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MOFFETT FIELD
SSIC NO. 5090.3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

OFFICE OF
RESEARCH AND DEVELOPMENT
OSPRE/Technical Liaison Program

1 April 1993

MEMORANDUM

FROM: Joseph Greenblott, ORD Technical Liaison-Region 9

TO: Kimberly A. Walsh, Project Biologist, James M. Montgomery, Inc.

THROUGH: Michael Gill, Remedial Project Manager, NAS Moffett Field

TOPIC: Detection Limits and Methodologies for Ecological Assessments.

I have not found any official EPA guidance on detection limits and analytical methodologies for Superfund ecological assessments. Currently, detection limits and methodologies for ecological assessments are based on "best professional judgement" considering site-specific needs.

I have discussed this issue with several EPA staff in the Region's Laboratory Support Section, Quality Assurance Management Section, and Oceans and Estuaries Section. EPA is actively engaged with several other agencies to review detection limits and available analytical methodologies for dredge materials. Attached is a draft analysis table for dredged material. This is provided only as a general technical/professional opinion as to appropriate detection limits and what may be obtainable using the methods listed in the table. Site-specific conditions may significantly effect the ability to meet the listed detection limits. Again, this is only a working draft and currently has no official EPA standing. Some of the methods and/or detection limits could change before a final draft is completed. A final draft is expected within a few weeks.

It is highly recommended that the contractor use diligence in selecting an appropriate laboratory to perform the analyses. Many of the methodologies listed in the table are not CLP methods and may require special procedures, equipment, and/or experience. It is also recommended the each media (e.g., sediment, soil, water, groundwater) be characterized prior to attempting any these methods to determine possible sources of matrix interference.

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Question on analytical methodologies may be directed to Hedy Ficklin of EPA-Region 9 Quality Assurance Management Section (P-3-2) at telephone number 415-744-1497. Hedy has also agreed to review any workplans and field sampling and analysis plans for the NAS Moffett Field ecological assessment.

I hope this information is helpful. Please contact me at 415-744-2307 if you have any other questions.

Attachment (1)

cc: Roberta Blank, RPM-Region 9
Lida Tan, RPM-Region 9
Hedy Ficklin, QAMS-Region 9

STANDARD ELUTRIATE, SEDIMENT AND TISSUE ANALYSES FOR DREDGED MATERIAL TESTING IN THE CORPS OF ENGINEERS, SAN FRANCISCO DISTRICT

Analytical Parameter[1]	Elutriate Analyses MDLs[2] in µg/L (unless otherwise specified)	Sediment Analyses MDLs in mg/kg dry weight (unless otherwise specified)	Tissue Analyses MDLs in mg/kg dry weight (unless otherwise specified)
A. Physical or Conventional Tests			
1. Grain Size Distribution	NA[3]	1.0%[4] Plumb 1981[5]	NA
2. Total Suspended Solids	~~1.0%~~ 1 mg/L EPA 160.2[6]	NA	NA
3. Total Settleable Solids	~~1.0%~~ 0.05 ml/L EPA 160.5	NA	NA
4. Percent Solids	NA	1.0% Plumb 1981	NA
5. Total Volatile Solids	~~1.0%~~ NA EPA 160.4	0.1% Plumb 1981	NA
6. Specific Gravity	NA	0.01 mg/L Plumb 1981	NA
7. pH	0.1 pH units Plumb 1981	0.1 pH units Plumb 1981	NA
8. Ammonia	~~0.1~~ 50 EPA 350.3	0.1 Plumb 1981	NA
9. Total Organic Carbon	~~0.1%~~ 100 APHA ~~EPA 415.1~~ 5310D	~~0.1%~~ 1 EPA 9060	NA
10. Acid Volatile Sulfides	NA	0.1 µmol/g Allen *et al.* 1991	NA
11. Total Sulfides @	~~0.1~~ 100 EPA 376.2	~~0.1~~ 1 Plumb 1981 or EPA 9030	NA
12. Total Lipids in Test Species	NA	NA	0.1 Lee *et al.* 1989
13. Total Water Content of Test Species	NA	NA	0.1% U.S. EPA 1986 or 1987

@ SF Bay Manual: Dissolved sulfide by thermal desorption GC/PID. If you want the low dL, but no lab set up to do it.

Analytical Parameter[1]	Elutriate Analyses MDLs[2] in µg/L (unless otherwise specified)	Sediment Analyses MDLs in mg/kg dry weight (unless otherwise specified)	Tissue Analyses MDLs in mg/kg dry weight (unless otherwise specified)
B. Metals and Nonmetals			
1. Antimony (114)[7]	(0.1*) 4 EPA ~~200.7, 204.1 or~~ 204.2	0.1 EPA ~~7040,~~ 7041, ~~or 6010~~	0.1 EPA ~~7040,~~ 7041, ~~or 6010~~
2. Arsenic (115)	(0.1*) 0.3 EPA ~~206.2 or~~ 206.3	0.1 EPA ~~7060~~ 7061, ~~or 6010~~	0.1 EPA ~~7060,~~ 7061, ~~or 6010~~
3. Cadmium (118)	(0.1**) 1 EPA ~~200.7, 213.1 or~~ 213.2	0.1 EPA ~~7130~~ 7131, ~~or 6010~~	0.1 EPA ~~7130,~~ 7131, ~~or 6010~~
4. Chromium (119) Hexavalent Chromium	(0.1*) 1 ~~Cr (VI) 218.5;~~ ~~Total Cr 200.7, 218.1 or~~ EPA 218.2 50 218.5	0.1 ~~Cr (VI) EPA 7197;~~ ~~Total Cr~~ EPA ~~7090,~~ 7191, ~~or 6010~~ 5 7197	0.1 ~~Cr (VI) EPA 7197;~~ ~~Total Cr~~ EPA ~~7090,~~ 7191, ~~or 6010~~ 5 7197
5. Cobalt	(0.1*) 4 EPA ~~200.7, 219.1 or~~ 219.2	0.1 EPA ~~7200,~~ 7201, ~~or 6010~~	0.1 EPA ~~7200,~~ 7201, ~~or 6010~~
6. Copper (120)	(0.1**) 1 EPA ~~200.7, 220.1 or~~ 220.2	0.1 EPA ~~7210,~~ 7211, ~~or 6010~~	0.1 EPA ~~7210,~~ 7211, ~~or 6010~~
7. Lead (122)	(0.1**) 2.5 EPA ~~200.7, 239.1 or~~ 239.2	0.1 EPA ~~7420,~~ 7421, ~~or 6010~~	0.1 EPA ~~7420,~~ 7421, ~~or 6010~~
8. Mercury (123)	~~0.02~~ 0.2 @ EPA ~~245.1 or 245.2~~	~~0.02~~ 0.2 @ EPA ~~7470 or 7471~~	~~0.02~~ 0.2 @ EPA ~~7470 or 7471~~
9. Nickel (124)	(0.1**) 8 EPA ~~200.7, 249.1 or~~ 249.2	0.1 EPA 7520 ~~or 6010~~	0.1 EPA 7520 ~~or 6010~~
10. Selenium (125)	(0.1*) 1 EPA ~~270.2 or~~ 270.3	0.1 EPA ~~7740 or~~ 7741	0.1 EPA ~~7740 or~~ 7741
11. Silver (126)	(0.1**) 1 EPA ~~200.7, 272.1 or~~ 272.2	0.1 EPA ~~7760,~~ 7761, ~~or 6010~~	0.1 EPA ~~7760,~~ 7761, ~~or 6010~~
12. Zinc (128)	(0.1*) 1.5 EPA 200.7, ~~289.1 or 289.2~~	0.1 EPA 7950, ~~7951, or 6010~~	0.1 EPA 7950, ~~7951, or 6010~~

* ICP-MS d.l.

** APDC-GFAA d.l.

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C. Pesticides			
1. Total Pesticides chlorinated	0.02 EPA 608	0.02 EPA 8080 or NOAA 1985	0.02 EPA 8080 or NOAA 1985
2. Aldrin (89)	0.002 EPA 608	0.002 EPA 8080 or NOAA 1985	0.002 EPA 8080 or NOAA 1985
3. Chlorbenside	?[8] EPA ?	? EPA ?	? EPA ?
4. Chlordane (91) and Derivatives	0.002 EPA 608	0.002 EPA 8080 or NOAA 1985	0.002 EPA 8080 or NOAA 1985
5. Dacthal	? 0.03 EPA ? 608.2	? EPA ?	? EPA ?
6. Dieldrin (90)	0.002 EPA 608	0.002 EPA 8080 or NOAA 1985	0.002 EPA 8080 or NOAA 1985
7. Dichlorodiphenyltrichloroethane (DDT) (92) and Derivatives	0.002 EPA 608	0.002 EPA 8080 or NOAA 1985	0.002 EPA 8080 or NOAA 1985
8. Endosulfan (95) and Derivatives	0.002 EPA 608	0.002 EPA 8080 or NOAA 1985	0.002 EPA 8080 or NOAA 1985
9. Endrin (98 & 99) and Derivatives	0.002 EPA 608	0.002 EPA 8080 or NOAA 1985	0.002 EPA 8080 or NOAA 1985
10. Heptachlor (100 & 101) and Derivatives	0.002 EPA 608	0.002 EPA 8080 or NOAA 1985	0.002 EPA 8080 or NOAA 1985
11. Hexachlorocyclohexane (HCH) (102, 103, 104 & 105) and Derivatives	0.002 EPA 608	0.002 EPA 8080 or NOAA 1985	0.002 EPA 8080 or NOAA 1985
12. Malathion [CWA § 301(h) pesticide]	~~0.005~~ 0.8 ~~APHA 1985~~ ~~Standard Method~~ ~~509 A~~ 8141	0.005 EPA 8141	0.005 EPA 8141
13. Methoxychlor [CWA § 301(h) pesticide]	0.002 EPA 608	0.002 EPA 8080	0.002 EPA 8080

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14. Parathion [CWA § 301(h) pesticide]	~~0.006~~ 0.8 ~~APHA 1985 Standard Method 509 A~~ EPA 8141	0.006 EPA 8141	0.006 EPA 8141
15. Toxaphene (113)	0.03 EPA 608	0.03 EPA 8080	0.03 EPA 8080
D. Organic Compounds			
1. Cycloalkanes	~~0.01~~ 50 EPA 8015	~~0.01~~ 5 EPA 8015	~~0.01~~ 5 EPA 8015
2. Organotin Mono-, Di-, and Tributyl Tin	~~0.001~~ 0.002 Rice *et al.* 1987 or Uhler and Durrel 1989	0.001 Rice *et al.* 1987 or Uhler and Durrel 1989	0.001 Rice *et al.* 1987 or Uhler and Durrel 1989
3. Petroleum Hydrocarbons, Total Recoverable	~~1.0~~ 500 EPA 418.1	~~1.0~~ 5 EPA 418.1	NA
4. Phenols and Substituted Phenols a. Total Phenols b. Individual Phenol Concentrations: Phenol (65), 2,4-Dimethylphenol (34), 2,4,6-Trichlorophenol (21), Para-chloro-meta-cresol (22), 2-Chlorophenol (24), 2,4-Dichlorophenol (31), 2-Nitrophenol (57), 4-Nitrophenol (58), 2,4-Dinitrophenol (59), 4,6-Dinitro-o-cresol (60), and Pentachlorophenol (64).	0.02-0.1 EPA ~~604~~ 8270	0.02-0.1 EPA ~~8040~~ 8270	0.02-0.1 EPA ~~8040~~ 8270
5. Phthalate Esters a. Total Phthalates b. Individual Phthalate Concentrations: Bis(2-ethylhexl)phthalate (66), Butyl benzyl phthalate (67), Di-n-butyl phthalate (68), Diethyl phthalate (70), Dimethyl phthalate (71), and Di-n-octyl phthalate (69).	0.01 EPA ~~606~~ 8270	0.01 EPA ~~8060~~ 8270	0.01 EPA ~~8060~~ 8270
6. Polychlorinated Biphenyls (PCB) a. Total PCB Congeners b. Individual Congener Concentrations: Tetra-, Penta-, and Hexa- Isomers.	0.001 NOAA 1989 or Tetra Tech 1986	~~0.001~~ 0.02 NOAA 1989 or Tetra Tech 1986	~~0.001~~ 0.02 NOAA 1989 or Tetra Tech 1986
7. Polychlorinated Terphenyls	? EPA ?	? EPA ?	? EPA ?

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8. Hexachlorobenzene (9)	0.02 EPA 625	0.02 EPA ~~8010, 8020, 8250 or~~ 8270	0.02 EPA ~~8010, 8020, 8250 or~~ 8270
9. Hexachlorobutadiene (52)	0.04 EPA 625	0.04 EPA ~~8120, 8250 or~~ 8270	0.04 EPA ~~8120, 8250 or~~ 8270
10. Polynuclear Aromatic Hydrocarbons (PAH) a. Total PAHs b. Individual Low Molecular Weight PAHs: Acenaphthene (1), Naphthalene (55), Acenaphthlyene (77), Anthracene (78), Phenanthrene (81), and Fluorene (80). c. Individual High Molecular Weight PAHs: Fluoranthene (39), Benzo(a)anthracene (72), Benzo(a)pyrene (73), Benzo(b)fluoranthene (74), Benzo(k)fluoranthene (75), Chrysene (76), Benzo(ghi)perylene (79), Dibenzo(a,h)anthracene (82), Indeno(1,2,3-cd)pyrene (83) and Pyrene (84). d. Benzo(e)pyrene e. Methylnaphthalene f. 2,6-Dimethylnaphthalene g. Dibenzothiophene h. Benzthiazole i. 2-(4-morpholinyl)benthiazole j. 1-Methylphenanthrene k. 2,3,5-Trimethylphenanthrene	0.01 EPA ~~610~~ 8270	0.01 EPA ~~8100, 8250 or~~ 8270	0.01 EPA ~~8100, 8250 or~~ 8270
11. 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD Dioxin) (129)	0.000001 EPA 1625 or 613	0.000001 EPA 8280	0.000001 EPA 8280

Superscript Footnotes:

1 = Analytical parameters may change depending on the dredging project or other known or suspected contaminants. The list of EPA Priority Pollutants and other chemicals is based on pollutants listed in SFEP (1991).
2 = Method Detection Limit
3 = Not Applicable.
4 = MDL.
5 = Reference containing approved method.
6 = EPA method number.
7 = EPA Priority Pollutant numbers are in parentheses.
8 = MDL and approved method must be determined.

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APHA = Std Methods