01.01-02/18/99-01835

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT

NCDENR

JAMES B. HUNT JR.
GOVERNOR

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SECRETARY

WILLIAM L. MEYER
DIRECTOR

February 18, 1999

Mr. Lance Laughmiller
Atlantic Division of Naval Facilities Engineering Command
Code 18235
1510 Gilbert Street
Norfolk, VA 23511-2699

Subject: Comments on **SWMU Assessment Report (SAR)**
Site 84, Golf Course Maintenance Area
MCAS-Cherry Point, NC

Dear Mr. Laughmiller:

The North Carolina Superfund Section has reviewed the subject document. Enclosed are our comments.

If you have any questions, please do not hesitate to contact me at (919) 733-2801, extension 340.

Sincerely,

Linda F. Raynor

Linda F. Raynor
Environmental Engineer
NC Superfund Section

Cc: Richard Powers
Beth Hartzell
Jay Bassett
Rachel Johnson
Matt Cochran

401 OBERLIN ROAD, SUITE 150, RALEIGH, NC 27605
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SWMU ASSESSMENT REPORT
SITE 84, GOLF COURSE MAINTENANCE AREA
MCAS-CHERRY POINT
(Document dated March 1998)
Comments from NC Superfund Section

General Comments:

1. Please refer to the attached table for North Carolina Soil Screening Levels for soil-to-groundwater screening values rather than using the 1996 NCRAF S3-G1 values. The 1996 values are no longer valid.

2. 1996 NCRAF S3-G3 soil concentrations are not used by the State at this time, therefore, delete discussions and conclusions regarding these values.

3. For each parameter listed in the tables, please denote whether these are carcinogens or non-carcinogens.

4. A few errors were noted in the tables. Please check all tables for accuracy, including ecological screening values, using current references, and adjust accordingly.

5. Some of the conclusions presented in this report may need to be rewritten based on changes/corrections to the tables. Please adjust accordingly.

6. Need to designate which soil boring/monitoring well was placed at the location of the batteries that were found on-site.

Specific Comments:

1. Figure 2-2 – This figure is unclear regarding the location of the batteries; weren't the batteries just located at one of the two debris areas?

2. Page 4-2, 4th para. – "All surface and **sub**surface soil samples…" (Add bolded text.)

3. Table 5-1 – Surface soils and sediments:

- The units for residential RBCs for all the organics listed (except methylene chloride) appear to be in mg/kg, and the analytical results are reported in ug/kg. Please present organic RBCs in ug/kg also, for comparison purposes. Note: If the correct units are used, there does not appear to be any exceedances of residential RBCs.
- Also, for metals, need to present average background and 2 times average background for comparison purposes. Exceedances of twice the average background should be denoted.

4. Table 5-2 – All soil and sediment :
   - Since this is a RCRA SWMU, this table should include screening values for industrial and residential RBCs; need to replace the column of NCRAF S3-G3 values with the most recent residential RBCs.
   - Need to check values presented for S3-G1 against attached table values. For contaminants not listed, a S3-G1 value should be calculated.
   - As per comment 2 above, screen metals against 2 times average background values.

5. Table 5-3 - Replace the last column (NCRAF G3) with average groundwater background concentrations (for metals only). Also, need to check table for potential errors. For example, the NC 2L for silver is not listed, but should be 18 ug/l.

6. Page 5-5:
   - 1st para. "In addition, the screening value for antimony is less than Air Station background levels." Table 5-1 indicates antimony is "ND". Need to delete this sentence.
   - 2nd para., last sentence – " ...S2 concentrations (**industrial** exposure)..." (Correction bolded.)

7. Page 5-6, 2nd bullet – Need to delete the last sentence "In addition, the detection of this pesticide does not correspond to the waste materials that were disposed at the site (batteries, scrap metal, and other inorganic debris), and is, therefore, not site related." Since this area has been used for dumping, it cannot be absolutely concluded that dumping of pesticides and/or containers may not have occurred and is not site related.

TABLE 1
NORTH CAROLINA SOIL SCREENING LEVELS
Protective of Groundwater Used for Drinking

DRAFT: Values in Table are subject to change. Contact the NC Hazardous Waste Section, Facility Management Branch for the most recent version.

COMPOUNDS **DRAFT**	CAS #	Kd (L/kg)	Ref.	Koc (L/kg)	Ref.	HENRY'S LAW CONSTANT (unitless)	Ref.	See Footnotes	TARGET GROUNDWATER CONCENTRATION (2L, Interim 2L Recommended 2L, or MCL) (mg/L)	NC SSL CONCENTRATIONS (mg/kg)
ACENAPHTHENE	83329			4900	a	0.00636	a	1	0.08	8.16
ACENAPHTHYLENE	208968			2500	c	0.05945	c	1	0.21	11.4
ACETONE	67641			0.575	a	0.00159	a		0.7	2.81
ACRYLAMIDE (PROPENAMIDE)	79061			0	e	1.2423E-07	e	2	0.000008	0.000032
ANTHRACENE	120127			23500	a	0.00267	a	1	2.1	995
ARSENIC	7440382	26	a					2	0.00002	0.0105
ATRAZINE	1912249			200	f	0.000000086	j	1	0.003	0.024
BARIUM	7440393	21	a						2	848
BENZENE	71432			61.7	a	0.2255	c		0.001	0.00562
BENZO (A) ANTHRACENE	56553			358000	a	0.000137	a	1	0.0000479	0.343
BENZO (A) PYRENE	50328			969000	a	0.0000463	a	1	0.0000047	0.0911
BENZO (G,H,I) PERYLENE	191242			1600000	c	0.000005904	c	1	0.21	6720
BERYLLIUM	7440417	42	a					3	0.004	3.38
BIS (2-CHLOROETHYL) ETHER	111444			75.9	a	0.004633	c			
BIS (2-CHLOROISO-PROPYL) ETHER	396383329			61	c	0.004633	c			
BORON	7440428	3	d					2	0.315	20.2
BROMODICHLOROMETHANE	75274			55	a	0.0656	a	1	0.00056	0.00292
BROMOFORM (TRIBROMOMETHANE)	75252			126	a	0.0219	a	2	0.00443	0.0291
BROMOMETHANE	74839			5.9	c	8.077	c			
BUTYL BENZYL PHTHALATE	85687			13700	a	0.0000517	a		0.1	27.8
CADMIUM	7440439	27	a					2	0.00175	0.952
CAPROLACTAM	105602				cd		cd	1	3.5	
CARBOFURAN	1563662			158	e	1.5908E-06	e	2	0.035	0.251
CARBON DISULFIDE	75150			45.7	a	1.24	a	1	0.7	4.94
CARBON TETRACHLORIDE	56235			152	a	1.2013	c	2	0.00026	0.0237
CHLORDANE	57749			51300	a	0.00199	a	2	0.0000269	0.0277

1 - Interim 2L Standard
2 - Recommended 2L Standards per 4/15/98 OEES Memorandum
3 - No 2L Std; MCLG/proposed MCLG used instead

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DRAFT COMPOUNDS	CAS #	Kd (L/kg)	Ref.	Koc (L/kg)	Ref.	HENRY'S LAW CONSTANT (unitless)	Ref.	See Footnotes	TARGET GROUNDWATER CONCENTRATION (2L, Interim 2L Recommended 2L, or MCL) (mg/L)	NC SSL CONCENTRATIONS (mg/kg)
CHLOROBENZENE	108907			224	a	0.16113	c		0.05	0.438
CHLOROETHANE	124481			3.24	e	0.4551	e	1	2.8	13.6
CHLOROFORM (TRICHLOROMETHANE)	75003			52.5	a	0.13899	c	2	0.0057	0.0302
CHLOROPHENOL 2-	95578			397	a	0.016	a	2	0.0350	0.419
CHROMIUM	7440473	27	a					2	0.00175	0.952
CHRYSENE	218019			398000	a	0.00388	a	1	0.00479	38.1
COPPER	7440508	35	d						1	704
CYANIDE	57125	9.9	a					2	0.07	14.1
4,4' - DDD	72548			4.58E+04	a	1.64E-04	a	1	0.00014	0.129
4,4' - DDT	50293			6.78E+05	a	3.32E-04	a	1	0.0001	1.36
DIBENZ (A,H) ANTHRACENE	53703			1.79E+06	a	6.03E-07	a	1	0.0000047	0.168
DI (OR BIS) 2-ETHYLHEXYL PHTHALATE (DEHP)	117817			111000	c	0.0000418	c	2	0.0025	5.56
DI-N-BUTYL (OR DIBUTYL) PHTHALATE (DBP)	84742			1570	a	3.85E-08	a		0.7	24.8
DI-N-OCTYL PHTHALATE	117840			83200000	a	0.00274	a		0.14	233000
DIBROMOCHLOROMETHANE (CHLORODIBROMOMETHANE)	124481			6.31E+01	a	0.03210	a	3	0.06	0.251
DIBROMO-3-CHLOROPROPANE 1,2-	96128			98	b	0.01275	b		0.000025	0.00015
DICHLOROBENZENE 1,2 (O-DCB)	95501			379	a	0.07954	c	2	0.024	0.281
DICHLOROBENZENE 1,3 (M-DCB)	541731			1700	c	0.10783	c	2	0.63	24.1
DICHLOROBENZENE 1,4 (P-DCB)	106467			616	a	0.11152	c	2	0.011	0.182
DICHLORODIFLUOROMETHANE (FREON-12; HALON)	75718			58	b	123	e		1.4	306
DICHLOROETHANE 1,1	75343			53.4	a	0.22345	c	2	0.07	0.382
DICHLOROETHANE 1,2 (ETHYLENE DICHLORIDE)	107062			38	a	0.0451	c		0.00038	0.00184
DICHLOROETHENE 1,2 (CIS)	156592			35.5	a	0.167	a		0.07	0.350
DICHLOROETHENE 1,2 (TRANS)	156605			38	a	0.385	a	2	0.1	0.543
DICHLOROETHYLENE 1,1 (VINYLIDENE CHLORIDE)	75354			65	c	0.6109	c	2	0.000058	0.000369
DICHLOROPHENOXY ACETIC ACID 2,4 (2,4-D)	94757			20	b	0.007708	b		0.07	0.309
DICHLOROPROPANE 1,2-	78875			47	a	0.11562	c	2	0.00051	0.00262
DICHLOROPROPENE 1,3 (CIS AND TRANS)	542756			27.1	a	0.1435	c	1	0.00019	0.00091

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2 - Recommended 2L Standards per 4/15/98 OEES Memorandum
3 - No 2L Std; MCLG/proposed MCLG used instead

North Carolina
Department of Health and Human Services
Division of Epidemiology
P.O. Box 29601 • Raleigh, NC 27626-0601

James B. Hunt Jr., Governor

H. David Bruton, M.D., Secretary

April 15, 1998

OEES proposed 2L Stds

MEMORANDUM

TO: Jack Butler, Chief
Superfund Section

Jimmy Carter, Chief, Hazardous Waste Section
Division of Waste Management

Dexter Matthews, Chief, Solid Waste Section
Division of Waste Management

Arthur Mouberry, Chief, Groundwater Section
Division of Water Quality

THROUGH: Stanley I. Music, M.D., DTPH (Lond.), Chief
Occupational and Environmental Epidemiology Section

FROM: Luanne K. Williams, Pharm.D., Toxicologist
Medical Evaluation and Risk Assessment Branch
Occupational and Environmental Epidemiology Section

SUBJECT: Updated List of Groundwater Quality Standards and List of Recommended Changes to Groundwater Quality Standards for Distribution

Several groundwater quality standards have been established since the last publishing of the groundwater rules "Classifications and Water Quality Standards Applicable To The Groundwaters of North Carolina" (15A NCAC 2L .0100, .0200, and .0300). Also, the Occupational and Environmental Epidemiology Section (OEES) has recommended several revisions to the groundwater quality standards since 1995. Unfortunately, no revisions to the standards have been made since November 8, 1993. In order to protect public health, revision to some of the groundwater quality standards should be made because long-term exposure to some of the existing groundwater quality standards may pose an increased health risk.

The OEES has been using the recommended standards instead of the outdated standards when evaluating the risk to human health. In order to minimize confusion and to protect public health, the OEES is providing the attached list as a reference to use when evaluating the risk from drinking groundwater. The concentrations provided can be compared to concentrations found in drinking water. If the concentrations are at or below the concentrations provided, then exposure should not pose a significant health risk.

Please feel free to distribute this list to the regional offices. If you have any questions, call me at 715-6429.

LKW:lp

The following revisions were recommended in a November 3, 1995 memorandum to the Groundwater Quality Section, but none of the revisions have been made.

Constituents	Existing standards (mg/L)	Recommended Standards (mg/L)
acrylamide	0.00001	0.000008
arsenic	0.05	0.00002
boron	0.32	0.315
bromoform	0.00019	0.00443
cadmium	0.005	0.00175
carbofuran	0.036	0.035
carbon tetrachloride	0.0003	0.00026
chlordane	2.7×10^{-5}	2.69×10^{-5}
chloroform	0.00019	0.0057
2-chlorophenol	0.0001	0.035
total chromium (III & VI)	0.05	0.00175
cyanide	0.154	0.07
1,2-dichlorobenzene	0.62	0.024
1,4-dichlorobenzene	0.075	0.011
1,1-dichloroethane	0.7	0.07
trans-1,2-dichloroethylene	0.07	0.1
1,2-dichloropropane	0.00056	0.00051
di(2-ethylhexyl)phthalate	0.003	0.0025
1,4-dioxane	0.007	0.00318
ethylbenzene	0.029	0.7
ethylene glycol	7.0	14
fluoride	2.0	1.0
heptachlor	8.0×10^{-6}	7.8×10^{-6}
heptachlor epoxide	4.0×10^{-6}	3.8×10^{-6}
heptane	2.1	0.42
mercury	0.0011	0.00105
methylene chloride	0.005	0.0046
methyl ethyl ketone	0.17	4.2
methyl tert-butyl ether	0.2	0.07
pentachlorophenol	0.0003	0.00029
radium-226	5 pCi/L	0.227 pCi/L
radium-228	5 pCi/L	0.263 pCi/L
silver	0.018	0.0175
zinc	2.1	1.05

The following revisions were recommended in an April 9 memorandum to the Groundwater Quality Section. None of the revisions have been made.

Constituents	Existing Standards (mg/L)	Recommended Standards (mg/L)
1,3-dichlorobenzene	0.62	0.63
1,1-dichloroethylene	0.007	5.8×10^{-5}

TABLE 1

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DIELDRIN				25500	a	0.000619	a	1	0.0000022	0.00113
DIETHYLPHTHALATE (DEP)	84662			82.2	a	0.0000185	a		5	28.2
DINOSEB (DNBP) (2-SEC-BUTYL-4,6-DINITROPHENOL)								3	0.007	
DIOXANE 1,4	123911			3.47	e	0.00020008	e	2	0.00318	0.0129
DIOXIN: 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD)	1746016			3300000	b	0.1476	b		0.00000000022	0.0000145
DIPHENYL (BIPHENYL)	92524			1072	e	0.007913	e	1	0.35	8.91
DIUNDECYL PHTHALATE (SANTICIZER 711)	3648202				cd		cd		0.14	
ENDRIN	72208			10800	a	0.000308	a	1	0.002	0.440
EPICHLOROHYDRIN (1-CHLORO-2,3-EPOXYPROPANE)	106898			10	b	0.0013079	b		0.00354	0.0149
ETHYLBENZENE	100414			204	a	0.14063	c	2	0.7	5.83
ETHYLENE DIBROMIDE (EDB, 1,2-DIBROMOETHANE)	106934			44	c	0.027593	c		0.0000004	0.00000197
ETHYLENE GLYCOL	107211			0.0127	g	9.594E-09	k	2	14	56.0
FLUORANTHENE	206440			49100	a	0.00066	a	1	0.28	276
FLUORENE	86737			7710	a	0.00261	a		0.28	44.3
FLUORIDE	7782414		cd					2	1	
HEPTACHLOR	76448			9530	a	60.7	a	2	0.0000078	0.00234
HEPTACHLOR EPOXIDE	1024573			83200	a	0.00039	a	2	0.0000038	0.00634
HEPTANE	142825			5870	h	83.435	e	2	0.42	112
HEXACHLOROBENZENE (PERCHLOROBENZENE)	118741			80000	a	0.0541	a		0.00002	0.0321
HEXACHLOROCYCLOPENTADIENE	77474			200000	a	1.1	a	3	0.05	200
IRON	7439896	25	d						0.3	151
INDENO (1,2,3-CD) PYRENE	193395			3.47E+06	a	6.56E-05	a	1	0.000047	3.26
ISOPHORONE	78591			46.8	a	0.000272	a	1	0.0368	0.182
ISOPROPYL ETHER (DIISOPOROPYL ETHER)	108203			31.22	g	0.40877	e	1	0.07	0.373
LEAD	7439921	900	d						0.015	270
LINDANE (GAMMA-BHC)	58899			1350	a	0.000574	a		0.0002	0.00620
MANGANESE	7439965	65	d						0.05	65.2
MERCURY	7439976	0.46	a			0.467	a	2	0.00105	0.0147

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COMPOUNDS	CAS #	Kd (L/kg)	Ref.	Koc (L/kg)	Ref.	HENRY'S LAW CONSTANT (unitless)	Ref.	See Footnotes	TARGET GROUNDWATER CONCENTRATION (2L, Interim 2L Recommended 2L, or MCL) (mg/L)	NC SSL CONCENTRATIONS (mg/kg)
METHANOL	67561			2.75	e	0.00018204	e	1	3.5	14.2
METHOXYCHLOR	72435			80000	a	0.000648	a		0.035	56.1
METHYL ETHYL KETONE (MEK; 2-BUTANONE)	78933			3.5	c	0.0011234	c	2	4.2	17.1
METHYL ISOBUTYL KETONE (MIBK)	108101			3.1	c	0.005658	c			
METHYL TERT-BUTYL ETHER	1634044			27	c	0.024231	c	2	0.07	0.321
METHYLENE CHLORIDE (DICHLOROMETHANE)	75092			10	a	0.13079	c	2	0.0046	0.0203
N-HEXANE	110543			1468	h	31.488	e		0.42	36.9
NAPHTHALENE	91203			1190	a	0.0198	a		0.021	0.585
NICKEL	7440020	28	a						0.1	56.4
NITRATE (AS N)	14797558		cd						10	
NITRITE (AS N)	14797650		cd						1	
OXAMYL	23135220			2.24	l	0.0000902	l		0.175	0.708
PENTACHLOROPHENOL	87865			3650	a	0.000001	a	2	0.00029	0.0223
PHENANTHRENE	85018			14000	c	0.0016113	c		0.21	59.6
PHENOL	108952			91	c	0.0000163	a		0.3	1.75
POLYCHLORINATED BIPHENYLS; PCBs										
PYRENE	129000			68000	a	0.000451	a	1	0.21	286
SELENIUM	7782492	12	a						0.05	12.2
SILVER	7440224	0.42	a					2	0.0175	0.217
SILVEX (2,4,5-TP)	93721			2570	i	3.444E-09	i		0.05	2.77
SIMAZINE	122349			138	l	1.394E-07	l	1	0.0035	0.0237
STYRENE (ETHENYLBENZENE)	100425			912	a	0.10701	c		0.1	2.24
SULFATE	4808798		cd						250	
TETRACHLOROETHANE 1,1,1,2-	630206			54	c	0.451	c			
TETRACHLOROETHANE 1,1,2,2-	79345			79	a	0.01558	c			
TETRACHLOROETHYLENE (PERCHLOROETHYLENE; PCE)	127184			265	a	0.754	a		0.0007	0.00742
THALLIUM	7440280	51	a					3	0.001	0.512
TOLUENE (METHYLBENZENE)	108883			140	a	0.27388	c		1	7.27

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TOXAPHENE	8001352			95800	a	0.000246	a		0.000031	0.0595
TRICHLOROBENZENE 1,2,4-	120821			1660	a	0.05822	c	3	0.07	2.61
TRICHLOROETHANE 1,1,1 (METHYL CHLOROFORM)	71556			135	a	0.9471	c		0.2	1.67
TRICHLOROETHANE 1,1,2-	79005			75	a	0.03731	c	3	0.003	0.0167
TRICHLOROETHYLENE (TCE)	79016			94.3	a	0.37392	c		0.0028	0.0183
TRICHLOROFLUORO-METHANE	75694			158	e	4.51	e		2.1	31.5
VINYL CHLORIDE (CHLOROETHYLENE)	75014			18.6	a	1.1398	c		0.000015	0.0000952
XYLENES (O-, M-, AND P-)	1330207			249	a	0.21607	c		0.53	4.96
ZINC	7440666	26	a					2	1.05	550

a USEPA, 1996, Soil screening guidance: Technical background document: EPA/540/R95/128

b USEPA, 1986, Superfund public health evaluation manual: Office of Emergency and Remedial Response

c Massachusetts Department of Environmental Protection, 1994, Background documentation for the development of the MCP numerical standards

d Baes, C.F., III, R.D. Sharp, A.L. Sjoreen, and R.W. Shor, 1984, A review and analysis of parameters for assessing transport of environmentally released radionuclides through agriculture: Oak Ridge National Laboratory

e Montgomery, J.H., 1996, Groundwater chemicals desk reference: CRC Press, Inc.

f Lymen, W.J., W.F. Reehl, D.H. Rosenblat, 1990, Handbook of chemical property estimation methods: American Chemical Society

g Calculated using equation (70) in reference (a)

h Calculated using equation (71) in reference (a)

i Sims, R.C., J.L. Sims, and S.G. Hansen, 1991, Soil transport and fate database, version 2.0: USEPA Robert S. Kerr Environmental Research Laboratory

j Calculated using equation (63) in reference (a)

k ABDR Toxicity Profile, 1993

l Montgomery, J.H., 1993, Agrochemical desk reference environmental data: Lewis Publishers, Chelsea, MI

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2 - Recommended 2L Standards per 4/15/98 OEES Memorandum
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