SEPARATION CHART

Class or Division	Notes	1.1-1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 gas Zone A*	2.3 gas Zone B*	3	4.1	4.2	4.3	5.1	5.2	6.1 liquids PG-I Zone A*	7	8 liquids only
Explosives . . . . . 1.1 and 1.2	A	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
Explosives . . . . . 1.3		*	*	*	*	*	X		X	X	X		X	X	X	X	X		X
Explosives . . . . . 1.4		*	*	*	*	*	O		O	O	O		O				O		O
Very insensitive explosives . . . . . 1.5	A	*	*	*	*	*	X	X	X	X	X	X	X	X	X	X	X	X	X
Extremely insensitive explosives . . . . . 1.6		*	*	*	*	*													
Flammable gases . . . . . 2.1		X	X	O	X				X	O							O	O	
Non-toxic, non-flammable gases . . . . . 2.2		X			X														
Poisonous gas - Zone A** . . . . . 2.3		X	X	O	X		X				X	X	X	X	X	X			X
Poisonous gas - Zone B** . . . . . 2.3		X	X	O	X		O				O	O	O	O	O	O			O
Flammable liquids . . . . . 3		X	X	O	X				X	O					O		X		O
Flammable solids . . . . . 4.1		X			X				X	O							X		O
Spontaneously combustible materials . . . . . 4.2		X	X	O	X				X	O							X		X
Dangerous-when-wet materials . . . . . 4.3		X	X		X				X	O							X		O
Oxidizers . . . . . 5.1	A	X	X		X				X	O	O						X		O
Organic peroxides . . . . . 5.2		X	X		X				X	O							X		O
Poisonous liquids PG I - Zone A** . . . . . 6.1		X	X	O	X		O				X	X	X	X	X	X			X
Radioactive materials . . . . . 7		X			X		O												
Corrosive liquids . . . . . 8		X	X	O	X				X	O		O	X	O	O	O	X		

No entry means that the materials are compatible (have no restrictions).

- X These materials may not be loaded, transported, or stored together in the same vehicle or facility.
- O The materials may not be loaded, transported, or stored together in the same vehicle or facility unless they are separated for 4 feet on all sides.
- \* Check the explosives compatibility chart in 49 CFR 179.848(f).
- A Ammonium nitrate fertilizers may be stored with Division 1.1 materials.
- \*\* Denotes inhalation hazardous for poisons; consult field team leader or project manager if you encounter a material in this class before shipment.

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**ATTACHMENT G  
LITHIUM BATTERY SHIPPING PAPERS**

**3224637861**

**TRANSPORT DETAILS**  
This shipment is within the provisions prescribed for: (delete non-applicable)  

CARGO AIRCRAFT ORK	Airport of Departure
--------------------	----------------------

Airport of Destination: <b>19CYS</b>	Shipments type: (delete non-applicable) <b>NON-RADIOACTIVE</b>
---	---

**WARNING**  
Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

**NATURE AND QUANTITY OF DANGEROUS GOODS**  
Dangerous Goods Identification

Proper Shipping Name	Class or Division	UN or ID No.	Subsidiary Risk	Quantity and type of packing	Packing Inst.	Authorization
LITHIUM BATTERIES CONTAINED IN EQUIPMENT	9	UN3091		1 PLASTIC BOX X 55 GRAMS	912 II	PER CA-9206009

**Additional Handling Information**  
1 HERMIT SERIES DATALOGGER X 55 GRAMS (11 GRAMS/CELL)

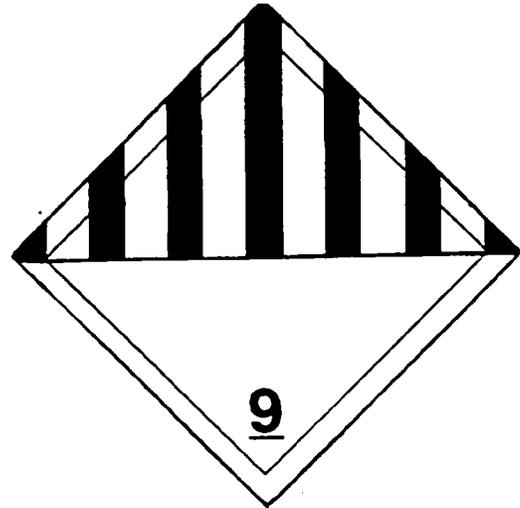
I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in the proper condition for transport by air according to the applicable International and National Government Regulations.

Emergency Telephone Number (Required for US Origin or Destination Shipments)  
**800-535-5053**

**IF ACCEPTABLE FOR PASSENGER AIRCRAFT, THIS SHIPMENT CONTAINS RADIOACTIVE MATERIAL INTENDED FOR USE IN, OR INCIDENT TO, RESEARCH, MEDICAL DIAGNOSIS, OR TREATMENT.**

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**ATTACHMENT G (CONTINUED)  
LITHIUM BATTERY SHIPPING PAPERS**



**LITHIUM BATTERIES CONTAINED  
IN EQUIPMENT.  
UN-3091.  
SHIPPED UNDER CA-9206009**

**APPENDIX K  
LAND SURVEY DATA  
(5 SITES) BASEWIDE STUMP NECK ANNEX**

# AIR BLAST POND

CODE	NORTHING	EASTING	ELEVATION
C1+100	322,796.61	1,248,434.13	6.01
SB01	322,738.49	1,248,386.02	13.11
SB04	322,665.28	1,248,309.00	13.86
C2+200	322,743.89	1,248,296.27	6.53
SD03	322,715.24	1,248,258.13	4.41
SD02	322,587.78	1,248,236.46	5.50
SD01	322,561.02	1,248,171.45	3.92
SB02	322,660.59	1,248,423.48	13.69
SB03	322,631.28	1,248,341.44	14.33
SS02	322,652.44	1,248,372.25	2.21
SS01	322,681.43	1,248,373.88	3.12
SS03	322,696.57	1,248,398.57	4.28
SD04	322,502.22	1,248,380.93	.68
C6	322,552.15	1,248,512.10	9.64



*James B. Murphy*  
9/30/97

# SWMU 4 DUMP SITE B

CODE	NORTHING	EASTING	ELEVATION
C1	320,415.38	1,245,285.19	8.14
DSBMW01	320,299.99	1,245,178.03	12.00
GRND	320,302.36	1,245,178.08	9.52
RISR	320,299.95	1,245,178.04	11.73
C4+200	320,209.24	1,245,151.34	9.12
DSBMW02	320,320.83	1,244,917.76	6.41
GRND	320,322.30	1,244,916.61	3.54
RISR	320,320.77	1,244,917.78	5.93
DSBMW04	320,444.83	1,244,790.27	17.25
GRND	320,445.80	1,244,789.05	14.93
RISR	320,444.83	1,244,790.23	16.83
C11-100	320,294.84	1,244,793.73	9.06
DSBMW03	320,236.44	1,244,770.26	10.67
GRND	320,235.52	1,244,768.89	8.01
RISR	320,236.40	1,244,770.14	10.40



*James S. Murphy*  
9/30/97

# SWMU 2/3 RANGE 3 BURN POINT/DUMP SITE A

CODE	NORTHING	EASTING	ELEVATION
RN3MW01	319,708.28	1,243,417.93	28.07
GRND	319,709.35	1,243,416.29	25.62
RISR	319,708.25	1,243,417.91	27.76
C9	319,632.22	1,243,418.87	14.21
SB14	319,493.61	1,243,585.84	5.18
C5+135	319,443.81	1,243,571.02	6.07
SD04	319,423.05	1,243,632.38	3.00
RN3MW03	319,206.08	1,243,662.25	5.93
GRND	319,206.82	1,243,663.50	5.85
RISR	319,206.01	1,243,662.35	5.56
RN3MW04	319,258.35	1,243,424.47	7.26
GRND	319,257.84	1,243,423.21	7.16
RISR	319,258.36	1,243,424.42	6.74
SD03	319,306.19	1,243,344.30	2.05
C1	319,234.93	1,243,458.69	6.75
RN3MW02	319,363.56	1,243,649.28	5.51
GRND	319,365.71	1,243,649.75	5.49
RISR	319,363.61	1,243,649.25	5.03



*James B. Murphy*  
9/30/97

# SWMU 5 RANGE 6

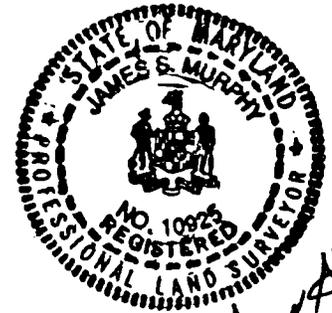
CODE	NORTHING	EASTING	ELEVATION
RN6MW05	318,185.22	1,242,266.20	32.47
GRND	318,185.38	1,242,263.61	30.07
RISR	318,185.26	1,242,266.13	32.17
RN6MW04	317,967.18	1,242,289.21	26.50
GRND	317,968.87	1,242,289.30	24.01
RISR	317,967.22	1,242,289.30	26.23
SB14	317,887.71	1,242,240.00	20.22
C1	317,927.77	1,242,134.25	27.51
SB12	317,753.12	1,242,130.47	14.26
C4+200	317,643.15	1,242,337.76	10.42
SB15	317,712.68	1,242,334.91	10.85
RN6MW03	317,526.75	1,242,027.97	12.67
GRND	317,525.63	1,242,029.75	10.02
RISR	317,526.69	1,242,027.83	12.27
SB04	317,382.38	1,242,209.72	7.51
5GW01	317,364.41	1,242,222.66	10.00
GRND	317,365.71	1,242,224.12	7.09
RISR	317,364.53	1,242,222.46	9.55
SB03	317,422.80	1,242,243.05	7.89
SB02	317,447.43	1,242,285.67	7.59
SB01	317,504.09	1,242,336.98	7.47
SB05	317,347.16	1,242,180.85	6.63
SB06	317,310.27	1,242,149.43	6.03
SB07	317,275.22	1,242,104.67	5.64
C8	317,230.39	1,242,155.40	4.66
SDSW02	317,178.10	1,242,200.74	1.72
SB08	317,224.91	1,242,049.31	4.84
RN6MW02	317,181.33	1,242,035.02	6.62
GRND	317,180.96	1,242,036.60	4.19
RISR	317,181.29	1,242,035.02	6.28
SDSW03	317,439.99	1,241,919.86	1.97
SDSW01	317,432.86	1,242,477.43	2.36
SDSW04	317,696.90	1,241,923.05	2.07



*James S. Murphy*  
9/30/97

# SWMU 1, RUM POINT LANDFILL

CODE	NORTHING	EASTING	ELEVATION
RPLMW01S	321,457.76	1,256,468.44	91.78
<u>GRND</u>	321,458.87	1,256,469.97	<u>89.49</u>
RISR	321,457.86	1,256,468.49	91.55
RPLMW01D	321,456.66	1,256,459.42	91.55
<u>GRND</u>	321,457.73	1,256,461.16	<u>89.59</u>
RISR	321,456.79	1,256,459.38	91.23
C1	321,435.07	1,256,385.76	90.14
C4	321,586.83	1,256,377.75	81.68
C1+150	321,427.17	1,256,236.69	90.48
RPLMW02	321,381.35	1,256,165.27	77.47
GRND	321,379.61	1,256,165.06	74.91
RISR	321,381.29	1,256,165.30	77.12
SWSD03	321,406.00	1,256,091.45	43.27 —
RPLMW04D	321,533.75	1,256,181.26	66.37
GRND	321,535.62	1,256,181.84	64.01
RISR	321,533.72	1,256,181.27	66.05
RPLMW04S	321,524.79	1,256,180.15	68.10
GRND	321,525.97	1,256,181.43	<u>65.40</u>
RISR	321,524.67	1,256,180.14	67.89
RPLMW03	321,696.86	1,256,261.10	63.64
<u>GRND</u>	321,695.71	1,256,259.96	60.96
RISR	321,697.06	1,256,261.02	63.30
SWSD01	321,816.40	1,256,187.38	31.35 —
SWSD02	321,697.62	1,256,352.56	50.16 —



*James S. Murphy*  
9/30/97

**APPENDIX L**  
**CHAINS-OF-CUSTODY**

# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

FAXED/SEND TO LEE LECK  
AND PAT HOOPER

Contract #/Billing Reference

1 of 4 Pgs.

Project: STUMPNECK JOB# 7581					Turnaround Time	STD	STD														
Client: P.R.I.					# of Containers	1	1														
Send Results To:					Container Type	1	1														
Address:					Preservative Used	4C	4C														
Phone:					Type of Analysis	VOR MPTA	S VOA MPTA APPENDIX B EXPLOSIVES														
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials											CLIENT COMMENTS						
RN6SB0010101	6/25/97	0948	SO	FUR	✓	✓															
RN6SS0010101	6/25/97	0948	SO	FUR	✓	✓															
RN6SS0020101		1000	SO	FUR	✓	✓															
RN6SB0020101		1000	SO	FUR	✓	✓															
RN6SB0030101		1010		FUR	✓	✓															
RN6SB0030101		1010		FUR	✓	✓															
RN6SB0040101		1020		FUR	✓	✓															
RN6SS0040101		1020		FUR																	
RN6SS0050101		1030		FUR	✓	✓															
RN6SS0050101		1030		FUR	✓	✓															
RN6SS0060101		1035		FUR	✓	✓															
RN6SB0060101	6/25/97	1055	SO	FUR	✓	✓															
Relinquished By: <i>[Signature]</i>		Date/Time: 6/25/97 09:00	Received By: 6-26-97 <i>[Signature]</i>		Received for Laboratory By:		Date/Time:														
Relinquished By:		Date/Time:	Received By:		Date/Time:	Shipper:	Airbill No.:														
Relinquished By:		Date/Time:	Received By:		Lab Comments:					Temp:											

G.P. W.O. \_\_\_\_\_

# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

2 of 4 Pgs.

Project: STUMP NECK JOB # 7581					Turnaround Time		STD	STD																
Client: BRE					# of Containers		1	1																
Send Results To:					Container Type		40% WMB	80% LMB																
Address:					Preservative Used		4°C	4°C																
Phone:					Type of Analysis		VOA <del>ANALYSIS</del> S-VOA <del>ANALYSIS</del> APPENIX B MET PERMISSIVE																	
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Lab Cooler No.									CLIENT COMMENTS										
RN6 DUPO1	6/25/97	0000	So	FUR	✓	✓																		
RN6SS0070101		1115		FUR	✓	✓																		RN6SS0070101
RN6SB0070101		1115		FUR	✓	✓																		
RN6SS0080101		1455		FUR	✓	✓																		
RN6SB0080101		1455		FUR	✓	✓																		
RN6SB0090101		1500		FUR	✓	✓																		
RN6SS0090101		1500		FUR	✓	✓																		
RN6SB0100101		1510		FUR	✓	✓																		
RN6SS0100101		1510		FUR	✓	✓																		
RN6SS0110101		1530		FUR	✓	✓																		
RN6SB0110101		1530		FUR	✓	✓																		
RN6SB0120101	6/25/97	1535	So	FUR	✓	✓											NO RESULTS FOR ON THIS SAMPLE							
Relinquished By:		Date/Time	Received By:		6-26-97		Relinquished By:			Received for Laboratory By:			Date/Time											
[Signature]		6/26/97 0900	[Signature]		07:00																			
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:	Airbill No.:																	
Relinquished By:		Date/Time	Received By:		Lab Comments:						Temp:													

G.P. W.O. \_\_\_\_\_

# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

3 of 4 Pgs.

Project: STUMPNECK # 7581					Turnaround Time		SID		SID														
Client BRE					# of Containers		1		1														
Send Results To:					Container Type		4.1 MWG		8.0E														
Address:					Preservative Used		4°C		4°C														
Phone:					Type of Analysis		VOA APP II		S-VOCIA APP II		AP PPM MET		EXPLOSIVES										
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials																	CLIENT COMMENTS		
RN6SS0120101	6/25/97	1535	SO	FUR	✓	✓																	
RN6DUPO2	6/25/97	0000	SO	FUR	✓	✓																	
RN6SS0130101		1545	SO	FUR	✓	✓																	
<del>RN6SS008</del>																						FUR	
RN6SBO130101	6/25/97	1545	SO	FUR	✓	✓																	
RN6SS0140101	6/25/97	1620	SO	FUR	✓	✓																	
RN6SBO140101	6/25/97	1620	SO	FUR	✓	✓																	
RN6SS0150101	6/25/97	1630	SO	FUR	✓	✓																	
RN6SBO150101	6/25/97	1630	SO	FUR	✓	✓																	
RN6DUPO3	6/25/97	0000	SO	FUR	✓	✓																	
RN6TB-001	6/25/97	0800	AQ	FUR FROM LAB	✓																		
TEMP. BL	6/25/97	NA	AQ	NA	NA	NA																From LAB	
Relinquished By:		Date/Time		Received By:		6-26-97		Relinquished By:		Received for Laboratory By:		Date/Time											
<i>[Signature]</i>		09:00		<i>[Signature]</i>		09:00																	
Relinquished By:		Date/Time		Received By:				Date/Time		Shipper:		Airbill No.:											
Relinquished By:		Date/Time		Received By:				Lab Comments:														Temp:	

# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

4 of 4 Pgs.

Project: STUMP NECK JOB #7581					Turnaround Time				STD	STD	STD	STD								
Client BRE					# of Containers				2	1	1	1								
Send Results To:					Container Type				40ML.	1L.	300ML	1L.								
Address:					Preservative Used				HCL	NONE	HNO3	NONE								
Phone:					Type of Analysis				VOA APPE	S-VOA APPE	APPE METALS	EXPLOSIVES								
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Lab Cooler No.														CLIENT COMMENTS	
RN6RB001	6/25/97	1810	AQ	SRW	✓	✓	✓	✓												
TEMP.	6/25/97	NA	AG	NA	NA	NA	NA	NA												
Relinquished By:					Date/Time	Received By: 6-26-97				Relinquished By:				Received for Laboratory By:				Date/Time		
[Signature]					6/25/97 0900	KIMAN 09:00														
Relinquished By:					Date/Time	Received By:				Date/Time	Shipper:				Airbill No.:					
Relinquished By:					Date/Time	Received By:				Lab Comments:				Temp:						

G.P. W.O. \_\_\_\_\_

# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

1 of 1 Pgs.

Project: <u>STUMPNECK JOB# 7581</u>					Turnaround Time	STD	STD	STD	STD	STD	STD	Lab Cooler No.	CLIENT COMMENTS
Client: <u>BRE</u>					# of Containers	1	1	2	1	2	1		
Send Results To:					Container Type	4oz	8oz	10ml	1L	500ml	1L		
Address:					Preservative Used	4°C	4°C	HCl	NONE	HNO <sub>3</sub>	NONE		
Phone:					Type of Analysis	VOA APP II	S-VOA APP II	VOA APP II	S-VOA APP II	METALS APP II	EXPLOSIVES APP II		
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials									
RN6SD0010001	6-26-97	1525	SO	SRW	✓	✓							
RN6SD0020001	6-26-97	1415	SO	SRW	✓	✓							
RN6SD0030001	6-26-97	1330	SO	SRW	✓	✓							
RN6SD0040001	6-26-97	1405	SO	SRW	✓	✓							
RN6SW0010001	6-26-97	1515	AQ	SRW			✓	✓	✓	✓			
RN6SW0020001	6-26-97	1435	AQ	SRW			✓	✓	✓	✓			
RN6SW0030001	6-26-97	1315	AQ	SRW			✓	✓	✓	✓			
RN6SW0040001	6-26-97	1355	AQ	SRW			✓	✓	✓	✓			
RN6TB-002	6-26-97	0800	AQ	SRW			✓						
TEMP. BL	6-26-97	NA	AQ	NA	NA	NA	NA	NA	NA	NA			
RN6RB002	6-26-97	1650	AQ	SRW			✓	✓	✓	✓		"DO NOT HOLD ANALYZE"	
Relinquished By: 		Date/Time: <u>6/27/97 15:05</u>	Received By: <u>6-27-97</u> <u>15:05</u>		Relinquished By:		Received for Laboratory By:		Date/Time				
Relinquished By:		Date/Time:	Received By:		Date/Time	Shipper:		Airbill No.:					
Relinquished By:		Date/Time:	Received By:		Lab Comments:					Temp:			

G.P. W.O. \_\_\_\_\_

# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

1 of 1 Pgs.

Project: STUMP Neck JOB # 7541					Turnaround Time					STD	STD	STD	STD	STD						
Client: BRE					# of Containers					1	1	2	2	1						
Send Results To:					Container Type					4oz	8oz	40ml	1L	300ml						
Address:					Preservative Used					4°C	4°C	HCL	None	HNO <sub>3</sub>						
Phone:					Type of Analysis					VIA APP. IX	S-VIA METALS APP. IX	VIA APP. IX	S-VIA APP. IX	METALS APP. IX						
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Lab Cooler No.															CLIENT COMMENTS
RPLSD0010001	6-27-97	1145	SO	SRW	✓	✓														
RPLSD0020001	6-27-97	1117	SO	SRW	✓	✓														
RPLSD0030001	6-27-97	1050	SO	SRW	✓	✓														
RPLDUP004	6-27-97	0000	SO	SRW	✓	✓														
RPLSW0010001	6-27-97	1135	SO AQ	SRW			✓	✓	✓											
RPLSW0020001	6-27-97	1102	AQ	SRW			✓	✓	✓											
RPLSW0030001	6-27-97	1040	AQ	SRW			✓	✓	✓											
RPLDUP001	6-27-97	0000	AQ	SRW			✓	✓	✓											
RPLTB <sup>003</sup> <del>001</del>	6-27-97	0800	AQ	SRW			✓													
TEMP. BL	6-27-97	NA	AQ	NA	NA	NA	NA	NA	NA											
RPLRB <sup>003</sup> <del>001</del>	6-27-97	1400	AQ	SRW			✓	✓	✓											
Relinquished By:		Date/Time	Received By: 6-27-97		Relinquished By:			Received for Laboratory By:			Date/Time									
<i>[Signature]</i>		6/27/97 15:05	<i>[Signature]</i> 15:05																	
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:												
Relinquished By:		Date/Time	Received By:		Lab Comments:							Temp:								

G.P. W.O. \_\_\_\_\_

# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

1 of 1 Pgs.

Project: STUMP PILE K					Turnaround Time							Lab Cooler No.	CLIENT COMMENTS
Client: B.R.F.					STD	STD	STD	STD	STD	STD	STD		
Send Results To:					# of Containers	1	1	2	1	1	2		
Address:					Container Type	402	402	402	402	402	402		
Phone:					Preservative Used	-	-	HCL	-	HOPE	-		
					Type of Analysis	APPENDIX II VOA	APPENDIX II VOA TOX METALS + EXPL	APPENDIX II VOA	APPENDIX II VOA	APPENDIX II VOA	APPENDIX II VOA		
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials									
RN3SS0010101	7/8/97	0810	SO	FUR	✓	✓							
RN3SS0020101	7/8/97	0820	SO	FW	✓	✓							
RN3SS0020101	11/8/97	0827	SO	FW	✓	✓							
RN3SB0020201	7/8/97	0848	SO	FW	✓	✓							
RN3SB0010101		0855	SO	FW	✓	✓							
RN3SB0010201		1047	SO	FW	✓	✓							
RN3RB004	7-8-97	1520	AQ	FUR			✓	✓	✓	✓	"HOLD" DO NOT ANALYZE		
RN3SS0030101	7-8-97	1105	SO	FW	✓	✓							
RN3SB0030101		1122	SO	FW	✓	✓							
RN3SS0040101		1441	SO	FW	✓	✓							
RN3SB0030201	7-8-97	1133	SO	FW	✓	✓							
RN3TB004	7-8-97	0800	AQ	FUR			✓						
Relinquished By: Fred Ramer		Date/Time: 7/14/97 1630	Received By: [Signature]		Date/Time: 7-08-97 16:30		Relinquished By:		Received for Laboratory By:		Date/Time:		
Relinquished By:		Date/Time:	Received By:		Date/Time:	Shipper:		Airbill No.:					
Relinquished By:		Date/Time:	Received By:		Lab Comments: TOC + TOX CHANGE ON THIS CUL LAB WAS NOTIFIED ABOUT					Temp:			

G.P. W.O. \_\_\_\_\_

# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

1 of 3 Pgs.

Project: STUMPNECK R/V/I DB# 7581					Turnaround Time			SID			SID			SID			Lab Cooler No.	CLIENT COMMENTS
Client					# of Containers			1			1			2				
Send Results To:					Container Type			4oz			4oz			4oz				
Address:					Preservative Used			-			-			-				
Phone:					Type of Analysis			APPLX VOA			APPLX VOA METALS TOXIC EXPLOSIVES			APPLX VOA				
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials														
RN3SS0050101	7-1-97	0816	SO	FW	✓	✓												
RN3SB0050101	7-1-97	0818	SO	FW	✓	✓												
RN3SB0040101	7-8-97	1511	SO	FW	✓	✓												
RN3SB0040201	7-8-97	1545	SO	FW	✓	✓												
RN3SS0060101	7-9-97	0858	SO	FW	✓	✓												
RN3SB0060101	7-9-97	0900	SO	FW	✓	✓												
RN3DUP005	7-9-97	0000	SO	FW	✓	✓												
RN3SB0080101	7-9-97	0148	SO	FW	✓	✓												
RN3SS0080101	7-9-97	0946	SO	FW	✓	✓												
RN3SS0070101	7-9-97	0915	SO	FW	✓	✓												
RN3SB0070101	7-9-97	0918	SO	FW	✓	✓												
RN3TB001	7-9-97	0800	AQ	FW			✓										RECEIVED FROM LAB	

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
<i>[Signature]</i>	7/9/97	7-09-97 <i>[Signature]</i> 17:23			
Relinquished By:	Date/Time	Received By:	Date/Time	Shipper:	Airbill No.:
Relinquished By:	Date/Time	Received By:	Lab Comments:		Temp:

G.P. W.O. \_\_\_\_\_









# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

\_\_\_\_\_ of \_\_\_\_\_ Pgs.

Project: STUMPNECK R/VL JOB# 758 1					Turnaround Time	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD	STD		
Client BRE					# of Containers	1	1	2	1	1												
Send Results To:					Container Type	4L W/16	4L W/16	4L W/16	500ML HDPE	500ML HDPE	1L HDPE	1L HDPE										
Address:					Preservative Used	-	-	HCL	HNO <sub>3</sub>	-												
Phone:					Type of Analysis	APPX VOA	APPX VOA METALS	APPX VOA	APPX METALS	APPX VOA												
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials																CLIENT COMMENTS		
RPLS0010101	7-11-97	1422	SO	FW	✓	✓																
RPLS0010101	7-11-97	1534	SO	FW	✓	✓																
RPLS0010201	7-11-97	1705	SO	FW	✓	✓																
RPLDUP009	7-11-97	0000	SO	FW	✓	✓																
RPLTB001	7-11-97	0800	AQ	FW			✓															
RPLRB007	7-11-97	1800	AQ	FW			✓		✓	✓												THIS SAMPLE WAS INITIALLY OMITTED FROM THE COC, ADDED TO COC'S AFTER TELEPHONE COMMUNICATION BETWEEN FUR + KEN IVES OF GP INC. SUR 7-14-97
Relinquished By: <i>[Signature]</i>					Date/Time	Received By: <i>[Signature]</i>					Relinquished By:					Received for Laboratory By:					Date/Time	
Relinquished By:					Date/Time	Received By:					Date/Time	Shipper:					Airbill No.:					
Relinquished By:					Date/Time	Received By:					Lab Comments:					Temp:						

G.P. W.O. \_\_\_\_\_

# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

\_\_\_\_\_ of \_\_\_\_\_ Pgs.

Project: JOB # 7581 STUMPFICK RI/VI					Turnaround Time			STD	STD	STD							
Client BRE					# of Containers			1	1	2							
Send Results To:					Container Type			40z W/40z	80z W/80z	400z VIAL							
Address:					Preservative Used			-	-								
Phone:					Type of Analysis			APPX VIA	APPX S VIA INITIALS	APPX VIA							
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Lab Cooler No.										CLIENT COMMENTS		
RPLSBC0010401	7/11/97	1453	SO	FW											✓	✓	
RPLTB001	7/14/97	0800	AQ	FR			✓										
Relinquished By:		Date/Time		Received By:		7-14-97		Relinquished By:		Received for Laboratory By:		Date/Time					
<i>[Signature]</i>		7/17/97		<i>[Signature]</i>		17:30											
Relinquished By:		Date/Time		Received By:		Date/Time		Shipper:		Airbill No.:							
Relinquished By:		Date/Time		Received By:		Lab Comments:				Temp:							

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# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

\_\_\_\_\_ of \_\_\_\_\_ Pgs.

Project: JOB# 7581 STUMPNECK RI/VI					Turnaround Time								Lab Cooler No.	CLIENT COMMENTS
Client BRE					STD	STD	STD	SID	STD	SID	SID	SID		
Send Results To:					# of Containers	1	1	1	2	1	1	2		
Address:					Container Type	40 L WMB	50 L WMB	40 L WMB	40 L WMB	40 L WMB	40 L WMB	40 L WMB		
Phone:					Preservative Used	-	-	HCL	-	HNO3	-	-		
					Type of Analysis	APPE VOA	APPE VOA METALS	APPE SVOA Metals	APPE VOA	APPE SVOA	TAL METALS	EXPLOSIVES		
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials										
ABPSS0010101	7/13/97	1425	SO	FW	✓		✓							
ABPSS0020101	7/13/97	1430	SO	FW	✓		✓							
ABPSS0030101	7/13/97	1435	SO	FW	✓		✓							
RPLRB008	7/14/97	1430	AQ	FWR			✓	✓	✓	✓			"HOLD" DO NOT ANALYZE	
RPLSB0020101	7/12/97	1534	SO	FW	✓	✓							ADD THIS COMMENT	
RPLSB0020201	7/12/97	1657	SO	FW	✓	✓							7-15-97, CONTACTED	
RPLSS0030001	7/14/97	1653	SO	FWR	✓	✓							LAB KEN LIVES OF THIS ADDITIONAL SENT COPY TO THE LAB.	
RPLSB003001	7/14/97	1700	SO	FWR	✓	✓							PUR 7-15-97	
RPLSB0020301	7/12/97	1616	SO	FWR	✓	✓								
RPLSS0020101	7/12/97	1510	SO	FW	✓	✓								
RPLSB0010301	7/11/97	1428	SO	FW	✓	✓								
Relinquished By:		Date/Time	Received By: 7-14-97		Relinquished By:				Received for Laboratory By:		Date/Time			
<i>[Signature]</i>		7/14/97 1730	<i>[Signature]</i> 17:30											
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:						
Relinquished By:		Date/Time	Received By:		Lab Comments:				Temp:					

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202 Perry Parkway  
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\_\_\_\_\_ of \_\_\_\_\_ Pgs.

Project: <b>JOB# 7581 STUMPNECK RI/VI</b>					Turnaround Time										Lab Cooler No.	CLIENT COMMENTS	
Client: <b>BRE</b>					STD	STD	STD	STD	STD	STD	STD	STD	STD	STD			
Send Results To:					# of Containers	1	1	1	1	1	1	1	2	1			
Address:					Container Type	4oz W/RF	3oz W/RF	8oz W/RF	1L AMB	1L AMB	500ML HDPE	400ML W/RF	1L AMB				
Phone:					Preservative Used	-	-	-	-	H2SO4	HNO3	HCL	-				
					Type of Analysis	APP B VOA	APP B S-VOA	TOX METALS	PCB PESTICIDE	TAL METALS SU TOX	TOX PESTICIDE	TOX METALS SU TOX	TOX + TOX	TAL METALS + SU	VOA	APP B S-VOA	
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials													
RPLS0040101	7/15/97	0832	SO	FW	✓	✓											
RPLD4P010	7/15/97	0000	SO	FW	✓	✓											
RPLS0040101	7/15/97	0942	SO	FW	✓	✓											
RPLSCWY0201	7/15/97	1015	SO	FW	✓	✓											
RA5B0040301	7/15/97	1032	SO	FW	✓	✓											
BLDSS0010101	7/15/97	1025	SO...	FWN			✓										
BLD580010101	7/15/97	1045	SO	FWN			✓										
BLDRB009	7/15/97	1600	AO	PAB				✓	✓	✓	✓	✓				ADD APP B S-VOA TO THIS SAMPLE	
BLDTB001	7/15/97	-	AO	LAB								✓					
Relinquished By: <i>[Signature]</i>					Date/Time: 7/15/97 10:10	Received By: 7-16-97 <i>[Signature]</i>					Received for Laboratory By:					Date/Time:	
Relinquished By:					Date/Time:	Received By:					Date/Time:	Shipper:	Airbill No.:				
Relinquished By:					Date/Time:	Received By:					Lab Comments:					Temp:	

G.P. W.O.

CHAIN OF CUSTODY RECORD

Brown & Root Environmental  
 661 Andersen Drive VII  
 Pittsburgh PA 15220

1 of 2

PROJECT NO.: 7581		SITE NAME: Stump Neck RFI / VI				NO. OF CONTAINERS	ANALYSIS TYPES										REMARKS			
SAMPLERS (SIGNATURE): <i>Thompson</i>							402 GISS	APPLIC VOCs	602 GISS	APPLIC SVOCs	INORGANICS, EXPLOSIVE	40 WL VIAI	40 WL BLANK	APPLIC VOC	IL ANION	IL CATION		EXPLOSIVE	APPLIC HHS	IL ANION
STATION NO.	DATE	TIME	COMP	GRAB	STATION LOCATION															
ABP	7/21/97	1414		✓	ABP-SS-004-0101	2	1	1												
		1645		✓	ABP-SS-005-0101	2	1	1												
		1418		✓	ABP-SB-001-0101	2	1	1												
		1648		✓	ABP-SB-002-0101	2	1	1												
		1721		✓	ABP-SB-002-0201	2	1	1												
✓		-		✓	ABP-DUP010	2	1	1												
DSB		1717		✓	DSB-SS-004-0101	2	1	1												
		1732		✓	DSB-SB-004-0101	2	1	1												
✓	✓	1807		✓	DSB-SB-004-0201	2	1	1												
Trip Blank	7/21/97	1525		✓	ABP TB 001	2					2									Trip Blank
Trip Blank	↓	1550		✓	ABPRB010	6					2	2	1	1						"HOLD"
ABP	7/21/97	0847		✓	ABP-SS0060101	2	1	1												
		0850		✓	ABP-SB0030101	2	1	1												
✓	✓	0905		✓	ABP-SB0030201	2	1	1												
RELINQUISHED BY (SIGNATURE): <i>Thompson</i>			DATE / TIME: 7/22/97 1700	RECEIVED BY (SIGNATURE): <i>Alu Ala</i> 7-22-97 17:00			RELINQUISHED BY (SIGNATURE):			DATE / TIME:	RECEIVED BY (SIGNATURE):									
RELINQUISHED BY (SIGNATURE):			DATE / TIME:	RECEIVED BY (SIGNATURE):			RELINQUISHED BY (SIGNATURE):			DATE / TIME:	RECEIVED BY (SIGNATURE):									
RELINQUISHED BY (SIGNATURE):			DATE / TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):			DATE / TIME:	REMARKS:												





**CHAIN OF CUSTODY**  
Original Chain of Custody goes to Laboratory

3188

Page 1 of 1

Proj. # <b>7581</b>		Project name <b>STump Neck RFI/VT</b>		Sample Matrix	Number of containers	Analyses										Remarks
Samplers (Please print) <b>SR Willoughby</b>						APPENDIX B Subc, metals Ephedrine 802	APPENDIX IR 402	UOAT	1/2 Lb Amber PIAEB	500ML TAL M - + SA	1/2 Lb Amber TOX, TOC	40ML	Trip Blank	PCB, PEST, metals + SN, TOX, TOC B22 5/5/01		
DATE	Time	Comp. Grab.	Sample Identification													
7-24-97	1130	Sub	ABPSD0010101	Soil	2	1	1									
"	1135	"	ABPSD0020101	↓	2	1	1									
"	1140	"	ABPSD0030101	↓	2	1	1	2	2	2						
"	1245	"	BGDRB013	Aq	4			2	1	1						
"	-	"	BGDTB001	Aq	2						2					
"	1700 1700	"	BGD <sup>SS</sup> 0020101	Soil	1											
"	1640	"	BGD <sup>SS</sup> 0050101	↓	2							1				
7-25-97	0800	"	ABPSD0040101	↓	2	1	1									
7-24-97	1644	"	BGDSB0050101	↓	1							1				
7-24-97	1710	"	BGDSB0020101	↓	2							2*		* 4oz glass		

Relinquished by (Signature) <i>SR Willoughby</i>	Date/Time 7-24-97 23 10	Received by (Signature) <i>[Signature]</i>	Date/Time 1630 07-25-97	Remarks:
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time	
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time	



# GP ENVIRONMENTAL SERVICES, INC.

202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

2<sup>nd</sup> of 2 Pgs.

Project: STUMPNECK ANNEX, R1/V1					Turnaround Time															
Client BROWN/ROOT					# of Containers		2		1		2									
Send Results To: PAUL FRANK					Container Type		4oz		4oz											
Address: 661 Andersen Ave, Foster 7					Preservative Used		4°C		4°C											
Pittsburgh, Pa 15220					Type of Analysis		APP IX SVOCs		M.M.I.E. Explosives											
Phone: 412-921-8950							APP IX VOA's													
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Lab Cooler No.										CLIENT COMMENTS					
DSB580100101	8-2	1520	SO	SRW	2	1														
DSB580090101		1530			4	2														RUN MS/MSD
DSB580070101		1545			2	1														
DSB T8001	8-2-97	0800	AQ	SRW		2														2x 40ml vials
Relinquished By:		Date/Time		Received By:		8-02-97		Relinquished By:		Received for Laboratory By:		Date/Time								
<i>SK [Signature]</i>		8-1-97 1730		<i>Bill [Signature]</i>		17:30														
Relinquished By:		Date/Time		Received By:		Date/Time		Shipper:		Airbill No.:										
Relinquished By:		Date/Time		Received By:		Lab Comments:				Temp:										

G.P. W.O. \_\_\_\_\_



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Gaithersburg, Maryland 20877  
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Contract #/Billing Reference

\_\_\_\_\_ of \_\_\_\_\_ Pgs.

Project: STUMPNECK ANNEX, RI/VI					Turnaround Time													
Client: BROWN & ROOT					# of Containers													
Send Results To: PAUL FRANK					Container Type													
Address: 661 ANDERSEN DR.					Preservative Used													
PITTSBURGH, PA 15220					Type of Analysis													
Phone: 412-921-8150					Lab Cooler No.													
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	REP IX VOA	AIRB IX	SVOC	APP IX METALS	TOTAL (ASH)	TOX TCC*	AFF IX METALS	Dissolved	PEST/PCB	APP IX	EXPLOSIVES	TRM METALS	ANIONS	CLIENT COMMENTS
RN3MWO01U001	8-3-97	0945	AQ	SRW	3	2	1	1						1				
RN3MWO01F001	8-3-97	0945	AQ	SRW														
RN3MWO04U001	8-3-97	1600	AQ	SRW	3	2	1	1						1				
RN3MWO04F001	8-3-97	1600	AQ	SRW														
5GW01	8-3-97	2005	AQ	SRW	3	2	1	1						1				
RN3 TB001	8-3-97	0800	AQ	SRW	2													FROM LAB
RN3 FB001	8-3-97	0800	AQ	SRW	2	12		1					3	1	2	1		
Relinquished By: Fred Ramer		Date/Time: 8-4-97 1830		Received By: Kenneth M. Lues		Date/Time: 8/4/97 1830		Relinquished By:			Received for Laboratory By:			Date/Time:				
Relinquished By:		Date/Time:		Received By:		Date/Time:		Shipper:			Airbill No.:							
Relinquished By:		Date/Time:		Received By:		Lab Comments: *DO NOT RUN TNH3 FOR 8-6-97					Temp:							

G.P. W.O. \_\_\_\_\_

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202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

\_\_\_\_\_ of \_\_\_\_\_ Pgs.

Project: STUMPNECK Annex: R1/VI					Turnaround Time										Lab Cooler No.	CLIENT COMMENTS
Client BROWN / ROOT					# of Containers											
Send Results To: PAUL FRANK					Container Type											
Address: 661 ANDERSEN DR., FOSTER 7 PITTSBURGH, PA 15220					Preservative Used											
Phone: 412-921-8950					Type of Analysis											
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	APP II VOA	APP II SVOA	APP II	EXPLOSIVE	APP II TOTAL METALS + SN	APP II DISSOLVED METALS + SN	TOX / TOC					
RN3M4003U001	8-4-97	0820	AQ	SRW	3	2	1	1		1						
RN3M4003F001		0820								1						
RN6M4005U001		1300			3	2	1	1								
RN6M4005F001		1300								1						
RN6M4003U001		1500			3	2	1	1								
RN6M4003F001		1500								1						
RN6M4002U001		1645		PAH	3	2	1	1								
RN6M4002F001		1645		PAH						1						
RN6M4004U001		1800		SRW	3			1								
RN6 DUPE002	8-4-97	0000	AQ	SRW	3	2	1	1	1							RN6M4003[UIF]001
TB 001		0000	AQ	-	2											
Relinquished By: <i>[Signature]</i>		Date/Time: 8-5-97 1815	Received By: <i>[Signature]</i>		8/5/97		19/15		Relinquished By:			Received for Laboratory By:			Date/Time:	
Relinquished By:		Date/Time:	Received By:		Date/Time:	Shipper:		Airbill No.:								
Relinquished By:		Date/Time:	Received By:		Lab Comments:				Temp:							

G.P. W.O. \_\_\_\_\_

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202 Perry Parkway  
Gaithersburg, Maryland 20877  
(301) 926-6802

Contract #/Billing Reference

of Pgs.

Project: STONINECK ANNEX: R1/V1					Turnaround Time										Lab Cooler No.		
Client BROWN/ROOT					# of Containers		3		2		1		1			1	
Send Results To: PAUL FRANK					Container Type		40ML		AMBER LITER		AMBER LITER		500ML			500ML	
Address: 161 ANDERSEN DR., FOSTER 7					Preservative Used		4°C										
PITTSBURGH, PA 15220					Typg of Analysis		HCL										
Phone: 412-921-8950					APP IX VOC		APP IX SVOC		APP IX EXPLOSIVES		APP IX METALS + SW		APP IX METALS + SW			APP IX METALS + SW	
					HNO3		HNO3		HNO3		HNO3		HNO3			HNO3	
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	APP IX VOC	APP IX SVOC	APP IX EXPLOSIVES	APP IX METALS + SW	APP IX METALS + SW	APP IX METALS + SW	APP IX METALS + SW	APP IX METALS + SW	APP IX METALS + SW	APP IX METALS + SW	APP IX METALS + SW	APP IX METALS + SW	CLIENT COMMENTS
DSB MW03U001	8-5-97	1100	AQ	PAH	3	2	1	1									
DSB MW03F001		1100		PAH					1								
DSB MW01 U001		1110		SKW	9	6	3	3									RUN MS/MSD
DSB MW01 F001		1110		SKW					3								RUN MS/MSD
DSB MW04U001		1715		PAH	3	2	1	1									
DSB MW04F001		1715		PAH					1								
DSB DU003	8-5-97	0000	AQ	PAH	3	2	1	1	1								DSB MW003[U/F]001
Relinquished By:		Date/Time	Received By:		Relinquished By:			Received for Laboratory By:			Date/Time						
<i>[Signature]</i>		8/5/97 1815	<i>[Signature]</i> 8/5/97 1815														
Relinquished By:		Date/Time	Received By:		Date/Time	Shipper:		Airbill No.:									
Relinquished By:		Date/Time	Received By:		Lab Comments:						Temp:						

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Gaithersburg, Maryland 20877  
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of Pgs.

Project: STUMPAECK ANNEX: PL/NI, 7581					Turnaround Time										
Client: BROWN ROOT					# of Containers										
Send Results To: IAN FRANK					Container Type										
Address: 661 ANDERSON DR, PITTSBURGH, PA 15220					Preservative Used										
Phone: 412-421-8150					Type of Analysis										
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	APP IX	VOC	SVOC	APP IX	EXPLOSIVES	METALS TOTAL	METALS 1.5h	METALS DISSOLVED	TOX / TOC	Lab Cooler No.	CLIENT
															COMMENTS
RN3MWO02U001	8-5-97	1845	AQ	SRW	3	2	1	1							
RN3MWO02F001		1845								1					
RN6MWO04U001		1930			3 <sup>th</sup>	2	1								
RN6MWO04F001		1930													
RPLMWO01U001	8-6-97	1115		PAH	3	2			8-13-97	1					DO NOT RUN EXPLOSIVES ON THIS SAMPLE
RPLMWO01F001		1115		PAH					8-13-97	1					DO NOT RUN EXPLOSIVES ON THIS SAMPLE
RPLMWO03U001		1415		SRW	3	2				1					
RPLMWO03F001		1415		SRW							1				
DSBMWO02U001		1935		PAH	3	2	1	1							
DSBMWO02F001		1935		PAH							1				
RPLTR001	080597	1830	AQ		2										
DSBRB017	080997	0845	AQ	SRW	3	2	1	1							Standard Spec Tank
Relinquished By: <i>[Signature]</i>		Date/Time: 8-7-97 09:35		Received By: <i>[Signature]</i>		Date/Time: 8-07-97		Relinquished By:			Received for Laboratory By:			Date/Time:	
Relinquished By:		Date/Time:		Received By:		Date/Time:		Shipper:		Airbill No.:					
Relinquished By:		Date/Time:		Received By:		Lab Comments: CHANGES FAXED TO LAB 8-13-97			Temp:						

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Contract #/Billing Reference

1 of 1 Pgs.

Project: <u>STUDY AREA ANNEC: 17/VI</u>					Turnaround Time													
Client: <u>BROWN TREE ENVIRONMENTAL</u>					# of Containers		3		2		1		1		1		1	
Send Results To: <u>PAUL FRANK</u>					Container Type		40mL		L amber		L amber		500mL		4oz		8oz	
Address: <u>661 ANDERSON DR, FORT BELVUE, VA 22030</u>					Preservative Used		HCL		HNO3		H2SO4							
Phone: <u>410-921-5950</u>					Type of Analysis		VOC		SVOC		EXPLOSIVES		METALS +SN		VOC		SVOC+EXPLOSIVE METALS +SN TOX/TOC	
Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	ALL II	VOC	SVOC	EXPLOSIVES	METALS +SN	VOC	SVOC+EXPLOSIVE METALS +SN TOX/TOC	TOX/TOC	Lab Cooler No.	CLIENT COMMENTS				
RN3SW0010101	8-14-97	1540	AQ	SKW	3	2	1	1			1							
RN3SD0010101		1600	SO						1	1				RUN MS/MSD ON THIS SAMPLE				
RN3SW0020101		1615	AQ		3	2	1	1			3			RUN MS/MSD ON TOX/TOC				
RN3SD0020101		1630	SO						1	1								
RN3SD0040101		1745	SO						1	1								
RN3DUP005	Y	0000	AQ								1			RN3SW0020101 TOX/TOC				
RN3SD0030101	8-15-97	0730	SO						1	1								
RN3DUP017	8-15-97	0000	SO	Y					1	1								
RN3RB018	8-14-97	1900	AQ	FWR	3	2	1	1			1			HOLD, DO NOT ANALYZE				
RN3 TB001	8-14-97	0800	AQ	FWR	2													
Relinquished By: <u>[Signature]</u>		Date/Time: <u>8-15-97 17:40</u>	Received By: <u>[Signature]</u>		Date/Time: <u>8-15-97 17:40</u>		Relinquished By:		Received for Laboratory By:		Date/Time:							
Relinquished By:		Date/Time:	Received By:		Date/Time:	Shipper:		Airbill No.:										
Relinquished By:		Date/Time:	Received By:		Lab Comments: <u>FWR CONTACTED LAB OF MD. ON RN3RB018 'HOLD DO NOT ANALYZE'</u>					Temp:								

G.P. W.O. \_\_\_\_\_

**APPENDIX M**  
**ANALYTICAL DATABASE**

**SWMU 5 RANGE 6**

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,2,3-TRICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,2-DIBROMO-3-CHLOROPROPANE	100 U	110 U					
1,2-DIBROMOETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,4-DICHLORO-2-BUTENE	100 U	110 U					
2-BUTANONE	10 UR	11 UR					
2-HEXANONE	10 U	11 U					
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
ACETONE	33 U	50 U	27 U	25 U	49 U	69 U	130
ACETONITRILE	100 U	110 U					
ACROLEIN	21 UR	21 UR	21 UR	21 UR	22 UR	21 UR	22 UR
ACRYLONITRILE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
ALLYL CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
BENZENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	6 U
BROMOMETHANE	10 U	11 U					

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
CHLOROETHANE	10 U	11 U					
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	6 U
CHLOROMETHANE	10 U	11 U					
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
DIBROMOMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
DICHLORODIFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
ETHYLBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	1 J
IODOMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
ISOBUTYL ALCOHOL	52 U	53 U	54 U	54 U	54 U	53 U	56 U
M&P-XYLENES	5 U	5 U	5 U	5 U	5 U	5 U	6 U
METHACRYLONITRILE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
METHYL METHACRYLATE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
METHYLENE CHLORIDE	23	30	30	19	37	52	77
O-XYLENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
PENTACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
PROPIONITRILE	52 U	53 U	54 U	54 U	54 U	53 U	56 U
STYRENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TOLUENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TRICHLOROFUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
VINYL ACETATE	10 U	11 U					
VINYL CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	6 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
1,2,4-TRICHLOROBENZENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
1,2-DICHLOROBENZENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
1,3,5-TRINITROBENZENE-OS	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
1,3-DICHLOROBENZENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
1,3-DINITROBENZENE-OS	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
1,4-DICHLOROBENZENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
1,4-DIOXANE-OS	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
1,4-NAPHTHOQUINONE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
1-NAPHTHYLAMINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2,3,4,6-TETRACHLOROPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ	3600 UJ	1800 UJ	1900 UJ
2,4,5-TRICHLOROPHENOL	700 UJ	710 UJ	720 UJ	720 UJ	1400 UJ	710 UJ	750 UJ
2,4,6-TRICHLOROPHENOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2,4-DICHLOROPHENOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2,4-DIMETHYLPHENOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2,4-DINITROPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ	3600 UJ	1800 UJ	1900 UJ
2,4-DINITROTOLUENE-OS	350 UJ	1800	360 UJ	360 UJ	9300 J	350 UJ	85 J

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
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SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2,6-DINITROTOLUENE-OS	350 UJ	130 J	360 UJ	360 UJ	500 J	350 UJ	370 UJ
2-ACETYLAMINOFUORENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2-CHLORONAPHTHALENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2-CHLOROPHENOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2-METHYLNAPHTHALENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2-METHYLPHENOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2-NAPHTHYLAMINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2-NITROANILINE	1800 UJ	1800 UJ	1800 UJ	1800 UJ	3600 UJ	1800 UJ	1900 UJ
2-NITROPHENOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
2-PICOLINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
3,3-DICHLOROBENZIDINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
3,3-DIMETHYLBENZIDINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
3-METHYLCHOLANTHRENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
3-NITROANILINE	1800 UJ	1800 UJ	1800 UJ	1800 UJ	3600 UJ	1800 UJ	1900 UJ
4,6-DINITRO-2-METHYLPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ	3600 UJ	1800 UJ	1900 UJ
4-AMINOBIHENYL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
4-BROMOPHENYL PHENYL ETHER	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
4-CHLORO-3-METHYLPHENOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
4-CHLOROANILINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
4-CHLOROPHENYL PHENYL ETHER	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
4-NITROANILINE	1800 UJ	1800 UJ	1800 UJ	1800 UJ	3600 UJ	1800 UJ	1900 UJ
4-NITROPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ	3600 UJ	1800 UJ	1900 UJ
4-NITROQUINOLINE-1-OXIDE	350 UR	350 UR	360 UR	360 UR	720 UR	350 UR	370 UR

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

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SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
A,A-DIMETHYLPHENETHYLAMINE	700 UJ	710 UJ	720 UJ	720 UJ	1400 UJ	710 UJ	750 UJ
ACENAPHTHENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
ACENAPHTHYLENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
ACETOPHENONE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
ANILINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
ANTHRACENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
ARAMITE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
BENZO(A)ANTHRACENE	350 UJ	350 UJ	44 J	360 UJ	720 UJ	350 UJ	370 UJ
BENZO(A)PYRENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
BENZO(B)FLUORANTHENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
BENZO(G,H,I)PERYLENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
BENZO(K)FLUORANTHENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
BENZYL ALCOHOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
BIS(2-CHLOROETHOXY)METHANE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
BIS(2-CHLOROETHYL)ETHER	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
BUTYLBENZYL PHTHALATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
CHLOROBENZILATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
CHRYSENE	350 UJ	350 UJ	51 J	360 UJ	720 UJ	350 UJ	370 UJ
CIS-ISOSAFROLE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
DI-N-BUTYL PHTHALATE	230 J	2200 J	360 UJ	360 UJ	6500 J	350 UJ	130 J
DI-N-OCTYL PHTHALATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
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SAMPLE NUMBER:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
DIBENZO(A,H)ANTHRACENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
DIBENZOFURAN	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
DIETHYL PHTHALATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
DIMETHYL PHTHALATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
DIPHENYLAMINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
ETHYL METHACRYLATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
ETHYL METHANESULFONATE	700 UJ	710 UJ	720 UJ	720 UJ	1400 UJ	710 UJ	750 UJ
FAMPHUR	350 UR	350 UR	360 UR	360 UR	720 UR	350 UR	370 UR
FLUORANTHENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
FLUORENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
HEXACHLOROBENZENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
HEXACHLOROBUTADIENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
HEXACHLOROCYCLOPENTADIENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
HEXACHLOROETHANE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
HEXACHLOROPROPENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
INDENO(1,2,3-CD)PYRENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
ISODRIN	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
ISOPHORONE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
KEPONE	350 UR	350 UR	360 UR	360 UR	720 UR	350 UR	370 UR
METHAPYRILENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UR	370 UJ
METHYL METHANESULFONATE	700 UJ	710 UJ	720 UJ	720 UJ	1400 UJ	710 UJ	750 UJ
N-NITROSO-DI-N-BUTYLAMINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
N-NITROSO-DI-N-PROPYLAMINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
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SAMPLE NUMBER:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
N-NITROSODIMETHYLAMINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
N-NITROSODIPHENYLAMINE	350 UJ	90 J	360 UJ	360 UJ	380 J	350 UJ	370 UJ
N-NITROSOMETHYLETHYLAMINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
N-NITROSOMORPHOLINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
N-NITROSOPIPERIDINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
N-NITROSOPYRROLIDINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
NAPHTHALENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
NITROBENZENE-OS	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
O-TOLUIDINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
P-DIMETHYLAMINOAZOBENZENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
P-PHENYLENEDIAMINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
PENTACHLOROBENZENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
PENTACHLORONITROBENZENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
PENTACHLOROPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ	3600 UJ	1800 UJ	1900 UJ
PHENACETIN	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
PHENANTHRENE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
PHENOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
PRONAMIDE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
PYRENE	350 UJ	350 UJ	63 J	360 UJ	720 UJ	350 UJ	370 UJ
PYRIDINE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
SAFROLE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
TRANS-ISOSAFROLE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ

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SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
PHORATE	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ
SULFOTEP	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	402 U					
1,3-DINITROBENZENE-EXP	37.2 U	372 U					
2,4,6-TRINITROTOLUENE	297	325	767	319	1740	2340	9270
2,4-DINITROTOLUENE-EXP	51.6 U	290	516 U				
2,6-DINITROTOLUENE-EXP	47.6 U	476 U					
2-AMINO-4,6-DINITROTOLUENE	324	411	827	389	859	2060	16000
2-NITROTOLUENE	81.4 U	814 U					
3-NITROTOLUENE	81.8 U	818 U					
4-AMINO-2,6-DINITROTOLUENE	40.9 U	409 U					
4-NITROTOLUENE	87.2 U	872 U					
HMX	70.5 U	70.5 U	941	70.5 U	454	907	17600
NITROBENZENE-EXP	35.2 U	352 U					
RDX	50.9 U	269	1190	243	307	1440	111000
TETRYL	163 U	1630 U					

**METALS (mg/kg)**

ANTIMONY	0.46 L	1.9 L	0.50 L	0.80 L	0.71 L	0.26 L	0.23 L
ARSENIC	2.4	4.1	3.3	3.7	4.1	2.3	2.4
BARIUM	25.4	27.8	27.5	32.3	41.9	32.0	27.3
BERYLLIUM	0.26	0.24	0.26	0.27	0.33	0.31	0.46

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0010101	RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101	RN6SS0060101	RN6SS0070101
FIELD DUPLICATE OF:							

<b>METALS (mg/kg)</b>							
CADMIUM	0.99	1.5	1.3	2.1	1.3	1.3	0.66 K
CHROMIUM	9.7	14.8	15.8	15.8	21.1	10.1	18.1
COBALT	4.1	5.9	3.5	3.6	3.6	4.0	3.1
COPPER	60.2	72.2	69.7	56.4	69.5	68.5	25.3
LEAD	35.7	111	39.2	30.9	30.2	24.4	181
MERCURY	0.16	0.12	0.12	0.18	0.12	0.28	0.41
NICKEL	4.8	5.6	4.6	7.3	7.6	6.0	7.0
SELENIUM	0.62	0.94	1.0	1.1	1.3	0.76	0.78
SILVER	0.24 U	0.67 U	0.36 U	0.33 U	0.32 U	0.19 U	0.08 U
THALLIUM	0.39 U	0.73 U	0.22 U	0.41 U	0.25 U	0.55 U	0.42 U
TIN	2.7 U	3.7 U	2.8 U	3.2 U	3.3 U	2.1 U	3.5 U
VANADIUM	15.1	22.6	20.5	25.5	28.7	15.8	19.9
ZINC	33.8	39.3	32.1	67.7	45.5	46.0	23.6

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	350 UJ	350 UJ	360 UJ	360 UJ	720 UJ	350 UJ	370 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-TRICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	110 U	110 U	100 U				
1,2-DIBROMOETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-DICHLORO-2-BUTENE	110 U	110 U	100 U				
2-BUTANONE	11 UR	11 UR	10 UR				
2-HEXANONE	11 U	11 U	10 U				
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ACETONE	61 U	100 J	52 U	10 U	69 U	96 U	45 U
ACETONITRILE	110 U	110 U	100 U				
ACROLEIN	21 UR	22 UR	21 UR	20 UR	21 UR	20 UR	21 UR
ACRYLONITRILE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ALLYL CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
BROMOMETHANE	11 U	11 U	10 U				

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROETHANE	11 U	11 U	10 U				
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	11 U	11 U	10 U				
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DIBROMOMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
DICHLORODIFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	1 J	5 U	5 U	5 U	5 U	5 U	5 U
IODOMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ISOBUTYL ALCOHOL	53 U	54 U	52 U	51 U	51 U	51 U	51 U
M&P-XYLENES	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METHACRYLONITRILE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METHYL METHACRYLATE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METHYLENE CHLORIDE	2 U	21 U	4 U	5 U	5 U	5 U	5 U
O-XYLENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
PENTACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
PROPIONITRILE	53 U	54 U	52 U	51 U	51 U	51 U	51 U
STYRENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	2 J	5 U	5 U	5 U	1 J	5 U
VINYL ACETATE	11 U	11 U	10 U				
VINYL CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	5 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
1,2,4-TRICHLOROBENZENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
1,2-DICHLOROBENZENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
1,3,5-TRINITROBENZENE-OS	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
1,3-DICHLOROBENZENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
1,3-DINITROBENZENE-OS	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
1,4-DICHLOROBENZENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
1,4-DIOXANE-OS	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
1,4-NAPHTHOQUINONE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
1-NAPHTHYLAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2,2-OXYBIS(1-CHLOROPROPANE)	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2,3,4,6-TETRACHLOROPHENOL	1800 UJ	1800 UJ	1700 UJ				
2,4,5-TRICHLOROPHENOL	710 UJ	720 UJ	690 UJ	680 UJ	690 UJ	670 UJ	680 UJ
2,4,6-TRICHLOROPHENOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2,4-DICHLOROPHENOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2,4-DIMETHYLPHENOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2,4-DINITROPHENOL	1800 UJ	1800 UJ	1700 UJ				
2,4-DINITROTOLUENE-OS	160 J	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ

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SAMPLE NUMBER:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2,6-DINITROTOLUENE-OS	120 J	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2-ACETYLAMINOFUORENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2-CHLORONAPHTHALENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2-CHLOROPHENOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2-METHYLNAPHTHALENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2-METHYLPHENOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2-NAPHTHYLAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2-NITROANILINE	1800 UJ	1800 UJ	1700 UJ				
2-NITROPHENOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
2-PICOLINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
3,3'-DICHLOROBENZIDINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
3,3'-DIMETHYLBENZIDINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
3-METHYLCHOLANTHRENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
3-NITROANILINE	1800 UJ	1800 UJ	1700 UJ				
4,6-DINITRO-2-METHYLPHENOL	1800 UJ	1800 UJ	1700 UJ				
4-AMINOBIHENYL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
4-BROMOPHENYL PHENYL ETHER	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
4-CHLORO-3-METHYLPHENOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
4-CHLOROANILINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
4-CHLOROPHENYL PHENYL ETHER	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
4-NITROANILINE	1800 UJ	1800 UJ	1700 UJ				
4-NITROPHENOL	1800 UJ	1800 UJ	1700 UJ				
4-NITROQUINOLINE-1-OXIDE	350 UR	360 UR	350 UR	340 UR	340 UR	340 UR	340 UR

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
A,A-DIMETHYLPHENETHYLAMINE	710 UJ	720 UJ	690 UJ	680 UJ	690 UJ	670 UJ	680 UJ
ACENAPHTHENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
ACENAPHTHYLENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
ACETOPHENONE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
ANILINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
ANTHRACENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
ARAMITE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BENZO(A)ANTHRACENE	350 UJ	97 J	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BENZO(A)PYRENE	350 UJ	73 J	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BENZO(B)FLUORANTHENE	350 UJ	170 J	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BENZO(G,H,I)PERYLENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BENZO(K)FLUORANTHENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BENZYL ALCOHOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BIS(2-CHLOROETHOXY)METHANE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BIS(2-CHLOROETHYL)ETHER	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
BUTYLBENZYL PHTHALATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
CHLOROBENZILATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
CHRYSENE	350 UJ	130 J	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
CIS-ISOSAFROLE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
DI-N-BUTYL PHTHALATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	48 J	83 J
DI-N-OCTYL PHTHALATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ

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SAMPLE NUMBER:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
DIBENZO(A,H)ANTHRACENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
DIBENZOFURAN	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
DIETHYL PHTHALATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
DIMETHYL PHTHALATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
DIPHENYLAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
ETHYL METHACRYLATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
ETHYL METHANESULFONATE	710 UJ	720 UJ	690 UJ	680 UJ	690 UJ	670 UJ	680 UJ
FAMPHUR	350 UR	360 UR	350 UR	340 UR	340 UR	340 UR	340 UR
FLUORANTHENE	350 UJ	220 J	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
FLUORENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
HEXACHLOROBENZENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
HEXACHLOROBUTADIENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
HEXACHLOROCYCLOPENTADIENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
HEXACHLOROETHANE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
HEXACHLOROPROPENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
INDENO(1,2,3-CD)PYRENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
ISODRIN	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
ISOPHORONE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
KEPONE	350 UR	360 UR	350 UR	340 UR	340 UR	340 UR	340 UR
METHAPYRILENE	350 UR	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
METHYL METHANESULFONATE	710 UJ	720 UJ	690 UJ	680 UJ	690 UJ	670 UJ	680 UJ
N-NITROSO-DI-N-BUTYLAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
N-NITROSO-DI-N-PROPYLAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ

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RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
FIELD DUPLICATE OF:							

SEMIVOLATILES (µg/kg)							
N-NITROSODIETHYLAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
N-NITROSODIMETHYLAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
N-NITROSODIPHENYLAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
N-NITROSOMETHYLETHYLAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
N-NITROSOMORPHOLINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
N-NITROSOPIPERIDINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
N-NITROSOPYRROLIDINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
NAPHTHALENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
NITROBENZENE-OS	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
O-TOLUIDINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
P-DIMETHYLAMINOAZOBENZENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
P-PHENYLENEDIAMINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
PENTACHLOROBENZENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
PENTACHLORONITROBENZENE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
PENTACHLOROPHENOL	1800 UJ	1800 UJ	1700 UJ				
PHENACETIN	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
PHENANTHRENE	350 UJ	130 J	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
PHENOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
PRONAMIDE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
PYRENE	350 UJ	310 J	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
PYRIDINE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
SAFROLE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
TRANS-ISOSAFROLE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
PHORATE	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ
SULFOTEP	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	10500	35.6 U	139	163	35.6 U	35.6 U	35.6 U
2,4-DINITROTOLUENE-EXP	3530	51.6 U					
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	7730	46.7 U	476	46.7 U	46.7 U	46.7 U	46.7 U
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	10600	70.5 U					
NITROBENZENE-EXP	35.2 U						
RDX	3420	684	50.9 U				
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.45 L	0.71 L	0.24 L	0.29 L	0.40 L	0.27 L	0.40 L
ARSENIC	2.9	2.7	2.1	1.2	3.3	1.8	3.1
BARIIUM	30.3	84.0	24.6	21.2	29.2	44.9	109
BERYLLIUM	0.98	0.38	0.27	0.14 U	0.34	0.40	0.47

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
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SAMPLE NUMBER:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SS0080101	RN6SS0090101	RN6SS0100101	RN6SS0110101	RN6SS0120101	RN6SS0130101	RN6SS0140101
FIELD DUPLICATE OF:							

<b>METALS (mg/kg)</b>							
CADMIUM	1.7	1.3	0.21 K	0.28 K	0.43 K	0.23 K	0.27 K
CHROMIUM	16.8	11.3	7.2	5.0	16.0	7.5	11.1
COBALT	10.4	8.1	6.4	5.5	5.4	6.3	7.2
COPPER	217	74.5	24.4	6.8	43.4	7.9	7.4
LEAD	49.5	108	14.9 K	5.3 K	22.8 K	6.2 K	6.1 K
MERCURY	0.47	1.6	0.02	0.02	0.03	0.04	0.02
NICKEL	20.9	10.4	4.9	4.2	7.4	5.6	6.7
SELENIUM	1.0	1.0	0.60 L	0.54 L	0.98 L	0.57 L	0.72 L
SILVER	0.17 U	0.13 U	0.31 U	0.06 U	0.07 U	0.05 U	0.06 U
THALLIUM	0.60 U	0.26 U	0.54 U	0.22 U	1.0 U	0.19 U	0.22 U
TIN	3.2 U	6.1 L	1.3 U	1.6 U	2.8 U	1.4 U	1.8 U
VANADIUM	28.1	16.6	12.0	9.4	17.6	14.1	18.1
ZINC	165	446	16.6	17.9	31.9	18.3	25.0

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	350 UJ	360 UJ	350 UJ	340 UJ	340 UJ	340 UJ	340 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
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SAMPLE NUMBER:	RN6SS0140101-D	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6SS0180101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97	07/10/97	07/10/97
LOCATION:	RN6DUP003	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6DUP007
FIELD DUPLICATE OF:	RN6SS0140101	RN6SS0140101					RN6SS0180101

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
1,2,3-TRICHLOROPROPANE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
1,2-DIBROMO-3-CHLOROPROPANE	100 U	100 U	100 U	100 U	100 UJ	110 U	110 U
1,2-DIBROMOETHANE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
1,4-DICHLORO-2-BUTENE	100 U	100 U	100 U	100 U	100 UJ	110 U	110 U
2-BUTANONE	10 UR	10 UR	10 UR	10 UR	10 UR	11 UR	11 UR
2-HEXANONE	10 U	10 U	10 U	10 U	10 UJ	11 U	11 U
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
ACETONE	30 U	37.5 U	69 U	81 J	13000 L	11 U	11 U
ACETONITRILE	100 U	100 U	100 U	100 UR	100 UR	110 UR	110 UR
ACROLEIN	20 UR	20.5 UR	20 UR	21 UR	21 UR	23 UR	22 UR
ACRYLONITRILE	5 U	5 U	5 U	5 UR	5 UR	6 UR	6 UR
ALLYL CHLORIDE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
BENZENE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
BROMOFORM	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	11 U	11 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0140101-D	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6SS0180101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97	07/10/97	07/10/97
LOCATION:	RN6DUP003	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6DUP007
FIELD DUPLICATE OF:	RN6SS0140101	RN6SS0140101					RN6SS0180101

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
CHLOROETHANE	10 U	10 U	10 U	10 U	10 U	11 U	11 U
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	6 U	6 U
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
DIBROMOMETHANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
DICHLORODIFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
ETHYLBENZENE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
IODOMETHANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
ISOBUTYL ALCOHOL	51 U	51 U	51 U	52 UR	52 UR	57 UR	56 UR
M&P-XYLENES	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
METHACRYLONITRILE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
METHYL METHACRYLATE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
METHYLENE CHLORIDE	4 U	4 U	9 U	3 U	6 B	22 U	6 U
O-XYLENE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
PENTACHLOROETHANE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
PROPIONITRILE	51 U	51 U	51 U	52 UR	52 UR	57 UR	56 UR
STYRENE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 UJ	6 U	6 U
TOLUENE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	6 U	6 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0140101-D	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6SS0180101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97	07/10/97	07/10/97
LOCATION:	RN6DUP003	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6DUP007
FIELD DUPLICATE OF:	RN6SS0140101	RN6SS0140101					RN6SS0180101

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	6 U	6 U
VINYL ACETATE	10 U	11 U	11 U				
VINYL CHLORIDE	5 U	5 U	5 U	5 U	5 U	6 U	6 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
1,2,4-TRICHLOROBENZENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
1,2-DICHLOROBENZENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
1,3,5-TRINITROBENZENE-OS	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
1,3-DICHLOROBENZENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
1,3-DINITROBENZENE-OS	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
1,4-DICHLOROBENZENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
1,4-DIOXANE-OS	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
1,4-NAPHTHOQUINONE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
1-NAPHTHYLAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2,3,4,6-TETRACHLOROPHENOL	1700 UJ	1900 UJ	1900 UJ				
2,4,5-TRICHLOROPHENOL	680 UJ	680 UJ	680 UJ	690 UJ	690 UJ	760 UJ	750 UJ
2,4,6-TRICHLOROPHENOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2,4-DICHLOROPHENOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2,4-DIMETHYLPHENOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2,4-DINITROPHENOL	1700 UJ	1900 UJ	1900 UJ				
2,4-DINITROTOLUENE-OS	340 UJ	340 UJ	55 J	340 UJ	350 UJ	380 UJ	370 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0140101-D	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6SS0180101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97	07/10/97	07/10/97
LOCATION:	RN6DUP003	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6DUP007
FIELD DUPLICATE OF:	RN6SS0140101	RN6SS0140101					RN6SS0180101

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2,6-DINITROTOLUENE-OS	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2-ACETYLAMINOFUORENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2-CHLORONAPHTHALENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2-CHLOROPHENOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2-METHYLNAPHTHALENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2-METHYLPHENOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2-NAPHTHYLAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2-NITROANILINE	1700 UJ	1900 UJ	1900 UJ				
2-NITROPHENOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
2-PICOLINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
3,3'-DICHLOROBENZIDINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
3,3'-DIMETHYLBENZIDINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
3-METHYLCHOLANTHRENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
3-NITROANILINE	1700 UJ	1900 UJ	1900 UJ				
4,6-DINITRO-2-METHYLPHENOL	1700 UJ	1900 UJ	1900 UJ				
4-AMINOBIIPHENYL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
4-BROMOPHENYL PHENYL ETHER	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
4-CHLORO-3-METHYLPHENOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
4-CHLOROANILINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
4-CHLOROPHENYL PHENYL ETHER	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
4-NITROANILINE	1700 UJ	1900 UJ	1900 UJ				
4-NITROPHENOL	1700 UJ	1900 UJ	1900 UJ				
4-NITROQUINOLINE-1-OXIDE	340 UR	340 UR	340 UR	340 UR	350 UR	380 UR	370 UR

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0140101-D	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6SS0180101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97	07/10/97	07/10/97
LOCATION:	RN6DUP003	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6DUP007
FIELD DUPLICATE OF:	RN6SS0140101	RN6SS0140101					RN6SS0180101

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
A,A-DIMETHYLPHENETHYLAMINE	680 UJ	680 UJ	680 UJ	690 UJ	690 UJ	760 UJ	750 UJ
ACENAPHTHENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
ACENAPHTHYLENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
ACETOPHENONE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
ANILINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
ANTHRACENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
ARAMITE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
BENZO(A)ANTHRACENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
BENZO(A)PYRENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
BENZO(B)FLUORANTHENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	170 J
BENZO(G,H,I)PERYLENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	90 J
BENZO(K)FLUORANTHENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	110 J
BENZYL ALCOHOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
BIS(2-CHLOROETHOXY)METHANE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
BIS(2-CHLOROETHYL)ETHER	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	340 UJ	340 UJ	340 UJ	72 J	640 J	380 UJ	370 UJ
BUTYLBENZYL PHTHALATE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
CHLOROBENZILATE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
CHRYSENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	73 J
CIS-ISOSAFROLE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
DI-N-BUTYL PHTHALATE	340 UJ	83 J	470	340 UJ	350 UJ	380 UJ	370 UJ
DI-N-OCTYL PHTHALATE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ

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RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0140101-D	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6SS0180101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97	07/10/97	07/10/97
LOCATION:	RN6DUP003	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6DUP007
FIELD DUPLICATE OF:	RN6SS0140101	RN6SS0140101					RN6SS0180101

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
DIBENZO(A,H)ANTHRACENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
DIBENZOFURAN	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
DIETHYL PHTHALATE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
DIMETHYL PHTHALATE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
DIPHENYLAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
ETHYL METHACRYLATE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
ETHYL METHANESULFONATE	680 UJ	680 UJ	680 UJ	690 UJ	690 UJ	760 UJ	750 UJ
FAMPUR	340 UR	340 UR	340 UR	340 UJ	350 UJ	380 UJ	370 UJ
FLUORANTHENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
FLUORENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
HEXACHLOROBENZENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
HEXACHLOROBUTADIENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
HEXACHLOROCYCLOPENTADIENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
HEXACHLOROETHANE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
HEXACHLOROPROPENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
INDENO(1,2,3-CD)PYRENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	90 J
ISODRIN	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
ISOPHORONE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
KEPONE	340 UR	340 UR	340 UR	340 UJ	350 UJ	380 UJ	370 UJ
METHAPYRILENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
METHYL METHANESULFONATE	680 UJ	680 UJ	680 UJ	690 UJ	690 UJ	760 UJ	750 UJ
N-NITROSO-DI-N-BUTYLAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
N-NITROSO-DI-N-PROPYLAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0140101-D	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6SS0180101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97	07/10/97	07/10/97
LOCATION:	RN6DUP003	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6DUP007
FIELD DUPLICATE OF:	RN6SS0140101	RN6SS0140101					RN6SS0180101

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
N-NITROSODIMETHYLAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
N-NITROSODIPHENYLAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
N-NITROSOMETHYLETHYLAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
N-NITROSOMORPHOLINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
N-NITROSOPIPERIDINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
N-NITROSOPYRROLIDINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
NAPHTHALENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
NITROBENZENE-OS	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
O-TOLUIDINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
P-DIMETHYLAMINOAZOBENZENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
P-PHENYLENEDIAMINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
PENTACHLOROBENZENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
PENTACHLORONITROBENZENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
PENTACHLOROPHENOL	1700 UJ	1900 UJ	1900 UJ				
PHENACETIN	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
PHENANTHRENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
PHENOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
PRONAMIDE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
PYRENE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
PYRIDINE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
SAFROLE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
TRANS-ISOSAFROLE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
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SAMPLE NUMBER:	RN6SS0140101-D	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6SS0180101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97	07/10/97	07/10/97
LOCATION:	RN6DUP003	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6DUP007
FIELD DUPLICATE OF:	RN6SS0140101	RN6SS0140101					RN6SS0180101

**HERBICIDES (µg/kg)**

DIMETHOATE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
PHORATE	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
SULFOTEP	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	340 UJ	402 U	40.2 U	40.2 U	40.2 U	40.2 U
1,3-DINITROBENZENE-EXP	37.2 U	340 UJ	372 U	37.2 U	37.2 U	37.2 U	37.2 U
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	248000	35.6 U	35.6 U	35.6 U	35.6 U
2,4-DINITROTOLUENE-EXP	51.6 U	340 UJ	516 U	51.6 U	51.6 U	51.6 U	51.6 U
2,6-DINITROTOLUENE-EXP	47.6 U	340 U	476 U	47.6 U	47.6 U	47.6 U	47.6 U
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	467 U	46.7 U	46.7 U	46.7 U	46.7 U
2-NITROTOLUENE	81.4 U	81.4 U	814 U	81.4 U	81.4 U	81.4 U	81.4 U
3-NITROTOLUENE	81.8 U	81.8 U	817 U	81.8 U	81.8 U	81.8 U	81.8 U
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U	408 U	40.9 U	40.9 U	40.9 U	40.9 U
4-NITROTOLUENE	87.2 U	87.2 U	872 U	87.2 U	87.2 U	87.2 U	87.2 U
HMX	70.5 U	70.5 U	26700	70.5 U	70.5 U	70.5 U	70.5 U
NITROBENZENE-EXP	35.2 U	340 UJ	352 U	35.2 U	35.2 U	35.2 U	35.2 U
RDX	50.9 U	50.9 U	397000	50.9 U	50.9 U	50.9 U	50.9 U
TETRYL	163 U	163 U	1630 U	163 U	163 U	163 U	163 U

**METALS (mg/kg)**

ANTIMONY	0.69 L	0.545 L	0.40 L	0.38 L	0.19 UR	0.47 L	0.79 L
ARSENIC	2.3	2.7	2.2	2.3	1.6	2.6	5.6
BARIUM	111	110	64.4	44.7	36.6	33.8	33.6
BERYLLIUM	0.39	0.43	0.48	0.41	0.46	0.45	0.73

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0140101-D	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6SS0180101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97	07/10/97	07/10/97
LOCATION:	RN6DUP003	RN6SS0140101-AVG	RN6SS0150101	RN6SS0160101	RN6SS0170101	RN6SS0180101	RN6DUP007
FIELD DUPLICATE OF:	RN6SS0140101	RN6SS0140101					RN6SS0180101

**METALS (mg/kg)**

CADMIUM	0.27 K	0.27 K	0.53 K	0.30 K	0.23 K	0.46 K	0.93 K
CHROMIUM	10.7	10.9	9.0	7.8	6.8	11.3	24.1
COBALT	7.1	7.15	6.5	6.1 J	6.9 J	4.5 J	3.1 J
COPPER	7.3	7.35	19.1	8.5	6.6	62.5	47.8
LEAD	19.6 K	12.85 K	16.2 K	9.8	6.3	9.9	9.7
MERCURY	0.02 U	0.015	0.72	0.21	0.03	0.05	0.18
NICKEL	6.6	6.65	6.9	6.7	5.7	9.6	9.3
SELENIUM	0.69 L	0.705 L	0.77 L	0.62	0.47	1.1	2.3
SILVER	0.06 U	0.06 U	0.04 U	0.07 U	0.06 U	0.10 U	0.10 U
THALLIUM	0.23 U	0.225 U	0.16 U	0.25 U	0.41 B	0.92 U	1.0 U
TIN	9.0	5.4	1.4 U	1.9 U	1.9 B	2.4 U	2.4 U
VANADIUM	18.1	18.1	21.4	14.7	12.0	20.9	30.3
ZINC	25.6	25.3	30.8	18.3	14.8	47.4	76.2

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	340 UJ	340 UJ	340 UJ	340 UJ	350 UJ	380 UJ	370 UJ
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**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	6 U	5 U	6 U	5.5 U	5.5 U		
1,1,1-TRICHLOROETHANE	6 U	5 U	6 U	5.5 U	0.19 U		
1,1,2,2-TETRACHLOROETHANE	6 U	5 U	6 U	5.5 U	0.58 U		
1,1,2-TRICHLOROETHANE	6 U	5 U	6 U	5.5 U	0.50 U		
1,1-DICHLOROETHANE	6 U	5 U	6 U	5.5 U	0.36 U		
1,1-DICHLOROETHENE	6 U	5 U	6 U	5.5 U	0.31 U		
1,2,3-TRICHLOROPROPANE	6 U	5 U	6 U	5.5 U	5.5 U		
1,2-DIBROMO-3-CHLOROPROPANE	110 U	110 U	110 U	110 U	110 U		
1,2-DIBROMOETHANE	6 U	5 U	6 U	5.5 U	5.5 U		
1,2-DICHLOROETHANE	6 U	5 U	6 U	5.5 U	5.5 U		
1,2-DICHLOROPROPANE	6 U	5 U	6 U	5.5 U	5.5 U		
1,4-DICHLORO-2-BUTENE	110 U	110 U	110 U	110 U	110 UJ		
1,4-DIOXANE-OV					165 UR		
2-BUTANONE	11 UR	11 UR	11 UR	11 UR	4.2 UR		
2-HEXANONE	11 U	11 U	11 U	11 U	2.5 U		
4-METHYL-2-PENTANONE	6 U	5 U	6 U	5.5 U	1.5 J		
ACETONE	11 U	11 U	11 U	11 U	23.1 U		
ACETONITRILE	110 UR	110 UR	110 UR	110 UR	110 U		
ACROLEIN	22.5 UR	22 UR	23 UR	22.5 UR	12.7 U		
ACRYLONITRILE	6 UR	5 UR	6 UR	5.5 UR	5.5 U		
ALLYL CHLORIDE	6 U	5 U	6 U	5.5 U	5.5 U		
BENZENE	6 U	5 U	6 U	5.5 U	0.28 U		
BROMODICHLOROMETHANE	6 U	5 U	6 U	5.5 U	0.21 U		
BROMOFORM	6 U	5 U	6 U	5.5 U	2.9 U		

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

<b>VOLATILES (µg/kg)</b>							
BROMOMETHANE	11 U	11 U	11 U	11 U	0.21 U		
CARBON DISULFIDE	6 U	5 U	6 U	5.5 U	1.3 U		
CARBON TETRACHLORIDE	6 U	5 U	6 U	5.5 U	0.13 U		
CHLOROBENZENE	6 U	5 U	6 U	5.5 U	0.40 U		
CHLOROETHANE	11 U	11 U	11 U	11 U	0.45 U		
CHLOROFORM	6 U	5 U	6 U	5.5 U	2.5 J		
CHLOROMETHANE	11 U	11 U	11 U	11 U	0.54 U		
CHLOROPRENE					5.5 UR		
CIS-1,3-DICHLOROPROPENE	6 U	5 U	6 U	5.5 U	0.30 U		
DIBROMOCHLOROMETHANE	6 U	5 U	6 U	5.5 U	0.24 U		
DIBROMOMETHANE	6 U	5 U	6 U	5.5 U	5.5 U		
DICHLORODIFLUOROMETHANE	6 U	5 U	6 U	5.5 U	0.23 U		
ETHYLBENZENE	6 U	5 U	6 U	5.5 U	1.5 U		
IODOMETHANE	6 U	5 U	6 U	5.5 U	5.5 U		
ISOBUTYL ALCOHOL	56.5 UR	54 UR	57 UR	55.5 UR	55.0 U		
M&P-XYLENES	6 U	5 U	6 U	5.5 U			
METHACRYLONITRILE	6 U	5 U	6 U	5.5 U	5.5 U		
METHYL METHACRYLATE	6 U	5 U	6 U	5.5 U	5.5 U		
METHYLENE CHLORIDE	14 U	5 U	6 U	5.5 U	16.6 U		
O-XYLENE	6 U	5 U	6 U	5.5 U			
PENTACHLOROETHANE	6 U	5 U	6 U	5.5 U	5.5 U		
PROPIONITRILE	56.5 UR	54 UR	57 UR	55.5 UR	55.0 U		
STYRENE	6 U	5 U	6 U	5.5 U	0.33 U		
TETRACHLOROETHENE	6 U	5 U	6 U	5.5 U	0.96 U		

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

**VOLATILES (µg/kg)**

TOLUENE	6 U	5 U	6 U	5.5 U	0.30		
TRANS-1,2-DICHLOROETHENE	6 U	5 U	6 U	5.5 U	0.31 U		
TRANS-1,3-DICHLOROPROPENE	6 U	5 U	6 U	5.5 U	0.54 U		
TRICHLOROETHENE	6 U	5 U	6 U	5.5 U	0.29 U		
TRICHLOROFUOROMETHANE	6 U	5 U	6 U	5.5 U	0.32 U		
VINYL ACETATE	11 U	11 U	11 U	11 U	0.31 UJ		
VINYL CHLORIDE	6 U	5 U	6 U	5.5 U	0.36 U		
XYLENES, TOTAL					0.76 U		

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROENZENE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
1,2,4-TRICHLOROENZENE	375 UJ	360 UJ	380 UJ	370 UJ	34.7 U		
1,2-DICHLOROENZENE	375 UJ	360 UJ	380 UJ	370 UJ			
1,3-DINITROENZENE					37.2 U	37.2 U	37.2 U
1,3,5-TRINITROENZENE					40.2 U	40.2 U	40.2 U
1,3,5-TRINITROENZENE-OS	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
1,3-DICHLOROENZENE	375 UJ	360 UJ	380 UJ	370 UJ			
1,3-DINITROENZENE-OS	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
1,4-DICHLOROENZENE	375 UJ	360 UJ	380 UJ	370 UJ			
1,4-DIOXANE-OS	375 UJ	360 UJ	380 UJ	370 UJ			
1,4-NAPHTHOQUINONE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
1-NAPHTHYLAMINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
2,2-OXYBIS(1-CHLOROPROPANE)	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
2,3,4,6-TETRACHLOROPHENOL	1900 UJ	1800 UJ	1900 UJ	1850 UJ	363 U		
2,4,5-TRICHLOROPHENOL	755 UJ	720 UJ	760 UJ	740 UJ	51.0 U		

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

<b>SEMIVOLATILES (µg/kg)</b>							
2,4,6-TRICHLOROPHENOL	375 UJ	360 UJ	380 UJ	370 UJ	70.4 U		
2,4-DICHLOROPHENOL	375 UJ	360 UJ	380 UJ	370 UJ	50.5 U		
2,4-DIMETHYLPHENOL	375 UJ	360 UJ	380 UJ	370 UJ	113 U		
2,4-DINITROPHENOL	1900 UJ	1800 UJ	1900 UJ	1850 UJ	178 U		
2,4-DINITROTOLUENE-OS	375 UJ	360 UJ	380 UJ	370 UJ	518		
2,6-DICHLOROPHENOL	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
2,6-DINITROTOLUENE-OS	375 UJ	360 UJ	380 UJ	370 UJ	15.6 U		
2-ACETYLAMINOFUORENE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
2-CHLORONAPHTHALENE	375 UJ	360 UJ	380 UJ	370 UJ	27.1 U		
2-CHLOROPHENOL	375 UJ	360 UJ	380 UJ	370 UJ	64.7 U		
2-METHYLNAPHTHALENE	375 UJ	360 UJ	380 UJ	370 UJ	43.8 U		
2-METHYLPHENOL	375 UJ	360 UJ	380 UJ	370 UJ	53.3 U		
2-NAPHTHYLAMINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
2-NITROANILINE	1900 UJ	1800 UJ	1900 UJ	1850 UJ	56.2 U		
2-NITROPHENOL	375 UJ	360 UJ	380 UJ	370 UJ	64.7 U		
2-PICOLINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
3,3'-DICHLOROBENZIDINE	375 UJ	360 UJ	380 UJ	370 UJ	356 U		
3,3'-DIMETHYLBENZIDINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
3-METHYLCHOLANTHRENE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
3-METHYLPHENOL					363 U		
3-NITROANILINE	1900 UJ	1800 UJ	1900 UJ	1850 UJ	136 U		
4,6-DINITRO-2-METHYLPHENOL	1900 UJ	1800 UJ	1900 UJ	1850 UJ	62.6 U		
4-AMINOBIHENYL	375 UJ	360 UJ	380 UJ	370 UJ	726 U		
4-BROMOPHENYL PHENYL ETHER	375 UJ	360 UJ	380 UJ	370 UJ	28.9 U		

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

<b>VOLATILES (µg/L)</b>							
1,1,1,2-TETRACHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,1,1-TRICHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U		5 U		5 U	5 U	5 U
1,2,3-TRICHLOROPROPANE	5 U		5 U		5 U	5 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	100 U		100 U		100 U	100 U	100 U
1,2-DIBROMOETHANE	5 U		5 U		5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U		5 U		5 U	5 U	5 U
1,4-DICHLORO-2-BUTENE	100 U		100 U		100 U	100 U	100 U
2-BUTANONE	10 UR		10 UR		10 UR	10 UR	10 UR
2-HEXANONE	10 U		10 U		10 U	10 U	10 U
4-METHYL-2-PENTANONE	5 U		5 U		5 U	5 U	5 U
ACETONE	10 UJ		10 U		10 U	10 U	10 U
ACETONITRILE	100 UR		100 UR		100 UR	100 UR	100 UR
ACROLEIN	20 UR		20 UR		20 UR	20 UR	20 UR
ACRYLONITRILE	5 UR		5 UR		5 UR	5 UR	5 UR
ALLYL CHLORIDE	5 U		5 U		5 U	5 U	5 U
BENZENE	5 U		5 U		5 U	5 U	5 U
BROMODICHLOROMETHANE	5 U		5 U		5 U	5 U	5 U
BROMOFORM	5 U		5 U		5 U	5 U	5 U
BROMOMETHANE	10 U		10 U		10 U	10 U	10 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

<b>VOLATILES (µg/L)</b>							
CARBON DISULFIDE	5 U		5 U		5 U	5 U	5 U
CARBON TETRACHLORIDE	5 U		5 U		5 U	5 U	5 U
CHLOROBENZENE	5 U		5 U		5 U	5 U	5 U
CHLOROETHANE	10 U		10 U		10 U	10 U	10 U
CHLOROFORM	5 U		5 U		5 U	5 U	5 U
CHLOROMETHANE	10 U		10 U		10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	5 U		5 U		5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U		5 U		5 U	5 U	5 U
DIBROMOMETHANE	5 U		5 U		5 U	5 U	5 U
DICHLORODIFLUOROMETHANE	5 U		5 U		5 U	5 U	5 U
ETHYLBENZENE	5 U		5 U		5 U	5 U	5 U
IODOMETHANE	5 U		5 U		5 U	5 U	5 U
ISOBUTYL ALCOHOL	50 UR		50 UR		50 UR	50 UR	50 UR
M&P-XYLENES	5 U		5 U		5 U	5 U	5 U
METHACRYLONITRILE	5 U		5 U		5 U	5 U	5 U
METHYL METHACRYLATE	5 U		5 U		5 U	5 U	5 U
METHYLENE CHLORIDE	5 U		5 U		5 U	5 U	5 U
O-XYLENE	5 U		5 U		5 U	5 U	5 U
PENTACHLOROETHANE	5 U		5 U		5 U	5 U	5 U
PROPIONITRILE	50 UR		50 UR		50 UR	50 UR	50 UR
STYRENE	5 U		5 U		5 U	5 U	5 U
TETRACHLOROETHENE	5 U		5 U		5 U	5 U	5 U
TOLUENE	5 U		5 U		5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U		5 U		5 U	5 U	5 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

<b>VOLATILES (µg/L)</b>							
TRANS-1,3-DICHLOROPROPENE	5 U		5 U		5 U	5 U	5 U
TRICHLOROETHENE	5 U		5 U		5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U		5 U		5 U	5 U	5 U
VINYL ACETATE	10 UR		10 UR		10 UR	10 UR	10 UR
VINYL CHLORIDE	5 U		5 U		5 U	5 U	5 U

<b>SEMIVOLATILES (µg/L)</b>							
1,2,4,5-TETRACHLOROBENZENE	11 U		11 U		11 U	11 U	11 U
1,2,4-TRICHLOROBENZENE	11 U		11 U		11 U	11 U	11 U
1,2-DICHLOROBENZENE	11 U		11 U		11 U	11 U	11 U
1,3,5-TRINITROBENZENE-OS	11 U		11 U		11 U	11 U	11 U
1,3-DICHLOROBENZENE	11 U		11 U		11 U	11 U	11 U
1,3-DINITROBENZENE-OS	11 U		11 U		11 U	11 U	11 U
1,4-DICHLOROBENZENE	11 U		11 U		11 U	11 U	11 U
1,4-DIOXANE-OS	11 U		11 UJ		11 UJ	11 UJ	11 UJ
1,4-NAPHTHOQUINONE	11 U		11 U		11 U	11 U	11 U
1-NAPHTHYLAMINE	11 U		11 U		11 U	11 U	11 U
2,2'-OXYBIS(1-CHLOROPROPANE)	11 U		11 U		11 U	11 U	11 U
2,3,4,6-TETRACHLOROPHENOL	56 U		57 U		57 U	55 U	56 U
2,4,5-TRICHLOROPHENOL	22 U		23 U		23 U	22 U	22.5 U
2,4,6-TRICHLOROPHENOL	11 U		11 U		11 U	11 U	11 U
2,4-DICHLOROPHENOL	11 U		11 U		11 U	11 U	11 U
2,4-DIMETHYLPHENOL	11 U		11 U		11 U	11 U	11 U
2,4-DINITROPHENOL	56 U		57 U		57 U	55 U	56 U
2,4-DINITROTOLUENE-OS	11 U		11 U		11 U	11 U	11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

<b>SEMIVOLATILES (µg/L)</b>							
2,6-DICHLOROPHENOL	11 U		11 U		11 U	11 U	11 U
2,6-DINITROTOLUENE-OS	11 U		11 U		11 U	11 U	11 U
2-ACETYLAMINOFUORENE	11 U		11 U		11 U	11 U	11 U
2-CHLORONAPHTHALENE	11 U		11 U		11 U	11 U	11 U
2-CHLOROPHENOL	11 U		11 U		11 U	11 U	11 U
2-METHYLNAPHTHALENE	11 U		11 U		11 U	11 U	11 U
2-METHYLPHENOL	11 U		11 U		11 U	11 U	11 U
2-NAPHTHYLAMINE	11 U		11 U		11 U	11 U	11 U
2-NITROANILINE	56 U		57 U		57 U	55 U	56 U
2-NITROPHENOL	11 U		11 U		11 U	11 U	11 U
2-PICOLINE	11 U		11 U		11 U	11 U	11 U
3,3'-DICHLOROBENZIDINE	11 UJ		11 UJ		11 UJ	11 UJ	11 UJ
3,3'-DIMETHYLBENZIDINE	11 U		11 U		11 U	11 U	11 U
3-METHYLCHOLANTHRENE	11 U		11 U		11 U	11 U	11 U
3-NITROANILINE	56 U		57 U		57 U	55 U	56 U
4,6-DINITRO-2-METHYLPHENOL	56 U		57 U		57 U	55 U	56 U
4-AMINOBIPHENYL	11 U		11 U		11 U	11 U	11 U
4-BROMOPHENYL PHENYL ETHER	11 U		11 U		11 U	11 U	11 U
4-CHLORO-3-METHYLPHENOL	11 U		11 U		11 U	11 U	11 U
4-CHLOROANILINE	11 U		11 U		11 U	11 U	11 U
4-CHLOROPHENYL PHENYL ETHER	11 U		11 U		11 U	11 U	11 U
4-NITROANILINE	56 UJ		57 UJ		57 UJ	55 UJ	56 UJ
4-NITROPHENOL	56 U		57 U		57 U	55 U	56 U
4-NITROQUINOLINE-1-OXIDE	11 UR		11 UR		11 UR	11 UR	11 UR

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

<b>SEMIVOLATILES (µg/L)</b>							
5-NITRO-O-TOLUIDINE	11 U		11 U		11 U	11 U	11 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	11 U		11 U		11 U	11 U	11 U
A,A-DIMETHYLPHENETHYLAMINE	22 U		23 UJ		23 UJ	22 UJ	22.5 UJ
ACENAPHTHENE	11 U		11 U		11 U	11 U	11 U
ACENAPHTHYLENE	11 U		11 U		11 U	11 U	11 U
ACETOPHENONE	11 U		11 U		11 U	11 U	11 U
ANILINE	11 U		11 U		11 U	11 U	11 U
ANTHRACENE	11 U		11 U		11 U	11 U	11 U
ARAMITE	11 U		11 UJ		11 UJ	11 UJ	11 UJ
BENZO(A)ANTHRACENE	11 U		11 U		11 U	11 U	11 U
BENZO(A)PYRENE	11 U		11 U		11 U	11 U	11 U
BENZO(B)FLUORANTHENE	11 U		11 U		11 U	11 U	11 U
BENZO(G,H,I)PERYLENE	11 U		11 U		11 U	11 U	11 U
BENZO(K)FLUORANTHENE	11 U		11 U		11 U	11 U	11 U
BENZYL ALCOHOL	11 U		11 U		11 U	11 U	11 U
BIS(2-CHLOROETHOXY)METHANE	11 U		11 U		11 U	11 U	11 U
BIS(2-CHLOROETHYL)ETHER	11 U		11 U		11 U	11 U	11 U
BIS(2-ETHYLHEXYL)PHTHALATE	11 U		11 U		1 J	3 J	2 J
BUTYLBENZYL PHTHALATE	11 U		11 U		11 U	11 U	11 U
CHLOROBENZILATE	11 U		11 U		11 U	11 U	11 U
CHRYSENE	11 U		11 U		11 U	11 U	11 U
CIS-ISOSAFROLE	11 UJ		11 UJ		11 UJ	11 UJ	11 UJ
DI-N-BUTYL PHTHALATE	11 U		1 J		11 U	1 J	1 J
DI-N-OCTYL PHTHALATE	11 U		11 U		11 U	11 U	11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

<b>SEMIVOLATILES (µg/L)</b>							
DIALLATE	11 U		11 U		11 U	11 U	11 U
DIBENZO(A,H)ANTHRACENE	11 U		11 U		11 U	11 U	11 U
DIBENZOFURAN	11 U		11 U		11 U	11 U	11 U
DIETHYL PHTHALATE	11 U		11 U		11 U	11 U	11 U
DIMETHYL PHTHALATE	11 U		11 U		11 U	11 U	11 U
DIPHENYLAMINE	11 U		11 U		11 U	11 U	11 U
ETHYL METHACRYLATE	11 U		11 U		11 U	11 U	11 U
ETHYL METHANESULFONATE	22 U		23 U		23 U	22 U	22.5 U
FAMPHUR	11 UR		11 UR		11 UR	11 UR	11 UR
FLUORANTHENE	11 U		11 U		11 U	11 U	11 U
FLUORENE	11 U		11 U		11 U	11 U	11 U
HEXACHLOROBENZENE	11 U		11 U		11 U	11 U	11 U
HEXACHLOROBUTADIENE	11 U		11 U		11 U	11 U	11 U
HEXACHLOROCYCLOPENTADIENE	11 U		11 U		11 U	11 U	11 U
HEXACHLOROETHANE	11 U		11 U		11 U	11 U	11 U
HEXACHLOROPROPENE	11 U		11 U		11 U	11 U	11 U
INDENO(1,2,3-CD)PYRENE	11 U		11 U		11 U	11 U	11 U
ISODRIN	11 U		11 U		11 U	11 U	11 U
ISOPHORONE	11 U		11 U		11 U	11 U	11 U
KEPONE	11 UR		11 UR		11 UR	11 UR	11 UR
METHAPYRILENE	11 UJ		11 U		11 U	11 U	11 U
METHYL METHANESULFONATE	22 U		23 U		23 U	22 U	22.5 U
N-NITROSO-DI-N-BUTYLAMINE	11 U		11 U		11 U	11 U	11 U
N-NITROSO-DI-N-PROPYLAMINE	11 U		11 U		11 U	11 U	11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

<b>SEMIVOLATILES (µg/L)</b>							
N-NITROSODIETHYLAMINE	11 U		11 U		11 U	11 U	11 U
N-NITROSODIMETHYLAMINE	11 U		11 U		11 U	11 U	11 U
N-NITROSODIPHENYLAMINE	11 U		11 U		11 U	11 U	11 U
N-NITROSOMETHYLETHYLAMINE	11 U		11 U		11 U	11 U	11 U
N-NITROSOMORPHOLINE	11 U		11 U		11 U	11 U	11 U
N-NITROSOPIPERIDINE	11 U		11 U		11 U	11 U	11 U
N-NITROSOPYRROLIDINE	11 U		11 U		11 U	11 U	11 U
NAPHTHALENE	11 U		11 U		11 U	11 U	11 U
NITROBENZENE-OS	11 U		11 U		11 U	11 U	11 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	11 U		11 U		11 U	11 U	11 U
O-TOLUIDINE	11 UJ		11 UJ		11 UJ	11 UJ	11 UJ
P-DIMETHYLAMINOAZOBENZENE	11 U		11 U		11 U	11 U	11 U
P-PHENYLENEDIAMINE	11 UJ		11 U		11 U	11 U	11 U
PENTACHLOROBENZENE	11 U		11 U		11 U	11 U	11 U
PENTACHLORONITROBENZENE	11 U		11 U		11 U	11 U	11 U
PENTACHLOROPHENOL	56 U		57 U		57 U	55 U	56 U
PHENACETIN	11 U		11 U		11 U	11 U	11 U
PHENANTHRENE	11 U		11 U		11 U	11 U	11 U
PHENOL	11 U		11 U		11 U	11 U	11 U
PRONAMIDE	11 U		11 U		11 U	11 U	11 U
PYRENE	11 U		11 U		11 U	11 U	11 U
PYRIDINE	11 U		11 U		11 U	11 U	11 U
SAFROLE	11 U		11 U		11 U	11 U	11 U
TRANS-ISOSAFROLE	11 U		11 UJ		11 UJ	11 UJ	11 UJ

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

**HERBICIDES (µg/L)**

DIMETHOATE	11 UJ		11 UJ		11 UJ	11 UJ	11 UJ
PHORATE	11 U		11 U		11 U	11 U	11 U
SULFOTEP	11 U		11 UJ		11 UJ	11 UJ	11 UJ

**ENERGETICS (µg/L)**

1,3,5-TRINITROBENZENE-EXP	0.6 U		0.6 U		0.6 J	0.6 K	11 U
1,3-DINITROBENZENE-EXP	0.6 U		0.6 U		0.6 U	0.6 U	11 U
2,4,6-TRINITROTOLUENE	0.6 U		0.6 U		43.4	44.1 K	43.75 K
2,4-DINITROTOLUENE-EXP	0.6 U		0.6 U		1.9	1.8 K	11 U
2,6-DINITROTOLUENE-EXP	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
2-AMINO-4,6-DINITROTOLUENE	2.8		0.6 U		57.7	58.7 K	58.2 K
2-NITROTOLUENE	1.3 U		1.3 U		1.3 U	1.3 U	1.3 U
3-NITROTOLUENE	1.3 U		1.3 U		1.3 U	1.3 U	1.3 U
4-AMINO-2,6-DINITROTOLUENE	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
4-NITROTOLUENE	1.3 U		1.3 U		1.8	1.7 K	1.75 K
HMX	1.3 U		1.3 U		38.3	41.2 K	39.75 K
NITROBENZENE-EXP	0.6 U		0.6 U		0.6 U	0.6 U	11 U
RDX	1.3 U		1.3 U		336 J	352 K	344 K
TETRYL	1.3 U		1.3 U		1.3 U	1.3 U	1.3 U

**METALS (µg/L)**

ANTIMONY	2.3 U		2.3 U		2.4 U	2.3 U	1.775
ARSENIC	16.4 L		3.0 L		1.9 UL	1.9 UL	1.9 UL
BARIUM	307		57.5		12.5	12.1	12.3
BERYLLIUM	1.9 U		0.20 U		0.35 U	0.20 U	0.225 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

<b>METALS (µg/L)</b>							
CADMIUM	1.3 U		1.3 U		1.3 U	1.3 U	1.3 U
CHROMIUM	55.7		4.8		2.0 U	2.0 U	2 U
COBALT	47.8		2.4		2.0	1.6	1.8
COPPER	54.5		3.3 U		3.3 U	3.3 U	3.3 U
LEAD	33.0		1.3 U		1.4	1.3 U	1.025
MERCURY	0.23		0.10 U		0.17	0.17	0.17
NICKEL	28.7		2.6 U		1.1 U	1.1 U	0.825 U
SELENIUM	2.5 U		2.5 U		2.5 U	2.5 U	2.5 U
SILVER	0.70 U		1.2 U		1.4 U	1.0 U	1.2 U
THALLIUM	2.5 U		2.5 U		2.5 U	2.5 U	2.5 U
TIN	2.6 U		1.2 U		1.2 U	1.2 U	1.2 U
VANADIUM	75.7		5.2		1.3 U	1.3 U	1.3 U
ZINC	85.4 U		2.7		5.1	3.8	4.45

<b>DISSOLVED METALS (µg/L)</b>							
ANTIMONY, FILTERED		2.3 U		2.3 U			
ARSENIC, FILTERED		9.0 L		2.8 L			
BARIUM, FILTERED		189		60.8			
BERYLLIUM, FILTERED		0.20 U		0.20 U			
CADMIUM, FILTERED		1.3 U		1.3 U			
CHROMIUM, FILTERED		2.0 U		4.7			
COBALT, FILTERED		33.0		2.6			
COPPER, FILTERED		3.3 U		3.5			
LEAD, FILTERED		2.5 U		1.3 U			
MERCURY, FILTERED		0.10 U		0.10 U			

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6MW003U001-D	RN6MW003U001-AVG
SAMPLE DATE:	08/03/97	08/03/97	08/04/97	08/04/97	08/04/97	08/04/97	08/04/97
LOCATION:	5GW01	5GW01F	RN6MW002U001	RN6MW002F001	RN6MW003U001	RN6DUP002	RN6MW003U001-AVG
FIELD DUPLICATE OF:						RN6MW003U001	RN6MW003U001

**DISSOLVED METALS (µg/L)**

NICKEL, FILTERED		1.8		3.5 U			
SELENIUM, FILTERED		2.5 U		2.5 U			
SILVER, FILTERED		0.70 U		1.2 U			
THALLIUM, FILTERED		2.5 U		2.5 U			
TIN, FILTERED		1.8 U		1.2 U			
VANADIUM, FILTERED		0.70 U		4.7			
ZINC, FILTERED		2.5 U		4.2			

**MISCELLANEOUS PARAMETERS (µg/L)**

M & P-CRESOL	11 U		11 U		11 U	11 U	11 U
TOTAL ORGANIC CARBON	17						
TOTAL ORGANIC HALIDES (µg/L)	56.8 U						

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

<b>VOLATILES (µg/L)</b>							
1,1,1,2-TETRACHLOROETHANE					5 U		5 U
1,1,1-TRICHLOROETHANE					5 U		5 U
1,1,2,2-TETRACHLOROETHANE					5 U		5 U
1,1,2-TRICHLOROETHANE					5 U		5 U
1,1-DICHLOROETHANE					5 U		5 U
1,1-DICHLOROETHENE					5 U		5 U
1,2,3-TRICHLOROPROPANE					5 U		5 U
1,2-DIBROMO-3-CHLOROPROPANE					100 U		100 U
1,2-DIBROMOETHANE					5 U		5 U
1,2-DICHLOROETHANE					5 U		5 U
1,2-DICHLOROPROPANE					5 U		5 U
1,4-DICHLORO-2-BUTENE					100 U		100 U
2-BUTANONE					10 UR		10 UR
2-HEXANONE					10 U		10 U
4-METHYL-2-PENTANONE					5 U		5 U
ACETONE					10 U		10 U
ACETONITRILE					100 UR		100 UR
ACROLEIN					20 UR		20 UR
ACRYLONITRILE					5 UR		5 UR
ALLYL CHLORIDE					5 U		5 U
BENZENE					5 U		5 U
BROMODICHLOROMETHANE					5 U		5 U
BROMOFORM					5 U		5 U
BROMOMETHANE					10 U		10 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

<b>VOLATILES (µg/L)</b>							
CARBON DISULFIDE					5 U		5 U
CARBON TETRACHLORIDE					5 U		5 U
CHLOROBENZENE					5 U		5 U
CHLOROETHANE					10 U		10 U
CHLOROFORM					5 U		5 U
CHLOROMETHANE					10 U		10 U
CIS-1,3-DICHLOROPROPENE					5 U		5 U
DIBROMOCHLOROMETHANE					5 U		5 U
DIBROMOMETHANE					5 U		5 U
DICHLORODIFLUOROMETHANE					5 U		5 U
ETHYLBENZENE					5 U		5 U
IODOMETHANE					5 U		5 U
ISOBUTYL ALCOHOL					50 UR		50 UR
M&P-XYLENES					5 U		5 U
METHACRYLONITRILE					5 U		5 U
METHYL METHACRYLATE					5 U		5 U
METHYLENE CHLORIDE					5 U		5 U
O-XYLENE					5 U		5 U
PENTACHLOROETHANE					5 U		5 U
PROPIONITRILE					50 UR		50 UR
STYRENE					5 U		5 U
TETRACHLOROETHENE					5 U		5 U
TOLUENE					5 U		5 U
TRANS-1,2-DICHLOROETHENE					5 U		5 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

**VOLATILES (µg/L)**

TRANS-1,3-DICHLOROPROPENE					5 U		5 U
TRICHLOROETHENE					5 U		5 U
TRICHLOROFLUOROMETHANE					5 U		5 U
VINYL ACETATE					10 UR		10 UR
VINYL CHLORIDE					5 U		5 U

**SEMIVOLATILES (µg/L)**

1,2,4,5-TETRACHLOROBENZENE					11 U		12 U
1,2,4-TRICHLOROBENZENE					11 U		12 U
1,2-DICHLOROBENZENE					11 U		12 U
1,3,5-TRINITROBENZENE-OS					11 U		12 U
1,3-DICHLOROBENZENE					11 U		12 U
1,3-DINITROBENZENE-OS					11 U		12 U
1,4-DICHLOROBENZENE					11 U		12 U
1,4-DIOXANE-OS					11 U		12 UJ
1,4-NAPHTHOQUINONE					11 U		12 U
1-NAPHTHYLAMINE					11 U		12 U
2,2-OXYBIS(1-CHLOROPROPANE)					11 U		12 U
2,3,4,6-TETRACHLOROPHENOL					56 U		59 U
2,4,5-TRICHLOROPHENOL					22 U		24 U
2,4,6-TRICHLOROPHENOL					11 U		12 U
2,4-DICHLOROPHENOL					11 U		12 U
2,4-DIMETHYLPHENOL					11 U		12 U
2,4-DINITROPHENOL					56 U		59 U
2,4-DINITROTOLUENE-OS					11 U		12 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

<b>SEMIVOLATILES (µg/L)</b>							
2,6-DICHLOROPHENOL					11 U		12 U
2,6-DINITROTOLUENE-OS					11 U		12 U
2-ACETYLAMINOFUORENE					11 U		12 U
2-CHLORONAPHTHALENE					11 U		12 U
2-CHLOROPHENOL					11 U		12 U
2-METHYLNAPHTHALENE					11 U		12 U
2-METHYLPHENOL					11 U		12 U
2-NAPHTHYLAMINE					11 U		12 U
2-NITROANILINE					56 U		59 U
2-NITROPHENOL					11 U		12 U
2-PICOLINE					11 U		12 U
3,3'-DICHLOROBENZIDINE					11 UJ		12 UJ
3,3'-DIMETHYLBENZIDINE					11 U		12 U
3-METHYLCHOLANTHRENE					11 U		12 U
3-NITROANILINE					56 U		59 U
4,6-DINITRO-2-METHYLPHENOL					56 U		59 U
4-AMINOBIPHENYL					11 U		12 U
4-BROMOPHENYL PHENYL ETHER					11 U		12 U
4-CHLORO-3-METHYLPHENOL					11 U		12 U
4-CHLOROANILINE					11 U		12 U
4-CHLOROPHENYL PHENYL ETHER					11 U		12 U
4-NITROANILINE					56 UJ		59 UJ
4-NITROPHENOL					56 U		59 U
4-NITROQUINOLINE-1-OXIDE					11 UR		12 UR

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

<b>SEMIVOLATILES (µg/L)</b>							
5-NITRO-O-TOLUIDINE					11 U		12 U
7,12-DIMETHYLBENZ(A)ANTHRACENE					11 U		12 U
A,A-DIMETHYLPHENETHYLAMINE					22 U		24 UJ
ACENAPHTHENE					11 U		12 U
ACENAPHTHYLENE					11 U		12 U
ACETOPHENONE					11 U		12 U
ANILINE					11 U		12 U
ANTHRACENE					11 U		12 U
ARAMITE					11 U		12 UJ
BENZO(A)ANTHRACENE					11 U		12 U
BENZO(A)PYRENE					11 U		12 U
BENZO(B)FLUORANTHENE					11 U		12 U
BENZO(G,H,I)PERYLENE					11 U		12 U
BENZO(K)FLUORANTHENE					11 U		12 U
BENZYL ALCOHOL					11 U		12 U
BIS(2-CHLOROETHOXY)METHANE					11 U		12 U
BIS(2-CHLOROETHYL)ETHER					11 U		12 U
BIS(2-ETHYLHEXYL)PHTHALATE					11 U		6 J
BUTYLBENZYL PHTHALATE					11 U		12 U
CHLOROBENZILATE					11 U		12 U
CHRYSENE					11 U		12 U
CIS-ISOSAFROLE					11 UJ		12 UJ
DI-N-BUTYL PHTHALATE					11 U		1 J
DI-N-OCTYL PHTHALATE					11 U		12 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

<b>SEMIVOLATILES (µg/L)</b>							
DIALLATE					11 U		12 U
DIBENZO(A,H)ANTHRACENE					11 U		12 U
DIBENZOFURAN					11 U		12 U
DIETHYL PHTHALATE					11 U		12 U
DIMETHYL PHTHALATE					11 U		12 U
DIPHENYLAMINE					11 U		12 U
ETHYL METHACRYLATE					11 U		12 U
ETHYL METHANESULFONATE					22 U		24 U
FAMPHUR					11 UR		12 UR
FLUORANTHENE					11 U		12 U
FLUORENE					11 U		12 U
HEXACHLOROENZENE					11 U		12 U
HEXACHLOROBUTADIENE					11 U		12 U
HEXACHLOROCYCLOPENTADIENE					11 U		12 U
HEXACHLOROETHANE					11 U		12 U
HEXACHLOROPROPENE					11 U		12 U
INDENO(1,2,3-CD)PYRENE					11 U		12 U
ISODRIN					11 U		12 U
ISOPHORONE					11 U		12 U
KEPONE					11 UR		12 UR
METHAPYRILENE					11 UJ		12 U
METHYL METHANESULFONATE					22 U		24 U
N-NITROSO-DI-N-BUTYLAMINE					11 U		12 U
N-NITROSO-DI-N-PROPYLAMINE					11 U		12 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

<b>SEMIVOLATILES (µg/L)</b>							
N-NITROSODIETHYLAMINE					11 U		12 U
N-NITROSODIMETHYLAMINE					11 U		12 U
N-NITROSODIPHENYLAMINE					11 U		12 U
N-NITROSOMETHYLETHYLAMINE					11 U		12 U
N-NITROSOMORPHOLINE					11 U		12 U
N-NITROSOPIPERIDINE					11 U		12 U
N-NITROSOPIRROLIDINE					11 U		12 U
NAPHTHALENE					11 U		12 U
NITROBENZENE-OS					11 U		12 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT					11 U		12 U
O-TOLUIDINE					11 UJ		12 UJ
P-DIMETHYLAMINOAZOBENZENE					11 U		12 U
P-PHENYLENEDIAMINE					11 UJ		12 U
PENTACHLOROBENZENE					11 U		12 U
PENTACHLORONITROBENZENE					11 U		12 U
PENTACHLOROPHENOL					56 U		59 U
PHENACETIN					11 U		12 U
PHENANTHRENE					11 U		12 U
PHENOL					11 U		12 U
PRONAMIDE					11 U		12 U
PYRENE					11 U		12 U
PYRIDINE					11 U		12 U
SAFROLE					11 U		12 U
TRANS-ISOSAFROLE					11 U		12 UJ

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

**HERBICIDES (µg/L)**

DIMETHOATE					11 U		12 UJ
PHORATE					11 U		12 U
SULFOTEP					11 U		12 UJ

**ENERGETICS (µg/L)**

1,3,5-TRINITROBENZENE-EXP					0.6 U		0.6 U
1,3-DINITROBENZENE-EXP					0.6 U		0.6 U
2,4,6-TRINITROTOLUENE					0.6 U		0.6 U
2,4-DINITROTOLUENE-EXP					0.6 U		0.6 U
2,6-DINITROTOLUENE-EXP					0.6 U		0.6 U
2-AMINO-4,6-DINITROTOLUENE					0.6 U		0.6 U
2-NITROTOLUENE					1.3 U		1.3 U
3-NITROTOLUENE					1.3 U		1.3 U
4-AMINO-2,6-DINITROTOLUENE					0.6 U		0.6 U
4-NITROTOLUENE					1.3 U		1.3 U
HMX					1.3 U		1.3 U
NITROBENZENE-EXP					0.6 U		0.6 U
RDX					1.3 U		1.3 U
TETRYL					1.3 U		1.3 U

**METALS (µg/L)**

ANTIMONY					2.3 U		6.2 B
ARSENIC					1.9 UL		19.1 L
BARIUM					63.7		624
BERYLLIUM					0.82 U		7.8

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

**METALS (µg/L)**

CADMIUM					1.3 U		9.8
CHROMIUM					21.5		97.0
COBALT					4.2		641
COPPER					12.6		78.7
LEAD					10.1		46.0
MERCURY					0.14		0.17
NICKEL					7.5		77.6
SELENIUM					2.5 K		14.1
SILVER					1.1 U		0.75 B
THALLIUM					2.5 U		9.5 B
TIN					1.2 U		6.4 B
VANADIUM					32.7		120
ZINC					30.8		254

**DISSOLVED METALS (µg/L)**

ANTIMONY, FILTERED	2.3 U	2.3 U	2.3 U	2.3 U		2.3 U	
ARSENIC, FILTERED	1.9 UL	1.9 UL	1.9 UL	1.9 UL		1.9 UL	
BARIUM, FILTERED	11.8	12.2	12	5.1		4.0	
BERYLLIUM, FILTERED	0.20 U	0.20 U	0.2 U	1.3 U		0.20 U	
CADMIUM, FILTERED	1.3 U	1.3 U	1.3 U	1.3 U		1.3 U	
CHROMIUM, FILTERED	2.0 U	2.0 U	2 U	2.0 U		2.0 U	
COBALT, FILTERED	1.3	1.7	1.5	1.0		2.5	
COPPER, FILTERED	3.3 U	3.3 U	3.3 U	3.3 U		3.8	
LEAD, FILTERED	1.3 U	1.3 U	1.3 U	2.8 U		1.4	
MERCURY, FILTERED	0.14	0.15	0.145	0.14		0.10 U	

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6MW003F001	RN6MW003F001-D	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
SAMPLE DATE:	08/04/97	08/04/97	08/04/97	08/05/97	08/05/97	08/04/97	08/04/97
LOCATION:	RN6MW003F001	RN6DUP002-F	RN6MW003F001-AVG	RN6MW004F001	RN6MW004U001	RN6MW005F001	RN6MW005U001
FIELD DUPLICATE OF:		RN6MW003F001	RN6MW003F001				

**DISSOLVED METALS (µg/L)**

NICKEL, FILTERED	1.5 U	1.3 U	1.4 U	1.1 U		2.4 B	
SELENIUM, FILTERED	2.5 U	2.5 U	2.5 U	2.5 U		2.5 U	
SILVER, FILTERED	1.1 U	1.2 U	1.15 U	0.70 U		0.86 B	
THALLIUM, FILTERED	2.5 U	2.5 U	2.5 U	2.5 U		2.5 U	
TIN, FILTERED	1.2 U	1.2 U	1.2 U	1.2 U		1.2 U	
VANADIUM, FILTERED	0.70 U	0.70 U	0.7 U	0.70 U		0.70 U	
ZINC, FILTERED	4.9	7.6	6.25	5.1 U		7.3	

**MISCELLANEOUS PARAMETERS (µg/L)**

M & P-CRESOL					11 U		12 U
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**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/L)</b>							
1,1,1,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U			
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U			
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U			
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U			
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U			
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U			
1,2,3-TRICHLOROPROPANE	5 U	5 U	5 U	5 U			
1,2-DIBROMO-3-CHLOROPROPANE	100 U	100 U	100 U	100 U			
1,2-DIBROMOETHANE	5 U	5 U	5 U	5 U			
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U			
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U			
1,4-DICHLORO-2-BUTENE	100 U	100 U	100 U	100 U			
2-BUTANONE	10 UR	10 UR	10 UR	10 UR			
2-HEXANONE	10 U	10 U	10 U	10 U			
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U			
ACETONE	18 B	24 B	10 B	28 B			
ACETONITRILE	100 UR	100 UR	100 UR	100 UR			
ACROLEIN	20 UR	20 UR	20 UR	20 UR			
ACRYLONITRILE	5 UR	5 UR	5 UR	5 UR			
ALLYL CHLORIDE	5 U	5 U	5 U	5 U			
BENZENE	5 U	5 U	5 U	5 U			
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U			
BROMOFORM	5 U	5 U	5 U	5 U			
BROMOMETHANE	10 U	10 U	10 U	10 U			

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
FIELD DUPLICATE OF:							

**VOLATILES (µg/L)**

CARBON DISULFIDE	5 U	5 U	5 U	5 U			
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U			
CHLOROBENZENE	5 U	5 U	5 U	5 U			
CHLOROETHANE	10 U	10 U	10 U	10 U			
CHLOROFORM	5 U	5 U	5 U	5 U			
CHLOROMETHANE	10 U	10 U	10 U	10 U			
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U			
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U			
DIBROMOMETHANE	5 U	5 U	5 U	5 U			
DICHLORODIFLUOROMETHANE	5 U	5 U	5 U	5 U			
ETHYLBENZENE	5 U	5 U	5 U	5 U			
IODOMETHANE	5 U	5 U	5 U	5 U			
ISOBUTYL ALCOHOL	50 UR	50 UR	50 UR	50 UR			
M&P-XYLENES	5 U	5 U	5 U	5 U			
METHACRYLONITRILE	5 U	5 U	5 U	5 U			
METHYL METHACRYLATE	5 U	5 U	5 U	5 U			
METHYLENE CHLORIDE	2 B	2 B	2 B	2 B			
O-XYLENE	5 U	5 U	5 U	5 U			
PENTACHLOROETHANE	5 U	5 U	5 U	5 U			
PROPIONITRILE	50 UR	50 UR	50 UR	50 UR			
STYRENE	5 U	5 U	5 U	5 U			
TETRACHLOROETHENE	5 U	5 U	5 U	5 U			
TOLUENE	5 U	5 U	5 U	5 U			
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U			

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
FIELD DUPLICATE OF:							

**VOLATILES (µg/L)**

TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U			
TRICHLOROETHENE	5 U	5 U	5 U	5 U			
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U			
VINYL ACETATE	10 U	10 U	10 U	10 U			
VINYL CHLORIDE	5 U	5 U	5 U	5 U			

**SEMIVOLATILES (µg/L)**

1,2,4,5-TETRACHLOROBENZENE	11 U	12 U	11 U	12 U			
1,2,4-TRICHLOROBENZENE	11 U	12 U	11 U	12 U			
1,2-DICHLOROBENZENE	11 U	12 U	11 U	12 U			
1,3,5-TRINITROBENZENE-OS	11 U	12 U	11 U	12 U			
1,3-DICHLOROBENZENE	11 U	12 U	11 U	12 U			
1,3-DINITROBENZENE-OS	11 U	12 U	11 U	12 U			
1,4-DICHLOROBENZENE	11 U	12 U	11 U	12 U			
1,4-DIOXANE-OS	11 U	12 U	11 U	12 U			
1,4-NAPHTHOQUINONE	11 U	12 U	11 U	12 U			
1-NAPHTHYLAMINE	11 U	12 U	11 U	12 U			
2,2-OXYBIS(1-CHLOROPROPANE)	11 U	12 U	11 U	12 U			
2,3,4,6-TETRACHLOROPHENOL	55 U	60 U	57 U	58 U			
2,4,5-TRICHLOROPHENOL	22 U	24 U	23 U	23 U			
2,4,6-TRICHLOROPHENOL	11 U	12 U	11 U	12 U			
2,4-DICHLOROPHENOL	11 U	12 U	11 U	12 U			
2,4-DIMETHYLPHENOL	11 U	12 U	11 U	12 U			
2,4-DINITROPHENOL	55 U	60 U	57 U	58 U			
2,4-DINITROTOLUENE-OS	11 U	12 U	11 U	12 U			

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/L)**

2,6-DICHLOROPHENOL	11 U	12 U	11 U	12 U			
2,6-DINITROTOLUENE-OS	11 U	12 U	11 U	12 U			
2-ACETYLAMINOFUORENE	11 U	12 U	11 U	12 U			
2-CHLORONAPHTHALENE	11 U	12 U	11 U	12 U			
2-CHLOROPHENOL	11 U	12 U	11 U	12 U			
2-METHYLNAPHTHALENE	11 U	12 U	11 U	12 U			
2-METHYLPHENOL	11 U	12 U	11 U	12 U			
2-NAPHTHYLAMINE	11 U	12 U	11 U	12 U			
2-NITROANILINE	55 U	60 U	57 U	58 U			
2-NITROPHENOL	11 U	12 U	11 U	12 U			
2-PICOLINE	11 U	12 U	11 U	12 U			
3,3'-DICHLOROBENZIDINE	11 U	12 U	11 U	12 U			
3,3'-DIMETHYLBENZIDINE	11 U	12 U	11 U	12 U			
3-METHYLCHOLANTHRENE	11 U	12 U	11 U	12 U			
3-NITROANILINE	55 U	60 U	57 U	58 U			
4,6-DINITRO-2-METHYLPHENOL	55 U	60 U	57 U	58 U			
4-AMINOBIPHENYL	11 U	12 U	11 U	12 U			
4-BROMOPHENYL PHENYL ETHER	11 U	12 U	11 U	12 U			
4-CHLORO-3-METHYLPHENOL	11 U	12 U	11 U	12 U			
4-CHLOROANILINE	11 U	12 U	11 U	12 U			
4-CHLOROPHENYL PHENYL ETHER	11 U	12 U	11 U	12 U			
4-NITROANILINE	55 U	60 U	57 U	58 U			
4-NITROPHENOL	55 U	60 U	57 U	58 U			
4-NITROQUINOLINE-1-OXIDE	11 UR	12 UR	11 UR	12 UR			

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/L)</b>							
5-NITRO-O-TOLUIDINE	11 U	12 U	11 U	12 U			
7,12-DIMETHYLBENZ(A)ANTHRACENE	11 U	12 U	11 U	12 U			
A,A-DIMETHYLPHENETHYLAMINE	22 U	24 U	23 U	23 U			
ACENAPHTHENE	11 U	12 U	11 U	12 U			
ACENAPHTHYLENE	11 U	12 U	11 U	12 U			
ACETOPHENONE	11 U	12 U	11 U	12 U			
ANILINE	11 U	12 U	11 U	12 U			
ANTHRACENE	11 U	12 U	11 U	12 U			
ARAMITE	11 U	12 U	11 U	12 U			
BENZO(A)ANTHRACENE	11 U	12 U	11 U	12 U			
BENZO(A)PYRENE	11 U	12 U	11 U	12 U			
BENZO(B)FLUORANTHENE	11 U	12 U	11 U	12 U			
BENZO(G,H,I)PERYLENE	11 U	12 U	11 U	12 U			
BENZO(K)FLUORANTHENE	11 U	12 U	11 U	12 U			
BENZYL ALCOHOL	11 U	12 U	11 U	12 U			
BIS(2-CHLOROETHOXY)METHANE	11 U	12 U	11 U	12 U			
BIS(2-CHLOROETHYL)ETHER	11 U	12 U	11 U	12 U			
BIS(2-ETHYLHEXYL)PHTHALATE	11 U	12 U	11 U	12 U			
BUTYLBENZYL PHTHALATE	11 U	12 U	11 U	12 U			
CHLOROBENZILATE	11 U	12 U	11 U	12 U			
CHRYSENE	11 U	12 U	11 U	12 U			
CIS-ISOSAFROLE	11 U	12 U	11 U	12 U			
DI-N-BUTYL PHTHALATE	11 U	12 U	11 U	12 U			
DI-N-OCTYL PHTHALATE	11 U	12 U	11 U	12 U			

SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
 RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
 INDIAN HEAD DIVISION  
 NSWC INDIAN HEAD, MARYLAND

SAMPLE NUMBER:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/L)**

DIALLATE	11 U	12 U	11 U	12 U			
DIBENZO(A,H)ANTHRACENE	11 U	12 U	11 U	12 U			
DIBENZOFURAN	11 U	12 U	11 U	12 U			
DIETHYL PHTHALATE	11 U	12 U	11 U	12 U			
DIMETHYL PHTHALATE	11 U	12 U	11 U	12 U			
DIPHENYLAMINE	11 U	12 U	11 U	12 U			
ETHYL METHACRYLATE	11 U	12 U	11 U	12 U			
ETHYL METHANESULFONATE	22 U	24 U	23 U	23 U			
FAMPHUR	11 UJ	12 UJ	11 UJ	12 UJ			
FLUORANTHENE	11 U	12 U	11 U	12 U			
FLUORENE	11 U	12 U	11 U	12 U			
HEXACHLOROBENZENE	11 U	12 U	11 U	12 U			
HEXACHLOROBUTADIENE	11 U	12 U	11 U	12 U			
HEXACHLOROCYCLOPENTADIENE	11 U	12 U	11 U	12 U			
HEXACHLOROETHANE	11 U	12 U	11 U	12 U			
HEXACHLOROPROPENE	11 U	12 U	11 U	12 U			
INDENO(1,2,3-CD)PYRENE	11 U	12 U	11 U	12 U			
ISODRIN	11 U	12 U	11 U	12 U			
ISOPHORONE	11 U	12 U	11 U	12 U			
KEPONE	11 UR	12 UR	11 UR	12 UR			
METHAPYRILENE	11 U	12 U	11 U	12 U			
METHYL METHANESULFONATE	22 U	24 U	23 U	23 U			
N-NITROSO-DI-N-BUTYLAMINE	11 U	12 U	11 U	12 U			
N-NITROSO-DI-N-PROPYLAMINE	11 U	12 U	11 U	12 U			

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/L)</b>							
N-NITROSODIETHYLAMINE	11 U	12 U	11 U	12 U			
N-NITROSODIMETHYLAMINE	11 U	12 U	11 U	12 U			
N-NITROSODIPHENYLAMINE	11 U	12 U	11 U	12 U			
N-NITROSOMETHYLETHYLAMINE	11 U	12 U	11 U	12 U			
N-NITROSOMORPHOLINE	11 U	12 U	11 U	12 U			
N-NITROSOPIPERIDINE	11 U	12 U	11 U	12 U			
N-NITROSOPYRROLIDINE	11 U	12 U	11 U	12 U			
NAPHTHALENE	11 U	12 U	11 U	12 U			
NITROBENZENE-OS	11 U	12 U	11 U	12 U			
O,O,O-TRIETHYLPHOSPHOROTHIOAT	11 U	12 U	11 U	12 U			
O-TOLUIDINE	11 U	12 U	11 U	12 U			
P-DIMETHYLAMINOAZOBENZENE	11 U	12 U	11 U	12 U			
P-PHENYLENEDIAMINE	11 U	12 U	11 U	12 U			
PENTACHLOROBENZENE	11 U	12 U	11 U	12 U			
PENTACHLORONITROBENZENE	11 U	12 U	11 U	12 U			
PENTACHLOROPHENOL	55 U	60 U	57 U	58 U			
PHENACETIN	11 U	12 U	11 U	12 U			
PHENANTHRENE	11 U	12 U	11 U	12 U			
PHENOL	11 U	12 U	11 U	12 U			
PRONAMIDE	11 U	12 U	11 U	12 U			
PYRENE	11 U	12 U	11 U	12 U			
PYRIDINE	11 U	12 U	11 U	12 U			
SAFROLE	11 U	12 U	11 U	12 U			
TRANS-ISOSAFROLE	11 U	12 U	11 U	12 U			

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
FIELD DUPLICATE OF:							

**HERBICIDES (µg/L)**

DIMETHOATE	11 U	12 U	11 U	12 U			
PHORATE	11 U	12 U	11 U	12 U			
SULFOTEP	11 U	12 U	11 U	12 U			

**ENERGETICS (µg/L)**

1,3,5-TRINITROBENZENE-EXP	0.6 UR	0.6 U	0.6 U	0.6 U			
1,3-DINITROBENZENE-EXP	0.6 UR	0.6 U	0.6 U	0.6 U			
2,4,6-TRINITROTOLUENE	0.6 UR	0.6 U	0.6 U	0.6 U			
2,4-DINITROTOLUENE-EXP	0.6 UR	0.6 U	0.6 U	0.6 U			
2,6-DINITROTOLUENE-EXP	0.6 UR	0.6 U	0.6 U	0.6 U			
2-AMINO-4,6-DINITROTOLUENE	0.6 UR	0.6 U	0.6 U	0.6 U			
2-NITROTOLUENE	1.3 UR	1.3 U	1.3 U	1.3 U			
3-NITROTOLUENE	1.3 UR	1.3 U	1.3 U	1.3 U			
4-AMINO-2,6-DINITROTOLUENE	0.6 UR	0.6 U	0.6 U	0.6 U			
4-NITROTOLUENE	1.3 UR	1.3 U	1.3 U	1.3 U			
HMX	1.3 UR	1.3 U	1.3 U	1.3 U			
NITROBENZENE-EXP	0.6 UR	0.6 U	0.6 U	0.6 U			
RDX	1.3 UR	1.3 U	1.3 U	1.3 U			
TETRYL	1.3 UR	1.3 UJ	1.3 UJ	1.3 UJ			

**METALS (µg/L)**

ANTIMONY	2.3 U	2.3 U	2.3 U	2.3 U			
ARSENIC	1.9 UL	1.9 UL	1.9 UL	1.9 UL			
BARIUM	36.7	34.4	38.1	37.1			
BERYLLIUM	0.20 U	0.20 U	0.20 U	0.20 U			

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SW0010001	RN6SW0020001	RN6SW0030001	RN6SW0040001			
FIELD DUPLICATE OF:							

<b>METALS (µg/L)</b>							
CADMIUM	1.3 U	1.3 U	1.3 U	1.3 U			
CHROMIUM	2.0 U	2.0 U	2.0 U	2.0 U			
COBALT	0.70 U	0.70 U	0.70 U	0.70 U			
COPPER	5.2	3.4	3.7	3.4			
LEAD	3.3 B	2.6 B	2.3 B	2.9 B			
MERCURY	0.10 U	0.10 U	0.10 U	0.10 U			
NICKEL	1.1 U	1.1 U	1.1 U	1.1 U			
SELENIUM	2.5 U	2.5 U	2.5 U	2.5 U			
SILVER	0.70 U	0.70 U	0.70 U	0.70 U			
THALLIUM	2.5 U	2.5 U	2.5 U	2.5 U			
TIN	1.2 U	1.2 U	1.2 U	1.2 U			
VANADIUM	2.6	2.3	2.6	2.7			
ZINC	7.8	6.5	7.6	8.2			

<b>MISCELLANEOUS PARAMETERS (µg/L)</b>							
M & P-CRESOL	11 U	12 U	11 U	12 U			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U			
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	6 U			
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U			
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	6 U			
1,1-DICHLOROETHANE	6 U	6 U	6 U	6 U			
1,1-DICHLOROETHENE	6 U	6 U	6 U	6 U			
1,2,3-TRICHLOROPROPANE	6 U	6 U	6 U	6 U			
1,2-DIBROMO-3-CHLOROPROPANE	120 U	120 U	110 U	110 U			
1,2-DIBROMOETHANE	6 U	6 U	6 U	6 U			
1,2-DICHLOROETHANE	6 U	6 U	6 U	6 U			
1,2-DICHLOROPROPANE	6 U	6 U	6 U	6 U			
1,4-DICHLORO-2-BUTENE	120 U	120 U	110 U	110 U			
2-BUTANONE	12 UR	12 UR	11 UR	11 UR			
2-HEXANONE	12 U	12 U	11 U	11 U			
4-METHYL-2-PENTANONE	6 U	6 U	6 U	6 U			
ACETONE	38 U	70 U	50 U	110 U			
ACETONITRILE	120 U	120 U	110 U	110 U			
ACROLEIN	25 UR	25 UR	23 UR	22 UR			
ACRYLONITRILE	6 U	6 U	6 U	6 U			
ALLYL CHLORIDE	6 U	6 U	6 U	6 U			
BENZENE	6 U	6 U	6 U	6 U			
BROMODICHLOROMETHANE	6 U	6 U	6 U	6 U			
BROMOFORM	6 U	6 U	6 U	6 U			
BROMOMETHANE	12 U	12 U	11 U	11 U			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

CARBON DISULFIDE	6 U	6 U	6 U	6 U			
CARBON TETRACHLORIDE	6 U	6 U	6 U	6 U			
CHLOROBENZENE	6 U	6 U	6 U	6 U			
CHLOROETHANE	12 U	12 U	11 U	11 U			
CHLOROFORM	6 U	6 U	6 U	6 U			
CHLOROMETHANE	12 U	12 U	11 U	11 U			
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U			
DIBROMOCHLOROMETHANE	6 U	6 U	6 U	6 U			
DIBROMOMETHANE	6 U	6 U	6 U	6 U			
DICHLORODIFLUOROMETHANE	6 U	6 U	6 U	6 U			
ETHYLBENZENE	6 U	6 U	6 U	6 U			
IODOMETHANE	6 U	6 U	6 U	6 U			
ISOBUTYL ALCOHOL	62 U	62 U	57 U	56 U			
M&P-XYLENES	6 U	6 U	6 U	6 U			
METHACRYLONITRILE	6 U	6 U	6 U	6 U			
METHYL METHACRYLATE	6 U	6 U	6 U	6 U			
METHYLENE CHLORIDE	18 U	12 U	12 U	2 U			
O-XYLENE	6 U	6 U	6 U	6 U			
PENTACHLOROETHANE	6 U	6 U	6 U	6 U			
PROPIONITRILE	62 U	62 U	57 U	56 U			
STYRENE	6 U	6 U	6 U	6 U			
TETRACHLOROETHENE	6 U	6 U	6 U	6 U			
TOLUENE	6 U	6 U	6 U	6 U			
TRANS-1,2-DICHLOROETHENE	6 U	6 U	6 U	6 U			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U			
TRICHLOROETHENE	6 U	6 U	6 U	6 U			
TRICHLOROFLUOROMETHANE	6 U	6 U	6 U	6 U			
VINYL ACETATE	12 U	12 U	11 U	11 U			
VINYL CHLORIDE	6 U	6 U	6 U	6 U			

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROGENZENE	410 U	420 U	380 U	370 U			
1,2,4-TRICHLOROGENZENE	410 U	420 U	380 U	370 U			
1,2-DICHLOROGENZENE	410 U	420 U	380 U	370 U			
1,3,5-TRINITROGENZENE-OS	410 U	420 U	380 U	370 U			
1,3-DICHLOROGENZENE	410 U	420 U	380 U	370 U			
1,3-DINITROGENZENE-OS	410 U	420 U	380 U	370 U			
1,4-DICHLOROGENZENE	410 U	420 U	380 U	370 U			
1,4-DIOXANE-OS	410 U	420 U	380 U	370 U			
1,4-NAPHTHOQUINONE	410 U	420 U	380 U	370 U			
1-NAPHTHYLAMINE	410 U	420 U	380 U	370 U			
2,2-OXYBIS(1-CHLOROPROPANE)	410 U	420 U	380 U	370 U			
2,3,4,6-TETRACHLOROPHENOL	2100 U	2100 U	1900 U	1900 U			
2,4,5-TRICHLOROPHENOL	820 U	830 U	760 U	740 U			
2,4,6-TRICHLOROPHENOL	410 U	420 U	380 U	370 U			
2,4-DICHLOROPHENOL	410 U	420 U	380 U	370 U			
2,4-DIMETHYLPHENOL	410 U	420 U	380 U	370 U			
2,4-DINITROPHENOL	2100 U	2100 U	1900 U	1900 U			
2,4-DINITROTOLUENE-OS	410 U	420 U	380 U	370 U			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/kg)**

2,6-DICHLOROPHENOL	410 U	420 U	380 U	370 U			
2,6-DINITROTOLUENE-OS	410 U	420 U	380 U	370 U			
2-ACETYLAMINOFUORENE	410 U	420 U	380 U	370 U			
2-CHLORONAPHTHALENE	410 U	420 U	380 U	370 U			
2-CHLOROPHENOL	410 U	420 U	380 U	370 U			
2-METHYLNAPHTHALENE	410 U	420 U	380 U	370 U			
2-METHYLPHENOL	410 U	420 U	380 U	370 U			
2-NAPHTHYLAMINE	410 U	420 U	380 U	370 U			
2-NITROANILINE	2100 U	2100 U	1900 U	1900 U			
2-NITROPHENOL	410 U	420 U	380 U	370 U			
2-PICOLINE	410 U	420 U	380 U	370 U			
3,3'-DICHLOROBENZIDINE	410 U	420 U	380 U	370 U			
3,3'-DIMETHYLBENZIDINE	410 U	420 U	380 U	370 U			
3-METHYLCHOLANTHRENE	410 U	420 U	380 U	370 U			
3-NITROANILINE	2100 U	2100 U	1900 U	1900 U			
4,6-DINITRO-2-METHYLPHENOL	2100 U	2100 U	1900 U	1900 U			
4-AMINOBIPHENYL	410 U	420 U	380 U	370 U			
4-BROMOPHENYL PHENYL ETHER	410 U	420 U	380 U	370 U			
4-CHLORO-3-METHYLPHENOL	410 U	420 U	380 U	370 U			
4-CHLOROANILINE	410 U	420 U	380 U	370 U			
4-CHLOROPHENYL PHENYL ETHER	410 U	420 U	380 U	370 U			
4-NITROANILINE	2100 U	2100 U	1900 U	1900 U			
4-NITROPHENOL	2100 U	2100 U	1900 U	1900 U			
4-NITROQUINOLINE-1-OXIDE	410 UR	420 UR	380 UR	370 UR			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	410 U	420 U	380 U	370 U			
7,12-DIMETHYLBENZ(A)ANTHRACENE	410 U	420 U	380 U	370 U			
A,A-DIMETHYLPHENETHYLAMINE	820 U	830 U	760 U	740 U			
ACENAPHTHENE	410 U	420 U	380 U	370 U			
ACENAPHTHYLENE	410 U	420 U	380 U	370 U			
ACETOPHENONE	410 U	420 U	380 U	370 U			
ANILINE	410 U	420 U	380 U	370 U			
ANTHRACENE	410 U	420 U	380 U	370 U			
ARAMITE	410 U	420 U	380 U	370 U			
BENZO(A)ANTHRACENE	71 J	420 U	380 U	370 U			
BENZO(A)PYRENE	60 J	420 U	380 U	370 U			
BENZO(B)FLUORANTHENE	100 J	420 U	380 U	370 U			
BENZO(G,H,I)PERYLENE	410 U	420 U	380 U	370 U			
BENZO(K)FLUORANTHENE	410 U	420 U	380 U	370 U			
BENZYL ALCOHOL	410 U	420 U	380 U	370 U			
BIS(2-CHLOROETHOXY)METHANE	410 U	420 U	380 U	370 U			
BIS(2-CHLOROETHYL)ETHER	410 U	420 U	380 U	370 U			
BIS(2-ETHYLHEXYL)PHTHALATE	410 U	420 U	380 U	370 U			
BUTYLBENZYL PHTHALATE	410 U	420 U	380 U	370 U			
CHLOROBENZILATE	410 U	420 U	380 U	370 U			
CHRYSENE	56 J	420 U	380 U	370 U			
CIS-ISOSAFROLE	410 U	420 U	380 U	370 U			
DI-N-BUTYL PHTHALATE	410 U	160 J	380 U	390			
DI-N-OCTYL PHTHALATE	410 U	95 J	380 U	370 U			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	410 U	420 U	380 U	370 U			
DIBENZO(A,H)ANTHRACENE	410 U	420 U	380 U	370 U			
DIBENZOFURAN	410 U	420 U	380 U	370 U			
DIETHYL PHTHALATE	410 U	420 U	380 U	370 U			
DIMETHYL PHTHALATE	410 U	420 U	380 U	370 U			
DIPHENYLAMINE	410 U	420 U	380 U	370 U			
ETHYL METHACRYLATE	410 U	420 U	380 U	370 U			
ETHYL METHANESULFONATE	820 U	830 U	760 U	740 U			
FAMPHUR	410 U	420 UR	380 U	370 U			
FLUORANTHENE	77 J	420 U	380 U	370 U			
FLUORENE	410 U	420 U	380 U	370 U			
HEXACHLOROBENZENE	410 U	420 U	380 U	370 U			
HEXACHLOROBUTADIENE	410 U	420 U	380 U	370 U			
HEXACHLOROCYCLOPENTADIENE	410 U	420 U	380 U	370 U			
HEXACHLOROETHANE	410 U	420 U	380 U	370 U			
HEXACHLOROPROPENE	410 U	420 U	380 U	370 U			
INDENO(1,2,3-CD)PYRENE	410 U	420 U	380 U	370 U			
ISODRIN	410 U	420 U	380 U	370 U			
ISOPHORONE	410 U	420 U	380 U	370 U			
KEPONE	410 UR	420 UR	380 UR	370 UR			
METHAPYRILENE	410 U	420 U	380 U	370 U			
METHYL METHANESULFONATE	820 U	830 U	760 U	740 U			
N-NITROSO-DI-N-BUTYLAMINE	410 U	420 U	380 U	370 U			
N-NITROSO-DI-N-PROPYLAMINE	410 U	420 U	380 U	370 U			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	410 U	420 U	380 U	370 U			
N-NITROSODIMETHYLAMINE	410 U	420 U	380 U	370 U			
N-NITROSODIPHENYLAMINE	410 U	420 U	380 U	370 U			
N-NITROSOMETHYLETHYLAMINE	410 U	420 U	380 U	370 U			
N-NITROSOMORPHOLINE	410 U	420 U	380 U	370 U			
N-NITROSOPIPERIDINE	410 U	420 U	380 U	370 U			
N-NITROSOPIRROLIDINE	410 U	420 U	380 U	370 U			
NAPHTHALENE	410 U	420 U	380 U	370 U			
NITROBENZENE-OS	410 U	420 U	380 U	370 U			
O,O,O-TRIETHYLPHOSPHOROTHIOAT	410 U	420 U	380 U	370 U			
O-TOLUIDINE	410 U	420 U	380 U	370 U			
P-DIMETHYLAMINOAZOBENZENE	410 U	420 U	380 U	370 U			
P-PHENYLENEDIAMINE	410 U	420 U	380 U	370 U			
PENTACHLOROBENZENE	410 U	420 U	380 U	370 U			
PENTACHLORONITROBENZENE	410 U	420 U	380 U	370 U			
PENTACHLOROPHENOL	2100 U	2100 U	1900 U	1900 U			
PHENACETIN	410 U	420 U	380 U	370 U			
PHENANTHRENE	410 U	420 U	380 U	370 U			
PHENOL	410 U	420 U	380 U	370 U			
PRONAMIDE	410 U	420 U	380 U	370 U			
PYRENE	63 J	420 U	380 U	370 U			
PYRIDINE	410 U	420 U	380 U	370 U			
SAFROLE	410 U	420 U	380 U	370 U			
TRANS-ISOSAFROLE	410 U	420 U	380 U	370 U			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	410 U	420 U	380 U	370 U			
PHORATE	410 U	420 U	380 U	370 U			
SULFOTEP	410 U	420 U	380 U	370 U			

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	40.2 U	40.2 U	40.2 U			
1,3-DINITROBENZENE-EXP	37.2 U	37.2 U	37.2 U	37.2 U			
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	35.6 U	35.6 U			
2,4-DINITROTOLUENE-EXP	51.6 U	51.6 U	51.6 U	51.6 U			
2,6-DINITROTOLUENE-EXP	47.6 U	47.6 U	47.6 U	47.6 U			
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	46.7 U	46.7 U			
2-NITROTOLUENE	81.4 U	81.4 U	81.4 U	81.4 U			
3-NITROTOLUENE	81.8 U	81.8 U	81.8 U	81.8 U			
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U	40.9 U	40.9 U			
4-NITROTOLUENE	87.2 U	87.2 U	87.2 U	87.2 U			
HMX	70.5 U	70.5 U	70.5 U	70.5 U			
NITROBENZENE-EXP	35.2 U	35.2 U	35.2 U	35.2 U			
RDX	50.9 U	50.9 U	50.9 U	50.9 U			
TETRYL	163 UJ	163 UJ	163 UJ	163 UJ			

**METALS (mg/kg)**

ANTIMONY	0.29 L	0.24 UL	0.23 UL	0.20 UL			
ARSENIC	3.0	0.84 L	0.47 L	0.97 L			
BARIUM	24.1 J	7.7 J	6.5 J	10.3 J			
BERYLLIUM	0.31	0.13 U	0.06 U	0.04 U			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
SAMPLE DATE:	06/26/97	06/26/97	06/26/97	06/26/97	//	//	//
LOCATION:	RN6SD0010001	RN6SD0020001	RN6SD0030001	RN6SD0040001			
FIELD DUPLICATE OF:							

**METALS (mg/kg)**

CADMIUM	0.80	0.40	0.22	0.33			
CHROMIUM	10.9 J	7.2 J	10.2 J	3.6 J			
COBALT	3.3	1.0	0.72	0.67			
COPPER	50.5	11.1	2.2	3.3			
LEAD	28.0	9.4	2.4	2.5			
MERCURY	0.12	0.11	0.13	0.02			
NICKEL	6.6	2.3	12.8	2.7			
SELENIUM	0.96 J	0.52 J	0.35 J	0.37 J			
SILVER	0.17 U	0.13 U	0.10 U	0.09 U			
THALLIUM	0.32 U	0.26 U	0.25 U	0.22 U			
TIN	2.6 U	2.4 U	2.1 U	1.8 U			
VANADIUM	17.4	6.8	3.0	3.5			
ZINC	43.5	15.8	7.5	9.3			

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	410 U	420 U	380 U	370 U			
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**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

**SEMIVOLATILES (µg/kg)**

4-CHLORO-3-METHYLPHENOL	375 UJ	360 UJ	380 UJ	370 UJ	57.7 U		
4-CHLOROANILINE	375 UJ	360 UJ	380 UJ	370 UJ	82.0 U		
4-CHLOROPHENYL PHENYL ETHER	375 UJ	360 UJ	380 UJ	370 UJ	21.8 U		
4-METHYLPHENOL					41.8 U		
4-NITROANILINE	1900 UJ	1800 UJ	1900 UJ	1850 UJ	64.1 U		
4-NITROPHENOL	1900 UJ	1800 UJ	1900 UJ	1850 UJ	128 U		
4-NITROQUINOLINE-1-OXIDE	375 UR	360 UR	380 UR	380 UR	1450 UR		
5-NITRO-O-TOLUIDINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
7,12-DIMETHYLBENZ(A)ANTHRACENE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
A,A-DIMETHYLPHENETHYLAMINE	755 UJ	720 UJ	760 UJ	740 UJ	363 U		
ACENAPHTHENE	375 UJ	360 UJ	380 UJ	370 UJ	37.7 U		
ACENAPHTHYLENE	375 UJ	360 UJ	380 UJ	370 UJ	37.2 U		
ACETOPHENONE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
ANILINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
ANTHRACENE	375 UJ	360 UJ	380 UJ	370 UJ	25.5 U		
ARAMITE	375 UJ	360 UJ	380 UJ	370 UJ	726 U		
BENZO(A)ANTHRACENE	375 UJ	360 UJ	380 UJ	370 UJ	13.2 U		
BENZO(A)PYRENE	375 UJ	360 UJ	380 UJ	370 UJ	16.5 U		
BENZO(B)FLUORANTHENE	170 J	360 UJ	380 UJ	370 UJ	49.0 U		
BENZO(G,H,I)PERYLENE	90 J	360 UJ	380 UJ	370 UJ	50.4 U		
BENZO(K)FLUORANTHENE	110 J	360 UJ	380 UJ	370 UJ	40.4 U		
BENZYL ALCOHOL	375 UJ	360 UJ	380 UJ	370 UJ	49.4 U		
BIS(2-CHLOROETHOXY)METHANE	375 UJ	360 UJ	380 UJ	370 UJ	51.5 U		
BIS(2-CHLOROETHYL)ETHER	375 UJ	360 UJ	380 UJ	370 UJ	77.9 U		

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

**SEMIVOLATILES (µg/kg)**

BIS(2-ETHYLHEXYL)PHTHALATE	375 UJ	360 UJ	380 UJ	370 UJ	71.0 U		
BUTYLBENZYL PHTHALATE	375 UJ	360 UJ	380 UJ	370 UJ	102 U		
CHLOROBENZILATE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
CHRYSENE	73 J	360 UJ	380 UJ	370 UJ	20.5 U		
CIS-ISOSAFROLE	375 UJ	360 UJ	380 UJ	370 UJ			
DI-N-BUTYL PHTHALATE	375 UJ	360 UJ	380 UJ	370 UJ	740		
DI-N-OCTYL PHTHALATE	375 UJ	360 UJ	380 UJ	370 UJ	52.1 U		
DIALLATE	375 UJ	360 UJ	380 UJ	370 UJ	363 UR		
DIBENZO(A,H)ANTHRACENE	375 UJ	360 UJ	380 UJ	370 UJ	41.7 U		
DIBENZOFURAN	375 UJ	360 UJ	380 UJ	370 UJ	28.0 U		
DIETHYL PHTHALATE	375 UJ	360 UJ	380 UJ	370 UJ	39.6 U		
DIMETHYL PHTHALATE	375 UJ	360 UJ	380 UJ	370 UJ	18.3 U		
DIPHENYLAMINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
ETHYL METHACRYLATE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
ETHYL METHANESULFONATE	755 UJ	720 UJ	760 UJ	740 UJ			
FAMPHUR	375 UJ	360 UJ	380 UJ	370 UJ	726 UJ		
FLUORANTHENE	375 UJ	360 UJ	380 UJ	370 UJ	49.3 U		
FLUORENE	375 UJ	360 UJ	380 UJ	370 UJ	26.4 U		
HEXACHLOROENZENE	375 UJ	360 UJ	380 UJ	370 UJ	21.6 U		
HEXACHLOROBUTADIENE	375 UJ	360 UJ	380 UJ	370 UJ	39.9 U		
HEXACHLOROCYCLOPENTADIENE	375 UJ	360 UJ	380 UJ	370 UJ	66.7 U		
HEXACHLOROETHANE	375 UJ	360 UJ	380 UJ	370 UJ	23.6 U		
HEXACHLOROPHENE					1820 UR		
HEXACHLOROPROPENE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

<b>SEMIVOLATILES (µg/kg)</b>							
INDENO(1,2,3-CD)PYRENE	90 J	360 UJ	380 UJ	370 UJ	45.1 U		
ISODRIN	375 UJ	360 UJ	380 UJ	370 UJ	726 U		
ISOPHORONE	375 UJ	360 UJ	380 UJ	370 UJ	52.9 U		
ISOSAFROLE					363 U		
KEPONE	375 UJ	360 UJ	380 UJ	370 UJ	726 UR		
METHAPYRILENE	375 UJ	360 UJ	380 UJ	370 UJ	3630 U		
METHYL METHANESULFONATE	755 UJ	720 UJ	760 UJ	740 UJ	544 U		
N-NITROSO-DI-N-BUTYLAMINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
N-NITROSO-DI-N-PROPYLAMINE	375 UJ	360 UJ	380 UJ	370 UJ	62.5 U		
N-NITROSODIETHYLAMINE	375 UJ	360 UJ	380 UJ	370 UJ	726 U		
N-NITROSODIMETHYLAMINE	375 UJ	360 UJ	380 UJ	370 UJ	54.7 U		
N-NITROSODIPHENYLAMINE	375 UJ	360 UJ	380 UJ	370 UJ	36.6 U		
N-NITROSOMETHYLETHYLAMINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
N-NITROSOMORPHOLINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
N-NITROSOPIPERIDINE	375 UJ	360 UJ	380 UJ	370 UJ	726 U		
N-NITROSOPYRROLIDINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
NAPHTHALENE	375 UJ	360 UJ	380 UJ	370 UJ	33.6 U		
NITROBENZENE-OS	375 UJ	360 UJ	380 UJ	370 UJ	49.5 U		
O,O,O-TRIETHYLPHOSPHOROTHIOAT	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
O,O-DIETHYL-O-2-PYRAZINYLPHOSPH					363 U		
O-TOLUIDINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
P-DIMETHYLAMINOAZOBENZENE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
P-PHENYLENEDIAMINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
PENTACHLOROBENZENE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

**SEMIVOLATILES (µg/kg)**

PENTACHLORONITROBENZENE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
PENTACHLOROPHENOL	1900 UJ	1800 UJ	1900 UJ	1850 UJ	116 U		
PHENACETIN	375 UJ	360 UJ	380 UJ	370 UJ	726 U		
PHENANTHRENE	375 UJ	360 UJ	380 UJ	370 UJ	41.0 U		
PHENOL	375 UJ	360 UJ	380 UJ	370 UJ	151 U		
PRONAMIDE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
PYRENE	375 UJ	360 UJ	380 UJ	370 UJ	90.6 U		
PYRIDINE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
SAFROLE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
TRANS-ISOSAFROLE	375 UJ	360 UJ	380 UJ	370 UJ			

**HERBICIDES (µg/kg)**

DIMETHOATE	375 UJ	360 UJ	380 UJ	370 UJ	726 U		
PHORATE	375 UJ	360 UJ	380 UJ	370 UJ	363 U		
SULFOTEP	375 UJ	360 UJ	380 UJ	370 UJ			

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	375 UJ	40.2 U	40.2 U	370 UJ			
1,3-DINITROBENZENE-EXP	375 UJ	37.2 U	37.2 U	370 UJ			
2,4-DINITROTOLUENE					51.6 U	51.6 U	51.6 U
2,4,6-TRINITROTOLUENE	35.6 U	167	735	451	1560	28400	14980
2,4-DINITROTOLUENE-EXP	375 UJ	51.6 U	51.6 U	370 UJ			
2,6-DINITROTOLUENE					47.6 U	47.6 U	47.6 U
2,6-DINITROTOLUENE-EXP	375 UJ	47.6 U	47.6 U	370 UJ			
2-AMINO-4,6-DINITROTOLUENE	46.7 U	344	4400	2372	488 J	403 J	445.5 J
2-NITROTOLUENE	81.4 U						

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

**ENERGETICS (µg/kg)**

3-NITROTOLUENE	81.8 U	81.8 U	81.8 U	81.8 U	81.7 U	81.7 U	81.7 U
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U	40.9 U	40.9 U	40.8 U	40.8 U	40.8 U
4-NITROTOLUENE	87.2 U	87.2 U	87.2 U				
HMX	70.5 U	70.5 U	70.5 U	70.5 U	597	516	556.5
NITRO-BENZENE					35.2 U	35.2 U	35.2 U
NITROBENZENE-EXP	375 UJ	35.2 U	35.2 U	370 UJ			
NITROCELLULOSE					5.9 U	7.3 U	6.6 U
NITROGLYCERIN					10000 U	10000 U	10000 U
NITROGUANIDINE					63.0 U	63.0 U	63 U
PETN					250 U	250 U	250 U
RDX	50.9 U	50.9 U	50.9 U	50.9 U	3380	1610	2495
TETRYL	163 U	163 U	163 U				

**METALS (mg/kg)**

ALUMINUM					6290	5880	6085
ANTIMONY	0.63 L	0.24 L	0.52 L	0.38 L	0.19 UL	0.23 L	0.21 UL
ARSENIC	4.1	2.1	2.7	2.4	2.8	2.9	2.85
BARIUM	33.7	16.5	52.2	34.35	26.4	20.2	23.3
BERYLLIUM	0.59	0.68	0.58	0.63	0.25	0.19	0.22
CADMIUM	0.695 K	0.39 K	0.63 K	0.51 K	0.96 L	1.4	1.18 L
CALCIUM					87.5 U	78.4 U	82.95 U
CHROMIUM	17.7	10.3	12.6	11.45	12.6	13.3	12.95
COBALT	3.8 J	2.8 J	4.5 J	3.65 J	3.6	3.3	3.45
COPPER	55.15	34.1	31.4	32.75	54.3	41.3	47.8
CYANIDE					1.1 U	1.1 U	1.1 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SS0180101-AVG	RN6SS0190101	RN6SS0190101-D	RN6SS0190101-AVG	S5-MW01-01	S5-MW01-01-D	S5-MW01-01-AVG
SAMPLE DATE:	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95	09/20/95
LOCATION:	RN6SS0180101-AVG	RN6SS0190101	RN6DUP008	RN6SS0190101-AVG	S05-MW01-01	FD03	S5-MW01-01-AVG
FIELD DUPLICATE OF:	RN6SS0180101		RN6SS0190101	RN6SS0190101		S5-MW01-01	S5-MW01-01

**METALS (mg/kg)**

IRON					14300 J	14400 J	14350 J
LEAD	9.8	10.7	20.1	15.4	30.3 L	25.2 L	27.75 L
MAGNESIUM					323	281	302
MANGANESE					82.6	89.9	86.25
MERCURY	0.115	0.28	1.4	0.84	0.14 L	0.13 L	0.135 L
NICKEL	9.45	4.4	8.0	6.2	4.9 J	6.2 J	5.55 J
POTASSIUM					311	257	284
SELENIUM	1.7	0.57	1.1	0.835	0.17 U	0.16 U	0.165 U
SILVER	0.1 U	0.13 U	0.12 U	0.125 U	0.27	0.22	0.245
SODIUM					37.8 U	37.5 U	37.65 U
THALLIUM	0.96 U	0.23 U	0.55 U	0.39 U	0.28 U	0.27 U	0.275 U
TIN	2.4 U	2.2 U	4.5 U	3.35 U	4.4 UJ	4.4 UJ	4.4 UJ
VANADIUM	25.6	14.7	24.6	19.65	17.9	19.2	18.55
ZINC	61.8	25.4	43.8	34.6	32.6	39.7	36.15

**MISCELLANEOUS PARAMETERS (mg/kg)**

AMMONIA					16.1 L	21.6 L	18.85 L
M & P-CRESOL	375 UJ	360 UJ	380 UJ	370 UJ			
NITRATE/NITRITE					3.8	3.0	3.4
TOTAL ORGANIC CARBON					1400	2770	2085

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0060101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6DUP001
FIELD DUPLICATE OF:							RN6SB0060101

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	6 U	1 J	28 U	28 U
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
1,1-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
1,1-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
1,2,3-TRICHLOROPROPANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
1,2-DIBROMO-3-CHLOROPROPANE	110 U	120 U	110 U	110 U	110 U	560 U	560 U
1,2-DIBROMOETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
1,2-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
1,2-DICHLOROPROPANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
1,4-DICHLORO-2-BUTENE	110 U	120 U	110 U	110 U	110 U	560 U	560 U
2-BUTANONE	11 UR	12 UR	11 UR	11 UR	11 UR	56 UR	56 UR
2-HEXANONE	11 U	12 U	11 U	11 U	11 U	56 U	56 U
4-METHYL-2-PENTANONE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
ACETONE	25 U	58 U	50 U	45 U	97	130 U	200 U
ACETONITRILE	110 U	120 U	110 U	110 U	110 U	560 U	560 U
ACROLEIN	22 UR	23 UR	22 UR	23 UR	23 UR	110 UR	110 UR
ACRYLONITRILE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
ALLYL CHLORIDE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
BENZENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
BROMODICHLOROMETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
BROMOFORM	6 U	6 U	6 U	6 U	6 U	28 U	28 U
BROMOMETHANE	11 U	12 U	11 U	11 U	11 U	56 U	56 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0060101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6DUP001
FIELD DUPLICATE OF:							RN6SB0060101

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
CARBON TETRACHLORIDE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
CHLOROBENZENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
CHLOROETHANE	11 U	12 U	11 U	11 U	11 U	56 U	56 U
CHLOROFORM	6 U	6 U	6 U	6 U	6 U	28 U	28 U
CHLOROMETHANE	11 U	12 U	11 U	11 U	11 U	56 U	56 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
DIBROMOCHLOROMETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
DIBROMOMETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
DICHLORODIFLUOROMETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
ETHYLBENZENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
IODOMETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
ISOBUTYL ALCOHOL	55 U	58 U	55 U	57 U	57 U	280 U	280 U
M&P-XYLENES	6 U	6 U	6 U	6 U	6 U	28 U	28 U
METHACRYLONITRILE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
METHYL METHACRYLATE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
METHYLENE CHLORIDE	37	30	22	51	44	73	70
O-XYLENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
PENTACHLOROETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
PROPIONITRILE	55 U	58 U	55 U	57 U	57 U	280 U	280 U
STYRENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
TETRACHLOROETHENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
TOLUENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
TRANS-1,2-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0060101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6DUP001
FIELD DUPLICATE OF:							RN6SB0060101

<b>VOLATILES (µg/kg)</b>							
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
TRICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
TRICHLOROFLUOROMETHANE	6 U	6 U	6 U	6 U	6 U	28 U	28 U
VINYL ACETATE	11 U	12 U	11 U	11 U	11 U	56 U	56 U
VINYL CHLORIDE	6 U	6 U	6 U	6 U	6 U	28 U	28 U

<b>SEMIVOLATILES (µg/kg)</b>							
1,2,4,5-TETRACHLOROBENZENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
1,2,4-TRICHLOROBENZENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
1,2-DICHLOROBENZENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
1,3,5-TRINITROBENZENE-OS	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
1,3-DICHLOROBENZENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
1,3-DINITROBENZENE-OS	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
1,4-DICHLOROBENZENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
1,4-DIOXANE-OS	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
1,4-NAPHTHOQUINONE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
1-NAPHTHYLAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2,2-OXYBIS(1-CHLOROPROPANE)	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2,3,4,6-TETRACHLOROPHENOL	1800 UJ	1900 UJ					
2,4,5-TRICHLOROPHENOL	730 UJ	780 UJ	740 UJ	760 UJ	760 UJ	750 UJ	740 UJ
2,4,6-TRICHLOROPHENOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2,4-DICHLOROPHENOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2,4-DIMETHYLPHENOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2,4-DINITROPHENOL	1800 UJ	1900 UJ					
2,4-DINITROTOLUENE-OS	370 UJ	390 UJ	370 UJ	380 UJ	190 J	74 J	370 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0060101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6DUP001
FIELD DUPLICATE OF:							RN6SB0060101

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2,6-DINITROTOLUENE-OS	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2-ACETYLAMINOFUORENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2-CHLORONAPHTHALENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2-CHLOROPHENOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2-METHYLNAPHTHALENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2-METHYLPHENOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2-NAPHTHYLAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2-NITROANILINE	1800 UJ	1900 UJ					
2-NITROPHENOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
2-PICOLINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
3,3'-DICHLOROBENZIDINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
3,3'-DIMETHYLBENZIDINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
3-METHYLCHOLANTHRENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
3-NITROANILINE	1800 UJ	1900 UJ					
4,6-DINITRO-2-METHYLPHENOL	1800 UJ	1900 UJ					
4-AMINOBIHENYL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
4-BROMOPHENYL PHENYL ETHER	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
4-CHLORO-3-METHYLPHENOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
4-CHLOROANILINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
4-CHLOROPHENYL PHENYL ETHER	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
4-NITROANILINE	1800 UJ	1900 UJ					
4-NITROPHENOL	1800 UJ	1900 UJ					
4-NITROQUINOLINE-1-OXIDE	370 UR	390 UR	370 UR	380 UR	380 UR	370 UR	370 UR

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0060101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6DUP001
FIELD DUPLICATE OF:							RN6SB0060101

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
A,A-DIMETHYLPHENETHYLAMINE	730 UJ	780 UJ	740 UJ	760 UJ	760 UJ	750 UJ	740 UJ
ACENAPHTHENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
ACENAPHTHYLENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
ACETOPHENONE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
ANILINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
ANTHRACENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
ARAMITE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
BENZO(A)ANTHRACENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
BENZO(A)PYRENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
BENZO(B)FLUORANTHENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
BENZO(G,H,I)PERYLENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
BENZO(K)FLUORANTHENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
BENZYL ALCOHOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
BIS(2-CHLOROETHOXY)METHANE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
BIS(2-CHLOROETHYL)ETHER	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	370 UJ	390 UJ	41 J	380 UJ	110 J	38 J	370 UJ
BUTYLBENZYL PHTHALATE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
CHLOROBENZILATE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
CHRYSENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
CIS-ISOSAFROLE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
DI-N-BUTYL PHTHALATE	84 J	40 J	370 UJ	380 UJ	370 J	370 UJ	370 UJ
DI-N-OCTYL PHTHALATE	370 UJ	390 UJ	370 UJ	380 UJ	110 J	47 J	370 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0060101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6DUP001
FIELD DUPLICATE OF:							RN6SB0060101

**SEMIVOLATILES (µg/kg)**

DIALLATE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
DIBENZO(A,H)ANTHRACENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
DIBENZOFURAN	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
DIETHYL PHTHALATE	52 J	390 UJ	57 J	380 UJ	380 UJ	370 UJ	370 UJ
DIMETHYL PHTHALATE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
DIPHENYLAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
ETHYL METHACRYLATE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
ETHYL METHANESULFONATE	730 UJ	780 UJ	740 UJ	760 UJ	760 UJ	750 UJ	740 UJ
FAMPHUR	370 UR	390 UR	370 UR	380 UR	380 UR	370 UR	370 UR
FLUORANTHENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
FLUORENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
HEXACHLOROBENZENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
HEXACHLOROBUTADIENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
HEXACHLOROCYCLOPENTADIENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
HEXACHLOROETHANE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
HEXACHLOROPROPENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
INDENO(1,2,3-CD)PYRENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
ISODRIN	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
ISOPHORONE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
KEPONE	370 UR	390 UR	370 UR	380 UR	380 UR	370 UR	370 UR
METHAPYRILENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UR	370 UR	370 UR
METHYL METHANESULFONATE	730 UJ	780 UJ	740 UJ	760 UJ	760 UJ	750 UJ	740 UJ
N-NITROSO-DI-N-BUTYLAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
N-NITROSO-DI-N-PROPYLAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0060101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6DUP001
FIELD DUPLICATE OF:							RN6SB0060101

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
N-NITROSODIMETHYLAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
N-NITROSODIPHENYLAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
N-NITROSOMETHYLETHYLAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
N-NITROSOMORPHOLINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
N-NITROSOPIPERIDINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
N-NITROSOPYRROLIDINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
NAPHTHALENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
NITROBENZENE-OS	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
O-TOLUIDINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
P-DIMETHYLAMINOAZOBENZENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
P-PHENYLENEDIAMINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
PENTACHLOROBENZENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
PENTACHLORONITROBENZENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
PENTACHLOROPHENOL	1800 UJ	1900 UJ					
PHENACETIN	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
PHENANTHRENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
PHENOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
PRONAMIDE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
PYRENE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
PYRIDINE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
SAFROLE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
TRANS-ISOSAFROLE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0060101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6DUP001
FIELD DUPLICATE OF:							RN6SB0060101

**HERBICIDES (µg/kg)**

DIMETHOATE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
PHORATE	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ
SULFOTEP	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U	19200	422	2820	1010	3570	3410
2,4-DINITROTOLUENE-EXP	51.6 U	216	51.6 U	630	306	955	984
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	46.7 U	2000	594	2930	1750	11600	10400
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U	586	70.5 U	756	70.5 U	3010	2920
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U	301	50.9 U	1160	50.9 U	7270	8720
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.59 L	2.0 L	0.51 L	0.48 L	0.55 L	0.64 L	0.62 L
ARSENIC	2.6	3.3	3.4	5.3	3.0	2.8	3.0
BARIUM	26.2	25.6	23.3	25.7	27.5	28.7	36.9
BERYLLIUM	0.28	0.38	0.27	0.27	0.29	0.41	0.45

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0060101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0010101	RN6SB0020101	RN6SB0030101	RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6DUP001
FIELD DUPLICATE OF:							RN6SB0060101

<b>METALS (mg/kg)</b>							
CADMIUM	1.3	0.80 K	0.73 K	1.0	1.1	0.85 K	1.1
CHROMIUM	9.3	20.5	16.3	21.6	18.8	16.9	13.8
COBALT	4.8	5.6	3.3	4.3	3.2	4.5	5.2
COPPER	60.4	28.5	69.4	19.5	70.3	70.4	96.8
LEAD	36.8	28.8	28.8	12.1	47.1	46.4	59.4
MERCURY	0.16	0.03	0.16	0.13	0.24	0.34	0.57
NICKEL	4.6	8.4	4.9	7.6	5.8	12.1	7.7
SELENIUM	0.81	1.1	0.95	1.2	0.99	0.77	1.0
SILVER	0.22 U	0.57 U	0.51 U	0.07 U	0.53 U	0.45 U	0.31 U
THALLIUM	0.78 U	1.7 U	0.35 U	0.62 U	0.26 U	0.39 U	0.18 U
TIN	2.6 U	3.2 U	3.1 U	3.1 U	3.4 U	3.9 U	3.3 U
VANADIUM	15.4	19.6	21.5	27.8	21.5	21.1	22.6
ZINC	36.6	28.2	26.7	23.4	34.9	43.3	54.1

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	370 UJ	390 UJ	370 UJ	380 UJ	380 UJ	370 UJ	370 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6SB0110101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6DUP002
FIELD DUPLICATE OF:	RN6SB0060101						RN6SB0110101

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
1,1,1-TRICHLOROETHANE	28 U	6 U	6 U	6 U	5 U	5 U	1 J
1,1,2,2-TETRACHLOROETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
1,2,3-TRICHLOROPROPANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	560 U	110 U	110 U	110 U	110 U	100 U	100 U
1,2-DIBROMOETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
1,4-DICHLORO-2-BUTENE	560 U	110 U	110 U	110 U	110 U	100 U	100 U
2-BUTANONE	56 UR	11 UR	11 UR	11 UR	11 UR	10 UR	10 UR
2-HEXANONE	56 U	11 U	11 U	11 U	11 U	10 U	10 U
4-METHYL-2-PENTANONE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
ACETONE	165 U	57 U	67 U	18 U	38 U	10 U	160 U
ACETONITRILE	560 U	110 U	110 U	110 U	110 U	100 U	100 U
ACROLEIN	110 UR	22 UR	23 UR	22 UR	22 UR	21 UR	21 UR
ACRYLONITRILE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
ALLYL CHLORIDE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
BENZENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
BROMODICHLOROMETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
BROMOFORM	28 U	6 U	6 U	6 U	5 U	5 U	5 U
BROMOMETHANE	56 U	11 U	11 U	11 U	11 U	10 U	10 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6SB0110101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6DUP002
FIELD DUPLICATE OF:	RN6SB0060101						RN6SB0110101

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
CARBON TETRACHLORIDE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
CHLOROBENZENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
CHLOROETHANE	56 U	11 U	11 U	11 U	11 U	10 U	10 U
CHLOROFORM	28 U	6 U	6 U	6 U	5 U	5 U	5 U
CHLOROMETHANE	56 U	11 U	11 U	11 U	11 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
DIBROMOMETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
DICHLORODIFLUOROMETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
ETHYLBENZENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
IODOMETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
ISOBUTYL ALCOHOL	280 U	55 U	57 U	55 U	54 U	52 U	52 U
M&P-XYLENES	28 U	6 U	6 U	6 U	5 U	5 U	5 U
METHACRYLONITRILE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
METHYL METHACRYLATE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
METHYLENE CHLORIDE	71.5	42	24	6 U	9 U	5 U	3 U
O-XYLENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
PENTACHLOROETHANE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
PROPIONITRILE	280 U	55 U	57 U	55 U	54 U	52 U	52 U
STYRENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
TETRACHLOROETHENE	28 U	6 U	1 J	6 U	5 U	5 U	5 U
TOLUENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6SB0110101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6DUP002
FIELD DUPLICATE OF:	RN6SB0060101						RN6SB0110101

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
TRICHLOROETHENE	28 U	6 U	6 U	6 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	28 U	6 U	1 J	2 J	5 U	5 U	5 U
VINYL ACETATE	56 U	11 U	11 U	11 U	11 U	10 U	10 U
VINYL CHLORIDE	28 U	6 U	6 U	6 U	5 U	5 U	5 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
1,2,4-TRICHLOROBENZENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
1,2-DICHLOROBENZENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
1,3,5-TRINITROBENZENE-OS	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
1,3-DICHLOROBENZENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
1,3-DINITROBENZENE-OS	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
1,4-DICHLOROBENZENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
1,4-DIOXANE-OS	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
1,4-NAPHTHOQUINONE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
1-NAPHTHYLAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2,3,4,6-TETRACHLOROPHENOL	1900 UJ	1800 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1700 UJ
2,4,5-TRICHLOROPHENOL	745 UJ	730 UJ	760 UJ	730 UJ	720 UJ	700 UJ	690 UJ
2,4,6-TRICHLOROPHENOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2,4-DICHLOROPHENOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2,4-DIMETHYLPHENOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2,4-DINITROPHENOL	1900 UJ	1800 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1700 UJ
2,4-DINITROTOLUENE-OS	74 J	140 J	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6SB0110101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6DUP002
FIELD DUPLICATE OF:	RN6SB0060101						RN6SB0110101

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2,6-DINITROTOLUENE-OS	370 UJ	290 J	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2-ACETYLAMINOFUORENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2-CHLORONAPHTHALENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2-CHLOROPHENOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2-METHYLNAPHTHALENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2-METHYLPHENOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2-NAPHTHYLAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2-NITROANILINE	1900 UJ	1800 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1700 UJ
2-NITROPHENOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
2-PICOLINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
3,3'-DICHLOROBENZIDINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
3,3'-DIMETHYLBENZIDINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
3-METHYLCHOLANTHRENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
3-NITROANILINE	1900 UJ	1800 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1700 UJ
4,6-DINITRO-2-METHYLPHENOL	1900 UJ	1800 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1700 UJ
4-AMINOBIPHENYL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
4-BROMOPHENYL PHENYL ETHER	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
4-CHLORO-3-METHYLPHENOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
4-CHLOROANILINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
4-CHLOROPHENYL PHENYL ETHER	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
4-NITROANILINE	1900 UJ	1800 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1700 UJ
4-NITROPHENOL	1900 UJ	1800 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1700 UJ
4-NITROQUINOLINE-1-OXIDE	370 UR	370 UR	380 UR	370 UR	360 UR	350 UR	350 UR

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6SB0110101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6DUP002
FIELD DUPLICATE OF:	RN6SB0060101						RN6SB0110101

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
A,A-DIMETHYLPHENETHYLAMINE	745 U	730 UJ	760 UJ	730 UJ	720 UJ	700 UJ	690 UJ
ACENAPHTHENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
ACENAPHTHYLENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
ACETOPHENONE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
ANILINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
ANTHRACENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
ARAMITE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BENZO(A)ANTHRACENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BENZO(A)PYRENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BENZO(B)FLUORANTHENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BENZO(G,H,I)PERYLENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BENZO(K)FLUORANTHENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BENZYL ALCOHOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BIS(2-CHLOROETHOXY)METHANE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BIS(2-CHLOROETHYL)ETHER	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	111.5	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
BUTYLBENZYL PHTHALATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
CHLOROBENZILATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
CHRYSENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
CIS-ISOSAFROLE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
DI-N-BUTYL PHTHALATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	56 J
DI-N-OCTYL PHTHALATE	116	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
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SAMPLE NUMBER:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6SB0110101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6DUP002
FIELD DUPLICATE OF:	RN6SB0060101						RN6SB0110101

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
DIBENZO(A,H)ANTHRACENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
DIBENZOFURAN	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
DIETHYL PHTHALATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
DIMETHYL PHTHALATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
DIPHENYLAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
ETHYL METHACRYLATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
ETHYL METHANESULFONATE	745 U	730 UJ	760 UJ	730 UJ	720 UJ	700 UJ	690 UJ
FAMPHUR	370 UR	370 UR	380 UR	370 UR	360 UR	350 UR	350 UR
FLUORANTHENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
FLUORENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
HEXACHLOROBENZENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
HEXACHLOROBUTADIENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
HEXACHLOROCYCLOPENTADIENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
HEXACHLOROETHANE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
HEXACHLOROPROPENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
INDENO(1,2,3-CD)PYRENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
ISODRIN	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
ISOPHORONE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
KEPONE	370 UR	370 UR	380 UR	370 UR	360 UR	350 UR	350 UR
METHAPYRILENE	370 UR	370 UR	380 UR	370 UR	360 UJ	350 UJ	350 UJ
METHYL METHANESULFONATE	745 U	730 UJ	760 UJ	730 UJ	720 UJ	700 UJ	690 UJ
N-NITROSO-DI-N-BUTYLAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
N-NITROSO-DI-N-PROPYLAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6SB0110101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6DUP002
FIELD DUPLICATE OF:	RN6SB0060101						RN6SB0110101

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
N-NITROSODIMETHYLAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
N-NITROSODIPHENYLAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
N-NITROSOMETHYLETHYLAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
N-NITROSOMORPHOLINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
N-NITROSOPIPERIDINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
N-NITROSOPYRROLIDINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
NAPHTHALENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
NITROBENZENE-OS	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
O-TOLUIDINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
P-DIMETHYLAMINOAZOBENZENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
P-PHENYLENEDIAMINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
PENTACHLOROBENZENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
PENTACHLORONITROBENZENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
PENTACHLOROPHENOL	1900 UJ	1800 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1700 UJ
PHENACETIN	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
PHENANTHRENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
PHENOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
PRONAMIDE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
PYRENE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
PYRIDINE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
SAFROLE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
TRANS-ISOSAFROLE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6SB0110101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6DUP002
FIELD DUPLICATE OF:	RN6SB0060101						RN6SB0110101

**HERBICIDES (µg/kg)**

DIMETHOATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
PHORATE	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ
SULFOTEP	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	40.2 U	40.2 U	40.2 U	40.2 U	40.2 U	40.2 U
1,3-DINITROBENZENE-EXP	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U	37.2 U
2,4,6-TRINITROTOLUENE	3490	6320	35.6 U	35.6 U	35.6 U	217	175
2,4-DINITROTOLUENE-EXP	549.5	5790	51.6 U				
2,6-DINITROTOLUENE-EXP	208.8 U	47.6 U					
2-AMINO-4,6-DINITROTOLUENE	11000	1170	46.7 U				
2-NITROTOLUENE	81.4 U	81.4 U	81.4 U	81.4 U	81.4 U	81.4 U	81.4 U
3-NITROTOLUENE	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U	81.8 U
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U	40.9 U	40.9 U	40.9 U	40.9 U	40.9 U
4-NITROTOLUENE	87.2 U	87.2 U	87.2 U	87.2 U	87.2 U	87.2 U	87.2 U
HMX	2965	740	70.5 U				
NITROBENZENE-EXP	202.6 U	35.2 U					
RDX	7995	5430	50.9 U				
TETRYL	163 U	163 U	163 U	163 U	163 U	163 U	163 U

**METALS (mg/kg)**

ANTIMONY	0.63 L	0.41 L	0.28 L	0.40 L	0.32 L	0.23 L	0.29 L
ARSENIC	2.9	3.2	2.4	4.2	2.9	1.3	0.98
BARIUM	32.8	24.3	29.6	37.7	46.5	21.7	16.4
BERYLLIUM	0.43	0.84	0.67	0.28	0.39	0.16 U	0.13 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6SB0110101-D
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97
LOCATION:	RN6SB0060101-AVG	RN6SB0070101	RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SB0110101	RN6DUP002
FIELD DUPLICATE OF:	RN6SB0060101						RN6SB0110101

<b>METALS (mg/kg)</b>							
CADMIUM	0.975	0.66 K	0.34 K	0.42 K	0.37 U	0.20 K	0.19 K
CHROMIUM	15.35	20.7	15.1	12.8	10.3	5.4	4.0
COBALT	4.85	2.8	3.2	4.4	8.0	7.6	4.4
COPPER	83.6	39.2	17.0	9.2	7.8 U	4.5 U	4.6 U
LEAD	52.9	19.5	38.1	6.2	5.5	3.1 K	2.8 K
MERCURY	0.455	0.02	0.09	0.03	0.03	0.01	0.01
NICKEL	9.9	5.1	6.9	5.4	8.4	4.0	3.5
SELENIUM	0.885	1.0	0.86	0.87	0.66	0.44 L	0.40 L
SILVER	0.38 U	0.07 U	0.07 U	0.06 U	0.05 U	0.06 U	0.06 U
THALLIUM	0.24	0.27 U	0.52 U	0.21 U	0.19 U	0.20 U	0.23 U
TIN	3.6 U	2.7 U	2.7 U	2.2 U	1.9 U	1.7 U	1.8 U
VANADIUM	21.85	23.4	28.1	24.9	18.8	9.2	6.8
ZINC	48.7	36.5	23.8	26.4	20.9	11.0	8.2

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	370 UJ	370 UJ	380 UJ	370 UJ	360 UJ	350 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97
LOCATION:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
FIELD DUPLICATE OF:	RN6SB0110101						

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,1,1-TRICHLOROETHANE	1 J	5 U	5 U	5 U	5 U	5 U	6 U
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,2,3-TRICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,2-DIBROMO-3-CHLOROPROPANE	100 U	100 U	100 U	100 U	100 U	100 U	120 U
1,2-DIBROMOETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
1,4-DICHLORO-2-BUTENE	100 U	100 U	100 U	100 U	100 U	100 U	120 U
2-BUTANONE	10 UR	10 UR	10 U	10 UR	10 UR	10 UR	12 UR
2-HEXANONE	10 U	10 U	10 U	10 U	10 U	10 U	12 U
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
ACETONE	82.5 U	55 U	66 U	49 U	56 U	10 U	2700 L
ACETONITRILE	100 U	100 U	100 U	100 U	100 U	100 UR	120 UR
ACROLEIN	21 UR	21 UR	21 UR	21 UR	21 UR	21 UR	24 UR
ACRYLONITRILE	5 U	5 U	5 U	5 U	5 U	5 UR	6 UR
ALLYL CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
BENZENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
BROMOFORM	5 U	5 U	5 U	5 U	5 U	5 U	6 U
BROMOMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	12 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97
LOCATION:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
FIELD DUPLICATE OF:	RN6SB0110101						

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
CHLOROETHANE	10 U	12 U					
CHLOROFORM	5 U	5 U	5 U	5 U	5 U	5 U	6 U
CHLOROMETHANE	10 U	12 U					
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
DIBROMOMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
DICHLORODIFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
ETHYLBENZENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
IODOMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
ISOBUTYL ALCOHOL	52 U	52 U	51 U	52 U	52 U	52 UR	60 UR
M&P-XYLENES	5 U	5 U	5 U	5 U	5 U	5 U	6 U
METHACRYLONITRILE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
METHYL METHACRYLATE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
METHYLENE CHLORIDE	3 U	5 U	7 U	5 U	3 U	6 U	19 U
O-XYLENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
PENTACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
PROPIONITRILE	52 U	52 U	51 U	52 U	52 U	52 UR	60 UR
STYRENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TOLUENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97
LOCATION:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
FIELD DUPLICATE OF:	RN6SB0110101						

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
TRICHLOROFUOROMETHANE	5 U	5 U	5 U	5 U	5 U	5 U	6 U
VINYL ACETATE	10 U	12 U					
VINYL CHLORIDE	5 U	5 U	5 U	5 U	5 U	5 U	6 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
1,2,4-TRICHLOROBENZENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
1,2-DICHLOROBENZENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
1,3,5-TRINITROBENZENE-OS	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
1,3-DICHLOROBENZENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
1,3-DINITROBENZENE-OS	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
1,4-DICHLOROBENZENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
1,4-DIOXANE-OS	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
1,4-NAPHTHOQUINONE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
1-NAPHTHYLAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2,3,4,6-TETRACHLOROPHENOL	1750 UJ	1700 UJ	2000 UJ				
2,4,5-TRICHLOROPHENOL	695 UJ	690 UJ	790 UJ				
2,4,6-TRICHLOROPHENOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2,4-DICHLOROPHENOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2,4-DIMETHYLPHENOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2,4-DINITROPHENOL	1750 UJ	1700 UJ	2000 UJ				
2,4-DINITROTOLUENE-OS	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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SAMPLE NUMBER:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97
LOCATION:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
FIELD DUPLICATE OF:	RN6SB0110101						

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2,6-DINITROTOLUENE-OS	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2-ACETYLAMINOFUORENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2-CHLORONAPHTHALENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2-CHLOROPHENOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2-METHYLNAPHTHALENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2-METHYLPHENOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2-NAPHTHYLAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2-NITROANILINE	1750 UJ	1700 UJ	2000 UJ				
2-NITROPHENOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
2-PICOLINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
3,3'-DICHLOROBENZIDINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
3,3'-DIMETHYLBENZIDINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
3-METHYLCHOLANTHRENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
3-NITROANILINE	1750 UJ	1700 UJ	2000 UJ				
4,6-DINITRO-2-METHYLPHENOL	1750 UJ	1700 UJ	2000 UJ				
4-AMINOBIPHENYL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
4-BROMOPHENYL PHENYL ETHER	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
4-CHLORO-3-METHYLPHENOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
4-CHLOROANILINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
4-CHLOROPHENYL PHENYL ETHER	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
4-NITROANILINE	1750 UJ	1700 UJ	2000 UJ				
4-NITROPHENOL	1750 UJ	1700 UJ	2000 UJ				
4-NITROQUINOLINE-1-OXIDE	350 UR	340 UR	340 UR	350 UR	340 UR	340 UR	400 UR

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97
LOCATION:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
FIELD DUPLICATE OF:	RN6SB0110101						

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
A,A-DIMETHYLPHENETHYLAMINE	695 UJ	690 UJ	790 UJ				
ACENAPHTHENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
ACENAPHTHYLENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
ACETOPHENONE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
ANILINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
ANTHRACENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
ARAMITE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
BENZO(A)ANTHRACENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
BENZO(A)PYRENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
BENZO(B)FLUORANTHENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
BENZO(G,H,I)PERYLENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
BENZO(K)FLUORANTHENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
BENZYL ALCOHOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
BIS(2-CHLOROETHOXY)METHANE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
BIS(2-CHLOROETHYL)ETHER	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	140 J	400 UJ
BUTYLBENZYL PHTHALATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
CHLOROBENZILATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
CHRYSENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
CIS-ISOSAFROLE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
DI-N-BUTYL PHTHALATE	56 J	38 J	41 J	100 J	48 J	370 J	400 UJ
DI-N-OCTYL PHTHALATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97
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FIELD DUPLICATE OF:	RN6SB0110101						

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
DIBENZO(A,H)ANTHRACENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
DIBENZOFURAN	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
DIETHYL PHTHALATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
DIMETHYL PHTHALATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
DIPHENYLAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
ETHYL METHACRYLATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
ETHYL METHANESULFONATE	695 UJ	690 UJ	790 UJ				
FAMPHUR	350 UR	340 UR	340 UR	350 UR	340 UR	340 UJ	400 UJ
FLUORANTHENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
FLUORENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
HEXACHLOROBENZENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
HEXACHLOROBUTADIENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
HEXACHLOROCYCLOPENTADIENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
HEXACHLOROETHANE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
HEXACHLOROPROPENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
INDENO(1,2,3-CD)PYRENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
ISODRIN	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
ISOPHORONE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
KEPONE	350 UR	340 UR	340 UR	350 UR	340 UR	340 UJ	400 UJ
METHAPYRILENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
METHYL METHANESULFONATE	695 UJ	690 UJ	790 UJ				
N-NITROSO-DI-N-BUTYLAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
N-NITROSO-DI-N-PROPYLAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
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SAMPLE NUMBER:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97
LOCATION:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
FIELD DUPLICATE OF:	RN6SB0110101						

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
N-NITROSODIMETHYLAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
N-NITROSODIPHENYLAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
N-NITROSOMETHYLETHYLAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
N-NITROSOMORPHOLINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
N-NITROSOPIPERIDINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
N-NITROSOPYRROLIDINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
NAPHTHALENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
NITROBENZENE-OS	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
O-TOLUIDINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
P-DIMETHYLAMINOAZOBENZENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
P-PHENYLENEDIAMINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
PENTACHLOROBENZENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
PENTACHLORONITROBENZENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
PENTACHLOROPHENOL	1750 UJ	1700 UJ	2000 UJ				
PHENACETIN	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
PHENANTHRENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
PHENOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
PRONAMIDE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
PYRENE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
PYRIDINE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
SAFROLE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
TRANS-ISOSAFROLE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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SAMPLE NUMBER:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97
LOCATION:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
FIELD DUPLICATE OF:	RN6SB0110101						

**HERBICIDES (µg/kg)**

DIMETHOATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
PHORATE	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ
SULFOTEP	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	350 UJ	40.2 U					
1,3-DINITROBENZENE-EXP	350 UJ	37.2 U					
2,4,6-TRINITROTOLUENE	196	35.6 U	35.6 U	35.6 U	142	35.6 U	35.6 U
2,4-DINITROTOLUENE-EXP	350 UJ	51.6 U					
2,6-DINITROTOLUENE-EXP	350 UJ	47.6 U					
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	350 UJ	35.2 U					
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.26 L	0.19 UL	0.39 L	0.35 L	0.28 L	0.32 L	0.64 L
ARSENIC	1.14	1.3	2.5	2.5	2.5	1.3	7.8
BARIUM	19.05	25.0	29.6	58.1	50.4	19.6	74.2
BERYLLIUM	0.145 U	0.17 U	0.27	0.26	0.29	0.17 U	0.47

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
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NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
SAMPLE DATE:	06/25/97	06/25/97	06/25/97	06/25/97	06/25/97	07/09/97	07/09/97
LOCATION:	RN6SB0110101-AVG	RN6SB0120101	RN6SB0130101	RN6SB0140101	RN6SB0150101	RN6SB0160101	RN6SB0160201
FIELD DUPLICATE OF:	RN6SB0110101						

<b>METALS (mg/kg)</b>							
CADMIUM	0.195 K	0.19 K	0.22 K	0.22 K	0.24 K	0.25 K	0.73 K
CHROMIUM	4.7	5.5	10.4	11.5	10.2	4.9	12.8
COBALT	6	4.3	7.5	7.7	7.3	5.5 J	6.1 J
COPPER	4.55 U	4.7 U	6.1	6.2	6.7	5.6	9.1
LEAD	2.95 K	3.5 K	5.1 K	6.7 K	6.0 K	3.5	8.4
MERCURY	0.01	0.02 U	0.02 U	0.02	0.02 U	0.01	0.03
NICKEL	3.75	3.9	7.5	4.8	6.8	3.7	8.6
SELENIUM	0.42 L	0.52 L	0.62 L	0.77 L	0.70 L	0.27	1.6
SILVER	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.07 U	0.07 U
THALLIUM	0.215 U	0.20 U	0.20 U	0.23 U	0.21 U	0.24 U	0.80 U
TIN	1.75 U	1.7 U	1.8 U	1.4 U	1.7 U	2.2 U	2.7 U
VANADIUM	8	9.5	17.4	18.2	17.6	8.5	25.7
ZINC	9.6	10.2	19.4	20.2	20.9	10.9	33.3

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	350 UJ	340 UJ	340 UJ	350 UJ	340 UJ	340 UJ	400 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6SB0170301-D	RN6SB0170301-AVG
SAMPLE DATE:	07/23/97	07/23/97	07/09/97	07/10/97	07/23/97	07/23/97	07/23/97
LOCATION:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6DUP012	RN6SB0170301
FIELD DUPLICATE OF:						RN6SB0170301	RN6SB0170301

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
1,1,1-TRICHLOROETHANE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
1,1,2-TRICHLOROETHANE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
1,2,3-TRICHLOROPROPANE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
1,2-DIBROMO-3-CHLOROPROPANE	110 U	100 UJ	120 U	120 U	100 U	100 UJ	100 U
1,2-DIBROMOETHANE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
1,2-DICHLOROETHANE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
1,4-DICHLORO-2-BUTENE	110 U	100 UJ	120 U	120 U	100 U	100 U	100 U
2-BUTANONE	11 UR	10 UR	12 UR	12 UR	10 UR	10 UR	10 UR
2-HEXANONE	11 U	10 UJ	12 U	12 U	10 U	10 UJ	10 U
4-METHYL-2-PENTANONE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
ACETONE	11 U	10 UJ	12 U	12 U	10 U	10 U	10 U
ACETONITRILE	110 UR	100 UR	120 UR	120 UR	100 UR	100 UR	100 UR
ACROLEIN	22 UR	21 UR	24 UR	25 UR	21 UR	21 UR	21 UR
ACRYLONITRILE	6 UR	5 UR	6 UR	6 UR	5 UR	5 UR	5 UR
ALLYL CHLORIDE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
BENZENE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
BROMODICHLOROMETHANE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
BROMOFORM	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
BROMOMETHANE	11 U	10 UJ	12 U	12 U	10 U	10 U	10 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6SB0170301-D	RN6SB0170301-AVG
SAMPLE DATE:	07/23/97	07/23/97	07/09/97	07/10/97	07/23/97	07/23/97	07/23/97
LOCATION:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6DUP012	RN6SB0170301
FIELD DUPLICATE OF:						RN6SB0170301	RN6SB0170301

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
CARBON TETRACHLORIDE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
CHLOROBENZENE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
CHLOROETHANE	11 U	10 UJ	12 U	12 U	10 U	10 U	10 U
CHLOROFORM	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
CHLOROMETHANE	11 U	10 UJ	12 U	12 U	10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
DIBROMOCHLOROMETHANE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
DIBROMOMETHANE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
DICHLORODIFLUOROMETHANE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
ETHYLBENZENE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
IODOMETHANE	6 UJ	5 UJ	6 U	6 U	5 UJ	5 UJ	5 U
ISOBUTYL ALCOHOL	55 UR	52 UR	60 UR	62 UR	52 UR	52 UR	52 UR
M&P-XYLENES	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
METHACRYLONITRILE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
METHYL METHACRYLATE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
METHYLENE CHLORIDE	5 U	5 UJ	23 U	24 U	5 B	5 B	5 B
O-XYLENE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
PENTACHLOROETHANE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
PROPIONITRILE	55 UR	52 UR	60 UR	62 UR	52 UR	52 UR	52 UR
STYRENE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
TETRACHLOROETHENE	6 U	5 UJ	6 U	6 U	5 U	5 UJ	5 U
TOLUENE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6SB0170301-D	RN6SB0170301-AVG
SAMPLE DATE:	07/23/97	07/23/97	07/09/97	07/10/97	07/23/97	07/23/97	07/23/97
LOCATION:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6DUP012	RN6SB0170301
FIELD DUPLICATE OF:						RN6SB0170301	RN6SB0170301

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
TRICHLOROETHENE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U
VINYL ACETATE	11 UR	10 UR	12 U	12 U	10 UR	10 UR	10 UR
VINYL CHLORIDE	6 U	5 UJ	6 U	6 U	5 U	5 U	5 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
1,2,4-TRICHLOROBENZENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
1,2-DICHLOROBENZENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
1,3,5-TRINITROBENZENE-OS	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
1,3-DICHLOROBENZENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
1,3-DINITROBENZENE-OS	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
1,4-DICHLOROBENZENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
1,4-DIOXANE-OS	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
1,4-NAPHTHOQUINONE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
1-NAPHTHYLAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2,3,4,6-TETRACHLOROPHENOL	1800 UJ	1700 UJ	2000 UJ	2100 UJ	1700 UJ	1700 UJ	1700 UJ
2,4,5-TRICHLOROPHENOL	730 UJ	690 UJ	790 UJ	820 UJ	690 UJ	690 UJ	690 UJ
2,4,6-TRICHLOROPHENOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2,4-DICHLOROPHENOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2,4-DIMETHYLPHENOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2,4-DINITROPHENOL	1800 UJ	1700 UJ	2000 UJ	2100 UJ	1700 UJ	1700 UJ	1700 UJ
2,4-DINITROTOLUENE-OS	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6SB0170301-D	RN6SB0170301-AVG
SAMPLE DATE:	07/23/97	07/23/97	07/09/97	07/10/97	07/23/97	07/23/97	07/23/97
LOCATION:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6DUP012	RN6SB0170301
FIELD DUPLICATE OF:						RN6SB0170301	RN6SB0170301

<b>SEMIVOLATILES (<math>\mu\text{g}/\text{kg}</math>)</b>							
2,6-DICHLOROPHENOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2,6-DINITROTOLUENE-OS	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2-ACETYLAMINOFLUORENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2-CHLORONAPHTHALENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2-CHLOROPHENOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2-METHYLNAPHTHALENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2-METHYLPHENOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2-NAPHTHYLAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2-NITROANILINE	1800 UJ	1700 UJ	2000 UJ	2100 UJ	1700 UJ	1700 UJ	1700 UJ
2-NITROPHENOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
2-PICOLINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
3,3'-DICHLOROBENZIDINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
3,3'-DIMETHYLBENZIDINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
3-METHYLCHOLANTHRENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
3-NITROANILINE	1800 UJ	1700 UJ	2000 UJ	2100 UJ	1700 UJ	1700 UJ	1700 UJ
4,6-DINITRO-2-METHYLPHENOL	1800 UJ	1700 UJ	2000 UJ	2100 UJ	1700 UJ	1700 UJ	1700 UJ
4-AMINOBIHENYL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
4-BROMOPHENYL PHENYL ETHER	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
4-CHLORO-3-METHYLPHENOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
4-CHLOROANILINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
4-CHLOROPHENYL PHENYL ETHER	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
4-NITROANILINE	1800 UJ	1700 UJ	2000 UJ	2100 UJ	1700 UJ	1700 UJ	1700 UJ
4-NITROPHENOL	1800 UJ	1700 UJ	2000 UJ	2100 UJ	1700 UJ	1700 UJ	1700 UJ
4-NITROQUINOLINE-1-OXIDE	370 UR	350 UR	400 UR	410 UR	350 UR	350 UR	350 UR

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6SB0170301-D	RN6SB0170301-AVG
SAMPLE DATE:	07/23/97	07/23/97	07/09/97	07/10/97	07/23/97	07/23/97	07/23/97
LOCATION:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6DUP012	RN6SB0170301
FIELD DUPLICATE OF:						RN6SB0170301	RN6SB0170301

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
A,A-DIMETHYLPHENETHYLAMINE	730 UJ	690 UJ	790 UJ	820 UJ	690 UJ	690 UJ	690 UJ
ACENAPHTHENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
ACENAPHTHYLENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
ACETOPHENONE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
ANILINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
ANTHRACENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
ARAMITE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
BENZO(A)ANTHRACENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
BENZO(A)PYRENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
BENZO(B)FLUORANTHENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
BENZO(G,H,I)PERYLENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
BENZO(K)FLUORANTHENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
BENZYL ALCOHOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
BIS(2-CHLOROETHOXY)METHANE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
BIS(2-CHLOROETHYL)ETHER	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	110 J	490 J	1100 J	160 J	350 UJ	350 UJ	350 UJ
BUTYLBENZYL PHTHALATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
CHLOROBENZILATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
CHRYSENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
CIS-ISOSAFROLE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
DI-N-BUTYL PHTHALATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
DI-N-OCTYL PHTHALATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6SB0170301-D	RN6SB0170301-AVG
SAMPLE DATE:	07/23/97	07/23/97	07/09/97	07/10/97	07/23/97	07/23/97	07/23/97
LOCATION:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6DUP012	RN6SB0170301
FIELD DUPLICATE OF:						RN6SB0170301	RN6SB0170301

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
DIBENZO(A,H)ANTHRACENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
DIBENZOFURAN	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
DIETHYL PHTHALATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
DIMETHYL PHTHALATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
DIPHENYLAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
ETHYL METHACRYLATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
ETHYL METHANESULFONATE	730 UJ	690 UJ	790 UJ	820 UJ	690 UJ	690 UJ	690 UJ
FAMPHUR	370 UR	350 UR	400 UJ	410 UJ	350 UR	350 UR	350 UR
FLUORANTHENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
FLUORENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
HEXACHLOROENZENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
HEXACHLOROBUTADIENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
HEXACHLOROCYCLOPENTADIENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
HEXACHLOROETHANE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
HEXACHLOROPROPENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
INDENO(1,2,3-CD)PYRENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
ISODRIN	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
ISOPHORONE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
KEPONE	370 UR	350 UR	400 UJ	410 UJ	350 UR	350 UR	350 UR
METHAPYRILENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
METHYL METHANESULFONATE	730 UJ	690 UJ	790 UJ	820 UJ	690 UJ	690 UJ	690 UJ
N-NITROSO-DI-N-BUTYLAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
N-NITROSO-DI-N-PROPYLAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6SB0170301-D	RN6SB0170301-AVG
SAMPLE DATE:	07/23/97	07/23/97	07/09/97	07/10/97	07/23/97	07/23/97	07/23/97
LOCATION:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6DUP012	RN6SB0170301
FIELD DUPLICATE OF:						RN6SB0170301	RN6SB0170301

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
N-NITROSODIMETHYLAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
N-NITROSODIPHENYLAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
N-NITROSOMETHYLETHYLAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
N-NITROSOMORPHOLINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
N-NITROSOPIPERIDINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
N-NITROSOPYRROLIDINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
NAPHTHALENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
NITROBENZENE-OS	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
O-TOLUIDINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
P-DIMETHYLAMINOAZOBENZENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
P-PHENYLENEDIAMINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
PENTACHLOROBENZENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
PENTACHLORONITROBENZENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
PENTACHLOROPHENOL	1800 UJ	1700 UJ	2000 UJ	2100 UJ	1700 UJ	1700 UJ	1700 UJ
PHENACETIN	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
PHENANTHRENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
PHENOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
PRONAMIDE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
PYRENE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
PYRIDINE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
SAFROLE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
TRANS-ISOSAFROLE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6SB0170301-D	RN6SB0170301-AVG
SAMPLE DATE:	07/23/97	07/23/97	07/09/97	07/10/97	07/23/97	07/23/97	07/23/97
LOCATION:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6DUP012	RN6SB0170301
FIELD DUPLICATE OF:						RN6SB0170301	RN6SB0170301

**HERBICIDES (µg/kg)**

DIMETHOATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
PHORATE	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
SULFOTEP	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U						
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE-EXP	47.6 U	47.6 UJ					
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.40 U	0.33 U	0.53 L	0.44 L	0.37 B	0.42 B	0.395 B
ARSENIC	1.8	2.0	4.3	4.4	2.1	2.0	2.05
BARIUM	16.4	19.1	27.4	56.6	14.2	20.7	17.45
BERYLLIUM	0.31 K	0.26 K	0.41	0.57	0.20 B	0.24 K	0.22 K

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6SB0170301-D	RN6SB0170301-AVG
SAMPLE DATE:	07/23/97	07/23/97	07/09/97	07/10/97	07/23/97	07/23/97	07/23/97
LOCATION:	RN6SB0160301	RN6SB0160401	RN6SB0170101	RN6SB0170201	RN6SB0170301	RN6DUP012	RN6SB0170301
FIELD DUPLICATE OF:						RN6SB0170301	RN6SB0170301

**METALS (mg/kg)**

CADMIUM	0.13 K	0.16 K	0.48 K	0.47 K	0.15 K	0.16 K	0.155 K
CHROMIUM	6.8	6.6	13.4	19.5	6.1	6.3	6.2
COBALT	4.5	5.5	10.8 J	3.5 J	5.6	7.8	6.7
COPPER	4.9	6.1	10.6	15.6	4.6	5.0	4.8
LEAD	3.2 K	3.9 K	6.6	11.2	3.8 K	4.1 K	3.95 K
MERCURY	0.02 U	0.01	0.02	0.05	0.01	0.02 U	0.01
NICKEL	4.3	5.6	8.1	10.5	5.2	5.4	5.3
SELENIUM	0.28 L	0.36 L	1.2	0.97	0.28 L	0.31 L	0.295 L
SILVER	0.08 U	0.06 U	0.07 U	0.08 U	0.08 B	0.07 B	0.075 B
THALLIUM	0.22 U	0.21 U	0.43 U	0.30 U	0.22 U	0.23 U	0.225 U
TIN	1.5 U	1.5 U	2.6 U	2.9 U	1.6 B	1.7 B	1.65 B
VANADIUM	10.8	10.6	23.0	31.1	9.4	10.5	9.95
ZINC	11.2	12.0	22.4	38.4	10.4	12.5	11.45

**MISCELLANEOUS PARAMETERS ()**

M & P-CRESOL	370 UJ	350 UJ	400 UJ	410 UJ	350 UJ	350 UJ	350 UJ
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**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
1,1,1-TRICHLOROETHANE	6 U	5 U	5 U	6 U	7 U	0.19 U	0.19 UJ
1,1,2,2-TETRACHLOROETHANE	6 U	5 U	5 U	6 U	7 U	0.60 U	0.58 UJ
1,1,2-TRICHLOROETHANE	6 U	5 U	5 U	6 U	7 U	0.51 U	0.49 UJ
1,1-DICHLOROETHANE	6 U	5 U	5 U	6 U	7 U	0.37 U	0.36 UJ
1,1-DICHLOROETHENE	6 U	5 U	5 U	6 U	7 U	0.32 U	0.31 UJ
1,2,3-TRICHLOROPROPANE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
1,2-DIBROMO-3-CHLOROPROPANE	120 U	100 U	100 U	120 U	130 U	113 U	109 UJ
1,2-DIBROMOETHANE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
1,2-DICHLOROETHANE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
1,2-DICHLOROPROPANE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
1,4-DICHLORO-2-BUTENE	120 U	100 U	100 U	120 U	130 U	113 UJ	109 UJ
1,4-DIOXANE-OV						170 UR	164 UR
2-BUTANONE	12 UR	10 UR	10 UR	12 UR	13 UR	4.3 UR	4.1 UR
2-HEXANONE	12 U	10 U	10 U	12 U	13 U	2.5 U	2.4 UJ
4-METHYL-2-PENTANONE	6 U	5 U	5 U	6 U	7 U	1.7 U	1.7 UJ
ACETONE	12 U	26 J	10 U	69 J	67 J	29.2 U	44.0 U
ACETONITRILE	120 UR	100 UR	100 UR	120 UR	130 UR	113 U	109 UJ
ACROLEIN	24 UR	21 UR	21 UR	23 UR	26 UR	13.1 U	12.6 UJ
ACRYLONITRILE	6 UR	5 UR	5 UR	6 UR	7 UR	5.7 U	5.5 UJ
ALLYL CHLORIDE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
BENZENE	6 U	5 U	5 U	6 U	7 U	0.28 U	0.27 UJ
BROMODICHLOROMETHANE	6 U	5 U	5 U	6 U	7 U	0.22 U	0.21 UJ
BROMOFORM	6 U	5 U	5 U	6 U	7 U	3.0 U	2.9 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

<b>VOLATILES (µg/kg)</b>							
BROMOMETHANE	12 U	10 U	10 U	12 U	13 U	0.22 U	0.21 UJ
CARBON DISULFIDE	6 U	5 U	5 U	6 U	8	1.3 U	1.3 UJ
CARBON TETRACHLORIDE	6 U	5 U	5 U	6 U	7 U	0.14 U	0.13 UJ
CHLOROBENZENE	6 U	5 U	5 U	6 U	7 U	0.41 U	0.39 UJ
CHLOROETHANE	12 U	10 U	10 U	12 U	13 U	0.47 U	0.45 UJ
CHLOROFORM	6 U	5 U	5 U	6 U	7 U	1.1 J	3.5 J
CHLOROMETHANE	12 U	10 U	10 U	12 U	13 U	0.56 U	0.54 UJ
CHLOROPRENE						5.7 UR	5.5 UR
CIS-1,3-DICHLOROPROPENE	6 U	5 U	5 U	6 U	7 U	0.31 U	0.30 UJ
DIBROMOCHLOROMETHANE	6 U	5 U	5 U	6 U	7 U	0.25 U	0.24 UJ
DIBROMOMETHANE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
DICHLORODIFLUOROMETHANE	6 U	5 U	5 U	6 U	7 U	0.24 U	0.23 UJ
ETHYLBENZENE	6 U	5 U	5 U	6 U	7 U	1.5 U	1.5 UJ
IODOMETHANE	6 UJ	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
ISOBUTYL ALCOHOL	60 UR	52 UR	52 UR	58 UR	66 UR	56.7 U	54.6 UJ
M&P-XYLENES	6 U	5 U	5 U	6 U	7 U		
METHACRYLONITRILE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
METHYL METHACRYLATE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
METHYLENE CHLORIDE	14 U	5 U	2 U	16 U	11 U	26.6 U	66.5 U
O-XYLENE	6 U	5 U	5 U	6 U	7 U		
PENTACHLOROETHANE	6 U	5 U	5 U	6 U	7 U	5.7 U	5.5 UJ
PROPIONITRILE	60 UR	52 UR	52 UR	58 UR	66 UR	56.7 U	54.6 UJ
STYRENE	6 U	5 U	5 U	6 U	7 U	0.34 U	0.33 UJ
TETRACHLOROETHENE	6 U	5 U	5 U	6 U	7 U	0.99 U	0.95 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

<b>VOLATILES (µg/kg)</b>							
TOLUENE	6 U	5 U	5 U	6 U	7 U	0.31 U	1.3 J
TRANS-1,2-DICHLOROETHENE	6 U	5 U	5 U	6 U	7 U	0.32 U	0.31 UJ
TRANS-1,3-DICHLOROPROPENE	6 U	5 U	5 U	6 U	7 U	0.56 U	0.54 UJ
TRICHLOROETHENE	6 U	5 U	5 U	6 U	7 U	0.30 U	0.28 UJ
TRICHLOROFLUOROMETHANE	6 U	5 U	5 U	6 U	7 U	0.33 U	0.32 UJ
VINYL ACETATE	12 UR	10 U	10 U	12 U	13 U	0.32 UJ	0.31 UJ
VINYL CHLORIDE	6 U	5 U	5 U	6 U	7 U	0.37 U	0.36 UJ
XYLENES, TOTAL						0.78 U	0.75 UJ

<b>SEMIVOLATILES (µg/kg)</b>							
1,2,4,5-TETRACHLOROBENZENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
1,2,4-TRICHLOROBENZENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	35.7 U	34.4 U
1,2-DICHLOROBENZENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ		
1,3-DINITROBENZENE						37.2 U	
1,3,5-TRINITROBENZENE						40.2 U	
1,3,5-TRINITROBENZENE-OS	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
1,3-DICHLOROBENZENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ		
1,3-DINITROBENZENE-OS	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
1,4-DICHLOROBENZENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ		
1,4-DIOXANE-OS	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ		
1,4-NAPHTHOQUINONE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
1-NAPHTHYLAMINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
2,3,4,6-TETRACHLOROPHENOL	2000 UJ	1700 UJ	1700 UJ	1900 UJ	2200 UJ	373 U	360 U
2,4,5-TRICHLOROPHENOL	800 UJ	690 UJ	690 UJ	780 UJ	880 UJ	52.4 U	50.5 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

<b>SEMIVOLATILES (µg/kg)</b>							
2,4,6-TRICHLOROPHENOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	72.3 U	69.7 U
2,4-DICHLOROPHENOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	51.9 U	50.0 U
2,4-DIMETHYLPHENOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	116 U	112 U
2,4-DINITROPHENOL	2000 UJ	1700 UJ	1700 UJ	1900 UJ	2200 UJ	183 U	177 U
2,4-DINITROTOLUENE-OS	400 UJ	350 UJ	350 UJ	840 J	440 UJ	25.4 U	24.5 U
2,6-DICHLOROPHENOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
2,6-DINITROTOLUENE-OS	400 UJ	350 UJ	350 UJ	63 J	440 UJ	16.0 U	15.4 U
2-ACETYLAMINOFUORENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
2-CHLORONAPHTHALENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	27.8 U	26.8 U
2-CHLOROPHENOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	66.4 U	64.1 U
2-METHYLNAPHTHALENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	45.0 U	43.4 U
2-METHYLPHENOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	54.8 U	52.8 U
2-NAPHTHYLAMINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
2-NITROANILINE	2000 UJ	1700 UJ	1700 UJ	1900 UJ	2200 UJ	57.8 U	55.7 U
2-NITROPHENOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	66.4 U	64.1 U
2-PICOLINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
3,3'-DICHLOROBENZIDINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	365 U	352 U
3,3'-DIMETHYLBENZIDINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
3-METHYLCHOLANTHRENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
3-METHYLPHENOL						373 U	360 U
3-NITROANILINE	2000 UJ	1700 UJ	1700 UJ	1900 UJ	2200 UJ	140 U	135 U
4,6-DINITRO-2-METHYLPHENOL	2000 UJ	1700 UJ	1700 UJ	1900 UJ	2200 UJ	64.3 U	62.0 U
4-AMINOBIHENYL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	746 U	719 U
4-BROMOPHENYL PHENYL ETHER	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	29.7 U	28.6 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

<b>SEMIVOLATILES (µg/kg)</b>							
4-CHLORO-3-METHYLPHENOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	59.2 U	57.1 U
4-CHLOROANILINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	84.3 U	81.3 U
4-CHLOROPHENYL PHENYL ETHER	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	22.4 U	21.6 U
4-METHYLPHENOL						43.0 U	41.5 U
4-NITROANILINE	2000 UJ	1700 UJ	1700 UJ	1900 UJ	2200 UJ	65.9 U	63.6 U
4-NITROPHENOL	2000 UJ	1700 UJ	1700 UJ	1900 UJ	2200 UJ	131 U	126 U
4-NITROQUINOLINE-1-OXIDE	400 UR	350 UR	350 UR	390 UR	440 UR	1490 UR	1440 UR
5-NITRO-O-TOLUIDINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
A,A-DIMETHYLPHENETHYLAMINE	800 UJ	690 UJ	690 UJ	780 UJ	880 UJ	373 U	360 U
ACENAPHTHENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	38.7 U	37.3 U
ACENAPHTHYLENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	38.3 U	36.9 U
ACETOPHENONE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
ANILINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
ANTHRACENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	26.2 U	25.3 U
ARAMITE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	746 U	719 U
BENZO(A)ANTHRACENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	13.6 U	13.1 U
BENZO(A)PYRENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	16.9 U	16.3 U
BENZO(B)FLUORANTHENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	50.3 U	48.6 U
BENZO(G,H,I)PERYLENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	51.8 U	50.0 U
BENZO(K)FLUORANTHENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	41.6 U	40.1 U
BENZYL ALCOHOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	50.8 U	49.0 U
BIS(2-CHLOROETHOXY)METHANE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	52.9 U	51.0 U
BIS(2-CHLOROETHYL)ETHER	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	80.0 U	77.2 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

<b>SEMIVOLATILES (µg/kg)</b>							
BIS(2-ETHYLHEXYL)PHTHALATE	210 J	350 UJ	350 UJ	130 J	440 UJ	72.9 U	41.5 U
BUTYLBENZYL PHTHALATE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	105 U	102 U
CHLOROBENZILATE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
CHRYSENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	21.0 U	20.3 U
CIS-ISOSAFROLE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ		
DI-N-BUTYL PHTHALATE	400 UJ	350 UJ	350 UJ	1500 J	440 UJ	69.2 U	59.6 U
DI-N-OCTYL PHTHALATE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	53.5 U	51.6 U
DIALATE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 UR	360 UR
DIBENZO(A,H)ANTHRACENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	42.8 U	41.3 U
DIBENZOFURAN	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	28.7 U	27.7 U
DIETHYL PHTHALATE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	40.6 U	39.2 U
DIMETHYL PHTHALATE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	18.8 U	18.2 U
DIPHENYLAMINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
ETHYL METHACRYLATE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
ETHYL METHANESULFONATE	800 UJ	690 UJ	690 UJ	780 UJ	880 UJ		
FAMPHUR	400 UR	350 UJ	350 UJ	390 UJ	440 UJ	746 UJ	719 UJ
FLUORANTHENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	50.7 U	48.9 U
FLUORENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	27.1 U	26.1 U
HEXACHLOROBENZENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	22.2 U	21.4 U
HEXACHLOROBUTADIENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	41.0 U	39.6 U
HEXACHLOROCYCLOPENTADIENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	68.5 U	66.1 U
HEXACHLOROETHANE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	24.3 U	23.4 U
HEXACHLOROPHENE						1860 UR	1800 UR
HEXACHLOROPROPENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

**SEMIVOLATILES (µg/kg)**

INDENO(1,2,3-CD)PYRENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	46.4 U	44.7 U
ISODRIN	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	746 U	719 U
ISOPHORONE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	54.4 U	52.4 U
ISOSAFROLE						373 U	360 U
KEPONE	400 UR	350 UJ	350 UJ	390 UJ	440 UJ	746 UR	719 UR
METHAPYRILENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	3730 U	3600 U
METHYL METHANESULFONATE	800 UJ	690 UJ	690 UJ	780 UJ	880 UJ	559 U	540 U
N-NITROSO-DI-N-BUTYLAMINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	64.2 U	61.9 U
N-NITROSODIETHYLAMINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	746 U	719 U
N-NITROSODIMETHYLAMINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	56.2 U	54.2 U
N-NITROSODIPHENYLAMINE	400 UJ	350 UJ	350 UJ	110 J	440 UJ	37.6 U	36.3 U
N-NITROSOMETHYLETHYLAMINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
N-NITROSOMORPHOLINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
N-NITROSOPIPERIDINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	746 U	719 U
N-NITROSOPYRROLIDINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
NAPHTHALENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	34.5 U	33.2 U
NITROBENZENE-OS	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	50.8 U	49.0 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
O,O-DIETHYL-O-2-PYRAZINYLPHOSPH						373 U	360 U
O-TOLUIDINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
P-DIMETHYLAMINOAZOBENZENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
P-PHENYLENEDIAMINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
PENTACHLOROBENZENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

**SEMIVOLATILES (µg/kg)**

PENTACHLORONITROBENZENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
PENTACHLOROPHENOL	2000 UJ	1700 UJ	1700 UJ	1900 UJ	2200 UJ	119 U	114 U
PHENACETIN	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	746 U	719 U
PHENANTHRENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	42.1 U	40.6 U
PHENOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	155 U	149 U
PRONAMIDE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
PYRENE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	93.0 U	89.8 U
PYRIDINE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
SAFROLE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
TRANS-ISOSAFROLE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ		

**HERBICIDES (µg/kg)**

DIMETHOATE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	746 U	719 U
PHORATE	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ	373 U	360 U
SULFOTEP	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ		

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4-DINITROTOLUENE						51.6 U	
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	35.6 U	191	35.6 U	1430	
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE						47.6 U	
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	46.7 U	186	46.7 U	560 J	
2-NITROTOLUENE	81.4 U						

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

**ENERGETICS (µg/kg)**

3-NITROTOLUENE	81.8 U	81.7 U					
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.8 U					
4-NITROTOLUENE	87.2 U						
HMX	70.5 U	511					
NITRO-BENZENE						35.2 U	
NITROBENZENE-EXP	35.2 U						
NITROCELLULOSE						7.3 U	
NITROGLYCERIN						10000 U	
NITROGUANIDINE						63.0 U	
PETN						250 U	
RDX	50.9 U	50.9 U	50.9 U	162	50.9 U	3350	
TETRYL	163 U						

**METALS (mg/kg)**

ALUMINUM						6130	
ANTIMONY	0.58 U	0.20 L	0.22 UR	0.29 L	0.40 L	0.59 L	
ARSENIC	2.6	3.2	1.6	3.0	2.8	3.8	
BARIUM	45.9	6.8	6.6	30.8	17.5	30.3	
BERYLLIUM	0.39 K	0.15 U	0.63	0.55	0.32	0.29	
CADMIUM	0.14 U	0.17 K	0.85 K	0.38 K	0.28 K	1.1	
CALCIUM						126 K	
CHROMIUM	15.6	12.4	5.7	14.5	8.9	14.7	
COBALT	4.6	3.4 J	0.89 J	2.9 J	5.0 J	5.4	
COPPER	9.1	3.4 U	3.0 U	21.5	7.5	37.9	
CYANIDE						1.1 U	

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S5-MW01-02	S5-MW01-02-D
SAMPLE DATE:	07/23/97	07/10/97	07/10/97	07/10/97	07/10/97	09/20/95	09/20/95
LOCATION:	RN6SB0170401	RN6SB0180101	RN6SB0180201	RN6SB0190101	RN6SB0190201	S05-MW01-02	FD04
FIELD DUPLICATE OF:							S5-MW01-02

**METALS (mg/kg)**

IRON						12900 J	
LEAD	8.9 K	2.3	1.7	42.6	5.4	38.9 L	
MAGNESIUM						377	
MANGANESE						97.4	
MERCURY	0.06	0.02	0.01 U	0.79	0.04	0.14 L	
NICKEL	8.5	1.6	1.2	6.4	5.1	8.2	
POTASSIUM						307	
SELENIUM	0.72 L	0.44	0.58	1.1	0.50	0.17 K	
SILVER	0.08 U	0.05 U	0.57 U	0.06 U	0.12 U	0.22	
SODIUM						28.0 U	
THALLIUM	0.26 U	0.26 U	0.24 U	0.73 U	0.32 U	0.28 U	
TIN	2.1 U	1.8 U	2.6 U	3.3 U	2.8 U	4.5 UJ	
VANADIUM	20.2	7.5	3.7	25.1	13.8	17.7	
ZINC	30.7	8.3	7.1	22.0	14.0	32.7	

**MISCELLANEOUS PARAMETERS (mg/kg)**

AMMONIA						23.1 L	
M & P-CRESOL	400 UJ	350 UJ	350 UJ	390 UJ	440 UJ		
NITRATE/NITRITE						3.0	
TOTAL ORGANIC CARBON						2540	

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	5.6 U						
1,1,1-TRICHLOROETHANE	0.19 U						
1,1,2,2-TETRACHLOROETHANE	0.59 U						
1,1,2-TRICHLOROETHANE	0.5 U						
1,1-DICHLOROETHANE	0.365 U						
1,1-DICHLOROETHENE	0.315 U						
1,2,3-TRICHLOROPROPANE	5.6 U						
1,2-DIBROMO-3-CHLOROPROPANE	111 U						
1,2-DIBROMOETHANE	5.6 U						
1,2-DICHLOROETHANE	5.6 U						
1,2-DICHLOROPROPANE	5.6 U						
1,4-DICHLORO-2-BUTENE	111 UJ						
1,4-DIOXANE-OV	167 UR						
2-BUTANONE	4.2 UR						
2-HEXANONE	2.45 U						
4-METHYL-2-PENTANONE	1.7 U						
ACETONE	36.6 U						
ACETONITRILE	111 U						
ACROLEIN	12.85 U						
ACRYLONITRILE	5.6 U						
ALLYL CHLORIDE	5.6 U						
BENZENE	0.275 U						
BROMODICHLOROMETHANE	0.215 U						
BROMOFORM	2.95 U						

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						

**VOLATILES (µg/kg)**

BROMOMETHANE	0.215 U						
CARBON DISULFIDE	1.3 U						
CARBON TETRACHLORIDE	0.135 U						
CHLOROBENZENE	0.4 U						
CHLOROETHANE	0.46 U						
CHLOROFORM	2.3 J						
CHLOROMETHANE	0.55 U						
CHLOROPRENE	5.6 UR						
CIS-1,3-DICHLOROPROPENE	0.305 U						
DIBROMOCHLOROMETHANE	0.245 U						
DIBROMOMETHANE	5.6 U						
DICHLORODIFLUOROMETHANE	0.235 U						
ETHYLBENZENE	1.5 U						
IODOMETHANE	5.6 U						
ISOBUTYL ALCOHOL	55.65 U						
METHACRYLONITRILE	5.6 U						
METHYL METHACRYLATE	5.6 U						
METHYLENE CHLORIDE	46.55 U						
PENTACHLOROETHANE	5.6 U						
PROPIONITRILE	55.65 U						
STYRENE	0.335 U						
TETRACHLOROETHENE	0.97 U						
TOLUENE	0.805 U						
TRANS-1,2-DICHLOROETHENE	0.315 U						

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	0.55 U						
TRICHLOROETHENE	0.29 U						
TRICHLOROFLUOROMETHANE	0.325 U						
VINYL ACETATE	0.315 UJ						
VINYL CHLORIDE	0.365 U						
XYLENES, TOTAL	0.765 U						

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	366.5 U						
1,2,4-TRICHLOROBENZENE	35.05 U						
1,3-DINITROBENZENE	37.2 U						
1,3,5-TRINITROBENZENE	40.2 U						
1,3,5-TRINITROBENZENE-OS	366.5 U						
1,3-DINITROBENZENE-OS	366.5 U						
1,4-NAPHTHOQUINONE	366.5 U						
1-NAPHTHYLAMINE	366.5 U						
2,2'-OXYBIS(1-CHLOROPROPANE)	366.5 U						
2,3,4,6-TETRACHLOROPHENOL	366.5 U						
2,4,5-TRICHLOROPHENOL	51.45 U						
2,4,6-TRICHLOROPHENOL	71 U						
2,4-DICHLOROPHENOL	50.95 U						
2,4-DIMETHYLPHENOL	114 U						
2,4-DINITROPHENOL	180 U						
2,4-DINITROTOLUENE-OS	24.95 U						
2,6-DICHLOROPHENOL	366.5 U						

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DINITROTOLUENE-OS	15.7 U						
2-ACETYLAMINOFUORENE	366.5 U						
2-CHLORONAPHTHALENE	27.3 U						
2-CHLOROPHENOL	65.25 U						
2-METHYLNAPHTHALENE	44.2 U						
2-METHYLPHENOL	53.8 U						
2-NAPHTHYLAMINE	366.5 U						
2-NITROANILINE	56.75 U						
2-NITROPHENOL	65.25 U						
2-PICOLINE	366.5 U						
3,3'-DICHLOROBENZIDINE	358.5 U						
3,3'-DIMETHYLBENZIDINE	366.5 U						
3-METHYLCHOLANTHRENE	366.5 U						
3-METHYLPHENOL	366.5 U						
3-NITROANILINE	137.5 U						
4,6-DINITRO-2-METHYLPHENOL	63.15 U						
4-AMINOBIHENYL	732.5 U						
4-BROMOPHENYL PHENYL ETHER	29.15 U						
4-CHLORO-3-METHYLPHENOL	58.15 U						
4-CHLOROANILINE	82.8 U						
4-CHLOROPHENYL PHENYL ETHER	22 U						
4-METHYLPHENOL	42.25 U						
4-NITROANILINE	64.75 U						
4-NITROPHENOL	128.5 U						

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						

<b>SEMIVOLATILES (µg/kg)</b>							
4-NITROQUINOLINE-1-OXIDE	1465 UR						
5-NITRO-O-TOLUIDINE	366.5 U						
7,12-DIMETHYLBENZ(A)ANTHRACENE	366.5 U						
A,A-DIMETHYLPHENETHYLAMINE	366.5 U						
ACENAPHTHENE	38 U						
ACENAPHTHYLENE	37.6 U						
ACETOPHENONE	366.5 U						
ANILINE	366.5 U						
ANTHRACENE	25.75 U						
ARAMITE	732.5 U						
BENZO(A)ANTHRACENE	13.35 U						
BENZO(A)PYRENE	16.6 U						
BENZO(B)FLUORANTHENE	49.45 U						
BENZO(G,H,I)PERYLENE	50.9 U						
BENZO(K)FLUORANTHENE	40.85 U						
BENZYL ALCOHOL	49.9 U						
BIS(2-CHLOROETHOXY)METHANE	51.95 U						
BIS(2-CHLOROETHYL)ETHER	78.6 U						
BIS(2-ETHYLHEXYL)PHTHALATE	57.2 U						
BUTYLBENZYL PHTHALATE	103.5 U						
CHLOROBENZILATE	366.5 U						
CHRYSENE	20.65 U						
DI-N-BUTYL PHTHALATE	64.4 U						
DI-N-OCTYL PHTHALATE	52.55 U						

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	366.5 UR						
DIBENZO(A,H)ANTHRACENE	42.05 U						
DIBENZOFURAN	28.2 U						
DIETHYL PHTHALATE	39.9 U						
DIMETHYL PHTHALATE	18.5 U						
DIPHENYLAMINE	366.5 U						
ETHYL METHACRYLATE	366.5 U						
FAMPHUR	732.5 UJ						
FLUORANTHENE	49.8 U						
FLUORENE	26.6 U						
HEXACHLOROBENZENE	21.8 U						
HEXACHLOROBUTADIENE	40.3 U						
HEXACHLOROCYCLOPENTADIENE	67.3 U						
HEXACHLOROETHANE	23.85 U						
HEXACHLOROPHENE	1830 UR						
HEXACHLOROPROPENE	366.5 U						
INDENO(1,2,3-CD)PYRENE	45.55 U						
ISODRIN	732.5 U						
ISOPHORONE	53.4 U						
ISOSAFROLE	366.5 U						
KEPONE	732.5 UR						
METHAPYRILENE	366.5 U						
METHYL METHANESULFONATE	549.5 U						
N-NITROSO-DI-N-BUTYLAMINE	366.5 U						

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSO-DI-N-PROPYLAMINE	63.05 U						
N-NITROSODIETHYLAMINE	732.5 U						
N-NITROSODIMETHYLAMINE	55.2 U						
N-NITROSODIPHENYLAMINE	36.95 U						
N-NITROSOMETHYLETHYLAMINE	366.5 U						
N-NITROSOMORPHOLINE	366.5 U						
N-NITROSOPIPERIDINE	732.5 U						
N-NITROSOPYRROLIDINE	366.5 U						
NAPHTHALENE	33.85 U						
NITROBENZENE-OS	49.9 U						
O,O,O-TRIETHYLPHOSPHOROTHIOAT	366.5 U						
O,O-DIETHYL-O-2-PYRAZINYLPHOSPH	366.5 U						
O-TOLUIDINE	366.5 U						
P-DIMETHYLAMINOAZOBENZENE	366.5 U						
P-PHENYLENEDIAMINE	366.5 U						
PENTACHLOROBENZENE	366.5 U						
PENTACHLORONITROBENZENE	366.5 U						
PENTACHLOROPHENOL	116.5 U						
PHENACETIN	732.5 U						
PHENANTHRENE	41.35 U						
PHENOL	152 U						
PRONAMIDE	366.5 U						
PYRENE	91.4 U						
PYRIDINE	366.5 U						

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						

**SEMIVOLATILES (µg/kg)**

SAFROLE	366.5 U						
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**HERBICIDES (µg/kg)**

DIMETHOATE	732.5 U						
PHORATE	366.5 U						

**ENERGETICS (µg/kg)**

2,4-DINITROTOLUENE	51.6 U						
2,4,6-TRINITROTOLUENE	1430						
2,6-DINITROTOLUENE	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	560 J						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.7 U						
4-AMINO-2,6-DINITROTOLUENE	40.8 U						
4-NITROTOLUENE	87.2 U						
HMX	511						
NITRO-BENZENE	35.2 U						
NITROCELLULOSE	7.3 U						
NITROGLYCERIN	10000 U						
NITROGUANIDINE	63 U						
PETN	250 U						
RDX	3350						
TETRYL	163 U						

**METALS (mg/kg)**

ALUMINUM	6130						
ANTIMONY	0.59 L						

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						

<b>METALS (mg/kg)</b>							
ARSENIC	3.8						
BARIUM	30.3						
BERYLLIUM	0.29						
CADMIUM	1.1						
CALCIUM	126 K						
CHROMIUM	14.7						
COBALT	5.4						
COPPER	37.9						
CYANIDE	1.1 U						
IRON	12900 J						
LEAD	38.9 L						
MAGNESIUM	377						
MANGANESE	97.4						
MERCURY	0.14 L						
NICKEL	8.2						
POTASSIUM	307						
SELENIUM	0.17 K						
SILVER	0.22						
SODIUM	28 U						
THALLIUM	0.28 U						
TIN	4.5 UJ						
VANADIUM	17.7						
ZINC	32.7						

**MISCELLANEOUS PARAMETERS (mg/kg)**

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 5 - RANGE 6  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	S5-MW01-02-AVG						
SAMPLE DATE:	09/20/95	//	//	//	//	//	//
LOCATION:	S5-MW01-02-AVG						
FIELD DUPLICATE OF:	S5-MW01-02						
<b>MISCELLANEOUS PARAMETERS (mg/kg)</b>							
AMMONIA	23.1 L						
NITRATE/NITRITE	3						
TOTAL ORGANIC CARBON	2540						

**SWMU 2/3 RANGE 3/CHICAMUXEN CREEK'S EDGE DUMP SITE A**

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/08/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,1,1-TRICHLOROETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,1,2,2-TETRACHLOROETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,1,2-TRICHLOROETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,1-DICHLOROETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,1-DICHLOROETHENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,2,3-TRICHLOROPROPANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,2-DIBROMO-3-CHLOROPROPANE	110 UJ	110 UJ	110 UJ	110 UJ	120 U	120 U	110 UJ
1,2-DIBROMOETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,2-DICHLOROETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,2-DICHLOROPROPANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
1,4-DICHLORO-2-BUTENE	110 UJ	110 UJ	110 UJ	110 UJ	120 U	120 U	110 UJ
2-BUTANONE	11 UR	11 UR	11 UR	11 UR	12 UR	12 UR	11 UR
2-HEXANONE	11 UJ	11 UJ	11 UJ	11 UJ	12 U	12 U	11 UJ
4-METHYL-2-PENTANONE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
ACETONE	2300 J	1700 J	11 B	96 J	45 B	12 U	490 J
ACETONITRILE	110 UJ	110 UJ	110 UJ	110 UJ	120 UR	120 UR	110 UR
ACROLEIN	22 UR	22 UR	22 UR	22 UR	24 UR	24 UR	22 UR
ACRYLONITRILE	6 UJ	6 UJ	5 UJ	5 UJ	6 UR	6 UR	5 UR
ALLYL CHLORIDE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
BENZENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
BROMODICHLOROMETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
BROMOFORM	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
BROMOMETHANE	11 UJ	11 UJ	11 UJ	11 UJ	12 U	12 U	11 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/08/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
CARBON TETRACHLORIDE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
CHLOROBENZENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
CHLOROETHANE	11 UJ	11 UJ	11 UJ	11 UJ	12 U	12 U	11 UJ
CHLOROFORM	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
CHLOROMETHANE	11 UJ	11 UJ	11 UJ	11 UJ	12 U	12 U	11 UJ
CIS-1,3-DICHLOROPROPENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
DIBROMOCHLOROMETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
DIBROMOMETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
DICHLORODIFLUOROMETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
ETHYLBENZENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
IODOMETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
ISOBUTYL ALCOHOL	56 UJ	55 UJ	54 UJ	54 UJ	60 UR	60 UR	54 UR
M&P-XYLENES	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
METHACRYLONITRILE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
METHYL METHACRYLATE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
METHYLENE CHLORIDE	700 J	7 B	10 B	12 B	5 B	8 B	9 B
O-XYLENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
PENTACHLOROETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
PROPIONITRILE	52 UJ	55 UJ	54 UJ	54 UJ	60 UR	60 UR	54 UR
STYRENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
TETRACHLOROETHENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
TOLUENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
TRANS-1,2-DICHLOROETHENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/08/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
TRICHLOROETHENE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
TRICHLOROFLUOROMETHANE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ
VINYL ACETATE	11 UJ	11 UJ	11 UJ	11 UJ	12 U	12 U	11 UJ
VINYL CHLORIDE	6 UJ	6 UJ	5 UJ	5 UJ	6 U	6 U	5 UJ

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
1,2,4-TRICHLOROBENZENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
1,2-DICHLOROBENZENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
1,3,5-TRINITROBENZENE-OS	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
1,3-DICHLOROBENZENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
1,3-DINITROBENZENE-OS	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
1,4-DICHLOROBENZENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
1,4-DIOXANE-OS	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
1,4-NAPHTHOQUINONE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
1-NAPHTHYLAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2,3,4,6-TETRACHLOROPHENOL	1900 U	1800 UJ	1800 U	1800 U	2000 U	2000 U	1800 U
2,4,5-TRICHLOROPHENOL	750 U	730 UJ	720 U	720 U	800 U	790 U	720 U
2,4,6-TRICHLOROPHENOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2,4-DICHLOROPHENOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2,4-DIMETHYLPHENOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2,4-DINITROPHENOL	1900 U	1800 UJ	1800 U	1800 U	2000 U	2000 U	1800 U
2,4-DINITROTOLUENE-OS	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/08/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2,6-DINITROTOLUENE-OS	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2-ACETYLAMINOFLUORENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2-CHLORONAPHTHALENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2-CHLOROPHENOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2-METHYLNAPHTHALENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2-METHYLPHENOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2-NAPHTHYLAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2-NITROANILINE	1900 U	1800 UJ	1800 U	1800 U	2000 U	2000 U	1800 U
2-NITROPHENOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
2-PICOLINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
3,3'-DICHLOROBENZIDINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
3,3'-DIMETHYLBENZIDINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
3-METHYLCHOLANTHRENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
3-NITROANILINE	1900 U	1800 UJ	1800 U	1800 U	2000 U	2000 U	1800 U
4,6-DINITRO-2-METHYLPHENOL	1900 U	1800 UJ	1800 U	1800 U	2000 U	2000 U	1800 U
4-AMINOBIIPHENYL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
4-BROMOPHENYL PHENYL ETHER	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
4-CHLORO-3-METHYLPHENOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
4-CHLOROANILINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
4-CHLOROPHENYL PHENYL ETHER	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
4-NITROANILINE	1900 U	1800 UJ	1800 U	1800 U	2000 U	2000 U	1800 U
4-NITROPHENOL	1900 U	1800 UJ	1800 U	1800 U	2000 U	2000 U	1800 U
4-NITROQUINOLINE-1-OXIDE	370 UR	370 UR	360 UR	360 UR	400 UR	400 UR	360 UR

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/08/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
A,A-DIMETHYLPHENETHYLAMINE	750 UJ	730 UJ	720 UJ	720 UJ	800 UJ	790 UJ	720 UJ
ACENAPHTHENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
ACENAPHTHYLENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
ACETOPHENONE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
ANILINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
ANTHRACENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
ARAMITE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
BENZO(A)ANTHRACENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
BENZO(A)PYRENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
BENZO(B)FLUORANTHENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
BENZO(G,H,I)PERYLENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
BENZO(K)FLUORANTHENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
BENZYL ALCOHOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
BIS(2-CHLOROETHOXY)METHANE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
BIS(2-CHLOROETHYL)ETHER	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	590	270 K	780	86 J	400 U	400 U	360 U
BUTYLBENZYL PHTHALATE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
CHLOROBENZILATE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
CHRYSENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
CIS-ISOSAFROLE	370 UJ	370 UJ	360 U	360 UJ	400 U	400 U	360 U
DI-N-BUTYL PHTHALATE	370 U	68 K	360 U	37 J	400 U	400 U	96 J
DI-N-OCTYL PHTHALATE	370 U	290 K	360 U	360 U	400 U	400 U	360 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/08/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALATE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
DIBENZO(A,H)ANTHRACENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
DIBENZOFURAN	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
DIETHYL PHTHALATE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
DIMETHYL PHTHALATE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
DIPHENYLAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
ETHYL METHACRYLATE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
ETHYL METHANESULFONATE	750 U	730 UJ	720 U	720 U	800 U	790 U	720 U
FAMPHUR	370 UJ	370 UR	360 UJ	360 UJ	400 UJ	400 UJ	360 U
FLUORANTHENE	59 J	370 UJ	360 U	360 U	400 U	400 U	360 U
FLUORENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
HEXACHLOROBENZENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
HEXACHLOROBUTADIENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
HEXACHLOROCYCLOPENTADIENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
HEXACHLOROETHANE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
HEXACHLOROPROPENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
INDENO(1,2,3-CD)PYRENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
ISODRIN	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
ISOPHORONE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
KEPONE	370 UR	370 UR	360 UR	360 UR	400 UR	400 UR	360 UR
METHAPYRILENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
METHYL METHANESULFONATE	750 U	730 UJ	720 U	720 U	800 U	790 U	720 U
N-NITROSO-DI-N-BUTYLAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/08/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
N-NITROSODIMETHYLAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
N-NITROSODIPHENYLAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
N-NITROSOMETHYLETHYLAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
N-NITROSOMORPHOLINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
N-NITROSOPIPERIDINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
N-NITROSOPYRROLIDINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
NAPHTHALENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
NITROBENZENE-OS	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
O-TOLUIDINE	370 UJ	370 UJ	360 UJ	360 UJ	400 UJ	400 UJ	360 U
P-DIMETHYLAMINOAZOBENZENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
P-PHENYLENEDIAMINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
PENTACHLOROBENZENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
PENTACHLORONITROBENZENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
PENTACHLOROPHENOL	1900 U	1800 UJ	1800 U	1800 U	2000 U	2000 U	1800 U
PHENACETIN	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
PHENANTHRENE	53 J	370 UJ	360 U	360 U	400 U	400 U	360 U
PHENOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
PRONAMIDE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
PYRENE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
PYRIDINE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
SAFROLE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
TRANS-ISOSAFROLE	370 UJ	370 UJ	360 U	360 U	400 U	400 U	360 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/08/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	370 U	370 UJ	360 U	360 U	400 UJ	400 UJ	360 U
PHORATE	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
SULFOTEP	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	40.2 U	40.2 U	40.2 U	420	40.2 U	40.2 U
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	35.6 U	121	6570	35.6 U	35.6 U
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	46.7 U	211	525	46.7 U	46.7 U
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U	70.5 U	70.5 U	355	70.5 U	70.5 U	70.5 U
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.51 L	0.45 L	0.42 L	0.55 L	0.61 B	0.36 B	0.35 B
ARSENIC	6.7	5.8	4.7	4.4	3.5	3.6	2.9
BARIUM	65.9	35.4	30.7	28.3	94.1	31.8	24.5
BERYLLIUM	0.53	0.21	0.15	0.15	0.72	0.37	0.23

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
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SAMPLE NUMBER:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/08/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SS0010101	RN3SS0020101	RN3SS0030101	RN3SS0040101	RN3SS0050101	RN3SS0060101	RN3SS0070101
FIELD DUPLICATE OF:							

**METALS (mg/kg)**

CADMIUM	0.95 K	0.68 K	0.65 K	0.94	0.50 K	0.52 K	0.14 K
CHROMIUM	21.1	23.9	20.2	20.4	16.7	11.5	12.3
COBALT	5.8 J	4.1 J	4.0 J	21.6 J	13.3	11.2	1.2
COPPER	14.5	12.5	13.5	46.7	14.5	15.1	5.5
LEAD	13.5 J	16.7 J	26.3 J	37.2 J	11.4	20.8	4.4
MERCURY	0.09	0.06	0.07	0.06	0.02	0.15	0.02
NICKEL	10.5	7.2	5.9	26.7	18.2	24.9	3.0
SELENIUM	2.2	1.5	1.2	1.1	1.2	0.88	0.53
SILVER	0.08 U	0.06 U	0.06 U	0.25	0.08 B	0.21 B	0.06 U
THALLIUM	1.5 B	0.30 B	0.22 U	0.24 U	0.86 B	0.30 B	0.35 B
TIN	1.3 B	2.2 B	2.0 B	2.2 B	2.6 B	2.0 B	2.1 B
VANADIUM	37.6	35.1	31.5	26.0	26.7	18.3	16.6
ZINC	36.9 J	22.8 J	25.0 J	33.4 J	53.4	40.1	10.6

**MISCELLANEOUS PARAMETERS ()**

M & P-CRESOL	370 U	370 UJ	360 U	360 U	400 U	400 U	360 U
TOTAL ORGANIC CARBON	30000	2030	1310 U	2960	19700	9440	1860
TOTAL ORGANIC HALIDES (ug/L)	49.3 U	54.9 U	46.7 U	48.5 U	49.8 U	53.5 U	48.5 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0070101-D	RN3SS0070101-AVG	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3DUP005	RN3SS0070101	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
FIELD DUPLICATE OF:	RN3SS0070101	RN3SS0070101					

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,1,1-TRICHLOROETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,1,2-TRICHLOROETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,1-DICHLOROETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,1-DICHLOROETHENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,2,3-TRICHLOROPROPANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,2-DIBROMO-3-CHLOROPROPANE	110 U	110 U	110 UJ	110 UJ	110 U	110 UJ	110 UJ
1,2-DIBROMOETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,2-DICHLOROETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,2-DICHLOROPROPANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
1,4-DICHLORO-2-BUTENE	110 U	110 U	110 UJ	110 UJ	110 U	110 UJ	110 UJ
2-BUTANONE	11 UR						
2-HEXANONE	11 U	11 U	11 UJ	11 UJ	11 U	11 UJ	11 UJ
4-METHYL-2-PENTANONE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
ACETONE	250 J	370 J	150	930 J	220 B	420 J	2600 J
ACETONITRILE	110 UR	110 UR	110 UR	110 UR	110 UJ	110 UR	110 UR
ACROLEIN	22 UR	22 UR	23 UR	21 UR	22 UR	22 UR	22 UR
ACRYLONITRILE	5 UR	5 UR	6 UR	5 UR	6 U	5 UR	6 UR
ALLYL CHLORIDE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
BENZENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
BROMODICHLOROMETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
BROMOFORM	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
BROMOMETHANE	11 U	11 U	11 UJ	11 UJ	11 U	11 UJ	11 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0070101-D	RN3SS0070101-AVG	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3DUP005	RN3SS0070101	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
FIELD DUPLICATE OF:	RN3SS0070101	RN3SS0070101					

**VOLATILES (µg/kg)**

CARBON DISULFIDE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
CARBON TETRACHLORIDE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
CHLOROBENZENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
CHLOROETHANE	11 U	11 U	11 UJ	11 UJ	11 U	11 UJ	11 UJ
CHLOROFORM	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
CHLOROMETHANE	11 U	11 U	11 UJ	11 UJ	11 U	11 UJ	11 UJ
CIS-1,3-DICHLOROPROPENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
DIBROMOCHLOROMETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
DIBROMOMETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
DICHLORODIFLUOROMETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
ETHYLBENZENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
IODOMETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
ISOBUTYL ALCOHOL	54 UR	54 UR	57 UR	53 UR	55 U	54 UR	55 UR
M&P-XYLENES	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
METHACRYLONITRILE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
METHYL METHACRYLATE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
METHYLENE CHLORIDE	4 B	6.5 B	9 B	10 B	15 B	15 B	10 B
O-XYLENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
PENTACHLOROETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
PROPIONITRILE	54 UR	54 UR	57 UR	53 UR	55 U	54 UR	55 UR
STYRENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
TETRACHLOROETHENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
TOLUENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
TRANS-1,2-DICHLOROETHENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0070101-D	RN3SS0070101-AVG	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3DUP005	RN3SS0070101	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
FIELD DUPLICATE OF:	RN3SS0070101	RN3SS0070101					

<b>VOLATILES (µg/kg)</b>							
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
TRICHLOROETHENE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
TRICHLOROFLUOROMETHANE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ
VINYL ACETATE	11 U	11 U	11 UJ	11 UJ	11 U	11 UJ	11 UJ
VINYL CHLORIDE	5 U	5 U	6 UJ	5 UJ	6 U	5 UJ	6 UJ

<b>SEMIVOLATILES (µg/kg)</b>							
1,2,4,5-TETRACHLOROBENZENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
1,2,4-TRICHLOROBENZENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
1,2-DICHLOROBENZENE	360 UJ	360 U	380 U	350 U	360 U	360 U	370 U
1,3,5-TRINITROBENZENE-OS	360 U	360 U	380 U	350 U	360 U	360 U	370 U
1,3-DICHLOROBENZENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
1,3-DINITROBENZENE-OS	360 U	360 U	380 U	350 U	360 U	360 U	370 U
1,4-DICHLOROBENZENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
1,4-DIOXANE-OS	360 U	360 U	380 U	350 U	360 UR	360 U	370 U
1,4-NAPHTHOQUINONE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
1-NAPHTHYLAMINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2,3,4,6-TETRACHLOROPHENOL	1800 U	1800 U	1900 U	1800 U	1800 U	1800 U	1800 U
2,4,5-TRICHLOROPHENOL	720 U	720 U	760 U	700 U	720 U	720 U	730 U
2,4,6-TRICHLOROPHENOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2,4-DICHLOROPHENOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2,4-DIMETHYLPHENOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2,4-DINITROPHENOL	1800 U	1800 U	1900 U	1800 U	1800 U	1800 U	1800 U
2,4-DINITROTOLUENE-OS	360 U	360 U	380 U	350 U	360 U	360 U	370 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
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SAMPLE NUMBER:	RN3SS0070101-D	RN3SS0070101-AVG	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3DUP005	RN3SS0070101	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
FIELD DUPLICATE OF:	RN3SS0070101	RN3SS0070101					

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2,6-DINITROTOLUENE-OS	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2-ACETYLAMINOFUORENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2-CHLORONAPHTHALENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2-CHLOROPHENOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2-METHYLNAPHTHALENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2-METHYLPHENOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2-NAPHTHYLAMINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2-NITROANILINE	1800 U	1800 U	1900 U	1800 U	1800 U	1800 U	1800 U
2-NITROPHENOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
2-PICOLINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
3,3'-DICHLOROBENZIDINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
3,3'-DIMETHYLBENZIDINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
3-METHYLCHOLANTHRENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
3-NITROANILINE	1800 U	1800 U	1900 U	1800 U	1800 UR	1800 U	1800 U
4,6-DINITRO-2-METHYLPHENOL	1800 U	1800 U	1900 U	1800 U	1800 U	1800 U	1800 U
4-AMINOBIHENYL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
4-BROMOPHENYL PHENYL ETHER	360 U	360 U	380 U	350 U	360 U	360 U	370 U
4-CHLORO-3-METHYLPHENOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
4-CHLOROANILINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
4-CHLOROPHENYL PHENYL ETHER	360 U	360 U	380 U	350 U	360 U	360 U	370 U
4-NITROANILINE	1800 U	1800 U	1900 U	1800 U	1800 U	1800 U	1800 U
4-NITROPHENOL	1800 U	1800 U	1900 U	1800 U	1800 U	1800 U	1800 U
4-NITROQUINOLINE-1-OXIDE	360 UR	360 UR	380 UR	350 UR	360 UR	360 UR	370 UR

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
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INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0070101-D	RN3SS0070101-AVG	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3DUP005	RN3SS0070101	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
FIELD DUPLICATE OF:	RN3SS0070101	RN3SS0070101					

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
A,A-DIMETHYLPHENETHYLAMINE	720 U	720 U	760 UJ	700 U	720 U	720 U	730 U
ACENAPHTHENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
ACENAPHTHYLENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
ACETOPHENONE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
ANILINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
ANTHRACENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
ARAMITE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
BENZO(A)ANTHRACENE	360 U	360 U	45 J	350 U	360 U	360 U	370 U
BENZO(A)PYRENE	360 UJ	360 U	45 J	350 UJ	360 U	360 U	370 UJ
BENZO(B)FLUORANTHENE	360 UJ	360 U	85 J	350 UJ	360 U	360 U	370 UJ
BENZO(G,H,I)PERYLENE	360 UJ	360 U	380 U	350 UJ	360 U	360 U	370 UJ
BENZO(K)FLUORANTHENE	360 UJ	360 U	380 U	350 UJ	360 U	360 U	370 UJ
BENZYL ALCOHOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
BIS(2-CHLOROETHOXY)METHANE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
BIS(2-CHLOROETHYL)ETHER	360 U	360 U	380 U	350 U	360 U	360 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
BUTYLBENZYL PHTHALATE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
CHLOROBENZILATE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
CHRYSENE	360 U	360 U	53 J	350 U	360 U	360 U	370 U
CIS-ISOSAFROLE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
DI-N-BUTYL PHTHALATE	360 U	96 J	61 J	350 U	360 U	360 U	370 U
DI-N-OCTYL PHTHALATE	360 UJ	360 U	380 U	350 UJ	360 U	360 U	370 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0070101-D	RN3SS0070101-AVG	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3DUP005	RN3SS0070101	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
FIELD DUPLICATE OF:	RN3SS0070101	RN3SS0070101					

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
DIBENZO(A,H)ANTHRACENE	360 UJ	360 U	380 U	350 UJ	360 U	360 U	370 UJ
DIBENZOFURAN	360 U	360 U	380 U	350 U	360 U	360 U	370 U
DIETHYL PHTHALATE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
DIMETHYL PHTHALATE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
DIPHENYLAMINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
ETHYL METHACRYLATE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
ETHYL METHANESULFONATE	720 U	720 U	760 U	700 U	720 U	720 U	730 U
FAMPHUR	360 UR	360 U	380 U	350 U	360 UR	360 UR	370 UR
FLUORANTHENE	57 J	57 J	88 J	350 U	360 U	360 U	370 U
FLUORENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
HEXACHLOROBENZENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
HEXACHLOROBUTADIENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
HEXACHLOROCYCLOPENTADIENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
HEXACHLOROETHANE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
HEXACHLOROPROPENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
INDENO(1,2,3-CD)PYRENE	360 UJ	360 U	380 U	350 UJ	360 U	360 U	370 UJ
ISODRIN	360 U	360 U	380 U	350 U	360 U	360 U	370 U
ISOPHORONE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
KEPONE	360 UR	360 UR	380 UR	350 UR	360 UR	360 UR	370 UR
METHAPYRILENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
METHYL METHANESULFONATE	720 U	720 U	760 U	700 U	720 U	720 U	730 U
N-NITROSO-DI-N-BUTYLAMINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0070101-D	RN3SS0070101-AVG	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3DUP005	RN3SS0070101	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
FIELD DUPLICATE OF:	RN3SS0070101	RN3SS0070101					

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
N-NITROSODIMETHYLAMINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
N-NITROSODIPHENYLAMINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
N-NITROSOMETHYLETHYLAMINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
N-NITROSOMORPHOLINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
N-NITROSOPIPERIDINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
N-NITROSOPYRROLIDINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
NAPHTHALENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
NITROBENZENE-OS	360 U	360 U	380 U	350 U	360 U	360 U	370 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	360 U	360 U	380 U	350 U	360 U	360 U	370 U
O-TOLUIDINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
P-DIMETHYLAMINOAZOBENZENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
P-PHENYLENEDIAMINE	360 UJ	360 U	380 U	350 U	360 UJ	360 UJ	370 UJ
PENTACHLOROBENZENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
PENTACHLORONITROBENZENE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
PENTACHLOROPHENOL	1800 U	1800 U	1900 U	1800 U	1800 U	1800 U	1800 U
PHENACETIN	360 U	360 U	380 U	350 U	360 U	360 U	370 U
PHENANTHRENE	49 J	49 J	57 J	350 U	360 U	360 U	370 U
PHENOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
PRONAMIDE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
PYRENE	49 J	49 J	81 J	350 U	360 U	360 U	370 U
PYRIDINE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
SAFROLE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
TRANS-ISOSAFROLE	360 U	360 U	380 U	350 U	360 U	360 U	370 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0070101-D	RN3SS0070101-AVG	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3DUP005	RN3SS0070101	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
FIELD DUPLICATE OF:	RN3SS0070101	RN3SS0070101					

**HERBICIDES (µg/kg)**

DIMETHOATE	360 UJ	360 U	380 U	350 UJ	360 UJ	360 UJ	370 UJ
PHORATE	360 U	360 U	380 U	350 U	360 U	360 U	370 U
SULFOTEP	360 U	360 U	380 U	350 U	360 U	360 U	370 U

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	104	35.6 U	35.6 U	35.6 U	35.6 U
2,4-DINITROTOLUENE-EXP	51.6 U	360 U	51.6 U	51.6 U	51.6 U	51.6 U	51.6 U
2,6-DINITROTOLUENE-EXP	47.6 U	360 U	47.6 U	47.6 U	47.6 U	47.6 U	47.6 U
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	127	46.7 U	46.7 U	46.7 U	46.7 U
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U	360 U	35.2 U	35.2 U	35.2 U	35.2 U	35.2 U
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.38 B	0.365 B	0.30 B	0.41 B	0.70 L	0.40 B	0.55 B
ARSENIC	2.2	2.55	3.4	3.6	4.9	4.5	4.6
BARIUM	21.7	23.1	22.4	18.5	35.5	24.0	23.8
BERYLLIUM	0.17	0.2	0.24	0.18	0.26	0.27	0.19

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0070101-D	RN3SS0070101-AVG	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3DUP005	RN3SS0070101	RN3SS0080101	RN3SS0090101	RN3SS0100101	RN3SS0110101	RN3SS0120101
FIELD DUPLICATE OF:	RN3SS0070101	RN3SS0070101					

<b>METALS (mg/kg)</b>							
CADMIUM	0.16 K	0.15 K	0.23 K	0.24 K	0.33 K	0.28 K	0.23 K
CHROMIUM	9.2	10.75	9.7	11.5	22.6 J	35.8	16.5
COBALT	0.94	1.07	5.4	1.3	4.1	3.2	2.8
COPPER	48 B	5.15 B	7.1	9.4	10.6	9.7	8.6
LEAD	3.9	4.15	12.2	12.2	9.8	8.9	12.8
MERCURY	0.02	0.02	0.19	0.03	0.07	0.05	0.04
NICKEL	2.1	2.55	3.6	2.8	6.7	7.2	4.8
SELENIUM	0.55	0.54	0.45	0.64	1.3 L	1.1	0.96
SILVER	0.08 B	0.055 B	0.12 B	0.07 B	0.06 U	0.06 U	0.06 U
THALLIUM	0.25 U	0.2375	0.19 U	0.24 U	0.20 U	0.83 B	0.59 B
TIN	2.2 B	2.15 B	1.8 B	2.2 B	1.7 B	2.2 B	2.2 B
VANADIUM	13.1	14.85	11.4	17.1	32.8	29.4	25.8
ZINC	8.0	9.3	18.1	9.8	20.0	16.3	15.3

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	360 U	360 U	380 U	350 U	360 U	360 U	370 U
TOTAL ORGANIC CARBON	3640	2750	12100	4550	3700	4160	1570
TOTAL ORGANIC HALIDES (ug/L)	48.3 U	48.4 U	51.8 U	47.5 U	49.3 U	47.4 U	50.7 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0130101	RN3SS0140101					
SAMPLE DATE:	07/09/97	07/08/97	//	//	//	//	//
LOCATION:	RN3SS0130101	RN3SS0140101					
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	6 UJ	5 U					
1,1,1-TRICHLOROETHANE	6 UJ	5 U					
1,1,2,2-TETRACHLOROETHANE	6 UJ	5 U					
1,1,2-TRICHLOROETHANE	6 UJ	5 U					
1,1-DICHLOROETHANE	6 UJ	5 U					
1,1-DICHLOROETHENE	6 UJ	5 U					
1,2,3-TRICHLOROPROPANE	6 UJ	5 U					
1,2-DIBROMO-3-CHLOROPROPANE	110 UJ	110 U					
1,2-DIBROMOETHANE	6 UJ	5 U					
1,2-DICHLOROETHANE	6 UJ	5 U					
1,2-DICHLOROPROPANE	6 UJ	5 U					
1,4-DICHLORO-2-BUTENE	110 UJ	110 U					
2-BUTANONE	11 UR	11 UR					
2-HEXANONE	11 UJ	11 U					
4-METHYL-2-PENTANONE	6 UJ	5 U					
ACETONE	2200 J	100 B					
ACETONITRILE	110 UJ	110 UJ					
ACROLEIN	22 UR	22 UR					
ACRYLONITRILE	6 U	5 U					
ALLYL CHLORIDE	6 UJ	5 U					
BENZENE	6 UJ	5 U					
BROMODICHLOROMETHANE	6 UJ	5 U					
BROMOFORM	6 UJ	5 U					
BROMOMETHANE	11 UJ	11 U					

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0130101	RN3SS0140101					
SAMPLE DATE:	07/09/97	07/08/97	//	//	//	//	//
LOCATION:	RN3SS0130101	RN3SS0140101					
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 UJ	5 U					
CARBON TETRACHLORIDE	6 UJ	5 U					
CHLOROBENZENE	6 UJ	5 U					
CHLOROETHANE	11 UJ	11 U					
CHLOROFORM	6 UJ	5 U					
CHLOROMETHANE	11 UJ	11 U					
CIS-1,3-DICHLOROPROPENE	6 UJ	5 U					
DIBROMOCHLOROMETHANE	6 UJ	5 U					
DIBROMOMETHANE	6 UJ	5 U					
DICHLORODIFLUOROMETHANE	6 UJ	5 U					
ETHYLBENZENE	6 UJ	5 U					
IODOMETHANE	6 UJ	5 U					
ISOBUTYL ALCOHOL	60 UJ	54 U					
M&P-XYLENES	6 UJ	5 U					
METHACRYLONITRILE	6 UJ	5 U					
METHYL METHACRYLATE	6 UJ	5 U					
METHYLENE CHLORIDE	6 UJ	22 B					
O-XYLENE	6 UJ	5 U					
PENTACHLOROETHANE	6 UJ	5 U					
PROPIONITRILE	60 UJ	54 U					
STYRENE	6 UJ	5 U					
TETRACHLOROETHENE	6 UJ	5 U					
TOLUENE	6 UJ	5 U					
TRANS-1,2-DICHLOROETHENE	6 UJ	5 U					

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0130101	RN3SS0140101					
SAMPLE DATE:	07/09/97	07/08/97	//	//	//	//	//
LOCATION:	RN3SS0130101	RN3SS0140101					
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 UJ	5 U				
TRICHLOROETHENE	6 UJ	5 U				
TRICHLOROFLUOROMETHANE	6 UJ	5 U				
VINYL ACETATE	11 UR	11 U				
VINYL CHLORIDE	6 UJ	5 U				

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	360 U	360 U				
1,2,4-TRICHLOROBENZENE	360 U	360 U				
1,2-DICHLOROBENZENE	360 U	360 U				
1,3,5-TRINITROBENZENE-OS	360 U	360 U				
1,3-DICHLOROBENZENE	360 U	360 U				
1,3-DINITROBENZENE-OS	360 U	360 U				
1,4-DICHLOROBENZENE	360 U	360 U				
1,4-DIOXANE-OS	360 UR	360 UR				
1,4-NAPHTHOQUINONE	360 U	360 U				
1-NAPHTHYLAMINE	360 U	360 U				
2,2'-OXYBIS(1-CHLOROPROPANE)	360 U	360 U				
2,3,4,6-TETRACHLOROPHENOL	1800 U	1800 U				
2,4,5-TRICHLOROPHENOL	720 U	720 U				
2,4,6-TRICHLOROPHENOL	360 U	360 U				
2,4-DICHLOROPHENOL	360 U	360 U				
2,4-DIMETHYLPHENOL	360 U	360 U				
2,4-DINITROPHENOL	1800 U	1800 U				
2,4-DINITROTOLUENE-OS	360 U	360 U				

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0130101	RN3SS0140101					
SAMPLE DATE:	07/09/97	07/08/97	//	//	//	//	//
LOCATION:	RN3SS0130101	RN3SS0140101					
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	360 U	360 U					
2,6-DINITROTOLUENE-OS	360 U	360 U					
2-ACETYLAMINOFLUORENE	360 U	360 U					
2-CHLORONAPHTHALENE	360 U	360 U					
2-CHLOROPHENOL	360 U	360 U					
2-METHYLNAPHTHALENE	360 U	360 U					
2-METHYLPHENOL	360 U	360 U					
2-NAPHTHYLAMINE	360 U	360 U					
2-NITROANILINE	1800 U	1800 U					
2-NITROPHENOL	360 U	360 U					
2-PICOLINE	360 U	360 U					
3,3'-DICHLOROBENZIDINE	360 U	360 U					
3,3'-DIMETHYLBENZIDINE	360 U	360 U					
3-METHYLCHOLANTHRENE	360 U	360 U					
3-NITROANILINE	1800 UR	1800 UR					
4,6-DINITRO-2-METHYLPHENOL	1800 U	1800 U					
4-AMINOBIIPHENYL	360 U	360 U					
4-BROMOPHENYL PHENYL ETHER	360 U	360 U					
4-CHLORO-3-METHYLPHENOL	360 U	360 U					
4-CHLOROANILINE	360 U	360 U					
4-CHLOROPHENYL PHENYL ETHER	360 U	360 U					
4-NITROANILINE	1800 U	1800 U					
4-NITROPHENOL	1800 U	1800 U					
4-NITROQUINOLINE-1-OXIDE	360 UR	360 UR					

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0130101	RN3SS0140101					
SAMPLE DATE:	07/09/97	07/08/97	//	//	//	//	//
LOCATION:	RN3SS0130101	RN3SS0140101					
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/kg)**

5-NITRO-O-TOLUIDINE	360 U	360 U					
7,12-DIMETHYLBENZ(A)ANTHRACENE	360 U	360 U					
A,A-DIMETHYLPHENETHYLAMINE	720 U	720 U					
ACENAPHTHENE	360 U	360 U					
ACENAPHTHYLENE	360 U	360 U					
ACETOPHENONE	360 U	360 U					
ANILINE	360 U	360 U					
ANTHRACENE	360 U	360 U					
ARAMITE	360 U	360 U					
BENZO(A)ANTHRACENE	360 U	360 U					
BENZO(A)PYRENE	360 U	360 U					
BENZO(B)FLUORANTHENE	360 U	360 U					
BENZO(G,H,I)PERYLENE	360 U	360 U					
BENZO(K)FLUORANTHENE	360 U	360 U					
BENZYL ALCOHOL	360 U	360 U					
BIS(2-CHLOROETHOXY)METHANE	360 U	360 U					
BIS(2-CHLOROETHYL)ETHER	360 U	360 U					
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	360 U					
BUTYLBENZYL PHTHALATE	360 U	360 U					
CHLOROBENZILATE	360 U	360 U					
CHRYSENE	360 U	360 U					
CIS-ISOSAFROLE	360 U	360 U					
DI-N-BUTYL PHTHALATE	360 U	52 B					
DI-N-OCTYL PHTHALATE	360 U	360 U					

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0130101	RN3SS0140101					
SAMPLE DATE:	07/09/97	07/08/97	//	//	//	//	//
LOCATION:	RN3SS0130101	RN3SS0140101					
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALATE	360 U	360 U					
DIBENZO(A,H)ANTHRACENE	360 U	360 U					
DIBENZOFURAN	360 U	360 U					
DIETHYL PHTHALATE	360 U	360 U					
DIMETHYL PHTHALATE	360 U	360 U					
DIPHENYLAMINE	360 U	360 U					
ETHYL METHACRYLATE	360 U	360 U					
ETHYL METHANESULFONATE	720 U	720 U					
FAMPHUR	360 UR	360 UR					
FLUORANTHENE	360 U	360 U					
FLUORENE	360 U	360 U					
HEXACHLOROBENZENE	360 U	360 U					
HEXACHLOROBUTADIENE	360 U	360 U					
HEXACHLOROCYCLOPENTADIENE	360 U	360 U					
HEXACHLOROETHANE	360 U	360 U					
HEXACHLOROPROPENE	360 U	360 U					
INDENO(1,2,3-CD)PYRENE	360 U	360 U					
ISODRIN	360 U	360 U					
ISOPHORONE	360 U	360 U					
KEPONE	360 UR	360 UR					
METHAPYRILENE	360 U	360 U					
METHYL METHANESULFONATE	720 U	720 U					
N-NITROSO-DI-N-BUTYLAMINE	360 U	360 U					
N-NITROSO-DI-N-PROPYLAMINE	360 U	360 U					

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SS0130101	RN3SS0140101					
SAMPLE DATE:	07/09/97	07/08/97	//	//	//	//	//
LOCATION:	RN3SS0130101	RN3SS0140101					
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	360 U	360 U					
N-NITROSODIMETHYLAMINE	360 U	360 U					
N-NITROSODIPHENYLAMINE	360 U	360 U					
N-NITROSOMETHYLETHYLAMINE	360 U	360 U					
N-NITROSOMORPHOLINE	360 U	360 U					
N-NITROSOPIPERIDINE	360 U	360 U					
N-NITROSOPYRROLIDINE	360 U	360 U					
NAPHTHALENE	360 U	360 U					
NITROBENZENE-OS	360 U	360 U					
O,O,O-TRIETHYLPHOSPHOROTHIOAT	360 U	360 U					
O-TOLUIDINE	360 U	360 U					
P-DIMETHYLAMINOAZOBENZENE	360 U	360 U					
P-PHENYLENEDIAMINE	360 UJ	360 UJ					
PENTACHLOROBENZENE	360 U	360 U					
PENTACHLORONITROBENZENE	360 U	360 U					
PENTACHLOROPHENOL	1800 U	1800 U					
PHENACETIN	360 U	360 U					
PHENANTHRENE	360 U	360 U					
PHENOL	360 U	360 U					
PRONAMIDE	360 U	360 U					
PYRENE	360 U	360 U					
PYRIDINE	360 U	360 U					
SAFROLE	360 U	360 U					
TRANS-ISOSAFROLE	360 U	360 U					

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

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SAMPLE DATE:	07/09/97	07/08/97	//	//	//	//	//
LOCATION:	RN3SS0130101	RN3SS0140101					
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	360 UJ	360 UJ				
PHORATE	360 U	360 U				
SULFOTEP	360 U	360 U				

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	40.2 U				
1,3-DINITROBENZENE-EXP	37.2 U	37.2 U				
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U				
2,4-DINITROTOLUENE-EXP	51.6 U	51.6 U				
2,6-DINITROTOLUENE-EXP	47.6 U	47.6 U				
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U				
2-NITROTOLUENE	81.4 U	81.4 U				
3-NITROTOLUENE	81.8 U	81.8 U				
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U				
4-NITROTOLUENE	87.2 U	87.2 U				
HMX	70.5 U	70.5 U				
NITROBENZENE-EXP	35.2 U	35.2 U				
RDX	50.9 U	50.9 U				
TETRYL	163 U	163 U				

**METALS (mg/kg)**

ANTIMONY	0.87 L	0.56 L				
ARSENIC	4.7	4.1				
BARIUM	37.9	37.7				
BERYLLIUM	0.26	0.39				

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
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SAMPLE DATE:	07/09/97	07/08/97	///	///	///	///	///
LOCATION:	RN3SS0130101	RN3SS0140101					
FIELD DUPLICATE OF:							

**METALS (mg/kg)**

CADMIUM	0.44 K	0.49 K					
CHROMIUM	21.4 J	17.0 J					
COBALT	4.9	5.9					
COPPER	12.6	22.2					
LEAD	15.9	16.0					
MERCURY	0.05	0.20					
NICKEL	6.6	8.9					
SELENIUM	1.2 L	1.4 L					
SILVER	0.07 U	0.07 U					
THALLIUM	0.60 B	0.50 B					
TIN	2.3 B	2.2 B					
VANADIUM	33.8	25.4					
ZINC	22.8	32.7					

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	360 U	360 U					
TOTAL ORGANIC CARBON	2010	3680					
TOTAL ORGANIC HALIDES (ug/L)	48.0 U	49.5 U					

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
SAMPLE DATE:	07/08/97	07/08/97	07/22/97	07/22/97	07/08/97	07/08/97	07/08/97
LOCATION:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,1,1-TRICHLOROETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,1,2,2-TETRACHLOROETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,1,2-TRICHLOROETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,1-DICHLOROETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,1-DICHLOROETHENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,2,3-TRICHLOROPROPANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,2-DIBROMO-3-CHLOROPROPANE	120 UJ	100 UJ	120 U	130 U	110 UJ	110 UJ	240 UJ
1,2-DIBROMOETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,2-DICHLOROETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,2-DICHLOROPROPANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
1,4-DICHLORO-2-BUTENE	120 UJ	100 UJ	120 U	130 U	110 UJ	110 UJ	240 UJ
2-BUTANONE	12 UR	10 UR	12 UR	13 UR	11 UR	11 UR	170 J
2-HEXANONE	12 UJ	10 UJ	12 U	13 U	11 UJ	11 UJ	12 UJ
4-METHYL-2-PENTANONE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	24 UJ
ACETONE	160 J	190 J	12 U	13 U	160 J	4700 J	3000 J
ACETONITRILE	120 UJ	100 UJ	120 UR	130 UR	110 UJ	110 UJ	240 UJ
ACROLEIN	24 UR	21 UR	24 UR	27 UR	22 UR	22 UR	48 UR
ACRYLONITRILE	6 UJ	5 UJ	6 UR	7 UR	6 UJ	6 UJ	12 UJ
ALLYL CHLORIDE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
BENZENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
BROMODICHLOROMETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
BROMOFORM	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
BROMOMETHANE	12 UJ	10 UJ	12 U	13 U	11 UJ	11 UJ	24 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
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SAMPLE DATE:	07/08/97	07/08/97	07/22/97	07/22/97	07/08/97	07/08/97	07/08/97
LOCATION:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

CARBON DISULFIDE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
CARBON TETRACHLORIDE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
CHLOROBENZENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
CHLOROETHANE	12 UJ	10 UJ	12 U	13 U	11 UJ	11 UJ	24 UJ
CHLOROFORM	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
CHLOROMETHANE	12 UJ	10 UJ	12 U	13 U	11 UJ	11 UJ	24 UJ
CIS-1,3-DICHLOROPROPENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
DIBROMOCHLOROMETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
DIBROMOMETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
DICHLORODIFLUOROMETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
ETHYLBENZENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
IODOMETHANE	6 UJ	5 UJ	6 UJ	7 UJ	6 UJ	6 UJ	12 UJ
ISOBUTYL ALCOHOL	61 UJ	52 UJ	59 UR	67 UR	55 UJ	56 UJ	120 UJ
M&P-XYLENES	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
METHACRYLONITRILE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
METHYL METHACRYLATE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
METHYLENE CHLORIDE	10 B	4 B	4 B	3 B	15 B	6 B	32 B
O-XYLENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
PENTACHLOROETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
PROPIONITRILE	61 UJ	52 UJ	59 UR	67 UR	55 UJ	56 UJ	120 UJ
STYRENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
TETRACHLOROETHENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
TOLUENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
TRANS-1,2-DICHLOROETHENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
SAMPLE DATE:	07/08/97	07/08/97	07/22/97	07/22/97	07/08/97	07/08/97	07/08/97
LOCATION:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
TRICHLOROETHENE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
TRICHLOROFLUOROMETHANE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ
VINYL ACETATE	12 UJ	10 UJ	12 UR	13 UR	11 UJ	11 UJ	24 UJ
VINYL CHLORIDE	6 UJ	5 UJ	6 U	7 U	6 UJ	6 UJ	12 UJ

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
1,2,4-TRICHLOROBENZENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
1,2-DICHLOROBENZENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
1,3,5-TRINITROBENZENE-OS	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
1,3-DICHLOROBENZENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
1,3-DINITROBENZENE-OS	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
1,4-DICHLOROBENZENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
1,4-DIOXANE-OS	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
1,4-NAPHTHOQUINONE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
1-NAPHTHYLAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2,2'-OXYBIS(1-CHLOROPROPANE)	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2,3,4,6-TETRACHLOROPHENOL	2000 U	1700 U	2000 UJ	2200 UJ	1800 U	1900 U	4000 U
2,4,5-TRICHLOROPHENOL	810 U	700 U	780 UJ	890 UJ	730 U	750 U	1600 U
2,4,6-TRICHLOROPHENOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2,4-DICHLOROPHENOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2,4-DIMETHYLPHENOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2,4-DINITROPHENOL	2000 U	1700 U	2000 UJ	2200 UJ	1800 U	1900 U	4000 U
2,4-DINITROTOLUENE-OS	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
SAMPLE DATE:	07/08/97	07/08/97	07/22/97	07/22/97	07/08/97	07/08/97	07/08/97
LOCATION:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/kg)**

2,6-DICHLOROPHENOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2,6-DINITROTOLUENE-OS	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2-ACETYLAMINOFUORENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2-CHLORONAPHTHALENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2-CHLOROPHENOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2-METHYLNAPHTHALENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2-METHYLPHENOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2-NAPHTHYLAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2-NITROANILINE	2000 U	1700 U	2000 UJ	2200 UJ	1800 U	1900 U	4000 U
2-NITROPHENOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
2-PICOLINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
3,3'-DICHLOROBENZIDINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
3,3'-DIMETHYLBENZIDINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
3-METHYLCHOLANTHRENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
3-NITROANILINE	2000 U	1700 U	2000 UJ	2200 UJ	1800 U	1900 U	4000 U
4,6-DINITRO-2-METHYLPHENOL	2000 U	1700 U	2000 UJ	2200 UJ	1800 U	1900 U	4000 U
4-AMINOBIPHENYL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
4-BROMOPHENYL PHENYL ETHER	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
4-CHLORO-3-METHYLPHENOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
4-CHLOROANILINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
4-CHLOROPHENYL PHENYL ETHER	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
4-NITROANILINE	2000 U	1700 U	2000 UJ	2200 UJ	1800 U	1900 U	4000 U
4-NITROPHENOL	2000 U	1700 U	2000 UJ	2200 UJ	1800 U	1900 U	4000 U
4-NITROQUINOLINE-1-OXIDE	400 UR	350 UR	390 UR	440 UR	370 UR	370 UR	810 UR

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RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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SAMPLE NUMBER:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
SAMPLE DATE:	07/08/97	07/08/97	07/22/97	07/22/97	07/08/97	07/08/97	07/08/97
LOCATION:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (<math>\mu\text{g}/\text{kg}</math>)</b>							
5-NITRO-O-TOLUIDINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
A,A-DIMETHYLPHENETHYLAMINE	810 UJ	700 UJ	780 UJ	890 UJ	730 UJ	750 UJ	1600 UJ
ACENAPHTHENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
ACENAPHTHYLENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
ACETOPHENONE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
ANILINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
ANTHRACENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
ARAMITE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
BENZO(A)ANTHRACENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
BENZO(A)PYRENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
BENZO(B)FLUORANTHENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
BENZO(G,H,I)PERYLENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
BENZO(K)FLUORANTHENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
BENZYL ALCOHOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
BIS(2-CHLOROETHOXY)METHANE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
BIS(2-CHLOROETHYL)ETHER	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
BIS(2-ETHYLHEXYL)PHTHALATE	400 U	420	1500 J	400 J	370 U	4000	810 U
BUTYLBENZYL PHTHALATE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
CHLOROBENZILATE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
CHRYSENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
CIS-ISOSAFROLE	400 UJ	350 UJ	390 UJ	440 UJ	370 U	370 UJ	810 UJ
DI-N-BUTYL PHTHALATE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
DI-N-OCTYL PHTHALATE	400 U	350 U	390 UJ	440 UJ	38 J	370 U	810 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
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INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
SAMPLE DATE:	07/08/97	07/08/97	07/22/97	07/22/97	07/08/97	07/08/97	07/08/97
LOCATION:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
DIBENZO(A,H)ANTHRACENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
DIBENZOFURAN	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
DIETHYL PHTHALATE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
DIMETHYL PHTHALATE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
DIPHENYLAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
ETHYL METHACRYLATE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
ETHYL METHANESULFONATE	810 U	700 U	780 UJ	890 UJ	730 U	750 U	1600 U
FAMPHUR	400 UJ	350 UJ	390 UR	440 UR	370 UR	370 UJ	810 UJ
FLUORANTHENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
FLUORENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
HEXACHLOROBENZENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
HEXACHLOROBUTADIENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
HEXACHLOROCYCLOPENTADIENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
HEXACHLOROETHANE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
HEXACHLOROPROPENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
INDENO(1,2,3-CD)PYRENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
ISODRIN	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
ISOPHORONE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
KEPONE	400 UR	350 UR	390 UR	440 UR	370 UR	370 UR	810 UR
METHAPYRILENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
METHYL METHANESULFONATE	810 U	700 U	780 UJ	890 UJ	730 U	750 U	1600 U
N-NITROSO-DI-N-BUTYLAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
N-NITROSO-DI-N-PROPYLAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
SAMPLE DATE:	07/08/97	07/08/97	07/22/97	07/22/97	07/08/97	07/08/97	07/08/97
LOCATION:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
N-NITROSODIMETHYLAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
N-NITROSODIPHENYLAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
N-NITROSOMETHYLETHYLAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
N-NITROSOMORPHOLINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
N-NITROSOPIPERIDINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
N-NITROSOPYRROLIDINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
NAPHTHALENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
NITROBENZENE-OS	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
O-TOLUIDINE	400 UJ	350 UJ	390 UJ	440 UJ	370 UJ	370 U	810 UJ
P-DIMETHYLAMINOAZOBENZENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
P-PHENYLENEDIAMINE	400 U	350 U	390 UJ	440 UJ	370 U	370 UJ	810 U
PENTACHLOROBENZENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
PENTACHLORONITROBENZENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
PENTACHLOROPHENOL	2000 U	1700 U	2000 UJ	2200 UJ	1800 U	1900 U	4000 U
PHENACETIN	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
PHENANTHRENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
PHENOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
PRONAMIDE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
PYRENE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
PYRIDINE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
SAFROLE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
TRANS-ISOSAFROLE	400 UJ	350 UJ	390 UJ	440 UJ	370 U	370 UJ	810 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
SAMPLE DATE:	07/08/97	07/08/97	07/22/97	07/22/97	07/08/97	07/08/97	07/08/97
LOCATION:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
PHORATE	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
SULFOTEP	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U						
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.25 UR	0.16 UR	0.86 B	0.71 B	0.49 L	0.32 L	0.56 L
ARSENIC	2.7	2.9	5.0	1.9	4.7	4.2	8.4
BARIUM	66.9	9.1	22.6	87.0	25.6	24.9	119
BERYLLIUM	0.82	0.12	0.38 K	0.62 K	0.16	0.14	0.96

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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SAMPLE NUMBER:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
SAMPLE DATE:	07/08/97	07/08/97	07/22/97	07/22/97	07/08/97	07/08/97	07/08/97
LOCATION:	RN3SB0010101	RN3SB0010201	RN3SB0010301	RN3SB0010401	RN3SB0020101	RN3SB0020201	RN3SB0030101
FIELD DUPLICATE OF:							

<b>METALS (mg/kg)</b>							
CADMIUM	0.43 K	0.22 K	0.15 K	0.24 K	0.56 K	0.48 K	1.4
CHROMIUM	19.2	7.9	7.2	15.1	21.2	18.0	23.6
COBALT	7.7 J	2.1 J	3.8	18.5	3.4 J	3.9 J	11.1 J
COPPER	15.4	4.2 B	10.1	14.3	8.3	7.3	40.1
LEAD	10.5 J	2.4 J	2.5 K	10.0 K	6.8 J	8.0 J	30.7 J
MERCURY	0.02	0.01 U	0.02 U	0.07	0.05	0.05	3.5
NICKEL	13.8	3.8	6.6	16.8	6.4	4.9	20.8
SELENIUM	0.73 K	0.46 K	0.90 L	0.57 L	1.2	1.1	2.6
SILVER	0.07 U	0.05 U	0.13 B	0.08 B	0.07 U	0.07 U	0.16
THALLIUM	0.27 U	0.17 U	0.26 U	0.30 U	0.26 U	0.23 U	0.51 U
TIN	2.2 B	1.5 B	3.7 B	2.7 B	2.1 B	2.1 B	5.1 B
VANADIUM	29.7	7.2	8.9	15.0	27.0	22.2	51.4
ZINC	44.6 J	10.1 J	23.2	52.3	16.9 J	13.5 J	83.7 J

<b>MISCELLANEOUS PARAMETERS (l)</b>							
M & P-CRESOL	400 U	350 U	390 UJ	440 UJ	370 U	370 U	810 U
TOTAL ORGANIC CARBON	27800	1270 U	1010	2610	878 U	2960	104000
TOTAL ORGANIC HALIDES (ug/L)	41.4 U	46.2 U	47.6 U	53.4 U	50.3 U	48.8 U	105 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/23/97	07/23/97	07/09/97	07/09/97
LOCATION:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,1,1-TRICHLOROETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,1,2,2-TETRACHLOROETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,1,2-TRICHLOROETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,1-DICHLOROETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,1-DICHLOROETHENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,2,3-TRICHLOROPROPANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,2-DIBROMO-3-CHLOROPROPANE	220 UJ	110 UJ	120 U	110 U	130 U	130 U	110 UJ
1,2-DIBROMOETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,2-DICHLOROETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,2-DICHLOROPROPANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
1,4-DICHLORO-2-BUTENE	220 UJ	110 UJ	120 U	110 U	130 U	130 U	110 UJ
2-BUTANONE	22 UR	11 UR	12 UR	11 UR	13 UR	13 UR	11 UR
2-HEXANONE	22 UJ	11 UJ	12 U	11 U	13 U	13 U	11 UJ
4-METHYL-2-PENTANONE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
ACETONE	2800 J	810 J	150 B	11 U	13 U	13 U	11 UJ
ACETONITRILE	220 UJ	110 UR	120 UR	110 UR	130 UR	130 UR	110 UR
ACROLEIN	44 UR	23 UR	24 UR	23 UR	26 UR	25 UR	23 UR
ACRYLONITRILE	11 UJ	6 UR					
ALLYL CHLORIDE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
BENZENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
BROMODICHLOROMETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
BROMOFORM	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
BROMOMETHANE	22 UJ	11 UJ	12 U	11 U	13 U	13 U	11 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/23/97	07/23/97	07/09/97	07/09/97
LOCATION:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	110 J	6 UJ	6 U	6 U	6 U	6 U	6 UJ
CARBON TETRACHLORIDE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
CHLOROBENZENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
CHLOROETHANE	22 UJ	11 UJ	12 U	11 U	13 U	13 U	11 UJ
CHLOROFORM	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
CHLOROMETHANE	22 UJ	11 UJ	12 U	11 U	13 U	13 U	11 UJ
CIS-1,3-DICHLOROPROPENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
DIBROMOCHLOROMETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
DIBROMOMETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
DICHLORODIFLUOROMETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
ETHYLBENZENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
IODOMETHANE	11 UJ	6 UJ	6 U	6 UJ	6 UJ	6 U	6 UJ
ISOBUTYL ALCOHOL	110 UJ	57 UR	61 UR	57 UR	64 UR	63 UR	57 UR
M&P-XYLENES	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
METHACRYLONITRILE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
METHYL METHACRYLATE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
METHYLENE CHLORIDE	410 J	69 J	6 B	6 B	6 U	33 B	37 B
O-XYLENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
PENTACHLOROETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
PROPIONITRILE	110 UJ	57 UR	61 UR	57 UR	64 UR	63 UR	57 UR
STYRENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
TETRACHLOROETHENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
TOLUENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
TRANS-1,2-DICHLOROETHENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/23/97	07/23/97	07/09/97	07/09/97
LOCATION:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
TRICHLOROETHENE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
TRICHLOROFUOROMETHANE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ
VINYL ACETATE	22 UJ	11 UJ	12 U	11 UR	13 UR	13 U	11 UJ
VINYL CHLORIDE	11 UJ	6 UJ	6 U	6 U	6 U	6 U	6 UJ

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
1,2,4-TRICHLOROBENZENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
1,2-DICHLOROBENZENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
1,3,5-TRINITROBENZENE-OS	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
1,3-DICHLOROBENZENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
1,3-DINITROBENZENE-OS	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
1,4-DICHLOROBENZENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
1,4-DIOXANE-OS	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
1,4-NAPHTHOQUINONE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
1-NAPHTHYLAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2,3,4,6-TETRACHLOROPHENOL	3700 U	1900 U	2000 U	1900 UJ	2100 UJ	2100 U	1900 U
2,4,5-TRICHLOROPHENOL	1500 U	760 U	810 UJ	760 UJ	850 UJ	840 U	760 U
2,4,6-TRICHLOROPHENOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2,4-DICHLOROPHENOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2,4-DIMETHYLPHENOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2,4-DINITROPHENOL	3700 U	1900 U	2000 U	1900 UJ	2100 UJ	2100 U	1900 U
2,4-DINITROTOLUENE-OS	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/23/97	07/23/97	07/09/97	07/09/97
LOCATION:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2,6-DINITROTOLUENE-OS	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2-ACETYLAMINOFUORENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2-CHLORONAPHTHALENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2-CHLOROPHENOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2-METHYLNAPHTHALENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2-METHYLPHENOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2-NAPHTHYLAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2-NITROANILINE	3700 U	1900 U	2000 U	1900 UJ	2100 UJ	2100 U	1900 U
2-NITROPHENOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
2-PICOLINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
3,3'-DICHLOROBENZIDINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
3,3'-DIMETHYLBENZIDINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
3-METHYLCHOLANTHRENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
3-NITROANILINE	3700 U	1900 U	2000 U	1900 UJ	2100 UJ	2100 U	1900 U
4,6-DINITRO-2-METHYLPHENOL	3700 U	1900 U	2000 U	1900 UJ	2100 UJ	2100 U	1900 U
4-AMINOBIPHENYL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
4-BROMOPHENYL PHENYL ETHER	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
4-CHLORO-3-METHYLPHENOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
4-CHLOROANILINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
4-CHLOROPHENYL PHENYL ETHER	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
4-NITROANILINE	3700 U	1900 U	2000 U	1900 UJ	2100 UJ	2100 U	1900 U
4-NITROPHENOL	3700 U	1900 U	2000 U	1900 UJ	2100 UJ	2100 U	1900 U
4-NITROQUINOLINE-1-OXIDE	740 UR	380 UR	410 UR	380 UR	430 UR	420 UR	380 UR

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/23/97	07/23/97	07/09/97	07/09/97
LOCATION:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/kg)**

5-NITRO-O-TOLUIDINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
A,A-DIMETHYLPHENETHYLAMINE	1500 UJ	760 UJ	810 U	760 UJ	850 UJ	840 UJ	760 U
ACENAPHTHENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
ACENAPHTHYLENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
ACETOPHENONE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
ANILINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
ANTHRACENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
ARAMITE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
BENZO(A)ANTHRACENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
BENZO(A)PYRENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
BENZO(B)FLUORANTHENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
BENZO(G,H,I)PERYLENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
BENZO(K)FLUORANTHENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
BENZYL ALCOHOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
BIS(2-CHLOROETHOXY)METHANE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
BIS(2-CHLOROETHYL)ETHER	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	160 J	59 J	410 U	380 UJ	430 UJ	120 J	380 U
BUTYLBENZYL PHTHALATE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
CHLOROBENZILATE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
CHRYSENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
CIS-ISOSAFROLE	740 UJ	380 U	410 U	380 UJ	430 UJ	420 U	380 U
DI-N-BUTYL PHTHALATE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
DI-N-OCTYL PHTHALATE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/23/97	07/23/97	07/09/97	07/09/97
LOCATION:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
DIBENZO(A,H)ANTHRACENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
DIBENZOFURAN	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
DIETHYL PHTHALATE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
DIMETHYL PHTHALATE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
DIPHENYLAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
ETHYL METHACRYLATE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
ETHYL METHANESULFONATE	1500 U	760 U	810 U	760 UJ	850 UJ	840 U	760 U
FAMPHUR	740 U	380 UJ	410 UJ	380 UR	430 UR	420 UJ	380 U
FLUORANTHENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
FLUORENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
HEXACHLOROBENZENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
HEXACHLOROBUTADIENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
HEXACHLOROCYCLOPENTADIENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
HEXACHLOROETHANE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
HEXACHLOROPROPENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
INDENO(1,2,3-CD)PYRENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
ISODRIN	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
ISOPHORONE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
KEPONE	740 UR	380 UR	410 UR	380 UR	430 UR	420 UR	380 UR
METHAPYRILENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
METHYL METHANESULFONATE	1500 U	760 U	810 U	760 UJ	850 UJ	840 U	760 U
N-NITROSO-DI-N-BUTYLAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/23/97	07/23/97	07/09/97	07/09/97
LOCATION:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/kg)**

N-NITROSODIETHYLAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
N-NITROSODIMETHYLAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
N-NITROSODIPHENYLAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
N-NITROSOMETHYLETHYLAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
N-NITROSOMORPHOLINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
N-NITROSOPIPERIDINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
N-NITROSOPYRROLIDINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
NAPHTHALENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
NITROBENZENE-OS	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
O-TOLUIDINE	740 UJ	380 UJ	410 UJ	380 UJ	430 UJ	420 UJ	380 U
P-DIMETHYLAMINOAZOBENZENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
P-PHENYLENEDIAMINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
PENTACHLOROBENZENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
PENTACHLORONITROBENZENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
PENTACHLOROPHENOL	3700 U	1900 U	2000 U	1900 UJ	2100 UJ	2100 U	1900 U
PHENACETIN	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
PHENANTHRENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
PHENOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
PRONAMIDE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
PYRENE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
PYRIDINE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
SAFROLE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
TRANS-ISOSAFROLE	740 UJ	380 U	410 U	380 UJ	430 UJ	420 U	380 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/23/97	07/23/97	07/09/97	07/09/97
LOCATION:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	740 U	380 UJ	410 UJ	380 UJ	430 UJ	420 UJ	380 U
PHORATE	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
SULFOTEP	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U						
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.75 L	0.31 B	0.68 B	1.3 B	1.2 B	0.53 B	0.65 B
ARSENIC	6.7	2.7	7.9	3.2	9.1	5.7	6.8
BARIUM	116	22.1	27.5	12.0	53.6	77.5	33.9
BERYLLIUM	1.3	0.19	0.59	0.21 B	0.90 K	0.87	0.52

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
SAMPLE DATE:	07/08/97	07/08/97	07/08/97	07/23/97	07/23/97	07/09/97	07/09/97
LOCATION:	RN3SB0030201	RN3SB0040101	RN3SB0040201	RN3SB0040301	RN3SB0040401	RN3SB0050101	RN3SB0060101
FIELD DUPLICATE OF:							

**METALS (mg/kg)**

CADMIUM	1.2	0.28 K	0.42 K	0.15 K	0.16 K	0.50 K	0.40 K
CHROMIUM	31.2	10.4	26.6	12.4	31.5	18.9	11.4
COBALT	14.4 J	1.9	2.5	1.9	4.3	19.7	5.4
COPPER	21.7	8.7	7.3	5.1	22.0	16.0	11.2
LEAD	15.1 J	11.3	5.9	16.8 K	12.3 K	22.9	8.9
MERCURY	1.6	0.14	0.02 U	0.03	0.02	0.09	0.03
NICKEL	25.3	2.6	4.9	3.4	10.8	21.2	6.5
SELENIUM	2.7	0.50	2.1	0.50 L	2.1 L	1.6	2.0
SILVER	0.14 U	0.11 B	0.08 B	0.15 B	0.09 U	0.08 U	0.05 U
THALLIUM	0.51 U	0.50 B	1.4 B	0.28 U	0.61 B	1.8 B	1.2 B
TIN	5.5 B	3.0 B	2.3 B	1.9 B	3.2 B	2.8 B	2.0 B
VANADIUM	56.2	16.1	25.2	15.9	56.2	29.5	20.3
ZINC	77.9 J	12.5	19.9	9.8	41.3	58.2	29.2

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	740 U	380 U	410 U	380 UJ	430 UJ	420 U	380 U
TOTAL ORGANIC CARBON	86800	2220	3410	391	5930	8500	5650
TOTAL ORGANIC HALIDES (ug/L)	99.2 U	52.1 U	55.0 U	46.8 U	49.7 U	56.1 U	48.9 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3SB0100101-D	RN3SB0100101-AVG	RN3SB0110101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3DUP006	RN3SB0100101	RN3SB0110101
FIELD DUPLICATE OF:					RN3SB0100101	RN3SB0100101	

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,1,1-TRICHLOROETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,1,2-TRICHLOROETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,1-DICHLOROETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,1-DICHLOROETHENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,2,3-TRICHLOROPROPANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,2-DIBROMO-3-CHLOROPROPANE	110 U	120 U	110 UJ	110 UJ	110 U	110 U	130 U
1,2-DIBROMOETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,2-DICHLOROETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,2-DICHLOROPROPANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
1,4-DICHLORO-2-BUTENE	110 U	120 U	110 UJ	110 UJ	110 U	110 U	130 U
2-BUTANONE	11 UR	12 UR	11 UR	11 UR	11 UR	11 UR	13 UR
2-HEXANONE	11 U	12 U	11 UJ	11 UJ	11 U	11 U	13 U
4-METHYL-2-PENTANONE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
ACETONE	190 B	180 B	2100 J	460 J	61 B	260.5 B	93 B
ACETONITRILE	110 UR	120 UR	110 UR	110 UR	110 UR	110 UR	130 UR
ACROLEIN	22 UR	24 UR	21 UR	22 UR	21 UR	21.5 UR	25 UR
ACRYLONITRILE	6 UR	6 UR	5 UR	6 UR	5 UR	5.5 UR	6 UR
ALLYL CHLORIDE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
BENZENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
BROMODICHLOROMETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
BROMOFORM	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
BROMOMETHANE	11 U	12 U	11 UJ	11 UJ	11 U	11 U	13 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3SB0100101-D	RN3SB0100101-AVG	RN3SB0110101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3DUP006	RN3SB0100101	RN3SB0110101
FIELD DUPLICATE OF:					RN3SB0100101	RN3SB0100101	

**VOLATILES (µg/kg)**

CARBON DISULFIDE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
CARBON TETRACHLORIDE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
CHLOROBENZENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
CHLOROETHANE	11 U	12 U	11 UJ	11 UJ	11 U	11 U	13 U
CHLOROFORM	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
CHLOROMETHANE	11 U	12 U	11 UJ	11 UJ	11 U	11 U	13 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
DIBROMOCHLOROMETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
DIBROMOMETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
DICHLORODIFLUOROMETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
ETHYLBENZENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
IODOMETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
ISOBUTYL ALCOHOL	56 UR	60 UR	53 UR	55 UR	53 UR	54 UR	63 UR
M&P-XYLENES	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
METHACRYLONITRILE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
METHYL METHACRYLATE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
METHYLENE CHLORIDE	25 B	20 B	15 B	10 B	5 U	6.25	6 B
O-XYLENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
PENTACHLOROETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
PROPIONITRILE	56 UR	60 UR	53 UR	55 UR	53 UR	54 UR	63 UR
STYRENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
TETRACHLOROETHENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
TOLUENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
TRANS-1,2-DICHLOROETHENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3SB0100101-D	RN3SB0100101-AVG	RN3SB0110101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3DUP006	RN3SB0100101	RN3SB0110101
FIELD DUPLICATE OF:					RN3SB0100101	RN3SB0100101	

<b>VOLATILES (µg/kg)</b>							
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
TRICHLOROETHENE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
TRICHLOROFLUOROMETHANE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U
VINYL ACETATE	11 U	12 U	11 UJ	11 UJ	11 U	11 U	13 U
VINYL CHLORIDE	6 U	6 U	5 UJ	6 UJ	5 U	5.5 U	6 U

<b>SEMIVOLATILES (µg/kg)</b>							
1,2,4,5-TETRACHLOROBENZENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
1,2,4-TRICHLOROBENZENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
1,2-DICHLOROBENZENE	370 U	400 U	350 U	370 U	350 UJ	360 U	420 U
1,3,5-TRINITROBENZENE-OS	370 U	400 U	350 U	370 U	350 U		420 U
1,3-DICHLOROBENZENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
1,3-DINITROBENZENE-OS	370 U	400 U	350 U	370 U	350 U	370 U	420 U
1,4-DICHLOROBENZENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
1,4-DIOXANE-OS	370 U	400 U	350 U	370 U	350 U	360 U	420 U
1,4-NAPHTHOQUINONE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
1-NAPHTHYLAMINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2,3,4,6-TETRACHLOROPHENOL	1900 U	2000 U	1800 U	1800 U	1800 U	1800 U	2100 U
2,4,5-TRICHLOROPHENOL	740 U	790 U	710 U	730 U	700 U	715 U	840 U
2,4,6-TRICHLOROPHENOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2,4-DICHLOROPHENOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2,4-DIMETHYLPHENOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2,4-DINITROPHENOL	1900 U	2000 U	1800 U	1800 U	1800 U	1800 U	2100 U
2,4-DINITROTOLUENE-OS	370 U	400 U	350 U	370 U	1600	892.5	420 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3SB0100101-D	RN3SB0100101-AVG	RN3SB0110101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3DUP006	RN3SB0100101	RN3SB0110101
FIELD DUPLICATE OF:					RN3SB0100101	RN3SB0100101	

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2,6-DINITROTOLUENE-OS	370 U	400 U	350 U	370 U	140 J	140 J	420 U
2-ACETYLAMINOFUORENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2-CHLORONAPHTHALENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2-CHLOROPHENOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2-METHYLNAPHTHALENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2-METHYLPHENOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2-NAPHTHYLAMINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2-NITROANILINE	1900 U	2000 U	1800 U	1800 U	1800 U	1800 U	2100 U
2-NITROPHENOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
2-PICOLINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
3,3'-DICHLOROBENZIDINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
3,3'-DIMETHYLBENZIDINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
3-METHYLCHOLANTHRENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
3-NITROANILINE	1900 U	2000 U	1800 U	1800 U	1800 U	1800 U	2100 U
4,6-DINITRO-2-METHYLPHENOL	1900 U	2000 U	1800 U	1800 U	1800 U	1800 U	2100 U
4-AMINOBIHENYL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
4-BROMOPHENYL PHENYL ETHER	370 U	400 U	350 U	370 U	350 U	360 U	420 U
4-CHLORO-3-METHYLPHENOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
4-CHLOROANILINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
4-CHLOROPHENYL PHENYL ETHER	370 U	400 U	350 U	370 U	350 U	360 U	420 U
4-NITROANILINE	1900 U	2000 U	1800 U	1800 U	1800 U	1800 U	2100 U
4-NITROPHENOL	1900 U	2000 U	1800 U	1800 U	1800 U	1800 U	2100 U
4-NITROQUINOLINE-1-OXIDE	370 UR	400 UR	350 UR	370 UR	350 UR	360 UR	420 UR

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3SB0100101-D	RN3SB0100101-AVG	RN3SB0110101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3DUP006	RN3SB0100101	RN3SB0110101
FIELD DUPLICATE OF:					RN3SB0100101	RN3SB0100101	

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
A,A-DIMETHYLPHENETHYLAMINE	740 U	790 U	710 U	730 U	700 U	715 U	840 U
ACENAPHTHENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
ACENAPHTHYLENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
ACETOPHENONE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
ANILINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
ANTHRACENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
ARAMITE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
BENZO(A)ANTHRACENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
BENZO(A)PYRENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
BENZO(B)FLUORANTHENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
BENZO(G,H,I)PERYLENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
BENZO(K)FLUORANTHENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
BENZYL ALCOHOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
BIS(2-CHLOROETHOXY)METHANE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
BIS(2-CHLOROETHYL)ETHER	370 U	400 U	350 U	370 U	350 U	360 U	420 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	400 U	350 U	370 U	65 J	65 J	420 U
BUTYLBENZYL PHTHALATE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
CHLOROBENZILATE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
CHRYSENE	370 U	400 U	350 U	370 U	52 J	52 J	420 U
CIS-ISOSAFROLE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
DI-N-BUTYL PHTHALATE	370 U	400 U	96 J	370 U	2400	1292.5	420 U
DI-N-OCTYL PHTHALATE	370 U	400 U	350 U	370 U	350 U	360 U	420 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3SB0100101-D	RN3SB0100101-AVG	RN3SB0110101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3DUP006	RN3SB0100101	RN3SB0110101
FIELD DUPLICATE OF:					RN3SB0100101	RN3SB0100101	

**SEMIVOLATILES (µg/kg)**

DIALLATE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
DIBENZO(A,H)ANTHRACENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
DIBENZOFURAN	370 U	400 U	350 U	370 U	350 U	360 U	420 U
DIETHYL PHTHALATE	370 U	400 U	350 U	370 U	340 J	340 J	420 U
DIMETHYL PHTHALATE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
DIPHENYLAMINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
ETHYL METHACRYLATE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
ETHYL METHANESULFONATE	740 U	790 U	710 U	730 U	700 U	715 U	840 U
FAMPHUR	370 U	400 U	350 U	370 U	350 UR	370 U	420 U
FLUORANTHENE	370 U	400 U	350 U	370 U	79 J	79 J	420 U
FLUORENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
HEXACHLOROBENZENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
HEXACHLOROBUTADIENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
HEXACHLOROCYCLOPENTADIENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
HEXACHLOROETHANE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
HEXACHLOROPROPENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
INDENO(1,2,3-CD)PYRENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
ISODRIN	370 U	400 U	350 U	370 U	350 U	360 U	420 U
ISOPHORONE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
KEPONE	370 UR	400 UR	350 UR	370 UR	350 UR	360 UR	420 UR
METHAPYRILENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
METHYL METHANESULFONATE	740 U	790 U	710 U	730 U	700 U	715 U	840 U
N-NITROSO-DI-N-BUTYLAMINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3SB0100101-D	RN3SB0100101-AVG	RN3SB0110101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3DUP006	RN3SB0100101	RN3SB0110101
FIELD DUPLICATE OF:					RN3SB0100101	RN3SB0100101	

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
N-NITROSODIMETHYLAMINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
N-NITROSODIPHENYLAMINE	370 U	400 U	350 U	370 U	300 J	300 J	420 U
N-NITROSOMETHYLETHYLAMINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
N-NITROSOMORPHOLINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
N-NITROSOPIPERIDINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
N-NITROSOPYRROLIDINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
NAPHTHALENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
NITROBENZENE-OS	370 U	400 U	350 U	370 U	350 U	360 U	420 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	370 U	400 U	350 U	370 U	350 U	360 U	420 U
O-TOLUIDINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
P-DIMETHYLAMINOAZOBENZENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
P-PHENYLENEDIAMINE	370 U	400 U	350 U	370 U	350 UJ	360 U	420 U
PENTACHLOROBENZENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
PENTACHLORONITROBENZENE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
PENTACHLOROPHENOL	1900 U	2000 U	1800 U	1800 U	1800 U	1800 U	2100 U
PHENACETIN	370 U	400 U	350 U	370 U	350 U	360 U	420 U
PHENANTHRENE	370 U	400 U	350 U	370 U	88 J	88 J	420 U
PHENOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
PRONAMIDE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
PYRENE	370 U	400 U	350 U	370 U	91 J	91 J	420 U
PYRIDINE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
SAFROLE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
TRANS-ISOSAFROLE	370 U	400 U	350 U	370 U	350 U	360 U	420 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3SB0100101-D	RN3SB0100101-AVG	RN3SB0110101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3DUP006	RN3SB0100101	RN3SB0110101
FIELD DUPLICATE OF:					RN3SB0100101	RN3SB0100101	

**HERBICIDES (µg/kg)**

DIMETHOATE	370 U	400 U	350 U	370 U	350 UJ	360 U	420 U
PHORATE	370 U	400 U	350 U	370 U	350 U	360 U	420 U
SULFOTEP	370 U	400 U	350 U	370 U	350 U	360 U	420 U

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	497	35.6 U	35.6 U	35.6 U	1180	598.9	35.6 U
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	405	46.7 U					
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.56 B	0.40 B	0.41 B	0.51 B	2.1 L	1.305 L	0.78 B
ARSENIC	3.9	2.4	3.1	4.6	3.8	4.2	5.7
BARIUM	41.6	97.0	19.6	23.0	56.2	39.6	74.4
BERYLLIUM	0.34	0.93	0.17	0.17	0.23	0.2	0.34

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3SB0100101-D	RN3SB0100101-AVG	RN3SB0110101
SAMPLE DATE:	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97	07/09/97
LOCATION:	RN3SB0070101	RN3SB0080101	RN3SB0090101	RN3SB0100101	RN3DUP006	RN3SB0100101	RN3SB0110101
FIELD DUPLICATE OF:					RN3SB0100101	RN3SB0100101	

**METALS (mg/kg)**

CADMIUM	0.33 K	0.26 K	0.23 K	0.32 K	1.8	1.06	0.90
CHROMIUM	16.2	12.4	13.0	16.1	11.5	13.8	17.4
COBALT	4.2	14.3	1.6	4.5	5.5	5	8.6
COPPER	13.5	12.6	18.1	9.5	66.6	38.05	20.4
LEAD	10.5	17.4	40.4	8.9	301	154.95	60.4
MERCURY	0.05	0.03	0.04	0.05	0.96	0.505	1.9
NICKEL	7.7	10.4	3.7	5.0	22.2	13.6	5.7
SELENIUM	1.0	0.81	0.67	1.3	0.81	1.055	1.3
SILVER	0.08 B	0.08 U	0.07 U	0.07 U	0.46 B	0.2475 B	0.07 U
THALLIUM	0.45 B	0.67 B	0.25 U	0.24 U	0.24 U	0.24 U	0.34 B
TIN	2.7 B	2.8 B	2.3 B	2.3 B	5.0 B	3.65 B	2.6 B
VANADIUM	23.4	18.7	17.8	27.4	19.1	23.25	25.2
ZINC	25.2	35.8	12.2	12.8	69.6	41.2	25.0

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	370 U	400 U	350 U	370 U	350 U	360 U	420 U
TOTAL ORGANIC CARBON	12300	6800	1050	2250	2310	2280	9080
TOTAL ORGANIC HALIDES (ug/L)	49.2 U	54.7 U	47.9 U	48.5 U	47.1 U	47.8 U	58.0 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
SAMPLE DATE:	07/09/97	07/09/97	07/08/97	//	//	//	//
LOCATION:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
FIELD DUPLICATE OF:							

VOLATILES (µg/kg)							
1,1,1,2-TETRACHLOROETHANE	8 U	6 U	6 U				
1,1,1-TRICHLOROETHANE	8 U	6 U	6 U				
1,1,2,2-TETRACHLOROETHANE	8 U	6 U	6 U				
1,1,2-TRICHLOROETHANE	8 U	6 U	6 U				
1,1-DICHLOROETHANE	8 U	6 U	6 U				
1,1-DICHLOROETHENE	8 U	6 U	6 U				
1,2,3-TRICHLOROPROPANE	8 U	6 U	6 U				
1,2-DIBROMO-3-CHLOROPROPANE	150 U	110 U	120 U				
1,2-DIBROMOETHANE	8 U	6 U	6 U				
1,2-DICHLOROETHANE	8 U	6 U	6 U				
1,2-DICHLOROPROPANE	8 U	6 U	6 U				
1,4-DICHLORO-2-BUTENE	150 U	110 U	120 U				
2-BUTANONE	15 UR	11 UR	12 UR				
2-HEXANONE	15 U	11 U	12 U				
4-METHYL-2-PENTANONE	8 U	6 U	6 U				
ACETONE	180 B	2600 J	160 B				
ACETONITRILE	150 UR	110 UJ	120 UJ				
ACROLEIN	30 UR	22 UR	23 UR				
ACRYLONITRILE	8 UR	6 U	6 U				
ALLYL CHLORIDE	8 U	6 U	6 U				
BENZENE	8 U	6 U	6 U				
BROMODICHLOROMETHANE	8 U	6 U	6 U				
BROMOFORM	8 U	6 U	6 U				
BROMOMETHANE	15 U	11 U	12 U				

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
SAMPLE DATE:	07/09/97	07/09/97	07/08/97	//	//	//	//
LOCATION:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	8 U	6 U	6 U				
CARBON TETRACHLORIDE	8 U	6 U	6 U				
CHLOROBENZENE	8 U	6 U	6 U				
CHLOROETHANE	15 U	11 U	12 U				
CHLOROFORM	8 U	6 U	6 U				
CHLOROMETHANE	15 U	11 U	12 U				
CIS-1,3-DICHLOROPROPENE	8 U	6 U	6 U				
DIBROMOCHLOROMETHANE	8 U	6 U	6 U				
DIBROMOMETHANE	8 U	6 U	6 U				
DICHLORODIFLUOROMETHANE	8 U	6 U	6 U				
ETHYLBENZENE	8 U	6 U	6 U				
IODOMETHANE	8 U	6 U	6 U				
ISOBUTYL ALCOHOL	75 UR	56 U	58 U				
M&P-XYLENES	8 U	6 U	6 U				
METHACRYLONITRILE	8 U	6 U	6 U				
METHYL METHACRYLATE	8 U	6 U	6 U				
METHYLENE CHLORIDE	10 B	7 B	16 B				
O-XYLENE	8 U	6 U	6 U				
PENTACHLOROETHANE	8 U	6 U	6 U				
PROPIONITRILE	75 UR	56 U	58 U				
STYRENE	8 U	6 U	6 U				
TETRACHLOROETHENE	8 U	6 U	6 U				
TOLUENE	8 U	6 U	6 U				
TRANS-1,2-DICHLOROETHENE	8 U	6 U	6 U				

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
SAMPLE DATE:	07/09/97	07/09/97	07/08/97	//	//	//	//
LOCATION:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	8 U	6 U	6 U				
TRICHLOROETHENE	8 U	6 U	6 U				
TRICHLOROFLUOROMETHANE	8 U	6 U	6 U				
VINYL ACETATE	15 U	11 U	12 U				
VINYL CHLORIDE	8 U	6 U	6 U				

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	500 U	370 U	390 U				
1,2,4-TRICHLOROBENZENE	500 U	370 U	390 U				
1,2-DICHLOROBENZENE	500 U	370 U	390 U				
1,3,5-TRINITROBENZENE-OS	500 U	370 U	390 U				
1,3-DICHLOROBENZENE	500 U	370 U	390 U				
1,3-DINITROBENZENE-OS	500 U	370 U	390 U				
1,4-DICHLOROBENZENE	500 U	370 U	390 U				
1,4-DIOXANE-OS	500 U	370 UR	390 UR				
1,4-NAPHTHOQUINONE	500 U	370 U	390 U				
1-NAPHTHYLAMINE	500 U	370 U	390 U				
2,2'-OXYBIS(1-CHLOROPROPANE)	500 U	370 U	390 U				
2,3,4,6-TETRACHLOROPHENOL	2500 U	1900 U	1900 U				
2,4,5-TRICHLOROPHENOL	1000 U	740 U	780 U				
2,4,6-TRICHLOROPHENOL	500 U	370 U	390 U				
2,4-DICHLOROPHENOL	500 U	370 U	390 U				
2,4-DIMETHYLPHENOL	500 U	370 U	390 U				
2,4-DINITROPHENOL	2500 U	1900 U	1900 U				
2,4-DINITROTOLUENE-OS	500 U	370 U	390 U				

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
SAMPLE DATE:	07/09/97	07/09/97	07/08/97	//	//	//	//
LOCATION:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	500 U	370 U	390 U				
2,6-DINITROTOLUENE-OS	500 U	370 U	390 U				
2-ACETYLAMINOFUORENE	500 U	370 U	390 U				
2-CHLORONAPHTHALENE	500 U	370 U	390 U				
2-CHLOROPHENOL	500 U	370 U	390 U				
2-METHYLNAPHTHALENE	500 U	370 U	390 U				
2-METHYLPHENOL	500 U	370 U	390 U				
2-NAPHTHYLAMINE	500 U	370 U	390 U				
2-NITROANILINE	2500 U	1900 U	1900 U				
2-NITROPHENOL	500 U	370 U	390 U				
2-PICOLINE	500 U	370 U	390 U				
3,3'-DICHLOROBENZIDINE	500 U	370 U	390 U				
3,3'-DIMETHYLBENZIDINE	500 U	370 U	390 U				
3-METHYLCHOLANTHRENE	500 U	370 U	390 U				
3-NITROANILINE	2500 U	1900 UR	1900 UR				
4,6-DINITRO-2-METHYLPHENOL	2500 U	1900 U	1900 U				
4-AMINOBIPHENYL	500 U	370 U	390 U				
4-BROMOPHENYL PHENYL ETHER	500 U	370 U	390 U				
4-CHLORO-3-METHYLPHENOL	500 U	370 U	390 U				
4-CHLOROANILINE	500 U	370 U	390 U				
4-CHLOROPHENYL PHENYL ETHER	500 U	370 U	390 U				
4-NITROANILINE	2500 U	1900 U	1900 U				
4-NITROPHENOL	2500 U	1900 U	1900 U				
4-NITROQUINOLINE-1-OXIDE	500 UR	370 UR	390 UR				

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
SAMPLE DATE:	07/09/97	07/09/97	07/08/97	//	//	//	//
LOCATION:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	500 U	370 U	390 U				
7,12-DIMETHYLBENZ(A)ANTHRACENE	500 U	370 U	390 U				
A,A-DIMETHYLPHENETHYLAMINE	1000 U	740 U	780 U				
ACENAPHTHENE	500 U	370 U	390 U				
ACENAPHTHYLENE	500 U	370 U	390 U				
ACETOPHENONE	500 U	370 U	390 U				
ANILINE	500 U	370 U	390 U				
ANTHRACENE	500 U	370 U	390 U				
ARAMITE	500 U	370 U	390 U				
BENZO(A)ANTHRACENE	500 U	370 U	390 U				
BENZO(A)PYRENE	500 U	370 U	390 U				
BENZO(B)FLUORANTHENE	500 U	370 U	390 U				
BENZO(G,H,I)PERYLENE	500 U	370 U	390 U				
BENZO(K)FLUORANTHENE	500 U	370 U	390 U				
BENZYL ALCOHOL	500 U	370 U	390 U				
BIS(2-CHLOROETHOXY)METHANE	500 U	370 U	390 U				
BIS(2-CHLOROETHYL)ETHER	500 U	370 U	390 U				
BIS(2-ETHYLHEXYL)PHTHALATE	500 U	370 U	71 J				
BUTYLBENZYL PHTHALATE	500 U	370 U	390 U				
CHLOROBENZILATE	500 U	370 U	390 U				
CHRYSENE	500 U	370 U	390 U				
CIS-ISOSAFROLE	500 U	370 U	390 U				
DI-N-BUTYL PHTHALATE	500 U	370 U	390 U				
DI-N-OCTYL PHTHALATE	500 U	370 U	390 U				

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
SAMPLE DATE:	07/09/97	07/09/97	07/08/97	//	//	//	//
LOCATION:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	500 U	370 U	390 U				
DIBENZO(A,H)ANTHRACENE	500 U	370 U	390 U				
DIBENZOFURAN	500 U	370 U	390 U				
DIETHYL PHTHALATE	500 U	370 U	390 U				
DIMETHYL PHTHALATE	500 U	370 U	390 U				
DIPHENYLAMINE	500 U	370 U	390 U				
ETHYL METHACRYLATE	500 U	370 U	390 U				
ETHYL METHANESULFONATE	1000 U	740 U	780 U				
FAMPHUR	500 UR	370 UR	390 UR				
FLUORANTHENE	500 U	370 U	390 U				
FLUORENE	500 U	370 U	390 U				
HEXACHLOROBENZENE	500 U	370 U	390 U				
HEXACHLOROBUTADIENE	500 U	370 U	390 U				
HEXACHLOROCYCLOPENTADIENE	500 U	370 U	390 U				
HEXACHLOROETHANE	500 U	370 U	390 U				
HEXACHLOROPROPENE	500 U	370 U	390 U				
INDENO(1,2,3-CD)PYRENE	500 U	370 U	390 U				
ISODRIN	500 U	370 U	390 U				
ISOPHORONE	500 U	370 U	390 U				
KEPONE	500 UR	370 UR	390 UR				
METHAPYRILENE	500 U	370 U	390 U				
METHYL METHANESULFONATE	1000 U	740 U	780 U				
N-NITROSO-DI-N-BUTYLAMINE	500 U	370 U	390 U				
N-NITROSO-DI-N-PROPYLAMINE	500 U	370 U	390 U				

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
SAMPLE DATE:	07/09/97	07/09/97	07/08/97	//	//	//	//
LOCATION:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	500 U	370 U	390 U				
N-NITROSODIMETHYLAMINE	500 U	370 U	390 U				
N-NITROSODIPHENYLAMINE	500 U	370 U	390 U				
N-NITROSOMETHYLETHYLAMINE	500 U	370 U	390 U				
N-NITROSOMORPHOLINE	500 U	370 U	390 U				
N-NITROSOPIPERIDINE	500 U	370 U	390 U				
N-NITROSOPYRROLIDINE	500 U	370 U	390 U				
NAPHTHALENE	500 U	370 U	390 U				
NITROBENZENE-OS	500 U	370 U	390 U				
O,O,O-TRIETHYLPHOSPHOROTHIOAT	500 U	370 U	390 U				
O-TOLUIDINE	500 U	370 U	390 U				
P-DIMETHYLAMINOAZOBENZENE	500 U	370 U	390 U				
P-PHENYLENEDIAMINE	500 UJ	370 UJ	390 UJ				
PENTACHLOROBENZENE	500 U	370 U	390 U				
PENTACHLORONITROBENZENE	500 U	370 U	390 U				
PENTACHLOROPHENOL	2500 U	1900 U	1900 U				
PHENACETIN	500 U	370 U	390 U				
PHENANTHRENE	500 U	370 U	390 U				
PHENOL	500 U	370 U	390 U				
PRONAMIDE	500 U	370 U	390 U				
PYRENE	500 U	370 U	390 U				
PYRIDINE	500 U	370 U	390 U				
SAFROLE	500 U	370 U	390 U				
TRANS-ISOSAFROLE	500 U	370 U	390 U				

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
SAMPLE DATE:	07/09/97	07/09/97	07/08/97	//	//	//	//
LOCATION:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	500 UJ	370 UJ	390 UJ				
PHORATE	500 U	370 U	390 U				
SULFOTEP	500 U	370 U	390 U				

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	40.2 U	40.2 U				
1,3-DINITROBENZENE-EXP	37.2 U	37.2 U	37.2 U				
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	35.6 U				
2,4-DINITROTOLUENE-EXP	51.6 U	51.6 U	51.6 U				
2,6-DINITROTOLUENE-EXP	47.6 U	47.6 U	47.6 U				
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	46.7 U				
2-NITROTOLUENE	81.4 U	81.4 U	81.4 U				
3-NITROTOLUENE	81.8 U	81.8 U	81.8 U				
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U	40.9 U				
4-NITROTOLUENE	87.2 U	87.2 U	87.2 U				
HMX	70.5 U	70.5 U	70.5 U				
NITROBENZENE-EXP	35.2 U	35.2 U	35.2 U				
RDX	50.9 U	50.9 U	50.9 U				
TETRYL	163 U	163 U	163 U				

**METALS (mg/kg)**

ANTIMONY	0.61 B	1.3 L	0.33 L				
ARSENIC	6.7	5.2	1.6				
BARIUM	43.2	38.0	108				
BERYLLIUM	0.32 B	0.17 B	0.66				

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
SAMPLE DATE:	07/09/97	07/09/97	07/08/97	//	//	//	//
LOCATION:	RN3SB0120101	RN3SB0130101	RN3SB0140101				
FIELD DUPLICATE OF:							

**METALS (mg/kg)**

CADMIUM	0.42 K	0.35 K	0.32 K				
CHROMIUM	29.4	20.6 J	5.5 J				
COBALT	3.3	6.2	8.5				
COPPER	13.1	8.6	8.7				
LEAD	16.7	9.9	6.7				
MERCURY	0.08	0.11	0.25				
NICKEL	7.2	6.3	5.5				
SELENIUM	1.7	1.3 L	0.49 L				
SILVER	0.09 U	0.06 U	0.08 U				
THALLIUM	0.87 B	0.46 B	0.28 U				
TIN	3.3 B	2.9 B	2.6 B				
VANADIUM	43.7	27.2	9.8				
ZINC	24.1	16.4	16.3				

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	500 U	370 U	390 U				
TOTAL ORGANIC CARBON	1120	650	6060				
TOTAL ORGANIC HALIDES (ug/L)	64.2 U	49.4 U	50.8 U				

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/L)</b>							
1,1,1,2-TETRACHLOROETHANE	5 U		5 U		5 U		5 U
1,1,1-TRICHLOROETHANE	5 U		5 U		5 U		5 U
1,1,2,2-TETRACHLOROETHANE	5 U		5 U		5 U		5 U
1,1,2-TRICHLOROETHANE	5 U		5 U		5 U		5 U
1,1-DICHLOROETHANE	5 U		5 U		5 U		5 U
1,1-DICHLOROETHENE	5 U		5 U		5 U		5 U
1,2,3-TRICHLOROPROPANE	5 U		5 U		5 U		5 U
1,2-DIBROMO-3-CHLOROPROPANE	100 U		100 U		100 U		100 U
1,2-DIBROMOETHANE	5 U		5 U		5 U		5 U
1,2-DICHLOROETHANE	5 U		5 U		5 U		5 U
1,2-DICHLOROPROPANE	5 U		5 U		5 U		5 U
1,4-DICHLORO-2-BUTENE	100 U		100 U		100 U		100 U
2-BUTANONE	10 UR		10 UR		10 UR		10 UR
2-HEXANONE	10 U		10 U		10 U		10 U
4-METHYL-2-PENTANONE	5 U		5 U		5 U		5 U
ACETONE	10 UJ		23 J		200 J		10 UJ
ACETONITRILE	100 UR		100 UR		100 UR		100 UR
ACROLEIN	20 UR		20 UR		20 UR		20 UR
ACRYLONITRILE	5 UR		5 UR		5 UR		5 UR
ALLYL CHLORIDE	5 U		5 U		5 U		5 U
BENZENE	5 U		5 U		5 U		5 U
BROMODICHLOROMETHANE	5 U		5 U		5 U		5 U
BROMOFORM	5 U		5 U		5 U		5 U
BROMOMETHANE	10 U		10 U		10 U		10 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/L)</b>							
CARBON DISULFIDE	5 U		5 U		5 U		5 U
CARBON TETRACHLORIDE	5 U		5 U		5 U		5 U
CHLOROBENZENE	5 U		5 U		5 U		5 U
CHLOROETHANE	10 U		10 U		10 U		10 U
CHLOROFORM	5 U		5 U		2 J		5 U
CHLOROMETHANE	10 U		10 U		10 U		10 U
CIS-1,3-DICHLOROPROPENE	5 U		5 U		5 U		5 U
DIBROMOCHLOROMETHANE	5 U		5 U		5 U		5 U
DIBROMOMETHANE	5 U		5 U		5 U		5 U
DICHLORODIFLUOROMETHANE	5 U		5 U		5 U		5 U
ETHYLBENZENE	5 U		5 U		5 U		5 U
IODOMETHANE	5 U		5 U		5 U		5 U
ISOBUTYL ALCOHOL	50 UR		50 UR		50 UR		50 UR
M&P-XYLENES	5 U		5 U		5 U		5 U
METHACRYLONITRILE	5 U		5 U		5 U		5 U
METHYL METHACRYLATE	5 U		5 U		5 U		5 U
METHYLENE CHLORIDE	5 U		2 B		2 B		5 U
O-XYLENE	5 U		5 U		5 U		5 U
PENTACHLOROETHANE	5 U		5 U		5 U		5 U
PROPIONITRILE	50 UR		50 UR		50 UR		50 UR
STYRENE	5 U		5 U		5 U		5 U
TETRACHLOROETHENE	5 U		5 U		5 U		5 U
TOLUENE	5 U		5 U		5 U		5 U
TRANS-1,2-DICHLOROETHENE	5 U		5 U		5 U		5 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/L)</b>							
TRANS-1,3-DICHLOROPROPENE	5 U		5 U		5 U		5 U
TRICHLOROETHENE	5 U		5 U		5 U		5 U
TRICHLOROFLUOROMETHANE	5 U		5 U		5 U		5 U
VINYL ACETATE	10 UR		10 UR		10 UR		10 UR
VINYL CHLORIDE	5 U		5 U		5 U		5 U

<b>SEMIVOLATILES (µg/L)</b>							
1,2,4,5-TETRACHLOROBENZENE	11 U		11 U		11 U		12 U
1,2,4-TRICHLOROBENZENE	11 U		11 U		11 U		12 U
1,2-DICHLOROBENZENE	11 U		11 U		11 U		12 U
1,3,5-TRINITROBENZENE-OS	11 U		11 U		11 U		12 U
1,3-DICHLOROBENZENE	11 U		11 U		11 U		12 U
1,3-DINITROBENZENE-OS	11 U		11 U		11 U		12 U
1,4-DICHLOROBENZENE	11 U		11 U		11 U		12 U
1,4-DIOXANE-OS	11 U		11 U		11 UJ		12 U
1,4-NAPHTHOQUINONE	11 U		11 U		11 U		12 U
1-NAPHTHYLAMINE	11 U		11 U		11 U		12 U
2,2'-OXYBIS(1-CHLOROPROPANE)	11 U		11 U		11 U		12 U
2,3,4,6-TETRACHLOROPHENOL	56 U		56 U		56 U		60 U
2,4,5-TRICHLOROPHENOL	22 U		22 U		22 U		24 U
2,4,6-TRICHLOROPHENOL	11 U		11 U		11 U		12 U
2,4-DICHLOROPHENOL	11 U		11 U		11 U		12 U
2,4-DIMETHYLPHENOL	11 U		11 U		11 U		12 U
2,4-DINITROPHENOL	56 U		56 U		56 U		60 U
2,4-DINITROTOLUENE-OS	11 U		11 U		11 U		12 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/L)</b>							
2,6-DICHLOROPHENOL	11 U		11 U		11 U		12 U
2,6-DINITROTOLUENE-OS	11 U		11 U		11 U		12 U
2-ACETYLAMINOFUORENE	11 U		11 U		11 U		12 U
2-CHLORONAPHTHALENE	11 U		11 U		11 U		12 U
2-CHLOROPHENOL	11 U		11 U		11 U		12 U
2-METHYLNAPHTHALENE	11 U		11 U		11 U		12 U
2-METHYLPHENOL	11 U		11 U		11 U		12 U
2-NAPHTHYLAMINE	11 U		11 U		11 U		12 U
2-NITROANILINE	56 U		56 U		56 U		60 U
2-NITROPHENOL	11 U		11 U		11 U		12 U
2-PICOLINE	11 U		11 U		11 U		12 U
3,3'-DICHLOROBENZIDINE	11 UJ		11 UJ		11 UJ		12 UJ
3,3'-DIMETHYLBENZIDINE	11 U		11 U		11 U		12 U
3-METHYLCHOLANTHRENE	11 U		11 U		11 U		12 U
3-NITROANILINE	56 U		56 U		56 U		60 U
4,6-DINITRO-2-METHYLPHENOL	56 U		56 U		56 U		60 U
4-AMINOBIHENYL	11 U		11 U		11 U		12 U
4-BROMOPHENYL PHENYL ETHER	11 U		11 U		11 U		12 U
4-CHLORO-3-METHYLPHENOL	11 U		11 U		11 U		12 U
4-CHLOROANILINE	11 U		11 U		11 U		12 U
4-CHLOROPHENYL PHENYL ETHER	11 U		11 U		11 U		12 U
4-NITROANILINE	56 UJ		56 UJ		56 UJ		60 UJ
4-NITROPHENOL	56 U		56 U		56 U		60 U
4-NITROQUINOLINE-1-OXIDE	11 UR		11 UR		11 UR		12 UR

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/L)</b>							
5-NITRO-O-TOLUIDINE	11 U		11 U		11 U		12 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	11 U		11 U		11 U		12 U
A,A-DIMETHYLPHENETHYLAMINE	22 U		22 U		22 UJ		24 U
ACENAPHTHENE	11 U		11 U		11 U		12 U
ACENAPHTHYLENE	11 U		11 U		11 U		12 U
ACETOPHENONE	11 U		11 U		11 U		12 U
ANILINE	11 U		11 U		11 U		12 U
ANTHRACENE	11 U		11 U		11 U		12 U
ARAMITE	11 U		11 U		11 UJ		12 U
BENZO(A)ANTHRACENE	11 U		11 U		11 U		12 U
BENZO(A)PYRENE	11 U		11 U		11 U		12 U
BENZO(B)FLUORANTHENE	11 U		11 U		11 U		12 U
BENZO(G,H,I)PERYLENE	11 U		11 U		11 U		12 U
BENZO(K)FLUORANTHENE	11 U		11 U		11 U		12 U
BENZYL ALCOHOL	11 U		11 U		11 U		12 U
BIS(2-CHLOROETHOXY)METHANE	11 U		11 U		11 U		12 U
BIS(2-CHLOROETHYL)ETHER	11 U		11 U		11 U		12 U
BIS(2-ETHYLHEXYL)PHTHALATE	11 U		11 U		11 U		12 U
BUTYLBENZYL PHTHALATE	11 U		11 U		11 U		12 U
CHLOROBENZILATE	11 U		11 U		11 U		12 U
CHRYSENE	11 U		11 U		11 U		12 U
CIS-ISOSAFROLE	11 UJ		11 UJ		11 UJ		12 UJ
DI-N-BUTYL PHTHALATE	11 U		11 U		11 U		12 U
DI-N-OCTYL PHTHALATE	11 U		11 U		11 U		12 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/L)</b>							
DIALLATE	11 U		11 U		11 U		12 U
DIBENZO(A,H)ANTHRACENE	11 U		11 U		11 U		12 U
DIBENZOFURAN	11 U		11 U		11 U		12 U
DIETHYL PHTHALATE	11 U		11 U		11 U		12 U
DIMETHYL PHTHALATE	11 U		11 U		11 U		12 U
DIPHENYLAMINE	11 U		11 U		11 U		12 U
ETHYL METHACRYLATE	11 U		11 U		11 U		12 U
ETHYL METHANESULFONATE	22 U		22 U		22 U		24 U
FAMPHUR	11 UR		11 UR		11 UR		12 UR
FLUORANTHENE	11 U		11 U		11 U		12 U
FLUORENE	11 U		11 U		11 U		12 U
HEXACHLOROENZENE	11 U		11 U		11 U		12 U
HEXACHLOROBUTADIENE	11 U		11 U		11 U		12 U
HEXACHLOROCYCLOPENTADIENE	11 U		11 U		11 U		12 U
HEXACHLOROETHANE	11 U		11 U		11 U		12 U
HEXACHLOROPROPENE	11 U		11 U		11 U		12 U
INDENO(1,2,3-CD)PYRENE	11 U		11 U		11 U		12 U
ISODRIN	11 U		11 U		11 U		12 U
ISOPHORONE	11 U		11 U		11 U		12 U
KEPONE	11 UR		11 UR		11 UR		12 UR
METHAPYRILENE	11 UJ		11 UJ		11 U		12 UJ
METHYL METHANESULFONATE	22 U		22 U		22 U		24 U
N-NITROSO-DI-N-BUTYLAMINE	11 U		11 U		11 U		12 U
N-NITROSO-DI-N-PROPYLAMINE	11 U		11 U		11 U		12 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/L)</b>							
N-NITROSODIETHYLAMINE	11 U		11 U		11 U		12 U
N-NITROSODIMETHYLAMINE	11 U		11 U		11 U		12 U
N-NITROSODIPHENYLAMINE	11 U		11 U		11 U		12 U
N-NITROSOMETHYLETHYLAMINE	11 U		11 U		11 U		12 U
N-NITROSOMORPHOLINE	11 U		11 U		11 U		12 U
N-NITROSOPIPERIDINE	11 U		11 U		11 U		12 U
N-NITROSOPYRROLIDINE	11 U		11 U		11 U		12 U
NAPHTHALENE	11 U		11 U		11 U		12 U
NITROBENZENE-OS	11 U		11 U		11 U		12 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	11 U		11 U		11 U		12 U
O-TOLUIDINE	11 UJ		11 UJ		11 UJ		12 UJ
P-DIMETHYLAMINOAZOBENZENE	11 U		11 U		11 U		12 U
P-PHENYLENEDIAMINE	11 UJ		11 UJ		11 U		12 UJ
PENTACHLOROBENZENE	11 U		11 U		11 U		12 U
PENTACHLORONITROBENZENE	11 U		11 U		11 U		12 U
PENTACHLOROPHENOL	56 U		56 U		56 U		60 U
PHENACETIN	11 U		11 U		11 U		12 U
PHENANTHRENE	11 U		11 U		11 U		12 U
PHENOL	11 U		11 U		11 U		12 U
PRONAMIDE	11 U		11 U		11 U		12 U
PYRENE	11 U		11 U		11 U		12 U
PYRIDINE	11 U		11 U		11 U		12 U
SAFROLE	11 U		11 U		11 U		12 U
TRANS-ISOSAFROLE	11 U		11 U		11 UJ		12 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

**HERBICIDES (µg/L)**

DIMETHOATE	11 UJ		11 U		11 UJ		12 U
PHORATE	11 U		11 U		11 U		12 U
SULFOTEP	11 U		11 U		11 UJ		12 U

**ENERGETICS (µg/L)**

1,3,5-TRINITROBENZENE-EXP	0.6 U		0.6 U		0.6 U		0.6 U
1,3-DINITROBENZENE-EXP	0.6 U		0.6 U		0.6 U		0.6 U
2,4,6-TRINITROTOLUENE	0.6 U		0.6 U		0.6 U		0.6 U
2,4-DINITROTOLUENE-EXP	0.6 U		0.6 U		0.6 U		0.6 U
2,6-DINITROTOLUENE-EXP	0.6 U		0.6 U		0.6 U		0.6 U
2-AMINO-4,6-DINITROTOLUENE	0.6 U		0.6 U		0.6 U		0.6 U
2-NITROTOLUENE	1.3 U		1.3 U		1.3 U		1.3 U
3-NITROTOLUENE	1.3 U		1.3 U		1.3 U		1.3 U
4-AMINO-2,6-DINITROTOLUENE	0.6 U		0.6 U		0.6 U		0.6 U
4-NITROTOLUENE	1.3 U		1.3 U		1.3 U		1.3 U
HMX	1.3 U		1.3 U		1.3 U		1.3 U
NITROBENZENE-EXP	0.6 U		0.6 U		0.6 U		0.6 U
RDX	1.2 J		1.3 U		1.3 U		1.3 U
TETRYL	1.3 U		1.3 U		1.3 U		1.3 U

**METALS (µg/L)**

ANTIMONY	2.3 U		2.3 U		2.3 U		2.3 U
ARSENIC	1.9 UL		1.9 UL		1.9 UL		1.9 UL
BARIUM	12.9		112		60.0		169
BERYLLIUM	1.3 B		0.86 B		0.20 U		1.2 B

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

<b>METALS (µg/L)</b>							
CADMIUM	1.3 U		1.4		1.3 U		1.3 U
CHROMIUM	2.0 U		2.0 U		2.0 U		2.0 U
COBALT	3.8		4.0		2.7		40.4
COPPER	4.0 B		4.8 B		3.3 U		3.3 U
LEAD	2.7 B		2.7 B		1.3 U		2.8 B
MERCURY	0.10 U		0.18		0.19		0.10 U
NICKEL	8.7		2.9		1.7 B		28.3
SELENIUM	2.5 U		2.5 U		2.5 U		2.5 U
SILVER	0.70 U		0.70 U		0.84		0.70 U
THALLIUM	2.5 U		2.5 U		2.5 U		2.5 U
TIN	1.2 U		1.2 U		1.4 B		1.2 U
VANADIUM	1.2 B		0.70 U		1.5 B		0.70 U
ZINC	13.2 B		12.6 B		6.7		56.6 B

<b>DISSOLVED METALS (µg/L)</b>							
ANTIMONY, FILTERED		2.3 U		3.1		2.3 U	
ARSENIC, FILTERED		1.9 UL		1.9 UL		1.9 UL	
BARIUM, FILTERED		9.9		122		58.2	
BERYLLIUM, FILTERED		1.5 B		1.0 B		0.20 U	
CADMIUM, FILTERED		1.3 U		1.4		1.3 U	
CHROMIUM, FILTERED		2.0 U		2.0 U		2.0 U	
COBALT, FILTERED		3.0		6.2		3.2	
COPPER, FILTERED		3.3 U		3.3 U		3.3 U	
LEAD, FILTERED		2.4 B		1.6 B		1.3 U	
MERCURY, FILTERED		0.10 U		0.19		0.10 U	

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
SAMPLE DATE:	08/03/97	08/03/97	08/05/97	08/05/97	08/04/97	08/04/97	08/03/97
LOCATION:	RN3MW001U001	RN3MW001F001	RN3MW002U001	RN3MW002F001	RN3MW003U001	RN3MW003F001	RN3MW004U001
FIELD DUPLICATE OF:							

**DISSOLVED METALS (µg/L)**

NICKEL, FILTERED		7.5		3.8		1.1 B	
SELENIUM, FILTERED		2.5 U		2.5 U		2.5 U	
SILVER, FILTERED		0.70 U		1.2		1.1	
THALLIUM, FILTERED		2.5 U		2.5 U		2.5 U	
TIN, FILTERED		1.2 U		1.2 U		1.2 U	
VANADIUM, FILTERED		0.70 U		1.3 B		0.70 U	
ZINC, FILTERED		7.8 B		11.4 B		6.1	

**MISCELLANEOUS PARAMETERS (µg/L)**

M & P-CRESOL	11 U		11 U		11 U		12 U
TOTAL ORGANIC CARBON	1.11		37.8		11.4		6.47
TOTAL ORGANIC HALIDES (µg/L)	16 B		85.2 B		52.6		25.4 B

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 2/3-RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3MW004F001						
SAMPLE DATE:	08/03/97	//	//	//	//	//	//
LOCATION:	RN3MW004F001						
FIELD DUPLICATE OF:							

<b>DISSOLVED METALS (µg/L)</b>							
ANTIMONY, FILTERED	2.3 U						
ARSENIC, FILTERED	1.9 UL						
BARIUM, FILTERED	182						
BERYLLIUM, FILTERED	0.98 B						
CADMIUM, FILTERED	1.3 U						
CHROMIUM, FILTERED	2.0 U						
COBALT, FILTERED	39.8						
COPPER, FILTERED	3.3 U						
LEAD, FILTERED	2.0 B						
MERCURY, FILTERED	0.10 U						
NICKEL, FILTERED	29.0						
SELENIUM, FILTERED	2.5 U						
SILVER, FILTERED	0.70 U						
THALLIUM, FILTERED	2.5 U						
TIN, FILTERED	1.2 U						
VANADIUM, FILTERED	0.70 U						
ZINC, FILTERED	60.6 B						

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SW0010101	RN3SW0020101	RN3SW0020101-D	RN3SW0020101-AVG			
SAMPLE DATE:	08/14/97	08/14/97	08/14/97	08/14/97	//	//	//
LOCATION:	RN3SW0010101	RN3SW0020101	RN3DUP005	RN3SW0020101			
FIELD DUPLICATE OF:			RN3SW0020101	RN3SW0020101			

**VOLATILES (µg/L)**

1,1,1,2-TETRACHLOROETHANE	5 U	5 U				
1,1,1-TRICHLOROETHANE	5 U	5 U				
1,1,2,2-TETRACHLOROETHANE	5 U	5 U				
1,1,2-TRICHLOROETHANE	5 U	5 U				
1,1-DICHLOROETHANE	5 U	5 U				
1,1-DICHLOROETHENE	5 U	5 U				
1,2,3-TRICHLOROPROPANE	5 U	5 U				
1,2-DIBROMO-3-CHLOROPROPANE	100 U	100 U				
1,2-DIBROMOETHANE	5 U	5 U				
1,2-DICHLOROETHANE	5 U	5 U				
1,2-DICHLOROPROPANE	5 U	5 U				
1,4-DICHLORO-2-BUTENE	100 U	100 U				
2-BUTANONE	10 UR	10 UR				
2-HEXANONE	10 U	10 U				
4-METHYL-2-PENTANONE	5 U	5 U				
ACETONE	10 U	10 U				
ACETONITRILE	100 UR	100 UR				
ACROLEIN	20 UR	20 UR				
ACRYLONITRILE	5 UR	5 UR				
ALLYL CHLORIDE	5 U	5 U				
BENZENE	5 U	5 U				
BROMODICHLOROMETHANE	5 U	5 U				
BROMOFORM	5 U	5 U				
BROMOMETHANE	10 U	10 U				

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SW0010101	RN3SW0020101	RN3SW0020101-D	RN3SW0020101-AVG			
SAMPLE DATE:	08/14/97	08/14/97	08/14/97	08/14/97	//	//	//
LOCATION:	RN3SW0010101	RN3SW0020101	RN3DUP005	RN3SW0020101			
FIELD DUPLICATE OF:			RN3SW0020101	RN3SW0020101			

<b>VOLATILES (µg/L)</b>							
CARBON DISULFIDE	5 U	5 U					
CARBON TETRACHLORIDE	5 U	5 U					
CHLOROBENZENE	5 U	5 U					
CHLOROETHANE	10 U	10 U					
CHLOROFORM	5 U	5 U					
CHLOROMETHANE	10 U	10 U					
CIS-1,3-DICHLOROPROPENE	5 U	5 U					
DIBROMOCHLOROMETHANE	5 U	5 U					
DIBROMOMETHANE	5 U	5 U					
DICHLORODIFLUOROMETHANE	5 U	5 U					
ETHYLBENZENE	5 U	5 U					
IODOMETHANE	5 U	5 U					
ISOBUTYL ALCOHOL	50 UR	50 UR					
M&P-XYLENES	5 U	5 U					
METHACRYLONITRILE	5 U	5 U					
METHYL METHACRYLATE	5 U	5 U					
METHYLENE CHLORIDE	3 B	3 B					
O-XYLENE	5 U	5 U					
PENTACHLOROETHANE	5 U	5 U					
PROPIONITRILE	50 UR	50 UR					
STYRENE	5 U	5 U					
TETRACHLOROETHENE	5 U	5 U					
TOLUENE	5 U	5 U					
TRANS-1,2-DICHLOROETHENE	5 U	5 U					

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SW0010101	RN3SW0020101	RN3SW0020101-D	RN3SW0020101-AVG			
SAMPLE DATE:	08/14/97	08/14/97	08/14/97	08/14/97	//	//	//
LOCATION:	RN3SW0010101	RN3SW0020101	RN3DUP005	RN3SW0020101			
FIELD DUPLICATE OF:			RN3SW0020101	RN3SW0020101			

**VOLATILES (µg/L)**

TRANS-1,3-DICHLOROPROPENE	5 U	5 U				
TRICHLOROETHENE	5 U	5 U				
TRICHLOROFLUOROMETHANE	5 U	5 U				
VINYL ACETATE	10 UR	10 UR				
VINYL CHLORIDE	5 U	5 U				

**SEMIVOLATILES (µg/L)**

1,2,4,5-TETRACHLOROENZENE	11 U	11 U				
1,2,4-TRICHLOROENZENE	11 U	11 U				
1,2-DICHLOROENZENE	11 U	11 U				
1,3,5-TRINITROENZENE-OS	11 U	11 U				
1,3-DICHLOROENZENE	11 U	11 U				
1,3-DINITROENZENE-OS	11 U	11 U				
1,4-DICHLOROENZENE	11 U	11 U				
1,4-DIOXANE-OS	11 U	11 U				
1,4-NAPHTHOQUINONE	11 U	11 U				
1-NAPHTHYLAMINE	11 U	11 U				
2,2'-OXYBIS(1-CHLOROPROPANE)	11 U	11 U				
2,3,4,6-TETRACHLOROPHENOL	57 U	56 U				
2,4,5-TRICHLOROPHENOL	23 U	22 U				
2,4,6-TRICHLOROPHENOL	11 U	11 U				
2,4-DICHLOROPHENOL	11 U	11 U				
2,4-DIMETHYLPHENOL	11 U	11 U				
2,4-DINITROPHENOL	57 U	56 U				
2,4-DINITROTOLUENE-OS	11 U	11 U				

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SW0010101	RN3SW0020101	RN3SW0020101-D	RN3SW0020101-AVG			
SAMPLE DATE:	08/14/97	08/14/97	08/14/97	08/14/97	//	//	//
LOCATION:	RN3SW0010101	RN3SW0020101	RN3DUP005	RN3SW0020101			
FIELD DUPLICATE OF:			RN3SW0020101	RN3SW0020101			

<b>SEMIVOLATILES (µg/L)</b>							
2,6-DICHLOROPHENOL	11 U	11 U					
2,6-DINITROTOLUENE-OS	11 U	11 U					
2-ACETYLAMINOFLUORENE	11 U	11 U					
2-CHLORONAPHTHALENE	11 U	11 U					
2-CHLOROPHENOL	11 U	11 U					
2-METHYLNAPHTHALENE	11 U	11 U					
2-METHYLPHENOL	11 U	11 U					
2-NAPHTHYLAMINE	11 U	11 U					
2-NITROANILINE	57 U	56 U					
2-NITROPHENOL	11 U	11 U					
2-PICOLINE	11 U	11 U					
3,3'-DICHLOROBENZIDINE	11 U	11 U					
3,3'-DIMETHYLBENZIDINE	11 U	11 U					
3-METHYLCHOLANTHRENE	11 U	11 U					
3-NITROANILINE	57 U	56 U					
4,6-DINITRO-2-METHYLPHENOL	57 U	56 U					
4-AMINOBIIPHENYL	11 U	11 U					
4-BROMOPHENYL PHENYL ETHER	11 U	11 U					
4-CHLORO-3-METHYLPHENOL	11 U	11 U					
4-CHLOROANILINE	11 U	11 U					
4-CHLOROPHENYL PHENYL ETHER	11 U	11 U					
4-NITROANILINE	57 U	56 U					
4-NITROPHENOL	57 U	56 U					
4-NITROQUINOLINE-1-OXIDE	11 UR	11 UR					

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SW0010101	RN3SW0020101	RN3SW0020101-D	RN3SW0020101-AVG			
SAMPLE DATE:	08/14/97	08/14/97	08/14/97	08/14/97	//	//	//
LOCATION:	RN3SW0010101	RN3SW0020101	RN3DUP005	RN3SW0020101			
FIELD DUPLICATE OF:			RN3SW0020101	RN3SW0020101			

**SEMIVOLATILES (µg/L)**

5-NITRO-O-TOLUIDINE	11 U	11 U				
7,12-DIMETHYLBENZ(A)ANTHRACENE	11 U	11 U				
A,A-DIMETHYLPHENETHYLAMINE	23 UJ	22 UJ				
ACENAPHTHENE	11 U	11 U				
ACENAPHTHYLENE	11 U	11 U				
ACETOPHENONE	11 U	11 U				
ANILINE	11 U	11 U				
ANTHRACENE	11 U	11 U				
ARAMITE	11 UJ	11 UJ				
BENZO(A)ANTHRACENE	11 U	11 U				
BENZO(A)PYRENE	11 U	11 U				
BENZO(B)FLUORANTHENE	11 U	11 U				
BENZO(G,H,I)PERYLENE	11 U	11 U				
BENZO(K)FLUORANTHENE	11 U	11 U				
BENZYL ALCOHOL	11 U	11 U				
BIS(2-CHLOROETHOXY)METHANE	11 U	11 U				
BIS(2-CHLOROETHYL)ETHER	11 U	11 U				
BIS(2-ETHYLHEXYL)PHTHALATE	11 U	11 U				
BUTYLBENZYL PHTHALATE	11 U	11 U				
CHLOROBENZILATE	11 U	11 U				
CHRYSENE	11 U	11 U				
CIS-ISOSAFROLE	11 U	11 U				
DI-N-BUTYL PHTHALATE	11 U	11 U				
DI-N-OCTYL PHTHALATE	11 U	11 U				

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SW0010101	RN3SW0020101	RN3SW0020101-D	RN3SW0020101-AVG			
SAMPLE DATE:	08/14/97	08/14/97	08/14/97	08/14/97	//	//	//
LOCATION:	RN3SW0010101	RN3SW0020101	RN3DUP005	RN3SW0020101			
FIELD DUPLICATE OF:			RN3SW0020101	RN3SW0020101			

**SEMIVOLATILES (µg/L)**

DIALATE	11 U	11 U				
DIBENZO(A,H)ANTHRACENE	11 U	11 U				
DIBENZOFURAN	11 U	11 U				
DIETHYL PHTHALATE	11 U	11 U				
DIMETHYL PHTHALATE	11 U	11 U				
DIPHENYLAMINE	11 U	11 U				
ETHYL METHACRYLATE	11 U	11 U				
ETHYL METHANESULFONATE	23 U	22 U				
FAMPHUR	11 UR	11 UR				
FLUORANTHENE	11 U	11 U				
FLUORENE	11 U	11 U				
HEXACHLOROBENZENE	11 U	11 U				
HEXACHLOROBUTADIENE	11 U	11 U				
HEXACHLOROCYCLOPENTADIENE	11 U	11 U				
HEXACHLOROETHANE	11 U	11 U				
HEXACHLOROPROPENE	11 U	11 U				
INDENO(1,2,3-CD)PYRENE	11 U	11 U				
ISODRIN	11 U	11 U				
ISOPHORONE	11 U	11 U				
KEPONE	11 UR	11 UR				
METHAPYRILENE	11 UJ	11 UJ				
METHYL METHANESULFONATE	23 U	22 U				
N-NITROSO-DI-N-BUTYLAMINE	11 U	11 U				
N-NITROSO-DI-N-PROPYLAMINE	11 U	11 U				

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SW0010101	RN3SW0020101	RN3SW0020101-D	RN3SW0020101-AVG			
SAMPLE DATE:	08/14/97	08/14/97	08/14/97	08/14/97	//	//	//
LOCATION:	RN3SW0010101	RN3SW0020101	RN3DUP005	RN3SW0020101			
FIELD DUPLICATE OF:			RN3SW0020101	RN3SW0020101			

**SEMIVOLATILES (µg/L)**

N-NITROSODIETHYLAMINE	11 U	11 U				
N-NITROSODIMETHYLAMINE	11 U	11 U				
N-NITROSODIPHENYLAMINE	11 U	11 U				
N-NITROSOMETHYLETHYLAMINE	11 U	11 U				
N-NITROSOMORPHOLINE	11 U	11 U				
N-NITROSOPIPERIDINE	11 U	11 U				
N-NITROSOPIRROLIDINE	11 U	11 U				
NAPHTHALENE	11 U	11 U				
NITROBENZENE-OS	11 U	11 U				
O,O,O-TRIETHYLPHOSPHOROTHIOAT	11 U	11 U				
O-TOLUIDINE	11 U	11 U				
P-DIMETHYLAMINOAZOBENZENE	11 U	11 U				
P-PHENYLENEDIAMINE	11 UJ	11 UJ				
PENTACHLOROBENZENE	11 U	11 U				
PENTACHLORONITROBENZENE	11 U	11 U				
PENTACHLOROPHENOL	57 U	56 U				
PHENACETIN	11 U	11 U				
PHENANTHRENE	11 U	11 U				
PHENOL	11 U	11 U				
PRONAMIDE	11 U	11 U				
PYRENE	11 U	11 U				
PYRIDINE	11 U	11 U				
SAFROLE	11 U	11 U				
TRANS-ISOSAFROLE	11 U	11 U				

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SW0010101	RN3SW0020101	RN3SW0020101-D	RN3SW0020101-AVG			
SAMPLE DATE:	08/14/97	08/14/97	08/14/97	08/14/97	//	//	//
LOCATION:	RN3SW0010101	RN3SW0020101	RN3DUP005	RN3SW0020101			
FIELD DUPLICATE OF:			RN3SW0020101	RN3SW0020101			

**HERBICIDES (µg/L)**

DIMETHOATE	11 UJ	11 UJ				
PHORATE	11 U	11 U				
SULFOTEP	11 U	11 U				

**ENERGETICS (µg/L)**

1,3,5-TRINITROBENZENE-EXP	0.6 U	0.6 U				
1,3-DINITROBENZENE-EXP	0.6 U	0.6 U				
2,4,6-TRINITROTOLUENE	0.6 U	0.6 U				
2,4-DINITROTOLUENE-EXP	0.6 U	0.6 U				
2,6-DINITROTOLUENE-EXP	0.6 U	0.6 U				
2-AMINO-4,6-DINITROTOLUENE	0.6 U	0.6 U				
2-NITROTOLUENE	1.3 U	1.3 U				
3-NITROTOLUENE	1.3 U	1.3 U				
4-AMINO-2,6-DINITROTOLUENE	0.6 U	0.6 U				
4-NITROTOLUENE	1.3 U	1.3 U				
HMX	1.3 U	1.3 U				
NITROBENZENE-EXP	0.6 U	0.6 U				
RDX	1.3 U	1.3 U				
TETRYL	1.3 U	1.3 U				

**METALS (µg/L)**

ANTIMONY	2.3 U	2.3 U				
ARSENIC	1.9 UL	1.9 UL				
BARIUM	65.2	66.5				
BERYLLIUM	1.5 B	1.8 B				

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SW0010101	RN3SW0020101	RN3SW0020101-D	RN3SW0020101-AVG			
SAMPLE DATE:	08/14/97	08/14/97	08/14/97	08/14/97	//	//	//
LOCATION:	RN3SW0010101	RN3SW0020101	RN3DUP005	RN3SW0020101			
FIELD DUPLICATE OF:			RN3SW0020101	RN3SW0020101			

**METALS (µg/L)**

CADMIUM	1.3 U	1.3 U				
CHROMIUM	2.0 U	2.0 U				
COBALT	0.70 U	0.70 U				
COPPER	3.3 U	3.3 U				
LEAD	3.0 B	2.6 B				
MERCURY	0.10 U	0.10 U				
NICKEL	1.1 U	1.1 U				
SELENIUM	2.5 UL	2.5 UL				
SILVER	0.70 U	0.70 U				
THALLIUM	2.5 U	2.5 U				
TIN	1.2 U	1.2 U				
VANADIUM	2.6 B	2.9 B				
ZINC	8.6 B	7.1 B				

**MISCELLANEOUS PARAMETERS (µg/L)**

M & P-CRESOL	11 U	11 U				
TOTAL ORGANIC CARBON	9.65	10.1	5.53	7.815		
TOTAL ORGANIC HALIDES (ug/L)	20.8	23.8	10.0 U	14.4		

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3SD0030101-D	RN3SD0030101-AVG	RN3SD0040101	
SAMPLE DATE:	08/14/97	08/14/97	08/15/97	08/15/97	08/15/97	08/14/97	//
LOCATION:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3DUP017	RN3SD0030101	RN3SD0040101	
FIELD DUPLICATE OF:				RN3SD0030101	RN3SD0030101		

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,1,1-TRICHLOROETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,1,2,2-TETRACHLOROETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,1,2-TRICHLOROETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,1-DICHLOROETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,1-DICHLOROETHENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,2,3-TRICHLOROPROPANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,2-DIBROMO-3-CHLOROPROPANE	420 U	420 U	190 U	170 U	180 U	110 U	
1,2-DIBROMOETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,2-DICHLOROETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,2-DICHLOROPROPANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
1,4-DICHLORO-2-BUTENE	420 U	420 U	190 U	170 U	180 U	110 U	
2-BUTANONE	42 UR	110 L	19 UR	17 UR	18 UR	11 UR	
2-HEXANONE	42 U	42 U	19 U	17 U	18 U	11 U	
4-METHYL-2-PENTANONE	21 U	21 U	9 U	8 U	8.5 U	6 U	
ACETONE	1100	800	50	53	51.5	11 U	
ACETONITRILE	420 U	420 U	190 U	170 U	180 U	110 U	
ACROLEIN	83 U	83 U	37 U	34 U	35.5 U	22 U	
ACRYLONITRILE	21 U	21 U	9 U	8 U	8.5 U	6 U	
ALLYL CHLORIDE	21 U	21 U	9 U	8 U	8.5 U	6 U	
BENZENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
BROMODICHLOROMETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
BROMOFORM	21 U	21 U	9 U	8 U	8.5 U	6 U	
BROMOMETHANE	42 U	42 U	19 U	17 U	18 U	11 U	

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3SD0030101-D	RN3SD0030101-AVG	RN3SD0040101	
SAMPLE DATE:	08/14/97	08/14/97	08/15/97	08/15/97	08/15/97	08/14/97	//
LOCATION:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3DUP017	RN3SD0030101	RN3SD0040101	
FIELD DUPLICATE OF:				RN3SD0030101	RN3SD0030101		

**VOLATILES (µg/kg)**

CARBON DISULFIDE	21 U	29	9 U	8 U	8.5 U	6 U	
CARBON TETRACHLORIDE	21 U	21 U	9 U	8 U	8.5 U	6 U	
CHLOROBENZENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
CHLOROETHANE	42 U	42 U	19 U	17 U	18 U	11 U	
CHLOROFORM	21 U	21 U	9 U	8 U	8.5 U	6 U	
CHLOROMETHANE	42 U	42 U	19 U	17 U	18 U	11 U	
CIS-1,3-DICHLOROPROPENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
DIBROMOCHLOROMETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
DIBROMOMETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
DICHLORODIFLUOROMETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
ETHYLBENZENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
IODOMETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
ISOBUTYL ALCOHOL	210 U	210 U	93 U	85 U	89 U	56 U	
M&P-XYLENES	21 U	21 U	9 U	8 U	8.5 U	6 U	
METHACRYLONITRILE	21 U	21 U	9 U	8 U	8.5 U	6 U	
METHYL METHACRYLATE	21 U	21 U	9 U	8 U	8.5 U	6 U	
METHYLENE CHLORIDE	16 B	19 B	5 B	6 B	5.5 B	11 B	
O-XYLENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
PENTACHLOROETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
PROPIONITRILE	210 U	210 U	93 U	85 U	89 U	56 U	
STYRENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
TETRACHLOROETHENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
TOLUENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
TRANS-1,2-DICHLOROETHENE	21 U	21 U	9 U	8 U	8.5 U	6 U	

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3SD0030101-D	RN3SD0030101-AVG	RN3SD0040101	
SAMPLE DATE:	08/14/97	08/14/97	08/15/97	08/15/97	08/15/97	08/14/97	//
LOCATION:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3DUP017	RN3SD0030101	RN3SD0040101	
FIELD DUPLICATE OF:				RN3SD0030101	RN3SD0030101		

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
TRICHLOROETHENE	21 U	21 U	9 U	8 U	8.5 U	6 U	
TRICHLOROFLUOROMETHANE	21 U	21 U	9 U	8 U	8.5 U	6 U	
VINYL ACETATE	42 UR	42 UR	19 UR	17 UR	18 UR	11 UR	
VINYL CHLORIDE	21 U	21 U	9 U	8 U	8.5 U	6 U	

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
1,2,4-TRICHLOROBENZENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
1,2-DICHLOROBENZENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
1,3,5-TRINITROBENZENE-OS	1400 U	1400 U	620 U	560 U		370 U	
1,3-DICHLOROBENZENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
1,3-DINITROBENZENE-OS	1400 U	1400 U	620 U	560 U		370 U	
1,4-DICHLOROBENZENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
1,4-DIOXANE-OS	1400 U	1400 U	620 U	560 U	590 U	370 U	
1,4-NAPHTHOQUINONE	1400 U	1400 U	620 U	560 U	590 U	370 U	
1-NAPHTHYLAMINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
2,2'-OXYBIS(1-CHLOROPROPANE)	1400 U	1400 U	620 U	560 U	590 U	370 U	
2,3,4,6-TETRACHLOROPHENOL	6900 U	6900 U	3100 U	2800 U	2950 U	1900 U	
2,4,5-TRICHLOROPHENOL	2800 U	2800 U	1200 U	1100 U	1150 U	740 U	
2,4,6-TRICHLOROPHENOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
2,4-DICHLOROPHENOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
2,4-DIMETHYLPHENOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
2,4-DINITROPHENOL	6900 U	6900 U	3100 U	2800 U	2950 U	1900 U	
2,4-DINITROTOLUENE-OS	1400 U	1400 U	620 U	560 U		370 U	

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SD0010101	RN3SD00020101	RN3SD00030101	RN3SD0030101-D	RN3SD0030101-AVG	RN3SD0040101	
SAMPLE DATE:	08/14/97	08/14/97	08/15/97	08/15/97	08/15/97	08/14/97	//
LOCATION:	RN3SD0010101	RN3SD00020101	RN3SD00030101	RN3DUP017	RN3SD0030101	RN3SD0040101	
FIELD DUPLICATE OF:				RN3SD0030101	RN3SD0030101		

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
2,6-DINITROTOLUENE-OS	1400 U	1400 U	620 U	560 U		370 U	
2-ACETYLAMINOFUORENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
2-CHLORONAPHTHALENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
2-CHLOROPHENOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
2-METHYLNAPHTHALENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
2-METHYLPHENOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
2-NAPHTHYLAMINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
2-NITROANILINE	6900 U	6900 U	3100 U	2800 U	2950 U	1900 U	
2-NITROPHENOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
2-PICOLINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
3,3'-DICHLOROBENZIDINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
3,3'-DIMETHYLBENZIDINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
3-METHYLCHOLANTHRENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
3-NITROANILINE	6900 U	6900 U	3100 U	2800 U	2950 U	1900 U	
4,6-DINITRO-2-METHYLPHENOL	6900 U	6900 U	3100 U	2800 U	2950 U	1900 U	
4-AMINOBIHENYL	1400 U	1400 U	620 U	560 U	590 U	370 U	
4-BROMOPHENYL PHENYL ETHER	1400 U	1400 U	620 U	560 U	590 U	370 U	
4-CHLORO-3-METHYLPHENOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
4-CHLOROANILINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
4-CHLOROPHENYL PHENYL ETHER	1400 U	1400 U	620 U	560 U	590 U	370 U	
4-NITROANILINE	6900 U	6900 U	3100 U	2800 U	2950 U	1900 U	
4-NITROPHENOL	6900 U	6900 U	3100 U	2800 U	2950 U	1900 U	
4-NITROQUINOLINE-1-OXIDE	1400 UR	1400 UR	620 UR	560 UR	590 UR	370 UR	

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3SD0030101-D	RN3SD0030101-AVG	RN3SD0040101	
SAMPLE DATE:	08/14/97	08/14/97	08/15/97	08/15/97	08/15/97	08/14/97	//
LOCATION:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3DUP017	RN3SD0030101	RN3SD0040101	
FIELD DUPLICATE OF:				RN3SD0030101	RN3SD0030101		

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
7,12-DIMETHYLBENZ(A)ANTHRACENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
A,A-DIMETHYLPHENETHYLAMINE	2800 UJ	2800 UJ	1200 UJ	1100 UJ	1150 UJ	740 UJ	
ACENAPHTHENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
ACENAPHTHYLENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
ACETOPHENONE	1400 U	1400 U	620 U	560 U	590 U	370 U	
ANILINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
ANTHRACENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
ARAMITE	1400 UJ	1400 UJ	620 UJ	560 UJ	590 UJ	370 UJ	
BENZO(A)ANTHRACENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
BENZO(A)PYRENE	1400 U	150 J	620 U	560 U	590 U	370 U	
BENZO(B)FLUORANTHENE	1400 U	1400 U	620 U	62 J	62 J	370 U	
BENZO(G,H,I)PERYLENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
BENZO(K)FLUORANTHENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
BENZYL ALCOHOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
BIS(2-CHLOROETHOXY)METHANE	1400 U	1400 U	620 U	560 U	590 U	370 U	
BIS(2-CHLOROETHYL)ETHER	1400 U	1400 U	620 U	560 U	590 U	370 U	
BIS(2-ETHYLHEXYL)PHTHALATE	790 J	1400 U	620 U	560 U	590 U	370 U	
BUTYLBENZYL PHTHALATE	1400 U	1400 U	620 U	560 U	590 U	370 U	
CHLOROBENZILATE	1400 U	1400 U	620 U	560 U	590 U	370 U	
CHRYSENE	1400 U	1400 U	64 J	63 J	63.5 J	370 U	
CIS-ISOSAFROLE	1400 U	1400 U	620 U	560 U	590 U	370 U	
DI-N-BUTYL PHTHALATE	1400 U	260 J	620 U	560 U	590 U	370 U	
DI-N-OCTYL PHTHALATE	1400 U	1400 U	620 U	560 U	590 U	370 U	

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3SD0030101-D	RN3SD0030101-AVG	RN3SD0040101	
SAMPLE DATE:	08/14/97	08/14/97	08/15/97	08/15/97	08/15/97	08/14/97	//
LOCATION:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3DUP017	RN3SD0030101	RN3SD0040101	
FIELD DUPLICATE OF:				RN3SD0030101	RN3SD0030101		

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	1400 U	1400 U	620 U	560 U	590 U	370 U	
DIBENZO(A,H)ANTHRACENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
DIBENZOFURAN	1400 U	1400 U	620 U	560 U	590 U	370 U	
DIETHYL PHTHALATE	1400 U	1400 U	620 U	560 U	590 U	370 U	
DIMETHYL PHTHALATE	1400 U	1400 U	620 U	560 U	590 U	370 U	
DIPHENYLAMINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
ETHYL METHACRYLATE	1400 U	1400 U	620 U	560 U	590 U	370 U	
ETHYL METHANESULFONATE	2800 U	2800 U	1200 U	1100 U	1150 U	740 U	
FAMPHUR	1400 UR	1400 UR	620 UR	560 UR	590 UR	370 UR	
FLUORANTHENE	1400 U	1400 U	72 J	100 J	86 J	370 U	
FLUORENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
HEXACHLOROBENZENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
HEXACHLOROBUTADIENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
HEXACHLOROCYCLOPENTADIENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
HEXACHLOROETHANE	1400 U	1400 U	620 U	560 U	590 U	370 U	
HEXACHLOROPROPENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
INDENO(1,2,3-CD)PYRENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
ISODRIN	1400 U	1400 U	620 U	560 U	590 U	370 U	
ISOPHORONE	1400 U	1400 U	620 U	560 U	590 U	370 U	
KEPONE	1400 UR	1400 UR	620 UR	560 UR	590 UR	370 UR	
METHAPYRILENE	1400 UJ	1400 UJ	620 UJ	560 UJ	590 UJ	370 UJ	
METHYL METHANESULFONATE	2800 U	2800 U	1200 U	1100 U	1150 U	740 U	
N-NITROSO-DI-N-BUTYLAMINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
N-NITROSO-DI-N-PROPYLAMINE	1400 U	1400 U	620 U	560 U	590 U	370 U	

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3SD0030101-D	RN3SD0030101-AVG	RN3SD0040101	
SAMPLE DATE:	08/14/97	08/14/97	08/15/97	08/15/97	08/15/97	08/14/97	//
LOCATION:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3DUP017	RN3SD0030101	RN3SD0040101	
FIELD DUPLICATE OF:				RN3SD0030101	RN3SD0030101		

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
N-NITROSODIMETHYLAMINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
N-NITROSODIPHENYLAMINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
N-NITROSOMETHYLETHYLAMINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
N-NITROSOMORPHOLINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
N-NITROSOPIPERIDINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
N-NITROSOPYRROLIDINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
NAPHTHALENE	150 J	1400 U	620 U	560 U	590 U	370 U	
NITROBENZENE-OS	1400 U	1400 U	620 U	560 U		370 U	
O,O,O-TRIETHYLPHOSPHOROTHIOAT	1400 U	1400 U	620 U	560 U	590 U	370 U	
O-TOLUIDINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
P-DIMETHYLAMINOAZOBENZENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
P-PHENYLENEDIAMINE	1400 UJ	1400 UJ	620 UJ	560 UJ	590 UJ	370 UJ	
PENTACHLOROBENZENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
PENTACHLORONITROBENZENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
PENTACHLOROPHENOL	6900 U	6900 U	3100 U	2800 U	2950 U	1900 U	
PHENACETIN	1400 U	1400 U	620 U	560 U	590 U	370 U	
PHENANTHRENE	1400 U	1400 U	620 U	560 U	590 U	370 U	
PHENOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
PRONAMIDE	1400 U	1400 U	620 U	560 U	590 U	370 U	
PYRENE	1400 U	1400 U	620 U	83 J	83 J	370 U	
PYRIDINE	1400 U	1400 U	620 U	560 U	590 U	370 U	
SAFROLE	1400 U	1400 U	620 U	560 U	590 U	370 U	
TRANS-ISOSAFROLE	1400 U	1400 U	620 U	560 U	590 U	370 U	

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3SD0030101-D	RN3SD0030101-AVG	RN3SD0040101	
SAMPLE DATE:	08/14/97	08/14/97	08/15/97	08/15/97	08/15/97	08/14/97	//
LOCATION:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3DUP017	RN3SD0030101	RN3SD0040101	
FIELD DUPLICATE OF:				RN3SD0030101	RN3SD0030101		

**HERBICIDES (µg/kg)**

DIMETHOATE	1400 UJ	1400 UJ	620 UJ	560 UJ	590 U	370 UJ	
PHORATE	1400 U	1400 U	620 U	560 U	590 U	370 U	
SULFOTEP	1400 U	1400 U	620 U	560 U	590 U	370 U	

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	40.2 U	40.2 U	40.2 U	590 U	40.2 U	
1,3-DINITROBENZENE-EXP	37.2 U	37.2 U	37.2 U	37.2 U	590 U	37.2 U	
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	347	521	434	35.6 U	
2,4-DINITROTOLUENE-EXP	51.6 U	51.6 U	51.6 U	51.6 U	590 U	51.6 U	
2,6-DINITROTOLUENE-EXP	47.6 U	47.6 U	47.6 U	47.6 U	590 U	47.6 U	
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	1.9 UL	1.9 UL	2.3 L	2.3 L	2.3 L	0.94 L	
ARSENIC	7.8 B	8.5	9.9	9.9	9.9	2.4	
BARIUM	116	142	66.1	66.8	66.45	12.6	
BERYLLIUM	0.34 B	1.5 B	0.59 B	0.60 B	0.595 B	0.07 B	

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 2/3 - RANGE 3 BURN POINT/CHICAMUXEN CREEK'S EDGE DUMP SITE A  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3SD0030101-D	RN3SD0030101-AVG	RN3SD0040101	
SAMPLE DATE:	08/14/97	08/14/97	08/15/97	08/15/97	08/15/97	08/14/97	//
LOCATION:	RN3SD0010101	RN3SD0020101	RN3SD0030101	RN3DUP017	RN3SD0030101	RN3SD0040101	
FIELD DUPLICATE OF:				RN3SD0030101	RN3SD0030101		

<b>METALS (mg/kg)</b>							
CADMIUM	1.1 U	1.1 U	2.7	2.6	2.65	0.76	
CHROMIUM	27.5	41.2	20.4	25.9	23.15	10.8	
COBALT	15.5	19.7	17.6	15.3	16.45	1.6	
COPPER	45.3 J	305 J	169 J	181 J	175 J	13.4 J	
LEAD	40.3	46.3	217	231	224	34.4	
MERCURY	0.61	0.07 U	10.4	3.1	6.75	0.02	
NICKEL	33.1	34.2	25.4	26.1	25.75	4.0	
SELENIUM	2.1 UL	2.0 UL	0.93 UL	1.1 J	0.7825 J	0.55 UL	
SILVER	0.58 U	0.57 U	0.37	0.29	0.33	0.16 U	
THALLIUM	2.1 U	2.0 U	0.93 U	0.93 U	0.93 U	0.55 U	
TIN	12.2	12.5	7.2	7.3	7.25	2.9	
VANADIUM	42.3	56.2	35.9	42.0	38.95	10.4	
ZINC	140 J	172 J	178 J	172 J	175 J	15.1 J	

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	1400 U	1400 U	620 U	560 U	590 U	370 U	
TOTAL ORGANIC CARBON	40700	30300	17200	8920	13060	2260	
TOTAL ORGANIC HALIDES (ug/L)	171 U	182 U	68.3 U	70.5 U	69.4 U	51.2 U	

**SWMU 1 RUM POINT LANDFILL**

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLCP0010101	RPLCP0010101-D	RPLCP0010101-AVG	RPLSS0010101	RPLSS0010101-D	RPLSS0010101-AVG	RPLCP0020101
SAMPLE DATE:	07/31/97	07/31/97	07/31/97	07/11/97	07/11/97	07/11/97	07/31/97
LOCATION:	RPLCP0010101	RPLDUP013	RPLCP0010101	RPLSS0010101	RPLDUP009	RPLSS0010101	RPLCP0020101
FIELD DUPLICATE OF:		RPLCP0010101	RPLCP0010101		RPLSS0010101	RPLSS0010101	

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,1-DICHLOROETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,1-DICHLOROETHENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,2,3-TRICHLOROPROPANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,2-DIBROMO-3-CHLOROPROPANE	110 U						
1,2-DIBROMOETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,2-DICHLOROETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,2-DICHLOROPROPANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
1,4-DICHLORO-2-BUTENE	110 U						
2-BUTANONE	11 UR						
2-HEXANONE	11 U						
4-METHYL-2-PENTANONE	6 U	6 U	6 U	5 U	5 U	5 U	3 J
ACETONE	70 J	23 J	46.5 J	41 B	11 U	23.25	11 U
ACETONITRILE	110 UJ	110 UJ	110 UJ	110 UR	110 UR	110 UR	110 UJ
ACROLEIN	22 U	22 U	22 U	21 UR	21 UR	21 UR	22 U
ACRYLONITRILE	6 U	6 U	6 U	5 UR	5 UR	5 UR	6 U
ALLYL CHLORIDE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
BENZENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
BROMODICHLOROMETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
BROMOFORM	6 U	6 U	6 U	5 U	5 U	5 U	6 U
BROMOMETHANE	11 U						

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLCP0010101	RPLCP0010101-D	RPLCP0010101-AVG	RPLSS0010101	RPLSS0010101-D	RPLSS0010101-AVG	RPLCP0020101
SAMPLE DATE:	07/31/97	07/31/97	07/31/97	07/11/97	07/11/97	07/11/97	07/31/97
LOCATION:	RPLCP0010101	RPLDUP013	RPLCP0010101	RPLSS0010101	RPLDUP009	RPLSS0010101	RPLCP0020101
FIELD DUPLICATE OF:		RPLCP0010101	RPLCP0010101		RPLSS0010101	RPLSS0010101	

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
CARBON TETRACHLORIDE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
CHLOROBENZENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
CHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROFORM	6 U	6 U	6 U	5 U	5 U	5 U	6 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	11 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
DIBROMOCHLOROMETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
DIBROMOMETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
DICHLORODIFLUOROMETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
ETHYLBENZENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
IODOMETHANE	6 U	6 U	6 U	5 U	5 UJ	5 U	6 U
ISOBUTYL ALCOHOL	56 U	55 U	55.5 U	53 UR	53 UR	53 UR	55 U
M&P-XYLENES	6 U	6 U	6 U	5 U	5 U	5 U	6 U
METHACRYLONITRILE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
METHYL METHACRYLATE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
METHYLENE CHLORIDE	14 B	14 B	14 B	5 U	2 B	2.25 B	9 B
O-XYLENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
PENTACHLOROETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
PROPIONITRILE	56 U	55 U	55.5 U	53 UR	53 UR	53 UR	55 U
STYRENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
TETRACHLOROETHENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
TOLUENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
TRANS-1,2-DICHLOROETHENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLCP0010101	RPLCP0010101-D	RPLCP0010101-AVG	RPLSS0010101	RPLSS0010101-D	RPLSS0010101-AVG	RPLCP0020101
SAMPLE DATE:	07/31/97	07/31/97	07/31/97	07/11/97	07/11/97	07/11/97	07/31/97
LOCATION:	RPLCP0010101	RPLDUP013	RPLCP0010101	RPLSS0010101	RPLDUP009	RPLSS0010101	RPLCP0020101
FIELD DUPLICATE OF:		RPLCP0010101	RPLCP0010101		RPLSS0010101	RPLSS0010101	

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
TRICHLOROETHENE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
TRICHLOROFUOROMETHANE	6 U	6 U	6 U	5 U	5 U	5 U	6 U
VINYL ACETATE	11 U						
VINYL CHLORIDE	6 U	6 U	6 U	5 U	5 U	5 U	6 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
1,2,4-TRICHLOROBENZENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
1,2-DICHLOROBENZENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
1,3,5-TRINITROBENZENE-OS	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
1,3-DICHLOROBENZENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
1,3-DINITROBENZENE-OS	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
1,4-DICHLOROBENZENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
1,4-DIOXANE-OS	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
1,4-NAPHTHOQUINONE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
1-NAPHTHYLAMINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2,3,4,6-TETRACHLOROPHENOL	1900 U	1900 U	1900 U	1800 UJ	1800 UJ	1800 UJ	1800 U
2,4,5-TRICHLOROPHENOL	740 U	740 U	740 U	710 UJ	700 UJ	705 UJ	730 U
2,4,6-TRICHLOROPHENOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2,4-DICHLOROPHENOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2,4-DIMETHYLPHENOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2,4-DINITROPHENOL	1900 U	1900 U	1900 U	1800 UJ	1800 UJ	1800 UJ	1800 U
2,4-DINITROTOLUENE-OS	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLCP0010101	RPLCP0010101-D	RPLCP0010101-AVG	RPLSS0010101	RPLSS0010101-D	RPLSS0010101-AVG	RPLCP0020101
SAMPLE DATE:	07/31/97	07/31/97	07/31/97	07/11/97	07/11/97	07/11/97	07/31/97
LOCATION:	RPLCP0010101	RPLDUP013	RPLCP0010101	RPLSS0010101	RPLDUP009	RPLSS0010101	RPLCP0020101
FIELD DUPLICATE OF:		RPLCP0010101	RPLCP0010101		RPLSS0010101	RPLSS0010101	

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2,6-DINITROTOLUENE-OS	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2-ACETYLAMINOFUORENE	370 UJ	370 UJ	370 UJ	350 UJ	350 UJ	350 UJ	370 UJ
2-CHLORONAPHTHALENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2-CHLOROPHENOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2-METHYLNAPHTHALENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2-METHYLPHENOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2-NAPHTHYLAMINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2-NITROANILINE	1900 U	1900 U	1900 U	1800 UJ	1800 UJ	1800 UJ	1800 U
2-NITROPHENOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
2-PICOLINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
3,3'-DICHLOROBENZIDINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
3,3'-DIMETHYLBENZIDINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
3-METHYLCHOLANTHRENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
3-NITROANILINE	1900 U	1900 U	1900 U	1800 UJ	1800 UJ	1800 UJ	1800 U
4,6-DINITRO-2-METHYLPHENOL	1900 U	1900 U	1900 U	1800 UJ	1800 UJ	1800 UJ	1800 U
4-AMINOBIHENYL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
4-BROMOPHENYL PHENYL ETHER	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
4-CHLORO-3-METHYLPHENOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
4-CHLOROANILINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
4-CHLOROPHENYL PHENYL ETHER	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
4-NITROANILINE	1900 U	1900 U	1900 U	1800 UJ	1800 UJ	1800 UJ	1800 U
4-NITROPHENOL	1900 U	1900 U	1900 U	1800 UJ	1800 UJ	1800 UJ	1800 U
4-NITROQUINOLINE-1-OXIDE	370 UR	370 UR	370 UR	350 UR	350 UR	175 UR	370 UR

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLCP0010101	RPLCP0010101-D	RPLCP0010101-AVG	RPLSS0010101	RPLSS0010101-D	RPLSS0010101-AVG	RPLCP0020101
SAMPLE DATE:	07/31/97	07/31/97	07/31/97	07/11/97	07/11/97	07/11/97	07/31/97
LOCATION:	RPLCP0010101	RPLDUP013	RPLCP0010101	RPLSS0010101	RPLDUP009	RPLSS0010101	RPLCP0020101
FIELD DUPLICATE OF:		RPLCP0010101	RPLCP0010101		RPLSS0010101	RPLSS0010101	

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
A,A-DIMETHYLPHENETHYLAMINE	740 U	740 U	740 U	710 UJ	700 UJ	705 UJ	730 U
ACENAPHTHENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	38 J
ACENAPHTHYLENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	600
ACETOPHENONE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
ANILINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
ANTHRACENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	170 J
ARAMITE	370 UJ	370 UJ	370 U	350 UJ	350 UJ	350 UJ	370 UJ
BENZO(A)ANTHRACENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	920
BENZO(A)PYRENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	1400 J
BENZO(B)FLUORANTHENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	1300 J
BENZO(G,H,I)PERYLENE	370 U	37 J	37 J	350 UJ	350 UJ	350 UJ	1500 J
BENZO(K)FLUORANTHENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	970 J
BENZYL ALCOHOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
BIS(2-CHLOROETHOXY)METHANE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
BIS(2-CHLOROETHYL)ETHER	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
BUTYLBENZYL PHTHALATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
CHLOROBENZILATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
CHRYSENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	970
CIS-ISOSAFROLE	370 UJ	370 UJ	370 UJ	350 UJ	350 UJ	350 UJ	370 UJ
DI-N-BUTYL PHTHALATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
DI-N-OCTYL PHTHALATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLCP0010101	RPLCP0010101-D	RPLCP0010101-AVG	RPLSS0010101	RPLSS0010101-D	RPLSS0010101-AVG	RPLCP0020101
SAMPLE DATE:	07/31/97	07/31/97	07/31/97	07/11/97	07/11/97	07/11/97	07/31/97
LOCATION:	RPLCP0010101	RPLDUP013	RPLCP0010101	RPLSS0010101	RPLDUP009	RPLSS0010101	RPLCP0020101
FIELD DUPLICATE OF:		RPLCP0010101	RPLCP0010101		RPLSS0010101	RPLSS0010101	

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
DIBENZO(A,H)ANTHRACENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
DIBENZOFURAN	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
DIETHYL PHTHALATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
DIMETHYL PHTHALATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
DIPHENYLAMINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
ETHYL METHACRYLATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
ETHYL METHANESULFONATE	740 U	740 U	740 U	710 UJ	700 UJ	705 UJ	730 U
FAMPHUR	370 UR	370 UR	370 UR	350 UR	350 UR	350 UR	370 UR
FLUORANTHENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	1000
FLUORENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	96 J
HEXACHLOROBENZENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
HEXACHLOROBUTADIENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
HEXACHLOROCYCLOPENTADIENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
HEXACHLOROETHANE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
HEXACHLOROPROPENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
INDENO(1,2,3-CD)PYRENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	1200
ISODRIN	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
ISOPHORONE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
KEPONE	370 UR	370 UR	370 UR	350 UR	350 UR	350 UR	370 UR
METHAPYRILENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
METHYL METHANESULFONATE	740 U	740 U	740 U	710 UJ	700 UJ	705 UJ	730 U
N-NITROSO-DI-N-BUTYLAMINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLCP0010101	RPLCP0010101-D	RPLCP0010101-AVG	RPLSS0010101	RPLSS0010101-D	RPLSS0010101-AVG	RPLCP0020101
SAMPLE DATE:	07/31/97	07/31/97	07/31/97	07/11/97	07/11/97	07/11/97	07/31/97
LOCATION:	RPLCP0010101	RPLDUP013	RPLCP0010101	RPLSS0010101	RPLDUP009	RPLSS0010101	RPLCP0020101
FIELD DUPLICATE OF:		RPLCP0010101	RPLCP0010101		RPLSS0010101	RPLSS0010101	

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
N-NITROSODIMETHYLAMINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
N-NITROSODIPHENYLAMINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
N-NITROSOMETHYLETHYLAMINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
N-NITROSOMORPHOLINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
N-NITROSOPIPERIDINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
N-NITROSOPYRROLIDINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
NAPHTHALENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	40 J
NITROBENZENE-OS	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
O-TOLUIDINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
P-DIMETHYLAMINOAZOBENZENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
P-PHENYLENEDIAMINE	370 UJ	370 UJ	370 UJ	350 UJ	350 UJ	350 UJ	370 UJ
PENTACHLOROBENZENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
PENTACHLORONITROBENZENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
PENTACHLOROPHENOL	1900 U	1900 U	1900 U	1800 UJ	1800 UJ	1800 UJ	1800 U
PHENACETIN	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
PHENANTHRENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	440
PHENOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
PRONAMIDE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
PYRENE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	1800
PYRIDINE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
SAFROLE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
TRANS-ISOSAFROLE	370 UJ	370 UJ	370 UJ	350 UJ	350 UJ	350 UJ	370 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLCP0010101	RPLCP0010101-D	RPLCP0010101-AVG	RPLSS0010101	RPLSS0010101-D	RPLSS0010101-AVG	RPLCP0020101
SAMPLE DATE:	07/31/97	07/31/97	07/31/97	07/11/97	07/11/97	07/11/97	07/31/97
LOCATION:	RPLCP0010101	RPLDUP013	RPLCP0010101	RPLSS0010101	RPLDUP009	RPLSS0010101	RPLCP0020101
FIELD DUPLICATE OF:		RPLCP0010101	RPLCP0010101		RPLSS0010101	RPLSS0010101	

**HERBICIDES (µg/kg)**

DIMETHOATE	370 UJ	370 UJ	370 UJ	350 UJ	350 UJ	350 UJ	370 UJ
PHORATE	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
SULFOTEP	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U

**METALS (mg/kg)**

ANTIMONY	0.76 B	0.82 B	0.79 B	0.31 L	0.21 UL	0.2075	0.72 B
ARSENIC	6.2 K	5.5 K	5.85 K	1.9	0.96 B	1.43 B	2.8 K
BARIUM	18.4	18.3	18.35	16.0	14.5	15.25	28.9
BERYLLIUM	0.42	0.34	0.38	0.26	0.21	0.235	0.19
CADMIUM	0.12 U	0.12 U	0.12 U	0.22 K	0.15 K	0.185 K	0.15 K
CHROMIUM	24.9 K	22.5 K	23.7 K	8.2 J	5.9 J	7.05 J	13.3 K
COBALT	2.7	2.6	2.65	1.8	1.7	1.75	4.5
COPPER	10.0	6.7	8.35	2.7 B	2.0 B	2.35 B	12.9
LEAD	7.2 K	7.0 K	7.1 K	7.8 J	4.3 J	6.05 J	20.3 K
MERCURY	0.06	0.05	0.055	0.02	0.02	0.02	0.31
NICKEL	4.9	4.3	4.6	3.7	3.9	3.8	8.2
SELENIUM	1.1 L	0.87 L	0.985 L	0.48	0.30	0.39	0.42 L
SILVER	0.07 U	0.10 B	0.0675 B	0.06 U	0.07 U	0.065 U	0.13 B
THALLIUM	0.83 B	0.31 B	0.57 B	0.43 B	0.23 U	0.2725	0.24 U
TIN	3.3 B	2.9 B	3.1 B	2.2 B	1.8 B	2 B	3.0 B
VANADIUM	30.6	26.3	28.45	13.5	8.5	11	21.4
ZINC	19.5 J	17.4 J	18.45 J	11.7 J	10.2 J	10.95 J	28.2 J

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	370 U	370 U	370 U	350 UJ	350 UJ	350 UJ	370 U
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**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLSS0040101-D	RPLSS0040101-AVG
SAMPLE DATE:	07/12/97	07/31/97	07/12/97	07/31/97	07/15/97	07/15/97	07/15/97
LOCATION:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLDUP010	RPLSS0040101
FIELD DUPLICATE OF:						RPLSS0040101	RPLSS0040101

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,1,1-TRICHLOROETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,1,2-TRICHLOROETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,1-DICHLOROETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,1-DICHLOROETHENE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,2,3-TRICHLOROPROPANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,2-DIBROMO-3-CHLOROPROPANE	120 U	110 U	120 UJ	110 U	120 U	110 U	115 U
1,2-DIBROMOETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,2-DICHLOROETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,2-DICHLOROPROPANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
1,4-DICHLORO-2-BUTENE	120 U	110 U	120 UJ	110 U	120 U	110 U	115 U
2-BUTANONE	12 UR	11 UR	12 UR	11 UR	12 UR	11 UR	11.5 UR
2-HEXANONE	12 U	11 U	12 UJ	11 U	12 U	11 U	11.5 U
4-METHYL-2-PENTANONE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
ACETONE	58 B	11 U	2200	23 J	80 B	90 B	85 B
ACETONITRILE	120 UR	110 UJ	120 UR	110 UJ	120 UJ	110 UJ	115 UJ
ACROLEIN	23 UR	22 U	23 UR	23 U	24 UR	22 UR	11 UR
ACRYLONITRILE	6 UR	6 U	6 UR	6 U	6 U	5 U	5.5 U
ALLYL CHLORIDE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
BENZENE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
BROMODICHLOROMETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
BROMOFORM	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
BROMOMETHANE	12 U	11 U	12 UJ	11 U	12 U	11 U	11.5 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLSS0040101-D	RPLSS0040101-AVG
SAMPLE DATE:	07/12/97	07/31/97	07/12/97	07/31/97	07/15/97	07/15/97	07/15/97
LOCATION:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLDUP010	RPLSS0040101
FIELD DUPLICATE OF:						RPLSS0040101	RPLSS0040101

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
CARBON TETRACHLORIDE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
CHLOROBENZENE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
CHLOROETHANE	12 U	11 U	12 UJ	11 U	12 U	11 U	11.5 U
CHLOROFORM	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
CHLOROMETHANE	12 U	11 U	12 UJ	11 U	12 U	11 U	11.5 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
DIBROMOCHLOROMETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
DIBROMOMETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
DICHLORODIFLUOROMETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
ETHYLBENZENE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
IODOMETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
ISOBUTYL ALCOHOL	58 UR	56 U	58 UR	57 U	61 U	54 U	57.5 U
M&P-XYLENES	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
METHACRYLONITRILE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
METHYL METHACRYLATE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
METHYLENE CHLORIDE	6 U	20 B	2 B	22 B	7 B	7 B	7 B
O-XYLENE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
PENTACHLOROETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
PROPIONITRILE	58 UR	56 U	58 UR	57 U	61 U	54 U	57.5 U
STYRENE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
TETRACHLOROETHENE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
TOLUENE	6 U	6 U	6 UJ	6 U	2 J	5 U	2 J
TRANS-1,2-DICHLOROETHENE	6 U	6 U	6 UJ	1 J	6 U	5 U	5.5 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLSS0040101-D	RPLSS0040101-AVG
SAMPLE DATE:	07/12/97	07/31/97	07/12/97	07/31/97	07/15/97	07/15/97	07/15/97
LOCATION:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLDUP010	RPLSS0040101
FIELD DUPLICATE OF:						RPLSS0040101	RPLSS0040101

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
TRICHLOROETHENE	6 U	1 J	6 UJ	6 U	6 U	5 U	5.5 U
TRICHLOROFLUOROMETHANE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U
VINYL ACETATE	12 U	11 U	12 UJ	11 U	12 U	11 U	11.5 U
VINYL CHLORIDE	6 U	6 U	6 UJ	6 U	6 U	5 U	5.5 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
1,2,4-TRICHLOROBENZENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
1,2-DICHLOROBENZENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
1,3,5-TRINITROBENZENE-OS	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
1,3-DICHLOROBENZENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
1,3-DINITROBENZENE-OS	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
1,4-DICHLOROBENZENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
1,4-DIOXANE-OS	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
1,4-NAPHTHOQUINONE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
1-NAPHTHYLAMINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2,3,4,6-TETRACHLOROPHENOL	1900 UJ	1900 U	1900 UJ	1900 U	2000 UJ	1800 UJ	1900 UJ
2,4,5-TRICHLOROPHENOL	780 UJ	740 U	780 UJ	760 U	800 UJ	720 UJ	760 UJ
2,4,6-TRICHLOROPHENOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2,4-DICHLOROPHENOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2,4-DIMETHYLPHENOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2,4-DINITROPHENOL	1900 UJ	1900 U	1900 UJ	1900 U	2000 UJ	1800 UJ	1900 UJ
2,4-DINITROTOLUENE-OS	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLSS0040101-D	RPLSS0040101-AVG
SAMPLE DATE:	07/12/97	07/31/97	07/12/97	07/31/97	07/15/97	07/15/97	07/15/97
LOCATION:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLDUP010	RPLSS0040101
FIELD DUPLICATE OF:						RPLSS0040101	RPLSS0040101

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2,6-DINITROTOLUENE-OS	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2-ACETYLAMINOFUORENE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ
2-CHLORONAPHTHALENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2-CHLOROPHENOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2-METHYLNAPHTHALENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2-METHYLPHENOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2-NAPHTHYLAMINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2-NITROANILINE	1900 UJ	1900 U	1900 UJ	1900 U	2000 UJ	1800 UJ	1900 UJ
2-NITROPHENOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
2-PICOLINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
3,3'-DICHLOROBENZIDINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
3,3'-DIMETHYLBENZIDINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
3-METHYLCHOLANTHRENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
3-NITROANILINE	1900 UJ	1900 U	1900 UJ	1900 U	2000 UJ	1800 UJ	1900 UJ
4,6-DINITRO-2-METHYLPHENOL	1900 UJ	1900 U	1900 UJ	1900 U	2000 UJ	1800 UJ	1900 UJ
4-AMINOBIHENYL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
4-BROMOPHENYL PHENYL ETHER	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
4-CHLORO-3-METHYLPHENOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
4-CHLOROANILINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
4-CHLOROPHENYL PHENYL ETHER	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
4-NITROANILINE	1900 UJ	1900 U	1900 UJ	1900 U	2000 UJ	1800 UJ	1900 UJ
4-NITROPHENOL	1900 UJ	1900 U	1900 UJ	1900 U	2000 UJ	1800 UJ	1900 UJ
4-NITROQUINOLINE-1-OXIDE	390 UR	370 UR	390 UR	380 UR	400 UR	360 UR	380 UR

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLSS0040101-D	RPLSS0040101-AVG
SAMPLE DATE:	07/12/97	07/31/97	07/12/97	07/31/97	07/15/97	07/15/97	07/15/97
LOCATION:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLDUP010	RPLSS0040101
FIELD DUPLICATE OF:						RPLSS0040101	RPLSS0040101

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
A,A-DIMETHYLPHENETHYLAMINE	780 UJ	740 U	780 UJ	760 U	800 UJ	720 UJ	760 UJ
ACENAPHTHENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
ACENAPHTHYLENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
ACETOPHENONE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
ANILINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
ANTHRACENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
ARAMITE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ
BENZO(A)ANTHRACENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
BENZO(A)PYRENE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ
BENZO(B)FLUORANTHENE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ
BENZO(G,H,I)PERYLENE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ
BENZO(K)FLUORANTHENE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ
BENZYL ALCOHOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
BIS(2-CHLOROETHOXY)METHANE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
BIS(2-CHLOROETHYL)ETHER	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	96 J	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
BUTYLBENZYL PHTHALATE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
CHLOROBENZILATE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
CHRYSENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
CIS-ISOSAFROLE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ
DI-N-BUTYL PHTHALATE	390 UJ	370 U	390 UJ	380 U	46 UJ	84 UJ	65 UJ
DI-N-OCTYL PHTHALATE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLSS0040101-D	RPLSS0040101-AVG
SAMPLE DATE:	07/12/97	07/31/97	07/12/97	07/31/97	07/15/97	07/15/97	07/15/97
LOCATION:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLDUP010	RPLSS0040101
FIELD DUPLICATE OF:						RPLSS0040101	RPLSS0040101

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
DIBENZO(A,H)ANTHRACENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
DIBENZOFURAN	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
DIETHYL PHTHALATE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
DIMETHYL PHTHALATE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
DIPHENYLAMINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
ETHYL METHACRYLATE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
ETHYL METHANESULFONATE	780 UJ	740 U	780 UJ	760 U	800 UJ	720 UJ	760 UJ
FAMPHUR	390 UR	370 UR	390 UR	380 UR	400 UR	360 UR	360 UR
FLUORANTHENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
FLUORENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
HEXACHLOROBENZENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
HEXACHLOROBUTADIENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
HEXACHLOROCYCLOPENTADIENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
HEXACHLOROETHANE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
HEXACHLOROPROPENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
INDENO(1,2,3-CD)PYRENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
ISODRIN	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
ISOPHORONE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
KEPONE	390 UR	370 UR	390 UR	380 UR	400 UR	360 UR	360 UR
METHAPYRILENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
METHYL METHANESULFONATE	780 UJ	740 U	780 UJ	760 U	800 UJ	720 UJ	760 UJ
N-NITROSO-DI-N-BUTYLAMINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
N-NITROSO-DI-N-PROPYLAMINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLSS0040101-D	RPLSS0040101-AVG
SAMPLE DATE:	07/12/97	07/31/97	07/12/97	07/31/97	07/15/97	07/15/97	07/15/97
LOCATION:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLDUP010	RPLSS0040101
FIELD DUPLICATE OF:						RPLSS0040101	RPLSS0040101

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
N-NITROSODIMETHYLAMINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
N-NITROSODIPHENYLAMINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
N-NITROSOMETHYLETHYLAMINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
N-NITROSOMORPHOLINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
N-NITROSOPIPERIDINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
N-NITROSOPYRROLIDINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
NAPHTHALENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
NITROBENZENE-OS	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
O-TOLUIDINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
P-DIMETHYLAMINOAZOBENZENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
P-PHENYLENEDIAMINE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ
PENTACHLOROBENZENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
PENTACHLORONITROBENZENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
PENTACHLOROPHENOL	1900 UJ	1900 U	1900 UJ	1900 U	2000 UJ	1800 UJ	1900 UJ
PHENACETIN	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
PHENANTHRENE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
PHENOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
PRONAMIDE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
PYRENE	390 UJ	59 J	390 UJ	380 U	400 UJ	360 UJ	380 UJ
PYRIDINE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
SAFROLE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
TRANS-ISOSAFROLE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLSS0040101-D	RPLSS0040101-AVG
SAMPLE DATE:	07/12/97	07/31/97	07/12/97	07/31/97	07/15/97	07/15/97	07/15/97
LOCATION:	RPLSS0020101	RPLCP0030101	RPLSS0030101	RPLCP0040101	RPLSS0040101	RPLDUP010	RPLSS0040101
FIELD DUPLICATE OF:						RPLSS0040101	RPLSS0040101

**HERBICIDES (µg/kg)**

DIMETHOATE	390 UJ	370 UJ	390 UJ	380 UJ	400 UJ	360 UJ	380 UJ
PHORATE	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
SULFOTEP	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ

**METALS (mg/kg)**

ANTIMONY	0.31 L	1.2 B	0.26 UL	0.88 B	0.52 B	0.57 B	0.545 B
ARSENIC	2.5	4.2 K	1.8	3.7 K	3.1	4.0	3.55
BARIUM	18.6	40.9	12.5	42.7	21.7	25.7	23.7
BERYLLIUM	0.32	0.21	0.10 B	0.20	0.39 K	0.41 K	0.4 K
CADMIUM	0.33 K	0.14 U	0.25 K	0.14 U	0.13 U	0.12 U	0.125 U
CHROMIUM	10.3 J	16.5 K	9.6 J	18.4 K	20.4	22.0	21.2
COBALT	1.6	4.6	0.84	3.2	2.7	3.1	2.9
COPPER	3.3 B	11.3	4.5 B	9.4	3.4 B	3.5 B	3.45 B
LEAD	9.3 J	20.1 K	3.5 J	14.7 K	5.3 K	4.5 K	4.9 K
MERCURY	0.07	0.03	0.08	0.05	0.01 B	0.03 B	0.02 B
NICKEL	5.2	8.7	2.2	5.5	5.9	6.8	6.35
SELENIUM	0.63	0.53 L	0.65	0.74 L	0.64	0.75	0.695
SILVER	0.07 U	0.35 B	0.12 B	0.08 U	0.07 U	0.06 U	0.065 U
THALLIUM	0.29 U	0.28 U	0.28 U	0.37 B	0.52 B	0.66 K	0.59 K
TIN	2.5 B	3.4 B	2.4 B	4.0 B	2.7 B	2.9 B	2.8 B
VANADIUM	12.5	28.9	13.6	31.5	21.5	26.0	23.75
ZINC	14.8 J	30.7 J	7.0 J	32.0 J	19.4	23.1	21.25

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	390 UJ	370 U	390 UJ	380 U	400 UJ	360 UJ	380 UJ
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**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
SAMPLE DATE:	07/11/97	07/11/97	07/12/97	07/11/97	07/12/97	07/12/97	07/12/97
LOCATION:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,1,2,2-TETRACHLOROETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,1-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,1-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,2,3-TRICHLOROPROPANE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,2-DIBROMO-3-CHLOROPROPANE	120 UJ	130 U	120 U	120 U	120 UJ	120 UJ	120 U
1,2-DIBROMOETHANE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,2-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,2-DICHLOROPROPANE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
1,4-DICHLORO-2-BUTENE	120 UJ	130 U	120 U	120 U	120 UJ	120 UJ	120 U
2-BUTANONE	12 UR	13 UR	12 UR				
2-HEXANONE	12 UJ	13 U	12 U	12 U	12 UJ	12 UJ	12 U
4-METHYL-2-PENTANONE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
ACETONE	160 B	85 B	38 B	210 B	12 UJ	5000 K	12 U
ACETONITRILE	120 UR	130 UR	120 UR				
ACROLEIN	24 UR	26 UR	23 UR	24 UR	23 UR	24 UR	24 UR
ACRYLONITRILE	6 UR						
ALLYL CHLORIDE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
BENZENE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
BROMODICHLOROMETHANE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
BROMOFORM	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
BROMOMETHANE	12 U	13 U	12 U	12 U	12 UJ	12 UJ	12 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
SAMPLE DATE:	07/11/97	07/11/97	07/12/97	07/11/97	07/12/97	07/12/97	07/12/97
LOCATION:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6	6 U	6 U	6 U	6 UJ	6 UJ	6 U
CARBON TETRACHLORIDE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
CHLOROBENZENE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
CHLOROETHANE	12 U	13 U	12 U	12 U	12 UJ	12 UJ	12 U
CHLOROFORM	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
CHLOROMETHANE	12 U	13 U	12 U	12 U	12 UJ	12 UJ	12 U
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
DIBROMOCHLOROMETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
DIBROMOMETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
DICHLORODIFLUOROMETHANE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
ETHYLBENZENE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
IODOMETHANE	6 U	6 UJ	6 U	6 U	6 UJ	6 UJ	6 U
ISOBUTYL ALCOHOL	61 UR	65 UR	58 UR	60 UR	58 UR	61 UR	59 UR
M&P-XYLENES	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
METHACRYLONITRILE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
METHYL METHACRYLATE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
METHYLENE CHLORIDE	6 B	13 B	6 U	2 B	11 B	25 B	5 B
O-XYLENE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
PENTACHLOROETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
PROPIONITRILE	61 UR	65 UR	58 UR	60 UR	58 UR	61 UR	59 UR
STYRENE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
TETRACHLOROETHENE	6 UJ	6 U	6 U	6 U	6 UJ	6 UJ	6 U
TOLUENE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
TRANS-1,2-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
SAMPLE DATE:	07/11/97	07/11/97	07/12/97	07/11/97	07/12/97	07/12/97	07/12/97
LOCATION:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
TRICHLOROETHENE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
TRICHLOROFLUOROMETHANE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U
VINYL ACETATE	12 U	13 U	12 U	12 U	12 UJ	12 UJ	12 U
VINYL CHLORIDE	6 U	6 U	6 U	6 U	6 UJ	6 UJ	6 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
1,2,4-TRICHLOROBENZENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
1,2-DICHLOROBENZENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
1,3,5-TRINITROBENZENE-OS	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
1,3-DICHLOROBENZENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
1,3-DINITROBENZENE-OS	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
1,4-DICHLOROBENZENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
1,4-DIOXANE-OS	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
1,4-NAPHTHOQUINONE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
1-NAPHTHYLAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2,3,4,6-TETRACHLOROPHENOL	2000 UJ	2200 UJ	1900 UJ	2000 UJ	1900 UJ	2000 UJ	2000 UJ
2,4,5-TRICHLOROPHENOL	810 UJ	870 UJ	780 UJ	800 UJ	780 UJ	810 UJ	780 UJ
2,4,6-TRICHLOROPHENOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2,4-DICHLOROPHENOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2,4-DIMETHYLPHENOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2,4-DINITROPHENOL	2000 UJ	2200 UJ	1900 UJ	2000 UJ	1900 UJ	2000 UJ	2000 UJ
2,4-DINITROTOLUENE-OS	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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SAMPLE NUMBER:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
SAMPLE DATE:	07/11/97	07/11/97	07/12/97	07/11/97	07/12/97	07/12/97	07/12/97
LOCATION:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2,6-DINITROTOLUENE-OS	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2-ACETYLAMINOFUORENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2-CHLORONAPHTHALENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2-CHLOROPHENOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2-METHYLNAPHTHALENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2-METHYLPHENOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2-NAPHTHYLAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2-NITROANILINE	2000 UJ	2200 UJ	1900 UJ	2000 UJ	1900 UJ	2000 UJ	2000 UJ
2-NITROPHENOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
2-PICOLINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
3,3'-DICHLOROBENZIDINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
3,3'-DIMETHYLBENZIDINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
3-METHYLCHOLANTHRENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
3-NITROANILINE	2000 UJ	2200 UJ	1900 UJ	2000 UJ	1900 UJ	2000 UJ	2000 UJ
4,6-DINITRO-2-METHYLPHENOL	2000 UJ	2200 UJ	1900 UJ	2000 UJ	1900 UJ	2000 UJ	2000 UJ
4-AMINOBIHENYL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
4-BROMOPHENYL PHENYL ETHER	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
4-CHLORO-3-METHYLPHENOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
4-CHLOROANILINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
4-CHLOROPHENYL PHENYL ETHER	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
4-NITROANILINE	2000 UJ	2200 UJ	1900 UJ	2000 UJ	1900 UJ	2000 UJ	2000 UJ
4-NITROPHENOL	2000 UJ	2200 UJ	1900 UJ	2000 UJ	1900 UJ	2000 UJ	2000 UJ
4-NITROQUINOLINE-1-OXIDE	410 UR	430 UR	390 UR	400 UR	390 UR	410 UR	390 UR

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SAMPLE DATE:	07/11/97	07/11/97	07/12/97	07/11/97	07/12/97	07/12/97	07/12/97
LOCATION:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
A,A-DIMETHYLPHENETHYLAMINE	810 UJ	870 UJ	780 UJ	800 UJ	780 UJ	810 UJ	780 UJ
ACENAPHTHENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
ACENAPHTHYLENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
ACETOPHENONE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
ANILINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
ANTHRACENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
ARAMITE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
BENZO(A)ANTHRACENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
BENZO(A)PYRENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
BENZO(B)FLUORANTHENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
BENZO(G,H,I)PERYLENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
BENZO(K)FLUORANTHENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
BENZYL ALCOHOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
BIS(2-CHLOROETHOXY)METHANE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
BIS(2-CHLOROETHYL)ETHER	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	410 UJ	430 UJ	390 UJ	400 UJ	270 J	57 J	190 J
BUTYLBENZYL PHTHALATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
CHLOROBENZILATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
CHRYSENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
CIS-ISOSAFROLE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
DI-N-BUTYL PHTHALATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
DI-N-OCTYL PHTHALATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ

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SAMPLE NUMBER:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
SAMPLE DATE:	07/11/97	07/11/97	07/12/97	07/11/97	07/12/97	07/12/97	07/12/97
LOCATION:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
DIBENZO(A,H)ANTHRACENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
DIBENZOFURAN	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
DIETHYL PHTHALATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
DIMETHYL PHTHALATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
DIPHENYLAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
ETHYL METHACRYLATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
ETHYL METHANESULFONATE	810 UJ	870 UJ	780 UJ	800 UJ	780 UJ	810 UJ	780 UJ
FAMPHUR	410 UR	430 UR	390 UR	400 UR	390 UR	410 UR	390 UR
FLUORANTHENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
FLUORENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
HEXACHLOROBENZENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
HEXACHLOROBUTADIENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
HEXACHLOROCYCLOPENTADIENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
HEXACHLOROETHANE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
HEXACHLOROPROPENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
INDENO(1,2,3-CD)PYRENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
ISODRIN	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
ISOPHORONE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
KEPONE	410 UR	430 UR	390 UR	400 UR	390 UR	410 UR	390 UR
METHAPYRILENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
METHYL METHANESULFONATE	810 UJ	870 UJ	780 UJ	800 UJ	780 UJ	810 UJ	780 UJ
N-NITROSO-DI-N-BUTYLAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
N-NITROSO-DI-N-PROPYLAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ

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RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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SAMPLE NUMBER:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
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LOCATION:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
N-NITROSODIMETHYLAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
N-NITROSODIPHENYLAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
N-NITROSOMETHYLETHYLAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
N-NITROSOMORPHOLINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
N-NITROSOPIPERIDINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
N-NITROSOPYRROLIDINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
NAPHTHALENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
NITROBENZENE-OS	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
O-TOLUIDINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
P-DIMETHYLAMINOAZOBENZENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
P-PHENYLENEDIAMINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
PENTACHLOROBENZENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
PENTACHLORONITROBENZENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
PENTACHLOROPHENOL	2000 UJ	2200 UJ	1900 UJ	2000 UJ	1900 UJ	2000 UJ	2000 UJ
PHENACETIN	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
PHENANTHRENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
PHENOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
PRONAMIDE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
PYRENE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
PYRIDINE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
SAFROLE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
TRANS-ISOSAFROLE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ

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SAMPLE DATE:	07/11/97	07/11/97	07/12/97	07/11/97	07/12/97	07/12/97	07/12/97
LOCATION:	RPLSB0010101	RPLSB0010201	RPLSB0010301	RPLSB0010401	RPLSB0020101	RPLSB0020201	RPLSB0020301
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
PHORATE	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
SULFOTEP	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ

**METALS (mg/kg)**

ANTIMONY	0.53 L	0.34 L	0.43 L	0.62 L	0.86 L	1.0 L	0.39 L
ARSENIC	9.4	7.5	2.4	3.9	13.0	39.6	12.6
BARIUM	21.7	22.0	11.2	14.2	8.2	17.2	30.8
BERYLLIUM	0.41	0.69	0.42	1.0	1.0	1.9	0.50
CADMIUM	0.89	0.51 K	0.44 K	0.83 K	0.81 K	1.5	1.4
CHROMIUM	34.9 J	30.2 J	42.4 J	47.2 J	65.6 J	89.6 J	38.0 J
COBALT	0.69	2.2	0.63	2.8	1.0	3.2	0.70
COPPER	3.5 B	3.8 B	3.4 B	3.7 B	6.4	6.9	4.4 B
LEAD	3.6 J	3.8 J	4.5 J	4.8 J	4.5 J	5.7 J	3.2 J
MERCURY	0.02	0.02 U	0.03	0.02	0.03	0.02 U	0.02 U
NICKEL	7.5	7.7	2.5	8.6	5.7	25.8	10.7
SELENIUM	2.2	1.7	1.3	2.0	3.4	3.6	2.8
SILVER	0.07 U	0.09 U	0.16 B	0.08 U	0.08 B	0.08 U	0.08 U
THALLIUM	0.55 B	0.77 B	0.29 U	1.3 B	1.2 B	1.9 B	1.1 B
TIN	3.1 B	2.9 B	2.9 B	2.8 B	2.9 B	4.1 L	2.5 B
VANADIUM	27.9	30.6	41.8	29.9	51.8	56.4	26.1
ZINC	24.1 J	34.4 J	14.6 J	37.5 J	26.5 J	100 J	28.5 J

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	410 UJ	430 UJ	390 UJ	400 UJ	390 UJ	410 UJ	390 UJ
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**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
SAMPLE DATE:	07/12/97	07/12/97	07/15/97	07/15/97	07/15/97	//	//
LOCATION:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
1,1,1-TRICHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
1,1,2,2-TETRACHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
1,1,2-TRICHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
1,1-DICHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
1,1-DICHLOROETHENE	6 UJ	6 UJ	6 U	6 U	6 U		
1,2,3-TRICHLOROPROPANE	6 UJ	6 UJ	6 U	6 U	6 U		
1,2-DIBROMO-3-CHLOROPROPANE	110 UJ	120 UJ	120 U	120 U	130 U		
1,2-DIBROMOETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
1,2-DICHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
1,2-DICHLOROPROPANE	6 UJ	6 UJ	6 U	6 U	6 U		
1,4-DICHLORO-2-BUTENE	110 UJ	120 UJ	120 U	120 U	130 U		
2-BUTANONE	11 UR	12 UR	12 UR	12 UR	13 UR		
2-HEXANONE	11 UJ	12 UJ	12 U	12 U	13 U		
4-METHYL-2-PENTANONE	6 UJ	6 UJ	6 U	6 U	6 U		
ACETONE	1800	3800	12 U	610	46 B		
ACETONITRILE	110 UR	120 UR	120 UJ	120 UJ	130 UJ		
ACROLEIN	22 UR	24 UR	24 UR	24 UR	25 UR		
ACRYLONITRILE	6 UR	6 UR	6 U	6 U	6 U		
ALLYL CHLORIDE	6 UJ	6 UJ	6 U	6 U	6 U		
BENZENE	6 UJ	6 UJ	6 U	6 U	6 U		
BROMODICHLOROMETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
BROMOFORM	6 UJ	6 UJ	6 U	6 U	6 U		
BROMOMETHANE	11 UJ	12 UJ	12 U	12 U	13 U		

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
SAMPLE DATE:	07/12/97	07/12/97	07/15/97	07/15/97	07/15/97	//	//
LOCATION:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 UJ	6 UJ	6 U	6 U	6 U		
CARBON TETRACHLORIDE	6 UJ	6 UJ	6 U	6 U	6 U		
CHLOROBENZENE	6 UJ	6 UJ	6 U	6 U	6 U		
CHLOROETHANE	11 UJ	12 UJ	12 U	12 U	13 U		
CHLOROFORM	6 UJ	6 UJ	6 U	6 U	6 U		
CHLOROMETHANE	11 UJ	12 UJ	12 U	12 U	13 U		
CIS-1,3-DICHLOROPROPENE	6 UJ	6 UJ	6 U	6 U	6 U		
DIBROMOCHLOROMETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
DIBROMOMETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
DICHLORODIFLUOROMETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
ETHYLBENZENE	6 UJ	6 UJ	6 U	6 U	6 U		
IODOMETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
ISOBUTYL ALCOHOL	56 UR	59 UR	59 U	61 U	63 U		
M&P-XYLENES	6 UJ	6 UJ	6 U	6 U	6 U		
METHACRYLONITRILE	6 UJ	6 UJ	6 U	6 U	6 U		
METHYL METHACRYLATE	6 UJ	6 UJ	6 U	6 U	6 U		
METHYLENE CHLORIDE	14 B	27 B	8 B	9 B	8 B		
O-XYLENE	6 UJ	6 UJ	6 U	6 U	6 U		
PENTACHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
PROPIONITRILE	56 UR	59 UR	59 U	61 U	63 U		
STYRENE	6 UJ	6 UJ	6 U	6 U	6 U		
TETRACHLOROETHENE	6 UJ	6 UJ	6 U	6 U	6 U		
TOLUENE	6 UJ	6 UJ	6 U	6 U	6 U		
TRANS-1,2-DICHLOROETHENE	6 UJ	6 UJ	6 U	6 U	6 U		

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
SAMPLE DATE:	07/12/97	07/12/97	07/15/97	07/15/97	07/15/97	//	//
LOCATION:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 UJ	6 UJ	6 U	6 U	6 U		
TRICHLOROETHENE	6 UJ	6 UJ	6 U	6 U	6 U		
TRICHLOROFLUOROMETHANE	6 UJ	6 UJ	6 U	6 U	6 U		
VINYL ACETATE	11 UJ	12 UJ	12 U	12 U	13 U		
VINYL CHLORIDE	6 UJ	6 UJ	6 U	6 U	6 U		

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
1,2,4-TRICHLOROBENZENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
1,2-DICHLOROBENZENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
1,3,5-TRINITROBENZENE-OS	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
1,3-DICHLOROBENZENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
1,3-DINITROBENZENE-OS	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
1,4-DICHLOROBENZENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
1,4-DIOXANE-OS	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
1,4-NAPHTHOQUINONE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
1-NAPHTHYLAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2,2'-OXYBIS(1-CHLOROPROPANE)	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2,3,4,6-TETRACHLOROPHENOL	1900 UJ	2000 UJ	2000 UJ	2000 UJ	2100 UJ		
2,4,5-TRICHLOROPHENOL	750 UJ	780 UJ	790 UJ	810 UJ	840 UJ		
2,4,6-TRICHLOROPHENOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2,4-DICHLOROPHENOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2,4-DIMETHYLPHENOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2,4-DINITROPHENOL	1900 UJ	2000 UJ	2000 UJ	2000 UJ	2100 UJ		
2,4-DINITROTOLUENE-OS	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
SAMPLE DATE:	07/12/97	07/12/97	07/15/97	07/15/97	07/15/97	//	//
LOCATION:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2,6-DINITROTOLUENE-OS	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2-ACETYLAMINOFUORENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2-CHLORONAPHTHALENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2-CHLOROPHENOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2-METHYLNAPHTHALENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2-METHYLPHENOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2-NAPHTHYLAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2-NITROANILINE	1900 UJ	2000 UJ	2000 UJ	2000 UJ	2100 UJ		
2-NITROPHENOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
2-PICOLINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
3,3'-DICHLOROBENZIDINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
3,3'-DIMETHYLBENZIDINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
3-METHYLCHOLANTHRENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
3-NITROANILINE	1900 UJ	2000 UJ	2000 UJ	2000 UJ	2100 UJ		
4,6-DINITRO-2-METHYLPHENOL	1900 UJ	2000 UJ	2000 UJ	2000 UJ	2100 UJ		
4-AMINOBIPHENYL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
4-BROMOPHENYL PHENYL ETHER	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
4-CHLORO-3-METHYLPHENOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
4-CHLOROANILINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
4-CHLOROPHENYL PHENYL ETHER	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
4-NITROANILINE	1900 UJ	2000 UJ	2000 UJ	2000 UJ	2100 UJ		
4-NITROPHENOL	1900 UJ	2000 UJ	2000 UJ	2000 UJ	2100 UJ		
4-NITROQUINOLINE-1-OXIDE	370 UR	390 UR	400 UR	410 UR	420 UR		

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
SAMPLE DATE:	07/12/97	07/12/97	07/15/97	07/15/97	07/15/97	//	//
LOCATION:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/kg)**

5-NITRO-O-TOLUIDINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
7,12-DIMETHYLBENZ(A)ANTHRACENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
A,A-DIMETHYLPHENETHYLAMINE	750 UJ	780 UJ	790 UJ	810 UJ	840 UJ		
ACENAPHTHENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
ACENAPHTHYLENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
ACETOPHENONE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
ANILINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
ANTHRACENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
ARAMITE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BENZO(A)ANTHRACENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BENZO(A)PYRENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BENZO(B)FLUORANTHENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BENZO(G,H,I)PERYLENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BENZO(K)FLUORANTHENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BENZYL ALCOHOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BIS(2-CHLOROETHOXY)METHANE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BIS(2-CHLOROETHYL)ETHER	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BIS(2-ETHYLHEXYL)PHTHALATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
BUTYLBENZYL PHTHALATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
CHLOROBENZILATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
CHRYSENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
CIS-ISOSAFROLE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
DI-N-BUTYL PHTHALATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
DI-N-OCTYL PHTHALATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
SAMPLE DATE:	07/12/97	07/12/97	07/15/97	07/15/97	07/15/97	//	//
LOCATION:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
DIBENZO(A,H)ANTHRACENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
DIBENZOFURAN	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
DIETHYL PHTHALATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
DIMETHYL PHTHALATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
DIPHENYLAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
ETHYL METHACRYLATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
ETHYL METHANESULFONATE	750 UJ	780 UJ	790 UJ	810 UJ	840 UJ		
FAMPHUR	370 UR	390 UR	400 UR	410 UR	420 UR		
FLUORANTHENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
FLUORENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
HEXACHLOROENZENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
HEXACHLOROBUTADIENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
HEXACHLOROCYCLOPENTADIENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
HEXACHLOROETHANE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
HEXACHLOROPROPENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
INDENO(1,2,3-CD)PYRENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
ISODRIN	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
ISOPHORONE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
KEPONE	370 UR	390 UR	400 UR	410 UR	420 UR		
METHAPYRILENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
METHYL METHANESULFONATE	750 UJ	780 UJ	790 UJ	810 UJ	840 UJ		
N-NITROSO-DI-N-BUTYLAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
N-NITROSO-DI-N-PROPYLAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
SAMPLE DATE:	07/12/97	07/12/97	07/15/97	07/15/97	07/15/97	//	//
LOCATION:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
N-NITROSODIMETHYLAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
N-NITROSODIPHENYLAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
N-NITROSOMETHYLETHYLAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
N-NITROSOMORPHOLINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
N-NITROSOPIPERIDINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
N-NITROSOPYRROLIDINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
NAPHTHALENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
NITROBENZENE-OS	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
O,O,O-TRIETHYLPHOSPHOROTHIOAT	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
O-TOLUIDINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
P-DIMETHYLAMINOAZOBENZENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
P-PHENYLENEDIAMINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
PENTACHLOROBENZENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
PENTACHLORONITROBENZENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
PENTACHLOROPHENOL	1900 UJ	2000 UJ	2000 UJ	2000 UJ	2100 UJ		
PHENACETIN	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
PHENANTHRENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
PHENOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
PRONAMIDE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
PYRENE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
PYRIDINE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
SAFROLE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
TRANS-ISOSAFROLE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
SAMPLE DATE:	07/12/97	07/12/97	07/15/97	07/15/97	07/15/97	//	//
LOCATION:	RPLSB0030101	RPLSB0030201	RPLSB0040101	RPLSB0040201	RPLSB0040301		
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
PHORATE	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
SULFOTEP	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		

**METALS (mg/kg)**

ANTIMONY	0.21 UL	0.42 L	1.5 B	1.4 B	1.5 B		
ARSENIC	2.0	7.6	7.7	12.1	10.1		
BARIUM	15.0	12.5	19.3	30.0	24.3		
BERYLLIUM	0.12	0.33	1.4 K	1.8 K	1.9 K		
CADMIUM	0.23 K	0.37 K	0.14 U	0.16 U	0.14 U		
CHROMIUM	10.0 J	38.0 J	113	83.5	99.3		
COBALT	0.86	0.34	1.7	2.1	0.25		
COPPER	4.5 B	5.2	4.4 B	3.8 B	3.7 B		
LEAD	4.0 J	3.4 J	5.7 K	5.2 K	4.3 K		
MERCURY	0.07	0.02	0.02	0.02 U	0.02 U		
NICKEL	3.0	1.9	9.5	16.7	9.2		
SELENIUM	0.68	2.6	1.0	1.9	2.2		
SILVER	0.07 B	0.08 B	0.08 U	0.08 U	0.08 U		
THALLIUM	0.23 B	0.66 B	0.66 K	2.2 K	2.7 K		
TIN	1.9 B	2.0 B	3.8 B	4.2 B	3.9 B		
VANADIUM	16.7	28.4	84.2	59.9	79.6		
ZINC	10.3 J	8.2 J	39.4	43.6	37.5		

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	370 UJ	390 UJ	400 UJ	410 UJ	420 UJ		
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**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
SAMPLE DATE:	08/06/97	08/06/97	08/12/97	08/12/97	08/06/97	08/06/97	08/13/97
LOCATION:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
FIELD DUPLICATE OF:							

**VOLATILES (µg/L)**

1,1,1,2-TETRACHLOROETHANE	5 U		5 U		5 U		5 U
1,1,1-TRICHLOROETHANE	5 U		5 U		5 U		5 U
1,1,2,2-TETRACHLOROETHANE	5 U		5 U		5 U		5 U
1,1,2-TRICHLOROETHANE	5 U		5 U		5 U		5 U
1,1-DICHLOROETHANE	5 U		5 U		5 U		5 U
1,1-DICHLOROETHENE	5 U		5 U		5 U		5 U
1,2,3-TRICHLOROPROPANE	5 U		5 U		5 U		5 U
1,2-DIBROMO-3-CHLOROPROPANE	100 U		100 U		100 U		100 U
1,2-DIBROMOETHANE	5 U		5 U		5 U		5 U
1,2-DICHLOROETHANE	5 U		5 U		5 U		5 U
1,2-DICHLOROPROPANE	5 U		5 U		5 U		5 U
1,4-DICHLORO-2-BUTENE	100 U		100 U		100 U		100 U
2-BUTANONE	10 UR		10 UR		10 UR		10 UR
2-HEXANONE	10 U		10 U		10 U		10 U
4-METHYL-2-PENTANONE	5 U		5 U		5 U		5 U
ACETONE	10 U		95		10 U		10 U
ACETONITRILE	100 UR		100 UR		100 UR		100 UR
ACROLEIN	20 UR		20 UR		20 UR		20 UR
ACRYLONITRILE	5 UR		5 UR		5 UR		5 UR
ALLYL CHLORIDE	5 U		5 U		5 U		5 U
BENZENE	5 U		5 U		5 U		5 U
BROMODICHLOROMETHANE	5 U		5 U		5 U		5 U
BROMOFORM	5 U		5 U		5 U		5 U
BROMOMETHANE	10 U		10 U		10 U		10 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
SAMPLE DATE:	08/06/97	08/06/97	08/12/97	08/12/97	08/06/97	08/06/97	08/13/97
LOCATION:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/L)</b>							
CARBON DISULFIDE	6		5 U		5 U		5 U
CARBON TETRACHLORIDE	5 U		5 U		5 U		5 U
CHLOROBENZENE	5 U		5 U		5 U		5 U
CHLOROETHANE	10 U		10 U		10 U		10 U
CHLOROFORM	2 J		5 U		5 U		5 U
CHLOROMETHANE	10 U		10 U		10 U		10 U
CIS-1,3-DICHLOROPROPENE	5 U		5 U		5 U		5 U
DIBROMOCHLOROMETHANE	5 U		5 U		5 U		5 U
DIBROMOMETHANE	5 U		5 U		5 U		5 U
DICHLORODIFLUOROMETHANE	5 U		5 U		5 U		5 U
ETHYLBENZENE	5 U		5 U		5 U		5 U
IODOMETHANE	5 U		5 U		5 U		5 U
ISOBUTYL ALCOHOL	50 UR		50 UR		50 UR		50 UR
M&P-XYLENES	5 U		5 U		5 U		5 U
METHACRYLONITRILE	5 U		5 U		5 U		5 U
METHYL METHACRYLATE	5 U		5 U		5 U		5 U
METHYLENE CHLORIDE	3 B		4 B		2 B		4 B
O-XYLENE	5 U		5 U		5 U		5 U
PENTACHLOROETHANE	5 U		5 U		5 U		5 U
PROPIONITRILE	50 UR		50 U		50 UR		50 U
STYRENE	5 U		5 U		5 U		5 U
TETRACHLOROETHENE	5 U		5 U		5 U		5 U
TOLUENE	7		5 U		5 U		5 U
TRANS-1,2-DICHLOROETHENE	5 U		5 U		5 U		5 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
SAMPLE DATE:	08/06/97	08/06/97	08/12/97	08/12/97	08/06/97	08/06/97	08/13/97
LOCATION:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
FIELD DUPLICATE OF:							

**VOLATILES (µg/L)**

TRANS-1,3-DICHLOROPROPENE	5 U		5 U		5 U		5 U
TRICHLOROETHENE	5 U		5 U		5 U		5 U
TRICHLOROFUOROMETHANE	5 U		5 U		5 U		5 U
VINYL ACETATE	10 UR		10 UR		10 UR		10 UR
VINYL CHLORIDE	5 U		5 U		5 U		5 U

**SEMIVOLATILES (µg/L)**

1,2,4,5-TETRACHLOROBENZENE	11 U		11 U		11 U		11 U
1,2,4-TRICHLOROBENZENE	11 U		11 U		11 U		11 U
1,2-DICHLOROBENZENE	11 U		11 U		11 U		11 U
1,3,5-TRINITROBENZENE-OS	11 U		11 U		11 U		11 U
1,3-DICHLOROBENZENE	11 U		11 U		11 U		11 U
1,3-DINITROBENZENE-OS	11 U		11 U		11 U		11 U
1,4-DICHLOROBENZENE	11 U		11 U		11 U		11 U
1,4-DIOXANE-OS	11 U		11 U		11 UJ		11 U
1,4-NAPHTHOQUINONE	11 U		11 U		11 U		11 U
1-NAPHTHYLAMINE	11 U		11 U		11 U		11 U
2,2'-OXYBIS(1-CHLOROPROPANE)	11 U		11 U		11 U		11 U
2,3,4,6-TETRACHLOROPHENOL	57 U		55 U		54 U		56 U
2,4,5-TRICHLOROPHENOL	23 U		22 U		22 U		22 U
2,4,6-TRICHLOROPHENOL	11 U		11 U		11 U		11 U
2,4-DICHLOROPHENOL	11 U		11 U		11 U		11 U
2,4-DIMETHYLPHENOL	11 U		11 U		11 U		11 U
2,4-DINITROPHENOL	57 U		55 U		54 U		56 U
2,4-DINITROTOLUENE-OS	11 U		11 U		11 U		11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
SAMPLE DATE:	08/06/97	08/06/97	08/12/97	08/12/97	08/06/97	08/06/97	08/13/97
LOCATION:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/L)</b>							
2,6-DICHLOROPHENOL	11 U		11 U		11 U		11 U
2,6-DINITROTOLUENE-OS	11 U		11 U		11 U		11 U
2-ACETYLAMINOFUORENE	11 U		11 U		11 U		11 U
2-CHLORONAPHTHALENE	11 U		11 U		11 U		11 U
2-CHLOROPHENOL	11 U		11 U		11 U		11 U
2-METHYLNAPHTHALENE	11 U		11 U		11 U		11 U
2-METHYLPHENOL	11 U		11 U		11 U		11 U
2-NAPHTHYLAMINE	11 U		11 U		11 U		11 U
2-NITROANILINE	57 U		55 U		54 U		56 U
2-NITROPHENOL	11 U		11 U		11 U		11 U
2-PICOLINE	11 U		11 U		11 U		11 U
3,3'-DICHLOROBENZIDINE	11 UJ		11 U		11 U		11 U
3,3'-DIMETHYLBENZIDINE	11 U		11 U		11 U		11 U
3-METHYLCHOLANTHRENE	11 U		11 U		11 U		11 U
3-NITROANILINE	57 U		55 U		54 U		56 U
4,6-DINITRO-2-METHYLPHENOL	57 U		55 U		54 U		56 U
4-AMINOBIHENYL	11 U		11 U		11 U		11 U
4-BROMOPHENYL PHENYL ETHER	11 U		11 U		11 U		11 U
4-CHLORO-3-METHYLPHENOL	11 U		11 U		11 U		11 U
4-CHLOROANILINE	11 U		11 U		11 U		11 U
4-CHLOROPHENYL PHENYL ETHER	11 U		11 U		11 U		11 U
4-NITROANILINE	57 UJ		55 U		54 UJ		56 U
4-NITROPHENOL	57 U		55 U		54 U		56 U
4-NITROQUINOLINE-1-OXIDE	11 UR		11 UR		11 UR		11 UR

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
SAMPLE DATE:	08/06/97	08/06/97	08/12/97	08/12/97	08/06/97	08/06/97	08/13/97
LOCATION:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/L)</b>							
5-NITRO-O-TOLUIDINE	11 U		11 U		11 U		11 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	11 U		11 U		11 U		11 U
1,4-DIMETHYLPHENETHYLAMINE	23 U		22 UJ		22 UJ		22 UJ
ACENAPHTHENE	11 U		11 U		11 U		11 U
ACENAPHTHYLENE	11 U		11 U		11 U		11 U
ACETOPHENONE	11 U		11 U		11 U		11 U
ANILINE	11 U		11 U		11 U		11 U
ANTHRACENE	11 U		11 U		11 U		11 U
ARAMITE	11 U		11 UJ		11 U		11 UJ
BENZO(A)ANTHRACENE	11 U		11 U		11 U		11 U
BENZO(A)PYRENE	11 U		11 U		11 U		11 U
BENZO(B)FLUORANTHENE	11 U		11 U		11 U		11 U
BENZO(G,H,I)PERYLENE	11 U		11 U		11 U		11 U
BENZO(K)FLUORANTHENE	11 U		11 U		11 U		11 U
BENZYL ALCOHOL	11 U		11 U		11 U		11 U
BIS(2-CHLOROETHOXY)METHANE	11 U		11 U		11 U		11 U
BIS(2-CHLOROETHYL)ETHER	11 U		11 U		11 U		11 U
BIS(2-ETHYLHEXYL)PHTHALATE	1 J		11 U		4 J		11 U
BUTYLBENZYL PHTHALATE	11 U		11 U		11 U		11 U
CHLOROBENZILATE	11 U		11 U		11 U		11 U
CHRYSENE	11 U		11 U		11 U		11 U
CIS-ISOSAFROLE	11 UJ		11 U		11 U		11 U
DI-N-BUTYL PHTHALATE	1 J		11 U		11 U		11 U
DI-N-OCTYL PHTHALATE	11 U		11 U		11 U		11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
SAMPLE DATE:	08/06/97	08/06/97	08/12/97	08/12/97	08/06/97	08/06/97	08/13/97
LOCATION:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/L)</b>							
DIALATE	11 U		11 U		11 U		11 U
DIBENZO(A,H)ANTHRACENE	11 U		11 U		11 U		11 U
DIBENZOFURAN	11 U		11 U		11 U		11 U
DIETHYL PHTHALATE	3 J		11 U		11 U		11 U
DIMETHYL PHTHALATE	11 U		11 U		11 U		11 U
DIPHENYLAMINE	11 U		11 U		11 U		11 U
ETHYL METHACRYLATE	11 U		11 U		11 U		11 U
ETHYL METHANESULFONATE	23 U		22 U		22 U		22 U
FAMPHUR	11 UR		11 UR		11 UR		11 UR
FLUORANTHENE	11 U		11 U		11 U		11 U
FLUORENE	11 U		11 U		11 U		11 U
HEXACHLOROENZENE	11 U		11 U		11 U		11 U
HEXACHLOROBUTADIENE	11 U		11 U		11 U		11 U
HEXACHLOROCYCLOPENTADIENE	11 U		11 U		11 U		11 U
HEXACHLOROETHANE	11 U		11 U		11 U		11 U
HEXACHLOROPROPENE	11 U		11 U		11 U		11 U
INDENO(1,2,3-CD)PYRENE	11 U		11 U		11 U		11 U
ISODRIN	11 U		11 U		11 U		11 U
ISOPHORONE	11 U		11 U		11 U		11 U
KEPONE	11 UR		11 UR		11 UR		11 UR
METHAPYRILENE	11 UJ		11 U		11 UJ		11 U
METHYL METHANESULFONATE	23 U		22 U		22 U		22 U
N-NITROSO-DI-N-BUTYLAMINE	11 U		11 U		11 U		11 U
N-NITROSO-DI-N-PROPYLAMINE	11 U		11 U		11 U		11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
SAMPLE DATE:	08/06/97	08/06/97	08/12/97	08/12/97	08/06/97	08/06/97	08/13/97
LOCATION:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/L)**

N-NITROSODIETHYLAMINE	11 U		11 U		11 U		11 U
N-NITROSODIMETHYLAMINE	11 U		11 U		11 U		11 U
N-NITROSODIPHENYLAMINE	11 U		11 U		11 U		11 U
N-NITROSOMETHYLETHYLAMINE	11 U		11 U		11 U		11 U
N-NITROSOMORPHOLINE	11 U		11 U		11 U		11 U
N-NITROSOPIPERIDINE	11 U		11 U		11 U		11 U
N-NITROSOPYRROLIDINE	11 U		11 U		11 U		11 U
NAPHTHALENE	11 U		11 U		11 U		11 U
NITROBENZENE-OS	11 U		11 U		11 U		11 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	11 U		11 U		11 U		11 U
O-TOLUIDINE	11 UJ		11 U		11 U		11 U
P-DIMETHYLAMINOAZOBENZENE	11 U		11 U		11 U		11 U
P-PHENYLENEDIAMINE	11 UJ		11 UJ		11 UJ		11 UJ
PENTACHLOROBENZENE	11 U		11 U		11 U		11 U
PENTACHLORONITROBENZENE	11 U		11 U		11 U		11 U
PENTACHLOROPHENOL	57 U		55 U		54 U		56 U
PHENACETIN	11 U		11 U		11 U		11 U
PHENANTHRENE	11 U		11 U		11 U		11 U
PHENOL	11 U		11 U		11 U		11 U
PRONAMIDE	11 U		11 U		11 U		11 U
PYRENE	11 U		11 U		11 U		11 U
PYRIDINE	11 U		11 U		11 U		11 U
SAFROLE	11 U		11 U		11 U		11 U
TRANS-ISOSAFROLE	11 U		11 U		11 U		11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
SAMPLE DATE:	08/06/97	08/06/97	08/12/97	08/12/97	08/06/97	08/06/97	08/13/97
LOCATION:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
FIELD DUPLICATE OF:							

**HERBICIDES (µg/L)**

DIMETHOATE	11 U		11 UJ		11 U		11 UJ
PHORATE	11 U		11 U		11 U		11 U
SULFOTEP	11 U		11 U		11 U		11 U

**METALS (µg/L)**

ANTIMONY	2.3 U		2.3 U		2.3 U		2.3 U
ARSENIC	1.9 UL		1.9 UL		3.0 L		1.9 UL
BARIUM	60.3		55.8		64.3		26.4
BERYLLIUM	1.1 B		1.5 B		1.2 B		1.4 B
CADMIUM	1.3 U		1.3 U		1.3 U		1.3 U
CHROMIUM	2.5		16.0		8.0		29.6
COBALT	0.70 U		0.78		0.70 U		1.2
COPPER	3.3 U		3.3 U		3.8 B		7.4
LEAD	5.2 B		2.7 B		2.8 B		4.5 B
MERCURY	0.13		0.10 U		0.10		0.10 U
NICKEL	1.1 U		11.8		1.1 U		15.3
SELENIUM	2.5 U		2.5 UL		2.5 U		2.5 UL
SILVER	0.70 U		0.70 U		0.70 U		0.70 U
THALLIUM	2.5 U		2.5 U		2.5 U		2.5 U
TIN	1.2 U		1.2 U		1.2 U		1.2 U
VANADIUM	2.4 B		0.85		6.8		1.8
ZINC	6.4 B		6.0		11.0 B		12.6

**DISSOLVED METALS (µg/L)**

ANTIMONY, FILTERED		2.3 U		2.3 U		2.3 U	
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**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
SAMPLE DATE:	08/06/97	08/06/97	08/12/97	08/12/97	08/06/97	08/06/97	08/13/97
LOCATION:	RPLMW001U001	RPLMW001F001	RPLMW002U001	RPLMW002F001	RPLMW003U001	RPLMW003F001	RPLMW004U001
FIELD DUPLICATE OF:							

**DISSOLVED METALS (µg/L)**

ARSENIC, FILTERED		1.9 UL		1.9 UL		2.2 L	
BARIUM, FILTERED		60.3		60.9		55.8	
BERYLLIUM, FILTERED		1.2 B		1.4 B		1.6 B	
CADMIUM, FILTERED		1.3 U		1.3 U		1.3 U	
CHROMIUM, FILTERED		2.0 U		2.0 U		2.0 U	
COBALT, FILTERED		0.70 U		0.70 U		0.70 U	
COPPER, FILTERED		3.3 U		3.3 U		3.3 U	
LEAD, FILTERED		2.3 B		2.2 B		2.0 B	
MERCURY, FILTERED		0.16		0.10 U		0.14	
NICKEL, FILTERED		1.1 U		6.8		1.1 U	
SELENIUM, FILTERED		2.5 U		2.5 UL		2.5 U	
SILVER, FILTERED		0.70 U		0.70 U		0.70 U	
THALLIUM, FILTERED		2.5 U		2.5 U		2.5 U	
TIN, FILTERED		1.7 B		1.2 U		1.2 U	
VANADIUM, FILTERED		0.70 U		0.70 U		0.92 B	
ZINC, FILTERED		6.1 B		6.9		4.3 B	

**MISCELLANEOUS PARAMETERS (µg/L)**

M & P-CRESOL	11 U		11 U		11 U		11 U
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**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLMW004F001						
SAMPLE DATE:	08/13/97	//	//	//	//	//	//
LOCATION:	RPLMW004F001						
FIELD DUPLICATE OF:							

<b>DISSOLVED METALS (µg/L)</b>							
ANTIMONY, FILTERED	2.3 U						
ARSENIC, FILTERED	1.9 UL						
BARIUM, FILTERED	24.7						
BERYLLIUM, FILTERED	1.5 B						
CADMIUM, FILTERED	1.3 U						
CHROMIUM, FILTERED	2.0 U						
COBALT, FILTERED	0.83						
COPPER, FILTERED	3.3						
LEAD, FILTERED	2.2 B						
MERCURY, FILTERED	0.10 U						
NICKEL, FILTERED	12.3						
SELENIUM, FILTERED	2.5 UL						
SILVER, FILTERED	0.70 U						
THALLIUM, FILTERED	2.5 U						
TIN, FILTERED	1.2 U						
VANADIUM, FILTERED	0.70 U						
ZINC, FILTERED	8.4						

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSW0010001	RPLSW0020001	RPLSW0020001-D	RPLSW0020001-AVG	RPLSW0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSW0010001	RPLSW0020001	RPLDUP001	RPLSW0020001	RPLSW0030001		
FIELD DUPLICATE OF:			RPLSW0020001	RPLSW0020001			

**VOLATILES (µg/L)**

1,1,1,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U		
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U		
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U	5 U		
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U	5 U		
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U		
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U		
1,2,3-TRICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U		
1,2-DIBROMO-3-CHLOROPROPANE	100 U						
1,2-DIBROMOETHANE	5 U	5 U	5 U	5 U	5 U		
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U	5 U		
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U	5 U		
1,4-DICHLORO-2-BUTENE	100 U						
2-BUTANONE	10 UR						
2-HEXANONE	10 U						
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U	5 U		
ACETONE	12 B	24 B	16 B	20 B	6 B		
ACETONITRILE	100 UR						
ACROLEIN	20 UR						
ACRYLONITRILE	5 UR						
ALLYL CHLORIDE	5 U	5 U	5 U	5 U	5 U		
BENZENE	5 U	5 U	5 U	5 U	5 U		
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U	5 U		
BROMOFORM	5 U	5 U	5 U	5 U	5 U		
BROMOMETHANE	10 U						

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSW0010001	RPLSW0020001	RPLSW0020001-D	RPLSW0020001-AVG	RPLSW0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSW0010001	RPLSW0020001	RPLDUP001	RPLSW0020001	RPLSW0030001		
FIELD DUPLICATE OF:			RPLSW0020001	RPLSW0020001			

<b>VOLATILES (µg/L)</b>							
CARBON DISULFIDE	5 U	7	5 U	7	5 U		
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U	5 U		
CHLOROBENZENE	5 U	5 U	5 U	5 U	5 U		
CHLOROETHANE	10 U						
CHLOROFORM	5 U	5 U	5 U	5 U	5 U		
CHLOROMETHANE	10 U						
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U		
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U	5 U		
DIBROMOMETHANE	5 U	5 U	5 U	5 U	5 U		
DICHLORODIFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U		
ETHYLBENZENE	5 U	5 U	5 U	5 U	5 U		
IODOMETHANE	5 U	5 U	5 U	5 U	5 U		
ISOBUTYL ALCOHOL	50 UR						
M&P-XYLENES	5 U	5 U	5 U	5 U	5 U		
METHACRYLONITRILE	5 U	5 U	5 U	5 U	5 U		
METHYL METHACRYLATE	5 U	5 U	5 U	5 U	5 U		
METHYLENE CHLORIDE	4 B	6 B	6 B	6 B	6 B		
O-XYLENE	5 U	5 U	5 U	5 U	5 U		
PENTACHLOROETHANE	5 U	5 U	5 U	5 U	5 U		
PROPIONITRILE	50 UR						
STYRENE	5 U	5 U	5 U	5 U	5 U		
TETRACHLOROETHENE	5 U	5 U	5 U	5 U	5 U		
TOLUENE	5 U	5 U	5 U	5 U	5 U		
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U	5 U		

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSW0010001	RPLSW0020001	RPLSW0020001-D	RPLSW0020001-AVG	RPLSW0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSW0010001	RPLSW0020001	RPLDUP001	RPLSW0020001	RPLSW0030001		
FIELD DUPLICATE OF:			RPLSW0020001	RPLSW0020001			

**VOLATILES (µg/L)**

TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U	5 U		
TRICHLOROETHENE	5 U	5 U	5 U	5 U	5 U		
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U	5 U		
VINYL ACETATE	10 U						
VINYL CHLORIDE	5 U	5 U	5 U	5 U	5 U		

**SEMIVOLATILES (µg/L)**

1,2,4,5-TETRACHLOROBENZENE	12 U	10 U	11 U	10.5 U	11 U		
1,2,4-TRICHLOROBENZENE	12 U	10 U	11 U	10.5 U	11 U		
1,2-DICHLOROBENZENE	12 U	10 U	11 U	10.5 U	11 U		
1,3,5-TRINITROBENZENE-OS	12 U	10 U	11 U	10.5 U	11 U		
1,3-DICHLOROBENZENE	12 U	10 U	11 U	10.5 U	11 U		
1,3-DINITROBENZENE-OS	12 U	10 U	11 U	10.5 U	11 U		
1,4-DICHLOROBENZENE	12 U	10 U	11 U	10.5 U	11 U		
1,4-DIOXANE-OS	12 U	10 U	11 U	10.5 U	11 U		
1,4-NAPHTHOQUINONE	12 U	10 U	11 U	10.5 U	11 U		
1-NAPHTHYLAMINE	12 U	10 U	11 U	10.5 U	11 U		
2,2'-OXYBIS(1-CHLOROPROPANE)	12 U	10 U	11 U	10.5 U	11 U		
2,3,4,6-TETRACHLOROPHENOL	59 U	52 U	53 U	52.5 U	54 U		
2,4,5-TRICHLOROPHENOL	24 U	21 U	21 U	21 U	22 U		
2,4,6-TRICHLOROPHENOL	12 U	10 U	11 U	10.5 U	11 U		
2,4-DICHLOROPHENOL	12 U	10 U	11 U	10.5 U	11 U		
2,4-DIMETHYLPHENOL	12 U	10 U	11 U	10.5 U	11 U		
2,4-DINITROPHENOL	59 U	52 U	53 U	52.5 U	54 U		
2,4-DINITROTOLUENE-OS	12 U	10 U	11 U	10.5 U	11 U		

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSW0010001	RPLSW0020001	RPLSW0020001-D	RPLSW0020001-AVG	RPLSW0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSW0010001	RPLSW0020001	RPLDUP001	RPLSW0020001	RPLSW0030001		
FIELD DUPLICATE OF:			RPLSW0020001	RPLSW0020001			

<b>SEMIVOLATILES (µg/L)</b>							
2,6-DICHLOROPHENOL	12 U	10 U	11 U	10.5 U	11 U		
2,6-DINITROTOLUENE-OS	12 U	10 U	11 U	10.5 U	11 U		
2-ACETYLAMINOFLUORENE	12 U	10 U	11 U	10.5 U	11 U		
2-CHLORONAPHTHALENE	12 U	10 U	11 U	10.5 U	11 U		
2-CHLOROPHENOL	12 U	10 U	11 U	10.5 U	11 U		
2-METHYLNAPHTHALENE	12 U	10 U	11 U	10.5 U	11 U		
2-METHYLPHENOL	12 U	10 U	11 U	10.5 U	11 U		
2-NAPHTHYLAMINE	12 U	10 U	11 U	10.5 U	11 U		
2-NITROANILINE	59 U	52 U	53 U	52.5 U	54 U		
2-NITROPHENOL	12 U	10 U	11 U	10.5 U	11 U		
2-PICOLINE	12 U	10 U	11 U	10.5 U	11 U		
3,3'-DICHLOROBENZIDINE	12 U	10 U	11 U	10.5 U	11 U		
3,3'-DIMETHYLBENZIDINE	12 U	10 U	11 U	10.5 U	11 U		
3-METHYLCHOLANTHRENE	12 U	10 U	11 U	10.5 U	11 U		
3-NITROANILINE	59 U	52 U	53 U	52.5 U	54 U		
4,6-DINITRO-2-METHYLPHENOL	59 U	52 U	53 U	52.5 U	54 U		
4-AMINOBIIPHENYL	12 U	10 U	11 U	10.5 U	11 U		
4-BROMOPHENYL PHENYL ETHER	12 U	10 U	11 U	10.5 U	11 U		
4-CHLORO-3-METHYLPHENOL	12 U	10 U	11 U	10.5 U	11 U		
4-CHLOROANILINE	12 U	10 U	11 U	10.5 U	11 U		
4-CHLOROPHENYL PHENYL ETHER	12 U	10 U	11 U	10.5 U	11 U		
4-NITROANILINE	59 U	52 U	53 U	52.5 U	54 U		
4-NITROPHENOL	59 U	52 U	53 U	52.5 U	54 U		
4-NITROQUINOLINE-1-OXIDE	12 UR	10 UR	11 UR	10.5 UR	11 UR		

SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
 RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
 INDIAN HEAD DIVISION  
 NSWC INDIAN HEAD, MARYLAND

SAMPLE NUMBER:	RPLSW0010001	RPLSW0020001	RPLSW0020001-D	RPLSW0020001-AVG	RPLSW0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSW0010001	RPLSW0020001	RPLDUP001	RPLSW0020001	RPLSW0030001		
FIELD DUPLICATE OF:			RPLSW0020001	RPLSW0020001			

SEMIVOLATILES (µg/L)							
5-NITRO-O-TOLUIDINE	12 U	10 U	11 U	10.5 U	11 U		
7,12-DIMETHYLBENZ(A)ANTHRACENE	12 U	10 U	11 U	10.5 U	11 U		
A,A-DIMETHYLPHENETHYLAMINE	24 U	21 U	21 U	21 U	22 U		
ACENAPHTHENE	12 U	10 U	11 U	10.5 U	11 U		
ACENAPHTHYLENE	12 U	10 U	11 U	10.5 U	11 U		
ACETOPHENONE	12 U	10 U	11 U	10.5 U	11 U		
ANILINE	12 U	10 U	11 U	10.5 U	11 U		
ANTHRACENE	12 U	10 U	11 U	10.5 U	11 U		
ARAMITE	12 U	10 U	11 U	10.5 U	11 U		
BENZO(A)ANTHRACENE	12 U	10 U	11 U	10.5 U	11 U		
BENZO(A)PYRENE	12 U	10 U	11 U	10.5 U	11 U		
BENZO(B)FLUORANTHENE	12 U	10 U	11 U	10.5 U	11 U		
BENZO(G,H,I)PERYLENE	12 U	10 U	11 U	10.5 U	11 U		
BENZO(K)FLUORANTHENE	12 U	10 U	11 U	10.5 U	11 U		
BENZYL ALCOHOL	12 U	10 U	11 U	10.5 U	11 U		
BIS(2-CHLOROETHOXY)METHANE	12 U	10 U	11 U	10.5 U	11 U		
BIS(2-CHLOROETHYL)ETHER	12 U	10 U	11 U	10.5 U	11 U		
BIS(2-ETHYLHEXYL)PHTHALATE	12 U	10 U	11 U	10.5 U	11 U		
BUTYLBENZYL PHTHALATE	12 U	10 U	11 U	10.5 U	11 U		
CHLOROBENZILATE	12 U	10 U	11 U	10.5 U	11 U		
CHRYSENE	12 U	10 U	11 U	10.5 U	11 U		
CIS-ISOSAFROLE	12 U	10 U	11 U	10.5 U	11 U		
DI-N-BUTYL PHTHALATE	12 U	1 J	11 U	3.25	11 U		
DI-N-OCTYL PHTHALATE	12 U	10 U	11 U	10.5 U	11 U		

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSW0010001	RPLSW0020001	RPLSW0020001-D	RPLSW0020001-AVG	RPLSW0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSW0010001	RPLSW0020001	RPLDUP001	RPLSW0020001	RPLSW0030001		
FIELD DUPLICATE OF:			RPLSW0020001	RPLSW0020001			

<b>SEMIVOLATILES (µg/L)</b>							
DIALLATE	12 U	10 U	11 U	10.5 U	11 U		
DIBENZO(A,H)ANTHRACENE	12 U	10 U	11 U	10.5 U	11 U		
DIBENZOFURAN	12 U	10 U	11 U	10.5 U	11 U		
DIETHYL PHTHALATE	12 U	10 U	11 U	10.5 U	11 U		
DIMETHYL PHTHALATE	12 U	10 U	11 U	10.5 U	11 U		
DIPHENYLAMINE	12 U	10 U	11 U	10.5 U	11 U		
ETHYL METHACRYLATE	12 U	10 U	11 U	10.5 U	11 U		
ETHYL METHANESULFONATE	24 U	21 U	21 U	21 U	22 U		
FAMPHUR	12 UJ	10 UJ	11 UR	10 UJ	11 UR		
FLUORANTHENE	12 U	10 U	11 U	10.5 U	11 U		
FLUORENE	12 U	10 U	11 U	10.5 U	11 U		
HEXACHLOROENZENE	12 U	10 U	11 U	10.5 U	11 U		
HEXACHLOROBUTADIENE	12 U	10 U	11 U	10.5 U	11 U		
HEXACHLOROCYCLOPENTADIENE	12 U	10 U	11 U	10.5 U	11 U		
HEXACHLOROETHANE	12 U	10 U	11 U	10.5 U	11 U		
HEXACHLOROPROPENE	12 U	10 U	11 U	10.5 U	11 U		
INDENO(1,2,3-CD)PYRENE	12 U	10 U	11 U	10.5 U	11 U		
ISODRIN	12 U	10 U	11 U	10.5 U	11 U		
ISOPHORONE	12 U	10 U	11 U	10.5 U	11 U		
KEPONE	12 UR	10 UR	11 UR	10.5 UR	11 UR		
METHAPYRILENE	12 U	10 U	11 U	10.5 U	11 U		
METHYL METHANESULFONATE	24 U	21 U	21 U	21 U	22 U		
N-NITROSO-DI-N-BUTYLAMINE	12 U	10 U	11 U	10.5 U	11 U		
N-NITROSO-DI-N-PROPYLAMINE	12 U	10 U	11 U	10.5 U	11 U		

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSW0010001	RPLSW0020001	RPLSW0020001-D	RPLSW0020001-AVG	RPLSW0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSW0010001	RPLSW0020001	RPLDUP001	RPLSW0020001	RPLSW0030001		
FIELD DUPLICATE OF:			RPLSW0020001	RPLSW0020001			

**SEMIVOLATILES (µg/L)**

N-NITROSODIETHYLAMINE	12 U	10 U	11 U	10.5 U	11 U		
N-NITROSODIMETHYLAMINE	12 U	10 U	11 U	10.5 U	11 U		
N-NITROSODIPHENYLAMINE	12 U	10 U	11 U	10.5 U	11 U		
N-NITROSOMETHYLETHYLAMINE	12 U	10 U	11 U	10.5 U	11 U		
N-NITROSOMORPHOLINE	12 U	10 U	11 U	10.5 U	11 U		
N-NITROSOPIPERIDINE	12 U	10 U	11 U	10.5 U	11 U		
N-NITROSOPYRROLIDINE	12 U	10 U	11 U	10.5 U	11 U		
NAPHTHALENE	12 U	10 U	11 U	10.5 U	11 U		
NITROBENZENE-OS	12 U	10 U	11 U	10.5 U	11 U		
O,O,O-TRIETHYLPHOSPHOROTHIOAT	12 U	10 U	11 U	10.5 U	11 U		
O-TOLUIDINE	12 U	10 U	11 U	10.5 U	11 U		
P-DIMETHYLAMINOAZOBENZENE	12 U	10 U	11 U	10.5 U	11 U		
P-PHENYLENEDIAMINE	12 U	10 U	11 U	10.5 U	11 U		
PENTACHLOROBENZENE	12 U	10 U	11 U	10.5 U	11 U		
PENTACHLORONITROBENZENE	12 U	10 U	11 U	10.5 U	11 U		
PENTACHLOROPHENOL	59 U	52 U	53 U	52.5 U	54 U		
PHENACETIN	12 U	10 U	11 U	10.5 U	11 U		
PHENANTHRENE	12 U	10 U	11 U	10.5 U	11 U		
PHENOL	12 U	10 U	11 U	10.5 U	11 U		
PRONAMIDE	12 U	10 U	11 U	10.5 U	11 U		
PYRENE	12 U	10 U	11 U	10.5 U	11 U		
PYRIDINE	12 U	10 U	11 U	10.5 U	11 U		
SAFROLE	12 U	10 U	11 U	10.5 U	11 U		
TRANS-ISOSAFROLE	12 U	10 U	11 U	10.5 U	11 U		

**SUMMARY OF SURFACE WATER ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSW0010001	RPLSW0020001	RPLSW0020001-D	RPLSW0020001-AVG	RPLSW0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSW0010001	RPLSW0020001	RPLDUP001	RPLSW0020001	RPLSW0030001		
FIELD DUPLICATE OF:			RPLSW0020001	RPLSW0020001			

**HERBICIDES (µg/L)**

DIMETHOATE	12 U	10 U	11 U	10.5 U	11 U		
PHORATE	12 U	10 U	11 U	10.5 U	11 U		
SULFOTEP	12 U	10 U	11 U	10.5 U	11 U		

**METALS (µg/L)**

ANTIMONY	2.3 U						
ARSENIC	1.9 UL						
BARIUM	22.9	33.6	31.8	32.7	31.2		
BERYLLIUM	0.20 U	0.20 U	0.20 U	0.2 U	0.20 U		
CADMIUM	1.3 U						
CHROMIUM	2.0 U	2.0 U	2.0 U	2 U	2.0 U		
COBALT	0.70 U	0.70 U	0.70 U	0.7 U	0.70 U		
COPPER	3.3 U						
LEAD	2.2 B	2.1 B	1.5 B	1.8 B	1.9 B		
MERCURY	0.10 U	0.10 U	0.10 U	0.1 U	0.10 U		
NICKEL	1.1 U						
SELENIUM	2.5 U						
SILVER	0.70 U	0.70 U	0.70 U	0.7 U	0.70 U		
THALLIUM	2.5 U						
TIN	1.2 U						
VANADIUM	0.87	1.1	1.1	1.1	0.70 U		
ZINC	7.4	3.9	2.5 U	2.575	9.9		

**MISCELLANEOUS PARAMETERS (µg/L)**

M & P-CRESOL	12 U	10 U	11 U	10.5 U	11 U		
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**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSD0010001	RPLSD0020001	RPLSD0020001-D	RPLSD0020001-AVG	RPLSD0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSD0010001	RPLSD0020001	RPLDUP004	RPLSD0020001	RPLSD0030001		
FIELD DUPLICATE OF:			RPLSD0020001	RPLSD0020001			

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U	6 U		
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	6 U	6 U		
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U	6 U		
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	6 U	6 U		
1,1-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 U		
1,1-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U		
1,2,3-TRICHLOROPROPANE	6 U	6 U	6 U	6 U	6 U		
1,2-DIBROMO-3-CHLOROPROPANE	130 U	120 U	130 U	125 U	120 U		
1,2-DIBROMOETHANE	6 U	6 U	6 U	6 U	6 U		
1,2-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 U		
1,2-DICHLOROPROPANE	6 U	6 U	6 U	6 U	6 U		
1,4-DICHLORO-2-BUTENE	130 U	120 U	130 U	125 U	120 U		
2-BUTANONE	13 UR	12 UR	13 UR	12.5 UR	12 UR		
2-HEXANONE	13 U	12 U	13 U	12.5 U	12 U		
4-METHYL-2-PENTANONE	6 U	6 U	6 U	6 U	6 U		
ACETONE	81 B	130 B	100 B	115 B	74 B		
ACETONITRILE	130 U	120 U	130 U	125 U	120 U		
ACROLEIN	26 UR	25 UR	25 UR	25 UR	23 UR		
ACRYLONITRILE	6 U	6 U	6 U	6 U	6 U		
ALLYL CHLORIDE	6 U	6 U	6 U	6 U	6 U		
BENZENE	6 U	6 U	6 U	6 U	6 U		
BROMODICHLOROMETHANE	6 U	6 U	6 U	6 U	6 U		
BROMOFORM	6 U	6 U	6 U	6 U	6 U		
BROMOMETHANE	13 U	12 U	13 U	12.5 U	12 U		

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSD0010001	RPLSD0020001	RPLSD0020001-D	RPLSD0020001-AVG	RPLSD0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSD0010001	RPLSD0020001	RPLDUP004	RPLSD0020001	RPLSD0030001		
FIELD DUPLICATE OF:			RPLSD0020001	RPLSD0020001			

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 U	6 U	6 U	6 U	6 U		
CARBON TETRACHLORIDE	6 U	6 U	6 U	6 U	6 U		
CHLOROBENZENE	6 U	6 U	6 U	6 U	6 U		
CHLOROETHANE	13 U	12 U	13 U	12.5 U	12 U		
CHLOROFORM	6 U	6 U	6 U	6 U	6 U		
CHLOROMETHANE	13 U	12 U	13 U	12.5 U	12 U		
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 U		
DIBROMOCHLOROMETHANE	6 U	6 U	6 U	6 U	6 U		
DIBROMOMETHANE	6 U	6 U	6 U	6 U	6 U		
DICHLORODIFLUOROMETHANE	6 U	6 U	6 U	6 U	6 U		
ETHYLBENZENE	6 U	6 U	6 U	6 U	6 U		
IODOMETHANE	6 U	6 U	6 U	6 U	6 U		
ISOBUTYL ALCOHOL	65 U	62 U	63 U	62.5 U	59 U		
M&P-XYLENES	6 U	6 U	6 U	6 U	6 U		
METHACRYLONITRILE	6 U	6 U	6 U	6 U	6 U		
METHYL METHACRYLATE	6 U	6 U	6 U	6 U	6 U		
METHYLENE CHLORIDE	2 B	3 B	2 B	2.5 B	3 B		
O-XYLENE	6 U	6 U	6 U	6 U	6 U		
PENTACHLOROETHANE	6 U	6 U	6 U	6 U	6 U		
PROPIONITRILE	65 U	62 U	63 U	62.5 U	59 U		
STYRENE	6 U	6 U	6 U	6 U	6 U		
TETRACHLOROETHENE	6 U	6 U	6 U	6 U	6 U		
TOLUENE	6 U	6 U	6 U	6 U	6 U		
TRANS-1,2-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U		

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSD0010001	RPLSD0020001	RPLSD0020001-D	RPLSD0020001-AVG	RPLSD0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSD0010001	RPLSD0020001	RPLDUP004	RPLSD0020001	RPLSD0030001		
FIELD DUPLICATE OF:			RPLSD0020001	RPLSD0020001			

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 U		
TRICHLOROETHENE	6 U	6 U	6 U	6 U	6 U		
TRICHLOROFLUOROMETHANE	6 U	6 U	6 U	6 U	6 U		
VINYL ACETATE	13 U	12 U	13 U	12.5 U	12 U		
VINYL CHLORIDE	6 U	6 U	6 U	6 U	6 U		

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	430 U	410 U	420 U	415 U	390 U		
1,2,4-TRICHLOROBENZENE	430 U	410 U	420 U	415 U	390 U		
1,2-DICHLOROBENZENE	430 U	410 U	420 U	415 U	390 U		
1,3,5-TRINITROBENZENE-OS	430 U	410 U	420 U	415 U	390 U		
1,3-DICHLOROBENZENE	430 U	410 U	420 U	415 U	390 U		
1,3-DINITROBENZENE-OS	430 U	410 U	420 U	415 U	390 U		
1,4-DICHLOROBENZENE	430 U	410 U	420 U	415 U	390 U		
1,4-DIOXANE-OS	430 U	410 U	420 U	415 U	390 U		
1,4-NAPHTHOQUINONE	430 U	410 U	420 U	415 U	390 U		
1-NAPHTHYLAMINE	430 U	410 U	420 U	415 U	390 U		
2,2-OXYBIS(1-CHLOROPROPANE)	430 U	410 U	420 U	415 U	390 U		
2,3,4,6-TETRACHLOROPHENOL	2200 U	2100 U	2100 U	2100 U	2000 U		
2,4,5-TRICHLOROPHENOL	870 U	820 U	840 U	830 U	780 U		
2,4,6-TRICHLOROPHENOL	430 U	410 U	420 U	415 U	390 U		
2,4-DICHLOROPHENOL	430 U	410 U	420 U	415 U	390 U		
2,4-DIMETHYLPHENOL	430 U	410 U	420 U	415 U	390 U		
2,4-DINITROPHENOL	2200 U	2100 U	2100 U	2100 U	2000 U		
2,4-DINITROTOLUENE-OS	430 U	410 U	420 U	415 U	390 U		

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSD0010001	RPLSD0020001	RPLSD0020001-D	RPLSD0020001-AVG	RPLSD0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSD0010001	RPLSD0020001	RPLDUP004	RPLSD0020001	RPLSD0030001		
FIELD DUPLICATE OF:			RPLSD0020001	RPLSD0020001			

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	430 U	410 U	420 U	415 U	390 U		
2,6-DINITROTOLUENE-OS	430 U	410 U	420 U	415 U	390 U		
2-ACETYLAMINOFUORENE	430 U	410 U	420 U	415 U	390 U		
2-CHLORONAPHTHALENE	430 U	410 U	420 U	415 U	390 U		
2-CHLOROPHENOL	430 U	410 U	420 U	415 U	390 U		
2-METHYLNAPHTHALENE	430 U	410 U	420 U	415 U	390 U		
2-METHYLPHENOL	430 U	410 U	420 U	415 U	390 U		
2-NAPHTHYLAMINE	430 U	410 U	420 U	415 U	390 U		
2-NITROANILINE	2200 U	2100 U	2100 U	2100 U	2000 U		
2-NITROPHENOL	430 U	410 U	420 U	415 U	390 U		
2-PICOLINE	430 U	410 U	420 U	415 U	390 U		
3,3'-DICHLOROBENZIDINE	430 U	410 U	420 U	415 U	390 U		
3,3'-DIMETHYLBENZIDINE	430 U	410 U	420 U	415 U	390 U		
3-METHYLCHOLANTHRENE	430 U	410 U	420 U	415 U	390 U		
3-NITROANILINE	2200 U	2100 U	2100 U	2100 U	2000 U		
4,6-DINITRO-2-METHYLPHENOL	2200 U	2100 U	2100 U	2100 U	2000 U		
4-AMINOBIHENYL	430 U	410 U	420 U	415 U	390 U		
4-BROMOPHENYL PHENYL ETHER	430 U	410 U	420 U	415 U	390 U		
4-CHLORO-3-METHYLPHENOL	430 U	410 U	420 U	415 U	390 U		
4-CHLOROANILINE	430 U	410 U	420 U	415 U	390 U		
4-CHLOROPHENYL PHENYL ETHER	430 U	410 U	420 U	415 U	390 U		
4-NITROANILINE	2200 U	2100 U	2100 U	2100 U	2000 U		
4-NITROPHENOL	2200 U	2100 U	2100 U	2100 U	2000 U		
4-NITROQUINOLINE-1-OXIDE	430 UR	410 UR	420 UR	415 UR	390 UR		

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSD0010001	RPLSD0020001	RPLSD0020001-D	RPLSD0020001-AVG	RPLSD0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSD0010001	RPLSD0020001	RPLDUP004	RPLSD0020001	RPLSD0030001		
FIELD DUPLICATE OF:			RPLSD0020001	RPLSD0020001			

**SEMIVOLATILES (µg/kg)**

5-NITRO-O-TOLUIDINE	430 U	410 U	420 U	415 U	390 U		
7,12-DIMETHYLBENZ(A)ANTHRACENE	430 U	410 U	420 U	415 U	390 U		
A,A-DIMETHYLPHENETHYLAMINE	870 U	820 U	840 U	830 U	780 U		
ACENAPHTHENE	430 U	410 U	420 U	415 U	390 U		
ACENAPHTHYLENE	430 U	410 U	420 U	415 U	390 U		
ACETOPHENONE	430 U	410 U	420 U	415 U	390 U		
ANILINE	430 U	410 U	420 U	415 U	390 U		
ANTHRACENE	430 U	410 U	420 U	415 U	390 U		
ARAMITE	430 U	410 U	420 U	415 U	390 U		
BENZO(A)ANTHRACENE	430 U	410 U	420 U	415 U	390 U		
BENZO(A)PYRENE	430 U	410 U	420 U	415 U	390 U		
BENZO(B)FLUORANTHENE	430 U	410 U	420 U	415 U	390 U		
BENZO(G,H,I)PERYLENE	430 U	410 U	420 U	415 U	390 U		
BENZO(K)FLUORANTHENE	430 U	410 U	420 U	415 U	390 U		
BENZYL ALCOHOL	430 U	410 U	420 U	415 U	390 U		
BIS(2-CHLOROETHOXY)METHANE	430 U	410 U	420 U	415 U	390 U		
BIS(2-CHLOROETHYL)ETHER	430 U	410 U	420 U	415 U	390 U		
BIS(2-ETHYLHEXYL)PHTHALATE	430 U	410 U	420 U	415 U	390 U		
BUTYLBENZYL PHTHALATE	430 U	410 U	420 U	415 U	390 U		
CHLOROBENZILATE	430 U	410 U	420 U	415 U	390 U		
CHRYSENE	430 U	410 U	420 U	415 U	390 U		
CIS-ISOSAFROLE	430 U	410 U	420 U	415 U	390 U		
DI-N-BUTYL PHTHALATE	430 U	410 U	420 U	415 U	390 U		
DI-N-OCTYL PHTHALATE	430 U	410 U	44 J	44 J	390 U		

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSD0010001	RPLSD0020001	RPLSD0020001-D	RPLSD0020001-AVG	RPLSD0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSD0010001	RPLSD0020001	RPLDUP004	RPLSD0020001	RPLSD0030001		
FIELD DUPLICATE OF:			RPLSD0020001	RPLSD0020001			

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	430 U	410 U	420 U	415 U	390 U		
DIBENZO(A,H)ANTHRACENE	430 U	410 U	420 U	415 U	390 U		
DIBENZOFURAN	430 U	410 U	420 U	415 U	390 U		
DIETHYL PHTHALATE	430 U	410 U	420 U	415 U	390 U		
DIMETHYL PHTHALATE	430 U	410 U	420 U	415 U	390 U		
DIPHENYLAMINE	430 U	410 U	420 U	415 U	390 U		
ETHYL METHACRYLATE	430 U	410 U	420 U	415 U	390 U		
ETHYL METHANESULFONATE	870 U	820 U	840 U	830 U	780 U		
FAMPHUR	430 U	410 U	420 UR	410 U	390 U		
FLUORANTHENE	430 U	410 U	420 U	415 U	390 U		
FLUORENE	430 U	410 U	420 U	415 U	390 U		
HEXACHLOROBENZENE	430 U	410 U	420 U	415 U	390 U		
HEXACHLOROBUTADIENE	430 U	410 U	420 U	415 U	390 U		
HEXACHLOROCYCLOPENTADIENE	430 U	410 U	420 U	415 U	390 U		
HEXACHLOROETHANE	430 U	410 U	420 U	415 U	390 U		
HEXACHLOROPROPENE	430 U	410 U	420 U	415 U	390 U		
INDENO(1,2,3-CD)PYRENE	430 U	410 U	420 U	415 U	390 U		
ISODRIN	430 U	410 U	420 U	415 U	390 U		
ISOPHORONE	430 U	410 U	420 U	415 U	390 U		
KEPONE	430 UR	410 UR	420 UR	415 UR	390 UR		
METHAPYRILENE	430 U	410 U	420 U	415 U	390 U		
METHYL METHANESULFONATE	870 U	820 U	840 U	830 U	780 U		
N-NITROSO-DI-N-BUTYLAMINE	430 U	410 U	420 U	415 U	390 U		
N-NITROSO-DI-N-PROPYLAMINE	430 U	410 U	420 U	415 U	390 U		

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSD0010001	RPLSD0020001	RPLSD0020001-D	RPLSD0020001-AVG	RPLSD0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSD0010001	RPLSD0020001	RPLDUP004	RPLSD0020001	RPLSD0030001		
FIELD DUPLICATE OF:			RPLSD0020001	RPLSD0020001			

**SEMIVOLATILES (µg/kg)**

N-NITROSODIETHYLAMINE	430 U	410 U	420 U	415 U	390 U		
N-NITROSODIMETHYLAMINE	430 U	410 U	420 U	415 U	390 U		
N-NITROSODIPHENYLAMINE	430 U	410 U	420 U	415 U	390 U		
N-NITROSOMETHYLETHYLAMINE	430 U	410 U	420 U	415 U	390 U		
N-NITROSOMORPHOLINE	430 U	410 U	420 U	415 U	390 U		
N-NITROSOPIPERIDINE	430 U	410 U	420 U	415 U	390 U		
N-NITROSOPYRROLIDINE	430 U	410 U	420 U	415 U	390 U		
NAPHTHALENE	430 U	410 U	420 U	415 U	390 U		
NITROBENZENE-OS	430 U	410 U	420 U	415 U	390 U		
O,O,O-TRIETHYLPHOSPHOROTHIOAT	430 U	410 U	420 U	415 U	390 U		
O-TOLUIDINE	430 U	410 U	420 U	415 U	390 U		
P-DIMETHYLAMINOAZOBENZENE	430 U	410 U	420 U	415 U	390 U		
P-PHENYLENEDIAMINE	430 U	410 U	420 U	415 U	390 U		
PENTACHLOROBENZENE	430 U	410 U	420 U	415 U	390 U		
PENTACHLORONITROBENZENE	430 U	410 U	420 U	415 U	390 U		
PENTACHLOROPHENOL	2200 U	2100 U	2100 U	2100 U	2000 U		
PHENACETIN	430 U	410 U	420 U	415 U	390 U		
PHENANTHRENE	430 U	410 U	420 U	415 U	390 U		
PHENOL	430 U	410 U	420 U	415 U	390 U		
PRONAMIDE	430 U	410 U	420 U	415 U	390 U		
PYRENE	430 U	410 U	420 U	415 U	390 U		
PYRIDINE	430 U	410 U	420 U	415 U	390 U		
SAFROLE	430 U	410 U	420 U	415 U	390 U		
TRANS-ISOSAFROLE	430 U	410 U	420 U	415 U	390 U		

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 1 - RUM POINT LANDFILL  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	RPLSD0010001	RPLSD0020001	RPLSD0020001-D	RPLSD0020001-AVG	RPLSD0030001		
SAMPLE DATE:	06/27/97	06/27/97	06/27/97	06/27/97	06/27/97	//	//
LOCATION:	RPLSD0010001	RPLSD0020001	RPLDUP004	RPLSD0020001	RPLSD0030001		
FIELD DUPLICATE OF:			RPLSD0020001	RPLSD0020001			

**HERBICIDES (µg/kg)**

DIMETHOATE	430 U	410 U	420 U	415 U	390 U		
PHORATE	430 U	410 U	420 U	415 U	390 U		
SULFOTEP	430 U	410 U	420 U	415 U	390 U		

**METALS (mg/kg)**

ANTIMONY	0.30 UL	0.21 UL	0.22 UL	0.215 UL	0.24 UL		
ARSENIC	2.6	0.63 L	0.73 L	0.68 L	0.91 L		
BARIUM	13.0 J	4.3 J	3.9 J	4.1 J	5.8 J		
BERYLLIUM	0.21	0.08 B	0.12 B	0.1 B	0.16		
CADMIUM	0.54	0.23	0.16	0.195	0.28		
CHROMIUM	15.4 J	5.7 J	5.3 J	5.5 J	8.3 J		
COBALT	0.87	0.41	0.40	0.405	0.44		
COPPER	2.9	0.71	0.67	0.69	0.75		
LEAD	5.4	1.6	2.1	1.85	2.8		
MERCURY	0.03	0.02 U	0.03	0.02	0.02 U		
NICKEL	2.6	0.64	0.66	0.65	0.72		
SELENIUM	0.96 J	0.43 J	0.24 UJ	0.275	0.35 J		
SILVER	0.09 U	0.09 B	0.07 U	0.0625	0.07 U		
THALLIUM	0.32 U	0.23 U	0.24 U	0.235 U	0.26 U		
TIN	2.6 B	1.7 B	2.2 B	1.95 B	2.3 B		
VANADIUM	15.7	4.7	4.6	4.65	7.2		
ZINC	11.4	4.5	4.7	4.6	7.0		

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	430 U	410 U	420 U	415 U	390 U		
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**SWMU 4 CHICAMUXEN CREEK'S EDGE DUMP SITE B**

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBSS0050101-D	DSBSS0050101-AVG
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/21/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBDUP014	DSBSS0050101
FIELD DUPLICATE OF:						DSBSS0050101	DSBSS0050101

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
1,1,1-TRICHLOROETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
1,1,2,2-TETRACHLOROETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
1,1,2-TRICHLOROETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
1,1-DICHLOROETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
1,1-DICHLOROETHENE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
1,2,3-TRICHLOROPROPANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
1,2-DIBROMO-3-CHLOROPROPANE	110 U	100 UJ	110 U	110 U	110 UJ	110 U	110 U
1,2-DIBROMOETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
1,2-DICHLOROETHANE	6 U	5 UJ	5 UR	6 U	6 UJ	6 U	6 U
1,2-DICHLOROPROPANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
1,4-DICHLORO-2-BUTENE	110 U	100 UJ	110 U	110 U	110 UJ	110 U	110 U
2-BUTANONE	11 UR	10 UR	11 UR	11 UR	11 UR	11 UR	11 UR
2-HEXANONE	11 U	10 UJ	11 U	11 U	11 UJ	11 U	11 U
4-METHYL-2-PENTANONE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
ACETONE	11 U	27 UJ	55 B	5000	140 B	42 B	91 B
ACETONITRILE	110 UR	100 UR	110 U	110 UJ	110 UR	110 UR	110 UR
ACROLEIN	23 UR	21 UR	21 UR	23 UR	22 UR	22 UR	22 UR
ACRYLONITRILE	6 UR	5 UR	5 U	6 U	6 UR	6 UR	6 UR
ALLYL CHLORIDE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
BENZENE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
BROMODICHLOROMETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
BROMOFORM	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
BROMOMETHANE	11 U	10 UJ	11 U	11 U	11 UJ	11 UJ	11 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBSS0050101-D	DSBSS0050101-AVG
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/21/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBDUP014	DSBSS0050101
FIELD DUPLICATE OF:						DSBSS0050101	DSBSS0050101

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
CARBON TETRACHLORIDE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
CHLOROBENZENE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
CHLOROETHANE	11 U	10 UJ	11 U	11 U	11 UJ	11 U	11 U
CHLOROFORM	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
CHLOROMETHANE	11 U	10 UJ	11 U	11 U	11 UJ	11 U	11 U
CIS-1,3-DICHLOROPROPENE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
DIBROMOCHLOROMETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
DIBROMOMETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 U	6 U
DICHLORODIFLUOROMETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
ETHYLBENZENE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
IODOMETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
ISOBUTYL ALCOHOL	57 UR	52 UR	53 U	57 U	56 UR	56 UR	56 UR
M&P-XYLENES	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
METHACRYLONITRILE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
METHYL METHACRYLATE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
METHYLENE CHLORIDE	6 B	11 UJ	12 B	9 B	7 B	9 B	8 B
O-XYLENE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
PENTACHLOROETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
PROPIONITRILE	57 UR	52 UR	53 U	57 U	56 UR	56 UR	56 UR
STYRENE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
TETRACHLOROETHENE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
TOLUENE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
TRANS-1,2-DICHLOROETHENE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBSS0050101-D	DSBSS0050101-AVG
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/21/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBDUP014	DSBSS0050101
FIELD DUPLICATE OF:						DSBSS0050101	DSBSS0050101

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
TRICHLOROETHENE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
TRICHLOROFLUOROMETHANE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U
VINYL ACETATE	11 U	10 UR	11 U	11 U	11 UR	11 UR	11 UR
VINYL CHLORIDE	6 U	5 UJ	5 U	6 U	6 UJ	6 UJ	6 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
1,2,4-TRICHLOROBENZENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
1,2-DICHLOROBENZENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
1,3,5-TRINITROBENZENE-OS	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
1,3-DICHLOROBENZENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
1,3-DINITROBENZENE-OS	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	
1,4-DICHLOROBENZENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
1,4-DIOXANE-OS	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
1,4-NAPHTHOQUINONE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 U
1-NAPHTHYLAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2,3,4,6-TETRACHLOROPHENOL	1900 UJ	1700 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1900 UJ
2,4,5-TRICHLOROPHENOL	760 UJ	690 UJ	710 UJ	760 UJ	740 UJ	740 UJ	740 UJ
2,4,6-TRICHLOROPHENOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2,4-DICHLOROPHENOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2,4-DIMETHYLPHENOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2,4-DINITROPHENOL	1900 UJ	1700 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1900 UJ
2,4-DINITROTOLUENE-OS	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	

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INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBSS0050101-D	DSBSS0050101-AVG
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/21/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBDUP014	DSBSS0050101
FIELD DUPLICATE OF:						DSBSS0050101	DSBSS0050101

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2,6-DINITROTOLUENE-OS	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	
2-ACETYLAMINOFUORENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2-CHLORONAPHTHALENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2-CHLOROPHENOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2-METHYLNAPHTHALENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2-METHYLPHENOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2-NAPHTHYLAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2-NITROANILINE	1900 UJ	1700 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1900 UJ
2-NITROPHENOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
2-PICOLINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
3,3'-DICHLOROBENZIDINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
3,3'-DIMETHYLBENZIDINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
3-METHYLCHOLANTHRENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
3-NITROANILINE	1900 UJ	1700 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1900 U
4,6-DINITRO-2-METHYLPHENOL	1900 UJ	1700 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1900 UJ
4-AMINOBIHENYL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
4-BROMOPHENYL PHENYL ETHER	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
4-CHLORO-3-METHYLPHENOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
4-CHLOROANILINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
4-CHLOROPHENYL PHENYL ETHER	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
4-NITROANILINE	1900 UJ	1700 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1900 UJ
4-NITROPHENOL	1900 UJ	1700 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1900 UJ
4-NITROQUINOLINE-1-OXIDE	380 UR	350 UR	350 UR	380 UR	370 UR	370 UR	370 UR

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SAMPLE NUMBER:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBSS0050101-D	DSBSS0050101-AVG
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/21/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBDUP014	DSBSS0050101
FIELD DUPLICATE OF:						DSBSS0050101	DSBSS0050101

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
A,A-DIMETHYLPHENETHYLAMINE	760 UJ	690 UJ	710 UJ	760 UJ	740 UJ	740 UJ	740 UJ
ACENAPHTHENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
ACENAPHTHYLENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
ACETOPHENONE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
ANILINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
ANTHRACENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
ARAMITE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
BENZO(A)ANTHRACENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
BENZO(A)PYRENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
BENZO(B)FLUORANTHENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
BENZO(G,H,I)PERYLENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
BENZO(K)FLUORANTHENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
BENZYL ALCOHOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
BIS(2-CHLOROETHOXY)METHANE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
BIS(2-CHLOROETHYL)ETHER	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	380 UJ	280 J	1400 J	380 UJ	370 UJ	370 UJ	370 UJ
BUTYLBENZYL PHTHALATE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
CHLOROBENZILATE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
CHRYSENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
CIS-ISOSAFROLE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
DI-N-BUTYL PHTHALATE	53 J	350 UJ	350 UJ	380 UJ	370 UJ	190 J	190 J
DI-N-OCTYL PHTHALATE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ

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SAMPLE NUMBER:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBSS0050101-D	DSBSS0050101-AVG
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/21/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBDUP014	DSBSS0050101
FIELD DUPLICATE OF:						DSBSS0050101	DSBSS0050101

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
DIBENZO(A,H)ANTHRACENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
DIBENZOFURAN	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
DIETHYL PHTHALATE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
DIMETHYL PHTHALATE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
DIPHENYLAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
ETHYL METHACRYLATE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
ETHYL METHANESULFONATE	760 UJ	690 UJ	710 UJ	760 UJ	740 UJ	740 UJ	740 UJ
FAMPHUR	380 UJ	350 UR	350 UR	380 UR	370 UR	370 UR	370 UR
FLUORANTHENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
FLUORENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
HEXACHLOROBENZENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
HEXACHLOROBUTADIENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
HEXACHLOROCYCLOPENTADIENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
HEXACHLOROETHANE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
HEXACHLOROPROPENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
INDENO(1,2,3-CD)PYRENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
ISODRIN	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
ISOPHORONE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
KEPONE	380 UJ	350 UR	350 UR	380 UR	370 UR	370 UR	370 UR
METHAPYRILENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
METHYL METHANESULFONATE	760 UJ	690 UJ	710 UJ	760 UJ	740 UJ	740 UJ	740 U
N-NITROSO-DI-N-BUTYLAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
N-NITROSO-DI-N-PROPYLAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ

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SAMPLE NUMBER:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBSS0050101-D	DSBSS0050101-AVG
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/21/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBDUP014	DSBSS0050101
FIELD DUPLICATE OF:						DSBSS0050101	DSBSS0050101

**SEMIVOLATILES (µg/kg)**

N-NITROSODIETHYLAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
N-NITROSODIMETHYLAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
N-NITROSODIPHENYLAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
N-NITROSOMETHYLETHYLAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
N-NITROSOMORPHOLINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
N-NITROSOPIPERIDINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
N-NITROSOPIRROLIDINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
NAPHTHALENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
NITROBENZENE-OS	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	
O,O,O-TRIETHYLPHOSPHOROTHIOAT	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
O-TOLUIDINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
P-DIMETHYLAMINOAZOBENZENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
P-PHENYLENEDIAMINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
PENTACHLOROBENZENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
PENTACHLORONITROBENZENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
PENTACHLOROPHENOL	1900 UJ	1700 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1900 UJ
PHENACETIN	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
PHENANTHRENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
PHENOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
PRONAMIDE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
PYRENE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
PYRIDINE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
SAFROLE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
TRANS-ISOSAFROLE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ

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SAMPLE NUMBER:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBSS0050101-D	DSBSS0050101-AVG
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/21/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBDUP014	DSBSS0050101
FIELD DUPLICATE OF:						DSBSS0050101	DSBSS0050101

**HERBICIDES (µg/kg)**

DIMETHOATE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
PHORATE	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
SULFOTEP	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U						
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U	163 U	163 UJ	163 UJ	163 U	163 U	163 U

**METALS (mg/kg)**

ANTIMONY	0.52 L	0.74 B	0.24 UL	0.69 L	1.0 B	0.91 B	0.955 B
ARSENIC	3.6	3.1	3.3	5.1	4.9 L	4.3 L	4.6 L
BARIUM	46.7	67.2	31.0 J	59.1 J	44.5 J	45.8 J	45.15 J
BERYLLIUM	0.44	0.48 K	0.37	0.64	0.45 J	0.38 J	0.415 J

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NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBSS0050101-D	DSBSS0050101-AVG
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/21/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0010101	DSBSS0020101	DSBSS0030101	DSBSS0040101	DSBSS0050101	DSBDUP014	DSBSS0050101
FIELD DUPLICATE OF:						DSBSS0050101	DSBSS0050101

**METALS (mg/kg)**

CADMIUM	0.42 K	0.12 K	0.14 U	0.13 U	0.13 U	0.14 U	0.135 U
CHROMIUM	13.7	13.9	14.2 J	20.5 J	20.8 J	21.0 J	20.9 J
COBALT	6.2 J	9.6	5.2	22.4	4.2 J	4.0 J	4.1 J
COPPER	10.5	26.1	8.2	11.8	24.5	25.8	25.15
LEAD	10.1	14.3 K	11.2 J	12.4 J	17.9 J	16.4 J	17.15 J
MERCURY	0.02 U	0.06	0.05	0.07	0.04 L	0.03 L	0.035 L
NICKEL	8.8	6.2	5.6	9.6	9.0 J	9.2 J	9.1 J
SELENIUM	1.2	0.60 L	0.90	1.5	0.83 J	0.79 J	0.81 J
SILVER	0.07 U	0.06 U	0.07 U	0.07 U	0.08 B	0.08 U	0.06
THALLIUM	0.51 B	0.25 B	0.26 U	0.26 U	0.92 B	0.78 B	0.85 B
TIN	2.5 B	1.9 B	3.1 B	3.3 B	3.5 B	3.4 B	3.45 B
VANADIUM	24.1	20.2	22.5	29.6	32.6	30.9	31.75
ZINC	36.2	24.8	22.0 J	35.6 J	37.5 J	36.5 J	37 J

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	380 UJ	350 UJ	350 UJ	380 UJ	370 UJ	370 UJ	370 UJ
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**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
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SAMPLE NUMBER:	DSBSS0060101	DSBSS0070101	DSBSS0080101	DSBSS0090101	DSBSS0090101-D	DSBSS0090101-AVG	DSBSS0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0060101	DSBSS0070101	DSBSS0080101	DSBSS0090101	DSBDUP016	DSBSS0090101	DSBSS0100101
FIELD DUPLICATE OF:					DSBSS0090101	DSBSS0090101	

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,1,1-TRICHLOROETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,1,2,2-TETRACHLOROETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,1,2-TRICHLOROETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,1-DICHLOROETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,1-DICHLOROETHENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,2,3-TRICHLOROPROPANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,2-DIBROMO-3-CHLOROPROPANE	120 UJ	120 U	110 UJ	110 U	110 U	110 U	110 UJ
1,2-DIBROMOETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,2-DICHLOROETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,2-DICHLOROPROPANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
1,4-DICHLORO-2-BUTENE	120 UJ	120 U	110 UJ	110 U	110 U	110 U	110 UJ
2-BUTANONE	12 UR	12 UR	11 UR	11 UR	11 UR	11 UR	11 UR
2-HEXANONE	12 UJ	12 U	11 UJ	11 U	11 U	11 U	11 UJ
4-METHYL-2-PENTANONE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
ACETONE	88 B	88 B	56 B	56 B	20 B	38 B	60 B
ACETONITRILE	120 UR	120 U	110 UR	110 U	110 UR	110 U	110 UR
ACROLEIN	23 UR	24 UR	21 UR	23 UR	23 UR	23 UR	22 UR
ACRYLONITRILE	6 UR	6 U	5 UR	6 U	6 UR	6 U	6 UR
ALLYL CHLORIDE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
BENZENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
BROMODICHLOROMETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
BROMOFORM	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
BROMOMETHANE	12 UJ	12 U	11 UJ	11 U	11 UJ	11 U	11 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSS0060101	DSBSS0070101	DSBSS0080101	DSBSS0090101	DSBSS0090101-D	DSBSS0090101-AVG	DSBSS0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0060101	DSBSS0070101	DSBSS0080101	DSBSS0090101	DSBDUP016	DSBSS0090101	DSBSS0100101
FIELD DUPLICATE OF:					DSBSS0090101	DSBSS0090101	

**VOLATILES (µg/kg)**

CARBON DISULFIDE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
CARBON TETRACHLORIDE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
CHLOROBENZENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
CHLOROETHANE	12 UJ	12 U	11 UJ	11 U	11 U	11 U	11 UJ
CHLOROFORM	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
CHLOROMETHANE	12 UJ	12 U	11 UJ	11 U	11 U	11 U	11 UJ
CIS-1,3-DICHLOROPROPENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
DIBROMOCHLOROMETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
DIBROMOMETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
DICHLORODIFLUOROMETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
ETHYLBENZENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
IODOMETHANE	6 UJ	6 U	5 UJ	6 U	6 UJ	6 U	6 UJ
ISOBUTYL ALCOHOL	58 UR	60 U	53 UR	57 U	57 UR	57 U	55 UR
M&P-XYLENES	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
METHACRYLONITRILE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
METHYL METHACRYLATE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
METHYLENE CHLORIDE	7 B	5 B	9 B	5 B	8 B	6.5 B	13 UJ
O-XYLENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
PENTACHLOROETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
PROPIONITRILE	58 UR	60 U	53 UR	57 U	57 UR	57 U	55 UR
STYRENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
TETRACHLOROETHENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
TOLUENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
TRANS-1,2-DICHLOROETHENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
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NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSS0060101	DSBSS0070101	DSBSS0080101	DSBSS0090101	DSBSS0090101-D	DSBSS0090101-AVG	DSBSS0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0060101	DSBSS0070101	DSBSS0080101	DSBSS0090101	DSBDUP016	DSBSS0090101	DSBSS0100101
FIELD DUPLICATE OF:					DSBSS0090101	DSBSS0090101	

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
TRICHLOROETHENE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
TRICHLOROFLUOROMETHANE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ
VINYL ACETATE	12 UR	12 U	11 UR	11 U	11 UR	11 U	11 UR
VINYL CHLORIDE	6 UJ	6 U	5 UJ	6 U	6 U	6 U	6 UJ

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
1,2,4-TRICHLOROBENZENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
1,2-DICHLOROBENZENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
1,3,5-TRINITROBENZENE-OS	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
1,3-DICHLOROBENZENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
1,3-DINITROBENZENE-OS	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ		370 UJ
1,4-DICHLOROBENZENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
1,4-DIOXANE-OS	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
1,4-NAPHTHOQUINONE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
1-NAPHTHYLAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2,2-OXYBIS(1-CHLOROPROPANE)	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2,3,4,6-TETRACHLOROPHENOL	1900 UJ	2000 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1800 UJ
2,4,5-TRICHLOROPHENOL	780 UJ	790 UJ	710 UJ	760 UJ	760 UJ	760 UJ	730 UJ
2,4,6-TRICHLOROPHENOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2,4-DICHLOROPHENOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2,4-DIMETHYLPHENOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2,4-DINITROPHENOL	1900 UJ	2000 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1800 UJ
2,4-DINITROTOLUENE-OS	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ		370 UJ

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FIELD DUPLICATE OF:					DSBSS0090101	DSBSS0090101	

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2,6-DINITROTOLUENE-OS	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ		370 UJ
2-ACETYLAMINOFUORENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2-CHLORONAPHTHALENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2-CHLOROPHENOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2-METHYLNAPHTHALENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2-METHYLPHENOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2-NAPHTHYLAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2-NITROANILINE	1900 UJ	2000 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1800 UJ
2-NITROPHENOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
2-PICOLINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
3,3'-DICHLOROBENZIDINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
3,3'-DIMETHYLBENZIDINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
3-METHYLCHOLANTHRENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
3-NITROANILINE	1900 UJ	2000 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1800 UJ
4,6-DINITRO-2-METHYLPHENOL	1900 UJ	2000 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1800 UJ
4-AMINOBIIPHENYL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
4-BROMOPHENYL PHENYL ETHER	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
4-CHLORO-3-METHYLPHENOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
4-CHLOROANILINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
4-CHLOROPHENYL PHENYL ETHER	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
4-NITROANILINE	1900 UJ	2000 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1800 UJ
4-NITROPHENOL	1900 UJ	2000 UJ	1800 UJ	1900 UJ	1900 UJ	1900 UJ	1800 UJ
4-NITROQUINOLINE-1-OXIDE	390 UR	400 UR	350 UR	380 UR	380 UR	380 UR	370 UR

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FIELD DUPLICATE OF:					DSBSS0090101	DSBSS0090101	

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
A,A-DIMETHYLPHENETHYLAMINE	780 UJ	790 UJ	710 UJ	760 UJ	760 UJ	760 UJ	730 UJ
ACENAPHTHENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
ACENAPHTHYLENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
ACETOPHENONE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
ANILINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
ANTHRACENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
ARAMITE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
BENZO(A)ANTHRACENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
BENZO(A)PYRENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
BENZO(B)FLUORANTHENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
BENZO(G,H,I)PERYLENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
BENZO(K)FLUORANTHENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
BENZYL ALCOHOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
BIS(2-CHLOROETHOXY)METHANE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
BIS(2-CHLOROETHYL)ETHER	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	390 UJ	400 UJ	350 UJ	160 J	380 UJ	160 J	370 UJ
BUTYLBENZYL PHTHALATE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
CHLOROBENZILATE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
CHRYSENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
CIS-ISOSAFROLE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
DI-N-BUTYL PHTHALATE	390 UJ	150 J	350 UJ	160 J	340 J	250 J	160 J
DI-N-OCTYL PHTHALATE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ

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LOCATION:	DSBSS0060101	DSBSS0070101	DSBSS0080101	DSBSS0090101	DSBDUP016	DSBSS0090101	DSBSS0100101
FIELD DUPLICATE OF:					DSBSS0090101	DSBSS0090101	

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
DIBENZO(A,H)ANTHRACENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
DIBENZOFURAN	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
DIETHYL PHTHALATE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
DIMETHYL PHTHALATE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
DIPHENYLAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
ETHYL METHACRYLATE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
ETHYL METHANESULFONATE	780 UJ	790 UJ	710 UJ	760 UJ	760 UJ	760 UJ	730 UJ
FAMPHUR	390 UR	400 UR	350 UR	380 UR	380 UR	380 UR	370 UR
FLUORANTHENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
FLUORENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
HEXACHLOROBENZENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
HEXACHLOROBUTADIENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
HEXACHLOROCYCLOPENTADIENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
HEXACHLOROETHANE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
HEXACHLOROPROPENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
INDENO(1,2,3-CD)PYRENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
ISODRIN	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
ISOPHORONE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
KEPONE	390 UR	400 UR	350 UR	380 UR	380 UR	380 UR	370 UR
METHAPYRILENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
METHYL METHANESULFONATE	780 UJ	790 UJ	710 UJ	760 UJ	760 UJ	760 U	730 UJ
N-NITROSO-DI-N-BUTYLAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
N-NITROSO-DI-N-PROPYLAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ

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FIELD DUPLICATE OF:					DSBSS0090101	DSBSS0090101	

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
N-NITROSODIMETHYLAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
N-NITROSODIPHENYLAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
N-NITROSOMETHYLETHYLAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
N-NITROSOMORPHOLINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
N-NITROSOPIPERIDINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
N-NITROSOPYRROLIDINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
NAPHTHALENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
NITROBENZENE-OS	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ		370 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
O-TOLUIDINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
P-DIMETHYLAMINOAZOBENZENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
P-PHENYLENEDIAMINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
PENTACHLOROBENZENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
PENTACHLORONITROBENZENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
PENTACHLOROPHENOL	1900 UJ	2000 UJ	1800 UJ	1900 UJ	1900 UJ	1900 U	1800 UJ
PHENACETIN	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
PHENANTHRENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
PHENOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
PRONAMIDE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
PYRENE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
PYRIDINE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
SAFROLE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
TRANS-ISOSAFROLE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ

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FIELD DUPLICATE OF:					DSBSS0090101	DSBSS0090101	

**HERBICIDES (µg/kg)**

DIMETHOATE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
PHORATE	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
SULFOTEP	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U						
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	1.2 B	0.79 B	0.53 B	0.73 B	0.69 B	0.71 B	0.57 B
ARSENIC	3.4 L	2.5 L	2.6 L	2.7 L	2.5 L	2.6 L	3.9 L
BARIUM	48.1 J	48.3 J	76.6 J	54.6 J	57.2 J	55.9 J	44.3 J
BERYLLIUM	1.1 J	0.78 J	0.55 J	0.56 J	0.58 J	0.57 J	0.47 J

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SAMPLE NUMBER:	DSBSS0060101	DSBSS0070101	DSBSS0080101	DSBSS0090101	DSBSS0090101-D	DSBSS0090101-AVG	DSBSS0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBSS0060101	DSBSS0070101	DSBSS0080101	DSBSS0090101	DSBDUP016	DSBSS0090101	DSBSS0100101
FIELD DUPLICATE OF:					DSBSS0090101	DSBSS0090101	

**METALS (mg/kg)**

CADMIUM	0.15 U	0.14 U	0.12 U	0.13 U	0.13 U	0.13 U	0.13 U
CHROMIUM	21.0 J	21.0 J	15.2 J	15.1 J	15.6 J	15.35 J	16.2 J
COBALT	7.6 J	7.8 J	10.6 J	11.0 J	10.9 J	10.95 J	13.1 J
COPPER	17.8	16.9	7.5	7.9	7.3	7.6	9.8
LEAD	9.4 J	11.3 J	8.9 J	9.0 J	8.8 J	8.9 J	11.1 J
MERCURY	0.02 UL	0.02 L	0.03 L	0.04 L	0.04 L	0.04 L	0.07 L
NICKEL	13.5 J	12.0 J	7.8 J	8.7 J	8.1 J	8.4 J	9.0 J
SELENIUM	1.5 J	0.57 J	0.52 J	0.54 J	0.45 J	0.495 J	0.80 J
SILVER	0.08 U	0.07 U	0.06 U	0.07 U	0.07 U	0.07 U	0.07 B
THALLIUM	2.4 B	0.77 B	0.79 B	0.61 B	0.36 B	0.485 B	0.81 B
TIN	3.7 B	5.2 B	4.5 B	3.2 B	3.1 B	3.15 B	2.8 B
VANADIUM	35.9	39.1	22.8	25.4	24.6	25	26.3
ZINC	45.2 J	39.1 J	27.9 J	31.1 J	29.5 J	30.3 J	30.6 J

**MISCELLANEOUS PARAMETERS ()**

M & P-CRESOL	390 UJ	400 UJ	350 UJ	380 UJ	380 UJ	380 UJ	370 UJ
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**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/22/97	07/21/97	07/21/97	08/02/97
LOCATION:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
1,1-DICHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
1,1-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
1,2,3-TRICHLOROPROPANE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-DIBROMO-3-CHLOROPROPANE	120 U	120 U	120 U	110 U	120 U	120 U	120 U
1,2-DIBROMOETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-DICHLOROETHANE	6 U	6 U	6 UR	6 U	6 U	6 U	6 UJ
1,2-DICHLOROPROPANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
1,4-DICHLORO-2-BUTENE	120 U	120 U	120 U	110 U	120 U	120 U	120 U
2-BUTANONE	12 UR	12 UR	12 UR	11 UR	12 UR	12 UR	12 UR
2-HEXANONE	12 U	12 U	12 U	11 U	12 U	12 U	12 U
4-METHYL-2-PENTANONE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
ACETONE	12 U	12 U	220	11 U	50 B	1200	74 B
ACETONITRILE	120 UR	120 UR	120 U	110 UR	120 UJ	120 UJ	120 UR
ACROLEIN	24 UR	24 UR	23 UR	23 UR	23 UR	24 UR	23 UR
ACRYLONITRILE	6 UR	6 UR	6 U	6 UR	6 U	6 U	6 UR
ALLYL CHLORIDE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
BENZENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
BROMODICHLOROMETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
BROMOFORM	6 U	6 U	6 U	6 U	6 U	6 U	6 U
BROMOMETHANE	12 U	12 U	12 U	11 U	12 U	12 U	12 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/22/97	07/21/97	07/21/97	08/02/97
LOCATION:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
CARBON TETRACHLORIDE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
CHLOROBENZENE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
CHLOROETHANE	12 U	12 U	12 U	11 U	12 U	12 U	12 UJ
CHLOROFORM	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
CHLOROMETHANE	12 U	12 U	12 U	11 U	12 U	12 U	12 UJ
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
DIBROMOCHLOROMETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
DIBROMOMETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
DICHLORODIFLUOROMETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
ETHYLBENZENE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
IODOMETHANE	6 U	6 UJ	6 U	6 UJ	6 U	6 U	6 UJ
ISOBUTYL ALCOHOL	60 UR	60 UR	58 U	57 UR	58 U	60 U	58 UR
M&P-XYLENES	6 U	6 U	6 U	6 U	6 U	6 U	6 U
METHACRYLONITRILE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
METHYL METHACRYLATE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
METHYLENE CHLORIDE	6 B	4 B	15 B	10 B	5 B	7 B	7 B
O-XYLENE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
PENTACHLOROETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
PROPIONITRILE	60 UR	60 UR	58 U	57 UR	58 U	60 U	58 UR
STYRENE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
TETRACHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	6 U
TOLUENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
TRANS-1,2-DICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	6 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/22/97	07/21/97	07/21/97	08/02/97
LOCATION:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
TRICHLOROETHENE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
TRICHLOROFLUOROMETHANE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ
VINYL ACETATE	12 U	12 UR	12 U	11 UR	12 U	12 U	12 UR
VINYL CHLORIDE	6 U	6 U	6 U	6 U	6 U	6 U	6 UJ

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
1,2,4-TRICHLOROBENZENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
1,2-DICHLOROBENZENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
1,3,5-TRINITROBENZENE-OS	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
1,3-DICHLOROBENZENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
1,3-DINITROBENZENE-OS	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
1,4-DICHLOROBENZENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
1,4-DIOXANE-OS	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
1,4-NAPHTHOQUINONE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
1-NAPHTHYLAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2,3,4,6-TETRACHLOROPHENOL	2000 UJ	2000 UJ	1900 UJ	1900 UJ	1900 UJ	2000 UJ	1900 UJ
2,4,5-TRICHLOROPHENOL	800 UJ	800 UJ	780 UJ	770 UJ	770 UJ	790 UJ	780 UJ
2,4,6-TRICHLOROPHENOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2,4-DICHLOROPHENOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2,4-DIMETHYLPHENOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2,4-DINITROPHENOL	2000 UJ	2000 UJ	1900 UJ	1900 UJ	1900 UJ	2000 UJ	1900 UJ
2,4-DINITROTOLUENE-OS	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/22/97	07/21/97	07/21/97	08/02/97
LOCATION:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2,6-DINITROTOLUENE-OS	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2-ACETYLAMINOFUORENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2-CHLORONAPHTHALENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2-CHLOROPHENOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2-METHYLNAPHTHALENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2-METHYLPHENOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2-NAPHTHYLAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2-NITROANILINE	2000 UJ	2000 UJ	1900 UJ	1900 UJ	1900 UJ	2000 UJ	1900 UJ
2-NITROPHENOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
2-PICOLINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
3,3'-DICHLOROBENZIDINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
3,3'-DIMETHYLBENZIDINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
3-METHYLCHOLANTHRENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
3-NITROANILINE	2000 UJ	2000 UJ	1900 UJ	1900 UJ	1900 UJ	2000 UJ	1900 UJ
4,6-DINITRO-2-METHYLPHENOL	2000 UJ	2000 UJ	1900 UJ	1900 UJ	1900 UJ	2000 UJ	1900 UJ
4-AMINOBIIPHENYL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
4-BROMOPHENYL PHENYL ETHER	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
4-CHLORO-3-METHYLPHENOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
4-CHLOROANILINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
4-CHLOROPHENYL PHENYL ETHER	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
4-NITROANILINE	2000 UJ	2000 UJ	1900 UJ	1900 UJ	1900 UJ	2000 UJ	1900 UJ
4-NITROPHENOL	2000 UJ	2000 UJ	1900 UJ	1900 UJ	1900 UJ	2000 UJ	1900 UJ
4-NITROQUINOLINE-1-OXIDE	400 UR	400 UR	390 UR	380 UR	380 UR	400 UR	390 UR

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/22/97	07/21/97	07/21/97	08/02/97
LOCATION:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
A,A-DIMETHYLPHENETHYLAMINE	800 UJ	800 UJ	780 UJ	770 UJ	770 UJ	790 UJ	780 UJ
ACENAPHTHENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
ACENAPHTHYLENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
ACETOPHENONE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
ANILINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
ANTHRACENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
ARAMITE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
BENZO(A)ANTHRACENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
BENZO(A)PYRENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
BENZO(B)FLUORANTHENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
BENZO(G,H,I)PERYLENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
BENZO(K)FLUORANTHENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
BENZYL ALCOHOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
BIS(2-CHLOROETHOXY)METHANE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
BIS(2-CHLOROETHYL)ETHER	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	400 UJ	110 J	270 B	380 UJ	380 UJ	400 UJ	390 UJ
BUTYLBENZYL PHTHALATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
CHLOROBENZILATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
CHRYSENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
CIS-ISOSAFROLE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
DI-N-BUTYL PHTHALATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
DI-N-OCTYL PHTHALATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/22/97	07/21/97	07/21/97	08/02/97
LOCATION:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
DIBENZO(A,H)ANTHRACENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
DIBENZOFURAN	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
DIETHYL PHTHALATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
DIMETHYL PHTHALATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
DIPHENYLAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
ETHYL METHACRYLATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
ETHYL METHANESULFONATE	800 UJ	800 UJ	780 UJ	770 UJ	770 UJ	790 UJ	780 UJ
FAMPHUR	400 UJ	400 UR	390 UR	380 UR	380 UR	400 UR	390 UR
FLUORANTHENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
FLUORENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
HEXACHLOROBENZENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
HEXACHLOROBUTADIENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
HEXACHLOROCYCLOPENTADIENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
HEXACHLOROETHANE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
HEXACHLOROPROPENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
INDENO(1,2,3-CD)PYRENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
ISODRIN	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
ISOPHORONE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
KEPONE	400 UJ	400 UR	390 UR	380 UR	380 UR	400 UR	390 UR
METHAPYRILENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
METHYL METHANESULFONATE	800 UJ	800 UJ	780 UJ	770 UJ	770 UJ	790 UJ	780 UJ
N-NITROSO-DI-N-BUTYLAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
N-NITROSO-DI-N-PROPYLAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/22/97	07/21/97	07/21/97	08/02/97
LOCATION:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
N-NITROSODIMETHYLAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
N-NITROSODIPHENYLAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
N-NITROSOMETHYLETHYLAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
N-NITROSOMORPHOLINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
N-NITROSOPIPERIDINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
N-NITROSOPIRROLIDINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
NAPHTHALENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
NITROBENZENE-OS	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
O-TOLUIDINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
P-DIMETHYLAMINOAZOBENZENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
P-PHENYLENEDIAMINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
PENTACHLOROBENZENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
PENTACHLORONITROBENZENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
PENTACHLOROPHENOL	2000 UJ	2000 UJ	1900 UJ	1900 UJ	1900 UJ	2000 UJ	1900 UJ
PHENACETIN	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
PHENANTHRENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
PHENOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
PRONAMIDE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
PYRENE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
PYRIDINE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
SAFROLE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
TRANS-ISOSAFROLE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/22/97	07/21/97	07/21/97	08/02/97
LOCATION:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
PHORATE	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
SULFOTEP	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U						
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U	163 U	163 UJ	163 U	163 UJ	163 UJ	163 U

**METALS (mg/kg)**

ANTIMONY	0.40 L	0.43 B	0.43 L	0.66 B	0.66 L	0.45 L	0.61 B
ARSENIC	1.7	3.4	4.1	3.2	2.7	3.0	1.8 L
BARIUM	31.5	131	50.8 J	57.9	35.2 J	49.5 J	65.2 J
BERYLLIUM	0.58	1.2	0.68	0.61 K	0.67	0.68	0.41 J

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
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INDIAN HEAD DIVISION  
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SAMPLE NUMBER:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
SAMPLE DATE:	07/10/97	07/23/97	07/22/97	07/22/97	07/21/97	07/21/97	08/02/97
LOCATION:	DSBSB0010101	DSBSB0020101	DSBSB0030101	DSBSB0030201	DSBSB0040101	DSBSB0040201	DSBSB0050101
FIELD DUPLICATE OF:							

**METALS (mg/kg)**

CADMIUM	0.40 K	0.15 U	0.14 U	0.14 K	0.14 U	0.16 U	0.12 U
CHROMIUM	15.9	16.0	20.6 J	15.2	15.0 J	14.3 J	13.7 J
COBALT	8.5 J	19.4	10.8	6.8	4.5	10.5	5.3 J
COPPER	14.3	6.9	12.5	10.1	16.0	15.1	7.5
LEAD	9.3	11.2 K	9.2 J	7.6 K	10.3 J	9.6 J	9.1 J
MERCURY	0.02 U	0.07	0.02	0.02	0.02 U	0.02	0.04 L
NICKEL	7.6	10.2	12.0	9.0	10.1	12.1	7.5 J
SELENIUM	1.0	0.75 L	1.1	0.78 L	1.4	0.98	0.49 J
SILVER	0.06 U	0.08 U	0.06 U				
THALLIUM	0.37 B	0.29 U	0.27 U	0.33 B	0.35 B	0.30 U	0.23 U
TIN	2.2 B	2.1 B	3.1 B	2.1 B	3.3 B	3.7 B	2.6 B
VANADIUM	32.3	26.0	36.1	22.5	29.2	31.0	21.8
ZINC	27.4	36.7	37.2 J	33.2	33.4 J	37.6 J	27.9 J

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	400 UJ	400 UJ	390 UJ	380 UJ	380 UJ	400 UJ	390 UJ
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**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0050101-D	DSBSB0050101-AVG	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBDUP015	DSBSB0050101	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
FIELD DUPLICATE OF:	DSBSB0050101	DSBSB0050101					

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
1,1,1-TRICHLOROETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
1,1,2,2-TETRACHLOROETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
1,1,2-TRICHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
1,1-DICHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
1,1-DICHLOROETHENE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
1,2,3-TRICHLOROPROPANE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	120 UJ	120 U	110 U	110 U	110 UJ	120 U	110 U
1,2-DIBROMOETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
1,2-DICHLOROETHANE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
1,2-DICHLOROPROPANE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
1,4-DICHLORO-2-BUTENE	120 UJ	120 U	110 U	110 U	110 UJ	120 U	110 U
2-BUTANONE	12 UR	12 UR	11 UR	11 UR	11 UR	12 UR	11 UR
2-HEXANONE	12 UJ	12 U	11 U	11 U	11 UJ	12 U	11 U
4-METHYL-2-PENTANONE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
ACETONE	82 B	78 B	26 B	150 B	64 B	83 B	22 B
ACETONITRILE	120 UR	120 UR	110 UR	110 U	110 UR	120 U	110 U
ACROLEIN	23 UR	23 UR	22 UR	22 UR	23 UR	23 UR	21 UR
ACRYLONITRILE	6 UR	6 UR	6 UR	6 U	6 UR	6 U	5 U
ALLYL CHLORIDE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
BENZENE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
BROMODICHLOROMETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
BROMOFORM	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
BROMOMETHANE	12 UJ	12 UJ	11 UJ	11 U	11 UJ	12 U	11 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0050101-D	DSBSB0050101-AVG	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBDUP015	DSBSB0050101	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
FIELD DUPLICATE OF:	DSBSB0050101	DSBSB0050101					

**VOLATILES (µg/kg)**

CARBON DISULFIDE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
CARBON TETRACHLORIDE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
CHLOROBENZENE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
CHLOROETHANE	12 UJ	12 UJ	11 U	11 U	11 UJ	12 U	11 U
CHLOROFORM	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
CHLOROMETHANE	12 UJ	12 UJ	11 U	11 U	11 UJ	12 U	11 U
CIS-1,3-DICHLOROPROPENE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
DIBROMOCHLOROMETHANE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
DIBROMOMETHANE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
DICHLORODIFLUOROMETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
ETHYLBENZENE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
IODOMETHANE	6 UJ	6 UJ	6 UR	6 U	6 UR	6 U	5 U
ISOBUTYL ALCOHOL	58 UR	58 UR	56 UR	56 U	57 UR	58 U	53 U
M&P-XYLENES	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
METHACRYLONITRILE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
METHYL METHACRYLATE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
METHYLENE CHLORIDE	8 B	7.5 B	5 B	4 B	7 B	5 B	3 B
O-XYLENE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
PENTACHLOROETHANE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
PROPIONITRILE	58 UR	58 UR	56 UR	56 U	57 UR	58 U	53 U
STYRENE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
TETRACHLOROETHENE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
TOLUENE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
TRANS-1,2-DICHLOROETHENE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0050101-D	DSBSB0050101-AVG	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBDUP015	DSBSB0050101	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
FIELD DUPLICATE OF:	DSBSB0050101	DSBSB0050101					

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 UJ	6 U	6 U	6 U	6 UJ	6 U	5 U
TRICHLOROETHENE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
TRICHLOROFLUOROMETHANE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U
VINYL ACETATE	12 UR	6 UR	11 UR	11 U	11 UR	12 U	11 U
VINYL CHLORIDE	6 UJ	6 UJ	6 U	6 U	6 UJ	6 U	5 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
1,2,4-TRICHLOROBENZENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
1,2-DICHLOROBENZENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
1,3,5-TRINITROBENZENE-OS	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
1,3-DICHLOROBENZENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
1,3-DINITROBENZENE-OS	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
1,4-DICHLOROBENZENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
1,4-DIOXANE-OS	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
1,4-NAPHTHOQUINONE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
1-NAPHTHYLAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2,2-OXYBIS(1-CHLOROPROPANE)	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2,3,4,6-TETRACHLOROPHENOL	1900 UJ	1800 UJ					
2,4,5-TRICHLOROPHENOL	780 UJ	780 UJ	740 UJ	750 UJ	760 UJ	780 UJ	710 UJ
2,4,6-TRICHLOROPHENOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2,4-DICHLOROPHENOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2,4-DIMETHYLPHENOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2,4-DINITROPHENOL	1900 UJ	1800 UJ					
2,4-DINITROTOLUENE-OS	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ

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RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
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SAMPLE NUMBER:	DSBSB0050101-D	DSBSB0050101-AVG	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBDUP015	DSBSB0050101	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
FIELD DUPLICATE OF:	DSBSB0050101	DSBSB0050101					

**SEMIVOLATILES (µg/kg)**

2,6-DICHLOROPHENOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2,6-DINITROTOLUENE-OS	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2-ACETYLAMINOFUORENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2-CHLORONAPHTHALENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2-CHLOROPHENOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2-METHYLNAPHTHALENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2-METHYLPHENOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2-NAPHTHYLAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2-NITROANILINE	1900 UJ	1800 UJ					
2-NITROPHENOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
2-PICOLINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
3,3'-DICHLOROBENZIDINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
3,3'-DIMETHYLBENZIDINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
3-METHYLCHOLANTHRENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
3-NITROANILINE	1900 UJ	1800 UJ					
4,6-DINITRO-2-METHYLPHENOL	1900 UJ	1800 UJ					
4-AMINOBIPHENYL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
4-BROMOPHENYL PHENYL ETHER	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
4-CHLORO-3-METHYLPHENOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
4-CHLOROANILINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
4-CHLOROPHENYL PHENYL ETHER	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
4-NITROANILINE	1900 UJ	1800 UJ					
4-NITROPHENOL	1900 UJ	1800 UJ					
4-NITROQUINOLINE-1-OXIDE	390 UR	390 UR	370 UR	370 UR	380 UR	390 UR	350 UR

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INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0050101-D	DSBSB0050101-AVG	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBDUP015	DSBSB0050101	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
FIELD DUPLICATE OF:	DSBSB0050101	DSBSB0050101					

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
A,A-DIMETHYLPHENETHYLAMINE	780 UJ	780 UJ	740 UJ	750 UJ	760 UJ	780 UJ	710 UJ
ACENAPHTHENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
ACENAPHTHYLENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
ACETOPHENONE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
ANILINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
ANTHRACENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
ARAMITE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BENZO(A)ANTHRACENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BENZO(A)PYRENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BENZO(B)FLUORANTHENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BENZO(G,H,I)PERYLENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BENZO(K)FLUORANTHENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BENZYL ALCOHOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BIS(2-CHLOROETHOXY)METHANE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BIS(2-CHLOROETHYL)ETHER	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
BUTYLBENZYL PHTHALATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
CHLOROBENZILATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
CHRYSENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
CIS-ISOSAFROLE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
DI-N-BUTYL PHTHALATE	160 J	160 J	370 UJ	100 J	380 UJ	200 J	180 J
DI-N-OCTYL PHTHALATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ

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INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0050101-D	DSBSB0050101-AVG	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBDUP015	DSBSB0050101	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
FIELD DUPLICATE OF:	DSBSB0050101	DSBSB0050101					

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
DIBENZO(A,H)ANTHRACENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
DIBENZOFURAN	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
DIETHYL PHTHALATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
DIMETHYL PHTHALATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
DIPHENYLAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
ETHYL METHACRYLATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
ETHYL METHANESULFONATE	780 UJ	780 UJ	740 UJ	750 UJ	760 UJ	780 UJ	710 UJ
FAMPHUR	390 UR	390 UR	370 UR	370 UR	380 UR	390 UR	350 UR
FLUORANTHENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
FLUORENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
HEXACHLORO BENZENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
HEXACHLOROBUTADIENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
HEXACHLOROCYCLOPENTADIENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
HEXACHLOROETHANE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
HEXACHLOROPROPENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
INDENO(1,2,3-CD)PYRENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
ISODRIN	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
ISOPHORONE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
KEPONE	390 UR	390 UR	370 UR	370 UR	380 UR	390 UR	350 UR
METHAPYRILENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
METHYL METHANESULFONATE	780 UJ	780 UJ	740 UJ	750 UJ	760 UJ	780 UJ	710 UJ
N-NITROSO-DI-N-BUTYLAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
N-NITROSO-DI-N-PROPYLAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0050101-D	DSBSB0050101-AVG	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBDUP015	DSBSB0050101	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
FIELD DUPLICATE OF:	DSBSB0050101	DSBSB0050101					

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
N-NITROSODIMETHYLAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
N-NITROSODIPHENYLAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
N-NITROSOMETHYLETHYLAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
N-NITROSOMORPHOLINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
N-NITROSOPIPERIDINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
N-NITROSOPYRROLIDINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
NAPHTHALENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
NITROBENZENE-OS	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
O-TOLUIDINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
P-DIMETHYLAMINOAZOBENZENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
P-PHENYLENEDIAMINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
PENTACHLOROBENZENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
PENTACHLORONITROBENZENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
PENTACHLOROPHENOL	1900 UJ	1800 UJ					
PHENACETIN	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
PHENANTHRENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
PHENOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
PRONAMIDE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
PYRENE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
PYRIDINE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
SAFROLE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
TRANS-ISOSAFROLE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0050101-D	DSBSB0050101-AVG	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBDUP015	DSBSB0050101	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
FIELD DUPLICATE OF:	DSBSB0050101	DSBSB0050101					

**HERBICIDES (µg/kg)**

DIMETHOATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
PHORATE	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ
SULFOTEP	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U						
1,3-DINITROBENZENE-EXP	37.2 U						
2,4,6-TRINITROTOLUENE	35.6 U						
2,4-DINITROTOLUENE-EXP	51.6 U						
2,6-DINITROTOLUENE-EXP	47.6 U						
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U						
RDX	50.9 U						
TETRYL	163 U						

**METALS (mg/kg)**

ANTIMONY	0.48 B	0.545 B	0.67 B	0.89 B	1.0 B	1.0 B	0.71 B
ARSENIC	3.7 L	2.75 L	2.7 L	2.9 L	3.8 L	7.4 L	1.9 L
BARIUM	61.8 J	63.5 J	34.2 J	27.0 J	42.9 J	37.2 J	36.9 J
BERYLLIUM	0.57 J	0.49 J	0.78 J	0.87 J	0.47 J	0.71 J	0.46 J

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RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBSB0050101-D	DSBSB0050101-AVG	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
SAMPLE DATE:	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97	08/02/97
LOCATION:	DSBDUP015	DSBSB0050101	DSBSB0060101	DSBSB0070101	DSBSB0080101	DSBSB0090101	DSBSB0100101
FIELD DUPLICATE OF:	DSBSB0050101	DSBSB0050101					

<b>METALS (mg/kg)</b>							
CADMIUM	0.12 U	0.12 U	0.14 U	0.11 U	0.13 U	0.13 U	0.13 U
CHROMIUM	18.3 J	16 J	15.0 J	17.4 J	17.6 J	18.0 J	15.0 J
COBALT	4.9 J	5.1 J	5.0 J	8.3 J	10.7 J	5.1 J	5.9 J
COPPER	6.0	6.75	10.9	11.6	10.5	16.5	14.7
LEAD	9.0 J	9.05 J	6.7 J	7.2 J	9.7 J	10.7 J	9.9 J
MERCURY	0.04 L	0.04 L	0.01 L	0.01 L	0.05 L	0.02 L	0.02 L
NICKEL	7.9 J	7.7 J	8.6 J	8.5 J	9.5 J	10.5 J	10.9 J
SELENIUM	0.59 J	0.54 J	0.55 J	0.98 J	0.70 J	0.95 J	0.76 J
SILVER	0.06 U	0.06 U	0.08 B	0.06 U	0.07 U	0.07 B	0.07 U
THALLIUM	0.58 B	0.3475 B	0.68 B	1.5 B	1.1 B	1.8 B	1.6 B
TIN	2.9 B	2.75 B	3.1 B	2.9 B	2.9 B	3.0 B	3.2 B
VANADIUM	27.0	24.4	26.2	29.3	31.9	32.3	28.7
ZINC	28.8 J	28.35 J	28.2 J	31.8 J	31.3 J	33.7 J	33.2 J

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	390 UJ	390 UJ	370 UJ	370 UJ	380 UJ	390 UJ	350 UJ

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBMW003U001-D	DSBMW003U001-AVG
SAMPLE DATE:	08/05/97	08/05/97	08/06/97	08/06/97	08/05/97	08/05/97	08/05/97
LOCATION:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBDUP003	DSBMW003U001
FIELD DUPLICATE OF:						DSBMW003U001	DSBMW003U001

**VOLATILES (µg/L)**

1,1,1,2-TETRACHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,1,1-TRICHLOROETHANE	5 U		5 U		5 U	2 J	2 J
1,1,2,2-TETRACHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,1-DICHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,1-DICHLOROETHENE	5 U		5 U		5 U	5 U	5 U
1,2,3-TRICHLOROPROPANE	5 U		5 U		5 U	5 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	100 U		100 U		100 U	100 U	100 U
1,2-DIBROMOETHANE	5 U		5 U		5 U	5 U	5 U
1,2-DICHLOROETHANE	5 U		5 U		5 U	5 U	5 U
1,2-DICHLOROPROPANE	5 U		5 U		5 U	5 U	5 U
1,4-DICHLORO-2-BUTENE	100 U		100 U		100 U	100 U	100 U
2-BUTANONE	10 UR		10 UR		10 UR	10 UR	10 UR
2-HEXANONE	10 U		10 U		10 U	10 U	10 U
4-METHYL-2-PENTANONE	5 U		5 U		5 U	5 U	5 U
ACETONE	10 U		10 U		10 U	10 U	10 U
ACETONITRILE	100 UR		100 UR		100 UR	100 UR	100 UR
ACROLEIN	20 UR		20 UR		20 UR	20 UR	20 UR
ACRYLONITRILE	5 UR		5 UR		5 UR	5 UR	5 UR
ALLYL CHLORIDE	5 U		5 U		5 U	5 U	5 U
BENZENE	5 U		5 U		5 U	5 U	5 U
BROMODICHLOROMETHANE	5 U		5 U		5 U	5 U	5 U
BROMOFORM	5 U		5 U		5 U	5 U	5 U
BROMOMETHANE	10 U		10 U		10 U	10 U	10 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBMW003U001-D	DSBMW003U001-AVG
SAMPLE DATE:	08/05/97	08/05/97	08/06/97	08/06/97	08/05/97	08/05/97	08/05/97
LOCATION:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBDUP003	DSBMW003U001
FIELD DUPLICATE OF:						DSBMW003U001	DSBMW003U001

**VOLATILES (µg/L)**

CARBON DISULFIDE	5 U		5 U		5 U	5 U	5 U
CARBON TETRACHLORIDE	5 U		5 U		5 U	5 U	5 U
CHLOROBENZENE	5 U		5 U		5 U	5 U	5 U
CHLOROETHANE	10 U		10 U		10 U	10 U	10 U
CHLOROFORM	5 U		5 U		2 J	4 J	3 J
CHLOROMETHANE	10 U		10 U		10 U	10 U	10 U
CIS-1,3-DICHLOROPROPENE	5 U		5 U		5 U	5 U	5 U
DIBROMOCHLOROMETHANE	5 U		5 U		5 U	5 U	5 U
DIBROMOMETHANE	5 U		5 U		5 U	5 U	5 U
DICHLORODIFLUOROMETHANE	5 U		5 U		5 U	5 U	5 U
ETHYLBENZENE	5 U		5 U		5 U	5 U	5 U
IODOMETHANE	5 U		5 U		5 U	5 U	5 U
ISOBUTYL ALCOHOL	50 UR		50 UR		50 UR	50 UR	50 UR
M&P-XYLENES	5 U		5 U		5 U	5 U	5 U
METHACRYLONITRILE	5 U		5 U		5 U	5 U	5 U
METHYL METHACRYLATE	5 U		5 U		5 U	5 U	5 U
METHYLENE CHLORIDE	5 U		2 B		5 U	5 U	5 U
O-XYLENE	5 U		5 U		5 U	5 U	5 U
PENTACHLOROETHANE	5 U		5 U		5 U	5 U	5 U
PROPIONITRILE	50 UR		50 UR		50 UR	50 UR	50 UR
STYRENE	5 U		5 U		5 U	5 U	5 U
TETRACHLOROETHENE	5 U		5 U		5 U	5 U	5 U
TOLUENE	5 U		5 U		5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	5 U		5 U		5 U	5 U	5 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBMW003U001-D	DSBMW003U001-AVG
SAMPLE DATE:	08/05/97	08/05/97	08/06/97	08/06/97	08/05/97	08/05/97	08/05/97
LOCATION:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBDUP003	DSBMW003U001
FIELD DUPLICATE OF:						DSBMW003U001	DSBMW003U001

**VOLATILES (µg/L)**

TRANS-1,3-DICHLOROPROPENE	5 U		5 U		5 U	5 U	5 U
TRICHLOROETHENE	5 U		5 U		5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U		5 U		5 U	5 U	5 U
VINYL ACETATE	10 UR		10 UR		10 UR	10 UR	10 UR
VINYL CHLORIDE	5 U		5 U		5 U	5 U	5 U

**SEMIVOLATILES (µg/L)**

1,2,4,5-TETRACHLOROBENZENE	12 U		11 U		11 U	11 U	11 U
1,2,4-TRICHLOROBENZENE	12 U		11 U		11 U	11 U	11 U
1,2-DICHLOROBENZENE	12 U		11 U		11 U	11 U	11 U
1,3,5-TRINITROBENZENE-OS	12 U		11 U		11 U	11 U	11 U
1,3-DICHLOROBENZENE	12 U		11 U		11 U	11 U	11 U
1,3-DINITROBENZENE-OS	12 U		11 U		11 U	11 U	11 U
1,4-DICHLOROBENZENE	12 U		11 U		11 U	11 U	11 U
1,4-DIOXANE-OS	12 UJ		11 UJ		11 UJ	11 UJ	11 UJ
1,4-NAPHTHOQUINONE	12 U		11 U		11 U	11 U	11 U
1-NAPHTHYLAMINE	12 U		11 U		11 U	11 U	11 U
2,2'-OXYBIS(1-CHLOROPROPANE)	12 U		11 U		11 U	11 U	11 U
2,3,4,6-TETRACHLOROPHENOL	59 U		56 U		54 U	56 U	55 U
2,4,5-TRICHLOROPHENOL	24 U		22 U		22 U	22 U	22 U
2,4,6-TRICHLOROPHENOL	12 U		11 U		11 U	11 U	11 U
2,4-DICHLOROPHENOL	12 U		11 U		11 U	11 U	11 U
2,4-DIMETHYLPHENOL	12 U		11 U		11 U	11 U	11 U
2,4-DINITROPHENOL	59 U		56 U		54 U	56 U	55 U
2,4-DINITROTOLUENE-OS	12 U		11 U		11 U	11 U	11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBMW003U001-D	DSBMW003U001-AVG
SAMPLE DATE:	08/05/97	08/05/97	08/06/97	08/06/97	08/05/97	08/05/97	08/05/97
LOCATION:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBDUP003	DSBMW003U001
FIELD DUPLICATE OF:						DSBMW003U001	DSBMW003U001

<b>SEMIVOLATILES (µg/L)</b>							
2,6-DICHLOROPHENOL	12 U		11 U		11 U	11 U	11 U
2,6-DINITROTOLUENE-OS	12 U		11 U		11 U	11 U	11 U
2-ACETYLAMINOFUORENE	12 U		11 U		11 U	11 U	11 U
2-CHLORONAPHTHALENE	12 U		11 U		11 U	11 U	11 U
2-CHLOROPHENOL	12 U		11 U		11 U	11 U	11 U
2-METHYLNAPHTHALENE	12 U		11 U		11 U	11 U	11 U
2-METHYLPHENOL	12 U		11 U		11 U	11 U	11 U
2-NAPHTHYLAMINE	12 U		11 U		11 U	11 U	11 U
2-NITROANILINE	59 U		56 U		54 U	56 U	55 U
2-NITROPHENOL	12 U		11 U		11 U	11 U	11 U
2-PICOLINE	12 U		11 U		11 U	11 U	11 U
3,3'-DICHLOROBENZIDINE	12 UJ		11 U		11 UJ	11 UJ	11 UJ
3,3'-DIMETHYLBENZIDINE	12 U		11 U		11 U	11 U	11 U
3-METHYLCHOLANTHRENE	12 U		11 U		11 U	11 U	11 U
3-NITROANILINE	59 U		56 U		54 U	56 U	55 U
4,6-DINITRO-2-METHYLPHENOL	59 U		56 U		54 U	56 U	55 U
4-AMINOBIIPHENYL	12 U		11 U		11 U	11 U	11 U
4-BROMOPHENYL PHENYL ETHER	12 U		11 U		11 U	11 U	11 U
4-CHLORO-3-METHYLPHENOL	12 U		11 U		11 U	11 U	11 U
4-CHLOROANILINE	12 U		11 U		11 U	11 U	11 U
4-CHLOROPHENYL PHENYL ETHER	12 U		11 U		11 U	11 U	11 U
4-NITROANILINE	59 UJ		56 UJ		54 UJ	56 UJ	55 UJ
4-NITROPHENOL	59 U		56 U		54 U	56 U	55 U
4-NITROQUINOLINE-1-OXIDE	12 UR		11 UR		11 UR	11 UR	11 UR

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
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INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBMW003U001-D	DSBMW003U001-AVG
SAMPLE DATE:	08/05/97	08/05/97	08/06/97	08/06/97	08/05/97	08/05/97	08/05/97
LOCATION:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBDUP003	DSBMW003U001
FIELD DUPLICATE OF:						DSBMW003U001	DSBMW003U001

<b>SEMIVOLATILES (µg/L)</b>							
5-NITRO-O-TOLUIDINE	12 U		11 U		11 U	11 U	11 U
7,12-DIMETHYLBENZ(A)ANTHRACENE	12 U		11 U		11 U	11 U	11 U
A,A-DIMETHYLPHENETHYLAMINE	24 UJ		22 UJ		22 UJ	22 UJ	22 UJ
ACENAPHTHENE	12 U		11 U		11 U	11 U	11 U
ACENAPHTHYLENE	12 U		11 U		11 U	11 U	11 U
ACETOPHENONE	12 U		11 U		11 U	11 U	11 U
ANILINE	12 U		11 U		11 U	11 U	11 U
ANTHRACENE	12 U		11 U		11 U	11 U	11 U
ARAMITE	12 UJ		11 U		11 UJ	11 UJ	11 UJ
BENZO(A)ANTHRACENE	12 U		11 U		11 U	11 U	11 U
BENZO(A)PYRENE	12 U		11 U		11 U	11 U	11 U
BENZO(B)FLUORANTHENE	12 U		11 U		11 U	11 U	11 U
BENZO(G,H,I)PERYLENE	12 U		11 U		11 U	11 U	11 U
BENZO(K)FLUORANTHENE	12 U		11 U		11 U	11 U	11 U
BENZYL ALCOHOL	12 U		11 U		11 U	11 U	11 U
BIS(2-CHLOROETHOXY)METHANE	12 U		11 U		11 U	11 U	11 U
BIS(2-CHLOROETHYL)ETHER	12 U		11 U		11 U	11 U	11 U
BIS(2-ETHYLHEXYL)PHTHALATE	12 U		11 U		1 J	11 U	1 J
BUTYLBENZYL PHTHALATE	12 U		11 U		11 U	11 U	11 U
CHLOROBENZILATE	12 U		11 U		11 U	11 U	11 U
CHRYSENE	12 U		11 U		11 U	11 U	11 U
CIS-ISOSAFROLE	12 UJ		11 U		11 UJ	11 UJ	11 UJ
DI-N-BUTYL PHTHALATE	12 U		11 U		2 J	2 J	2 J
DI-N-OCTYL PHTHALATE	12 U		11 U		11 U	11 U	11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBMW003U001-D	DSBMW003U001-AVG
SAMPLE DATE:	08/05/97	08/05/97	08/06/97	08/06/97	08/05/97	08/05/97	08/05/97
LOCATION:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBDUP003	DSBMW003U001
FIELD DUPLICATE OF:						DSBMW003U001	DSBMW003U001

<b>SEMIVOLATILES (µg/L)</b>							
DIALLATE	12 U		11 U		11 U	11 U	11 U
DIBENZO(A,H)ANTHRACENE	12 U		11 U		11 U	11 U	11 U
DIBENZOFURAN	12 U		11 U		11 U	11 U	11 U
DIETHYL PHTHALATE	12 U		11 U		2 J	2 J	2 J
DIMETHYL PHTHALATE	12 U		11 U		11 U	11 U	11 U
DIPHENYLAMINE	12 U		11 U		11 U	11 U	11 U
ETHYL METHACRYLATE	12 U		11 U		11 U	11 U	11 U
ETHYL METHANESULFONATE	24 U		22 U		22 U	22 U	22 U
FAMPHUR	12 UR		11 UR		11 UR	11 UR	11 UR
FLUORANTHENE	12 U		11 U		11 U	11 U	11 U
FLUORENE	12 U		11 U		11 U	11 U	11 U
HEXACHLOROBENZENE	12 U		11 U		11 U	11 U	11 U
HEXACHLOROBUTADIENE	12 U		11 U		11 U	11 U	11 U
HEXACHLOROCYCLOPENTADIENE	12 U		11 U		11 U	11 U	11 U
HEXACHLOROETHANE	12 U		11 U		11 U	11 U	11 U
HEXACHLOROPROPENE	12 U		11 U		11 U	11 U	11 U
INDENO(1,2,3-CD)PYRENE	12 U		11 U		11 U	11 U	11 U
ISODRIN	12 U		11 U		11 U	11 U	11 U
ISOPHORONE	12 U		11 U		11 U	11 U	11 U
KEPONE	12 UR		11 UR		11 UR	11 UR	11 UR
METHAPYRILENE	12 U		11 UJ		11 U	11 U	11 U
METHYL METHANESULFONATE	24 U		22 U		22 U	22 U	22 U
N-NITROSO-DI-N-BUTYLAMINE	12 U		11 U		11 U	11 U	11 U
N-NITROSO-DI-N-PROPYLAMINE	12 U		11 U		11 U	11 U	11 U

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBMW003U001-D	DSBMW003U001-AVG
SAMPLE DATE:	08/05/97	08/05/97	08/06/97	08/06/97	08/05/97	08/05/97	08/05/97
LOCATION:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBDUP003	DSBMW003U001
FIELD DUPLICATE OF:						DSBMW003U001	DSBMW003U001

**SEMIVOLATILES (µg/L)**

N-NITROSODIETHYLAMINE	12 U		11 U		11 U	11 U	11 U
N-NITROSODIMETHYLAMINE	12 U		11 U		11 U	11 U	11 U
N-NITROSODIPHENYLAMINE	12 U		11 U		11 U	11 U	11 U
N-NITROSOMETHYLETHYLAMINE	12 U		11 U		11 U	11 U	11 U
N-NITROSOMORPHOLINE	12 U		11 U		11 U	11 U	11 U
N-NITROSOPIPERIDINE	12 U		11 U		11 U	11 U	11 U
N-NITROSOPYRROLIDINE	12 U		11 U		11 U	11 U	11 U
NAPHTHALENE	12 U		11 U		11 U	11 U	11 U
NITROBENZENE-OS	12 U		11 U		11 U	11 U	11 U
O,O,O-TRIETHYLPHOSPHOROTHIOAT	12 U		11 U		11 U	11 U	11 U
O-TOLUIDINE	12 UJ		11 U		11 UJ	11 UJ	11 UJ
P-DIMETHYLAMINOAZOBENZENE	12 U		11 U		11 U	11 U	11 U
P-PHENYLENEDIAMINE	12 U		11 UJ		11 U	11 U	11 U
PENTACHLOROBENZENE	12 U		11 U		11 U	11 U	11 U
PENTACHLORONITROBENZENE	12 U		11 U		11 U	11 U	11 U
PENTACHLOROPHENOL	59 U		56 U		54 U	56 U	55 U
PHENACETIN	12 U		11 U		11 U	11 U	11 U
PHENANTHRENE	12 U		1 J		2 J	2 J	2 J
PHENOL	12 U		11 U		11 U	11 U	11 U
PRONAMIDE	12 U		11 U		11 U	11 U	11 U
PYRENE	12 U		11 U		11 U	11 U	11 U
PYRIDINE	12 U		11 U		11 U	11 U	11 U
SAFROLE	12 U		11 U		11 U	11 U	11 U
TRANS-ISOSAFROLE	12 UJ		11 U		11 UJ	11 UJ	11 UJ

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBMW003U001-D	DSBMW003U001-AVG
SAMPLE DATE:	08/05/97	08/05/97	08/06/97	08/06/97	08/05/97	08/05/97	08/05/97
LOCATION:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBDUP003	DSBMW003U001
FIELD DUPLICATE OF:						DSBMW003U001	DSBMW003U001

**HERBICIDES (µg/L)**

DIMETHOATE	12 UJ		11 UJ		11 UJ	11 UJ	11 UJ
PHORATE	12 U		11 U		11 U	11 U	11 U
SULFOTEP	12 UJ		11 U		11 UJ	11 UJ	11 UJ

**ENERGETICS (µg/L)**

1,3,5-TRINITROBENZENE-EXP	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
1,3-DINITROBENZENE-EXP	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
2,4,6-TRINITROTOLUENE	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
2,4-DINITROTOLUENE-EXP	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
2,6-DINITROTOLUENE-EXP	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
2-AMINO-4,6-DINITROTOLUENE	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
2-NITROTOLUENE	1.3 U		1.3 U		1.3 U	1.3 U	1.3 U
3-NITROTOLUENE	1.3 U		1.3 U		1.3 U	1.3 U	1.3 U
4-AMINO-2,6-DINITROTOLUENE	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
4-NITROTOLUENE	1.3 U		1.3 U		1.3 U	1.3 U	1.3 U
HMX	1.3 U		1.3 U		1.3 U	1.3 U	1.3 U
NITROBENZENE-EXP	0.6 U		0.6 U		0.6 U	0.6 U	0.6 U
RDX	7.4		3.8		1.3 U	1.3 U	1.3 U
TETRYL	1.3 U		1.3 U		1.3 U	1.3 U	1.3 U

**METALS (µg/L)**

ANTIMONY	2.3 U						
ARSENIC	1.9 UL						
BARIUM	7.7	7.0	12.5 B	12.6 B	57.4	61.8	59.6
BERYLLIUM	0.33 B	0.20 U	1.4 B	1.1 B	0.37 B	0.20 U	0.235

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBMW003U001-D	DSBMW003U001-AVG
SAMPLE DATE:	08/05/97	08/05/97	08/06/97	08/06/97	08/05/97	08/05/97	08/05/97
LOCATION:	DSBMW001U001	DSBMW001F001	DSBMW002U001	DSBMW002F001	DSBMW003U001	DSBDUP003	DSBMW003U001
FIELD DUPLICATE OF:						DSBMW003U001	DSBMW003U001

**METALS (µg/L)**

CADMIUM	1.3 U	1.3 U	1.3 U	1.3 U	1.7	1.8	1.75
CHROMIUM	2.1	2.0 U	2.0 U	2.0 U	4.4	4.8	4.6
COBALT	28.7	25.3	6.6	6.2	32.0	33.4	32.7
COPPER	3.3 U	3.3 U	3.3 U	3.3 U	4.6	5.2	4.9
LEAD	1.3	1.3 U	1.4 B	2.5 B	1.5	1.5	1.5
MERCURY	0.10	0.13	0.13	0.10	0.20	0.18	0.19
NICKEL	2.4 B	2.5 B	1.1 U	1.1 U	11.2	10.5	10.85
SELENIUM	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
SILVER	1.3 B	0.96 B	0.70 U	0.70 U	1.0 B	0.79 B	0.895 B
THALLIUM	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
TIN	1.4 B	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
VANADIUM	2.0 B	0.70 U	0.70 U	0.70 U	3.4 B	4.6	4
ZINC	5.5	5.9	4.6 B	4.9 B	28.6	31.2	29.9

**MISCELLANEOUS PARAMETERS (µg/L)**

M & P-CRESOL	12 U		11 U		11 U	11 U	11 U
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**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW003F001	DSBMW003F001-D	DSBMW003F001-AVG	DSBMW004U001	DSBMW004F001		
SAMPLE DATE:	08/05/97	08/05/97	08/05/97	08/05/97	08/05/97	//	//
LOCATION:	DSBMW003F001	DSBDUP003-F	DSBMW003F001	DSBMW004U001	DSBMW004F001		
FIELD DUPLICATE OF:		DSBMW003F001	DSBMW003F001				

<b>VOLATILES (µg/L)</b>							
1,1,1,2-TETRACHLOROETHANE				5 U			
1,1,1-TRICHLOROETHANE				5 U			
1,1,2,2-TETRACHLOROETHANE				5 U			
1,1,2-TRICHLOROETHANE				5 U			
1,1-DICHLOROETHANE				5 U			
1,1-DICHLOROETHENE				5 U			
1,2,3-TRICHLOROPROPANE				5 U			
1,2-DIBROMO-3-CHLOROPROPANE				100 U			
1,2-DIBROMOETHANE				5 U			
1,2-DICHLOROETHANE				5 U			
1,2-DICHLOROPROPANE				5 U			
1,4-DICHLORO-2-BUTENE				100 U			
2-BUTANONE				10 UR			
2-HEXANONE				10 U			
4-METHYL-2-PENTANONE				5 U			
ACETONE				10 U			
ACETONITRILE				100 UR			
ACROLEIN				20 UR			
ACRYLONITRILE				5 UR			
ALLYL CHLORIDE				5 U			
BENZENE				5 U			
BROMODICHLOROMETHANE				5 U			
BROMOFORM				5 U			
BROMOMETHANE				10 U			

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW003F001	DSBMW003F001-D	DSBMW003F001-AVG	DSBMW004U001	DSBMW004F001		
SAMPLE DATE:	08/05/97	08/05/97	08/05/97	08/05/97	08/05/97	//	//
LOCATION:	DSBMW003F001	DSBDUP003-F	DSBMW003F001	DSBMW004U001	DSBMW004F001		
FIELD DUPLICATE OF:		DSBMW003F001	DSBMW003F001				

**VOLATILES (µg/L)**

CARBON DISULFIDE				5 U			
CARBON TETRACHLORIDE				5 U			
CHLOROBENZENE				5 U			
CHLOROETHANE				10 U			
CHLOROFORM				5 U			
CHLOROMETHANE				10 U			
CIS-1,3-DICHLOROPROPENE				5 U			
DIBROMOCHLOROMETHANE				5 U			
DIBROMOMETHANE				5 U			
DICHLORODIFLUOROMETHANE				5 U			
ETHYLBENZENE				5 U			
IODOMETHANE				5 U			
ISOBUTYL ALCOHOL				50 UR			
M&P-XYLENES				5 U			
METHACRYLONITRILE				5 U			
METHYL METHACRYLATE				5 U			
METHYLENE CHLORIDE				2 B			
O-XYLENE				5 U			
PENTACHLOROETHANE				5 U			
PROPIONITRILE				50 UR			
STYRENE				5 U			
TETRACHLOROETHENE				5 U			
TOLUENE				5 U			
TRANS-1,2-DICHLOROETHENE				5 U			

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW003F001	DSBMW003F001-D	DSBMW003F001-AVG	DSBMW004U001	DSBMW004F001		
SAMPLE DATE:	08/05/97	08/05/97	08/05/97	08/05/97	08/05/97	//	//
LOCATION:	DSBMW003F001	DSBDUP003-F	DSBMW003F001	DSBMW004U001	DSBMW004F001		
FIELD DUPLICATE OF:		DSBMW003F001	DSBMW003F001				

**VOLATILES (µg/L)**

TRANS-1,3-DICHLOROPROPENE				5 U			
TRICHLOROETHENE				5 U			
TRICHLOROFLUOROMETHANE				5 U			
VINYL ACETATE				10 UR			
VINYL CHLORIDE				5 U			

**SEMIVOLATILES (µg/L)**

1,2,4,5-TETRACHLOROBENZENE				12 U			
1,2,4-TRICHLOROBENZENE				12 U			
1,2-DICHLOROBENZENE				12 U			
1,3,5-TRINITROBENZENE-OS				12 U			
1,3-DICHLOROBENZENE				12 U			
1,3-DINITROBENZENE-OS				12 U			
1,4-DICHLOROBENZENE				12 U			
1,4-DIOXANE-OS				12 UJ			
1,4-NAPHTHOQUINONE				12 U			
1-NAPHTHYLAMINE				12 U			
2,2'-OXYBIS(1-CHLOROPROPANE)				12 U			
2,3,4,6-TETRACHLOROPHENOL				58 U			
2,4,5-TRICHLOROPHENOL				23 U			
2,4,6-TRICHLOROPHENOL				12 U			
2,4-DICHLOROPHENOL				12 U			
2,4-DIMETHYLPHENOL				12 U			
2,4-DINITROPHENOL				58 U			
2,4-DINITROTOLUENE-OS				12 U			

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW003F001	DSBMW003F001-D	DSBMW003F001-AVG	DSBMW004U001	DSBMW004F001		
SAMPLE DATE:	08/05/97	08/05/97	08/05/97	08/05/97	08/05/97	//	//
LOCATION:	DSBMW003F001	DSBDUP003-F	DSBMW003F001	DSBMW004U001	DSBMW004F001		
FIELD DUPLICATE OF:		DSBMW003F001	DSBMW003F001				

**SEMIVOLATILES (µg/L)**

2,6-DICHLOROPHENOL				12 U			
2,6-DINITROTOLUENE-OS				12 U			
2-ACETYLAMINOFUORENE				12 U			
2-CHLORONAPHTHALENE				12 U			
2-CHLOROPHENOL				12 U			
2-METHYLNAPHTHALENE				12 U			
2-METHYLPHENOL				12 U			
2-NAPHTHYLAMINE				12 U			
2-NITROANILINE				58 U			
2-NITROPHENOL				12 U			
2-PICOLINE				12 U			
3,3'-DICHLOROBENZIDINE				12 UJ			
3,3'-DIMETHYLBENZIDINE				12 U			
3-METHYLCHOLANTHRENE				12 U			
3-NITROANILINE				58 U			
4,6-DINITRO-2-METHYLPHENOL				58 U			
4-AMINOBIHENYL				12 U			
4-BROMOPHENYL PHENYL ETHER				12 U			
4-CHLORO-3-METHYLPHENOL				12 U			
4-CHLOROANILINE				12 U			
4-CHLOROPHENYL PHENYL ETHER				12 U			
4-NITROANILINE				58 UJ			
4-NITROPHENOL				58 U			
4-NITROQUINOLINE-1-OXIDE				12 UR			

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW003F001	DSBMW003F001-D	DSBMW003F001-AVG	DSBMW004U001	DSBMW004F001		
SAMPLE DATE:	08/05/97	08/05/97	08/05/97	08/05/97	08/05/97	//	//
LOCATION:	DSBMW003F001	DSBDUP003-F	DSBMW003F001	DSBMW004U001	DSBMW004F001		
FIELD DUPLICATE OF:		DSBMW003F001	DSBMW003F001				

<b>SEMIVOLATILES (µg/L)</b>							
5-NITRO-O-TOLUIDINE				12 U			
7,12-DIMETHYLBENZ(A)ANTHRACENE				12 U			
A,A-DIMETHYLPHENETHYLAMINE				23 UJ			
ACENAPHTHENE				12 U			
ACENAPHTHYLENE				12 U			
ACETOPHENONE				12 U			
ANILINE				12 U			
ANTHRACENE				12 U			
ARAMITE				12 UJ			
BENZO(A)ANTHRACENE				12 U			
BENZO(A)PYRENE				12 U			
BENZO(B)FLUORANTHENE				12 U			
BENZO(G,H,I)PERYLENE				12 U			
BENZO(K)FLUORANTHENE				12 U			
BENZYL ALCOHOL				12 U			
BIS(2-CHLOROETHOXY)METHANE				12 U			
BIS(2-CHLOROETHYL)ETHER				12 U			
BIS(2-ETHYLHEXYL)PHTHALATE				12 U			
BUTYLBENZYL PHTHALATE				12 U			
CHLOROBENZILATE				12 U			
CHRYSENE				12 U			
CIS-ISOSAFROLE				12 UJ			
DI-N-BUTYL PHTHALATE				12 U			
DI-N-OCTYL PHTHALATE				12 U			

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW003F001	DSBMW003F001-D	DSBMW003F001-AVG	DSBMW004U001	DSBMW004F001		
SAMPLE DATE:	08/05/97	08/05/97	08/05/97	08/05/97	08/05/97	//	//
LOCATION:	DSBMW003F001	DSBDUP003-F	DSBMW003F001	DSBMW004U001	DSBMW004F001		
FIELD DUPLICATE OF:		DSBMW003F001	DSBMW003F001				

**SEMIVOLATILES (µg/L)**

DIALLATE				12 U		
DIBENZO(A,H)ANTHRACENE				12 U		
DIBENZOFURAN				12 U		
DIETHYL PHTHALATE				12 U		
DIMETHYL PHTHALATE				12 U		
DIPHENYLAMINE				12 U		
ETHYL METHACRYLATE				12 U		
ETHYL METHANESULFONATE				23 U		
FAMPHUR				12 UR		
FLUORANTHENE				12 U		
FLUORENE				12 U		
HEXACHLOROBENZENE				12 U		
HEXACHLOROBUTADIENE				12 U		
HEXACHLOROCYCLOPENTADIENE				12 U		
HEXACHLOROETHANE				12 U		
HEXACHLOROPROPENE				12 U		
INDENO(1,2,3-CD)PYRENE				12 U		
ISODRIN				12 U		
ISOPHORONE				12 U		
KEPONE				12 UR		
METHAPYRILENE				12 U		
METHYL METHANESULFONATE				23 U		
N-NITROSO-DI-N-BUTYLAMINE				12 U		
N-NITROSO-DI-N-PROPYLAMINE				12 U		

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW003F001	DSBMW003F001-D	DSBMW003F001-AVG	DSBMW004U001	DSBMW004F001		
SAMPLE DATE:	08/05/97	08/05/97	08/05/97	08/05/97	08/05/97	//	//
LOCATION:	DSBMW003F001	DSBDUP003-F	DSBMW003F001	DSBMW004U001	DSBMW004F001		
FIELD DUPLICATE OF:		DSBMW003F001	DSBMW003F001				

<b>SEMIVOLATILES (µg/L)</b>							
N-NITROSODIETHYLAMINE				12 U			
N-NITROSODIMETHYLAMINE				12 U			
N-NITROSODIPHENYLAMINE				12 U			
N-NITROSOMETHYLETHYLAMINE				12 U			
N-NITROSOMORPHOLINE				12 U			
N-NITROSOPIPERIDINE				12 U			
N-NITROSOPYRROLIDINE				12 U			
NAPHTHALENE				12 U			
NITROBENZENE-OS				12 U			
O,O,O-TRIETHYLPHOSPHOROTHIOAT				12 U			
O-TOLUIDINE				12 UJ			
P-DIMETHYLAMINOAZOBENZENE				12 U			
P-PHENYLENEDIAMINE				12 U			
PENTACHLOROBENZENE				12 U			
PENTACHLORONITROBENZENE				12 U			
PENTACHLOROPHENOL				58 U			
PHENACETIN				12 U			
PHENANTHRENE				12 U			
PHENOL				12 U			
PRONAMIDE				12 U			
PYRENE				12 U			
PYRIDINE				12 U			
SAFROLE				12 U			
TRANS-ISOSAFROLE				12 UJ			

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW003F001	DSBMW003F001-D	DSBMW003F001-AVG	DSBMW004U001	DSBMW004F001		
SAMPLE DATE:	08/05/97	08/05/97	08/05/97	08/05/97	08/05/97	//	//
LOCATION:	DSBMW003F001	DSBDUP003-F	DSBMW003F001	DSBMW004U001	DSBMW004F001		
FIELD DUPLICATE OF:		DSBMW003F001	DSBMW003F001				

**HERBICIDES (µg/L)**

DIMETHOATE				12 UJ			
PHORATE				12 U			
SULFOTEP				12 UJ			

**ENERGETICS (µg/L)**

1,3,5-TRINITROBENZENE-EXP				0.6 U			
1,3-DINITROBENZENE-EXP				0.6 U			
2,4,6-TRINITROTOLUENE				0.6 U			
2,4-DINITROTOLUENE-EXP				0.6 U			
2,6-DINITROTOLUENE-EXP				0.6 U			
2-AMINO-4,6-DINITROTOLUENE				0.6 U			
2-NITROTOLUENE				1.3 U			
3-NITROTOLUENE				1.3 U			
4-AMINO-2,6-DINITROTOLUENE				0.6 U			
4-NITROTOLUENE				1.3 U			
HMX				1.3 U			
NITROBENZENE-EXP				0.6 U			
RDX				1.3 U			
TETRYL				1.3 U			

**METALS (µg/L)**

ANTIMONY	2.3 B	2.3 U	2.3 B	2.3 U	2.3 U		
ARSENIC	1.9 UL						
BARIUM	53.6	52.1	52.85	12.5	11.3		
BERYLLIUM	0.64 B	0.20 U	0.37	0.20 U	0.20 U		

**SUMMARY OF GROUNDWATER ANALYTIC RESULTS FOR SMWU 4 - CHICAMUXEN CREEK'S EDGE DUMP SITE B  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	DSBMW003F001	DSBMW003F001-D	DSBMW003F001-AVG	DSBMW004U001	DSBMW004F001		
SAMPLE DATE:	08/05/97	08/05/97	08/05/97	08/05/97	08/05/97	//	//
LOCATION:	DSBMW003F001	DSBDUP003-F	DSBMW003F001	DSBMW004U001	DSBMW004F001		
FIELD DUPLICATE OF:		DSBMW003F001	DSBMW003F001				

**METALS (µg/L)**

CADMIUM	1.8	1.8	1.8	1.9	1.6		
CHROMIUM	2.3	2.1	2.2	2.0 U	2.0 U		
COBALT	32.9	30.9	31.9	29.7	28.7		
COPPER	4.1	4.0	4.05	4.2	3.6		
LEAD	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U		
MERCURY	0.18	0.18	0.18	0.15	0.12		
NICKEL	10.3	10.2	10.25	4.1 B	3.8 B		
SELENIUM	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U		
SILVER	1.1 B	0.86	0.98	1.2	0.81		
THALLIUM	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U		
TIN	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U		
VANADIUM	0.93 B	0.70 U	0.64	1.7 B	0.70 U		
ZINC	27.8	25.1	26.45	7.5	6.9		

**MISCELLANEOUS PARAMETERS (µg/L)**

M & P-CRESOL				12 U			
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**SWMU 6 AIR BLAST POND**

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPSS0040101-D	ABPSS0040101-AVG	ABPSS0050101
SAMPLE DATE:	07/13/97	07/13/97	07/13/97	07/21/97	07/21/97	07/21/97	07/21/97
LOCATION:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPDUP010	ABPSS0040101	ABPSS0050101
FIELD DUPLICATE OF:					ABPSS0040101	ABPSS0040101	

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
1,1,1-TRICHLOROETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
1,1,2,2-TETRACHLOROETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
1,1,2-TRICHLOROETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
1,1-DICHLOROETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
1,1-DICHLOROETHENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
1,2,3-TRICHLOROPROPANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	110 U	130 U	120 U	110 U	110 U	110 U	110 U
1,2-DIBROMOETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
1,2-DICHLOROETHANE	6 U	7 U	6 U	5 U	6 UR	5.5 U	5 U
1,2-DICHLOROPROPANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
1,4-DICHLORO-2-BUTENE	110 U	130 U	120 U	110 U	110 U	110 U	110 U
2-BUTANONE	11 UR	13 UR	12 UR	11 UR	11 UR	11 UR	11 UR
2-HEXANONE	11 U	13 U	12 U	11 U	11 U	11 U	11 U
4-METHYL-2-PENTANONE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
ACETONE	46 B	44 B	37 B	11 B	53 B	32 B	2000
ACETONITRILE	110 UR	130 UR	120 UR	110 UJ	110 UJ	110 U	110 UJ
ACROLEIN	22 UR	26 UR	24 UR	22 UR	22 UR	22 UR	22 UR
ACRYLONITRILE	6 UR	7 UR	6 UR	5 U	6 U	5.5 U	5 U
ALLYL CHLORIDE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
BENZENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
BROMODICHLOROMETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
BROMOFORM	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
BROMOMETHANE	11 U	13 U	12 U	11 U	11 U	11 U	11 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPSS0040101-D	ABPSS0040101-AVG	ABPSS0050101
SAMPLE DATE:	07/13/97	07/13/97	07/13/97	07/21/97	07/21/97	07/21/97	07/21/97
LOCATION:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPDUP010	ABPSS0040101	ABPSS0050101
FIELD DUPLICATE OF:					ABPSS0040101	ABPSS0040101	

<b>VOLATILES (µg/kg)</b>							
CARBON DISULFIDE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
CARBON TETRACHLORIDE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
CHLOROBENZENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
CHLOROETHANE	11 U	13 U	12 U	11 U	11 U	11 U	11 U
CHLOROFORM	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
CHLOROMETHANE	11 U	13 U	12 U	11 U	11 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
DIBROMOCHLOROMETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
DIBROMOMETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
DICHLORODIFLUOROMETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
ETHYLBENZENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
IODOMETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
ISOBUTYL ALCOHOL	56 UR	66 UR	59 UR	54 U	55 U	54.5 U	54 U
M&P-XYLENES	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
METHACRYLONITRILE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
METHYL METHACRYLATE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
METHYLENE CHLORIDE	6 U	7 U	3 B	5 B	3 B	4 B	8 B
O-XYLENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
PENTACHLOROETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
PROPIONITRILE	56 UR	66 UR	59 UR	54 U	55 U	54.5 U	54 U
STYRENE	92	7 U	6 U	5 U	6 U	5.5 U	5 U
TETRACHLOROETHENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
TOLUENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
TRANS-1,2-DICHLOROETHENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPSS0040101-D	ABPSS0040101-AVG	ABPSS0050101
SAMPLE DATE:	07/13/97	07/13/97	07/13/97	07/21/97	07/21/97	07/21/97	07/21/97
LOCATION:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPDUP010	ABPSS0040101	ABPSS0050101
FIELD DUPLICATE OF:					ABPSS0040101	ABPSS0040101	

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
TRICHLOROETHENE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
TRICHLOROFLUOROMETHANE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U
VINYL ACETATE	11 U	13 U	12 U	11 U	11 U	11 U	11 U
VINYL CHLORIDE	6 U	7 U	6 U	5 U	6 U	5.5 U	5 U

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
1,2,4-TRICHLOROBENZENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
1,2-DICHLOROBENZENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
1,3,5-TRINITROBENZENE-OS	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ		360 UJ
1,3-DICHLOROBENZENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
1,3-DINITROBENZENE-OS	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ		360 UJ
1,4-DICHLOROBENZENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
1,4-DIOXANE-OS	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
1,4-NAPHTHOQUINONE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
1-NAPHTHYLAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2,2-OXYBIS(1-CHLOROPROPANE)	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2,3,4,6-TETRACHLOROPHENOL	1900 UJ	2200 UJ	2000 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
2,4,5-TRICHLOROPHENOL	750 UJ	880 UJ	780 UJ	720 UJ	730 UJ	725 UJ	720 UJ
2,4,6-TRICHLOROPHENOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2,4-DICHLOROPHENOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2,4-DIMETHYLPHENOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2,4-DINITROPHENOL	1900 UJ	2200 UJ	2000 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
2,4-DINITROTOLUENE-OS	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ		360 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPSS0040101-D	ABPSS0040101-AVG	ABPSS0050101
SAMPLE DATE:	07/13/97	07/13/97	07/13/97	07/21/97	07/21/97	07/21/97	07/21/97
LOCATION:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPDUP010	ABPSS0040101	ABPSS0050101
FIELD DUPLICATE OF:					ABPSS0040101	ABPSS0040101	

<b>SEMIVOLATILES (µg/kg)</b>							
2,6-DICHLOROPHENOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2,6-DINITROTOLUENE-OS	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ		360 UJ
2-ACETYLAMINOFUORENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2-CHLORONAPHTHALENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2-CHLOROPHENOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2-METHYLNAPHTHALENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2-METHYLPHENOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2-NAPHTHYLAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2-NITROANILINE	1900 UJ	2200 UJ	2000 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
2-NITROPHENOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
2-PICOLINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
3,3'-DICHLOROBENZIDINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
3,3'-DIMETHYLBENZIDINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
3-METHYLCHOLANTHRENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
3-NITROANILINE	1900 UJ	2200 UJ	2000 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
4,6-DINITRO-2-METHYLPHENOL	1900 UJ	2200 UJ	2000 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
4-AMINOBIIPHENYL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
4-BROMOPHENYL PHENYL ETHER	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
4-CHLORO-3-METHYLPHENOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
4-CHLOROANILINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
4-CHLOROPHENYL PHENYL ETHER	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
4-NITROANILINE	1900 UJ	2200 UJ	2000 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
4-NITROPHENOL	1900 UJ	2200 UJ	2000 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
4-NITROQUINOLINE-1-OXIDE	370 UR	440 UR	390 UR	360 UR	370 UR	365 UR	360 UR

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPSS0040101-D	ABPSS0040101-AVG	ABPSS0050101
SAMPLE DATE:	07/13/97	07/13/97	07/13/97	07/21/97	07/21/97	07/21/97	07/21/97
LOCATION:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPDUP010	ABPSS0040101	ABPSS0050101
FIELD DUPLICATE OF:					ABPSS0040101	ABPSS0040101	

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
A,A-DIMETHYLPHENETHYLAMINE	750 UJ	880 UJ	780 UJ	720 UJ	730 UJ	725 UJ	720 UJ
ACENAPHTHENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
ACENAPHTHYLENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
ACETOPHENONE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
ANILINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
ANTHRACENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
ARAMITE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
BENZO(A)ANTHRACENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
BENZO(A)PYRENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
BENZO(B)FLUORANTHENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
BENZO(G,H,I)PERYLENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
BENZO(K)FLUORANTHENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
BENZYL ALCOHOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
BIS(2-CHLOROETHOXY)METHANE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
BIS(2-CHLOROETHYL)ETHER	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	51 J	440 UJ	110 J	74 B	370 UJ	74 B	360 B
BUTYLBENZYL PHTHALATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
CHLOROBENZILATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
CHRYSENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
CIS-ISOSAFROLE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
DI-N-BUTYL PHTHALATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
DI-N-OCTYL PHTHALATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPSS0040101-D	ABPSS0040101-AVG	ABPSS0050101
SAMPLE DATE:	07/13/97	07/13/97	07/13/97	07/21/97	07/21/97	07/21/97	07/21/97
LOCATION:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPDUP010	ABPSS0040101	ABPSS0050101
FIELD DUPLICATE OF:					ABPSS0040101	ABPSS0040101	

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
DIBENZO(A,H)ANTHRACENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
DIBENZOFURAN	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
DIETHYL PHTHALATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
DIMETHYL PHTHALATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
DIPHENYLAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
ETHYL METHACRYLATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
ETHYL METHANESULFONATE	750 UJ	880 UJ	780 UJ	720 UJ	730 UJ	725 UJ	720 UJ
FAMPHUR	370 UR	440 UR	390 UR	360 UR	370 UR	365 UR	360 UR
FLUORANTHENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
FLUORENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
HEXACHLOROBENZENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
HEXACHLOROBUTADIENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
HEXACHLOROCYCLOPENTADIENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
HEXACHLOROETHANE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
HEXACHLOROPROPENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
INDENO(1,2,3-CD)PYRENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
ISODRIN	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
ISOPHORONE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
KEPONE	370 UR	440 UR	390 UR	360 UR	370 UR	365 UR	360 UR
METHAPYRILENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
METHYL METHANESULFONATE	750 UJ	880 UJ	780 UJ	720 UJ	730 UJ	725 UJ	720 UJ
N-NITROSO-DI-N-BUTYLAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
N-NITROSO-DI-N-PROPYLAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ

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NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPSS0040101-D	ABPSS0040101-AVG	ABPSS0050101
SAMPLE DATE:	07/13/97	07/13/97	07/13/97	07/21/97	07/21/97	07/21/97	07/21/97
LOCATION:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPDUP010	ABPSS0040101	ABPSS0050101
FIELD DUPLICATE OF:					ABPSS0040101	ABPSS0040101	

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
N-NITROSODIMETHYLAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
N-NITROSODIPHENYLAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
N-NITROSOMETHYLETHYLAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
N-NITROSOMORPHOLINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
N-NITROSOPIPERIDINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
N-NITROSOPIRROLIDINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
NAPHTHALENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
NITROBENZENE-OS	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ		360 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
O-TOLUIDINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
P-DIMETHYLAMINOAZOBENZENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
P-PHENYLENEDIAMINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
PENTACHLOROBENZENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
PENTACHLORONITROBENZENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
PENTACHLOROPHENOL	1900 UJ	2200 UJ	2000 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
PHENACETIN	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
PHENANTHRENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
PHENOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
PRONAMIDE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
PYRENE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
PYRIDINE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
SAFROLE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
TRANS-ISOSAFROLE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ

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SAMPLE DATE:	07/13/97	07/13/97	07/13/97	07/21/97	07/21/97	07/21/97	07/21/97
LOCATION:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPDUP010	ABPSS0040101	ABPSS0050101
FIELD DUPLICATE OF:					ABPSS0040101	ABPSS0040101	

**HERBICIDES (µg/kg)**

DIMETHOATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
PHORATE	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
SULFOTEP	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	365 UJ	40.2 U				
1,3-DINITROBENZENE-EXP	37.2 U	365 UJ	37.2 U				
2,4,6-TRINITROTOLUENE	35.6 U						
2,4-DINITROTOLUENE-EXP	51.6 U	365 UJ	51.6 U				
2,6-DINITROTOLUENE-EXP	47.6 U	365 UJ	47.6 U				
2-AMINO-4,6-DINITROTOLUENE	46.7 U						
2-NITROTOLUENE	81.4 U						
3-NITROTOLUENE	81.8 U						
4-AMINO-2,6-DINITROTOLUENE	40.9 U						
4-NITROTOLUENE	87.2 U						
HMX	70.5 U						
NITROBENZENE-EXP	35.2 U	365 UJ	35.2 U				
RDX	50.9 U						
TETRYL	163 U	163 U	163 U	163 UJ	163 UJ	163 UJ	163 UJ

**METALS (mg/kg)**

ANTIMONY	0.46 L	0.26 UL	0.24 L	0.36 L	0.28 L	0.32 L	0.58 L
ARSENIC	9.6	0.55 B	1.7	3.0	2.9	2.95	2.5
BARIUM	8.2	6.2	15.5	49.6 J	40.0 J	44.8 J	32.9 J
BERYLLIUM	0.03 B	0.04 B	0.22	0.47	0.51	0.49	0.41

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SAMPLE DATE:	07/13/97	07/13/97	07/13/97	07/21/97	07/21/97	07/21/97	07/21/97
LOCATION:	ABPSS0010101	ABPSS0020101	ABPSS0030101	ABPSS0040101	ABPDUP010	ABPSS0040101	ABPSS0050101
FIELD DUPLICATE OF:					ABPSS0040101	ABPSS0040101	

**METALS (mg/kg)**

CADMIUM	0.69	0.59 K	0.22 K	0.13 U	0.11 U	0.12 U	0.13 U
CHROMIUM	5.9 J	4.3 J	9.8 J	22.1 J	26.3 J	24.2 J	22.4 J
COBALT	2.3	0.59	1.1	3.1	2.5	2.8	2.2
COPPER	33.8	33.1	20.8	9.1	8.5	8.8	7.6
LEAD	47.0 J	8.2 J	15.0 J	10.0 J	8.9 J	9.45 J	8.9 J
MERCURY	0.02	0.02	0.05	0.06	0.04	0.05	0.04
NICKEL	7.6	1.2	2.8	6.2	5.6	5.9	4.5
SELENIUM	1.1	0.29	0.58	0.98	0.95	0.965	1.1
SILVER	0.16 B	0.35 B	0.41 B	0.07 U	0.06 U	0.065 U	0.07 U
THALLIUM	0.28 B	0.28 U	0.30 B	0.39 B	0.21 U	0.2475	0.24 U
TIN	2.3 B	2.3 B	3.0 B	3.3 B	2.7 B	3 B	2.9 B
VANADIUM	6.5	5.0	15.0	30.6	32.4	31.5	28.3
ZINC	80.8 J	58.8 J	19.7 J	22.0 J	21.1 J	21.55 J	19.2 J

**MISCELLANEOUS PARAMETERS ( )**

M & P-CRESOL	370 UJ	440 UJ	390 UJ	360 UJ	370 UJ	365 UJ	360 UJ
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SAMPLE NUMBER:	ABPSS0060101	ABPSS0060101-D	ABPSS0060101-AVG	ABPSS0070101			
SAMPLE DATE:	07/22/97	07/22/97	07/22/97	07/22/97	//	//	//
LOCATION:	ABPSS0060101	ABPDUP011	ABPSS0060101	ABPSS0070101			
FIELD DUPLICATE OF:		ABPSS0060101	ABPSS0060101				

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U			
1,1,1-TRICHLOROETHANE	5 U	5 U	5 U	5 U			
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 U	5 U			
1,1,2-TRICHLOROETHANE	5 U	5 U	5 U	5 U			
1,1-DICHLOROETHANE	5 U	5 U	5 U	5 U			
1,1-DICHLOROETHENE	5 U	5 U	5 U	5 U			
1,2,3-TRICHLOROPROPANE	5 U	5 U	5 U	5 U			
1,2-DIBROMO-3-CHLOROPROPANE	110 U	100 U	105 U	110 U			
1,2-DIBROMOETHANE	5 U	5 U	5 U	5 U			
1,2-DICHLOROETHANE	5 U	5 U	5 U	5 U			
1,2-DICHLOROPROPANE	5 U	5 U	5 U	5 U			
1,4-DICHLORO-2-BUTENE	110 U	100 U	105 U	110 U			
2-BUTANONE	11 UR	10 UR	10 UR	11 UR			
2-HEXANONE	11 U	10 U	10.5 U	11 U			
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U			
ACETONE	110 B	28 B	69 B	660 J			
ACETONITRILE	110 UJ	100 U	105 U	110 UJ			
ACROLEIN	21 UR	21 UR	10.5 UR	21 UR			
ACRYLONITRILE	5 U	5 U	5 U	5 U			
ALLYL CHLORIDE	5 U	5 U	5 U	5 U			
BENZENE	5 U	5 U	5 U	5 U			
BROMODICHLOROMETHANE	5 U	5 U	5 U	5 U			
BROMOFORM	5 U	5 U	5 U	5 U			
BROMOMETHANE	11 U	10 U	10.5 U	11 U			

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SAMPLE NUMBER:	ABPSS0060101	ABPSS0060101-D	ABPSS0060101-AVG	ABPSS0070101			
SAMPLE DATE:	07/22/97	07/22/97	07/22/97	07/22/97	//	//	//
LOCATION:	ABPSS0060101	ABPDUP011	ABPSS0060101	ABPSS0070101			
FIELD DUPLICATE OF:		ABPSS0060101	ABPSS0060101				

**VOLATILES (µg/kg)**

CARBON DISULFIDE	5 U	5 U	5 U	5 U			
CARBON TETRACHLORIDE	5 U	5 U	5 U	5 U			
CHLOROBENZENE	5 U	5 U	5 U	5 U			
CHLOROETHANE	11 U	10 U	10.5 U	11 U			
CHLOROFORM	5 U	5 U	5 U	5 U			
CHLOROMETHANE	11 U	10 U	10.5 U	11 U			
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U			
DIBROMOCHLOROMETHANE	5 U	5 U	5 U	5 U			
DIBROMOMETHANE	5 U	5 U	5 U	5 U			
DICHLORODIFLUOROMETHANE	5 U	5 U	5 U	5 U			
ETHYLBENZENE	5 U	5 U	5 U	5 U			
IODOMETHANE	5 U	5 U	5 U	5 U			
ISOBUTYL ALCOHOL	53 U	52 U	52.5 U	53 U			
M&P-XYLENES	5 U	5 U	5 U	5 U			
METHACRYLONITRILE	5 U	5 U	5 U	5 U			
METHYL METHACRYLATE	5 U	5 U	5 U	5 U			
METHYLENE CHLORIDE	16 B	14 B	15 B	5 B			
O-XYLENE	5 U	5 U	5 U	5 U			
PENTACHLOROETHANE	5 U	5 U	5 U	5 U			
PROPIONITRILE	53 U	52 U	52.5 U	53 U			
STYRENE	5 U	5 U	5 U	5 U			
TETRACHLOROETHENE	5 U	5 U	5 U	5 U			
TOLUENE	5 U	5 U	5 U	5 U			
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 U	5 U			

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SAMPLE NUMBER:	ABPSS0060101	ABPSS0060101-D	ABPSS0060101-AVG	ABPSS0070101			
SAMPLE DATE:	07/22/97	07/22/97	07/22/97	07/22/97	//	//	//
LOCATION:	ABPSS0060101	ABPDUP011	ABPSS0060101	ABPSS0070101			
FIELD DUPLICATE OF:		ABPSS0060101	ABPSS0060101				

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 U	5 U			
TRICHLOROETHENE	5 U	5 U	5 U	5 U			
TRICHLOROFLUOROMETHANE	5 U	5 U	5 U	5 U			
VINYL ACETATE	11 U	10 U	10.5 U	11 U			
VINYL CHLORIDE	5 U	5 U	5 U	5 U			

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	350 UJ	350 UJ	350 UJ	350 UJ			
1,2,4-TRICHLOROBENZENE	350 UJ	350 UJ	350 UJ	350 UJ			
1,2-DICHLOROBENZENE	350 UJ	350 UJ	350 UJ	350 UJ			
1,3,5-TRINITROBENZENE-OS	350 UJ	350 UJ		350 UJ			
1,3-DICHLOROBENZENE	350 UJ	350 UJ	350 UJ	350 UJ			
1,3-DINITROBENZENE-OS	350 UJ	350 UJ		350 UJ			
1,4-DICHLOROBENZENE	350 UJ	350 UJ	350 UJ	350 UJ			
1,4-DIOXANE-OS	350 UJ	350 UJ	350 UJ	350 UJ			
1,4-NAPHTHOQUINONE	350 UJ	350 UJ	350 UJ	350 UJ			
1-NAPHTHYLAMINE	350 UJ	350 UJ	350 UJ	350 UJ			
2,2'-OXYBIS(1-CHLOROPROPANE)	350 UJ	350 UJ	350 UJ	350 UJ			
2,3,4,6-TETRACHLOROPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ			
2,4,5-TRICHLOROPHENOL	700 UJ	700 UJ	700 UJ	700 UJ			
2,4,6-TRICHLOROPHENOL	350 UJ	350 UJ	350 UJ	350 UJ			
2,4-DICHLOROPHENOL	350 UJ	350 UJ	350 UJ	350 UJ			
2,4-DIMETHYLPHENOL	350 UJ	350 UJ	350 UJ	350 UJ			
2,4-DINITROPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ			
2,4-DINITROTOLUENE-OS	350 UJ	350 UJ		350 UJ			

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LOCATION:	ABPSS0060101	ABPDUP011	ABPSS0060101	ABPSS0070101			
FIELD DUPLICATE OF:		ABPSS0060101	ABPSS0060101				

**SEMIVOLATILES (µg/kg)**

2,6-DICHLOROPHENOL	350 UJ	350 UJ	350 UJ	350 UJ			
2,6-DINITROTOLUENE-OS	350 UJ	350 UJ		350 UJ			
2-ACETYLAMINOFUORENE	350 UJ	350 UJ	350 UJ	350 UJ			
2-CHLORONAPHTHALENE	350 UJ	350 UJ	350 UJ	350 UJ			
2-CHLOROPHENOL	350 UJ	350 UJ	350 UJ	350 UJ			
2-METHYLNAPHTHALENE	350 UJ	350 UJ	350 UJ	350 UJ			
2-METHYLPHENOL	350 UJ	350 UJ	350 UJ	350 UJ			
2-NAPHTHYLAMINE	350 UJ	350 UJ	350 UJ	350 UJ			
2-NITROANILINE	1800 UJ	1800 UJ	1800 UJ	1800 UJ			
2-NITROPHENOL	350 UJ	350 UJ	350 UJ	350 UJ			
2-PICOLINE	350 UJ	350 UJ	350 UJ	350 UJ			
3,3'-DICHLOROBENZIDINE	350 UJ	350 UJ	350 UJ	350 UJ			
3,3'-DIMETHYLBENZIDINE	350 UJ	350 UJ	350 UJ	350 UJ			
3-METHYLCHOLANTHRENE	350 UJ	350 UJ	350 UJ	350 UJ			
3-NITROANILINE	1800 UJ	1800 UJ	1800 UJ	1800 UJ			
4,6-DINITRO-2-METHYLPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ			
4-AMINOBIPHENYL	350 UJ	350 UJ	350 UJ	350 UJ			
4-BROMOPHENYL PHENYL ETHER	350 UJ	350 UJ	350 UJ	350 UJ			
4-CHLORO-3-METHYLPHENOL	350 UJ	350 UJ	350 UJ	350 UJ			
4-CHLOROANILINE	350 UJ	350 UJ	350 UJ	350 UJ			
4-CHLOROPHENYL PHENYL ETHER	350 UJ	350 UJ	350 UJ	350 UJ			
4-NITROANILINE	1800 UJ	1800 UJ	1800 UJ	1800 UJ			
4-NITROPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ			
4-NITROQUINOLINE-1-OXIDE	350 UR	350 UR	350 UR	350 UR			

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SAMPLE DATE:	07/22/97	07/22/97	07/22/97	07/22/97	//	//	//
LOCATION:	ABPSS0060101	ABPDUP011	ABPSS0060101	ABPSS0070101			
FIELD DUPLICATE OF:		ABPSS0060101	ABPSS0060101				

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	350 UJ	350 UJ	350 UJ	350 UJ			
7,12-DIMETHYLBENZ(A)ANTHRACENE	350 UJ	350 UJ	350 UJ	350 UJ			
A,A-DIMETHYLPHENETHYLAMINE	700 UJ	700 UJ	700 UJ	700 UJ			
ACENAPHTHENE	350 UJ	350 UJ	350 UJ	350 UJ			
ACENAPHTHYLENE	350 UJ	350 UJ	350 UJ	350 UJ			
ACETOPHENONE	350 UJ	350 UJ	350 UJ	350 UJ			
ANILINE	350 UJ	350 UJ	350 UJ	350 UJ			
ANTHRACENE	350 UJ	350 UJ	350 UJ	350 UJ			
ARAMITE	350 UJ	350 UJ	350 UJ	350 UJ			
BENZO(A)ANTHRACENE	350 UJ	350 UJ	350 UJ	350 UJ			
BENZO(A)PYRENE	350 UJ	350 UJ	350 UJ	350 UJ			
BENZO(B)FLUORANTHENE	350 UJ	350 UJ	350 UJ	350 UJ			
BENZO(G,H,I)PERYLENE	350 UJ	350 UJ	350 UJ	350 UJ			
BENZO(K)FLUORANTHENE	350 UJ	350 UJ	350 UJ	350 UJ			
BENZYL ALCOHOL	350 UJ	350 UJ	350 UJ	350 UJ			
BIS(2-CHLOROETHOXY)METHANE	350 UJ	350 UJ	350 UJ	350 UJ			
BIS(2-CHLOROETHYL)ETHER	350 UJ	350 UJ	350 UJ	350 UJ			
BIS(2-ETHYLHEXYL)PHTHALATE	65 B	2600 J	1332.5	53 B			
BUTYLBENZYL PHTHALATE	350 UJ	350 UJ	350 UJ	350 UJ			
CHLOROBENZILATE	350 UJ	350 UJ	350 UJ	350 UJ			
CHRYSENE	67 J	350 UJ	67 J	350 UJ			
CIS-ISOSAFROLE	350 UJ	350 UJ	350 UJ	350 UJ			
DI-N-BUTYL PHTHALATE	350 UJ	350 UJ	350 UJ	350 UJ			
DI-N-OCTYL PHTHALATE	350 UJ	350 UJ	350 UJ	350 UJ			

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INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSS0060101	ABPSS0060101-D	ABPSS0060101-AVG	ABPSS0070101			
SAMPLE DATE:	07/22/97	07/22/97	07/22/97	07/22/97	//	//	//
LOCATION:	ABPSS0060101	ABPDUP011	ABPSS0060101	ABPSS0070101			
FIELD DUPLICATE OF:		ABPSS0060101	ABPSS0060101				

**SEMIVOLATILES (µg/kg)**

DIALATE	350 UJ	350 UJ	350 UJ	350 UJ			
DIBENZO(A,H)ANTHRACENE	350 UJ	350 UJ	350 UJ	350 UJ			
DIBENZOFURAN	350 UJ	350 UJ	350 UJ	350 UJ			
DIETHYL PHTHALATE	350 UJ	350 UJ	350 UJ	350 UJ			
DIMETHYL PHTHALATE	350 UJ	350 UJ	350 UJ	350 UJ			
DIPHENYLAMINE	350 UJ	350 UJ	350 UJ	350 UJ			
ETHYL METHACRYLATE	350 UJ	350 UJ	350 UJ	350 UJ			
ETHYL METHANESULFONATE	700 UJ	700 UJ	700 UJ	700 UJ			
FAMPHUR	350 UR	350 UR	350 UR	350 UR			
FLUORANTHENE	350 UJ	350 UJ	350 UJ	350 UJ			
FLUORENE	350 UJ	350 UJ	350 UJ	350 UJ			
HEXACHLOROBENZENE	350 UJ	350 UJ	350 UJ	350 UJ			
HEXACHLOROBUTADIENE	350 UJ	350 UJ	350 UJ	350 UJ			
HEXACHLOROCYCLOPENTADIENE	350 UJ	350 UJ	350 UJ	350 UJ			
HEXACHLOROETHANE	350 UJ	350 UJ	350 UJ	350 UJ			
HEXACHLOROPROPENE	350 UJ	350 UJ	350 UJ	350 UJ			
INDENO(1,2,3-CD)PYRENE	350 UJ	350 UJ	350 UJ	350 UJ			
ISODRIN	350 UJ	350 UJ	350 UJ	350 UJ			
ISOPHORONE	350 UJ	350 UJ	350 UJ	350 UJ			
KEPONE	350 UR	350 UR	350 UR	350 UR			
METHAPYRILENE	350 UJ	350 UJ	350 UJ	350 UJ			
METHYL METHANESULFONATE	700 UJ	700 UJ	700 UJ	700 UJ			
N-NITROSO-DI-N-BUTYLAMINE	350 UJ	350 UJ	350 UJ	350 UJ			
N-NITROSO-DI-N-PROPYLAMINE	350 UJ	350 UJ	350 UJ	350 UJ			

**SUMMARY OF SURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSS0060101	ABPSS0060101-D	ABPSS0060101-AVG	ABPSS0070101			
SAMPLE DATE:	07/22/97	07/22/97	07/22/97	07/22/97	//	//	//
LOCATION:	ABPSS0060101	ABPDUP011	ABPSS0060101	ABPSS0070101			
FIELD DUPLICATE OF:		ABPSS0060101	ABPSS0060101				

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	350 UJ	350 UJ	350 UJ	350 UJ			
N-NITROSODIMETHYLAMINE	350 UJ	350 UJ	350 UJ	350 UJ			
N-NITROSODIPHENYLAMINE	350 UJ	350 UJ	350 UJ	350 UJ			
N-NITROSOMETHYLETHYLAMINE	350 UJ	350 UJ	350 UJ	350 UJ			
N-NITROSOMORPHOLINE	350 UJ	350 UJ	350 UJ	350 UJ			
N-NITROSOPIPERIDINE	350 UJ	350 UJ	350 UJ	350 UJ			
N-NITROSOPYRROLIDINE	350 UJ	350 UJ	350 UJ	350 UJ			
NAPHTHALENE	350 UJ	350 UJ	350 UJ	350 UJ			
NITROBENZENE-OS	350 UJ	350 UJ		350 UJ			
O,O,O-TRIETHYLPHOSPHOROTHIOAT	350 UJ	350 UJ	350 UJ	350 UJ			
O-TOLUIDINE	350 UJ	350 UJ	350 UJ	350 UJ			
P-DIMETHYLAMINOAZOBENZENE	350 UJ	350 UJ	350 UJ	350 UJ			
P-PHENYLENEDIAMINE	350 UJ	350 UJ	350 UJ	350 UJ			
PENTACHLOROBENZENE	350 UJ	350 UJ	350 UJ	350 UJ			
PENTACHLORONITROBENZENE	350 UJ	350 UJ	350 UJ	350 UJ			
PENTACHLOROPHENOL	1800 UJ	1800 UJ	1800 UJ	1800 UJ			
PHENACETIN	350 UJ	350 UJ	350 UJ	350 UJ			
PHENANTHRENE	63 J	350 UJ	63 J	350 UJ			
PHENOL	350 UJ	350 UJ	350 UJ	350 UJ			
PRONAMIDE	350 UJ	350 UJ	350 UJ	350 UJ			
PYRENE	350 UJ	350 UJ	350 UJ	350 UJ			
PYRIDINE	350 UJ	350 UJ	350 UJ	350 UJ			
SAFROLE	350 UJ	350 UJ	350 UJ	350 UJ			
TRANS-ISOSAFROLE	350 UJ	350 UJ	350 UJ	350 UJ			

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SAMPLE NUMBER:	ABPSS0060101	ABPSS0060101-D	ABPSS0060101-AVG	ABPSS0070101			
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LOCATION:	ABPSS0060101	ABPDUP011	ABPSS0060101	ABPSS0070101			
FIELD DUPLICATE OF:		ABPSS0060101	ABPSS0060101				

**HERBICIDES (µg/kg)**

DIMETHOATE	350 UJ	350 UJ	350 UJ	350 UJ			
PHORATE	350 UJ	350 UJ	350 UJ	350 UJ			
SULFOTEP	350 UJ	350 UJ	350 UJ	350 UJ			

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 UJ	40.2 U	350 UJ	40.2 U			
1,3-DINITROBENZENE-EXP	37.2 UJ	37.2 U	350 UJ	37.2 U			
2,4,6-TRINITROTOLUENE	35.6 UJ	35.6 U	35.6 U	35.6 U			
2,4-DINITROTOLUENE-EXP	51.6 UJ	51.6 U	350 UJ	51.6 U			
2,6-DINITROTOLUENE-EXP	47.6 UJ	47.6 U	350 UJ	47.6 U			
2-AMINO-4,6-DINITROTOLUENE	46.7 UJ	46.7 U	46.7 U	46.7 U			
2-NITROTOLUENE	81.4 UJ	81.4 U	81.4 U	81.4 U			
3-NITROTOLUENE	81.8 UJ	81.8 U	81.8 U	81.8 U			
4-AMINO-2,6-DINITROTOLUENE	40.9 UJ	40.9 U	40.9 U	40.9 U			
4-NITROTOLUENE	87.2 UJ	87.2 U	87.2 U	87.2 U			
HMX	70.5 UJ	70.5 U	70.5 U	70.5 U			
NITROBENZENE-EXP	35.2 UJ	35.2 U	350 UJ	35.2 U			
RDX	50.9 UJ	50.9 U	50.9 U	50.9 U			
TETRYL	163 UJ	163 UJ	163 U	163 UJ			

**METALS (mg/kg)**

ANTIMONY	0.30 L	0.19 UL	0.1975	0.24 L			
ARSENIC	2.8	2.7	2.75	1.7			
BARIUM	27.8 J	12.5 J	20.15 J	47.0 J			
BERYLLIUM	0.27	0.21	0.24	0.44			

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LOCATION:	ABPSS0060101	ABPDUP011	ABPSS0060101	ABPSS0070101			
FIELD DUPLICATE OF:		ABPSS0060101	ABPSS0060101				

<b>METALS (mg/kg)</b>							
CADMIUM	0.16	0.11 U	0.1075	0.12 U			
CHROMIUM	15.9 J	9.9 J	12.9 J	10.2 J			
COBALT	2.4	3.9	3.15	4.0			
COPPER	10.9	12.6	11.75	17.3			
LEAD	8.4 J	9.3 J	8.85 J	9.1 J			
MERCURY	0.03	0.04	0.035	0.03			
NICKEL	5.5	3.6	4.55	4.1			
SELENIUM	0.77	0.61	0.69	0.58			
SILVER	0.07 U	0.08	0.0575	0.07 U			
THALLIUM	0.26 U	0.21 U	0.235 U	0.24 U			
TIN	2.9 B	2.2 B	2.55 B	2.6 B			
VANADIUM	19.4	16.3	17.85	16.2			
ZINC	25.1 J	13.8 J	19.45 J	20.3 J			

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	350 UJ	350 UJ	350 UJ	350 UJ			

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
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SAMPLE NUMBER:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
SAMPLE DATE:	07/21/97	07/21/97	07/21/97	07/22/97	07/22/97	07/22/97	07/22/97
LOCATION:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

1,1,1,2-TETRACHLOROETHANE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
1,1,1-TRICHLOROETHANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
1,1,2,2-TETRACHLOROETHANE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
1,1,2-TRICHLOROETHANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
1,1-DICHLOROETHANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
1,1-DICHLOROETHENE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
1,2,3-TRICHLOROPROPANE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	110 U	110 U	110 U	110 U	110 UJ	110 U	110 U
1,2-DIBROMOETHANE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
1,2-DICHLOROETHANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
1,2-DICHLOROPROPANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
1,4-DICHLORO-2-BUTENE	110 U	110 U	110 U	110 U	110 UJ	110 U	110 U
2-BUTANONE	11 UR						
2-HEXANONE	11 U	11 U	11 U	11 U	11 UJ	11 U	11 U
4-METHYL-2-PENTANONE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
ACETONE	86 B	830 J	530 J	41 B	600 J	1100 J	970 J
ACETONITRILE	110 UJ						
ACROLEIN	22 UR	22 UR	23 UR	21 UR	22 UR	22 UJ	21 UJ
ACRYLONITRILE	5 U	6 U	6 U	5 U	5 UJ	5 UR	5 UR
ALLYL CHLORIDE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 U
BENZENE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
BROMODICHLOROMETHANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
BROMOFORM	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
BROMOMETHANE	11 U	11 U	11 U	11 U	11 UJ	11 UJ	11 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
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SAMPLE DATE:	07/21/97	07/21/97	07/21/97	07/22/97	07/22/97	07/22/97	07/22/97
LOCATION:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

CARBON DISULFIDE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
CARBON TETRACHLORIDE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
CHLOROBENZENE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
CHLOROETHANE	11 U	11 U	11 U	11 U	11 UJ	11 UJ	11 UJ
CHLOROFORM	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
CHLOROMETHANE	11 U	11 U	11 U	11 U	11 UJ	11 UJ	11 UJ
CIS-1,3-DICHLOROPROPENE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
DIBROMOCHLOROMETHANE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
DIBROMOMETHANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
DICHLORODIFLUOROMETHANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
ETHYLBENZENE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
IODOMETHANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
ISOBUTYL ALCOHOL	55 U	56 U	57 U	53 U	54 UJ	54 UJ	53 UJ
M&P-XYLENES	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
METHACRYLONITRILE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
METHYL METHACRYLATE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
METHYLENE CHLORIDE	6 B	10 B	6 B	3 B	3 B	7 J	3 B
O-XYLENE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
PENTACHLOROETHANE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
PROPIONITRILE	55 U	56 U	57 U	53 U	54 UJ	54 UJ	53 UJ
STYRENE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
TETRACHLOROETHENE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
TOLUENE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
TRANS-1,2-DICHLOROETHENE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
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SAMPLE NUMBER:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
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LOCATION:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
TRICHLOROETHENE	5 U	6 U	6 U	5 U	5 UJ	5 U	5 U
TRICHLOROFLUOROMETHANE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ
VINYL ACETATE	11 U	11 U	11 U	11 U	11 UJ	11 UJ	11 UJ
VINYL CHLORIDE	5 U	6 U	6 U	5 U	5 UJ	5 UJ	5 UJ

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
1,2,4-TRICHLOROBENZENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
1,2-DICHLOROBENZENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
1,3,5-TRINITROBENZENE-OS	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
1,3-DICHLOROBENZENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
1,3-DINITROBENZENE-OS	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
1,4-DICHLOROBENZENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
1,4-DIOXANE-OS	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
1,4-NAPHTHOQUINONE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
1-NAPHTHYLAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2,2-OXYBIS(1-CHLOROPROPANE)	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2,3,4,6-TETRACHLOROPHENOL	1800 UJ	1900 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
2,4,5-TRICHLOROPHENOL	720 UJ	750 UJ	770 UJ	700 UJ	720 UJ	720 UJ	710 UJ
2,4,6-TRICHLOROPHENOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2,4-DICHLOROPHENOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2,4-DIMETHYLPHENOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2,4-DINITROPHENOL	1800 UJ	1900 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
2,4-DINITROTOLUENE-OS	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ

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LOCATION:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (<math>\mu\text{g}/\text{kg}</math>)</b>							
2,6-DICHLOROPHENOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2,6-DINITROTOLUENE-OS	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2-ACETYLAMINOFUORENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2-CHLORONAPHTHALENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2-CHLOROPHENOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2-METHYLNAPHTHALENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2-METHYLPHENOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2-NAPHTHYLAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2-NITROANILINE	1800 UJ	1900 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
2-NITROPHENOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
2-PICOLINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
3,3'-DICHLOROBENZIDINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
3,3'-DIMETHYLBENZIDINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
3-METHYLCHOLANTHRENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
3-NITROANILINE	1800 UJ	1900 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
4,6-DINITRO-2-METHYLPHENOL	1800 UJ	1900 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
4-AMINOBIIPHENYL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
4-BROMOPHENYL PHENYL ETHER	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
4-CHLORO-3-METHYLPHENOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
4-CHLOROANILINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
4-CHLOROPHENYL PHENYL ETHER	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
4-NITROANILINE	1800 UJ	1900 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
4-NITROPHENOL	1800 UJ	1900 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
4-NITROQUINOLINE-1-OXIDE	360 UR	370 UR	380 UR	350 UR	360 UR	360 UR	350 UR

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FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
7,12-DIMETHYLBENZ(A)ANTHRACENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
A,A-DIMETHYLPHENETHYLAMINE	720 UJ	750 UJ	770 UJ	700 UJ	720 UJ	720 UJ	710 UJ
ACENAPHTHENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
ACENAPHTHYLENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
ACETOPHENONE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
ANILINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
ANTHRACENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
ARAMITE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
BENZO(A)ANTHRACENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
BENZO(A)PYRENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
BENZO(B)FLUORANTHENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
BENZO(G,H,I)PERYLENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
BENZO(K)FLUORANTHENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
BENZYL ALCOHOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
BIS(2-CHLOROETHOXY)METHANE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
BIS(2-CHLOROETHYL)ETHER	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	2100 J	370 UJ	380 UJ	350 UJ	360 UJ	360 B	1200 J
BUTYLBENZYL PHTHALATE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
CHLOROBENZILATE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
CHRYSENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
CIS-ISOSAFROLE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
DI-N-BUTYL PHTHALATE	360 UJ	390 B	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
DI-N-OCTYL PHTHALATE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ

**SUMMARY OF SUBSURFACE SOIL ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
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NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
SAMPLE DATE:	07/21/97	07/21/97	07/21/97	07/22/97	07/22/97	07/22/97	07/22/97
LOCATION:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
DIALLATE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
DIBENZO(A,H)ANTHRACENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
DIBENZOFURAN	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
DIETHYL PHTHALATE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
DIMETHYL PHTHALATE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
DIPHENYLAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
ETHYL METHACRYLATE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
ETHYL METHANESULFONATE	720 UJ	750 UJ	770 UJ	700 UJ	720 UJ	720 UJ	710 UJ
FAMPHUR	360 UR	370 UR	380 UR	350 UR	360 UR	360 UR	350 UR
FLUORANTHENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
FLUORENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
HEXACHLORO BENZENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
HEXACHLOROBUTADIENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
HEXACHLOROCYCLOPENTADIENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
HEXACHLOROETHANE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
HEXACHLOROPROPENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
INDENO(1,2,3-CD)PYRENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
ISODRIN	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
ISOPHORONE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
KEPONE	360 UR	370 UR	380 UR	350 UR	360 UR	360 UR	350 UR
METHAPYRILENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
METHYL METHANESULFONATE	720 UJ	750 UJ	770 UJ	700 UJ	720 UJ	720 UJ	710 UJ
N-NITROSO-DI-N-BUTYLAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
N-NITROSO-DI-N-PROPYLAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ

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LOCATION:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/kg)**

N-NITROSODIETHYLAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
N-NITROSODIMETHYLAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
N-NITROSODIPHENYLAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
N-NITROSOMETHYLETHYLAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
N-NITROSOMORPHOLINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
N-NITROSOPIPERIDINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
N-NITROSOPYRROLIDINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
NAPHTHALENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
NITROBENZENE-OS	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
O,O,O-TRIETHYLPHOSPHOROTHIOAT	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
O-TOLUIDINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
P-DIMETHYLAMINOAZOBENZENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
P-PHENYLENEDIAMINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
PENTACHLOROBENZENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
PENTACHLORONITROBENZENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
PENTACHLOROPHENOL	1800 UJ	1900 UJ	1900 UJ	1800 UJ	1800 UJ	1800 UJ	1800 UJ
PHENACETIN	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
PHENANTHRENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
PHENOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
PRONAMIDE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
PYRENE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
PYRIDINE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
SAFROLE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
TRANS-ISOSAFROLE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ

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LOCATION:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
PHORATE	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
SULFOTEP	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	40.2 UJ	40.2 U				
1,3-DINITROBENZENE-EXP	37.2 U	37.2 UJ	37.2 U				
2,4,6-TRINITROTOLUENE	35.6 U	35.6 UJ	35.6 U				
2,4-DINITROTOLUENE-EXP	51.6 U	51.6 UJ	51.6 U				
2,6-DINITROTOLUENE-EXP	47.6 U	47.6 UJ	47.6 U				
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 UJ	46.7 U				
2-NITROTOLUENE	81.4 U	81.4 UJ	81.4 U				
3-NITROTOLUENE	81.8 U	81.8 UJ	81.8 U				
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 UJ	40.9 U				
4-NITROTOLUENE	87.2 U	87.2 UJ	87.2 U				
HMX	70.5 U	70.5 UJ	70.5 U				
NITROBENZENE-EXP	35.2 U	35.2 UJ	35.2 U				
RDX	50.9 U	50.9 UJ	50.9 U				
TETRYL	163 UJ	163 UJ					

**METALS (mg/kg)**

ANTIMONY	0.24 UL	0.48 L	0.24 L	1.1 UL	0.23 UL	0.37 L	0.34 L
ARSENIC	3.0	2.5	1.8	1.5 B	1.4	2.7	3.5
BARIUM	70.8 J	38.5 J	27.7 J	37.1 J	22.9 J	40.4 J	21.1 J
BERYLLIUM	0.40	0.47	0.40	0.12 B	0.40	0.50	0.45

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LOCATION:	ABPSB0010101	ABPSB0020101	ABPSB0020201	ABPSB0030101	ABPSB0030201	ABPSB0040101	ABPSB0040201
FIELD DUPLICATE OF:							

**METALS (mg/kg)**

CADMIUM	0.14 U	0.14 U	0.12 U	0.64 U	0.13 U	0.13 U	0.13 U
CHROMIUM	18.5 J	24.2 J	28.2 J	13.8 J	22.7 J	14.3 J	19.4 J
COBALT	3.2	2.8	1.1	2.9	1.5	3.9	2.6
COPPER	11.9	7.6	4.1 B	9.4	4.2 B	6.6	6.5
LEAD	14.7 J	9.4 J	6.6 J	7.9 J	6.3 J	12.8 J	5.6 J
MERCURY	0.05	0.04	0.02 U	0.02 B	0.02 U	0.03	0.02
NICKEL	5.9	5.5	3.1	5.5 B	3.0	5.5	3.2
SELENIUM	0.85	0.67	0.70	1.8	0.65	0.76	1.2
SILVER	0.07 U	0.07 U	0.07 U	0.35 U	0.07 U	0.07 U	0.07 U
THALLIUM	0.27 U	0.26 U	0.24 U	1.2 U	0.25 U	0.24 U	0.26 U
TIN	3.5 B	3.4 B	2.8 B	3.0 B	2.7 B	3.0 B	3.0 B
VANADIUM	26.5	30.3	28.8	19.0	23.1	22.5	20.9
ZINC	21.6 J	19.7 J	13.7 J	20.0 J	12.8 J	22.8 J	13.2 J

**MISCELLANEOUS PARAMETERS (I)**

M & P-CRESOL	360 UJ	370 UJ	380 UJ	350 UJ	360 UJ	360 UJ	350 UJ
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**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
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SAMPLE NUMBER:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
SAMPLE DATE:	07/24/97	07/24/97	07/24/97	07/24/97	//	//	//
LOCATION:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
FIELD DUPLICATE OF:							

<b>VOLATILES (µg/kg)</b>							
1,1,1,2-TETRACHLOROETHANE	6 U	6 UJ	7 UJ	6 U			
1,1,1-TRICHLOROETHANE	6 U	2 J	2 K	6 U			
1,1,2,2-TETRACHLOROETHANE	6 U	6 UJ	7 UJ	6 U			
1,1,2-TRICHLOROETHANE	6 U	6 U	7 UJ	6 U			
1,1-DICHLOROETHANE	6 U	6 U	7 UJ	6 U			
1,1-DICHLOROETHENE	6 U	6 U	7 UJ	6 U			
1,2,3-TRICHLOROPROPANE	6 U	6 UJ	7 UJ	6 U			
1,2-DIBROMO-3-CHLOROPROPANE	130 U	110 UJ	150 UJ	120 U			
1,2-DIBROMOETHANE	6 U	6 U	7 UJ	6 U			
1,2-DICHLOROETHANE	6 U	6 U	7 UJ	6 U			
1,2-DICHLOROPROPANE	6 U	6 U	7 UJ	6 U			
1,4-DICHLORO-2-BUTENE	130 U	110 UJ	150 UJ	120 U			
2-BUTANONE	13 UR	11 UR	15 UR	12 UR			
2-HEXANONE	13 U	11 UJ	15 UJ	12 U			
4-METHYL-2-PENTANONE	6 U	6 UJ	7 UJ	6 U			
ACETONE	13 U	11 U	15 UJ	12 U			
ACETONITRILE	130 UR	110 UR	150 UR	120 UR			
ACROLEIN	26 UR	23 UR	29 UR	24 UR			
ACRYLONITRILE	6 UR	6 UR	7 UR	6 UR			
ALLYL CHLORIDE	6 U	6 U	7 UJ	6 U			
BENZENE	6 U	6 U	7 UJ	6 U			
BROMODICHLOROMETHANE	6 U	6 U	7 UJ	6 U			
BROMOFORM	6 U	6 U	7 UJ	6 U			
BROMOMETHANE	13 U	11 U	15 UJ	12 U			

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LOCATION:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

CARBON DISULFIDE	6 U	6 U	7 UJ	3 J			
CARBON TETRACHLORIDE	6 U	6 U	7 UJ	6 U			
CHLOROBENZENE	6 U	6 U	7 UJ	6 U			
CHLOROETHANE	13 U	11 U	15 UJ	12 U			
CHLOROFORM	6 U	6 U	7 UJ	6 U			
CHLOROMETHANE	13 U	11 U	15 UJ	12 U			
CIS-1,3-DICHLOROPROPENE	6 U	6 U	7 UJ	6 U			
DIBROMOCHLOROMETHANE	6 U	6 U	7 UJ	6 U			
DIBROMOMETHANE	6 U	6 U	7 UJ	6 U			
DICHLORODIFLUOROMETHANE	6 U	6 U	7 UJ	6 U			
ETHYLBENZENE	6 U	6 UJ	7 UJ	6 U			
IODOMETHANE	6 U	6 U	7 UJ	6 U			
ISOBUTYL ALCOHOL	64 UR	57 UR	74 UR	60 UR			
M&P-XYLENES	6 U	6 UJ	7 UJ	6 U			
METHACRYLONITRILE	6 U	6 U	7 UJ	6 U			
METHYL METHACRYLATE	6 U	6 U	7 UJ	6 U			
METHYLENE CHLORIDE	6 B	25 B	78 B	8 B			
O-XYLENE	6 U	6 UJ	7 UJ	6 U			
PENTACHLOROETHANE	6 U	6 UJ	7 UJ	6 U			
PROPIONITRILE	64 UR	57 UR	74 UR	60 UR			
STYRENE	6 U	6 UJ	7 UJ	6 U			
TETRACHLOROETHENE	6 U	6 UJ	7 UJ	6 U			
TOLUENE	6 U	6 U	7 UJ	6 U			
TRANS-1,2-DICHLOROETHENE	6 U	6 U	7 UJ	6 U			

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LOCATION:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
FIELD DUPLICATE OF:							

**VOLATILES (µg/kg)**

TRANS-1,3-DICHLOROPROPENE	6 U	6 U	7 UJ	6 U			
TRICHLOROETHENE	6 U	6 U	7 UJ	6 U			
TRICHLOROFLUOROMETHANE	6 U	6 U	7 UJ	6 U			
VINYL ACETATE	13 UR	11 UR	15 UR	12 UR			
VINYL CHLORIDE	6 U	6 U	7 UJ	6 U			

**SEMIVOLATILES (µg/kg)**

1,2,4,5-TETRACHLOROBENZENE	430 UJ	380 UJ	490 UJ	400 UJ			
1,2,4-TRICHLOROBENZENE	430 UJ	380 UJ	490 UJ	400 UJ			
1,2-DICHLOROBENZENE	430 UJ	380 UJ	490 UJ	400 UJ			
1,3,5-TRINITROBENZENE-OS	430 UJ	380 UJ	490 UJ	400 UJ			
1,3-DICHLOROBENZENE	430 UJ	380 UJ	490 UJ	400 UJ			
1,3-DINITROBENZENE-OS	430 UJ	380 UJ	490 UJ	400 UJ			
1,4-DICHLOROBENZENE	430 UJ	380 UJ	490 UJ	400 UJ			
1,4-DIOXANE-OS	430 UJ	380 UJ	490 UJ	400 UJ			
1,4-NAPHTHOQUINONE	430 UJ	380 UJ	490 UJ	400 UJ			
1-NAPHTHYLAMINE	430 UJ	380 UJ	490 UJ	400 UJ			
2,2-OXYBIS(1-CHLOROPROPANE)	430 UJ	380 UJ	490 UJ	400 UJ			
2,3,4,6-TETRACHLOROPHENOL	2100 UJ	1900 UJ	2500 UJ	2000 UJ			
2,4,5-TRICHLOROPHENOL	850 UJ	770 UJ	980 UJ	790 UJ			
2,4,6-TRICHLOROPHENOL	430 UJ	380 UJ	490 UJ	400 UJ			
2,4-DICHLOROPHENOL	430 UJ	380 UJ	490 UJ	400 UJ			
2,4-DIMETHYLPHENOL	430 UJ	380 UJ	490 UJ	400 UJ			
2,4-DINITROPHENOL	2100 UJ	1900 UJ	2500 UJ	2000 UJ			
2,4-DINITROTOLUENE-OS	430 UJ	380 UJ	490 UJ	400 UJ			

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LOCATION:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/kg)**

2,6-DICHLOROPHENOL	430 UJ	380 UJ	490 UJ	400 UJ			
2,6-DINITROTOLUENE-OS	430 UJ	380 UJ	490 UJ	400 UJ			
2-ACETYLAMINOFUORENE	430 UJ	380 UJ	490 UJ	400 UJ			
2-CHLORONAPHTHALENE	430 UJ	380 UJ	490 UJ	400 UJ			
2-CHLOROPHENOL	430 UJ	380 UJ	490 UJ	400 UJ			
2-METHYLNAPHTHALENE	430 UJ	380 UJ	490 UJ	400 UJ			
2-METHYLPHENOL	430 UJ	380 UJ	490 UJ	400 UJ			
2-NAPHTHYLAMINE	430 UJ	380 UJ	490 UJ	400 UJ			
2-NITROANILINE	2100 UJ	1900 UJ	2500 UJ	2000 UJ			
2-NITROPHENOL	430 UJ	380 UJ	490 UJ	400 UJ			
2-PICOLINE	430 UJ	380 UJ	490 UJ	400 UJ			
3,3'-DICHLOROBENZIDINE	430 UJ	380 UJ	490 UJ	400 UJ			
3,3'-DIMETHYLBENZIDINE	430 UJ	380 UJ	490 UJ	400 UJ			
3-METHYLCHOLANTHRENE	430 UJ	380 UJ	490 UJ	400 UJ			
3-NITROANILINE	2100 UJ	1900 UJ	2500 UJ	2000 UJ			
4,6-DINITRO-2-METHYLPHENOL	2100 UJ	1900 UJ	2500 UJ	2000 UJ			
4-AMINOBIPHENYL	430 UJ	380 UJ	490 UJ	400 UJ			
4-BROMOPHENYL PHENYL ETHER	430 UJ	380 UJ	490 UJ	400 UJ			
4-CHLORO-3-METHYLPHENOL	430 UJ	380 UJ	490 UJ	400 UJ			
4-CHLOROANILINE	430 UJ	380 UJ	490 UJ	400 UJ			
4-CHLOROPHENYL PHENYL ETHER	430 UJ	380 UJ	490 UJ	400 UJ			
4-NITROANILINE	2100 UJ	1900 UJ	2500 UJ	2000 UJ			
4-NITROPHENOL	2100 UJ	1900 UJ	2500 UJ	2000 UJ			
4-NITROQUINOLINE-1-OXIDE	430 UR	380 UR	490 UR	400 UR			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
SAMPLE DATE:	07/24/97	07/24/97	07/24/97	07/24/97	//	//	//
LOCATION:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
5-NITRO-O-TOLUIDINE	430 UJ	380 UJ	490 UJ	400 UJ			
7,12-DIMETHYLBENZ(A)ANTHRACENE	430 UJ	380 UJ	490 UJ	400 UJ			
A,A-DIMETHYLPHENETHYLAMINE	850 UJ	770 UJ	980 UJ	790 UJ			
ACENAPHTHENE	430 UJ	380 UJ	490 UJ	400 UJ			
ACENAPHTHYLENE	430 UJ	380 UJ	170 J	400 UJ			
ACETOPHENONE	430 UJ	380 UJ	490 UJ	400 UJ			
ANILINE	430 UJ	380 UJ	490 UJ	400 UJ			
ANTHRACENE	430 UJ	380 UJ	160 J	400 UJ			
ARAMITE	430 UJ	380 UJ	490 UJ	400 UJ			
BENZO(A)ANTHRACENE	430 UJ	380 UJ	580 J	400 UJ			
BENZO(A)PYRENE	430 UJ	380 UJ	510 J	400 UJ			
BENZO(B)FLUORANTHENE	430 UJ	380 UJ	950 J	400 UJ			
BENZO(G,H,I)PERYLENE	430 UJ	380 UJ	320 J	400 UJ			
BENZO(K)FLUORANTHENE	430 UJ	380 UJ	720 J	400 UJ			
BENZYL ALCOHOL	430 UJ	380 UJ	490 UJ	400 UJ			
BIS(2-CHLOROETHOXY)METHANE	430 UJ	380 UJ	490 UJ	400 UJ			
BIS(2-CHLOROETHYL)ETHER	430 UJ	380 UJ	490 UJ	400 UJ			
BIS(2-ETHYLHEXYL)PHTHALATE	430 UJ	380 UJ	150 J	58 J			
BUTYLBENZYL PHTHALATE	430 UJ	380 UJ	490 UJ	400 UJ			
CHLOROBENZILATE	430 UJ	380 UJ	490 UJ	400 UJ			
CHRYSENE	430 UJ	380 UJ	810 J	400 UJ			
CIS-ISOSAFROLE	430 UJ	380 UJ	490 UJ	400 UJ			
DI-N-BUTYL PHTHALATE	430 UJ	380 UJ	490 UJ	40 J			
DI-N-OCTYL PHTHALATE	430 UJ	380 UJ	490 UJ	400 UJ			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
SAMPLE DATE:	07/24/97	07/24/97	07/24/97	07/24/97	//	//	//
LOCATION:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
FIELD DUPLICATE OF:							

**SEMIVOLATILES (µg/kg)**

DIALLATE	430 UJ	380 UJ	490 UJ	400 UJ			
DIBENZO(A,H)ANTHRACENE	430 UJ	380 UJ	130 J	400 UJ			
DIBENZOFURAN	430 UJ	380 UJ	490 UJ	400 UJ			
DIETHYL PHTHALATE	430 UJ	380 UJ	490 UJ	400 UJ			
DIMETHYL PHTHALATE	430 UJ	380 UJ	490 UJ	400 UJ			
DIPHENYLAMINE	430 UJ	380 UJ	490 UJ	400 UJ			
ETHYL METHACRYLATE	430 UJ	380 UJ	490 UJ	400 UJ			
ETHYL METHANESULFONATE	850 UJ	770 UJ	980 UJ	790 UJ			
FAMPHUR	430 UR	380 UR	490 UR	400 UR			
FLUORANTHENE	430 UJ	380 UJ	860 J	400 UJ			
FLUORENE	430 UJ	380 UJ	490 UJ	400 UJ			
HEXACHLOROBENZENE	430 UJ	380 UJ	490 UJ	400 UJ			
HEXACHLOROBUTADIENE	430 UJ	380 UJ	490 UJ	400 UJ			
HEXACHLOROCYCLOPENTADIENE	430 UJ	380 UJ	490 UJ	400 UJ			
HEXACHLOROETHANE	430 UJ	380 UJ	490 UJ	400 UJ			
HEXACHLOROPROPENE	430 UJ	380 UJ	490 UJ	400 UJ			
INDENO(1,2,3-CD)PYRENE	430 UJ	380 UJ	340 J	400 UJ			
ISODRIN	430 UJ	380 UJ	490 UJ	400 UJ			
ISOPHORONE	430 UJ	380 UJ	490 UJ	400 UJ			
KEPONE	430 UR	380 UR	490 UR	400 UR			
METHAPYRILENE	430 UJ	380 UJ	490 UJ	400 UJ			
METHYL METHANESULFONATE	850 UJ	770 UJ	980 UJ	790 UJ			
N-NITROSO-DI-N-BUTYLAMINE	430 UJ	380 UJ	490 UJ	400 UJ			
N-NITROSO-DI-N-PROPYLAMINE	430 UJ	380 UJ	490 UJ	400 UJ			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
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INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
SAMPLE DATE:	07/24/97	07/24/97	07/24/97	07/24/97	//	//	//
LOCATION:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
FIELD DUPLICATE OF:							

<b>SEMIVOLATILES (µg/kg)</b>							
N-NITROSODIETHYLAMINE	430 UJ	380 UJ	490 UJ	400 UJ			
N-NITROSODIMETHYLAMINE	430 UJ	380 UJ	490 UJ	400 UJ			
N-NITROSODIPHENYLAMINE	430 UJ	380 UJ	490 UJ	400 UJ			
N-NITROSOMETHYLETHYLAMINE	430 UJ	380 UJ	490 UJ	400 UJ			
N-NITROSOMORPHOLINE	430 UJ	380 UJ	490 UJ	400 UJ			
N-NITROSOPIPERIDINE	430 UJ	380 UJ	490 UJ	400 UJ			
N-NITROSOPYRROLIDINE	430 UJ	380 UJ	490 UJ	400 UJ			
NAPHTHALENE	430 UJ	380 UJ	490 UJ	400 UJ			
NITROBENZENE-OS	430 UJ	380 UJ	490 UJ	400 UJ			
O,O,O-TRIETHYLPHOSPHOROTHIOAT	430 UJ	380 UJ	490 UJ	400 UJ			
O-TOLUIDINE	430 UJ	380 UJ	490 UJ	400 UJ			
P-DIMETHYLAMINOAZOBENZENE	430 UJ	380 UJ	490 UJ	400 UJ			
P-PHENYLENEDIAMINE	430 UJ	380 UJ	490 UJ	400 UJ			
PENTACHLOROBENZENE	430 UJ	380 UJ	490 UJ	400 UJ			
PENTACHLORONITROBENZENE	430 UJ	380 UJ	490 UJ	400 UJ			
PENTACHLOROPHENOL	2100 UJ	1900 UJ	2500 UJ	2000 UJ			
PHENACETIN	430 UJ	380 UJ	490 UJ	400 UJ			
PHENANTHRENE	430 UJ	380 UJ	99 J	400 UJ			
PHENOL	430 UJ	380 UJ	490 UJ	400 UJ			
PRONAMIDE	430 UJ	380 UJ	490 UJ	400 UJ			
PYRENE	430 UJ	380 UJ	970 J	400 UJ			
PYRIDINE	430 UJ	380 UJ	490 UJ	400 UJ			
SAFROLE	430 UJ	380 UJ	490 UJ	400 UJ			
TRANS-ISOSAFROLE	430 UJ	380 UJ	490 UJ	400 UJ			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
SAMPLE DATE:	07/24/97	07/24/97	07/24/97	07/24/97	//	//	//
LOCATION:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
FIELD DUPLICATE OF:							

**HERBICIDES (µg/kg)**

DIMETHOATE	430 UJ	380 UJ	490 UJ	400 UJ			
PHORATE	430 UJ	380 UJ	490 UJ	400 UJ			
SULFOTEP	430 UJ	380 UJ	490 UJ	400 UJ			

**ENERGETICS (µg/kg)**

1,3,5-TRINITROBENZENE-EXP	40.2 U	40.2 U	40.2 U	40.2 U			
1,3-DINITROBENZENE-EXP	37.2 U	37.2 U	37.2 U	37.2 U			
2,4,6-TRINITROTOLUENE	35.6 U	35.6 U	35.6 U	35.6 U			
2,4-DINITROTOLUENE-EXP	51.6 U	51.6 U	51.6 U	51.6 U			
2,6-DINITROTOLUENE-EXP	47.6 U	47.6 U	47.6 U	47.6 U			
2-AMINO-4,6-DINITROTOLUENE	46.7 U	46.7 U	46.7 U	46.7 U			
2-NITROTOLUENE	81.4 U	81.4 U	81.4 U	81.4 U			
3-NITROTOLUENE	81.8 U	81.8 U	81.8 U	81.8 U			
4-AMINO-2,6-DINITROTOLUENE	40.9 U	40.9 U	40.9 U	40.9 U			
4-NITROTOLUENE	87.2 U	87.2 U	87.2 U	87.2 U			
HMX	70.5 U	70.5 U	70.5 U	70.5 U			
NITROBENZENE-EXP	35.2 U	35.2 U	35.2 U	35.2 U			
RDX	50.9 U	50.9 U	50.9 U	50.9 U			
TETRYL	163 U	163 U	163 U	163 U			

**METALS (mg/kg)**

ANTIMONY	0.44 B	0.63 B	0.74 B	0.42 B			
ARSENIC	1.5	2.9	5.8	1.2			
BARIUM	19.0 J	23.5 J	80.6 J	18.3 J			
BERYLLIUM	0.14 B	0.37 K	0.52 K	0.14 B			

**SUMMARY OF SEDIMENT ANALYTIC RESULTS FOR SMWU 6 - AIR BLAST POND  
RCRA FACILITY INVESTIGATION/VERIFICATION INVESTIGATION REPORT  
INDIAN HEAD DIVISION  
NSWC INDIAN HEAD, MARYLAND**

SAMPLE NUMBER:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
SAMPLE DATE:	07/24/97	07/24/97	07/24/97	07/24/97	//	//	//
LOCATION:	ABPSD0010101	ABPSD0020101	ABPSD0030101	ABPSD0040101			
FIELD DUPLICATE OF:							

<b>METALS (mg/kg)</b>							
CADMIUM	0.15 U	0.14 U	0.39 K	0.18 K			
CHROMIUM	10.7 J	18.7 J	20.0 J	6.4 J			
COBALT	1.1	1.9	4.4	2.1			
COPPER	5.7	15.5	90.0	8.6			
LEAD	9.3	14.2	141	7.9			
MERCURY	0.03	0.02	0.12	0.03			
NICKEL	2.3	4.1	11.5	4.3			
SELENIUM	0.51	0.89	1.1	0.35			
SILVER	0.14 B	0.10 B	0.17 B	0.21 B			
THALLIUM	0.39 B	0.27 U	0.52 B	0.39 B			
TIN	3.4 B	3.6 B	10.0	3.8 B			
VANADIUM	18.2 J	30.9 J	40.5 J	9.1 J			
ZINC	15.9 J	18.3 J	337 J	32.9 J			

<b>MISCELLANEOUS PARAMETERS ( )</b>							
M & P-CRESOL	430 UJ	380 UJ	490 UJ	400 UJ			

**APPENDIX N**  
**DATA VALIDATION MEMOS**



MEMO TO: P. FRANK  
 DATE: SEPTEMBER 14, 1997 - PAGE 2

Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recovery (%R) for cadmium was above the 110% quality control limit. Positive results > 2X CRDL were qualified as biased high, "K".
- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
antimony	2.8 ug/L	1.4 mg/kg
beryllium	0.2 ug/L	0.1 mg/kg
copper <sup>(1)</sup>	1.003 mg/kg	5.015 mg/kg
lead <sup>(1)</sup>	0.147 mg/kg	0.735 mg/kg
silver	4.1 ug/L	2.05 mg/kg
thallium	6.5 ug/L	3.25 mg/kg
vanadium	0.8 ug/L	0.4 mg/kg
tin <sup>(1)</sup>	1.046 mg/kg	5.23 mg/kg

Samples Affected: All

<sup>(1)</sup> Maximum concentration present in a soil preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size, percent solids and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for antimony, copper, silver, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike (MS) Percent Recovery (%R) for antimony affecting the soil matrix was < 30% quality control limit. Positive results reported for the aforementioned analyte in the affected samples were qualified as biased low, "L".

Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %Rs for copper, lead and thallium were outside the 90-110% quality control limit. However, no validation actions were warranted as all results were either > 2X CRDL, were nondetects or were qualified as blank contamination.

A comparison of field duplicate pairs RN3SS0070101 / RN3DUP005 and RN3SB0100101 / RN3DUP006 is contained in Appendix C. However, no validation actions are required as per Region III guidance.

Executive Summary

**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

**Other Factors Affecting Data Quality:** Several analytes were present in the rinsate blank. The MS %R for antimony was < 30% quality control limit.

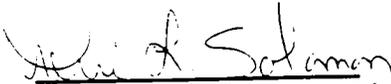
MEMO TO: P. FRANK  
DATE: SEPTEMBER 14, 1997 - PAGE 3

C-49-09-7-102

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Brown and Root Environmental  
Terri L. Solomon  
Chemist



Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of MS %R.
- K - Positive result is considered biased high as a result of CRDL %R.



MEMO TO: P. FRANK  
DATE: SEPTEMBER 14, 1997 - PAGE 3

C-49-09-7-107

Executive Summary

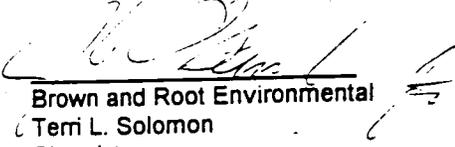
Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

U - Value is a nondetect as reported by the laboratory.



MEMO TO: P. FRANK  
DATE: SEPTEMBER 15, 1997 - PAGE 2

Executive Summary

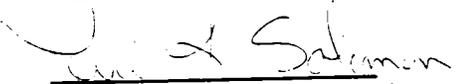
Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

U Value is a nondetect as reported by the laboratory.



MEMO TO: P. FRANK  
 DATE: SEPTEMBER 15, 1997 - PAGE 2

Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) for lead and tin were below the 90% quality control limit. Positive results < 2X CRDL and nondetects reported for the aforementioned analytes were qualified as biased low, "L" and "UL", respectively.
- The CRDL %R for aluminum, antimony, beryllium, cadmium, calcium, copper, iron, magnesium, thallium and zinc were above the 110% quality control limit. Positive results < 2X CRDL reported for the aforementioned analytes were qualified as biased high, "K". However, the results for antimony were qualified as estimated, "J", as a result of conflicting noncompliances.
- The following contaminants were detected in the method/preparation/rinsate blanks at the following maximum concentrations :

Analyte	Maximum Concentration	Action Level - Soil	Action Level - Aqueous
antimony <sup>(1)</sup>	0.3 mg/kg	1.5 mg/kg	NA
beryllium <sup>(1)</sup>	0.04 mg/kg	0.2 mg/kg	NA
calcium	501 ug/L	250.5 mg/Kg	2505 ug/L
copper	11.1 ug/L	5.55 mg/Kg	55.5 ug/L
iron <sup>(1)</sup>	8.26 mg/kg	41.3 mg/kg	NA
lead	1.7 ug/L	0.85 mg/Kg	8.5 ug/L
manganese <sup>(1)</sup>	0.084 mg/kg	0.42 mg/kg	NA
silver <sup>(2)</sup>	1.4 ug/L	NA	7.0 ug/L
tin <sup>(1)</sup>	0.984 mg/kg	4.92 mg/kg	NA
zinc <sup>(2)</sup>	4.4 ug/L	NA	22 ug/L

Samples Affected: All

<sup>(1)</sup> Maximum concentration found in an soil preparation blank.  
<sup>(2)</sup> Maximum concentration found in an aqueous preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size, weight, percent solids, and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action levels for antimony, calcium, copper, and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike (MS) Percent Recoveries (%Rs) for antimony and tin were < 75% quality control limit. Positive results reported for the aforementioned analytes were qualified as estimated, "J", as a result of conflicting noncompliances.
- The MS %R for lead was > 125% quality control limit. Positive results reported for the aforementioned analyte were qualified as biased high, "K".
- The ICP Serial Dilution Percent Differences (%Ds) for antimony, arsenic, beryllium, calcium, copper and thallium were greater than the 10% quality control limit. However, no action was taken because the concentrations of the above analytes in the original samples were < 50X Instrument Detection Limit (IDL) and the presence of conflicting noncompliances.

MEMO TO: P. FRANK  
DATE: SEPTEMBER 15, 1997 - PAGE 3

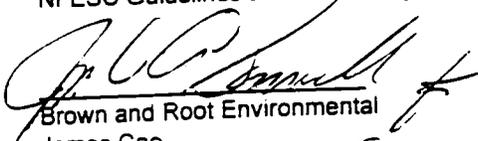
Notes

The CRDL %R for aluminum, calcium, iron, lead, magnesium, and zinc were outside the quality control limits. However no validation actions were warranted as all results were either > 2X CRDL or were qualified as blank contamination.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Naval Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
James Cao  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of CRDL %R and/or ICP Interference
- UL - Nondetected result is considered biased low as a result of CRDL %R and/or ICP Interference
- K - Positive result is considered biased high as a result of ICP interference.
- J - Positive result is considered estimated as a result of CRDL %R, ICP Interference, MS/MSD %R, laboratory duplicate imprecision and/or ICP Serial Dilution %D.
- UJ - Nondetected result is considered estimated as a result of MS/MSD %R.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-114

TO: PAUL FRANK\*

DATE: SEPTEMBER 15, 1997

FROM: KELLY JOHNSON-CARPER

CC: DATA VALIDATION FILE

SUBJECT: ORGANIC DATA VALIDATION - EXPLOSIVE ORGANIC COMPOUNDS  
CTO 0287, NSWC INDIAN HEAD, MARYLAND  
SDG 8, WO# 9707063

SAMPLES: 3/Solid/

ABPSS0010101

ABPSS0020101

ABPSS0030101

## Overview

The sample set for the CTO 0287 NSWC Indian Head, Maryland SDG 8 contains three (3) solid environmental samples that were analyzed for target compound list explosive organic compounds via SW-846 Method 8330.

The samples were collected by Brown and Root Environmental on July 13th, 1997 and analyzed by General Physics Environmental Services under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Analyses were conducted using the methods prescribed in SW-846 Method 8330 and reported using a Contract Laboratory Program (CLP) format.

## Summary

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until extraction/analysis, initial and continuing calibration data, laboratory and extraction blank results, laboratory control sample results, duplicate sample results, matrix spike/matrix spike duplicate results, compound identification, and compound quantitation.

## Notes

Samples are reported on a wet weight basis.

No problems related to laboratory performance or data quality were noted.

## Executive summary

**Laboratory Performance:** No laboratory performance issues were noted.

**Other Factors Affecting Data Quality:** No problems related to data quality were noted.

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Validation" (3/90), as amended for use within USEPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February 1996).

**MEMO TO: PAUL FRANK**  
**DATE: SEPTEMBER 15, 1997 - Page 2**

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Brown and Root Environmental

Kelly Johnson-Carper  
Chemist/Data Validator



Brown and Root Environmental

Joseph Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Summary:**

U - Nondetect as reported by the laboratory.

**TO:** P. FRANK **DATE:** SEPTEMBER 15, 1997  
**FROM:** Cheryle C. Lu **COPIES:** DV FILE  
**SUBJECT:** WET CHEMISTRY DATA VALIDATION:  
TOTAL ORGANIC CARBON AND TOTAL ORGANIC HALIDES  
CTO 287 - INDIAN HEAD  
SDG 9707083  
  
**SAMPLES:** 7/Soils/ RPLSS0040101 RPLDUP010 RPLSB0040101 RPLSB0040201  
RPLSB0040301 BGDSS0010101 BGDSB0010101  
1/ Aqueous/BGDRB009

Overview

The sample set for CTO 287, Indian Head, SDG 9707083, consists of seven (7) soil environmental samples and one (1) rinsate blank. One (1) field duplicate sample (RPLDUP010) was included within this SDG.

The soil samples were analyzed for percent solids. Two soil samples and one aqueous sample were analyzed for total organic carbon (TOC) and total organic halides (TOX). The samples were collected by Brown and Root Environmental on July 15, 1997 and analyzed by GP Environmental Services - Gaithersburg under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using method specific analytical and reporting protocols.

Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of available data including data completeness, holding times, calibration data, laboratory method/preparation/rinsate blanks, results matrix spike results, laboratory duplicate results, field duplicate results, detection limits.

Areas of concern with respect to data quality are listed below.

Major Problems - None.

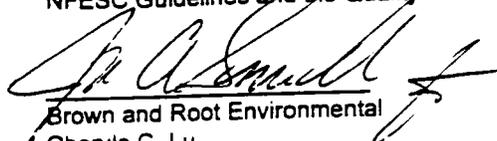
Minor Problems

- (1) A field blank should not be used for duplicate sample analysis. However, the rinsate blank (BGDRB009D) was used as duplicate sample for TOX analysis. The %RPD was reported as 0.3% on page 95017, whereas, the %RPD was reported as 0.6% on page 95019.
- (2) A 150 %RPD was reported on page 95021 and N.C. on page 95023 for sample BGDSS0010101D. Both sample results were below detection limits, therefore, the %RPD is not calculable (N.C.).

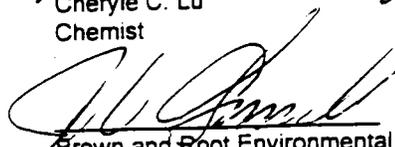
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Naval Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Brown and Root Environmental  
Cheryle C. Lu  
Chemist



Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-132

TO: PAUL FRANK

DATE: SEPTEMBER 17, 1997

FROM: SEAN NIXON

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - TCL EXPLOSIVES  
CTO 287 INDIAN HEAD, MARYLAND  
SDG - 9707124

SAMPLES: 12/Solid

DSBSB0020101	DSBSB0030201	DSBSS0020101
RN3SB0010301	RN3SB0010401	RN3SB0040301
RN3SB0040401	RN6SB0160301	RN6SB0160401
RN6SB0170301	RN6DUP012	RN6SB0170401

## Overview

The sample set for CTO 287 Indian Head, Maryland, SDG 9707124, consists of twelve (12) solid environmental samples. The field duplicate pair, samples RN6SB0170301/ RN6DUP01, was included in this SDG. The field crew did not specify a sample for Matrix Spike/ Matrix Spike Duplicate analysis in this SDG.

All of the samples were analyzed for Target Compound List (TCL) explosives. The samples were collected by Brown and Root Environmental on July 22 and 23, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The explosives analyses were conducted according to SW-846 Method 8330 respectively.

## Summary

All analytes were successfully analyzed with the exception of those rejected. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification, and detection limits.

Areas of concern with respect to data quality are listed below.

## Major Problems

- None.

MEMO TO: PAUL FRANK  
DATE: SEPTEMBER 16, 1997 PAGE 2

Minor Problems

- None

Notes

Validation was not taken for field duplicate precision, however a field duplicate comparison is included in Appendix C.

Executive Summary

**Laboratory Performance:** No issues.

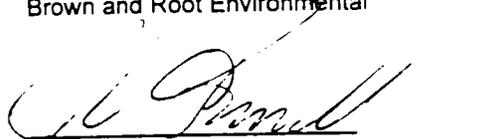
**Other Factors Affecting Data Quality:** No issues.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Sean T. Nixon  
Chemist/Data Validator  
Brown and Root Environmental

  
Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

U - Value is a nondetected results as reported by the laboratory.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

TO: PAUL FRANK  
FROM: LORAIN SHIPLEY  
SUBJECT: ORGANIC DATA VALIDATION - APPENDIX IX AND TCL VOAS AND SVOAS  
CTO 287 INDIAN HEAD, MARYLAND  
SDG 9707124

DATE: SEPTEMBER 22, 1997

COPIES: DV FILE

SAMPLES: 12/Solid

RN6DUP012	DSBSB0030201	RN3SB0010401	RN3SB0010301
DSBSS0020101	DSBSB0020101	RN3SB0040301	RN3SB0040401
RN6SB0160301	RN6SB0160401	RN6SB0170301	RN6SB0170401

1 Aqueous

DSBTB001

## Overview

The sample set for CTO 287 Indian Head, Maryland, SDG 9707124, consists of twelve (12) solid and one (1) aqueous environmental samples. The field duplicate pair, samples RN6SB0170301/RN6DUP012, was included in this SDG.

All of the samples were analyzed for Appendix IX volatiles and semivolatiles. The samples were collected by Brown and Root Environmental on June 22 and 23, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The VOAs and SVOAs were conducted according to SW-846 Methods 8260A and 8270 respectively.

## Summary

All analytes were successfully analyzed with the exception of those rejected. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, GCMS tuning, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification, & detection limits.

Areas of concern with respect to data quality are listed below.

MEMO TO: PAUL FRANK  
DATE: SEPTEMBER 22, 1997 PAGE 2

Major Problems

- A volatile initial calibration, affecting sample DSBTB001, contained RRFs for acetonitrile, acrolein, acrylonitrile, propionitrile, isobutyl alcohol, and 2-butanone that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for all compounds listed here in the aforementioned samples were rejected. (UR).
- A volatile initial calibration, affecting samples RN6DUP012, DSBSB0030201, RN3SB0010401, RN3SB0010301, DSBSS0020101, DSBSB0020101, RN3SB0040301, RN3SB0040401, RN6SB0160301, RN6SB0160401, RN6SB0170301, and RN6SB0170401, contained RRFs for acetonitrile, acrolein, acrylonitrile, propionitrile, isobutyl alcohol, and 2-butanone that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for all compounds listed here in the aforementioned samples were rejected. (UR).
- A volatile continuing calibration, affecting sample DSBTB001, contained RRFs for acetonitrile, acrolein, acrylonitrile, propionitrile, isobutyl alcohol, 2-butanone, and vinyl acetate that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for all compounds listed here in the aforementioned samples were rejected. (UR).
- A volatile continuing calibration, affecting samples RN6DUP012, DSBSB0030201, RN3SB0010401, RN3SB0010301, DSBSS0020101, DSBSB0020101, RN3SB0040301, RN3SB0040401, RN6SB0160301, RN6SB0160401, RN6SB0170301, and RN6SB0170401, contained RRFs for acetonitrile, acrolein, acrylonitrile, propionitrile, isobutyl alcohol, and 2-butanone that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for all compounds listed here in the aforementioned samples were rejected. (UR).
- A volatile continuing calibration, affecting samples RN6DUP012, DSBSB0030201, RN3SB0010401, RN3SB0010301, DSBSS0020101, DSBSB0020101, RN3SB0040301, RN3SB0040401, RN6SB0160301, RN6SB0160401, RN6SB0170301, and RN6SB0170401, contained RRFs for acetonitrile, acrolein, acrylonitrile, propionitrile, isobutyl alcohol, 2-butanone, and vinyl acetate that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for all compounds listed here in the aforementioned samples were rejected. (UR).
- A semivolatile initial calibration affecting all samples contained RRFs for famphur and kepone that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. All results for both compounds were nondetect and the results, for the aforementioned samples, were rejected. (UR).

Minor Problems

- A volatile continuing calibration, affecting sample DSBTB001, contained Percent Differences (%D) for dichlorodifluoromethane, chloromethane, chloroethane, trichlorofluoromethane, acrolein, acrylonitrile, acetonitrile, chloroform, 2-butanone, vinyl acetate, tetrachloroethene, and pentachloroethane that were greater than the 25% quality control limit. This noncompliance affects positive results only. All compounds were nondetect for this sample. Therefore, no additional qualification was made.

MEMO TO: PAUL FRANK  
DATE: SEPTEMBER 22, 1997 PAGE 3

- A volatile continuing calibration, affecting sample DSBTB001, contained Percent Differences (%D) for acrolein and vinyl acetate that were greater than the 50% quality control limit. This noncompliance affects nondetected results. The results for these compounds were previously qualified UR. Therefore, no additional qualification was made.
- A volatile continuing calibration, affecting samples RN6DUP012, DSBSB0030201, RN3SB0010401, RN3SB0010301, DSBSS0020101, DSBSB0020101, RN3SB0040301, RN3SB0040401, RN6SB0160301, RN6SB0160401, RN6SB0170301, and RN6SB0170401, contained %D for iodomethane that were greater than the 25% quality control limit. This noncompliance affects positive results only. No qualification was made.
- A volatile continuing calibration, affecting samples RN6DUP012, DSBSB0030201, RN3SB0010401, RN3SB0010301, DSBSS0020101, DSBSB0020101, RN3SB0040301, RN3SB0040401, RN6SB0160301, RN6SB0160401, RN6SB0170301, and RN6SB0170401, contained %D for dichlorodifluoromethane, chloromethane, iodomethane, acetonitrile, propionitrile, allyl chloride, vinyl acetate, 2-chloroethylvinyl ether, and acrolein that were greater than the 25% quality control limit. This noncompliance affects positive results only. The results for all compounds were nondetect. Therefore, no additional qualification was made.
- A volatile continuing calibration, affecting samples RN6DUP012, DSBSB0030201, RN3SB0010401, RN3SB0010301, DSBSS0020101, DSBSB0020101, RN3SB0040301, RN3SB0040401, RN6SB0160301, RN6SB0160401, RN6SB0170301, and RN6SB0170401, contained %D for iodomethane, vinyl acetate, and acrolein that were greater than the 50% quality control limit. This noncompliance affects nondetected results only. Results for the aforementioned samples for vinyl acetate and acrolein were previously qualified, UR, and have not been qualified for this noncompliance. Results for iodomethane for all aforementioned samples have been qualified. (UJ).
- A semivolatile continuing calibration, affecting sample RN6SB0170301 contained %D for benzoic acid that was greater than the 50% quality control limit. This noncompliance affects nondetected results only. Benzoic acid was not reported for the environmental samples, so no qualification was made.
- A semivolatile continuing calibration, affecting all samples except RN6SB0170301, contained %D for trans-isosafrole, cis-isosafrole, methyl parathion, 4-nitroquinoline-N-oxide, and famphur that were greater than the 50% quality control limit. This noncompliance affects nondetected results only. Results for the aforementioned samples for trans-isosafrole, cis-isosafrole, and 4-nitroquinoline-1-oxide were qualified. (UJ). Methyl parathion results were not reported for the environmental samples. Famphur results had already been rejected (UR), and were not further qualified.
- A semivolatile continuing calibration, affecting all samples except RN6SB0170301, contained RRF for famphur and kepone that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. These results were previously rejected (UR), so no additional qualifications were made.
- A semivolatile continuing calibration, affecting sample RN6SB0170301, contained %D for trans-isosafrole, cis-isosafrole, dimethoate, methyl parathion, 4-nitroquinoline-N-oxide, and kepone that were greater than the 50% quality control limit. This noncompliance affects nondetected results

MEMO TO: PAUL FRANK  
DATE: SEPTEMBER 22, 1997 PAGE 4

only. Results for the aforementioned samples for trans-isosafrole, cis-isosafrole, dimethoate, and 4-nitroquinoline-N-oxide were qualified, (UJ). Methyl parathion results were not reported for the environmental samples. Kepone results had already been rejected (UR), and were not further qualified.

- A semivolatile continuing calibration, affecting sample RN6SB0170301, contained RRF for famphur and kepone that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. These results were previously rejected (UR), so no additional qualifications were made.
- The following contaminants were detected in the laboratory method blanks at the following maximum concentrations:

<u>Method Blank</u>	<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
VBLKA	Methylene Chloride	5 ug/kg	50 ug/kg

Samples affected: All

Sample aliquot size, percent solid, and dilution factors were taken into consideration when applying all action levels. Positive results reported for methylene chloride in samples associated with each blank which were below the action levels were considered false positives and qualified, (B). It should be noted that the trip blank was not qualified for field quality control blank contamination.

- A volatile analysis of sample DSBSS0020101 reported internal standard recoveries for fluorobenzene, 1,4-difluorobenzene, and chlorobenzene-d5 less than the 50% quality control limit. The sample was unsuccessfully reanalyzed in regard to internal standard noncompliance. The original analysis was used for data validation. The positive and nondetected results associated with these noncompliant internal standards were qualified as estimated, (J) and (UJ), respectively.
- A volatile analysis of sample RN6SB0160401 reported internal standard recoveries for fluorobenzene, 1,4-difluorobenzene, and chlorobenzene-d5 less than the 50% quality control limit. Re-analysis showed acceptable results. However, the re-analysis was performed outside of allowable holding times and had a surrogate spike recovery below allowable lower limits. The original analysis was used for data validation. The positive and nondetected results associated with these noncompliant internal standards were qualified as estimated, (J) and (UJ), respectively.
- A volatile analysis of sample RN6DUP012 reported internal standard recoveries for chlorobenzene-d5 less than the 50% quality control limit. Re-analysis showed acceptable results with regards to internal standard recoveries. However, one surrogate recovery was outside quality control limits and the re-analysis was performed outside of allowable holding times. The original analysis was used for data validation. The positive and nondetected results associated with these noncompliant internal standards were qualified as estimated, (J) and (UJ), respectively.
- A semivolatile analysis of sample RN6SB0160301 reported internal standard recoveries for all six internal standards which were less than the 50% quality control limit. Re-analysis showed similar results. The original data were used for validation. The positive and nondetected results associated with these noncompliant internal standards were qualified as estimated, (J) and (UJ), respectively.

MEMO TO: PAUL FRANK  
DATE: SEPTEMBER 22, 1997 PAGE 5

- Semivolatiles analysis for all samples were noncompliant for holding time to extraction, 7 days. The positive and nondetected results reported for all of the samples were qualified as estimated. (J) and (UJ), respectively.
- Matrix spike/matrix spike duplicate analysis for semivolatiles, associated with sample DSBSB0030201, reported very low recoveries for 1,4-dichlorobenze and 1,2,4-trichlorobenze (<15%). Recoveries of the same compounds in the laboratory control spikes were also low. Therefore, the results for both compounds for sample DSBSB0030201 were qualified UL.

#### Notes

It should be noted that 1,1-dichloroethene exceeded the allowable upper limit for laboratory control standard recovery in several samples associated with the volatiles analysis.

It should be noted that surrogate spike recoveries of 2-fluorobiphenyl were below the allowable lower limit in samples RN3SB0010401, RN3SB0010301, RN3SB0040301, and RN3SB0040401. Re-analysis showed similar results. However, since only one surrogate was out of compliance, no qualification of sample results is necessary.

It should be noted that the recoveries for several compounds fell below the allowable lower limit for laboratory control standards associated with the semivolatiles analysis.

Internal standard recoveries for SB0030201MS were less than the 50% quality control limit. Re-analysis showed similar results.

Validation was not taken for field duplicate precision, however a field duplicate comparison is included in Appendix C.

Typographic errors were noted on the semivolatiles continuing calibrations (Form 7). The relative response factor column should read RRF50, not RRF20.

#### Executive Summary

**Laboratory Performance:** The holding time for semivolatiles extraction was exceeded. Blank contamination was noted for methylene chloride. Nondetected results for acetonitrile, acrolein, acrylonitrile, propionitrile, isobutyl alcohol, 2-butanone, and vinyl acetate were rejected on account of initial calibration non-compliances. Nondetected results for famphur and kepone were rejected on account of initial calibration non-compliances.

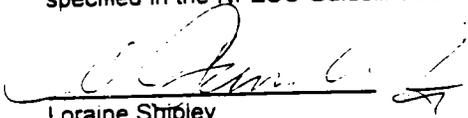
**Other Factors Affecting Data Quality:** Low internal standard areas were reported for several internal standards in several samples.

MEMO TO: PAUL FRANK  
DATE: SEPTEMBER 22, 1997 PAGE 6

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Loraine Shipley  
Civil Engineer/Data Validator  
Brown and Root Environmental



Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected result as reported by the laboratory.
- UJ - Nondetected result is considered estimated on account of initial/ continuing calibration noncompliances, or exceedance of holding time.
- UR - Nondetected result is rejected on account of poor Relative Response Factor.
- J - Positive result is considered estimated on account of initial/ continuing calibration noncompliances, or the exceedance of holding time, result was below the CRQL.
- B - Positive result is considered a false positive due to blank contamination.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-113

TO: PAUL FRANK

DATE: SEPTEMBER 22, 1997

FROM: BRIAN RUSHE

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - APPENDIX IX AND TCL VOAS AND SVOAS  
CTO 287 INDIAN HEAD, MARYLAND  
SDG 9708042

SAMPLES: 11/Aqueous

DSBMW001U001	DSBMW003U001	DSBDUP003
DSBMW004U001	RN3MW003U001	RN6MW002U001
RN6MW003U001	RN6DUP002	
RN6MW005U001	RN6MW004U001	
TB001062597		

## Overview

The sample set for CTO 287 Indian Head, Maryland, SDG9708042 consists of eleven (11) aqueous environmental samples. A Matrix Spike/ Matrix Spike Duplicate analysis was performed on sample DSBMW001V001. Two field duplicate pairs were included in this SDG.

All of the samples were analyzed for Appendix IX and Target Compound List (TCL) volatiles and semivolatiles. The samples were collected by Brown and Root Environmental on June 25, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The VOAs and SVOAs analyses were conducted according to SW-846 Methods 8260A and 8270B, respectively.

## Summary

All analytes were successfully analyzed with the exception of those rejected. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, GCMS tuning, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification, & detection limits.

Areas of concern with respect to data quality are listed below.

## Major Problems

MEMO TO: PAUL FRANK  
DATE: SEPTEMBER 26, 1997 PAGE 2

C-49-09-7-113

- A volatile initial calibration, affecting samples DSBMW001U001, DSBMW003U001, DSBBDUP003, DSBMW004U001, RN3MW003U001, RN3MW003U001, RN6MW002U001, RN6MW003U001, RN6DUP002, RN6MW005U001, RN6MW004U001, RN6MW004U001, and TB001062597 contained Relative Response Factors (RRFs) for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone, and vinyl acetate that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for in acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone, and vinyl acetate in the aforementioned samples were rejected, (UR).
- A volatile continuing calibration, affecting samples DSBMW001U001, DSBMW003U001, DSBBDUP003, DSBMW004Y001, RN3MW003U001, RN3MW003U001, RN6MW002U001, RN6MW003U001, RN6DUP002, RN6MW005U001, RN6MW004U001, TB001062597 contained RRFs for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone, and vinyl acetate that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone, and vinyl acetate in the aforementioned samples were rejected, (UR).
- A semivolatile continuing calibration, affecting samples DSBMW001U001, DSBMW003U001, DSBBDUP003, DSBMW004U001, RN3MW003U001, RN6MW002U001, RN6MW003V001, RN6DUP002, RN6MW005U001, RN6MW004U001, TB001062597 contained RRFs for 4-nitroquinoline-1-oxide, famphur, and kepone below the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for the aforementioned compounds in the affected samples were rejected, (UR).

#### Minor Problems

- A volatile continuing calibration contained a Percent Difference (%D) for chloroethane, acetone, acrolein, acrylonitrile, allyl chloride, methacrylonitrile, iodomethane, carbon disulfide, vinyl acetate, and pentachloroethane that was exceeded the 25% quality control limit. Since the RRF for Acrolein, Acrylonitrile, and Vinyl Acetate is less than 0.05 and the compounds are nondetect, the results were previously qualified as unusable.
- The volatile sample re-analyses for samples RN3MW003U001, RN6MW004U001, and TB001062597 occurred outside of the fourteen (14) day holding time. The positive and nondetected results reported for all of the samples were qualified as estimated, (J) and (UJ) respectively.
- The volatile surrogate recoveries in samples RN3MW003U001 and TB001062597 exceeded the system monitoring compound QC limits. All positive detects were qualified as estimated, (J). Sample RN3MW003U001 had the only positive detect.
- A semivolatile continuing calibration contained a Percent Difference (%D) for 4-Nitroaniline, 3,3-Dichlorobenzidine, trans-Isosafrole, cis-Isosafrole, Dimethoate, Famphur, Kepone, o-Tolidine, 1,4-Dioxane, a,a-Dimethylphenethylamine, Sulfotepp, and Aramite that was greater than 50%. Since the compounds are all nondetected, they were qualified as estimated, (UJ)

MEMO TO: PAUL FRANK  
DATE: SEPTEMBER 26, 1997 PAGE 3

C-49-09-7-113

- The following contaminants were detected in the laboratory method and field quality control blank at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
Methylene Chloride	1 ug/L	10 ug/kg

Samples Affected: All

For all samples, methylene chloride was considered false positive and qualified. (B).

#### Notes

Positive results reported below the Contract Required Quantitation Limits have been qualified as estimated, (J).

Several semivolatile compounds in the initial calibration contained %RSDs greater than the 30% quality control limit, but less than the 50% quality control limit. As per Region III guidance, since only nondetected results were reported for these compounds, no validation action was taken.

Several semivolatile compounds in the continuing calibrations contained %RSDs greater than the 25% quality control limit, but less than the 50% quality control limit. As per Region III guidance, since only nondetected results were reported for these compounds, no validation action was taken.

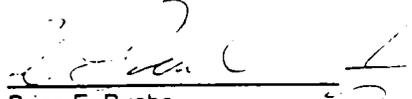
#### Executive Summary

**Laboratory Performance:** The holding times for volatile samples RN3MW003U001 and TB001062597 were exceeded. Blank contamination was noted for methylene chloride. Nondetected results for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone, and vinyl acetate were rejected on account of initial and continuing calibration noncompliances. Nondetected results for 4-Nitroquinoline-1-oxide, 4-Nitroaniline, 3,3-Dichlorobenzidine, trans-Isosafrole, cis-Isosafrole, Dimethoate, Famphur, Kepone, o-Tolidine, 1,4-Dioxane, a,a-Dimethylphenethylamine, Sulfotepp, and Aramite were rejected due to initial and continuing calibration noncompliances.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

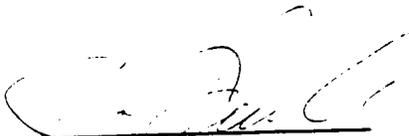
The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
\_\_\_\_\_  
Brian E. Rushe  
Civil Engineer  
Brown and Root Environmental

**MEMO TO: PAUL FRANK**  
**DATE: SEPTEMBER 26, 1997 PAGE 4**

**C-49-09-7-113**



Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

**Attachments:**

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected results as reported by the laboratory.
- UJ - Nondetected result is considered estimated on account of initial/ continuing calibration noncompliances, or exceedance of holding time.
- UR - Nondetected results is rejected on account of poor Relative Response Factor.
- J - Positive result is considered estimated on account of initial/ continuing calibration noncompliances, or the exceedance of holding time, result was below the CRQL.
- B - Positive result is considered a false positive due to blank contamination.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected results as reported by the laboratory.
- UJ - Nondetected result is considered estimated on account of initial/ continuing calibration noncompliances, or exceedance of holding time.
- UR - Nondetected results is rejected on account of poor Relative Response Factor.
- J - Positive result is considered estimated on account of initial/ continuing calibration noncompliances, or the exceedance of holding time, result was below the CRQL.
- B - Positive result is considered a false positive due to blank contamination.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-191

TO: P. FRANK

DATE: SEPTEMBER 26, 1997

FROM: PAMELA A. KORYAK

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION- TCL VOLATILE AND SEMIVOLATILE ORGANICS  
CTO 287, NSWC INDIAN HEAD, MARYLAND  
SDG 9708087

SAMPLES: 2/Aqueous/VOA/SVOA

RPLMW002U001

RPLMW004U001

1/Aqueous/VOA

RPLTB001

## Overview

The sample set for the CTO 287 NSWC Indian Head Naval Base site, SDG 9708087, consists of two (2) aqueous environmental samples and one (1) trip blank (designated-TB). The samples were analyzed for Target Compound List (TCL) volatile and semivolatile organic compounds. The laboratory designated one sample (RN3SW0020101) for Matrix Spike/Matrix Spike Duplicate analyses; this sample was shared with SDG9708099. A duplicate pair was not included in this SDG

The samples were collected by Brown and Root Environmental on August 12th and 13th, 1997 and analyzed by GP Environmental under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The volatile analyses were conducted using EPA method 8260A. The samples were analyzed for semivolatile compounds using EPA method 8270B.

## Summary

All compounds were successfully analyzed with the exception of those qualified as rejected. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standards performance, compound identification and compound quantitation. Areas of concern with respect to data quality are listed below.

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Major Problems

- The initial and continuing calibration Relative Response Factors (RRFs) for acrolein, acetonitrile, acrylonitrile, propionitrile, isobutyl alcohol, vinyl acetate, 2-butanone, 4-nitroquinoline-N-oxide, famphur, and kepone were less than 0.05. Only nondetected results were reported for these compounds in the affected samples. The results were qualified as rejected, UR.

Minor Problems

- Initial calibration Percent Relative Standard Deviations (%RSDs) greater than 50% were reported for p-phenylenediamine, dimethoate, famphur, and kepone. Only nondetected results were reported for these compounds in the affected samples. The results reported for these compounds in the affected samples were qualified as estimated, (UJ).
- Continuing calibration %Ds greater than 50% were reported for a,a-dimethylphenethylamine, p-phenylenediamine, aramite and famphur. Only nondetected results were reported for these compounds in the affected samples. The results were qualified as estimated for these compounds in the affected samples were qualified as estimated, (UJ).
- The following table summarizes the maximum concentrations of volatile and semivolatile compounds detected in laboratory method and/or field quality control blanks analyzed in this SDG.

<u>Compound</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
methylene chloride	1 µg/L	10 µg/L

Sample aliquot and dilution factors were considered during application of all action levels. Positive results reported for this compound in the associated samples at concentrations less than the respective action levels are considered false positives and are qualified, (B). Note that field quality control blanks are not qualified based on field quality control blank contamination.

- Positive results reported at concentrations below the CRQL are considered to be estimated and are qualified (J). The direction of the bias cannot be determined.

Notes

Initial calibration Percent Relative Standard Deviations (%RSDs) greater than 30% were reported for bromomethane and 1,2-dichlorobenzene. Only nondetected results were reported in the affected samples.

**MEMO TO: P. FRANK**  
**DATE: SEPTEMBER 26, 1997- PAGE 3**

According to guidance, no action was taken.

Initial calibration Percent Relative Standard Deviations (%RSDs) greater than 30% were reported for trans-isosafrole, cis-isosafrole, 4-nitroquinoline-N-oxide, 1,4-naphthoquinone, methapyrilene, o-tolidine, diphenylamine, 1,3,5-trinitrobenzene, and pronamide. Only nondetected results were reported in the affected samples. According to guidance, no action was taken.

Continuing calibration %Ds greater than 25% were reported for acrylonitrile and vinyl acetate. Only nondetected results were reported for these compounds in the affected samples and therefore, according to guidance, no action was taken.

Continuing calibration %Ds greater than 25% were reported for 2,2'-oxybis(1-chloropropane), hexachloroethane, isophorone, 2-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, 2-acetylaminofluorene, kepone, 4-nitroquinoline-N-oxide, pentachloronitrobenzene, trans-isosafrole, cis-isosafrole, dimethoate, 1,4-dioxane, N-nitrosodimethylamine, pyridine, ethyl methacrylate, 2-picoline, aniline, and hexachloropropene. Only nondetected results were reported for these compounds in the affected samples and therefore, according to guidance, no action was taken.

The %Recoveries (%Rs) in aqueous sample VLCS0825 exceeded the quality control limit for 1,1-dichloroethene, carbon tetrachloride, benzene, 1,2-dichloroethane, trichloroethene, bromodichloromethane, and dibromochloromethane. According to guidance, no action was taken.

#### Executive Summary

**Laboratory Performance:** The initial calibration %RSDs for p-phenylenediamine, dimethoate, famphur, and kepone were greater than 50%. Several initial calibration %RSDs for semivolatile compounds, 1,2-dichlorobenzene and bromomethane exceeded 30%. The initial and continuing calibration RRFs for several volatile and semivolatile compounds were less than 0.05. Several continuing calibration %Ds for volatile and semivolatile compounds were greater than 25%. Several %Rs exceeded the quality control limits for the volatile fraction in the aqueous laboratory control sample VLCS0825. Methylene chloride was detected in the aqueous method blank and in the trip blank.

**Other Factors Affecting Data Quality:** Positive results reported at concentrations below the CRQL are considered to be estimated.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Review"(9/94), as amended for use within EPA Region III, and the NFESC guidelines entitled

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The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Review"(9/94), as amended for use within EPA Region III, and the NFESC guidelines entitled "Navy Installation Restoration Program Laboratory Quality Assurance Guide"(February, 1996).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

  
Brown and Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- J - Estimate positive results for various technical reasons (i.e. calibration noncompliances).
- B - Result reflects blank contamination.
- UJ - Nondetected result is considered estimated due to technical reasons (i.e. calibration noncompliances).
- UR - Nondetected result is considered rejected due to calibration noncompliances.



MEMO TO: P. FRANK  
 DATE: SEPTEMBER 26, 1997 - PAGE 2

### Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recovery (%R) for cadmium was above the 110% quality control limit. Positive results <2X CRDL reported for the aforementioned analyte were qualified as biased high, "K".
- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
beryllium	0.5 ug/L	0.25 mg/kg
copper	10.6 ug/L	5.3 mg/kg
silver	1.6 ug/L	0.8 mg/kg
thallium	7.0 ug/L	3.5 mg/kg
tin	10.0 ug/L	5.0 mg/kg
zinc	5.9 ug/L	2.95 mg/kg

Samples Affected: All

(1) Maximum concentration present in a preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for beryllium, copper, silver, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The ICP Serial Dilution Percent Difference (%D) for cobalt was greater than the 10% quality control limit. Positive results reported for the aforementioned analyte were qualified as estimated, "J". The direction of bias could not be determined.

### Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %Rs for copper and lead were outside the quality control limits. However, no validation actions were warranted as all results were > 2X CRDL.

The MS %R for tin was < 75% quality control limit. However, no validation actions were warranted as all sample results reported for tin were qualified as blank contamination.

A comparison of field duplicate pairs, RN6SS0180101 / RN6DUP007 and RN6SS0190101 / RN6DUP008, is included in Appendix C. However, no validation action are required as per Region III guidance.

### Executive Summary

**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

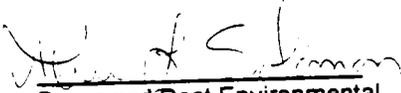
**Other Factors Affecting Data Quality:** The MS %R for antimony was < 30% quality control limit. The ICP Serial Dilution %D for cobalt was greater than the 10% quality control limit.

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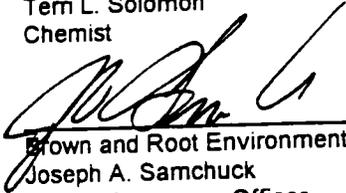
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Brown and Root Environmental  
Terri L. Solomon  
Chemist



Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of MS %R.
- K - Positive result is considered biased high as a result of CRDL %R.
- J - Positive result is considered estimated as a result of ICP Serial Dilution %D.
- UR - Nondetected result is considered rejected as a result of extremely low MS %R.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-113

TO: PAUL FRANK

DATE: SEPTEMBER 26, 1997

FROM: CRAIG FARKOS

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - APPENDIX IX AND TCL VOAS  
CTO 287 INDIAN HEAD, MARYLAND  
SDG 9708020

SAMPLES: 15/Solid

DSBDUP014	DSBDUP015	DSBDUP016
DSBSS00050101	DSBSS0060101	DSBSS0080101
DSBSS0070101	DSBSS0090101	DSBSS0100101
DSBSB00050101	DSBSB0060101	DSBSB0070101
DSBSB0080101	DSBSB0090101	DSBSB0100101

1 Aqueous

DSBTB001

## Overview

The sample set for CTO 287 Indian Head, Maryland, SDG 9708020, consists of fifteen (15) solid environmental samples and one aqueous trip blank. Samples for Matrix Spike/ Matrix Spike Duplicate analysis were included in this package.

All of the samples were analyzed for Appendix IX and Target Compound List (TCL) volatiles and semivolatiles. The samples were collected by Brown and Root Environmental on August 2, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The VOAs and SVOAs analyses were conducted according to SW-846 Methods 8260A and 8270B, respectively.

## Summary

All analytes were successfully analyzed with the exception of those rejected. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, GCMS tuning, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification, & detection limits.

Areas of concern with respect to data quality are listed below.

MEMO TO: PAUL FRANK  
DATE: SEPTEMBER 26, 1997 PAGE 2

C-49-09-7-113

Major Problems

- A volatile initial calibration, affecting samples DSBSS0050101, DSBSB0050101, DSBSS0060101, DSBSB0060101, DSBSS0080101, DSBSB0080101, DSBSS0100101, DSBBDUP014, DSBBDUP015, and DSBBDUP016 contained Relative Response Factors (RRFs) for acrolein (0.003), acrylonitrile (0.036), acetonitrile (0.016), propionitrile (0.036), isobutyl alcohol (0.015) and 2-butanone (0.029) that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol and 2-butanone in the aforementioned samples were rejected, (UR).
- A volatile initial calibration, affecting samples DSBTB001 contained Relative Response Factors (RRFs) for acrolein (0.011), acrylonitrile (0.037), acetonitrile (0.005), propionitrile (0.022), isobutyl alcohol (0.010), 2-butanone (0.017) and vinyl acetate (0.022) that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone and vinyl acetate in the aforementioned samples were rejected, (UR).
- A volatile continuing calibration, affecting samples DSBSS0050101, DSBSB0050101, DSBSS0060101, DSBSB0060101, DSBSS0080101, DSBSB0080101, contained Relative Response Factors (RRFs) for acrolein (0.006), acrylonitrile (0.031), acetonitrile (0.010), propionitrile (0.020), isobutyl alcohol (0.014), 2-butanone (0.027) and vinyl acetate (0.023) that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone and vinyl acetate in the aforementioned samples were rejected, (UR).
- A volatile continuing calibration, affecting samples DSBSS0100101, DSBBDUP014, DSBBDUP015, and DSBBDUP016 contained Relative Response Factors (RRFs) for acrolein (0.006), acrylonitrile (0.032), acetonitrile (0.012), propionitrile (0.025), isobutyl alcohol (0.014), 2-butanone (0.023) and vinyl acetate (0.025) that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone and vinyl acetate in the aforementioned samples were rejected, (UR).
- A volatile continuing calibration, affecting samples DSBSS090101, DSBSB090101, DSBSB0100101, DSBSS070101, DSBSB070101 contained Relative Response Factors (RRFs) for acrolein (0.036), and 2-butanone (0.031) that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein and 2-butanone in the aforementioned samples were rejected, (UR).
- A volatile continuing calibration, affecting samples DSBTB001 contained Relative Response Factors (RRFs) for acrolein (0.017), acetonitrile (0.005), propionitrile (0.019), isobutyl alcohol (0.008), 2-butanone (0.016) and vinyl acetate (0.021) that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone and vinyl acetate in the aforementioned samples were rejected, (UR).
- A semivolatile initial calibration, affecting samples DSBSS0050101, DSBSB0050101, DSBSS0060101, DSBSB0060101, DSBSS0080101, DSBSB0080101, DSBSS0090101,

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DATE: SEPTEMBER 26, 1997 PAGE 3

C-49-09-7-113

DSBSB0090101, DSBS0100101, DSBSB0100101, DSBBDUP016, DSBBDUP015, DSBBDUP014, DSBS0070101, and DSBSB0070101, contained RRFs for 4-Nitroquinoline-N-oxide, Famphur, and Kepone below the 0.05 quality control limit. The nondetected results for the aforementioned compounds in the affected samples were rejected, (UR).

- A semivolatile continuing calibration, affecting samples DSBS0050101, DSBSB0050101, DSBS0060101, DSBSB0060101, DSBS0080101, DSBSB0080101, DSBS0090101, DSBSB0090101, DSBS0100101, DSBSB0100101, DSBBDUP016, DSBBDUP015, DSBBDUP014, DSBS0070101, and DSBSB0070101, contained RRFs for 4-Nitroquinoline-N-oxide, Famphur, and Kepone below the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for the aforementioned compounds in the affected samples were rejected, (UR).

#### Minor Problems

- A volatile continuing calibration, affecting samples DSBS0050101, DSBSB0050101, DSBS0060101, DSBSB0060101, DSBS0080101, DSBSB0080101, contained a Percent Difference (%D) that was greater than the 25% quality control limit for chloromethane (26.9), bromomethane (-67.8), iodomethane (-106.9), acetone (-48.8), acrolein (-88.2), acetonitrile (38.9), carbon disulfide (-31.8), propionitrile (45.5), allyl chloride (39.7), methacrylonitrile (41.8), methyl methacrylate (37.7), ethyl methacrylate (36.4), vinyl acetate (79.4), 2-chloroethylvinyl ether (-61.4), tetrachloroethene (-39.0), trans 1,4-dichloro-2-butene (36.6) and pentachloroethane (35.6). This noncompliance affects some nondetect results. Nondetect results of gross exceedences of percent difference (>50%) for bromomethane (-67.8), iodomethane (-106.9) were qualified as UJ.
- A volatile continuing calibration, affecting samples DSBS0100101, DSBBDUP014, DSBBDUP015, and DSBBDUP016, contained a Percent Difference (%D) that was greater than the 25% quality control limit for bromomethane (-57.7), iodomethane (-146.6), acrolein (-88.2), acetonitrile (25.8), carbon disulfide (-29.5), propionitrile (31.3), allyl chloride (28.8), methacrylonitrile (29.0), methyl methacrylate (28.7), vinyl acetate (77.9), 2-chloroethylvinyl ether (-54.0), tetrachloroethene (-25.1) and trans 1,4-dichloro-2-butene (26.9). This noncompliance affects some nondetect results. Nondetect results of gross exceedences of percent difference (>50%) for bromomethane (-57.7), iodomethane (-146.6) were qualified as UJ.
- A volatile continuing calibration, affecting samples DSBS090101, DSBSB090101, DSBSB0100101 DSBS070101 DSBSB070101 contained a Percent Difference (%D) that was greater than the 25% quality control limit for dichlorodifluoromethane (36.3), acetonitrile (34.6), carbon disulfide (38.6) and vinyl acetate (47.7). The nondetected results for dichlorodifluoromethane, acetonitrile, carbon disulfide and vinyl acetate required no qualification as a result of this exceedance.
- A volatile continuing calibration, affecting samples DSBTB001 contained a Percent Difference (%D) that was greater than the 25% quality control limit for chloromethane (26.8), acrolein (-47.4) acrylonitrile (-79.3) and pentachloroethane (-35.4). The nondetected results for chloromethane, acrolein, acrylonitrile and pentachloroethane required no qualification as a result of this exceedance.
- System monitoring compound recovery exceeded acceptable limits for samples DSBS0050101, DSBS0100101, DSBBDUP015, and were less than acceptable limits for sample DSBS0100101. Analytical results for nondetect volatile target compounds in these samples were qualified (UJ).

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- Low internal standard areas were reported for internal standards in samples DSBSS0050101, DSBSB0050101, DSBSS0060101, DSBSS0080101, DSBSB0080101, DSBSS0100101, DSBBDUP014, DSBBDUP015. Nondetect compounds quantitated using internal standard area counts less than the lower limit were qualified (UJ).
- Each semivolatile compound sample exceeded the seven (7) day holding time from sample collection to extraction. The positive and nondetected results were reported for all of the samples were qualified as estimated, (J) and (UJ) respectively.
- A semivolatile initial calibration contained a %RSD for Dimethoate, Famphur, and Kepone greater than 50%. Since the compounds are all nondetect, they were qualified as estimated, (UJ).
- A semivolatile continuing calibration contained a Percent Difference (%D) for 4-Nitroaniline, trans-Isosafrole, cis-Isosafrole, Dimethoate, 4-Nitroquinoline-N-oxide, Famphur, Kepone, 1,4-Dioxane, a,a-Dimethylphenethylamine, Sulfotepp, and Aramite that was greater than 50%. Since the compounds are all nondetect, they were qualified as estimated, (UJ).
- The following contaminants were detected in the laboratory method and field quality control blank at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
Acetone	24 ug/kg	240 ug/kg
Methylene Chloride	3 ug/kg	30 ug/kg
Methylene Chloride	7 ug/L	70 ug/L

Samples Affected: All

Sample aliquot size, percent solid, and dilution factors were taken into consideration when applying all action levels. Positive results reported for di-n-butylphthalate and bis(2-ethylhexyl)phthalate below the respective action levels were considered false positives and qualified, (B). It should be noted that field quality control blanks were not qualified for field quality control blank contamination.

#### Notes

It should be noted that sample numbers DSBSS00050101 and DSBSB00050101 recorded on the chain of custody form were reported as DSBSS0050101 and DSBSB0050101.

#### Executive Summary

**Laboratory Performance:** The holding times for analysis of samples DSBSS0050101RE, DSBSB0050101RE, DSBSS0060101RE, DSBSS0080101RE, DSBSB0080101RE, DSBSS0100101RE, DSBBDUP014RE and DSBBDUP015RE were exceeded. Blank contamination was noted for acetone and methylene chloride.

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DATE: SEPTEMBER 26, 1997 PAGE 5

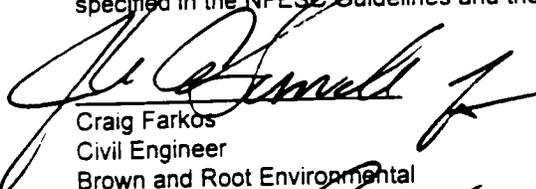
C-49-09-7-113

**Other Factors Affecting Data Quality:** Low internal standard areas were reported for several internal standards in several samples.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Craig Farkos  
Civil Engineer  
Brown and Root Environmental



Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected results as reported by the laboratory.
- UJ - Nondetected result is considered estimated on account of initial/ continuing calibration noncompliances, or exceedance of holding time.
- UR - Nondetected results is rejected on account of poor Relative Response Factor.
- J - Positive result is considered estimated on account of initial/ continuing calibration noncompliances, or the exceedance of holding time, result was below the CRQL.
- B - Positive result is considered a false positive due to blank contamination.



MEMO TO: P. FRANK  
 DATE: SEPTEMBER 28, 1997 - PAGE 2

Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) for cadmium and copper were above the 110% quality control limit. Positive results <2X CRDL reported for the aforementioned analytes were qualified as biased high, "K".
- The CRDL %R for lead was below the 90% quality control limit. The nondetected result reported for the aforementioned analyte was qualified as biased low, "UL".
- The following contaminants were detected in the laboratory method/preparation/rinsate blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
arsenic	2.8 ug/L	1.4 mg/kg
barium <sup>(2)</sup>	2.6 ug/L	1.3 mg/kg
beryllium	0.2 ug/L	0.1 mg/kg
cobalt	0.7 ug/L	0.35 mg/kg
copper <sup>(2)</sup>	11.9 ug/L	5.95 mg/kg
nickel	1.3 ug/L	0.65 mg/kg
silver	2.4 ug/L	1.2 mg/kg
thallium	7.1 ug/L	3.55 mg/kg
tin <sup>(1)</sup>	0.664 mg/kg	3.32 mg/kg
vanadium	0.8 ug/L	0.4 mg/kg
zinc <sup>(2)</sup>	3.2 ug/L	1.6 mg/kg

Samples Affected: All

(1) Maximum concentration present in a soil preparation blank.

(2) Maximum concentration present in a rinsate blank.

- An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for arsenic, beryllium, copper, silver, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects. It should be noted that field quality control samples are not qualified for field blank contamination.
- The Matrix Spike (MS) Percent Recoveries (%Rs) for antimony affecting the soil matrix were < 75% quality control limit. Positive results and nondetects reported for the aforementioned analyte were qualified as biased low, "L" and "UL", respectively.
  - The MS %Rs for tin affecting the soil matrix were < 30% quality control limit. Positive results reported for the aforementioned analyte were qualified as biased low, "L".
  - Laboratory duplicate imprecision was noted for chromium affecting the soil matrix. Positive results reported for the aforementioned analyte were qualified as estimated, "J". The direction of bias could not be determined.
  - The ICP Serial Dilution Percent Differences (%D) for lead and zinc affecting the soil matrix were greater than the 10% quality control limit. Positive results reported for the aforementioned analytes were qualified as estimated, "J". The direction of bias could not be determined.

MEMO TO: P. FRANK  
DATE: SEPTEMBER 28, 1997 - PAGE 3

### Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %R for thallium was > 110% quality control limits. However, no validation actions were warranted as all results were either qualified for blank contamination or were nondetects.

The CRDL %R for tin was < 90% quality control limit. However, no validation actions were warranted as a CRDL has not been established for tin.

A comparison of field duplicate pair, RPLSS0010101 / RPLDUP009, is included in Appendix C. However, no validation action are required as per Region III guidance.

### Executive Summary

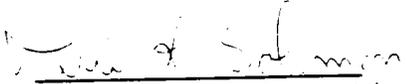
**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

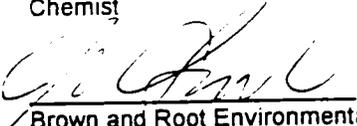
**Other Factors Affecting Data Quality:** Several analytes were present in the rinsate blank. The MS %R for antimony was < 75% quality control limit. The MS %R for tin was < 30% quality control limit. Laboratory duplicate imprecision was noted for chromium. The ICP Serial Dilution %Ds for lead and zinc were greater than the 10% quality control limit.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

### Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- UL - Nondetected result is considered biased low as a result of CRDL %R and/or MS %R.
- L - Positive result is considered biased low as a result of MS %R.
- K - Positive result is considered biased high as a result of CRDL %R.
- J - Positive result is considered estimated as a result of laboratory duplicate imprecision and/or ICP Serial Dilution %D.



MEMO TO: P. FRANK  
 DATE: OCTOBER 6, 1997 - PAGE 2

- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
antimony	2.7 ug/L	1.35 mg/kg
beryllium	0.5 ug/L	0.25 mg/kg
nickel	2.1 ug/L	1.05 mg/kg
silver	1.1 ug/L	0.55 mg/kg
thallium	3.4 ug/L	1.7 mg/kg
vanadium	3.4 ug/L	1.7 mg/kg
tin <sup>(1)</sup>	1.011 mg/kg	5.055 mg/kg

Samples Affected: All

<sup>(1)</sup> Maximum concentration present in a preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for antimony, beryllium, silver, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike (MS) Percent Recovery (%R) for chromium was > 125% quality control limit. Positive results reported for the aforementioned analyte were qualified as estimated, "J", as a result of conflicting noncompliances.
- Laboratory duplicate imprecision was noted for chromium. Positive results reported for the aforementioned analyte were qualified as estimated, "J". The direction of bias could not be determined.
- The ICP Serial Dilution Percent Differences (%Ds) for barium, vanadium and zinc were greater than the 10% quality control limit. Positive results reported for the aforementioned analytes were qualified as estimated, "J". The direction of bias could not be determined.

#### Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %Rs for lead, thallium, zinc and tin were outside the quality control limits. However, no validation actions were warranted as all results were either > 2X CRDL, were nondetects or were qualified as blank contamination.

The MS %R for antimony was < 75% quality control limit. However, no validation actions were warranted as all sample results reported for antimony were qualified as blank contamination.

#### Executive Summary

**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

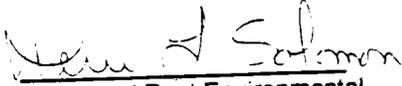
**Other Factors Affecting Data Quality:** The MS %R for chromium was > 125% quality control limit. Laboratory duplicate imprecision was noted for chromium. The ICP Serial Dilution %Ds for barium, vanadium and zinc were greater than the 10% quality control limit.

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DATE: OCTOBER 6, 1997 - PAGE 3

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

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Terri L. Solomon  
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Joseph A. Samchuck  
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**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- K - Positive result is considered biased high as a result of CRDL %R.
- J - Positive result is considered estimated as a result of MS %R, Duplicate imprecision and/or ICP Serial Dilution %D.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-10-07-060

TO: PAUL FRANK

DATE: OCTOBER 7, 1997

FROM: LINNEA JOHNSON

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - VOAS, SVOAS AND EXPLOSIVES  
CTO 287 NSWC INDIAN HEAD, MARYLAND  
SDG - 9707065

SAMPLES: 16/Soil

RN6SS0160101	RN6SB0170101	RN6SB0180101	RN6SB0190101
RN6SB0160101	RN6SB0170201	RN6SB0180201	RN6SB0190201
RN6SB0160201	RN6SS0180101	RN6SS0190101	DSBSS0010101
RN6SS0170101	RN6DUP007	RN6DUP008	DSBSB0010101

## Overview

The sample set for CTO 287 Indian Head, Maryland, SDG 9707065, consists of sixteen (16) soil samples, one aqueous trip blank and one aqueous rinsate blank. Two field duplicate pairs, samples RN6SS0180101/RN6DUP007 and RN6SS0190101/RN6DUP008, were included in this SDG. The field crew specified sample DSBSS0010101 for Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis.

All of the soil samples were analyzed for Appendix IX volatiles, semivolatiles and explosives. The trip blank was analyzed for low level volatiles only. The rinsate blank was analyzed for Appendix IX volatiles, semivolatiles and explosives. The samples were collected by Brown and Root Environmental on July 9 and 10, 1997 and analyzed by GP Environmental Services, Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The low level VOAs and SVOAs analyses were conducted according to U.S. EPA Methods 8260A and 8270B. The explosives analysis was conducted according to SW-846 method 8330.

## Summary

All analytes were successfully analyzed with the exception of those qualified as rejected. The findings offered in this report were based on a general review of all available data, including data completeness, holding times, GC/MS tuning, calibration data, laboratory and field quality control blank results, MS/MSD analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification, and detection limits.

Areas of concern with respect to data quality are listed below.

## Major Problems

- The low level volatile initial calibration, affecting all samples, had Relative Response Factors (RRFs) less than the 0.05 quality control limit for the following contaminants: Acrolein, Acrylonitrile,

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Acetonitrile, Propionitrile, Isobutyl Alcohol and 2-Butanone. The nondetected results for these contaminants were rejected (UR) in the aforementioned samples. There were no positive detections for these constituents in the aforementioned samples. These results are considered to be biased extremely low. Low level volatile continuing calibrations contained RRFs less than the 0.05 quality control limit for the the following contaminants: Acrolein, Acrylonitrile, Acetonitrile, Propionitrile, Isobutyl Alcohol and 2-Butanone. The nondetected results for these contaminants were rejected (UR) in the associated samples.

- The semivolatile initial calibration affecting all samples contained RRFs less than the 0.05 quality control limit for 4-nitroquinoline-1-oxide, famphur and kepone. The nondetected results for these compounds were rejected (UR). There were no positive detections for these constituents. All semivolatile continuing calibrations also contained RRFs less than the 0.05 quality control limit for 4-nitroquinoline-1-oxide, famphur and kepone. The nondetected results for these compounds were rejected (UR).
- The semivolatile analyses for sample RN6SB0160101 yielded one surrogate recovery noncompliance. The percent recovery (%R) for the surrogate 2-fluorophenol in the acid fraction was less than 10%. This sample was reanalyzed due to this noncompliance; however, the reanalysis displayed even lower %Rs. Consequently, the original analysis was used for data validation. The results in the acid fraction were considered unusable and were rejected (UR).

#### Minor Problems

- Samples RN6SB0160201 and RNSS0170101 contained acetone at levels exceeding the instruments linear calibration range, in a low level analysis. Consequently, these samples were reanalyzed at a medium level. Volatile holding times were exceeded (1 day) for the two re-analyses, RN6SB0160201 and RN6SS0170101. Consequently, results in these two re-analyses were qualified as estimated (J) due to conflicting directional bias.
- Semivolatile holding times were exceeded for all samples. Consequently, results in all samples were qualified estimated (J for positive detections and UJ for nondetects).
- A low level semivolatile initial calibration, percent RSDs exceeded 50 percent for dimethoate, and 1,4-Phenylenediamine. The nondetected results were qualified estimated (UJ).
- A low level semivolatile continuing calibration, percent differences exceeded 50 percent for dimethoate and 2,4-dinitrophenol. The nondetected results for these compounds were qualified estimated (UJ).
- A low level semivolatile continuing calibration, percent differences exceeded 50 percent for the following contaminants: trans-isosafrole, cis-isosafrole, 1,4-naphthoquinone, dimethoate, methapyriene hydrochloride and 2,4-dinitrophenol. The nondetected results for these contaminants were qualified estimated (UJ).
- The following contaminants were detected in low level analyses, in the laboratory method blank:

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<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
methylene chloride	2 ug/L	20 ug/L

Samples Affected: All

Sample aliquot size and dilution factors were taken into consideration when applying all action levels. Positive results reported for methylene chloride below the respective action levels were considered false positives and qualified, (B). It should be noted that field quality control blanks were not qualified for field quality control blank contamination. It should also be noted that no contaminants were detected in medium level blank analyses.

- The medium level volatile analysis for sample RN6SB0160201 contained a Percent Recovery (%R) of 118% for the surrogate toluene-d8, above the quality control limit. The low level volatile analysis of RN6SS0170101 contained a %R of 126% for the surrogate 4-bromofluorobenzene, above the quality control limit. The only positive results used from medium level analyses were for acetone. These acetone results were already qualified as estimated (J). No bias can be determined.
- The third internal standard area in sample RN6SS170101 was below the 50% quality control limit. Nondetected results quantitated relative to this internal standard were qualified as estimated (UJ).

#### Notes

The laboratory volatile noncompliance report indicates that one sample was dropped and broken at the lab; no replacement was provided.

The volatiles data package from the laboratory provides an incorrect sample identification number for one sample: RN6SS0180201 should be RN6SS0180101. This I.D. is correct in the semivolatiles and explosives data packages.

A low level volatile continuing calibration affecting samples RN6DUP007, RN6SB0180101, RN6SB0180201, RN6SS0190101, RN6SB0190101 and RN6SB0190201 contained percent differences (%D) exceeding 25 percent for Iodomethane and Acetonitrile. No action was taken, because these contaminants were not detected (U) in the aforementioned samples.

A low level semivolatile initial calibration affecting all samples contained percent relative standard deviations (%RSDs) greater than 30 percent for the following contaminants: trans-isosafrole, cis-isosafrole, 1,4-naphthoquinone, diphenylamine, sulfotepp, pronamide, 4-nitroquinoline-n-oxide, methapyrilene hydrochloride, 4-aminoazobenzene, o-tolidine and 1,2-dichlorobenzene. No action was taken, because these contaminants were not detected (U) in the aforementioned samples.

In the low level semivolatile initial calibration, percent RSDs exceeded 50 percent for famphur and kepone. No action was taken because these contaminants were already qualified UR for RRF exceedances.

A low level semivolatile continuing calibration contained percent differences (%D) greater than 25 percent for the following contaminants: 1,4-phenylenediamine, 1,4-naphthoquinone, methylpyrilene hydrochloride,

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DATE: OCTOBER 7, 1997 PAGE 4

4-aminoazobenzene, 4-aminophenylether, kepone, o-toluidine, dibenz(a,j)acridine, 2,2-oxybis(1-chloropropane), benzoic acid and 4,6-dinitro-2-methylphenol. No action was taken, because there were no positive detections for these constituents in associated samples.

In low level semivolatile continuing calibrations, percent differences exceeded 50 percent for 4-nitroquinoline-n-oxide and famphur. No action was taken because these compounds were already qualified UR for low RRF50s.

A low level semivolatile continuing calibration affecting samples contained percent differences (%D) greater than 25 percent for the following contaminants: n-nitrosomorpholine, 1,2-diphenylhydrazine, 2-naphthylamine, 1,3,5-trinitrobenzene, ethyl parathion, 4-aminoazobenzene, dibenzo(a,j)acridine, 2,2-oxybis(1-chloropropane), hexachlorocyclopentadiene, 4,6-dinitro-2-methylphenol and pentachlorophenol. No action was taken, because there were no positive detections for these constituents in associated samples.

It should be noted that the laboratory calibrated for the following semivolatile compounds, but did not report them: parathion, hexachloroprene, thionazin, disulfoton and dinoseb.

Samples RN6SB0160201 and RN6SS0170101 were reanalyzed because of high acetone detections exceeding the analytical instrument's linear calibration range. Acetone results in these samples were replaced with the acetone results detected in the respective duplicate analyses.

There were no major or minor problems detected in the explosives data package.

A field duplicate comparison is included in Appendix C.

#### Executive Summary

**Laboratory Performance:** Sample holding times were exceeded for the semivolatile fraction. Several volatile and semivolatile calibration noncompliances were noted. Methylene chloride was detected in a method blank.

**Other Factors Affecting Data Quality:** None

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

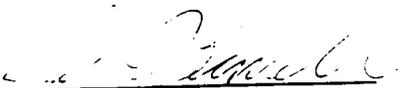
MEMO TO: PAUL FRANK  
DATE: OCTOBER 7, 1997 PAGE 5

C-49-10-7-060

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Linnea Johnson  
Risk Assessor/Data Validator  
Brown and Root Environmental



Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected results as reported by the laboratory.
- UJ - Nondetected result is considered estimated due to initial or continuing calibration noncompliances.
- UR - Nondetected results is rejected due to poor Relative Response Factor.
- J - Positive result is considered estimated due to various technical noncompliances, or the result was below the CRQL.
- B - Positive result is considered a false positive due to blank contamination.



MEMO TO: P. FRANK  
 DATE: OCTOBER 7, 1997 - PAGE 2

- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
antimony	2.7 ug/L	1.35 mg/kg
beryllium	0.5 ug/L	0.25 mg/kg
nickel	2.1 ug/L	1.05 mg/kg
silver <sup>(1)</sup>	0.124 mg/kg	0.62 mg/kg
thallium	3.4 ug/L	1.7 mg/kg
vanadium	0.9 ug/L	0.45 mg/kg
tin <sup>(1)</sup>	0.931 mg/kg	4.655 mg/kg

Samples Affected: All

(1) Maximum concentration present in a preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for antimony, beryllium, silver, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike (MS) Percent Recovery (%R) for lead was > 125% quality control limit. Positive results reported for the aforementioned analyte were qualified as biased high, "K".
- The MS %R for selenium was < 75% quality control limit. Positive results reported for the aforementioned analyte were qualified as biased low, "L".

#### Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %Rs for lead, thallium, zinc and tin were outside the quality control limits. However, no validation actions were warranted as all results were either > 2X CRDL, were nondetects or were qualified as blank contamination.

The MS %Rs for antimony and tin were < 30% quality control limit. However, no validation actions were warranted as all sample results reported for antimony and tin were qualified as blank contamination.

A comparison of field duplicate pair, RN6SB0170301 / RN6DUP012, is included in Appendix C. However, no validation actions are required as per Region III guidance.

#### Executive Summary

**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

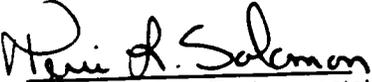
**Other Factors Affecting Data Quality:** The MS %R for lead was > 125% quality control limit. The MS %R for selenium was < 75% quality control limit.

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DATE: OCTOBER 6, 1997 - PAGE 3

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

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Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

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**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- K - Positive result is considered biased high as a result of CRDL %R and/or MS %R.
- L - Positive result is considered biased low as a result of MS %R.



MEMO TO: P. FRANK  
 DATE: OCTOBER 7, 1997 - PAGE 2

- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
antimony	2.7 ug/L	1.35 mg/kg
beryllium	0.5 ug/L	0.25 mg/kg
nickel	2.1 ug/L	1.05 mg/kg
silver <sup>(1)</sup>	0.124 mg/kg	0.62 mg/kg
thallium	3.4 ug/L	1.7 mg/kg
vanadium	0.9 ug/L	0.45 mg/kg
tin <sup>(1)</sup>	0.931 mg/kg	4.655 mg/kg

Samples Affected: All

(1) Maximum concentration present in a preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for antimony, beryllium, silver, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike (MS) Percent Recovery (%R) for lead was > 125% quality control limit. Positive results reported for the aforementioned analyte were qualified as biased high, "K".
- The MS %R for selenium was < 75% quality control limit. Positive results reported for the aforementioned analyte were qualified as biased low, "L".

#### Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %Rs for lead, thallium, zinc and tin were outside the quality control limits. However, no validation actions were warranted as all results were either > 2X CRDL, were nondetects or were qualified as blank contamination.

The MS %Rs for antimony and tin were < 30% quality control limit. However, no validation actions were warranted as all sample results reported for antimony and tin were qualified as blank contamination.

A comparison of field duplicate pair, RN6SB0170301 / RN6DUP012, is included in Appendix C. However, no validation actions are required as per Region III guidance.

#### Executive Summary

**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

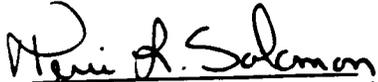
**Other Factors Affecting Data Quality:** The MS %R for lead was > 125% quality control limit. The MS %R for selenium was < 75% quality control limit.

MEMO TO: P. FRANK  
DATE: OCTOBER 6, 1997 - PAGE 3

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

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- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- K - Positive result is considered biased high as a result of CRDL %R and/or MS %R.
- L - Positive result is considered biased low as a result of MS %R.



MEMO TO: P. FRANK  
DATE: OCTOBER 7, 1997 - PAGE 2

Executive Summary

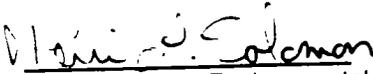
Laboratory Performance: None.

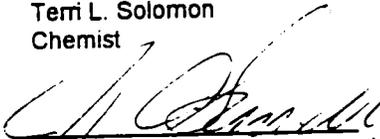
Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

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**Data Qualifier Key:**

U - Value is a nondetect as reported by the laboratory.



MEMO TO: P.FRANK  
DATE: OCTOBER 13, 1997 - PAGE 2

C-49-09-7-074

Minor Problems

- The CRDL %R for selenium was above the 110% quality control limit. Positive results < 2X CRDL reported for the aforementioned analyte were qualified as biased high, "K".
- The following contaminants were detected in the method/preparation/rinsate blanks at the following maximum concentrations :

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>	<u>Action Level - Aqueous</u>
beryllium	0.4 ug/L	0.2 mg/Kg	2.0 ug/L
copper <sup>(1)</sup>	11.6 ug/L	5.8 mg/Kg	58.0 ug/L
thallium	7.1 ug/L	3.55 mg/Kg	12.5 ug/L
tin <sup>(2)</sup>	0.97 mg/kg	4.85 mg/kg	NA
Nickel	1.3 ug/L	0.65 mg/Kg	
Vanadium	0.8 ug/L	0.4 mg/Kg	

Samples Affected: All

- (1) Maximum concentration found in an aqueous rinsate blank.  
(2) Maximum concentration found in an soil preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size, weight, percent solids, and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action levels for beryllium, copper, thallium and tin have been qualified, "B", as a result of blank contamination. It should be noted that field quality control samples are not qualified for field quality control blank contamination.

- The interfering analytes aluminum and iron were present in all the samples with this SDG, except for ABPSB0030101, at concentrations which were comparable to the levels of aluminum and iron in the Interference Check Sample (ICS) solution. Negative results for several analytes namely beryllium, nickel, and vanadium were reported in the ICS solution with absolute values which exceeded the Instrument Detection Limit (IDL). The positive results reported for the aforementioned analytes in the affected samples were qualified as biased low, "L".
- The interfering analytes aluminum and iron were present in all the samples with this SDG, except for ABPSB0030101, at concentrations which were comparable to the levels of aluminum and iron in the Interference Check Sample (ICS) solution. Several analytes namely antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, selenium, thallium, tin and zinc were present in the ICS solution at concentrations which exceeded the Instrument Detection Limit (IDL). Interference effects (false positive) exist for antimony, cadmium, and thallium in all the samples with this SDG except for ABPSB0030101. Also, interference effect exists for selenium in all the samples except for DSBSS0040101, DSBSB0040101, ABPSB0040201, and ABPSB0030101. The positive and nondetected results for antimony in affected samples were qualified as estimated, "J" and "UJ", respectively, as a result of conflicting noncompliances.
- The Matrix Spike (MS) sample Percent Recoveries (%Rs) for antimony and tin were < 75% quality control limit. The positive and nondetected results for antimony in affected samples were qualified as estimated, "J" and "UJ", respectively, as a result of conflicting noncompliances. No further action was taken for tin as this analyte was qualified for more severe noncompliance.

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DATE: OCTOBER 13, 1997 - PAGE 3

C-49-09-7-074

- The ICP Serial Dilution Percent Differences (%Ds) for barium, chromium, lead, and zinc were greater than the 10% quality control limit. Positive results reported for the aforementioned analytes were qualified as estimated, "J". The direction of bias could not be determined.

#### Notes

Laboratory duplicate Relative Percent Differences (RPDs) for beryllium and mercury were outside the control limit  $\pm 35\%$ . However, the concentrations reported for the aforementioned analytes were  $< 5x$  CRDL; thus a control limit of  $\pm 2x$  CRDL was utilized to evaluate the data. Since the results of the duplicate samples were within  $2x$  CRDL, no action was taken for the affected analytes

The Contract Required Detection Limit (CRDL) Percent Recoveries (%Rs) for tin was below the 90% quality control limit. No validation actions were taken as all results were qualified as blank contamination.

Sample ABPSB0030101 was diluted five (5) times in the ICP analysis due to interelement interferences.

#### Executive Summary

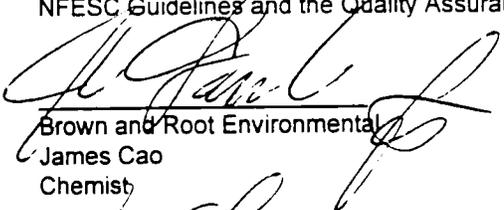
**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

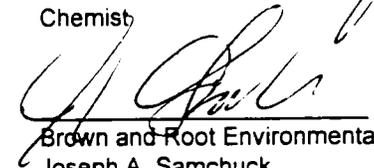
**Other Factors Affecting Data Quality:** The interfering analytes aluminum and iron were present in most samples. The MS %Rs for antimony and tin affecting the soil matrix were outside the 75-125% quality control limits. The ICP Serial Dilution %Ds for barium, chromium, lead, and zinc were greater than the 10% quality control limit.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
James Cao  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

**Attachments:**

1. **Appendix A - Qualified Analytical Results**
2. **Appendix B - Results as reported by the Laboratory**
3. **Appendix C - Support Documentation.**

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of CRDL %R and/or ICP Interference
- UL - Nondetected result is considered biased low as a result of CRDL %R and/or ICP Interference
- K - Positive result is considered biased high as a result of ICP interference.
- J - Positive result is considered estimated as a result of CRDL %R, ICP Interference, MS/MSD %R, laboratory duplicate imprecision and/or ICP Serial Dilution %D.
- UJ - Nondetected result is considered estimated as a result of MS/MSD %R.



## Brown & Root Environmental

INTERNAL CORRESPONDENCE

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C-49-10-7-104

TO: PAUL FRANK

DATE: OCTOBER 14, 1997

FROM: SEAN NIXON

COPIES: DV FILE

SUBJECT: INORGANIC DATA VALIDATION - APPENDIX IX METALS  
CTO 287 INDIAN HEAD, MARYLAND  
SDG - 9708087

SAMPLES: 2/Aqueous

RPLMW002U001 RPLMW004U001

2/Filtrate

RPLMW002F001 RPLMW004F001

### Overview

The sample set for CTO 287 Indian Head, SDG 9708087, consists of four (4) aqueous environmental samples. The field crew did not specify a sample for Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis. A Laboratory Matrix Spike, Duplicate, Post Digestion Spike, and Serial Dilution analyses were performed on sample RPLMW004U001 for Appendix IX metals, except mercury. A laboratory Matrix Spike and Duplicate analysis were performed on sample RPLMW002U001 for mercury.

All samples were analyzed for Appendix IX metals. The samples were collected by Brown and Root Environmental on August 12 and 13, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The Target Analyte List (TAL) metals analyses were conducted according to SW-846 Methods 6010 for TAL metals except mercury, and Method 7470A for mercury.

### Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times, calibration data, laboratory method/ preparation/ rinsate blanks, interference check samples (ICS), laboratory duplicate results, matrix spike recoveries, post digestion spike recoveries, laboratory control sample (LCS) results, ICP serial dilution results, detection limits, and analyte quantitation.

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DATE: OCTOBER 14, 1997 - PAGE 2

C-49-10-7-104

All analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were performed using cold vapor AA.

Areas of concern with respect to data quality are listed below.

Major Problems

- None.

Minor Problems

- The Contract Required Detection Limit (CRDL) analyses yielded Percent Recoveries (%Rs) for arsenic and selenium that were below the 90% quality control limit. This noncompliance affects positive results less than 2X CRDL and nondetected results. The nondetected results for arsenic and selenium were qualified as biased low, (UL).
- The CRDL %R for beryllium was above the 110% quality control limit. This noncompliance affects positive results less than 2X CRDL. However, all of the results for beryllium were qualified (B) for blank contamination.
- The following contaminants were detected in the laboratory method/preparation, and continuing calibration blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level (ug/L)</u>
Beryllium	2.5 ug/L	12.5
Lead	2.2 ug/L	11.0
Thallium	3.5 ug/L	16.5
Tin	2.5 ug/L	12.5

Samples Affected: All

An action level of 5X the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size, percent solids and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level for beryllium and lead have been qualified, (B), as a result of blank contamination. Validation action was not taken for the remaining analytes since the results were either greater than the action level, or were nondetected results.

Notes

It was noted that the sample IDs on the Form Is were not complete. The Form Is were amended with the corrected sample IDs.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 14, 1997 - PAGE 2

Executive Summary

**Laboratory Performance:** The CRDL Standard analyses reported %Rs for arsenic and selenium that were below the quality control limit. Several analytes were present in the laboratory method/preparation blanks.

**Other Factors Affecting Data Quality:** None.

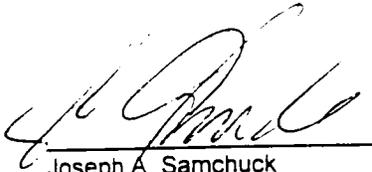
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Sean T. Nixon  
Chemist/Data Validator  
Brown and Root Environmental



Joseph A. Samchuck  
Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

### **DATA QUALIFIER TABLE**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- UL - Nondetected result is considered biased low as a result of low CRDL %R.
- L - Positive result is considered biased low as a result of low CRDL %R.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-10-7-113

TO: P. FRANK

DATE: OCTOBER 16, 1997

FROM: TERRI L. SOLOMON

COPIES: DV FILE

SUBJECT: INORGANIC DATA VALIDATION - APPENDIX IX TOTAL METALS AND APPENDIX IX DISSOLVED METALS  
CTO 287 -NSWC INDIAN HEAD, MARYLAND  
SDG - 9708042

SAMPLES: 19/Aqueous/

DSBMW001F001  
DSBDUP003  
RN3MW003F001  
RN6MW003F001  
RN6MW004U001

DSBMW001U001  
DSBDUP003-F  
RN3MW003U001  
RN6MW003U001  
RN6MW005F001

DSBMW003F001  
DSBMW004F001  
RN6MW002F001  
RN6DUP002  
RN6MW005U001

DSBMW003U001  
DSBMW004U001  
RN6MW002U001  
RN6DUP002-F

## Overview

The sample set for CTO 287, NSWC Indian Head, SDG 9708042, consists of nineteen (19) aqueous environmental samples. Four (4) field duplicate pairs (DSBMW003U001 / DSBDUP003, DSBMW003U001 / DSBDUP003-F, RN6MW003U001 / RN6DUP002 and RN6MW003U001 / RN6DUP002-F) were included within this SDG.

Samples DSBMW001U001, DSBMW003U001, DSBDUP003, DSBMW004U001, RN3MW003U001, RN6MW002U001, RN6MW003U001, RN6DUP002, RN6MW004U001 and RN6MW005U001 were analyzed for Total Appendix IX metals. Samples DSBMW001F001, DSBMW003F001, DSBDUP003-F, DSBMW004F001, RN3MW003F001, RN6MW002F001, RN6MW003F001, RN6DUP002-F and RN6MW005F001 The samples were collected by Brown and Root Environmental on August 4 and 5, 1997 and analyzed by GP Environmental Services under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using SW-846 methodologies. A CLP-like deliverable was provided.

## Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times, calibration data, laboratory method/preparation blanks, matrix spike results, post digestion spike recoveries, laboratory duplicate results, field duplicate results, laboratory control sample (LCS) results, ICP serial dilution results, detection limits and analyte quantitation.

All analyses, with the exception of mercury were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were conducted using cold vapor AA.

Areas of concern with respect to data quality are listed below.

MEMO TO: P. FRANK  
 DATE: OCTOBER 16, 1997 - PAGE 2

### Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recovery (%R) for arsenic was below the 90% quality control limit. Positive results < 2X CRDL and nondetects reported for the aforementioned analyte were qualified as biased low, "L" and "UL", respectively.
- The CRDL %R for selenium was above the 110% quality control limit. Positive results < 2X CRDL reported for the aforementioned analyte were qualified as biased high, "K".
- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Aqueous</u>
antimony	2.8 ug/L	14.0 ug/L
beryllium	0.2 ug/L	1.0 ug/L
nickel	1.2 ug/L	6.0 ug/L
silver	1.3 ug/L	6.5 ug/L
thallium	2.9 ug/L	14.5 ug/L
vanadium	0.9 ug/L	4.5 ug/L
tin	2.3 ug/L	11.5 ug/L

Samples Affected: All

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for antimony, beryllium, nickel, silver, thallium, vanadium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

### Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %R for thallium was > 110% quality control limit. However, no validation actions were warranted as all results were either nondetects or were qualified as blank contamination.

A comparison of field duplicate pairs, DSBMW003U001 / DSBM003, DSBMW003U001 / DSBM003-F, RN6MW003U001 / RN6DUP002 and RN6MW003U001 / RN6DUP002-F, is included in Appendix C. However, no validation actions are required as per Region III guidance.

### Executive Summary

**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

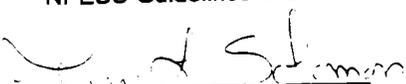
**Other Factors Affecting Data Quality:** None.

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DATE: OCTOBER 16, 1997 - PAGE 3

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- K - Positive result is considered biased high as a result of CRDL %R.
- L - Positive result is considered biased low as a result of CRDL %R.
- UL - Nondetected result is considered biased low as a result of CRDL %R.



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DATE: OCTOBER 15, 1997 - PAGE 2

laboratory's instruments could not achieve satisfactory sensitivity for these compounds therefore, the associated positive and nondetected results for these compounds are severely compromised. Only nondetects were reported for these compounds in the affected samples. Nondetected results reported for these compounds in the affected samples are considered to be unreliable and are rejected, (UR). These results are biased very low.

- Semivolatiles fraction initial and continuing calibration RRFs for 4-nitroquinoline-1-oxide, famphur, and kepone were less than the 0.050 validation quality control criteria. Failure to meet this quality control criterion indicates that the laboratory's instruments could not achieve satisfactory sensitivity for these compounds therefore, the associated positive and nondetected results for these compounds are severely compromised. Only nondetects were reported for these compounds in the affected samples. Nondetected results reported for these compounds in the affected samples are considered to be unreliable and are rejected, (UR). These results are biased very low.

#### Minor Problems

- The 7 day holding time until extraction was exceeded for semivolatiles fraction analysis of samples RPLSS0010101, RPLSB0010101, RPLSB0010201, RPLDUP009, ABPSS0010101, ABPSS0020101, ABPSS0030101, RPLSB0020101, RPLSB0020201, RPLSS0030101, RPLSB0030201, RPLSB0020301, RPLSS0020101, RPLSB0010301, RPLSB0010401. Positive and nondetected results reported for the target compounds in the affected sample were qualified as estimated (J) and (UJ), respectively. The bias could not be determined.
- Some initial calibration Percent Relative Standard Deviations (%RSDs) for 1,4-diphenylenediamine, dimethoate, famphur, and kepone exceeded the 50% validation quality control criteria. This noncompliance indicates a lack in instrumental consistency, and could potentially compromise the quantitation of positive and nondetected results for these compounds. Only nondetected results were reported for these compounds in the affected samples and these results were qualified as estimated, (UJ). No further actions were taken for famphur or kepone since these results were rejected as a result of more severe calibration noncompliances. No bias can be determined.
- Some continuing calibration Percent Differences (%Ds) for iodomethane, 1,4-diphenylenediamine, dimethoate, 2,4-dinitrophenol, trans-isosafrole, cis-isosafrole, 1,4-naphthoquinone, methapyrilene, 1,4-naphthoquinoline-1-oxide, famphur, and kepone exceeded the 50% validation quality control criteria. This noncompliance indicates a lack in instrumental consistency, and could potentially compromise the quantitation of positive and nondetected results for these compounds. Only nondetected results were reported for these compounds in the affected samples and these results were qualified as estimated, (UJ). No action was necessary for nondetects. No bias can be determined.

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 DATE: OCTOBER 15, 1997 - PAGE 3

- The following compounds were found in the low level laboratory method and field quality control blanks at the maximum concentrations indicated:

<u>Compounds</u>	<u>Maximum Concentrations</u>	<u>Action Level</u>
methylene chloride	8 µg/L	80 µg/L, µg/kg
acetone	38 µg/L	380 µg/L, µg/kg
Di-n-butylphthalate	40 µg/L	40 µg/L

Maximum concentration of this compound was detected in a field quality control blank.

Samples affected: All low level samples.

Adjustments were made for percent moisture, dilution factors, and aliquot used for analysis. Results reported for the aforementioned compounds reported at concentrations within the action level have been qualified, (B), and are considered to be false positives (artifacts of blank contamination). No actions were taken for di-n-butylphthalate as no positive results were reported for these compounds in the affected samples. It should be noted that field quality control blanks are not qualified based on field quality control blank contamination.

- The Percent Recovery (%R) for the surrogate compound bromofluorobenzene in sample RPLSB0020201DL was high. Only the acetone result from this sample was used in the validation of this data package. Therefore, the positive result reported for acetone was qualified as estimated, (K), this result is considered to be biased high.
- The internal standard areas for 1,4-difluorobenzene and chlorobenzene-d5 were low in sample RPLSB0010101. This sample was reanalyzed as a result of these noncompliant internal standard areas and the reanalysis yielded a low internal standard area for only chlorobenzene-d5. The reanalysis of samples RPLSB0010101 was used in the validation of this SDG. Positive and nondetected quantitated using the failed internal standard area were qualified as estimated, (J) and (UJ), respectively. No biased can be determined.
- The internal standard areas for all three volatile internal standard areas were low in sample RPLSB0020101. This sample was reanalyzed as a result of this noncompliance and the reanalysis of this displayed the same noncompliances. Therefore, the original sample analyses for the aforementioned samples were used in the validation of this SDG. Positive and nondetected results reported for the compounds quantitated by the failed internal standards were qualified as estimated, (J) and (UJ), respectively. No biased could be determined.
- The internal standard areas for all three volatile internal standard areas were low in samples RPLSB0020201, RPLSS0030101, RPLSB0030101, and RPLSB0030201. All these samples were reanalyzed at as medium level as a result of acetone concentrations in excess of the instruments linear calibration range. All of the internal standard areas were compliant in the reanalyses of these samples. Only the acetone results from the reanalyses were used in the validation of this

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DATE: OCTOBER 15, 1997 - PAGE 4

SDG. Results for all other target compounds in the affected samples were reported from the original sample analysis. Positive and nondetected results reported for all the target compounds quantitated using the failed internal standards were qualified as estimated, (J) and (UJ), respectively. No biased can be determined.

- Positive results reported at concentrations below the CRQL are considered to be estimated and are qualified (J). The direction of bias cannot be determined.

#### Notes

Several initial calibration Percent Relative Standard Deviations (%RSDs) for semivolatile compounds exceeded the 30% validation quality control criterion. No actions were warranted as result of these noncompliances since no positive results were reported for these compounds in the affected samples.

Several continuing calibration %Ds for volatile and semivolatile compounds exceeded the 25% validation quality control criterion. No actions were warranted as result of these noncompliances since no positive results were reported for these compounds in the affected samples.

Samples RPLSB0020201, RPLSS0030101, RPLSB0030101, and RPLSB0030201 were reanalyzed as medium level analyses due to concentrations of acetone exceeding the instruments linear calibration range. The medium level results for acetone only were transposed over to the original sample analysis and used in the validation of this SDG.

The internal standard areas for 1,4-difluorobenzene and chlorobenzene-d5 were low in the sample RPLDUP009MSD. No actions were warranted since the internal standard areas in RPLDUP009MS and RPLDUP009 displayed compliant internal standard areas.

The Laboratory Control Sample (LCS) Percent Recoveries (%Rs) for 1,1-dichloroethene, benzene, 1,2-dichloroethane, 1,1,1-trichloroethane, carbon tetrachloride, and dibromochloromethane were high. No actions were necessary since no positive results were reported for these compounds in the affected samples.

It should be noted that the laboratory spiked all target compounds into the volatile matrix spike/matrix spike duplicate samples but only presented precision and accuracy criteria for the volatile compounds required by CLP. The lab was contacted and ask to provide precision and accuracy criteria for all spiked compounds. Additionally, the laboratory only spiked in semivolatile compounds as per CLP instead of all target compounds as required by the Navy Interim Guidance document (2/96).

No other problems were noted.

#### Executive summary

**Laboratory Performance:** Di-n-butylphthalate was detected in the aqueous laboratory method blank. Holding time until extraction for all solid samples was exceeded for the semivolatile fraction. Several semivolatile initial calibration noncompliances were noted. Several volatile and semivolatile continuing

MEMO TO: PAUL FRANK  
DATE: OCTOBER 15, 1997 - PAGE 5

calibration noncompliances were present. High LCS %Rs were noted for the volatile fraction.

**Other Factors Affecting Data Quality:** Acetone and methylene chloride were detected in the field quality control blanks. One high surrogate recovery was noted in the volatile fraction. Several internal standard area noncompliances were noted in several Volatile fraction analyses. Several soils required analysis as medium level due to high concentrations of acetone. Positive results reported at concentrations below the CRQL are considered to be estimated.

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Evaluation", as amended for use within EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Brown & Root Environmental

Kelly Johnson-Carper  
Chemist/Data Validator



Brown & Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

### **Data Qualifier Summary**

- U - Nondetect as reported by the laboratory.
- B - Positive result qualified as a result of method or field quality control blank contamination.
- UR - Nondetected results qualified as unusable due to poor surrogate recoveries.
- UJ - Nondetected results qualified as estimated due to various technical reasons (i.e. calibration noncompliances, holding times, internal standard areas).
- J - Estimate positive results for various technical reasons (i.e. calibration noncompliances, holding times, internal standard areas , and values less than the CRQL).
- K - Estimate positive results as biased high due to high surrogate recoveries.



MEMO TO: P. FRANK  
DATE: OCTOBER 15, 1997 - PAGE 2

C-49-10-7-106

Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recovery (%R) for selenium was above the 110% quality control limit. Positive results <2X CRDL reported for the aforementioned analyte were qualified as estimated, "J", as a result of conflicting noncompliances.
- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
antimony <sup>(1)</sup>	0.383 mg/kg	1.915 mg/kg
barium <sup>(1)</sup>	0.520 mg/kg	2.6 mg/kg
cadmium <sup>(1)</sup>	0.158 mg/kg	0.79 mg/kg
cobalt	0.7 ug/L	0.35 mg/kg
lead <sup>(1)</sup>	0.137 mg/kg	0.685 mg/kg
nickel	2.2 ug/L	1.1 mg/kg
silver <sup>(1)</sup>	0.192 mg/kg	0.96 mg/kg
thallium	8.0 ug/L	4.0 mg/kg
vanadium <sup>(1)</sup>	0.185 mg/kg	0.925 mg/kg
zinc <sup>(1)</sup>	0.417 mg/kg	2.085 mg/kg
tin <sup>(1)</sup>	1.205 mg/kg	6.025 mg/kg

Samples Affected: All

<sup>(1)</sup> Maximum concentration present in a preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for antimony, silver, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike (MS) Percent Recoveries (%Rs) for lead and selenium were < 75% quality control limit. Positive results reported for the aforementioned analytes were qualified as estimated, "J", as a result of conflicting noncompliances.
- The MS %Rs for arsenic and mercury were < 75% quality control limit. Positive results and nondetects reported for the aforementioned analytes were qualified as biased low, "L" and "UL", respectively.
- The ICP Serial Dilution Percent Differences (%Ds) for barium, beryllium, chromium, cobalt, lead, nickel and zinc were greater than the 10% quality control limit. Positive results reported for the aforementioned analytes were qualified as estimated, "J". The direction of bias could not be determined.

Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %Rs for cadmium, thallium, zinc and tin were outside the quality control limits. However, no validation actions were warranted as all results were either > 2X CRDL, were nondetects or were qualified as blank contamination.

The MS %Rs for antimony and tin were outside the 75-125% quality control limits. However, no validation actions were warranted as all results reported for antimony and tin were qualified as blank contamination.

MEMO TO: P. FRANK  
DATE: OCTOBER 15, 1997 - PAGE 2

Laboratory duplicate imprecision was noted for tin. However, no validation actions were warranted as all results reported for tin were qualified as blank contamination.

A comparison of field duplicate pairs, DSBSB0050101 / DSBBDUP015, DSBSS0050101 / DSBBDUP014 and DSBSS0090101 / DSBBDUP016, are included in Appendix C. However, no validation actions are required as per Region III guidance.

Executive Summary

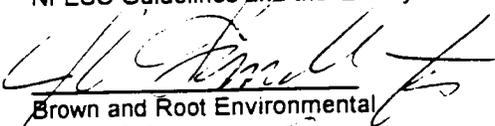
**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

**Other Factors Affecting Data Quality:** The MS %Rs for arsenic, lead, mercury, and selenium were outside the 75-125% quality control limits. The ICP Serial Dilution %Ds for barium, beryllium, chromium, cobalt, lead, nickel and zinc were greater than the 10% quality control limit.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of MS %R.
- UL - Nondetected result is considered biased low as a result of MS %R.
- J - Positive result is considered estimated as a result of CRDL %R, MS %R



MEMO TO: P. FRANK  
 DATE: OCTOBER 17, 1997 - PAGE 2

C-49-10-7-125

Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recoveries (%R) for arsenic and selenium was below the 90% quality control limit. Nondetected results reported for the aforementioned analytes were qualified as biased low, "UL". The positive result reported for selenium was qualified as estimated, "J", as a result of conflicting noncompliances.
- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Aqueous</u>	<u>Action Level - Soil</u>
arsenic	4.0 ug/L	20.0 ug/L	2.0 mg/kg
barium <sup>(2)</sup>	0.262 mg/kg	NA	1.31 mg/kg
beryllium	2.5 ug/L	12.5 ug/L	1.25 mg/kg
lead	2.2 ug/L	NA	1.1 mg/kg
lead <sup>(1)</sup>	2.7 ug/L	13.5 ug/L	NA
thallium	3.5 ug/L	17.5 ug/L	1.75 mg/kg
vanadium	1.0 ug/L	5.0 ug/L	0.5 mg/kg
zinc <sup>(1)</sup>	3.8 ug/L	19.0 ug/L	NA
tin	2.5 ug/L	12.5 ug/L	NA
tin <sup>(2)</sup>	2.358 mg/kg	NA	11.79 mg/kg

Samples Affected: All

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level arsenic, beryllium, lead, vanadium and zinc have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike (MS) Percent Recovery (%R) for antimony affecting the soil matrix was < 75% quality control limit. Positive results and nondetects reported for the aforementioned analyte in the affected samples were qualified as biased low, "L" and "UL", respectively.
- The MS %R for selenium affecting the soil matrix was > 125% quality control limit. The positive result reported for the aforementioned analyte in the affected sample was qualified as estimated, "J", as a result of conflicting noncompliances.
- Laboratory duplicate imprecision was noted for copper affecting the soil matrix. The positive results reported for the aforementioned analyte in the affected samples were qualified as estimated, "J". The direction of bias could not be determined.
- The ICP Serial Dilution Percent Difference (%D) for zinc affecting the soil matrix was greater than the 10% quality control limit. The positive results reported for the aforementioned analyte in the affected samples were qualified as estimated, "J". The direction of bias could not be determined.

MEMO TO: P. FRANK  
DATE: OCTOBER 17, 1997 - PAGE 3

### Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The Laboratory Control Standard control limit recoveries for the soil matrix were incorrectly reported on the Form 7. The laboratory was contacted at the Form 7 was resubmitted.

The CRDL %R for beryllium was > 110% quality control limit. However, no validation actions were warranted as all results were qualified as blank contamination.

A comparison of field duplicate pair, RN3SD0030101 / RN3DUP017, is included in Appendix C. However, no validation actions are required as per Region III guidance.

### Executive Summary

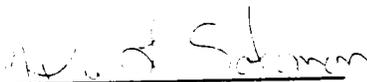
**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

**Other Factors Affecting Data Quality:** The MS %Rs for antimony and selenium were outside the 75-125% quality control limit. Laboratory duplicate imprecision was noted for copper. The ICP Serial Dilution %D for zinc was greater than the 10% quality control limit.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

### Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of MS %R.
- UL - Nondetected result is considered biased low as a result of CRDL %R and/or MS %R.
- J - Positive result is considered estimated as a result of laboratory duplicate imprecision, MS %R and/or ICP Serial Dilution %D.



MEMO TO: P. FRANK  
DATE: OCTOBER 17, 1997 - PAGE 2

C-49-10-7-126

Executive Summary

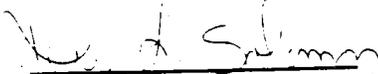
**Laboratory Performance:** None.

**Other Factors Affecting Data Quality:** None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

U - Value is a nondetect as reported by the laboratory.



MEMO TO: P. FRANK  
DATE: OCTOBER 17, 1997 - PAGE 2

C-49-10-7-126

Executive Summary

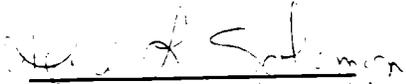
Laboratory Performance: None.

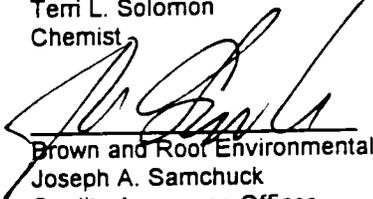
Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

U - Value is a nondetect as reported by the laboratory.



MEMO TO: P. FRANK  
 DATE: OCTOBER 22, 1997 - PAGE 2

### Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recovery (%R) for cadmium was above the 110% quality control limit. Positive results <2X CRDL reported for the aforementioned analyte were qualified as biased high, "K".
- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>
beryllium	0.5 ug/L	0.25 mg/kg
copper <sup>(1)</sup>	1.062 mg/kg	5.31 mg/kg
silver	1.6 ug/L	0.80 mg/kg
thallium	7.0 ug/L	3.5 mg/kg
tin	10.0 ug/L	5.0 mg/kg
zinc <sup>(1)</sup>	1.026 mg/kg	5.13 mg/kg

Samples Affected: All

<sup>(1)</sup> Maximum concentration present in a preparation blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot, percent moisture and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for copper, silver, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects.

- The Matrix Spike (MS) Percent Recovery (%R) for antimony was < 30% quality control limit. Positive results reported for the aforementioned analyte were qualified as biased low, "L".
- The MS %R for tin was < 75% quality control limit. Positive results reported for the aforementioned analyte were qualified as biased low, "L".

### Notes

Incomplete sample ids were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %Rs for copper and lead were outside the quality control limits. However, no validation actions were warranted as all results were > 2X CRDL.

### Executive Summary

**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

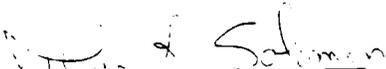
**Other Factors Affecting Data Quality:** The MS %R for antimony was < 30% quality control limit. The MS %R for tin was < 75% quality control limit.

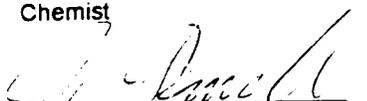
MEMO TO: P. FRANK  
DATE: OCTOBER 22, 1997 - PAGE 3

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of MS %R.
- K - Positive result is considered biased high as a result of CRDL %R.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-163

TO: P. FRANK

DATE: OCTOBER 22, 1997

FROM: PAMELA A. KORYAK

CC: DATA VALIDATION FILE

SUBJECT: ORGANIC DATA VALIDATION - EXPLOSIVE ORGANIC COMPOUNDS  
CTO 287 NSWC INDIAN HEAD, MARYLAND  
SDG 9706217

SAMPLES: 13/Soil/

RN6SS0100101	RN6SS0110101	RN6SB0110101
RN6SB0120101	RN6SS0120101	RN6SS0130101
RN6SB0130101	RN6SS0140101	RN6SB0140101
RN6SS0150101	RN6SB0150101	RN6DUP002
RN6DUP003		

1/Aqueous

RN6RB001062597

## Overview

The sample set for CTO 287, NSWC Indian Head, SDG 9706217 consists of thirteen (13) solid environmental samples and one rinse blank (-RB). The samples were analyzed for target compound list explosive organic compounds via SW-846 Method 8330. Sample RN6SB0120101 was designated as the Matrix Spike/Matrix Spike Duplicate sample by the laboratory. Two field duplicate pairs (samples RN6DUP003/RN6SS0140101 and RN6DUP002/RN6SB0110101) were included in this SDG.

## Summary

The samples were collected by Brown and Root Environmental on June 25th, 1997 and successfully analyzed by GP Environmental Services, Inc. under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Analyses were conducted using the methods prescribed in SW-846 Method 8330 and reported using a Contract Laboratory Program (CLP)-like format. The data contained in the SDG were validated with regard to data completeness, holding times until extraction, calibration data, laboratory control blank results, surrogate spike recoveries, laboratory control sample analyses, matrix spike/matrix spike duplicate analyses, and compound identification and quantitation.

Areas of concern with respect to data quality are listed below.

## Major Problems

- None.

MEMO TO: P. FRANK  
DATE: OCTOBER 22, 1997

Minor Problems

• None.

Notes

The continuing calibration Percent Difference (%D) for tetryl exceeded the 15% validation quality control criteria. No samples were affected.

A ten-fold dilution was performed on sample RN6SS0150101 due to the high concentration of 2,4,6-trinitrotoluene.

No additional problems were noted.

Executive summary

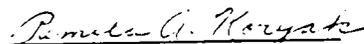
**Laboratory Performance:** The continuing calibration %D for tetryl was greater than 15%.

**Other Factors Affecting Data Quality:** No problems were noted.

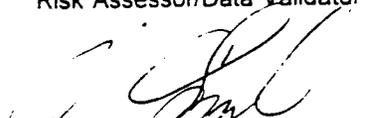
The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Validation" (9/94), as amended by EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

  
Brown and Root Environmental

Joseph Samchuck  
Data Validation Quality Assurance Officer

C-49-08-7-163

**MEMO TO:** P. FRANK  
**DATE:** OCTOBER 22, 1997

**Attachments:**

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Summary:**

U - Nondetect as reported by the laboratory.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-160

TO: P. FRANK

DATE: OCTOBER 22, 1997

FROM: PAMELA A. KORYAK

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - VOA/SVOA ORGANIC COMPOUNDS  
CTO 287, NSWC INDIAN HEAD, MARYLAND  
SDG 9706217

SAMPLES: 13/Soil/VOA

RN6SS0100101  
RN6SB0120101  
RN6SB0130101  
RN6SS0150101  
RN6DUP003

RN6SS0110101  
RN60SS120101  
RN6SS0140101  
RN6SB0150101

RN6SB0110101  
RN6SS0130101  
RN6SB0140101  
RN6DUP002

2/Aqueous/VOA

RN6TB001062597

RN6RB001062597

13/Soil/SVOA

RN6SS0100101  
RN6SB0120101  
RN6SB0130101  
RN6SS0150101  
RN6DUP003

RN6SS0110101  
RN60SS120101  
RN6SS0140101  
RN6SB0150101

RN6SB0110101  
RN6SS0130101  
RN6SB0140101  
RN6DUP002

1/Aqueous/SVOA

RN6RB001062597

## Overview

The sample set for the CTO 287 NSWC Indian Head Naval Base site, SDG 9706217, consists of thirteen (13) aqueous environmental samples, one (1) rinsate blank and one (1) trip blank. The samples were analyzed for Target Compound List (TCL) volatile and semivolatile organic compounds. The field crew designated a sample (RN6SB0120101) for Matrix Spike/Matrix Spike Duplicate analyses. Two field duplicate pairs (RN6DUP002/RN6SB0110101 and RN6DUP003/RN6SS0140101) were included in this SDG.

The samples were collected by Brown and Root Environmental on June 25th, 1997 and analyzed by GP GP Environmental Services, Inc. under Naval Facilities Engineering Service Center (NFESC) Quality

Assurance/Quality Control (QA/QC) criteria. All volatile organic compound analyses were conducted using USEPA method 8260A. Semivolatile organic and select Appendix IX compounds were analyzed using USEPA method 8270B.

### Summary

All compounds were successfully analyzed, with the exception of those results considered unreliable, (UR). The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standards performance, tentatively identified compounds, compound identification and compound quantitation. Areas of concern with respect to data quality are listed below.

### Major Problems

- The initial and continuing calibration Relative Response Factors (RRFs) for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, and 2-butanone were less than 0.050 in some standards. Failure to meet this quality control criterion indicates that the laboratory's instruments could not achieve satisfactory sensitivity for these compounds therefore, the associated nondetected results for these compounds are severely compromised. Nondetected results reported for these compounds in the affected samples are considered to be unreliable and are rejected, (UR). These results are biased very low.
- The continuing calibration Relative Response Factors (RRFs) for 4-nitroquinoline-N-oxide, famphur, and kepone were less than 0.050. Failure to meet this quality control criterion indicates that the laboratory's instruments could not achieve satisfactory sensitivity for these compounds therefore, the associated nondetected results for these compounds are severely compromised. Nondetected results reported for these compounds in the affected samples are considered to be unreliable and are rejected, (UR). These results are biased very low.

### Minor Problems

- The 7 day holding time until extraction was not met for the semivolatile fraction analyses for all of the environmental soil samples. The positive and nondetected results reported for all target compounds were qualified as estimated (J) and (UJ), respectively.
- The continuing calibration Percent Difference (%D) for a,a-dimethylphenylamine, famphur, and 4-nitroquinoline-N-oxide exceeded the 50% validation quality control criteria. This noncompliance indicates a lack of instrumental consistency, and could potentially compromise the quantitation of results. Only undetected results were reported for these compounds in the affected samples and these compounds were qualified as estimated, UJ.

MEMO TO: P. FRANK  
 DATE: OCTOBER 22, 1997 - PAGE 3

- The following table summarizes the maximum concentration of volatile and semivolatile compounds detected in the low level laboratory method and field quality control blanks analyzed in this SDG:

<u>Compound</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Methylene chloride	4 $\mu\text{g/L}$	40 $\mu\text{g/L}$ ; 40 $\mu\text{g/kg}$
Acetone	270 $\mu\text{g/L}$	2700 $\mu\text{g/L}$ ; 2700 $\mu\text{g/kg}$
Di-n-butylphthalate	2 $\mu\text{g/L}$	660 $\mu\text{g/kg}$

Samples Affected: All low level samples.

The aliquots used for analysis, percent solids, and dilution factors were considered during the application of the action levels. Positive results for methylene chloride, acetone, and di-n-butylphthalate that were reported in samples at concentrations less than the validation action level were considered false positives and were qualified, (B). It should be noted that field quality control blanks are not qualified based on field quality control blank contamination.

- The semivolatile internal standard areas for chrysene-d12 and perylene-d12 were below the quality control limits for samples RN6SB0130101, RN6SB0140101, and RN6SB0150101. Only nondetected results were reported and these results were qualified as estimated, UJ.

#### Notes

The continuing calibration Percent Difference (%D) for bromomethane, acrolein, propionitrile, and trans-1,4-dichloro-2-butene exceeded the 25% validation quality control criteria. This noncompliance indicates a lack of instrumental consistency, and could potentially compromise the quantitation of results. Only undetected results were reported for these compounds in the affected samples and no action was taken.

The continuing calibration Percent Differences (%Ds) for several semivolatile compounds exceeded the 25% validation quality control criteria. This noncompliance indicates a lack of instrumental consistency, and could potentially compromise the quantitation of results. Only undetected results were reported for these compounds in the affected samples and therefore no action was taken.

According to the case narrative, sample RN6TB001062597 was reanalyzed at a two-fold dilution due to acetone exceeding the calibration level. The volatile compound chloroprene was not analyzed or reported. Several semivolatile compounds were not calibrated for by the laboratory, namely, hexachlorophene and dinoseb. Additionally, several compounds were calibrated for but were not reported, namely, thionazin, disulfoton, ethyl and methyl parathion.

MEMO TO: P. FRANK  
DATE: OCTOBER 22, 1997 - PAGE 4

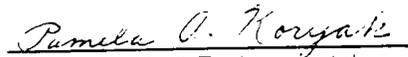
Executive Summary

**Laboratory Performance:** The holding time for the environmental soil samples exceeded 7 days. The continuing calibration %Ds for a,a-dimethylphenylamine, famphur, and kepone exceeded the 50% validation quality control criteria. The continuing calibration %Ds for bromomethane, acrolein, propionitrile, and trans-1,4-dichloro-2-butene exceeded the 25% quality control limit. The initial and continuing calibration Relative Response Factors (RRFs) for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, and 2-butanone were less than 0.050. The continuing calibration Relative Response Factors (RRFs) for 4-nitroquinoline-N-oxide, famphur, and kepone were less than 0.050. Two semivolatle standard areas were below the quality control limits for RN6SB0130101, RN6SB0140101, and RN6SB0150101.

**Other Factors Affecting Data Quality:** Methylene chloride, acetone and di-n-butylphthalate were detected in the field quality control blanks and method blanks.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Review", as amended for use within EPA Region III, and the NFESC guidelines entitled "Navy Installation Restoration Program Laboratory Quality Assurance Guide"(February, 1996).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/ Data Validator

  
Brown and Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

**MEMO TO: P. FRANK**  
**DATE: OCTOBER 22, 1997 - PAGE 5**

**Attachments:**

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**MEMO TO: P. FRANK**  
**DATE: OCTOBER 22, 1997 - PAGE 5**

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-177

TO: PAUL FRANK

DATE: OCTOBER 23, 1997

FROM: SEAN NIXON

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - EXPLOSIVES  
CTO 287 NSWC INDIAN HEAD, INDIAN HEAD MARYLAND, SDG 9706216

SAMPLES: 20/Aqueous

RN6-DUP001	RN6SB0010101	RN6SB0020101	RN6SB0030101
RN6SB0040101	RN6SB0050101	RN6SB0060101	RN7SB0070101
RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SS0010101
RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101
RN6SS0060101	RN6SS0070101	RN6SS0080101	RN6SS0090101

## Overview

The sample set for CTO 287 Naval Submarine Warfare Center (NSWC) Indian Head, Maryland, SDG 9706216, consists of twenty (20) solid environmental samples. The field crew did not specify a sample for Matrix Spike/ Matrix Spike Duplicate analysis in this SDG. The field duplicate pair, samples RN6SB0060101/ RN6DUP001 was included in this SDG.

All of the samples were analyzed for explosives. The samples were collected by Brown and Root Environmental on June 25, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The explosives analyses were conducted according to SW-846 method 8330.

## Summary

All analytes were successfully analyzed. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification, detection limits.

Areas of concern with respect to data quality are listed below.

## Major Problems

- None.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 23, 1997, PAGE 2

C-49-08-7-177

Minor Problems

- None

Notes

The solid LCS for the explosives analysis had a Percent Recovery (%R) greater than the quality control limit for nitrobenzene. However, no validation action was taken for LCS noncompliance.

The MS/MSD analysis of sample RN6SS0010101 yielded %Rs greater than the quality control limit for 2-nitrotoluene and 3-nitrotoluene. However, since only nondetected results were reported for the samples, no validation action was taken.

Although Region III states that data validation is not taken for field duplicate analyses. A field duplicate analysis comparison is presented in Appendix C.

Executive Summary

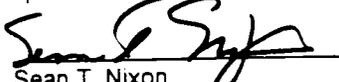
**Laboratory Performance:** No issues.

**Other Factors Affecting Data Quality:** No issues.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Sean T. Nixon  
Chemist/Data Validator  
Brown and Root Environmental

  
Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

U - Value is a nondetected result as reported by the laboratory.



MEMO TO: P. FRANK  
DATE: OCTOBER 23, 1997 - PAGE 2

C-49-08-7-191

Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recovery (%R) for cadmium was above the 110% quality control limit. Positive results <2X CRDL reported for the aforementioned analyte were qualified as biased high, "K".
- The CRDL %R for lead was below the 90% quality control limit. Positive results <2X CRDL reported for the aforementioned analyte were qualified as biased low, "L".
- The following contaminants were detected in the laboratory method/preparation/rinsate blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>	<u>Action Level-Aqueous</u>
barium <sup>(2)</sup>	1.9 ug/L	0.95 mg/kg	NA
beryllium	0.5 ug/L	0.25 mg/kg	2.5 ug/L
copper	10.6 ug/L	NA	53.0 ug/L
copper <sup>(1)</sup>	1.043 mg/kg	5.215 mg/kg	NA
lead <sup>(2)</sup>	1.5 ug/L	0.75 mg/kg	NA
silver	1.6 ug/L	0.80 mg/kg	NA
thallium	7.0 ug/L	3.5 mg/kg	35.0 ug/L
tin	10.0 ug/L	5.0 mg/kg	NA
zinc <sup>(2)</sup>	9.8 ug/L	4.9 mg/kg	NA

Samples Affected: All

- (1) Maximum concentration present in a soil preparation blank.  
(2) Maximum concentration present in a rinsate blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for beryllium, copper, silver, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects. It should be noted that field quality control blanks are not qualified for field blank contamination.

- The Matrix Spike (MS) Percent Recoveries (%Rs) for antimony and selenium affecting the soil samples were <75% quality control limit. Positive results and nondetects reported for the aforementioned analytes were qualified as biased low, "L" and "UL", respectively.
- The MS %R for lead affecting the soil samples was > 125% quality control limit. Positive results reported for the aforementioned analyte were qualified as biased high, "K".

Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %R for copper was above the 110% quality control limit. However, no validation actions were warranted as all results were either > 2X CRDL or were qualified as blank contamination.

A comparison of field duplicate pairs RN6SB0110101 / RN6DUP002 and RN6SS0140101 / RN6DUP003 is contained in Appendix C. However, no validation actions are required as per Region III guidance.

MEMO TO: P. FRANK  
DATE: OCTOBER 23, 1997 - PAGE 3

C-49-08-7-191

Executive Summary

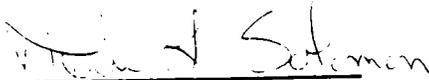
**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

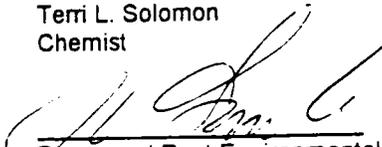
**Other Factors Affecting Data Quality:** Several analytes were present in the rinsate blank. The MS %Rs for antimony and selenium were < 75% quality control limit. The MS %R for lead was > 125% quality control limit.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of CRDL %R and/or MS %R.
- UL - Nondetected result is considered biased low as a result of MS %R.
- K - Positive result is considered biased high as a result of CRDL %R and/or MS %R.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-113

TO: PAUL FRANK

DATE: OCTOBER 23, 1997

FROM: SEAN NIXON

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - APPENDIX IX AND TCL VOAS AND SVOAS  
CTO 287 INDIAN HEAD, MARYLAND  
SDG - 9706216

SAMPLES: 20/Solid

RN6DUP001	RN6SB0010101	RN6SB0020101	RN6SB0030101
RN6SB0040101	RN6SB0050101	RN6SB0060101	RN6SB0070101
RN6SB0080101	RN6SB0090101	RN6SB0100101	RN6SS0010101
RN6SS0020101	RN6SS0030101	RN6SS0040101	RN6SS0050101
RN6SS0060101	RN6SS0070101	RN6SS0080101	RN6SS0090101

## Overview

The sample set for CTO 287 Indian Head, Maryland, SDG 9706216, consists of twenty (20) solid environmental samples. The field duplicate pair, samples RN6SB0060101/ RN6DUP001, was included in this SDG. The field crew did not specify a sample for Matrix Spike/ Matrix Spike Duplicate analysis in this SDG.

All of the samples were analyzed for Appendix IX and Target Compound List (TCL) volatiles and semivolatiles. The samples were collected by Brown and Root Environmental on June 25, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The VOAs and SVOAs analyses were conducted according to SW-846 Methods 8260A and 8270 respectively.

## Summary

All analytes were successfully analyzed with the exception of those rejected. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, GCMS tuning, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification, detection limits.

Areas of concern with respect to data quality are listed below.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 23, 1997 PAGE 2

C-49-09-7-113

Major Problems

- A volatile initial calibration, affecting samples RN6DUP001, RN6SB0010101, RN6SB0020101, RN6SB0030101, RN6SB0040101, RN6SB0050101, RN6SB0060101, RN6SB0070101, RN6SS0010101, RN6SS0020101, RN6SS0030101, RN6SS0040101, RN6SS0050101, RN6SS0060101, and RN6SS0070101, contained Relative Response Factors (RRFs) for acrolein (0.044) and 2-butanone (0.028) that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein and 2-butanone in the aforementioned samples were rejected, (UR).
- A volatile initial calibration, affecting samples, RN6SB0080101, RN6SB0090101, RN6SB0100101, RN6SS0080101, and RN6SS0090101, contained RRFs for acrolein and 2-butanone that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein and 2-butanone in the aforementioned samples were rejected, (UR).
- A volatile continuing calibration, affecting samples RN6DUP001, RN6SB0010101, RN6SB0020101, RN6SB0030101, RN6SB0040101, RN6SB0050101, RN6SB0060101, RN6SB0070101, RN6SS0010101, RN6SS0020101, RN6SS0030101, RN6SS0040101, RN6SS0050101, RN6SS0060101, and RN6SS0070101, contained RRFs for acrolein and 2-butanone that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein and 2-butanone in the aforementioned samples were rejected, (UR).
- A volatile continuing calibration, affecting samples RN6SB0080101, RN6SB0090101, RN6SB0100101, RN6SS0080101, and RN6SS0090101, contained RRFs for acrolein and 2-butanone that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for acrolein and 2-butanone in the aforementioned samples were rejected, (UR).
- A semivolatile initial calibration, affecting all of the samples except RN6SS0040101 and RN6SS00501, contained RRFs for 4-nitroquinoline-n-oxide, famphur, and kepone below the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for the aforementioned compounds in the affected samples were rejected, (UR).
- A semivolatile continuing calibration, affecting samples RN6SB0010101, RN6SB0020101, RN6SB0030101, RN6SB0040101, RN6SS0010101, RN6SS0020101, and RN6SS0030101, contained RRFs for 4-nitroquinoline-n-oxide, famphur, and kepone below the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for the aforementioned compounds in the affected samples were rejected, (UR).
- A semivolatile continuing calibration, affecting samples RN6SB0050101, RN6SB0060101, RN6SB0070101, RN6SB0080101, RN6SB0090101, RN6SS0060101, RN6DUP001, and RN6SS0080101, contained RRFs for 4-nitroquinoline-n-oxide, famphur, methyl pyrilene, and kepone below the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for the aforementioned compounds in the affected samples were rejected, (UR).
- A semivolatile continuing calibration, affecting samples RN6SS0070101, RN6SS0090101, and RN6SB0100101, contained RRFs for 4-nitroquinoline-n-oxide, famphur, and kepone below the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for the aforementioned compounds in the affected samples were rejected, (UR).

MEMO TO: PAUL FRANK  
DATE: OCTOBER 23, 1997 PAGE 3

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- A semivolatile continuing calibration, affecting samples RN6SS0040101 and RN6SS0050101, contained RRFs for 4-nitroquinoline-n-oxide, famphur, aramite, and kepone below the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for the aforementioned compounds in the affected samples were rejected, (UR).

#### Minor Problems

- A volatile continuing calibration, affecting samples RN6SB0080101, RN6SB0090101, RN6SB0100101, RN6SS0080101, and RN6SS0090101, contained a Percent Difference (%D) for acetone that was greater than the 25% quality control limit. This noncompliance affects positive results only. All of the affected samples, except RN6SS0090101, reported positive results for acetone that were qualified for blank contamination. The positive result for acetone in sample RN6SS0090101 that was not qualified for blank contamination was qualified as estimated, (J).
- The semivolatile sample extractions for all of the samples occurred outside of the seven (7) day holding time. The positive and nondetected results reported for all of the samples were qualified as estimated, (J) and (UJ) respectively.
- A semivolatile initial calibration, affecting all of the samples except RN6SS0040101 and RN6SS00501, contained a Percent Relative Standard Deviation (%RSD) for o-tolidine that was greater than the 50% quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for o-tolidine in the affected samples were qualified as estimated, (UJ).
- A semivolatile continuing calibration, affecting samples RN6SS0070101, RN6SS0090101, and RN6SB0100101, contained %RSDs for 2,4-dinitrophenol, aramite, and 2-acetylaminofluorene that were greater than the 50% quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for 2,4-dinitrophenol, aramite, and 2-acetylaminofluorene in the affected samples were qualified as estimated, (UJ).
- A semivolatile initial calibration, affecting all of the samples except RN6SS0040101 and RN6SS0050101, contained a Percent Relative Standard Deviation (%RSD) for 1,2-diphenylhydrazine that was greater than the 50% quality control limit. This noncompliance affects positive and nondetected results. The nondetected results for 1,2-diphenylhydrazine in the affected samples were qualified as estimated, (UJ).
- The semivolatile analysis of samples RN6SS0010101, RN6SB0040101, RN6SS0060101, RN6SB0090101, and RN6SS0090101 reported internal standard areas for chrysene-d12 and perylene-d12 less than the 50% quality control limit. The samples were unsuccessfully reanalyzed in regard to internal standard noncompliance. The original analyses were used for data validation. The positive and nondetected results associated with these noncompliant internal standards were qualified as estimated, (J) and (UJ) respectively, in the aforementioned samples.
- The semivolatile analysis of samples RN6SS0020101, RN6SB0020101, RN6SB0030101, RN6SS0030101, RN6SB0050101, RN6SB0060101, RN6SB0070101, and RN6SS0080101 reported internal standard areas for perylene-d12 less than the 50% quality control limit. The samples were unsuccessfully reanalyzed in regard to internal standard noncompliance. The original analyses were used for data validation. The positive and nondetected results associated with the noncompliant

MEMO TO: PAUL FRANK  
DATE: OCTOBER 23, 1997 PAGE 4

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- The semivolatile analysis of sample RN6SB0100101 reported internal standard areas for phenanthrene-d10, chrysene-d12, and perylene-d12 less than the 50% quality control limit. The samples were unsuccessfully reanalyzed in regard to internal standard noncompliance. The original analyses were used for data validation. The positive and nondetected results associated with these noncompliant internal standards were qualified as estimated, (J) and (UJ) respectively, in the aforementioned sample.
- The following contaminants were detected in the laboratory method blank at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
Acetone	8 ug/kg	80 ug/kg
Methylene Chloride	1 ug/kg	10 ug/kg

Samples Affected: All

Sample aliquot, percent solid, and dilution factors were taken into consideration when applying all action levels. Positive results reported for acetone and methylene chloride below the respective action levels were considered false positives and qualified, (B). It should be noted that field quality control blanks were not qualified for field quality control blank contamination.

#### Notes

It should be noted that the Appendix IX volatile compounds 1,4-dioxane and ethyl methacrylate were not reported in the volatile fraction, but instead were reported in the semivolatile fraction.

It should be noted that the Appendix IX volatile compound chloropropene was not analyzed in this SDG.

It should be noted that the Appendix IX semivolatile compounds Thionazin, Disulfoton, ethyl Parathion, and methyl Parathion were not reported on either the Form Is or the electronic data, but were calibrated in the semivolatile analyses. These compounds were not included in the data review.

It should be noted that the Appendix IX semivolatile compounds Dinoseb, hexachlorophene, and o,o-diethyl-o-2-pyrazinyl were neither calibrated nor reported in the semivolatile analyses.

Validation was not taken for field duplicate precision, however a field duplicate comparison is included in Appendix C.

Positive results reported below the Contract Required Quantitation Limits have been qualified as estimated, (J).

Several semivolatile compounds in the initial calibration contained %RSDs greater than the 30% quality control limit, but less than the 50% quality control limit. As per Region III guidance, since only nondetected results were reported for these compounds, no validation action was taken.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 23, 1997 PAGE 5

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Several semivolatile compounds in the continuing calibrations contained %RSDs greater than the 25% quality control limit, but less than the 50% quality control limit. As per Region III guidance, since only nondetected results were reported for these compounds, no validation action was taken.

#### Executive Summary

**Laboratory Performance:** The holding time for semivolatile extraction was exceeded. Blank contamination was noted for acetone and methylene chloride. Nondetected results for acrolein and 2-butanone were rejected on account of initial and continuing calibration noncompliances. Nondetected results for 4-nitroquinoline-n-oxide, aramite, methyl pyriline, famphur, and kepone were rejected due to initial and continuing calibration noncompliances.

**Other Factors Affecting Data Quality:** Low internal standard areas were reported for several internal standards in several samples.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Sean T. Nixon  
Chemist/Data Validator  
Brown and Root Environmental

  
Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

#### Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected result as reported by the laboratory.
- UJ - Nondetected result is considered estimated on account of initial/ continuing calibration noncompliances, or exceedance of holding time.
- UR - Nondetected result is rejected on account of poor Relative Response Factor.
- J - Positive result is considered estimated on account of initial/ continuing calibration noncompliances, or the exceedance of holding time, result was below the CRQL.
- B - Positive result is considered a false positive due to blank contamination.



Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recovery (%R) for arsenic was below the 90% quality control limit. Positive results <2X CRDL and nondetects reported for the aforementioned analyte were qualified as biased low, "L" and "UL", respectively.
- The CRDL %R for selenium was above the 110% quality control limit. Positive results <2X CRDL reported for the aforementioned analyte were qualified as estimated, "J", as a result of conflicting noncompliances.
- The following contaminants were detected in the laboratory method/preparation/rinsate blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Soil</u>	<u>Action Level-Aqueous</u>
beryllium	0.3 ug/L	0.15 mg/kg	1.5 ug/L
lead <sup>(2)</sup>	1.5 ug/L	NA	7.5 ug/L
lead <sup>(3)</sup>	1.6 ug/L	0.8 mg/kg	NA
silver	0.8 ug/L	0.4 mg/kg	4.0 ug/L
thallium	5.9 ug/L	2.95 mg/kg	29.5 ug/L
tin	2.5 ug/L	NA	12.5 ug/L
tin <sup>(1)</sup>	1.075 mg/kg	5.375 mg/kg	NA
zinc <sup>(1)</sup>	0.769 mg/kg	3.845 mg/kg	NA

Samples Affected: All

- (1) Maximum concentration present in a soil preparation blank.
- (2) Maximum concentration present in an aqueous preparation blank.
- (3) Maximum concentration present in a rinsate blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size, percent solids and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for beryllium, lead, silver, tin and thallium have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects. It should be noted that field quality control blanks are not qualified for field blank contamination.

- The Matrix Spike (MS) Percent Recovery (%R) for antimony affecting the soil matrix was <75% quality control limit. Positive results and nondetects reported for the aforementioned analyte in the affected samples were qualified as biased low, "L" and "UL", respectively.
- The MS %R for selenium affecting the soil matrix was < 75% quality control limit. Positive results reported for the aforementioned analyte in the affected samples were qualified as estimated, "J", as a result of conflicting noncompliances.
- The ICP Serial Dilution Percent Differences (%Ds) for barium and chromium affecting the soil matrix were greater than the 10% quality control limit. Positive results reported for the aforementioned analyte in the affected samples were qualified as estimated, "J". The direction of bias could not be determined.

MEMO TO: P. FRANK  
DATE: OCTOBER 24, 1997 - PAGE 3

### Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The CRDL %R for lead was above the 110% quality control limit. However, no validation actions were warranted as all results were either > 2X CRDL or were qualified as blank contamination.

A comparison of field duplicate pairs RPLSD0020001 / RPLDUP004 and RPLSW0020001 / RPLDUP001 is contained in Appendix C. However, no validation actions are required as per Region III guidance.

### Executive Summary

**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

**Other Factors Affecting Data Quality:** Several analytes were present in the rinsate blank. The MS %Rs for antimony and selenium were < 75% quality control limit. The ICP Serial Dilution %Ds for barium and chromium were greater than the 10% quality control limit.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

### Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- L - Positive result is considered biased low as a result of CRDL %R and/or MS %R.
- UL - Nondetected result is considered biased low as a result of CRDL %R and/or MS %R.
- J - Positive result is considered estimated as a result of CRDL %R, MS %R and/or ICP Serial Dilution %D.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-218

TO: MR. PAUL FRANK

DATE: OCTOBER 24, 1997

FROM: BONNI J. SMATHERS

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION- EXPLOSIVES  
CTO 287 NSWC, INDIAN HEAD  
9706232

SAMPLES: 4/Soil/

RN6SD0010001  
RN6SD0040001

RN6SD0020001

RN6SD0030001

4/Aqueous/

RN6SW0010001  
RN6SW0040001

RN6SW0020001

RN6SW0030001

## OVERVIEW

The sample set for CTO 0287, NSWC, Indian Head, 9706232, consists of four (4) environmental soil samples and four (4) aqueous samples that were analyzed for explosive compounds. Sample RN6SD0030001 was designated for Matrix Spike/Matrix Spike Duplicate analysis.

The samples were collected by Brown and Root Environmental on June 26, 1997 and analyzed by G.P. Environmental Services, Inc. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria, using Test Methods for Evaluating Solid Wastes, SW-846 Method 8330 analytical and reporting protocols.

## Summary

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standards performance, tentatively identified compounds, compound identification and compound quantitation. Areas of concern with respect to data quality are listed below.

## Explosives

Continuing calibration Percent Differences (%Ds) greater than 15% were reported for tetryl. This noncompliance affects positive and nondetected results. Therefore, action was taken to qualify nondetected results as estimated, (UJ), in the affected samples.

A low surrogate Percent Recovery (%R) was reported for 4-nitroaniline in sample RN6SW0010001. As a result of this noncompliance, the laboratory reanalyzed this sample. No validation action was taken since the reanalyses yielded results within acceptable limits.

**MEMO TO: MR. PAUL FRANK**  
**DATE: OCTOBER 24, 1997 - PAGE 2**

The % Moisture was inaccurately reported on the Form 1 Data Sheets for all samples. The data reviewer amended these Form 1 Data Sheets.

No other problems were noted with this data package.

**EXECUTIVE SUMMARY**

**Laboratory Performance Issues:** Continuing calibration Percent Differences (%Ds) greater than 15% were reported for the compound tetryl. Poor surrogate recovery was reported for 4-nitroaniline in sample RN6SW0010001. No other problems were noted.

**Other Factors Affecting Data Quality:** None.

MEMO TO: MR. PAUL FRANK  
DATE: OCTOBER 24, 1997 - PAGE 3

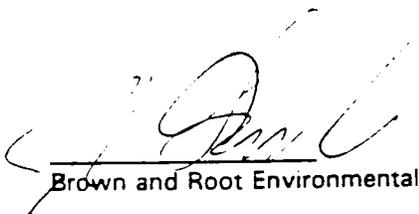
The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (2/94), and the NFESC guidelines "Navy Installation Restoration Program Laboratory Quality Assurance Guide" (February, 1996). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."



Brown and Root Environmental

Bonni J. Smathers  
Industrial Hygienist/Data Validator



Brown and Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation



# Brown & Root Environmental

C-49-08-7-192

INTERNAL CORRESPONDENCE

TO: P. FRANK

DATE: OCTOBER 24, 1997

FROM: PAMELA A. KORYAK

CC: DATA VALIDATION FILE

SUBJECT: ORGANIC DATA VALIDATION - EXPLOSIVE ORGANIC COMPOUNDS  
CTO 287 NSWC INDIAN HEAD, MARYLAND  
SDG 9707039

SAMPLES: 10/Soil/

RN3SB0010101  
RN3SB0020201  
RN3SS0010101  
RN3SS0040101

RN3SB0010201  
RN3SB0030101  
RN3SS0020101

RN3SB0020101  
RN3SB0030201  
RN3SS0030101

## Overview

The sample set for CTO 287, NSWC Indian Head, SDG 9707039 consists of ten (10) solid environmental samples. The samples were analyzed for target compound list explosive organic compounds via SW-846 Method 8330. Sample RN3SS0040101 was designated as the Matrix Spike/Matrix Spike Duplicate sample by the laboratory.

## Summary

The samples were collected by Brown and Root Environmental on July 8th, 1997 and successfully analyzed by GP Environmental Services, Inc. under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Analyses were conducted using the methods prescribed in SW-846 Method 8330 and reported using a Contract Laboratory Program (CLP)-like format. The data contained in the SDG were validated with regard to data completeness, holding times until extraction, calibration data, laboratory control blank results, surrogate spike recoveries, laboratory control sample analyses, matrix spike/matrix spike duplicate analyses, and compound identification and quantitation.

Areas of concern with respect to data quality are listed below

## Major Problems

- None.

## Minor Problems

- None.

## Notes

No problems.

## Executive summary

**Laboratory Performance:** No problems were noted.

MEMO TO: P. FRANK  
DATE: OCTOBER 24, 1997

**Other Factors Affecting Data Quality:** No problems were noted.

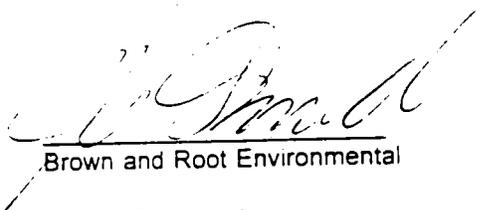
The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Validation" (2/94), and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

  
Brown and Root Environmental

Joseph Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Summary:**

U - Nondetect as reported by the laboratory.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-082

TO: P. FRANK

DATE: OCTOBER 24, 1997

FROM: PAMELA A. KORYAK

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION-VOLATILE AND SEMIVOLATILE ORGANICS  
CTO 287, NSWC INDIAN HEAD, MARYLAND  
SDG 9707039

SAMPLES: 10/Soil/VOA

RN3SS0010101	RN3SS0020101	RN3SB0020101
RN3SB0020201	RN3SB0010101	RN3SB0010201
RN3SS0030101	RN3SB0030101	RN3SS0040101
RN3SB0030201		

1/Aqueous/VOA

RN3TB004070897

10/Soil/SVOA

RN3SS0010101	RN3SS0020101	RN3SB0020101
RN3SB0020201	RN3SB0010101	RN3SB0010201
RN3SS0030101	RN3SB0030101	RN3SS0040101
RN3SB0030201		

## Overview

The sample set for the CTO 287 NSWC Indian Head Naval Base site, SDG 9707039, consists of ten (10) solid environmental samples and one (1) trip blank (designated-TB). The samples were analyzed for Target Compound List (TCL) volatile, semivolatile and select Appendix IX organic compounds. The laboratory designated two samples (RN3SB0030201 and RN3SS0010101) for Matrix Spike/Matrix Spike Duplicate analyses. No field duplicate pair was included in this SDG.

The samples were collected by Brown and Root Environmental on July 8th, 1997 and analyzed by GP Environmental under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using EPA methods 8260A and 8270B analytical protocols.

MEMO TO: P. FRANK  
DATE: OCTOBER 24, 1997- PAGE 2

### Summary

All compounds were successfully analyzed with the exception of those qualified as rejected, UR. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standards performance, tentatively identified compounds, compound identification and compound quantitation. Areas of concern with respect to data quality are listed below.

### Major Problems

- The initial and continuing calibration Relative Response Factors (RRFs) for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone, 4-nitroquinoline-N-oxide, and kepone were less than 0.05. Only nondetected results were reported for these compounds in the affected samples and these results were qualified as rejected, UR.
- The continuing calibration Relative Response Factor (RRF) for famphur was less than 0.05. Only nondetected results were reported for famphur in the affected sample and these results were qualified as rejected, UR.

### Minor Problems

- The initial calibration %RSDs for a,a-dimethylphenethylamine, famphur and o-tolidine were greater than 50%. Only nondetected results were reported for these compounds in the affected samples and the affected samples were qualified as estimated, (UJ). The direction of bias cannot be determined.
- An initial calibration Percent Relative Standard Deviation (%RSD) greater than the 30% quality control limit was reported for acetone. Only positive results are affected by this noncompliance. The positive results reported for acetone in the affected samples were qualified as estimated, J. The direction of bias cannot be determined.
- The continuing calibration %Ds for a,a-dimethylphenethylamine, trans-isosafrole, cis-isosafrole, famphur, kepone, and o-tolidine were greater than 50%. Positive and nondetected results are affected by this noncompliance. Only nondetected results were reported for acetonitrile in the affected samples and the affected samples were qualified as estimated, (UJ). The direction of bias cannot be determined.
- The continuing calibration %Ds for acetonitrile, acrolein, and allyl chloride were greater than 50%. Positive and nondetected results are affected by this noncompliance. Only nondetected results were reported for acetonitrile in the affected samples and the affected samples were qualified as estimated, (UJ). The direction of bias cannot be determined.
- The following table summarizes the maximum concentrations of volatile and semivolatile compounds detected in laboratory method and/or field quality control blanks analyzed in this SDG.

MEMO TO: P. FRANK  
 DATE: OCTOBER 24, 1997- PAGE 3

<u>Compound</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
methylene chloride*	4 µg/L	40 µg/kg
acetone*	8 µg/L	80 µg/kg

\*-Maximum concentration determined from field quality control blanks.

Percent moisture, sample aliquot, and dilution factors were considered during the application of all action levels. Positive results reported for these compounds in the associated samples at concentrations less than the respective action levels are considered false positives and are qualified, B. Note that field quality control blanks are not qualified based on field quality control blank contamination.

- The volatile internal standard areas for fluorobenzene, 1,4-difluorobenzene, and chlorobenzene-d5 were below the lower quality control limit for samples RN3SS0010101, RN3SB0030101, and RN3SB0030201. The positive results and nondetects associated with these internal standard areas have been qualified as estimated, J and UJ, respectively. The original analyses of these respective samples were used in the validation of this SDG, since the original detection limits are lower than those of the reanalyses. Although the original analyses were used, the acetone results were used from the medium level soil analyses. The direction of the bias cannot be determined.
- The semivolatiles internal standard areas for 1,4-dichlorobenzene-d4, naphthalene-d8, acenaphthene-d10, phenanthrene-d10, chrysene-d12, and perylene-d12 were below the lower quality control limit for sample RN3SS0020101. The positive and nondetected results associated with these internal standard areas have been qualified as estimated, J and UJ, respectively. The sample was reanalyzed and the internal standards were below the quality control limits. Therefore, the original sample was used in the validation of this SDG. The direction of the bias cannot be determined.
- The recovery of the volatile soil surrogate, 1,2-dichloroethane-d4, exceeded the upper quality control limit in samples RN3SS0010101, RN3SS0030101, and RN3SB0030101. Positive and nondetected results are affected by this noncompliance and all volatile organic compounds were qualified as estimated, J and UJ, respectively.
- The recovery of all six of the semivolatiles soil surrogates were greater than the upper quality control limits in sample RN3SS0020101 and the reanalysis of this sample. All positive base/neutral and acidic compounds were qualified as biased high, K.
- Positive results reported at concentrations below the CRQL are considered to be estimated and are qualified (J). The direction of the bias cannot be determined.

#### Notes

The initial calibration Percent Relative Standard Deviations (%RSDs) greater than the 30% quality control limit were reported for sulfotepp, kepone, and 2,4-dinitrophenol. Only nondetects were reported for these compounds in the affected samples. According to validation protocol, no action was taken.

**MEMO TO: P. FRANK**  
**DATE: OCTOBER 24, 1997- PAGE 4**

The continuing calibration %Ds for dichlorodifluoromethane, bromomethane, trichlorofluoromethane, allyl chloride, carbon tetrachloride, isobutyl alcohol, 4-methyl-2-pentanone, 2-hexanone, 1,2-dibromo-3-chloropropane, vinyl acetate, trans-1,4-dichloro-2-butene, chloroethane, acetone, acrolein, acetonitrile, acrylonitrile, 2-butanone, propionitrile, 1,2-dichloroethane, methacrylonitrile, and methyl methacrylate exceeded the 25% validation quality control criteria. Only nondetected results were reported for these compounds, therefore, no action was taken.

The continuing calibration %Ds for 2,4-dinitrophenol, 4-nitroaniline, 4,6-dinitro-2-methylphenol, 4-nitroquinoline-N-oxide, methapyrilene, kepone, sulfotepp, phorate, diallate, and dimethoate exceeded the 25% validation quality control criteria. Only nondetected results were reported for these compounds, therefore, no action was taken.

RN3SB0020201, RN3SB0030101, RN3SB0030201, RN3SS0010101, and RN3SS0020101 were reanalyzed due to acetone exceeding the instrument linear calibration range. The original analyses were chosen for validation with the exception of acetone. The dilution results for acetone were transposed over the original sample results and used in the validation of this SDG.

The aqueous laboratory check sample VLCS0711 displayed a high %R for chloroform, carbon tetrachloride, 1,2-dichloroethane, dibromochloromethane. According to validation protocol, no actions were taken based on these noncompliances.

The aqueous laboratory check sample VLCS0721 displayed a high %R for carbon tetrachloride. According to validation protocol, no actions were taken based on this noncompliance alone.

The soil laboratory check sample VLCS0711 displayed a high %R for vinyl chloride. According to validation protocol, no actions were taken based this noncompliance alone.

Several soil surrogate recoveries for the Matrix Spike and Matrix Spike Duplicate in the semivolatile fraction were greater than the quality control limit. The reanalyses of these samples yielded similar results.

The MS/MSD recoveries were high in the semivolatile fraction for several compounds and the RPD exceeded the quality control limit for phenol, 1,4-dichlorobenzene, N-nitroso-di-n-propylamine, 1,2,4-trichlorobenzene, 4-chloro-3-methylphenol, acenaphthene, 2,4-dinitrotoluene, pentachlorophenol, and pyrene.

#### Executive Summary

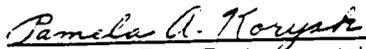
**Laboratory Performance:** The initial calibration %RSDs for a,a-dimethylphenethylamine, famphur, and kepone were greater than 50%. The initial calibration %RSD for acetone was greater than 30%. The initial and continuing calibration RRFs for several volatile and semivolatile compounds were less than 0.05. The continuing calibration %Ds for several volatile and semivolatile compounds were greater than 50%. Several volatile and semivolatile internal standard areas were below the quality control limits. The soil surrogate recoveries for the volatile and semivolatile fractions exceeded the upper quality control limits. Methylene chloride was detected in the method and field quality control blanks and acetone was detected in the field blank.

**Other Factors Affecting Data Quality:** Noncompliant MS/MSD %RPDs and %Rs were reported in the semivolatile fraction. Positive results reported at concentrations below the CRQL are considered to be estimated.

MEMO TO: P. FRANK  
DATE: OCTOBER 24, 1997- PAGE 5

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Review" (9/94), as amended for use within EPA Region III, and the NFESC guidelines entitled "Navy Installation Restoration Program Laboratory Quality Assurance Guide"(February, 1996).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

  
Brown and Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Key:**

- B - Value is considered a result of blank contamination.
- U - Value is a nondetect as reported by the laboratory.
- J - Estimate positive results for various technical reasons (i.e. internal standards, soil surrogate recovery, calibration noncompliances).
- K - Value is considered biased high due to soil semivolatile surrogate recoveries outside of quality control limits.
- UJ - Nondetected result is considered estimated due to technical reasons (i.e. internal standards, soil surrogate recovery, calibration noncompliances).
- UR - Nondetected result is considered rejected due to calibration noncompliances.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-219

TO: MR. PAUL FRANK

DATE: OCTOBER 24, 1997

FROM: BONNI J. SMATHERS

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION-VOA/SVOA  
CTO 287, NSWC, INDIAN HEAD  
9706232

SAMPLES:

11/Aqueous/

RN6SW0010001	RN6SW0020001	RN6SW0030001
RN6SW0040001	RN6TB002062897	RPLDUP001
RPLSW0010001	RPLSW0020001	RPLSW0030001
RPLRB003062797	RPLTB003062797	

8/Soil/

RN6SD0010001	RN6SD0020001	RN6SD0030001
RN6SD0040001	RPLDUP004	RPLSD0010001
RPLSD0020001	RPLSD0030001	

Overview

The sample set for the CTO 287 NSWC, Indian Head site, 9706232, consists of eleven (11) aqueous and eight (8) soil samples. The samples were analyzed for Appendix IX volatile and semivolatile organic compounds. Sample RN6SD0010001 was designated by the field crew for Matrix Spike/Matrix Spike Duplicate analyses. Two field duplicate pairs (Samples RPLDUP001/RPLSW0020001 and RPLDUP004/RPLSD0020001) were included in this SDG.

The samples were collected by Brown and Root Environmental on June 26th and 27th, 1997 and analyzed by G.P. Environmental Services, Inc. under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using SW-846 Methods 8260A and 8270B analytical and reporting protocols.

Summary

All compounds were successfully analyzed, with the exception of those results considered unreliable, (UR). The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standards performance, tentatively identified compounds, compound identification and compound quantitation. Areas of concern with respect to data quality are listed below.

MEMO TO: MR. PAUL FRANK  
 DATE: OCTOBER 24, 1997 - PAGE 2

#### Major Problems

- Initial and Continuing Calibration Relative Response Factors (RRFs) for acrolein, acetonitrile, acrylonitrile, isobutyl alcohol, propionitrile, and 2-butanone were less than 0.050. This noncompliance indicates a lack of instrument response. Positive and nondetected results are affected by this noncompliance. Therefore, nondetected results reported for these compounds in the affected samples were considered unreliable and were rejected, (UR).
- Initial and Continuing Calibration Relative Response Factors (RRFs) for 4-nitroquinoline and kepone were less than 0.050. Continuing Calibration Relative Response Factors (RRFs) for famphur were less than 0.050. These noncompliances indicate a lack of instrument response. Positive and nondetected results are affected by these noncompliances. Therefore, nondetected results reported for the aforementioned compounds in the affected samples were considered unreliable and were rejected, (UR).

#### Minor Problems

- An initial calibration %RSD greater than 50% was reported for famphur. Positive and nondetected results are affected by this noncompliance. Therefore, nondetected results for famphur were qualified as estimated, (UJ), in the affected samples.
- The following table summarizes the maximum concentration of volatile compounds detected in the laboratory method and field quality control blanks analyzed in this SDG.

<u>Compound</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Methylene Chloride	3 µg/L	30 µg/L, µg/kg
Acetone	36 µg/L	360 µg/L, µg/kg

Samples affected: All samples.

Dilution factors, percent solids and aliquots used for analysis were taken into consideration during to the application of all action levels. Positive results reported for methylene chloride and acetone in the affected samples were qualified in the manner indicated by the blank action table.

- Positive results reported at concentrations below the Contract Required Quantitation Limit (CRQL) are qualified as estimated, (J).

MEMO TO: MR. PAUL FRANK  
DATE: OCTOBER 24, 1997 - PAGE 3

Notes

An initial calibration Percent Relative Standard Deviation (%RSD) greater than 30% was reported for the volatile compound acetone and the semivolatile compound 2,4-dinitrophenol. The volatile compound acetonitrile, acrolein, bromomethane, chloroethane, isobutyl alcohol, propionitrile, trichlorofluoromethane, 2-hexanone, and trans-1,4-dichloro-2-butene had continuing calibration Percent Differences (%Ds) greater than 25%. Continuing calibration %Ds were also greater than 25% for the semivolatile compounds pyrene, 2-nitroaniline, 2,2'-oxybis(1-chloropropane), 2,4-dinitrophenol, 3,3'-dichlorobenzidine, 4-nitroaniline, 4-nitrophenol, and 4,6-dinitro-2-methylphenol. These noncompliances affect positive results only. Since only nondetected results were reported for these compounds in the affected samples, no action was taken.

Samples RPLSD0020001 had a poor internal standard area for chrysene-d12 and RPLDUP004 had poor internal standard areas reported for both chrysene-d12 and perylene-d12. As a result, the lab reanalyzed these samples. The reanalysis yielded results within the acceptable internal standard areas. Therefore, the reanalyses were chosen for validation. No further action was required.

Low surrogate Percent Recoveries (%Rs) were reported for 2-fluorophenol in samples RPLSW0020001 and RPLDUP004. As a result of this noncompliance, the laboratory reanalyzed these samples. The reanalyses yielded similar results. No action was taken since only one fractional surrogate was noncompliant.

Two samples reported acid surrogate recoveries less than 10%. However, the required re-extraction of these samples was not conducted. This demonstrates poor laboratory practice.

The Laboratory Control Sample of VLCS0709 yielded a high %R for carbon tetrachloride in the volatile fraction. No action was taken since Region III validation protocol does not qualify based solely on LCS noncompliances.

The Matrix Spike analysis of sample RN6SD0010001 yielded low Percent Recoveries (%Rs) for the semivolatile compounds 1,4-dichlorobenzene and 1,2,4-trichlorobenzene. Additionally, high %RPDs were reported for 1,4-dichlorobenzene and 1,2,4-trichlorobenzene. No action was taken since Region III validation protocol does not qualify based solely on Matrix Spike/Matrix Spike Duplicate noncompliances.

No other problems were noted.

MEMO TO: MR. PAUL FRANK  
DATE: OCTOBER 24, 1997 - PAGE 4

Executive Summary

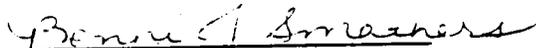
**Laboratory Performance:** Initial and Continuing Calibration Relative Response Factors (RRFs) for acrolein, acrylonitrile, isobutyl alcohol, propionitrile, 2-butanone, 4-nitroquinoline, kepone, and famphur were less than 0.050. An initial calibration %RSD greater than the 30% quality control limit was reported for the volatile compound acetone and the semivolatile compound 2,4-dinitrophenol. The volatile compounds acetonitrile, acrolein, bromomethane, chloroethane, isobutyl alcohol, propionitrile, trichlorofluoromethane, 2-hexanone, and trans-1,4-dichloro-2-butene had continuing calibration Percent Differences (%Ds) greater than the 25% quality control limit. The semivolatile compounds pyrene, 2-nitroaniline, 2,2'-oxybis(1-chloropropane), 2,4-dinitrophenol, 3,3'-dichlorobenzidine, 4-nitroaniline, 4-nitrophenol, and 4,6-dinitro-2-methylphenol also had %Ds greater than the 25% quality control limit. Methylene chloride and acetone were detected in the laboratory method blanks.

**Other Factors Affecting Data Quality:** Poor surrogate recoveries were reported for several samples in the semivolatile fraction. The Laboratory Control Sample yielded a high %R for carbon tetrachloride in the volatile fraction. The Matrix Spike sample reported high %Rs for 1,4-dichlorobenzene and 1,2,4-trichlorobenzene of the semivolatile fraction.

**MEMO TO: MR. PAUL FRANK**  
**DATE: OCTOBER 24, 1997 - PAGE 5**

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Review", as amended for use within EPA Region III, and the NFESC guidelines entitled "Navy Installation Restoration Program Laboratory Quality Assurance Guide"(February, 1996).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Bonni J. Smathers  
Industrial Hygienist/Data Validator

  
Brown and Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

**Attachments:**

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation



## Brown & Root Environmental

INTERNAL CORRESPONDENCE

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C-49-10-7-154

TO: PAUL FRANK

DATE: OCTOBER 27, 1997

FROM: SEAN NIXON

COPIES: DV FILE

SUBJECT: INORGANIC DATA VALIDATION - TOC, TOX, and ANIONS  
CTO 287 INDIAN HEAD, MARYLAND  
SDG - 9708030

SAMPLES: 5/Aqueous

5GW01

FB001

RN3MW001U001

RN3MW002U001

RN3MW004U001

### Overview

The sample set for CTO 287 Indian Head, SDG 9708030, consists of five (5) aqueous environmental samples including a field blank (FB001). The field crew did not specify any samples for Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses.

All samples were analyzed for Total Organic Carbon (TOC) and Total Organic Halides (TOX). Sample FB001 was also analyzed for Anions (total phosphorus, chloride, fluoride, nitrate, nitrite, and sulfate). The samples were collected by Brown and Root Environmental on August 3 and 5, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The TOC and TOX analyses were conducted according to Methods of Chemical Analysis of Wastes and Wastewater (MCAWW) 415.1 and SW-846 Method 9020 respectively. The anion analyses were conducted according to MCAWW 300.0.

### Summary

All analytes were successfully analyzed with the exception of those rejected. The findings offered in this report are based upon a general review of all available data including data completeness, holding times, calibration data, laboratory method/ preparation/ rinsate blanks, laboratory duplicate results, matrix spike recoveries, laboratory control sample (LCS) results, detection limits, and analyte quantitation.

Areas of concern with respect to data quality are listed below.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 27, 1997 - PAGE 2

C-49-10-7-154

Major Problems

- The 48 hour holding time for the anion analyses was exceeded by fourteen days, except for sulfate, chloride, and fluoride which have a 28 day holding time, for the sample FB001. The nondetected results for nitrite and nitrate were rejected, (UR). The positive result for phosphorus was qualified as estimated, (J).

Minor Problems

- The following contaminant was detected in the field blank at the following maximum concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level Aqueous</u>
TOX <sup>1</sup>	119 ug/L	595 ug/L

Samples Affected: All

An action level of 5X the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level for TOX have been qualified, (B), as a result of blank contamination. It should be noted that the field quality control blank was not qualified for field quality control blank contamination.

- (1) Maximum concentration found in Field Blank.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 27, 1997 - PAGE 3

C-49-10-7-154

Executive Summary

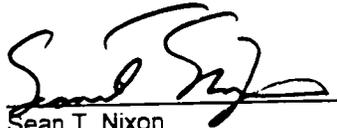
**Laboratory Performance:** The 48 hour holding time was exceeded by fourteen days for nitrate, nitrite, and phosphorus. Blank contamination was noted for TOX.

**Other Factors Affecting Data Quality:** None.

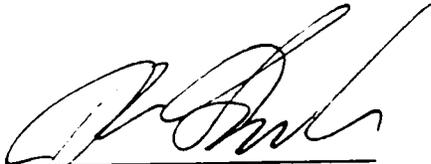
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Sean T. Nixon  
Chemist/Data Validator  
Brown and Root Environmental



Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-10-7-092

TO: PAUL FRANK

DATE: OCTOBER 27, 1997

FROM: SEAN NIXON

COPIES: DV FILE

SUBJECT: INORGANIC DATA VALIDATION - APPENDIX IX METALS  
CTO 287 INDIAN HEAD, MARYLAND  
SDG - 9708011

SAMPLES: 5/Solid

RPLCP0010101  
RPLCP0040101

RPLDUP013

RPLCP0020101

RPLCP0030101

1/Aqueous

RPLRB015073197

## Overview

The sample set for CTO 287 Indian Head, SDG 9708011, consists of five (5) solid environmental samples, and one (1) aqueous rinse blank. One (1) field duplicate pair, samples RPLCP0010101/RPLDUP013, was included within this SDG. The field crew did not specify a sample for Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis. Laboratory MS/MSD, Post Digestion Spike, and Serial Dilution analyses were performed on sample RPLCP0010101.

All samples were analyzed for Appendix IX metals. The samples were collected by Brown and Root Environmental on July 31, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The Target Analyte List (TAL) metals analyses were conducted according to SW-846 Methods 6010 for TAL metals except mercury, and Methods 7470A (aqueous) and 7471A (solids) for mercury.

## Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times, calibration data, laboratory method/ preparation/ rinse blanks, interference check samples (ICS), laboratory duplicate results, matrix spike recoveries, post digestion spike recoveries, laboratory control sample (LCS) results, ICP serial dilution results, detection limits, and analyte quantitation.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 27, 1997 - PAGE 2

C-49-10-7-092

All analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were performed using cold vapor AA.

Areas of concern with respect to data quality are listed below.

Major Problems

- None.

Minor Problems

- The Contract Required Detection Limit (CRDL) analyses yielded a Percent Recovery (%R) for cadmium that was above the 110% quality control limit. Positive results less than 2X CRDL for cadmium were qualified as biased high, (K).
- The following contaminants were detected in the laboratory method/preparation, and continuing calibration blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level Aqueous (ug/L)</u>	<u>Action-Level Soil (mg/kg)</u>
Antimony	2.5 ug/L	12.5	1.25
Barium <sup>1</sup>	2.3 ug/L	11.5	1.15
Cobalt	0.9 ug/L	4.50	0.45
Lead <sup>1</sup>	1.4 ug/L	7.0	0.70
Nickel	1.8 ug/L	9.0	0.90
Silver	1.0 ug/L	5.0	0.50
Thallium	4.4 ug/L	22.0	2.20
Tin <sup>2</sup>	1.078 mg/kg	NA	5.39
Vanadium	0.8 ug/L	4.0	0.40
Zinc <sup>1</sup>	8.2 ug/L	41.0	4.1

Samples Affected: All

- (1) Maximum concentration found in rinse blank.
- (2) Maximum concentration found in solid preparation blank.

An action level of 5X the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size, percent solids and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level for antimony, silver, thallium, and tin have been qualified, (B), as a result of blank contamination. Validation action was not taken for the remaining analytes since the results were either greater than the action level, or were nondetected results.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 27, 1997 - PAGE 3

- The Matrix Spike (MS) analysis of sample RPLCP0010101, affecting the solid samples, yielded a %R for selenium that was below the 75% quality control limit. This noncompliance affects positive and nondetected results. The positive results reported for selenium in all of the solid samples were qualified as biased low, (L).
- The Matrix Spike (MS) analysis of sample RPLCP0010101, affecting the solid samples, yielded %Rs for arsenic, chromium, and lead above the 125% quality control limit. This noncompliance affects positive results only. The positive results for arsenic, chromium, and lead in the solid samples were qualified as biased high, (K).
- The Serial dilution analysis of sample RPLCP0010101 contained a Percent Difference (%D) for zinc that was above the 10% quality control limit. The positive results for zinc in the solid samples were qualified as estimated, (J).

#### Notes

It was noted that the sample IDs on the Form Is were not complete. The Form Is were amended with the corrected sample ids.

The CRDL %R for tin was above the 110% quality control limit. However, all of the results for tin were qualified (B) for blank contamination.

A field duplicate precision comparison is presented in Appendix C.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 27, 1997 - PAGE 4

C-49-10-7-092

Executive Summary

**Laboratory Performance:** The CRDL Standard analysis reported a %R for cadmium that was above the quality control limit. Several analytes were present in the laboratory method/preparation blanks.

**Other Factors Affecting Data Quality:** High MS %Rs were reported for arsenic chromium, and lead, while low %Rs were reported for selenium and antimony. The serial dilution analysis reported a %D above the quality control limit for zinc.

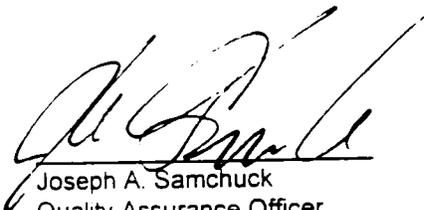
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Sean T. Nixon  
Chemist/Data Validator  
Brown and Root Environmental



Joseph A. Samchuck  
Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

### **DATA QUALIFIER TABLE**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- K - Positive result is considered biased high as a result of high CRDL %R, or high MS %R.
- L - Positive result is considered biased low as a result of low CRDL %R or low MS %R.
- J - Positive result is considered estimated as a result of serial dilution %D greater than 10%.



# Brown & Root Environmental

C-49-09-7-053 INTERNAL CORRESPONDENCE

TO: P. FRANK

DATE: OCTOBER 27, 1997

FROM: PAMELA A. KORYAK

CC: DATA VALIDATION FILE

SUBJECT: ORGANIC DATA VALIDATION - EXPLOSIVE ORGANIC COMPOUNDS  
CTO 287 NSWC INDIAN HEAD, MARYLAND  
SDG 9707050

SAMPLES: 5/Soil/

RN3SB0130101  
RN3SS0130101

RN3SB0140101  
RN3SS0140101

RN3SS0100101

1/Aqueous/

RN3RB005070997

## Overview

The sample set for CTO 287, NSWC Indian Head, SDG 9707050 consists of five (5) solid environmental samples. The samples were analyzed for explosive organic compounds via SW-846 Method 8330. Sample RN3SS0100101 was designated as the Matrix Spike/Matrix Spike Duplicate sample by the laboratory.

## Summary

The samples were collected by Brown and Root Environmental on July 9th, 1997 and successfully analyzed by GP Environmental Services, Inc under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Analyses were conducted using the methods prescribed in SW-846 Method 8330 and reported using a Contract Laboratory Program (CLP)-like format. The data contained in the SDG were validated with regard to data completeness, holding times until extraction, calibration data, laboratory control blank results, surrogate spike recoveries, laboratory control sample analyses, matrix spike/matrix spike duplicate analyses, and compound identification and quantitation.

Areas of concern with respect to data quality are listed below

## Notes

No problems were noted.

## Executive summary

**Laboratory Performance:** No problems were noted

**Other Factors Affecting Data Quality:** No problems were noted.

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Validation" (9/94), as amended for use by EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality

**MEMO TO: P. FRANK**  
**DATE: OCTOBER 27, 1997**

Assurance Guide" (February 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

*Pamela A. Koryak*  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

*Joseph Samchuck*  
Brown and Root Environmental

Joseph Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Summary:**

U - Nondetect as reported by the laboratory.



# Brown & Root Environmental

TO:

P. FRANK

C-49-09-7-212

INTERNAL CORRESPONDENCE

DATE: OCTOBER 27, 1997

FROM:

PAMELA A. KORYAK

CC: DATA VALIDATION FILE

SUBJECT:

ORGANIC DATA VALIDATION - EXPLOSIVE ORGANIC COMPOUNDS  
CTO 287 NSWC INDIAN HEAD, MARYLAND  
SDG 9708099

SAMPLES:

5/Soil/

RN3SD0010101  
RN3SD0040101

RN3SD0020101  
RN3DUP017

RN3SD0030101

2/Aqueous/

RN3SW0010101

RN3SW0020101

## Overview

The sample set for CTO 287, NSWC Indian Head, SDG 9708099 consists of five (5) solid environmental samples and two (2) aqueous environmental samples. The samples were analyzed for explosive organic compounds via SW-846 Method 8330. Sample RN3SD0010101 was designated as the Matrix Spike/Matrix Spike Duplicate sample by the field crew. The duplicate pair (RN3SD0030101/RN3DUP017) was included in this SDG.

## Summary

The samples were collected by Brown and Root Environmental on August 14th and 15th, 1997 and successfully analyzed by GP Environmental Services, Inc. under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Analyses were conducted using the methods prescribed in SW-846 Method 8330 and reported using a Contract Laboratory Program (CLP)-like format. The data contained in the SDG were validated with regard to data completeness, holding times until extraction, calibration data, laboratory control blank results, surrogate spike recoveries, laboratory control sample analyses, matrix spike/matrix spike duplicate analyses, and compound identification and quantitation.

Areas of concern with respect to data quality are listed below.

## Notes

No problems were noted.

## Executive summary

**Laboratory Performance:** No problems were noted.

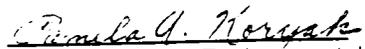
**Other Factors Affecting Data Quality:** No problems were noted.

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Validation" (9/94), as amended for use by EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality

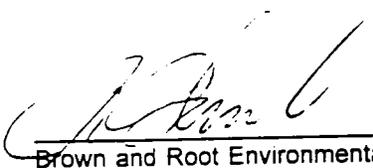
MEMO TO: P. FRANK  
DATE: OCTOBER 27, 1997

Assurance Guide" (February 1996).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

  
Brown and Root Environmental

Joseph Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Summary:**

U - Nondetect as reported by the laboratory.



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DATE: OCTOBER 27, 1997 - PAGE 2

Executive Summary

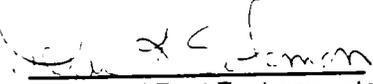
Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

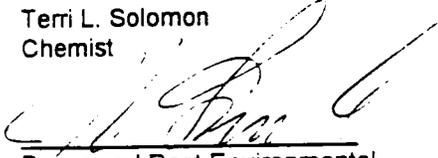
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Brown and Root Environmental  
Terri L. Solomon  
Chemist



Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

U - Value is a nondetect as reported by the laboratory.



**C-49-08-7-189**

**TO: P. FRANK**

**DATE: OCTOBER 27, 1997**

**FROM: PAMELA A. KORYAK**

**COPIES: DV FILE**

**SUBJECT: ORGANIC DATA VALIDATION - APPENDIX IX VOLATILE AND SEMIVOLATILE ORGANICS  
CTO 287, NSWC INDIAN HEAD, MARYLAND  
SDG 9708011**

**SAMPLES: 5/Soil/VOA/SVOA**

RPLCP0010101  
RPLCP0040101

RPLCP0020101  
RPLDUP013

RPLCP0030101

2/Aqueous/VOA

RPLTB001073197

RPLRB015073197

1/Aqueous/SVOA

RPLRB015073197

Overview

The sample set for the CTO 287 NSWC Indian Head Naval Base site, SDG 9708011, consists of five (5) solid environmental samples, one (1) trip blank (designated-TB) and one (1) rinsate blank (designated-RB). The samples were analyzed for Appendix IX volatile and semivolatile organic compounds. The laboratory designated one sample (RPLCP0010101) for Matrix Spike/Matrix Spike Duplicate analyses. One field duplicate pair (RPLDUP013/RPLCP0010101) was included in this SDG.

The samples were collected by Brown and Root Environmental on July 31st, 1997 and analyzed by GP Environmental under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The volatile analyses were conducted using EPA method 8260A. The samples were analyzed for semivolatile compounds using EPA method 8270B.

Summary

All compounds were successfully analyzed with the exception of those compounds which were qualified as rejected, UR. The findings offered in this report are based upon a general review of all available data

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 DATE: OCTOBER 27, 1997- PAGE 2

including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standards performance, tentatively identified compounds, compound identification and compound quantitation. Areas of concern with respect to data quality are listed below.

#### Major Problems

- The initial and continuing calibration Relative Response Factors (RRFs) for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, vinyl acetate, 4-nitroquinoline-N-oxide, famphur, and kepone were less than 0.05. Only nondetected results were reported for these compounds in the affected samples. The results were qualified as rejected, UR.
- The continuing Relative Response Factors (RRFs) for 2-butanone was less than 0.05. Only nondetected results were reported for this compound in the affected samples. The results were qualified as rejected, UR.

#### Minor Problems

- Initial calibration Percent Relative Standard Deviations (%RSDs) greater than 50% were reported for p-phenylenediamine, dimethoate, famphur, and kepone. Only nondetected results were reported for these compounds in the affected samples. The results reported for these compounds in the affected samples were qualified as estimated, (UJ).
- Continuing calibration %Ds greater than 50% were reported for acrylonitrile, acetonitrile, trans-isosafrole, cis-isosafrole, dimethoate, aramite, famphur, kepone, methapyrilene, and 2-acetylaminofluorene. Only nondetected results were reported for these compounds in the affected samples. The results were qualified as estimated for these compounds in the affected samples were qualified as estimated, (UJ).
- A continuing calibration %D greater than the 25% quality control limit was reported for acetone. Positive results for this compound in the affected samples were qualified as estimated, (J).
- The following table summarizes the maximum concentrations of volatile and semivolatile compounds detected in laboratory method and/or field quality control blanks analyzed in this SDG.

<u>Compound</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
methylene chloride	7 $\mu\text{g/L}$	70 $\mu\text{g/L}$
methylene chloride	3 $\mu\text{g/L}$	30 $\mu\text{g/L}$ , 30 $\mu\text{g/kg}$
di-n-butylphthalate	1 $\mu\text{g/L}$	10 $\mu\text{g/L}$
bis(2-ethylhexyl)phthalate	3 $\mu\text{g/L}$	30 $\mu\text{g/L}$ , 990 $\mu\text{g/kg}$

\* - Maximum concentration determined from field quality control blanks.

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Percent moisture, aliquot, and dilution factors were considered during application of all action levels. Positive results reported for these compounds in the associated samples at concentrations less than the respective action levels are considered false positives and are qualified, (B). Note that field quality control blanks are not qualified based on field quality control blank contamination.

- The internal standard area for perylene-d12 (PRY) was less than the quality control limit for sample RPLCP0040101 and the reanalysis of sample RPLCP0040101. Therefore the original sample was used in the validation of this SDG. Positive and nondetected results were affected by this noncompliance and these were qualified as estimated, J and UJ, respectively.
- The internal standard areas for samples RPLCP0020101 and RPLCP0030101 were outside of the quality control limits for perylene-d12 (PRY). The internal standard areas for chrysene-d12 and perylene-d12 (PRY) were outside of the quality control limits for the respective reanalyses of these samples. Positive and nondetected results were reported for these samples and the results were qualified as estimated, J and UJ, respectively. The original samples were used in the validation of this SDG.
- Positive results reported at concentrations below the CRQL are considered to be estimated and are qualified (J). The direction of the bias cannot be determined.

#### Notes

An initial calibration Percent Relative Standard Deviation (%RSD) greater than 30% was reported for bromomethane. Only nondetected results were reported in the affected samples. According to guidance, no action was taken.

An initial calibration Percent Relative Standard Deviation (%RSD) greater than 30% was reported for trans-isosafrole, cis-isosafrole, 1,4-naphthoquinone, methapyrilene, o-tolidine, diphenylamine, 1,3,5-trinitrobenzene, and pronamide. Only nondetected results were reported in the affected samples. According to guidance, no action was taken.

Continuing calibration %Ds greater than 25% were reported for dichlorodifluoromethane, acrylonitrile, vinyl acetate, acrolein, chloromethane, and pentachloroethane. Only nondetected results were reported for these compounds in the affected samples and therefore, according to guidance, no action was taken.

Continuing calibration %Ds greater than 25% were reported for benzo(g,h,i)perylene, di-n-octylphthalate, indeno(1,2,3-cd)pyrene, 2,4-dinitrophenol, 4-nitrophenol, 3,3'-dichlorobenzidine, o,o,o-triethylphosphorothioate, a,a-dimethylphenethylamine, hexachloropropene, 5-nitro-o-toluidine, diphenylamine, aramite, o-tolidine, 4-nitroquinoline-N-oxide, 1,3,5-trinitrobenzene, diallate, N-nitrosodimethylamine, 1,4-naphthoquinone, 5-nitro-o-toluidine, and methapyrilene. Only nondetected results were reported for these compounds in the affected samples and therefore, according to guidance, no action was taken.

The %Recoveries (%Rs) in soil sample VLCS0811 were less than the quality control limit for 1,1-dichloroethene and carbon tetrachloride. According to guidance, no action was taken.

The Matrix Spike/Matrix Spike Duplicate recoveries were less than the quality control limits for 1,1-

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DATE: OCTOBER 27, 1997- PAGE 4

dichloroethene in sample RPLCP0010101. No action was taken according to guidance.

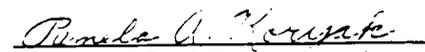
#### Executive Summary

**Laboratory Performance:** The initial calibration %RSD for p-phenylenediamine, dimethoate, famphur, and kepone were greater than 50%. Several initial calibration %RSDs for semivolatile compounds and bromomethane exceeded 30%. The initial and continuing calibration RRFs for several volatile and semivolatile compounds were less than 0.05. Several continuing calibration %Ds for volatile and semivolatile compounds were greater than 25%. The %Rs exceeded the quality control limits for the volatile fraction in the soil laboratory control sample VLCS0811. Methylene chloride and bis(2-ethylhexyl)phthalate were detected in aqueous method blanks and in the field blank. Di-n-butylphthalate was detected in the method blank.

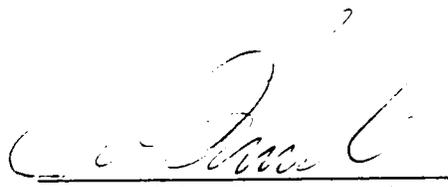
**Other Factors Affecting Data Quality:** Noncompliant MS/MSD %Rs were reported in the volatile fraction. Several internal standard areas were below quality control criteria for semivolatile compounds. Positive results reported at concentrations below the CRQL are considered to be estimated.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Review"(9/94), as amended for use within EPA Region III, and the NFESC guidelines entitled "Navy Installation Restoration Program Laboratory Quality Assurance Guide"(February, 1996).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

  
Brown and Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

Attachments:

**MEMO TO:** P. FRANK  
**DATE:** OCTOBER 27, 1997- PAGE 5

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- J - Estimate positive results for various technical reasons (i.e. calibration and internal standards noncompliances).
- B - Result reflects blank contamination
- UJ - Nondetected result is considered estimated due to technical reasons (i.e. calibration and internal standards noncompliances).
- UR - Nondetected result is considered rejected due to calibration noncompliances.



# Brown & Root Environmental

TO: P. FRANK

C-49-09-7-166

INTERNAL CORRESPONDENCE

DATE: OCTOBER 27, 1997

FROM: PAMELA A. KORYAK

CC: DATA VALIDATION FILE

SUBJECT: ORGANIC DATA VALIDATION - EXPLOSIVE ORGANIC COMPOUNDS  
CTO 287 NSWC INDIAN HEAD, MARYLAND  
SDG 9708042

SAMPLES: 9/Aqueous/

- RN3MW003V001  
RN6MW005V001  
DSBMW004V001

RN6MW002V001  
DSBMW001V001  
RN6DUP002

RN6MW003V001  
DSBMW003V001  
DSBDUP003

## Overview

The sample set for CTO 287, NSWC Indian Head, SDG 9708042 consists of nine (9) aqueous environmental samples. The samples were analyzed for target compound list explosive organic compounds via SW-846 Method 8330. Sample DSBMW001V001 was designated as the Matrix Spike/Matrix Spike Duplicate sample by the field crew. Two duplicate pairs (RN6MW003V001/RN6DUP002 and DSBMW003V001/DSBDUP003) were included in this SDG.

## Summary

The samples were collected by Brown and Root Environmental on August 4th and 5th, 1997 and successfully analyzed by GP Environmental Services, Inc. under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Analyses were conducted using the methods prescribed in SW-846 Method 8330 and reported using a Contract Laboratory Program (CLP)-like format. The data contained in the SDG were validated with regard to data completeness, holding times until extraction, calibration data, laboratory control blank results, surrogate spike recoveries, laboratory control sample analyses, matrix spike/matrix spike duplicate analyses, and compound identification and quantitation.

Areas of concern with respect to data quality are listed below.

## Minor Problems

The surrogate recovery (%R) for 4-nitroaniline in sample RN6DUP002 was above the upper quality control limit. The affected compounds were qualified as biased high, K.

## Notes

The surrogate recovery (%R) for 4-nitroaniline in sample RN6MW003V001 was above the upper quality control limit. No action was taken based on this noncompliance.

The Relative Percent Difference (RPD) for RDX was high. No action was taken as no validation actions are taken based on matrix spike results alone.

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DATE: OCTOBER 27, 1997

Executive summary

**Laboratory Performance:** The aqueous surrogate recovery was outside of quality control limits. The Relative Percent Difference was high in the Matrix Spike/Matrix Spike Duplicate.

**Other Factors Affecting Data Quality:** No additional problems were noted.

The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Validation" (9/94), as amended for use by EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Pamela A. Koryak  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

Joseph Samchuck  
Brown and Root Environmental

Joseph Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Summary:**

- U - Nondetect as reported by the laboratory.
- K - Detected results were qualified as biased high due to high surrogate recovery.



# Brown & Root Environmental

TO: P. FRANK

C-49-09-7-016

INTERNAL CORRESPONDENCE:  
DATE: OCTOBER 27, 1997

FROM: PAMELA A. KORYAK

CC: DATA VALIDATION FILE

SUBJECT: ORGANIC DATA VALIDATION - EXPLOSIVE ORGANIC COMPOUNDS  
CTO 287 NSWC INDIAN HEAD, MARYLAND  
SDG 9707049

SAMPLES: 19/Soil/

RN3DUP005	RN3DUP006	RN3SB0040101
RN3SB0040201	RN3SB0050101	RN3SB0060101
RN3SB0070101	RN3SB0080101	RN3SB0090101
RN3SB0100101	RN3SB0110101	RN3SB0120101
RN3SS0050101	RN3SS0060101	RN3SS0070101
RN3SS0080101	RN3SS0090101	RN3SS0110101
RN3SS0120101		

## Overview

The sample set for CTO 287, NSWC Indian Head, SDG 9707049 consists of nineteen (19) solid environmental samples. The samples were analyzed for explosive organic compounds via SW-846 Method 8330. Sample RN3SB0070101 was designated as the Matrix Spike/Matrix Spike Duplicate sample by the field crew. Two duplicate pairs (RN3DUP005/RN3SS0070101 and RN3DUP006/RN3SB0100101) were included in this SDG.

## Summary

The samples were collected by Brown and Root Environmental on July 8th and 9th, 1997 and successfully analyzed by GP Environmental Services, Inc. under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. Analyses were conducted using the methods prescribed in SW-846 Method 8330 and reported using a Contract Laboratory Program (CLP)-like format. The data contained in the SDG were validated with regard to data completeness, holding times until extraction, calibration data, laboratory control blank results, surrogate spike recoveries, laboratory control sample analyses, matrix spike/matrix spike duplicate analyses, and compound identification and quantiation.

## Notes

The reviewer observed that sample RN3DUP006 contained 2,4,6-trinitrotoluene at 1180 ug/kg and the duplicate pair RN3SB0100101 does not have a positive detect for this compound as indicated by the chromatogram. The conclusion of the reviewer is that the duplicate pair RN3DUP006/RN3SB0100101 was not from a homogeneous soil sample.

The Matrix Spike Duplicate Percent Recovery (%R) for 2-amino-4,6-dinitrotoluene was greater than the quality control limit and the Relative Percent Difference (%RPD) for 2-amino-4,6-dinitrotoluene exceeded the quality control limit in sample RN3SB0070101.

## Executive summary

**Laboratory Performance:** The Matrix Spike Duplicate %R and %RPD exceeded quality control criteria

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DATE: OCTOBER 27, 1997

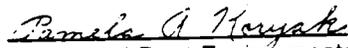
for 2-amino-4,6-dinitrotoluene.

**Other Factors Affecting Data Quality:** No additional problems were noted.

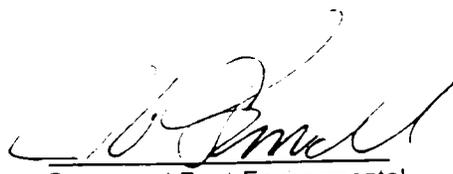
The data for these analyses were reviewed with reference to method-specific quality control criteria, the "National Functional Guidelines for Organic Data Validation" (9/94) as amended for use within EPA Region III, and the NFESC Interim Guidance Document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (February 1996).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

  
Brown and Root Environmental

Joseph Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Summary:**

U - Nondetect as reported by the laboratory.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-10-7-122

TO: PAUL FRANK

DATE: OCTOBER 27, 1997

FROM: SEAN NIXON

COPIES: DV FILE

SUBJECT: INORGANIC DATA VALIDATION - APPENDIX IX METALS  
CTO 287 INDIAN HEAD, MARYLAND  
SDG - 9708030

SAMPLES: 17/Aqueous

5GW01	5GW01F	DSBMW002F001	DSBMW002U001
DSRB017080797	FB001	RN3MW001F001	RN3MW001U001
RN3MW002F001	RN3MW002U001	RN3MW004F001	RN3MW004U001
RN6MW004F001	RPLMW001F001	RPLMW001U001	RPLMW003F001
RLPMW003U001			

## Overview

The sample set for CTO 287 Indian Head, SDG 9708030, consists of seventeen (17) aqueous environmental samples including a Rinse Blank (DSRB-) and a field blank (FB001). The aqueous samples containing "Fs" in their sample IDs are filtrates for dissolved Appendix IX metals. The field crew did not specify any samples for Matrix Spike/Matrix Spike Duplicate (MS/MSD) analyses.

All samples were analyzed for Appendix IX metals. The samples were collected by Brown and Root Environmental on August 3, 5, 6, and 7, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The Appendix IX metals and tin analyses were conducted according to SW-846 Methods 6010 except mercury which was analyzed by SW-846 Method 7470A.

## Summary

All analytes were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times, calibration data, laboratory method/ preparation/ rinsate blanks, interference check samples (ICS), laboratory duplicate results, matrix spike recoveries, post digestion spike recoveries, laboratory control sample (LCS) results, ICP serial dilution results, detection limits, and analyte quantitation.

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 DATE: OCTOBER 27, 1997 - PAGE 2

All analyses, with the exception of mercury, were conducted using Inductively Coupled Plasma (ICP) methodologies. Mercury analyses were performed using cold vapor AA.

Areas of concern with respect to data quality are listed below.

#### Major Problems

- None.

#### Minor Problems

- The Contract Required Detection Limit (CRDL) analyses yielded a Percent Recovery for arsenic that was below the 90% quality control limit. This noncompliance affects positive results for arsenic that are less than 2X the CRDL for arsenic, and nondetected results. Positive and nondetected results for arsenic were qualified as biased low, (L) and (UL), respectively.
- The CRDL analysis for beryllium reported a %R for beryllium that was above the 110% quality control limit. This noncompliance affects positive results that are less than 2X the CRDL. However, all of the positive results for beryllium were qualified, (B), for blank contamination.
- The following contaminants were detected in the laboratory method/preparation, and continuing calibration blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level Aqueous (ug/L)</u>
Barium <sup>1</sup>	5.2 ug/L	26
Beryllium	1.9 ug/L	9.5
Copper <sup>1</sup>	4.6 ug/L	23
Lead	3.2 ug/L	16
Thallium	3.5 ug/L	17.5
Tin	2.5 ug/L	12.5
Vanadium	1.1 ug/L	5.5
Zinc <sup>1</sup>	239 ug/L	1195

Samples Affected: All

An action level of 5X the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level for barium, beryllium, copper, lead, tin, vanadium, and zinc have been qualified, (B), as a result of blank contamination. Validation action was not taken for the remaining analytes since the results were either greater than the action level, or were nondetected results. It should be noted that field quality control blanks were not qualified for field quality control blank contamination.

- (1) Maximum concentration found in Field Blank.

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DATE: OCTOBER 27, 1997 - PAGE 3

C-49-10-7-122

Notes

It was noted that the sample IDs on the Form Is were not complete. The Form Is were amended with the corrected sample IDs.

It should be noted that sample 5GW01 reported 55.7 ug/L and 75.7 ug/L for chromium and vanadium respectively, while the filtrate of this sample, 5GW01F, reported nondetected results for chromium and vanadium. No validation action was taken for the noted difference for the aforementioned analytes between the two samples.

Executive Summary

**Laboratory Performance:** The CRDL Standard analyses reported a %R for arsenic that was below the quality control limit. Blank contamination for several elements was noted in the laboratory method/preparation and field quality control blanks.

**Other Factors Affecting Data Quality:** None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Sean T. Nixon  
Chemist/Data Validator  
Brown and Root Environmental

  
Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

### **DATA QUALIFIER TABLE**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- UL - Nondetected result is considered biased low as a result of low CRDL %R.
- L - Positive result is considered biased low as a result of low CRDL %R.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-164

TO: P. FRANK

DATE: OCTOBER 27, 1997

FROM: PAMELA A. KORYAK

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION- APPENDIX IX VOLATILE AND SEMIVOLATILE ORGANICS  
CTO 287, NSWC INDIAN HEAD, MARYLAND  
SDG 9707049

SAMPLES: 19/Soil/VOA

RN3DUP005  
RN3SB0040201  
RN3SB0070101  
RN3SB0100101  
RN3SS0050101  
RN3SS0080101  
RN3SS0120101

RN3DUP006  
RN3SB0050101  
RN3SB0080101  
RN3SB0110101  
RN3SS0060101  
RN3SS0090101

RN3SB0040101  
RN3SB0060101  
RN3SB0090101  
RN3SB0120101  
RN3SS0070101  
RN3SS0110101

1/Aqueous/VOA

RN3TB0010709

19/Soil/SVOA

RN3DUP005  
RN3SB0040201  
RN3SB0070101  
RN3SB0100101  
RN3SS0050101  
RN3SS0080101  
RN3SS0120101

RN3DUP006  
RN3SB0050101  
RN3SB0080101  
RN3SB0110101  
RN3SS0060101  
RN3SS0090101

RN3SB0040101  
RN3SB0060101  
RN3SB0090101  
RN3SB0120101  
RN3SS0070101  
RN3SS0110101

## Overview

The sample set for the CTO 287 NSWC Indian Head Naval Base site, SDG 9707049, consists of nineteen (19) solid environmental samples and one (1) trip blank (designated-TB). The samples were analyzed for Appendix IX volatile and semivolatile organic compounds. The field crew designated one sample (RN3SB070101) for Matrix Spike/Matrix Spike Duplicate analyses. Two field duplicate pairs

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(RN3DUP005/RN3SS0070101 and RN3DUP006/RN3SB0100101) were included in this SDG.

The samples were collected by Brown and Root Environmental on July 8th and 9th, 1997 and analyzed by GP Environmental under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The volatile analyses were conducted using EPA method 8260A. The samples were analyzed for semivolatile and select Appendix IX compounds using EPA method 8270B.

### Summary

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standards performance, tentatively identified compounds, compound identification and compound quantitation. Areas of concern with respect to data quality are listed below.

### Major Problems

- The initial calibration and continuing Relative Response Factors (RRFs) for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, 2-butanone, 4-nitroquinoline-N-oxide, famphur, and kepone were less than 0.05. Only nondetected results were reported for these compounds in the affected samples. The results were qualified as rejected, UR.

### Minor Problems

- An initial calibration Percent Relative Standard Deviation (%RSD) greater than the 50% quality control limit was reported for 1,4-phenylenediamine, dimethoate, and a,a-dimethylphenethylamine, famphur, kepone, and o-tolidine. Only nondetected results were reported for these compounds in the affected samples and these samples were qualified as estimated, (UJ).
- Continuing calibration %Ds greater than 50% were reported for dimethoate, famphur, o-tolidine, a,a-dimethylphenethylamine, 4-nitroquinoline-N-oxide, and kepone. Only nondetected results were reported for these compounds in the affected samples. The results reported for these compounds in the affected samples were qualified as estimated, (UJ).
- The following table summarizes the maximum concentrations of volatile and semivolatile compounds detected in laboratory method and/or field quality control blanks analyzed in this SDG.

<u>Compound</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
acetone	19 µg/L	190 µg/L, 190 µg/kg
methylene chloride	5 µg/L	50 µg/L, 50 µg/kg

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\* - Maximum concentration determined from field quality control blanks.

Percent moisture, aliquot size, and dilution factors were considered during application of all action levels. Positive results reported for these compounds in the associated samples at concentrations less than the respective action levels are considered false positives and are qualified, (B). Note that field quality control blanks are not qualified based on field quality control blank contamination.

- Samples RN3SB009010101 and RN3SS0120101 were reanalyzed as medium level soils due to high amounts of acetone. The medium level analyses were performed one day outside the holding time. However, the medium level analyses for acetone only were used in the validation of this SDG. All other results were taken from the original analysis. Positive and nondetected results were affected by these noncompliances. The results were qualified as estimated, J and UJ, respectively.
- The internal standard areas for fluorobenzene, 1,4-difluorobenzene, and chlorobenzene-d5 were less than quality control limits for samples RN3SB0040101, RN3SS0070101, RN3SS0090101, RN3SB0100101, and RN3SS0110101. Positive and nondetected results are affected by these noncompliances. The associated compounds were qualified as estimated, J and UJ, respectively. in the affected samples. The direction of bias could not be determined.
- The internal standard areas for fluorobenzene, 1,4-difluorobenzene, and chlorobenzene-d5 were less than the quality control limits for RN3SB0060101 and RN3SS0080101 and the respective reanalyses of these samples. Therefore, the original samples were used in the validation of this SDG. Positive and nondetected results are affected by these noncompliances. The associated compounds were qualified as estimated, J and UJ, respectively.
- Acetone exceeded the linear calibration range in sample RN3DUP005 and was qualified as estimated, J.
- The internal standard areas for fluorobenzene, 1,4-difluorobenzene, and chlorobenzene-d5 were slightly less than the quality control limits for sample RN3SS0120101. Positive and nondetected results were affected by these noncompliances and were qualified as estimated, J and UJ, respectively. Since the reanalyses was outside of the holding time, the original sample was used in the validation of this SDG.
- The internal standard areas for fluorobenzene, 1,4-difluorobenzene, and chlorobenzene-d5 were slightly less than the quality control limits for sample RN3SB0090101. Positive and nondetected results were affected by these noncompliances and were qualified as estimated, J and UJ, respectively. Since the holding time for the reanalyses of this sample was outside of the holding time and the soil surrogate recovery was poor for the reanalyses, the original sample was used in the validation of this SDG.
- The internal standard area for perylene-d12 (PRY) was less than the quality control limit for samples DUP005 and the reanalysis of sample RN3DUP005. Therefore the original sample was used in the validation of this SDG. Only nondetected results were affected by this noncompliance and these were qualified as estimated, UJ.

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- The internal standard areas for samples RN3SS0090101, RN3SB0090101, and RN3SB0100101 were outside of the quality control limits for chrysene-d12 (CRY) and perylene-d12 (PRY). The internal standard areas for PRY were outside of the quality control limit for the respective reanalyses of these samples. Only nondetected results were reported for these samples and the results were qualified as estimated, UJ. The reanalyses were used in the validation of this SDG. The direction of bias could not be determined.
- The internal standard area for perylene-d12 (PRY) was less than the quality control area for samples RN3SS0110101 and RN3SS0120101, and the respective reanalyses. Therefore, the original analyses were used in the validation of this SDG. Only nondetected results were reported and they were qualified as estimated, UJ. The direction of bias could not be determined.
- The soil surrogate recovery for the medium level soils analysis of sample RN3SB0090101 was greater than the quality control limit for 1,2-dichloroethane-d4, toluene-d8, and 4-bromofluorobenzene. Due to the exceedance of the holding time, the positive result for acetone was qualified as estimated, J.
- Positive results reported at concentrations below the CRQL are considered to be estimated and are qualified (J). The direction of the bias cannot be determined.

#### Notes

Initial calibration Percent Relative Standard Deviations (%RSDs) greater than 30% were reported for trans-isosafrole, cis-isosafrole, 1,4-naphthoquinone, diphenylamine, 1,3,5-trinitrobenzene, pronamide, 4-nitroquinoline-N-oxide, methapyrilene, o-tolidine, sulfotepp, kepone, 2,4-dinitrophenol, and 1,2-dichlorobenzene. Only nondetected results were reported in the affected samples. According to guidance, no action was taken.

Continuing calibration %Ds greater than 25% were reported for dichlorodifluoromethane, bromomethane, trichlorofluoromethane, acetonitrile, allyl chloride, carbon tetrachloride, vinyl acetate, and trans-1,4-dichloro-2-butene. Only nondetected results were reported for these compounds in the affected samples and therefore, according to guidance, no action was taken.

Continuing calibration %Ds greater than 25% were reported for a,a-dimethylphenethylamine, 2-naphthylamine, 1-naphthylamine, dimethoate, 4-aminobiphenyl, 4-nitroquinoline-N-oxide, methapyrilene, 2-acetylaminofluorene, o-tolidine, and 4-nitroaniline. Only nondetected results were reported for these compounds in the affected samples. Therefore, according to guidance, no action was taken.

RN3SB0090101 and RN3SS0120101 were reanalyzed at a dilution due to acetone exceeding the instrument linear calibration range. The original analysis was chosen for validation with the exception of acetone. The dilution results for acetone were transposed over the original sample result and used in the validation of this SDG.

The soil surrogate recovery for 2-fluorobiphenyl (FBP) was less than the quality control criteria in sample RN3SB0040101 and the reanalysis of this sample. Since the recoveries were similar, the original sample was used in the validation of this SDG. No action was taken, since only one surrogate was outside of the quality control limit in the semivolatile fraction.

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The %Recovery (%R) in aqueous sample VLCS0711 exceeded the quality control limit for chloroform, carbon tetrachloride, 1,2-dichloroethane, and dibromochloromethane. According to guidance, no action was taken.

The %Recovery (%R) in soil sample VLCS0724 exceeded the quality control limit for 1,1,1-trichloroethene, carbon tetrachloride, benzene, 1,2-dichloroethane, and dibromochloromethane. According to guidance, no action was taken.

The %Recovery (%R) in soil samples VLCS0722, VLCS0717, and VLCS0716 exceeded the quality control limit for 1,1-dichloroethene. According to guidance, no action was taken.

The Matrix Spike/Matrix Spike Duplicate recoveries were less than the quality control limits for 1,4-dichlorobenzene and 1,2,4-trichlorobenzene in sample RN3SB0070101. No action was taken according to guidance.

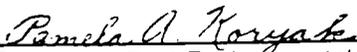
#### Executive Summary

**Laboratory Performance:** The initial calibration %RSD for 1,4-phenylenediamine, dimethoate, famphur, o-tolidine, and kepone were greater than 50%. Several initial calibration %RSDs for semivolatile compounds exceeded 30%. The initial and continuing calibration RRFs for several volatile and semivolatile compounds were less than 0.05. Several continuing calibration %Ds for volatile and semivolatile compounds were greater than 25%. The %Rs exceeded the quality control limits for the volatile fraction in the aqueous and soil laboratory control samples. Methylene chloride was detected in aqueous and soil method blanks and in the field blank. Acetone was detected in the field blank.

**Other Factors Affecting Data Quality:** Noncompliant MS/MSD %Rs were reported in the semivolatile fraction. Several internal standard areas were below quality control criteria for volatile and semivolatile compounds. Soil surrogate recoveries were outside of quality control limits for volatile and semivolatile fractions. Positive results reported at concentrations below the CRQL are considered to be estimated.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Review"(9/94), as amended for use within EPA Region III, and the NFESC guidelines entitled "Navy Installation Restoration Program Laboratory Quality Assurance Guide"(February, 1996).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

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DATE: OCTOBER 27, 1997- PAGE 6



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Brown and Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

C-49-07-7-164

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**Summary of Tentatively Identified Compounds (TICs)**

<b>Fraction</b>	TIC
Volatile	None
Semivolatiles	None



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 DATE: OCTOBER 27, 1997 - PAGE 2

Minor Problems

- The Contract Required Detection Limit (CRDL) Percent Recoveries (%R) for cadmium and copper were above the 110% quality control limit. Positive results < 2X CRDL reported for the aforementioned analytes were qualified as biased high, "K".
- The CRDL %R for selenium was below the 90% quality control limit. Nondetected results reported for the aforementioned analyte were qualified as biased low, "UL"
- The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level - Aqueous</u>	<u>Action Level - Soil</u>
beryllium	0.5 ug/L	2.5 ug/L	0.25 mg/kg
copper <sup>(1)</sup>	11.2 ug/L	NA	5.6 mg/kg
silver	1.6 ug/L	NA	0.8 mg/kg
thallium	7.0 ug/L	NA	3.5 mg/kg
zinc <sup>(1)</sup>	6.7 ug/L	NA	3.35 mg/kg
tin	10.0 ug/L	50.0 ug/L	5.0 mg/kg

Samples Affected: All

<sup>(1)</sup> Maximum concentration present in a rinsate blank.

An action level of 5x the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot size and dilution factors were taken into consideration when evaluating for blank contamination. Positive results < the action level for beryllium, thallium and tin have been qualified, "B", as a result of blank contamination. No action was taken for the remaining analytes since either the results were greater than the action level or were nondetects. It should be noted that field quality control samples are not qualified for field blank contamination.

- The Matrix Spike (MS) Percent Recovery (%R) for antimony affecting the soil matrix was < 30% quality control limit. Positive results reported for the aforementioned analyte in the affected samples were qualified as biased low, "L".
- The MS %R for selenium affecting the soil matrix was < 75% quality control limit. Positive results reported for the aforementioned analyte in the affected samples were qualified as biased low, "L".
- Laboratory duplicate imprecision was noted for chromium affecting the soil matrix. Positive results reported for the aforementioned analyte in the affected samples were qualified as estimated, "J".

Notes

Incomplete sample IDs were noted on the Form Is. The Form Is were amended for completeness.

The MS %Rs for thallium and tin were > 125% quality control limit. However, no validation actions were warranted as all results were either qualified as blank contamination or were nondetects.

MEMO TO: P. FRANK  
DATE: OCTOBER 27, 1997 - PAGE 3

C-49-10-7-118

Executive Summary

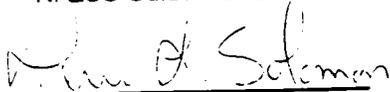
**Laboratory Performance:** The CRDL Standard analysis recoveries for several analytes were outside quality control limits. Several analytes were present in the laboratory method/preparation blanks.

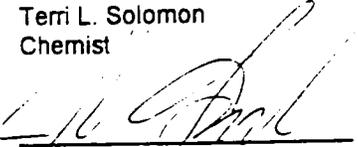
**Other Factors Affecting Data Quality:** The MS %R for antimony was < 30% quality control limit. The MS %R for selenium was < 75% quality control limit. Laboratory duplicate imprecision was noted for chromium.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental  
Terri L. Solomon  
Chemist

  
Brown and Root Environmental  
Joseph A. Samchuck  
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- B - Positive result is considered to be an artifact of blank contamination and should not be considered present.
- K - Positive result is considered biased high as a result of CRDL %R.
- L - Positive result is considered biased low as a result of MS %R.
- UL - Nondetected result is considered biased low as a result of CRDL %R.
- J - Positive result is considered estimated as a result of laboratory duplicate imprecision.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-041

TO: P. FRANK

DATE: OCTOBER 30, 1997

FROM: DANIEL MENICUCCI

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - APPENDIX IX VOAS, SVOAS; EXPLOSIVES  
CTO 287 NSWC INDIAN HEAD, MARYLAND  
SDG - 9707119

SAMPLES: 18/Soil

ABPSS0040101	ABPSS0050101	ABPSB00010101
ABPSB0020101	ABPSB0020201	ABPDUP010
DSBSS0040101	DSBSB0040101	DSBSB0040201
ABPSS0060101	ABPSB0030101	DSBSB0030101
ABPSB0030201	ABPSS0070101	ABPSB0040101
ABPSB0040201	ABPDUP011	DSBSS0030101

1/Aqueous

DSBRB011

## Overview

The sample set for CTO 287 Naval Surface Warfare Center (NSWC) Indian Head, Maryland, SDG 9707119, consists of eighteen (18) soil samples and one (1) aqueous environmental samples. Two field duplicate pairs, samples ABPDUP010 / ABPSS0040101 and ABPDUP011 / ABPSS0060101, was included in this SDG. The field crew specified sample ABPSB0030201 for Matrix Spike/ Matrix Spike Duplicate analysis in this SDG.

All of the samples, except ABPSB0030201, were analyzed for Appendix IX volatiles, semivolatiles, and explosives. The samples were collected by Brown and Root Environmental on July 21 and July 22, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The Appendix IX VOAs and SVOAs analyses were conducted according to methods 8260A and 8270B. The explosive analysis was conducted according to SW-846 Method 8330.

## Summary

All analytes were successfully analyzed, with the exception of those that were rejected. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, GCMS tuning, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification, quantification and detection limits.

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C-49-08-7-041

Areas of concern with respect to data quality are listed below.

#### Major Problems

- The Appendix IX volatile initial calibration, affecting low level aqueous samples contained Relative Response Factors (RRFs) for acrolein, acetonitrile, propionitrile, isobutyl alcohol, and 2-butanone less than the 0.05 quality control limit. The nondetected results in the associated samples were rejected (UR).
- The Appendix IX volatile initial calibration, affecting low level soil samples contained Relative Response Factors (RRFs) for some or all of the following compounds: acrolein, acetonitrile, acrylonitrile, propionitrile, isobutyl alcohol, vinyl acetate and 2-butanone that were less than the 0.05 quality control limit. The nondetected results in the associated samples were rejected (UR).
- The Appendix IX volatile continuing calibration affecting low level aqueous samples contained RRF's for propionitrile, acrolein, acrylonitrile, acetonitrile and isobutyl alcohol less than the 0.05 quality control limit. The nondetected results in the associated samples were rejected (UR).
- The Appendix IX volatile continuing calibration affecting low level soils samples contained RRF's for 2-Butanone less than the 0.05 quality control limit. The nondetected results in the associated samples were rejected (UR).
- The Appendix IX semivolatile initial calibration, affecting all samples had Relative Response Factors (RRFs) for 4-nitroquinoline-n-oxide, famphur and kepone less than the 0.05 quality control limit. The nondetected results were qualified as being rejected (UR).
- The Appendix IX semivolatile continuing calibration affecting all samples had RRF's for 4-nitroquinoline-n-oxide, famphur and kepone less than the 0.05 quality control limit. The nondetected results were rejected (UR). The positive results were qualified as biased (L).

#### Minor Problems

- The technical holding time from date of collection to date of extraction for all low level soil samples, exceeded the seven (7) day holding time for semi-volatiles. Positive and nondetects both affected. Positive results are qualified as estimated (J) and nondetects are qualified as estimated (UJ).
- An Appendix IX volatile initial calibration affecting low level soils samples had percent relative standard deviation greater than 30% and less than 50% quality control limit for acetone (31.1%). This noncompliance affects only positive results. Positive results are qualified as estimated (J).
- An Appendix IX volatile continuing calibration affecting low level soil samples contained Percent Differences (%D's) greater than 25% but lower than the 50% quality control limit for acetone (-28.2%) positive results are qualified as estimated (J).
- An Appendix IX volatile continuing calibration affecting low level soil samples contained Percent Differences (%D's) greater than the 50% quality control limit for acrolein, acetonitrile, 4-phenylenediamine and dimethoate. The nondetected results reported in the affected samples were qualified as estimated (UJ).

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 DATE: OCTOBER 30, 1997 PAGE 3

- An Appendix IX semi-volatile continuing calibration affecting low level soil samples contained Percent Differences (%D's) greater than the 50% quality control limit for trans-isosafrole, cis-isosafrole, kepone and/or aramite, 3,3'dichlorobenzidine and dimethoate. Nondetected results were qualified as estimated (UJ).
- An Appendix IX explosive continuing calibration affecting several low level soil samples contained Percent Differences (%D's) greater than 15% but lower than the 30% quality control limit for tetryl (18.0%). Nondetected results are qualified as estimated (UJ).
- The Appendix IX volatile analysis of several low level soil samples contained internal standards below the contract required quality control limits for fluorobenzene and/or 1,4-difluorobenzene, and chlorobenzene. The positive and nondetected results reported from the aforementioned analysis were qualified as estimated, (J) and (UJ) respectively.
- The Appendix IX explosive analysis of ABPSS0060101 had a Percent Recovery (%R) for the surrogate 4-nitroaniline below the quality control limit. Nondetected results are qualified as (UJ).

The following contaminants were detected in the laboratory method and field quality control blank at the following maximum concentrations for volatiles:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
Methylene chloride	5 ug/Kg	50 ug/Kg
Methylene chloride	1 ug/L	10 ug/L
Acetone	16 ug/Kg	160 ug/Kg

The following contaminants were detected in the laboratory method and field quality control blank at the following maximum concentrations for semi-volatiles:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
di-n-butylphthalate	9 ug/L	2970 ug/Kg
bis(2-ethylhexyl)phthalate	2 ug/L	660 ug/Kg

Samples Affected: All

Sample aliquot, percent solids, and dilution factors were taken into consideration when applying all action levels. Positive results reported for di-n-butylphthalate and bis(2-ethylhexyl)phthalate below the respective action levels were considered false positives and qualified, (B). It should be noted that field quality control blanks were not qualified for field quality control blank contamination.

#### Notes

It should be noted that several low level soil samples contained %RSD's greater than 30% and less than 50% quality control limit for trans-isosafrole (39.8%), cis-isosafrole (40.8%), 1,4-naphthoquinone (47.1%), diphenylamine (35.3%), 1,3,5-trinitrobenzene (42.9%), pronamide (30.2%), methyl patathion (48.7%), 4-nitroquinoline-n-oxide (36.0%), methapyrilene (46.1%), 4-aminoazobenzene (37.3%), o-tolidine (37.1%) and 1,2-dichlorobezene (32.0%). Noncompliant compounds contained only nondetected results, so no qualifications were required.

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DATE: OCTOBER 30, 1997 PAGE 4

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An Appendix IX volatile continuing calibration affecting low level soil samples contained Percent Differences (%D's) greater than 25% but lower than the 50% quality control limit for chloroethane (-27.8%), acetone (-28.2%), acrylonitrile (-43.3%), propionitrile (-37.3%) and methacrylonitrile (-42.2%). No qualifications were made to these compounds since only nondetected results were reported.

It should be noted that several low level soil samples contained %RSD's greater than the 50% quality control limit for famphur (136.1%) and kepone (87.7%). These compounds were not qualified because they had already been qualified for a more serious noncompliance.

It should be noted that several semi-volatile continuing calibration low level soil samples contained Percent Differences (%D's) greater than 25% but lower than the 50% quality control limit for hexachlorocyclopentadiene (39.2%), 2,4-dinitrophenol (47.9%), 4-nitroaniline (45.6%), hexachloropropene (37.5%), 1,4-naphthoquinone (-36.4%), methapyrilene (-49.0%), aramite (39.8%) and famphur (-45.3%). Noncompliant compounds contained only nondetected results, so no qualifications were required.

It should be noted that several semi-volatile continuing calibration low level soil samples contained Percent Differences (%D's) greater than 25% but lower than the 50% quality control limit for 4,6-dinitro-2-methylphenol (-27.0%), 1,3,5-trinitrobenzene (-32.8%), diallate (25.7%), 4-nitroquinoline-n-oxide (-40.5%), methapyraline (-40.5%), famphur (35.8%) and 2-acetylaminofluorene (-33.9%). Noncompliant compounds contained only nondetected results, so no qualifications were required.

It should be noted that sample ABPSB0040101 was reanalyzed at a 5x dilution because acetone exceeded the linear calibration curve of the instrument. Although the dilution still exceeded the calibration the result was still used.

It should be noted that there were some transcription errors. Sample DSBSB0030101 in volatiles reported a result of 220 ug/Kg for acetone, but in the raw data it was reported as 456 ug/Kg.

It should be noted that there were some transcription errors. Sample number on Form 1 = DSBSS0040101 but on the database printout = DSBS20040101.

It should be noted that the matrix spike, matrix spike duplicate recovery for 1,2,4-Trichlorobenzene was below the quality control limit for sample ABPSS0040101.

Samples DSBSB0030101, DSBSB0040201, DSBSS0040101, ABPSS0070101, ABPSS0050101, ABPSB0040201, ABPSB0040101, ABPSB0020201, ABPSB0020101 and ABPSB0030201 were reanalyzed at a dilution due to the high concentration of acetone.

MEMO TO: P. FRANK  
DATE: OCTOBER 30, 1997 PAGE 5

C-49-08-7-041

Executive Summary

**Laboratory Performance:** Blank contamination was noted for methylene chloride, acetone, di-n-butylphthalate, and bis(2-ethylhexyl)phthalate. Several volatile and semivolatile compounds required qualification due to calibration noncompliances. All semivolatile soil samples required qualification due to holding time noncompliances.

**Other Factors Affecting Data Quality:** The volatile analysis of several diluted samples required qualification due to high surrogate recovery. The volatile analysis of samples ABPSS05101DL and DSBSS0040101DL required qualification due to low surrogate recovery.

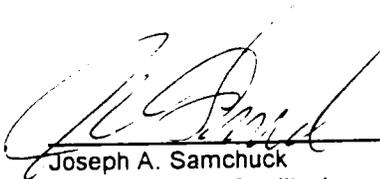
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Daniel J Menicucci  
Data Validator  
Brown and Root Environmental



Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected results as reported by the laboratory.
- UJ - Nondetected result is considered estimated due to initial or continuing calibration noncompliances.
- UR - Nondetected results is rejected due to poor Relative Response Factor.
- J - Positive result is considered estimated due to various technical noncompliances, or the result was below the CRQL.
- B - Positive result is considered a false positive due to blank contamination.
- L - Analyte present. Reported value may be biased low. Actual value is expected to be higher
- (no code) - Confirmed identification



MEMO TO: PAUL FRANK  
DATE: OCTOBER 31, 1997 PAGE 2

C-49-09-7-113

control limit. This noncompliance affects positive and nondetected results. The nondetected results are qualified as rejected (UR).

- A volatile initial calibration, affecting samples, ABPSD0010101, ABPSD0020101, ABPSD0030101 and ABPSD0040101, contained Relative Response Factors (RRFs) for acrolein (0.003), acrylonitrile (0.036), acetonitrile (0.016), propionitrile (0.036), isobutyl alcohol (0.015) and 2-butanone (0.029) that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results are qualified as rejected (UR).
- The volatile continuing calibration affecting samples ABPSD0010101, ABPSD0020101, ABPSD0030101 and ABPSD0040101 had RRF50's for acrolein (0.003), acrylonitrile (0.036), acetonitrile (0.016), propionitrile (0.036), isobutyl alcohol (0.015) and 2-butanone (0.029) less than the 0.05 quality control limit. The nondetected results were rejected (UR).
- The volatile continuing calibration affecting samples BGDTB001 had RRF50's for acrolein (0.011), acrylonitrile (0.037), acetonitrile (0.005), propionitrile (0.021), isobutyl alcohol (0.009), vinyl acetate (0.023) and 2-butanone (0.017) less than the 0.05 quality control limit. The nondetected results were rejected (UR).
- A semivolatile initial calibration, affecting all samples, contained Relative Response Factors (RRFs) for 4-nitroquinoline-n-oxide (0.033), famphur (0.009) and kepone (0.020), that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results are qualified as rejected, (UR). Positive results are qualified as biased low (L).
- The semivolatile continuing calibration affecting samples ABPSD0010101, ABPSD0020101 and ABPSD0040101 had RRF20's for 4-nitroquinoline-n-oxide (0.016), famphur (0.006) and kepone (0.005), less than the 0.05 quality control limit. The nondetected results were rejected (UR). The positive results were qualified as biased low (L).
- The semivolatile continuing calibration affecting samples ABPSD0030101 and ABPSD0040101RE had RRF20's for 4-nitroquinoline-n-oxide (0.028), famphur (0.006) and kepone (0.028), less than the 0.05 quality control limit. The nondetected results were rejected (UR). The positive results were qualified as biased low (L).

#### Minor Problems

- A volatile continuing calibration affecting samples ABPSD0010101, ABPSD0020101, ABPSD0030101 and ABPSD0040101 had Percent Differences (%D's) greater than the 50% quality control limit for iodomethane (-111.1%). This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated (UJ).
- The volatile analysis of ABPSD0030101 had a Percent Recovery (%R) of 62% for the system monitoring compound 1,2-dichlorobenzene-d4 which is below the quality control limit. The positive and nondetected results reported from the aforementioned analysis were qualified as estimated, (J) and (UJ) respectively.
- The technical holding time from date of collection to date of extraction for all samples exceeded the fourteen (14) day holding time for semivolatiles. Positive and nondetects are both affected. Positive results are qualified as estimated (J) and nondetects are qualified as estimated (UJ).

MEMO TO: PAUL FRANK  
DATE: OCTOBER 31, 1997 PAGE 3

C-49-09-7-113

- A semivolatile initial calibration affecting all samples had relative standard deviation (RSD%) greater than the 50% quality control limit for 1,4-phenylenediamine (68.8%), 1,2-diphenylhydrazine (51.3%), dimethoate (59.2%). This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated (UJ).
- A semivolatile continuing calibration affecting samples ABPSD0030101 and ABPSD0040101RE had Percent Differences (%D's) greater than 25% but lower than the 50% quality control limit for n-nitrosodimethylamine (29.8%), 1,4-naphthoquinone (-35.9%), 5-nitro-o-toluidine (43.4%), dilate (35.6%), ethyl parathion (-29.1%), methapyrilene hydrochloride (-25.7%), 4-aminoazobenzene (-31.9%), aramite (27.9%), famphur (29.1%), kepone (-45.0%) and 2-acetylaminofluorene (-31.2%). The noncompliance only affects positive results which are qualified as estimated (J).
- A semivolatile continuing calibration affecting samples ABPSD0010101, ABPSD0020101 and ABPSD0040101 had Percent Differences (%D's) greater than the 50% quality control limit for benzoic acid (-55.1%), trans-Isosafrole (57.0%), cis-Isosafrole (56.7%), dimethoate (-60.1%), methyl parathion (-74.6%), 4-nitroquinoline-n-oxide (50.3%) and kepone (59.5%). This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated (UJ). Positive results are qualified as estimated (J).
- A semivolatile continuing calibration affecting samples ABPSD0030101 and ABPSD0040101RE had Percent Differences (%D's) greater than the 50% quality control limit for trans-Isosafrole (57.2%), cis-Isosafrole (56.8%), dimethoate (-63.0%) and methyl parathion (-86.7%). This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated (UJ). Positive results are qualified as estimated (J).
- The semivolatile analysis of ABPSD0040101 had low responses for internal standards for perylene-d12. This noncompliance affected all compounds for the sample. Both positive and nondetected results are affected. Positive results are qualified as estimated (J) and nondetects are qualified as estimated (UJ).

The following contaminants were detected in the laboratory method and field quality control blank at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
Methylene Chloride	5 ug/Kg	50 ug/kg
Methylene Chloride	2 ug/L	20 ug/L

Samples Affected: All

Sample aliquot, percent solid, and dilution factors were taken into consideration when applying all action levels. Positive results reported below the respective action levels were considered false positives and qualified, (B). It should be noted that field quality control blanks were not qualified for field quality control blank contamination.

#### Notes

It should be noted that the Appendix IX volatile compounds 1,4-dioxane and ethyl methacrylate were not reported in the volatile fraction, but instead were reported in the semivolatile fraction.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 31, 1997 PAGE 4

C-49-09-7-113

It should be noted that the Appendix IX semivolatile compounds Thionazin, Disulfoton, ethyl Parathion, and methyl Parathion were not reported on either the Form Is or the electronic data, but were calibrated in the semivolatile analyses.

Several semivolatile compounds in the initial calibration contained %RSDs greater than the 30% quality control limit, but less than the 50% quality control limit. As per Region III guidance, since only nondetected results were reported for these compounds, no validation action was taken.

Several semivolatile compounds in the continuing calibrations contained %RSDs greater than the 25% quality control limit, but less than the 50% quality control limit. As per Region III guidance, since only nondetected results were reported for these compounds, no validation action was taken.

The volatile initial calibration affecting samples ABPSD0020101RE and ABPSD0030101RE had a %D greater than the 25% quality control limit for chloromethane, carbon disulfide, allyl chloride and vinyl acetate. Since this noncompliance only affects positive results and no positive results were reported, no validation action was taken.

The volatile initial calibration affecting sample BGDTB001 had a %D greater than the 25% quality control limit for bromomethane, iodomethane and acetone. Since this noncompliance only affects positive results and no positive results were reported, no validation action was taken.

The volatile initial calibration affecting samples ABPSD0010101, ABPSD0020101, ABPSD0030101 and ABPSD0040101 had a %D greater than the 25% quality control limit for dichlorodifluoromethane, chloromethane, bromomethane, acetonitrile, propionitrile and allyl chloride. Since this noncompliance only affects positive results and no positive results were reported, no validation action was taken.

The volatile initial calibration affecting samples BGDTB001 had a %RSD greater than the 30% quality control limit for bromomethane. Since this noncompliance only affects positive results and no positive results were reported, no validation action was taken.

The semivolatile matrix spike and matrix spike duplicate recovery for sample ABPSD0010101 affecting 1,4-dichlorobenzene and 1,2,4-trichlorobenzene had results lower than the quality control limit.

No qualifications were required while validating the explosive data section.

#### Executive Summary

**Laboratory Performance:** The holding time for semivolatile extraction was exceeded along with some volatiles. Blank contamination was noted for methylene chloride. Several volatile and semivolatile compounds required qualification due to calibration noncompliance's.

**Other Factors Affecting Data Quality:** Low internal standard areas were reported for several internal standards in several samples.

MEMO TO: PAUL FRANK  
DATE: OCTOBER 31, 1997 PAGE 5

C-49-09-7-113

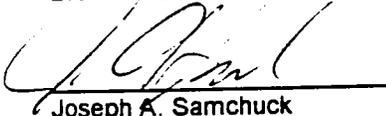
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Daniel J Menicucci  
Data Validator  
Brown and Root Environmental



Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected result as reported by the laboratory.
- UJ - Nondetected result is estimated
- UR - Nondetected results is rejected
- J - Positive result is estimated
- B - Positive result is considered a false positive due to blank contamination.



## Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-113

TO: PAUL FRANK

DATE: OCTOBER 31, 1997

FROM: DANIEL MENICUCCI

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - APPENDIX IX AND TCL VOAS AND SVOAS; TCL  
EXPLOSIVES  
CTO 287 INDIAN HEAD, MARYLAND  
SDG - 9708059

SAMPLES: 1/Aqueous

FB002

### Overview

The sample set for CTO 287 Indian Head, Maryland, SDG 9708059, consists of one (1) aqueous environmental samples. The field crew specified sample DSBMW001V001 for Matrix Spike/ Matrix Spike Duplicate analysis in this SDG

All of the samples were analyzed for Appendix IX volatiles and semivolatiles, and TCL explosives. The samples were collected by Brown and Root Environmental on August 7, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The VOAs and SVOAs analyses were conducted according to SW-846 Methods 8260A and 8270 respectively. The explosives analyses were conducted according to SW-846 method 8330.

### Summary

All analytes were successfully analyzed except those that were rejected. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, GCMS tuning, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification and detection limits.

Areas of concern with respect to data quality are listed below.

### Major Problems

- A volatile initial calibration, affecting sample FB002, contained Relative Response Factors (RRFs) for acrolein (0.011), acrylonitrile (0.037), acetonitrile (0.005), propionitrile (0.022), isobutyl alcohol (0.010), 2-butanone (0.017) and vinyl acetate (0.022) that were less than the 0.05 quality control limit. The nondetected results are qualified as rejected, (UR).

- The volatile continuing calibration affecting sample FB002 had RRF50's for acrolein (0.011), acetonitrile (0.005), propionitrile (0.022), isobutyl alcohol (0.010), vinyl acetate (0.017) and 2-butanone (0.029) less than the 0.05 quality control limit. The nondetected results were rejected (UR).
- A semivolatile initial calibration, affecting sample FB002, contained Relative Response Factors (RRFs) for 4-nitroquinoline-n-oxide (0.033), famphur (0.009) and kepone (0.020), that were less than the 0.05 quality control limit. This noncompliance affects positive and nondetected results. The nondetected results are qualified as rejected, (UR).
- The semivolatile continuing calibration affecting sample FB002 had RRF20's for 4-nitroquinoline-n-oxide (0.045), famphur (0.004) and kepone (0.012), less than the 0.05 quality control limit. The nondetected results were rejected (UR).

#### Minor Problems

- A semivolatile initial calibration affecting sample FB002 had relative standard deviation (RSD%) greater than the 50% quality control limit for 1,4-phenylenediamine (68.8%), dimethoate (59.2%), famphur (136.1%) and kepone (87.7%). This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated (UJ).
- A semivolatile continuing calibration affecting sample FB002 had Percent Differences (%D's) greater than the 50% quality control limit for 1,4-dioxane (58.3%), a,a-dimethylphenethylamine (61.5%), 1,4-phenylenediamine (55.1%), sulfotepp (-51.6%), methapyrilene hydrochloride (65.5%), aramite (53.3%), famphur (51.6%) and 4-nitroaniline (54.8%). This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated (UJ).

The following contaminant was detected in the laboratory method and field quality control blank at the following maximum concentration for volatiles:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
Methylene Chloride	4 ug/L	40 ug/L

Samples Affected: FB002

The following contaminants were detected in the laboratory method and field quality control blank at the following maximum concentrations for semivolatiles:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
Di-n-butylphthalate	2 ug/L	20 ug/L

Samples Affected: FB002

Sample aliquot and dilution factors were taken into consideration when applying all action levels. Positive results reported below the respective action levels were considered false positives and qualified, (B).

## Notes

Several semivolatile compounds in the initial calibration contained %RSDs greater than the 30% quality control limit, but less than the 50% quality control limit. As per Region III guidance, since only nondetected results were reported for these compounds, no validation action was taken.

Several semivolatile compounds in the continuing calibrations contained %RSDs greater than the 30% quality control limit, but less than the 50% quality control limit. As per Region III guidance, since only nondetected results were reported for these compounds, no validation action was taken.

The volatile initial calibration affecting samples FB002 had a %D greater than the 25% quality control limit for chloromethane, acrolein, acrylonitrile and vinyl acetate. Since this noncompliance only affects positive results and no positive results were reported, no validation action was taken.

The semivolatile matrix spike and matrix spike duplicate recovery for sample SP5ESAIC02 affecting 2,4-dinitrotoluene, 4-nitrophenol and pentachlorophenol had results above the the quality control limit.

The semivolatile surrogate recovery for sample FB002 had percent recovery for 2,4,6 tribromophenol above the quality control limit. No action is taken since only one fractional surrogate is outside the quality control limits.

No qualifications were required while validating the explosive data section.

## Executive Summary

**Laboratory Performance:** Blank contamination was noted for methylene chloride. Several volatile and semivolatile compounds required qualification due to calibration noncompliances.

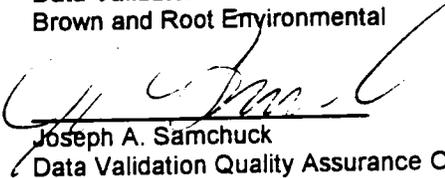
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

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Daniel J Mericucci  
Data Validator  
Brown and Root Environmental



Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected results as reported by the laboratory.
- UJ - Nondetected result is considered estimated as a result of various technical noncompliances.
- UR - Nondetected result is rejected as a result of poor Relative Response Factor.
- J - Positive result is considered estimated as a result of various technical noncompliances.
- B - Positive result is considered a false positive due to blank contamination.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-113

TO: PAUL FRANK

DATE: NOVEMBER 3, 1997

FROM: DANIEL MENICUCCI

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - EXPLOSIVES;  
CTO 287 INDIAN HEAD, MARYLAND  
SDG - 9708020

SAMPLES: 15/Soil

DSBSS0050101	DSBSB0050101	DSBSS0060101
DSBSB0060101	DSBSS0080101	DSBSB0080101
DSBSS0090101	DSBSB0090101	DSBSS0100101
DSBDUP016	DSBDUP015	DSBDUP014
DSBSB0100101	DSBSS0070101	DSBSB0070101

## Overview

The sample set for CTO 287 Indian Head, Maryland, SDG 9708020, consists of fifteen (15) soil environmental samples. Three field duplicate pairs, samples DSBDUP015 / DSBSB00550101, DSBDUP014 / DSBSS0050101 and DSBDUP016 / DSBSS0090101 was included in this SDG. The field crew specified samples DSSBSS0060101, DSBSB0060101, DSBSS0080101, DSBSB0080101 and DSBSB0070101 for Matrix Spike/ Matrix Spike Duplicate analysis in this SDG

The samples were collected by Brown and Root Environmental on August 2, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The explosive analyses were conducted according to SW-846 methods 8080A and 8330 respectively

## Summary

The findings offered in this report were based upon a general review of all available data including data completeness, holding times, GCMS tuning, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification and detection limits.

Areas of concern with respect to data quality are listed below.

### Notes

It should be noted that both sets of duplicate samples had no positive results, so field percision could not be calculated.

### Executive Summary

**Laboratory Performance:** No qualifications were required.

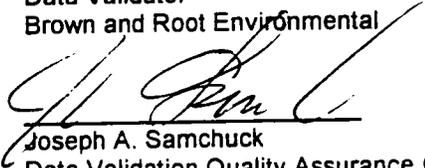
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", September 1994 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Daniel J Menicucci  
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Brown and Root Environmental



Joseph A. Samchuck  
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**DATA QUALIFIER TABLE:**

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- UJ - Nondetected result is considered estimated on account of initial/ continuing calibration noncompliance's, or exceedance of holding time.
- UR - Nondetected results is rejected on account of poor Relative Response Factor.
- J - Positive result is considered estimated on account of initial/ continuing calibration noncompliance's, or the exceedance of holding time, result was below the CRQL.
- B - Positive result is considered a false positive due to blank contamination.
- K - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L - Analyte present. Reported value may be biased low. Actual value is expected to be higher



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-041

TO: Paul Frank

DATE: NOVEMBER 3, 1997

FROM: Daniel Menicucci

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION - APPENDIX IX VOAS, SVOAS; PEST/PCBS  
CTO 273 NSWC INDIAN HEAD, MARYLAND  
SDG - 9707083

SAMPLES: 5/Soil

RPLSS0040101  
RPLSB0040201DL

RPLSB0040201  
RPLDUP010

RPLSB0040301

2/Aqueous

BGDRB009071597 BGDTB001

## Overview

The sample set for CTO 287 Naval Surface Warfare Center (NSWC) Indian Head, Maryland, SDG 9707083, consists of five (5) soil samples and two (2) aqueous environmental samples. One field duplicate pair, samples RPLSS0040101 / RPLDUP010, was included in this SDG. The field crew specified sample RN3SS0100101 for Matrix Spike/ Matrix Spike Duplicate analysis in this SDG.

All of the samples, except RN3SS0100101, were analyzed for Appendix IX volatiles, semivolatiles, pesticides/PCBs. The samples were collected by Brown and Root Environmental on July 15, 1997 and analyzed by GP Environmental Services Incorporated under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The Appendix IX VOAs and SVOAs analyses were conducted according to methods 8260A, 8270B, SW-846 and 8080A.

## Summary

All analytes were successfully analyzed. The findings offered in this report were based upon a general review of all available data including data completeness, holding times, GCMS tuning, calibration data, laboratory and field quality control blank results, Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) analyses, surrogate spike recoveries, internal standards performance, Laboratory Control Sample (LCS) analyses, field duplicate results, compound identification and quantification and detection limits.

Areas of concern with respect to data quality are listed below.

MEMO TO: Paul Frank  
DATE: NOVEMBER 3, 1997 PAGE 2

C-49-08-7-041

### Major Problems

- The Appendix IX volatile initial calibration of several samples contained Relative Response Factors (RRFs) for acrolein, 2-butanone and/or acrylonitrile, Isobutyl Alcohol, Acetonitrile, and Propionitrile less than the 0.05 quality control limit. The nondetected results for the sample were rejected (UR).
- The Appendix IX volatile continuing calibration affecting several samples contained (RRF50's) for acrolein, 2-butanone and/or acrylonitrile, propionitrile, Isobutyl alcohol, and acetonitrile had RRF50's less than the 0.05 quality control limit. The nondetected results were rejected (UR). The positive results were qualified as biased (L).
- The Appendix IX semivolatile initial calibration, affecting samples RPLSS0040101, RPLDUP010, RPLSB0040101, RPLSB0040201, RPLSB0040301, and BGDRB009 had Relative Response Factors (RRFs) for 4-nitroquinoline-n-oxide(0.033), famphur (0.009) and kepone (0.020) less than the 0.05 quality control limit. The nondetected results were qualified as being rejected, (UR). The positive results for acetone were qualified as biased low, (L).
- The Appendix IX semivolatile continuing calibration affecting several samples contained RRFC's for 4-nitroquinoline-n-oxide, famphur and kepone less than the 0.05 quality control limit. The nondetected results were rejected (UR). The positive results were qualified as biased (L).

### Minor Problems

- A Appendix IX volatile initial calibration affecting samples RPLDUP010, RPLSB0040101, RPLSB0040201, RPLSB0040301 and RPLSS0040101 had percent relative standard deviation greater than 30% and less than 50% quality control limit for acetone (31.1%). This noncompliance affects only positive results. Results are reported as estimated (J).
- A Appendix IX volatile continuing calibration affecting several samples contained Percent Differences (%D's) greater than the 50% quality control limit for acetonitrile, acrolein and allyl chloride. This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated, (UJ). Positive results are qualified as estimated (J).
- A Appendix IX volatile continuing calibration affecting samples BGDTB001 and BGDRB009 had Percent Differences (%D's) greater than 25% but lower than the 50% quality control limit for acetonitrile (50.0%), acrylonitrile (43.5%), 1\_2-dibromon-3-cholorpropane (32.4%), 2-butanone (44.9%), Dichlorodifluoromethane (42.4%), isobutyl alcohol (26.8%), vinyl acetate (49.8%), 4-methyl-2-pentanone (35.3%), 2-hexanone (32.1%), trichlorofluoromethane (25.8%). The noncompliance only affects positive results which are qualified as estimated (J).
- A Appendix IX volatile continuing calibration affecting samples RPLDUP010, RPLSB0040101, RPLSB0040201, RPLSB0040301 and RPLSS0040101 had Percent Differences (%D's) greater than 25% but lower than the 50% quality control limit for acetone (29.0%), propioitrile (31.4%), methacrylonitrile (37.1%), methyl methacrylate (31.3%). The noncompliance only affects positive results which are qualified as estimated (J).
- A Appendix IX semivolatile continuing calibration affecting sample BGDRB009 had percent differences (%D's) greater than 25% and less than 50% quality control limit for methyl methacrylate (27.3%), hexachloropropene (43.1%), 1,4-naphthoquinone (34.0%), 5-nitro-o-toludine (33.6%),

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- diphenylamine(35.2%), sulfotepp (37.7%), 1,3,5-trinitrobenzene (37.7%), methopyrilene (43.0%), aramite (44.1%), hexachlorocyclopentadiene (43.8%), n-nitrosodiphenylamine (29.5%), 3-3'-dichlorobenzidine (38.2%). This noncompliance affects only positive results. Results are reported as estimated (J).
- A Appendix IX semivolatile initial calibration affecting samples RPLDUP010, RPLSB0040101, RPLSB0040201, RPLSB0040301, RPLSS0040101 and BGDRB009 had percent relative standard deviation greater than 30% and less than 50% quality control limit for trans-isosafrole (39.8%), cis-isosafrole (40.8%), 1,4-naphthoquinone (47.1%), diphenylamine (35.3%), 1,3,5-trinitrobenzene (42.9%), pronamide (30.2%), 4-nitroquinoline-n-oxide (36.0%), 0-tolidine (37.1%), 1,2-dichlorobenzene (32.0%). This noncompliance affects only positive results. Results are reported as estimated (J).
  - A Appendix IX semivolatile initial calibration affecting samples RPLDUP010, RPLSB0040101, RPLSB0040201, RPLSB0040301, RPLSS0040101 and BGDRB009 had relative percent standard deviations (%RSD's) greater than the 50% quality control limit for 1,4-phenylenediamine (68.8%), dimethoate (51.3%), famphur (136.1%), kepone (87.7%). This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated, (UJ). Positive results are qualified as estimated (J).
  - A Appendix IX semivolatile continuing calibration affecting sample BGDRB009 had Percent Differences (%D's) greater than the 50% quality control limit for trans-isosafrole (56.5%), cis-isosafrole (56.1%), dimethoate (106.3%), famphur (57.7%), 2,4-dinitrophenol (51.1%). This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated, (UJ). Positive results are qualified as estimated (J).
  - A Appendix IX semivolatile continuing calibration affecting samples RPLDUP010, RPLSB0040101, RPLSB0040201, RPLSB0040301 and RPLSS0040101 had Percent Differences (%D's) greater than 25% but lower than the 50% quality control limit for n-nitrosomorpholine (25.9%), hexachloropropene (47.7%), 1,4-nitroquinoline-n-oxide (41.9%), hexachlorocyclopentadiene (46.3%), 4-nitroaniline (38.6%), 4,6-dinitro-2-methylphenol (25.3%), pentachlorophenol (28.9%). The noncompliance only affects positive results which are qualified as estimated (J).
  - A Appendix IX semivolatile continuing calibration affecting samples RPLDUP010, RPLSB0040101, RPLSB0040201, RPLSB0040301 and RPLSS0040101 had Percent Differences (%D's) greater than the 50% quality control limit for trans-ososaffraloe (58.0%), cis-isosafrole (57.6%), dimethoate (95.1%), famphur (66.2%), kepone (61.4%), 2,4-dinitrophenol (52.0%), 3,3-dichlorobenzidine (50.3%). This noncompliance affects positive and nondetected results. The nondetected results reported in the affected samples were qualified as estimated, (UJ). Positive results are qualified as estimated (J).
  - A Appendix IX pesticide initial calibration affecting sample BGDRB009 has a relative percent difference for ar1221 (21.94%), ar1254 (21.84%) greater than the 20% quality control limit. This noncompliance affects positive results. Positive results are qualified as estimated (J).
  - A Appendix IX pesticide initial calibration affecting samples BGDSS0010101 and BGDSS0010101 has a relative percent difference for ar1016 (20.42%), ar1254 (21.86%), ar1260 (20.73%) and ar1221 (20.49%) greater than the 20% quality control limit. This noncompliance affects positive results. Positive results are qualified as estimated (J).

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 DATE: NOVEMBER 3, 1997 PAGE 4

- A Appendix IX pesticide continuing calibration affecting sample BGDRB009 had percent differences (%D's) for ar1221 (100.0%) and ar1254 (100.0%) greater than the 50% quality control limit. This noncompliance affects both positive and nondetected results. Positive results are qualified as estimated (J) and nondetects are qualified as estimated (UJ),
- A Appendix IX pesticide continuing calibration affecting samples BGDSS0010101 and BGDSS0010101 had percent differences (%D's) for ar1016 (100.0%), ar1260 (100.0%), ar1221 (100.0%) and ar1254 (100.0%) greater than the 50% quality control limit. This noncompliance affects both positive and nondetected results. Positive results are qualified as estimated (J) and nondetects are qualified as estimated (UJ),
- The technical holding time from date of collection to date of extraction for samples RPLSS0040101, RPLDUP010, RPLSB0040101, RPLSB0040201, and RPLSB0040301 exceeded the seven (7) day holding time for semivolatiles. Positive and nondetects both affected. Positive results are qualified as estimated (J) and nondetects are qualified as estimated (UJ).
- The technical holding time from date of collection to date of extraction for samples BGDSB0010101 and BGDSS0010101 exceeded the seven (7) day holding time for pesticides. Positive and nondetects both affected. Positive results are qualified as estimated (J) and nondetects are qualified as estimated (UJ).
- The percent breakdown for DDT for samples BGDSS0010101 and BGDSS0010101 for RTX-5 (20.72%), and RTX-1701 (22.58%) exceeded the 20% quality control limit. Positive results are effected. Postive results are qualified as biased low (L).
- The following contaminants were detected in the laboratory method and field quality control blank at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action-Level</u>
Acetone	14 ug/Kg	140 ug/Kg

Samples Affected: All

Sample aliquot size and dilution factors were taken into consideration when applying all action levels. Positive results reported for methylene chloride below the respective action levels were considered false positives and qualified, (B). It should be noted that field quality control blanks were not qualified for field quality control blank contamination

#### Notes

It should be noted that sample RPLSS0040101 is a field duplicate of RPLDUP010. It should also be noted that toluene was detected in RPLSS0040101 but not detected in RPLDUP010.

It should be noted that sample RPLSS0040201DL had a percent recovery for benzene outside of the internal lab limits. It was disregarded since only the acetone from that sample was considered.

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**C-49-08-7-041**

It should be noted that sample RPLSS0040201 had to be reanalyzed at a 5x dilution due to acetone exceeding the calibration level. It should also be noted that the dilution sample was disregarded except for the acetone result.

**Executive Summary**

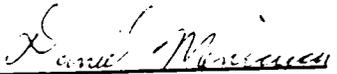
**Laboratory Performance:** Blank contamination was noted for methylene chloride. Several pesticide compounds required qualification due to holding time noncompliance's. Several volatile, semivolatile, and pesticide compounds yielded noncompliance due to data calibration.

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DATE: NOVEMBER 3, 1997 PAGE 6

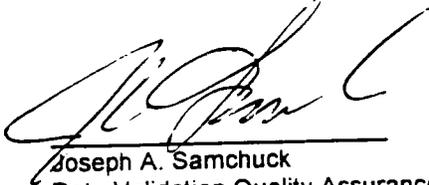
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Validation", April 1993 Revision as amended for use within USEPA Region III, and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."



Dan Menicucci  
Data Validator  
Brown and Root Environmental



Joseph A. Samchuck  
Data Validation Quality Assurance Officer  
Brown and Root Environmental

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

**DATA QUALIFIER TABLE:**

- U - Value is a nondetected results as reported by the laboratory.
- UJ - Nondetected result is considered estimated due to initial or continuing calibration noncompliance's.
- UR - Nondetected results is rejected due to poor Relative Response Factor.
- J - Positive result is considered estimated due to various technical noncompliance's, or the result was below the CRQL.
- B - Positive result is considered a false positive due to blank contamination.
- L - Analyte present. Reported value may be biased low. Actual value is expected to be higher.



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-210

TO: P. FRANK

DATE: NOVEMBER 4, 1997

FROM: PAMELA A. KORYAK

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION- APPENDIX IX VOLATILE AND SEMIVOLATILE ORGANICS  
CTO 287, NSWC INDIAN HEAD, MARYLAND  
SDG 9708099

SAMPLES: 5/Soil/VOA/SVOA

RN3SD0010101  
RN3SD0040101

RN3SD0020101  
RN3DUP017

RN3SD0030101

3/Aqueous/VOA

RN3SW0010101

RN3SW0020101

RN3TB001

2/Aqueous/SVOA

RN3SW0010101

RN3SW0020101

## Overview

The sample set for the CTO 287 NSWC Indian Head Naval Base site, SDG 9708099, consists of five (5) solid environmental samples, two aqueous environmental samples, and one (1) trip blank (designated-TB). The samples were analyzed for Target Compound List (TCL) volatile and semivolatile organic compounds. The field crew designated one sample (RN3SD0010101) for Matrix Spike/Matrix Spike Duplicate analyses. One field duplicate pair (RN3DUP017/RN3SD0030101) was included in this SDG.

The samples were collected by Brown and Root Environmental on August 14th and 15th, 1997 and analyzed by GP Environmental under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The volatile analyses were conducted using EPA method 8260A. The samples were analyzed for semivolatile compounds using EPA method 8270B.

## Summary

All compounds were successfully analyzed with the exception of those qualified as rejected. The findings

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offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standards performance, tentatively identified compounds, compound identification and compound quantitation. Areas of concern with respect to data quality are listed below.

#### Major Problems

- The initial and continuing calibration Relative Response Factors (RRFs) for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, vinyl acetate, 4-nitroquinoline-N-oxide, famphur, and kepone were less than 0.05. Only nondetected results were reported for these compounds in the affected samples. The results were qualified as rejected, UR.
- The initial Relative Response Factor (RRF) for 2-butanone was less than 0.05. Positive and nondetected results were reported for this compound in the affected samples. The results were qualified as biased low, L, and rejected, UR, respectively.

#### Minor Problems

- Initial calibration Percent Relative Standard Deviations (%RSDs) greater than 50% were reported for p-phenylenediamine, methapyrilene, dimethoate, famphur, and kepone. Only nondetected results were reported for these compounds in the affected samples. The results reported for these compounds in the affected samples were qualified as estimated, (UJ). The direction of bias cannot be determined.
- Continuing calibration %Ds greater than 50% were reported for a,a-dimethylphenethylamine, p-phenylenediamine, aramite, and famphur. Only nondetected results were reported for these compounds in the affected samples. The results were qualified as estimated for these compounds in the affected samples were qualified as estimated, (UJ). The direction of bias cannot be determined.
- The following table summarizes the maximum concentrations of volatile and semivolatile compounds detected in laboratory method and/or field quality control blanks analyzed in this SDG.

<u>Compound</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
methylene chloride	2 $\mu\text{g}/\text{kg}$	20 $\mu\text{g}/\text{kg}$
methylene chloride	2 $\mu\text{g}/\text{L}$	20 $\mu\text{g}/\text{L}$

Percent moisture, aliquot size, and dilution factors were considered during application of all action levels. Positive results reported for these compounds in the associated samples at concentrations less than the respective action levels are considered false positives and are qualified, (B). Note that field quality control blanks are not qualified based on field quality control blank contamination.

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- Positive results reported at concentrations below the CRQL are considered to be estimated and are qualified (J). The direction of the bias cannot be determined.

#### Notes

An initial calibration Percent Relative Standard Deviation (%RSD) greater than 30% was reported for bromomethane. Only nondetected results were reported in the affected samples. According to guidance, no action was taken.

An initial calibration Percent Relative Standard Deviation (%RSD) greater than 30% was reported for trans-isosafrole, cis-isosafrole, 1,4-naphthoquinone, diphenylamine, 1,3,5-trinitrobenzene, pronamide, 1,2-dichlorobenzene, 4-nitroquinoline-N-oxide, and o-tolidine. Only nondetected results were reported in the affected samples. According to guidance, no action was taken.

Continuing calibration %Ds greater than 25% were reported for acetone, vinyl acetate, dichlorodifluoromethane, isobutyl alcohol. Only nondetected results were reported for these compounds in the affected samples and therefore, according to guidance, no action was taken.

Continuing calibration %Ds greater than 25% were reported for 2,2'-oxybis(1-chloropropane), hexachloroethane, isophorone, 2-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, 1,4-dioxane, N-nitrosodimethylamine, pyridine, ethyl methacrylate, 2-picoline, aniline, hexachloropropene, trans-isosafrole, cis-isosafrole, sulfotepp, 2-acetylaminofluorene, 4-nitroquinoline-N-oxide, kepone, pentachloronitrobenzene, and dimethoate. Only nondetected results were reported for these compounds in the affected samples and therefore, according to guidance, no action was taken.

The soil surrogate recovery for 1,2-dichloroethane-d4 for sample RN3SD0010101MS was outside of the quality control limit. No action was taken based on this noncompliance.

The soil surrogate recovery for 2-fluorobiphenyl for sample RN3SD0010101 was outside of the quality control limit. No action was taken based on this noncompliance since only one semivolatile surrogate was outside of the limits.

The %Recoveries (%Rs) in soil sample VLCS0825 exceeded the quality control limit for 1,1-dichloroethene and 1,1,1-trichloroethene. According to guidance, no action was taken.

The %Recovery (%R) in aqueous sample VLCS0827 exceeded the quality control limit for 1,1-dichloroethene. According to guidance, no action was taken.

The Matrix Spike/Matrix Spike Duplicate recoveries were less than the quality control limits for 1,2,4-trichlorobenzene in sample RN3SD0010101. No action was taken according to guidance.

Sample RN3SD0010101 was reanalyzed at a five-fold dilution due to high levels of acetone.

#### Executive Summary

**Laboratory Performance:** The initial calibration %RSD for p-phenylenediamine, dimethoate, methapyrilene, famphur, and kepone were greater than 50%. Several initial calibration %RSDs for semivolatile compounds and bromomethane exceeded 30%. The initial and continuing calibration RRFs

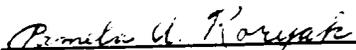
MEMO TO: P. FRANK  
DATE: NOVEMBER 4, 1997- PAGE 4

for several volatile and semivolatile compounds were less than 0.05. Several continuing calibration %Ds for volatile and semivolatile compounds were greater than 25%. The %Rs exceeded the quality control limits for the volatile fraction in the soil laboratory control sample VLCS0825 and aqueous laboratory control sample VLCS0827. Methylene chloride was detected in soil and aqueous method blanks and in the trip blank.

**Other Factors Affecting Data Quality:** Noncompliant MS/MSD %Rs were reported in the semivolatile fraction. Positive results reported at concentrations below the CRQL are considered to be estimated.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Review" (9/94), as amended for use within EPA Region III, and the NFESC guidelines entitled "Navy Installation Restoration Program Laboratory Quality Assurance Guide"(February, 1996).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

  
Brown and Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- J - Estimate positive results for various technical reasons (i.e. calibration noncompliances).
- B - Result reflects blank contamination.
- L - Result is considered biased low for technical reasons.
- UJ - Nondetected result is considered estimated due to technical reasons (i.e. calibration noncompliances).
- UR - Nondetected result is considered rejected due to calibration noncompliances.

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**Summary of Tentatively Identified Compounds (TICs)**

<b>Fraction</b>	<b>TIC</b>
Volatile	None
Semivolatiles	None



# Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-09-7-052

TO: P. FRANK

DATE: NOVEMBER 4, 1997

FROM: PAMELA A. KORYAK

COPIES: DV FILE

SUBJECT: ORGANIC DATA VALIDATION- VOLATILE AND SEMIVOLATILE ORGANICS  
CTO 287, NSWC INDIAN HEAD, MARYLAND  
SDG 9707050

SAMPLES: 5/Soil/VOA

RN3SS0100101  
RN3SS0140101

RN3SS0130101  
RN3SB0140101

RN3SB0130101

1/Aqueous/VOA

RN3RB005070997

5/Soil/SVOA

RN3SS0100101  
RN3SS0140101

RN3SS0130101  
RN3SB0140101

RN3SB0130101

1/Aqueous/SVOA

RN3RB005070997

## Overview

The sample set for the CTO 287 NSWC Indian Head Naval Base site, SDG 9707050, consists of five (5) solid environmental samples and one (1) nnsate blank (designated-RB). The samples were analyzed for Appendix IX volatile and semivolatile organic compounds. The field crew designated one sample (RN3SS0100101) for Matrix Spike/Matrix Spike Duplicate analyses. This SDG did not include any duplicate pairs.

The samples were collected by Brown and Root Environmental on July 9th, 1997 and analyzed by GP Environmental under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The volatile analyses were conducted using EPA method 8260A. The samples were analyzed for semivolatile and select Appendix IX compounds using EPA method 8270B.

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### Summary

All compounds were successfully analyzed. The findings offered in this report are based upon a general review of all available data including data completeness, holding times until analysis, GC/MS tuning and calibration data, laboratory and field blank results, surrogate spike recoveries, matrix spike/matrix spike duplicate results, internal standards performance, compound identification and compound quantitation. Areas of concern with respect to data quality are listed below.

### Major Problems

- The initial and continuing calibration Relative Response Factors (RRFs) for acrolein, acrylonitrile, acetonitrile, propionitrile, isobutyl alcohol, vinyl acetate, 2-butanone, 4-nitroquinoline-N-oxide, famphur, and kepone were less than 0.05. Only nondetected results were reported for these compounds in the affected samples. The results were qualified as estimated, UR.
- The continuing calibration Relative Response Factors (RRFs) for 3-nitroaniline, 1,4-dioxane, 4-nitroquinoline-N-oxide, famphur and kepone were less than 0.05. Only nondetected results were reported for these compounds in the affected samples. These results were qualified as estimated, UR.

### Minor Problems

- An initial calibration Percent Relative Standard Deviation (%RSD) greater than the 50% quality control limit was reported for p-phenylenediamine, dimethoate, famphur, and kepone. Only nondetected results were reported for these compounds in the affected samples and these samples were qualified as estimated, (UJ). The direction of bias cannot be determined.
- An initial calibration Percent Relative Standard Deviation (%RSD) greater than 30% was reported for acetone. Positive results were qualified as estimated, (J), in the affected samples. The direction of bias cannot be determined.
- Continuing calibration %Ds greater than 50% were reported for acetonitrile, 3-nitroaniline, and 1,4-dioxane. Only nondetected results were reported for these compounds in the affected samples and these results were qualified as estimated, UJ, in the affected samples. The direction of bias cannot be determined.
- The continuing calibration %D greater than 25% was reported for acetone. Positive results in the affected samples were qualified as estimated, (J). The direction of bias cannot be determined.
- The following table summarizes the maximum concentrations of volatile and semivolatile compounds detected in laboratory method and/or field quality control blanks analyzed in this SDG.

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	<u>Maximum Concentration</u>	<u>Action Level</u>
acetone*	43 µg/L	430 µg/L, 430 µg/kg
methylene chloride*	5 µg/L	50 µg/L, 50 µg/kg
di-n-butyl phthalate	6 µg/L	60 µg/L, 1980 µg/kg

\* - Maximum concentration determined from field quality control blank.

- The internal standard areas for fluorobenzene, 1,4-difluorobenzene, and chlorobenzene-d5 were less than the quality control limits for sample RN3SS0130101. Positive and nondetected results are affected by these noncompliances. The associated compounds were qualified as estimated, J and UJ, respectively, in the affected sample. The direction of bias cannot be determined. The original sample was used in the validation of this SDG, since the reanalysis was outside of the holding time.
- Positive results reported at concentrations below the CRQL are considered to be estimated and are qualified (J). The direction of the bias cannot be determined.

#### Notes

Samples RN3SS0130101 and RN3SB0130101 were reanalyzed by medium level analyses due to acetone exceeding the calibration level. The medium level analyses were performed one day outside the holding time. Therefore, the original analyses for sample RN3SB0130101 was used in the validation of this SDG with the exception of the result for acetone which was taken from the medium level sample.

Initial calibration Percent Relative Standard Deviations (%RSDs) greater than 30% were reported for acetone, trans-isosafrole, cis-isosafrole, 1,4-naphthoquinone, 1,3,5-trinitrobenzene, 4-nitroquinoline-N-oxide, methapyrilene, o-tolidine, and 1,2-dichlorobenzene. Only nondetected results were reported in the affected samples, except for acetone. According to guidance, no action was taken for nondetected results.

Continuing calibration %Ds greater than 25% were reported for acetone, propionitrile, methacrylonitrile, methyl methacrylate, 1,2-dichloroethane, dichlorofluoromethane, bromomethane, trichlorofluoromethane, acetonitrile, allyl chloride, carbon tetrachloride, vinyl acetate, trans-1,4-dichloro-2-butene, benzo(g,h,i)perylene, 4-nitroquinoline-N-oxide, and famphur. Only nondetected results were reported, except for acetone. These nondetected results in the affected samples, according to guidance, required no further action.

The %Recovery (%R) in aqueous sample VLCS0711 exceeded the quality control limit for chloroform, carbon tetrachloride, 1,2-dichloroethane, and dibromochloromethane. According to guidance, no action was taken.

The %Recovery (%R) in medium level soil sample VLCS0724 exceeded the quality control limit for 1,1,1-trichloroethene, carbon tetrachloride, benzene, 1,2-dichloroethane, and dibromochloromethane. According to guidance, no action was taken.

The Matrix Spike/Matrix Spike Duplicate Relative Percent Difference (%RPD) for 1,2,4-trichlorobenzene exceeded the quality control limit in sample RN3SS0100101. No action was taken according to guidance.

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DATE: NOVEMBER 4, 1997- PAGE 4

RN3SB0130101 and RN3SS0130101 were reanalyzed at a dilution due to acetone exceeding the instrument linear calibration range. The original analysis was chosen for validation with the exception of acetone. The dilution results for acetone were transposed over the original sample result and used in the validation of this SDG.

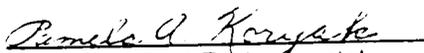
#### Executive Summary

**Laboratory Performance:** The initial calibration %RSD for 1,4-phenylenediamine, dimethoate, famphur, o-tolidine, and kepone were greater than 50%. Several initial calibration %RSDs for semivolatile compounds exceeded 30%. The initial and continuing calibration RRFs for several volatile and semivolatile compounds were less than 0.05. Several continuing calibration %Ds for volatile and semivolatile compounds were greater than 25%. The %Rs exceeded the quality control limits for the volatile fraction in the aqueous and soil laboratory control samples. Methylene chloride was detected in aqueous and soil method blanks and in the field blank. Acetone was detected in the field blank.

**Other Factors Affecting Data Quality:** Noncompliant MS/MSD %Rs were reported in the semivolatile fraction. Several internal standard areas were below quality control criteria for volatile and semivolatile compounds. Soil surrogate recoveries were outside of quality control limits for volatile and semivolatile fractions. Positive results reported at concentrations below the CRQL are considered to be estimated.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Data Review"(9/94), as amended for use within EPA Region III, and the NFESC guidelines entitled "Navy Installation Restoration Program Laboratory Quality Assurance Guide"(February, 1996).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

  
Brown and Root Environmental

Pamela A. Koryak  
Risk Assessor/Data Validator

  
Brown and Root Environmental

Joseph A. Samchuck  
Data Validation Quality Assurance Officer

**MEMO TO:** P. FRANK  
**DATE:** NOVEMBER 4, 1997- PAGE 5

**Attachments:**

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

**Data Qualifier Key:**

- U - Value is a nondetect as reported by the laboratory.
- J - Estimate positive results for various technical reasons (i.e. calibration noncompliances).
- B - Result reflects contamination in the blank.
- UJ - Nondetected result is considered estimated due to calibration noncompliances.
- UR - Nondetected result is considered rejected due to calibration noncompliances.