

Measurement of SVOCs in Food Grade Storage Bags Used for Archiving Sediment Samples

(or)

How ARI was Left Holding the Bag



Statement of the Problem

- Food-grade polyethylene bags (e.g., Ziploc[®] Bags) have been used for a variety of purposes in the DMMP Program
- Uses include cover the glass analytical sample jars in case of breakage, and/or to directly hold sediment samples for bioassays
- DMMP questioned whether these bags could leach SVOCs into the sediments at levels that would effect dredged material suitability determinations.



Analytical Approach

- Four samples test sample were created
 - ◆ Two with clean sand and deionized water in Ziploc® bags ("Zip-1 and Zip-2").
 - ◆ One sample loaded with clean sand and deionized water in a borosilicate sample jar ("Jar 2")
 - ◆ One sample loaded with 10mL of methanol in a Ziploc® bag ("Zip-3").



Analytical Approach

- All samples were left sitting overnight
- Processed the next day by Method 8270
- Analyzed by dual scan SVOCs and Selective Ion Monitoring SVOCs



Results

- All PAHs, chlorinated hydrocarbons, and miscellaneous extractables were non-detected at the method detection limits.
- All COCs were well below the SL levels



Results for Dual-Scan SVOC

- Sample Zip-1 had low-level detection of bis(2-ethylhexylphthalate) and benzoic acid
- Sample Zip-2 also had a low-level detection of benzoic acid, but not bis(2-ethylhexylphthalate)
- Both detections were flagged as “J” values

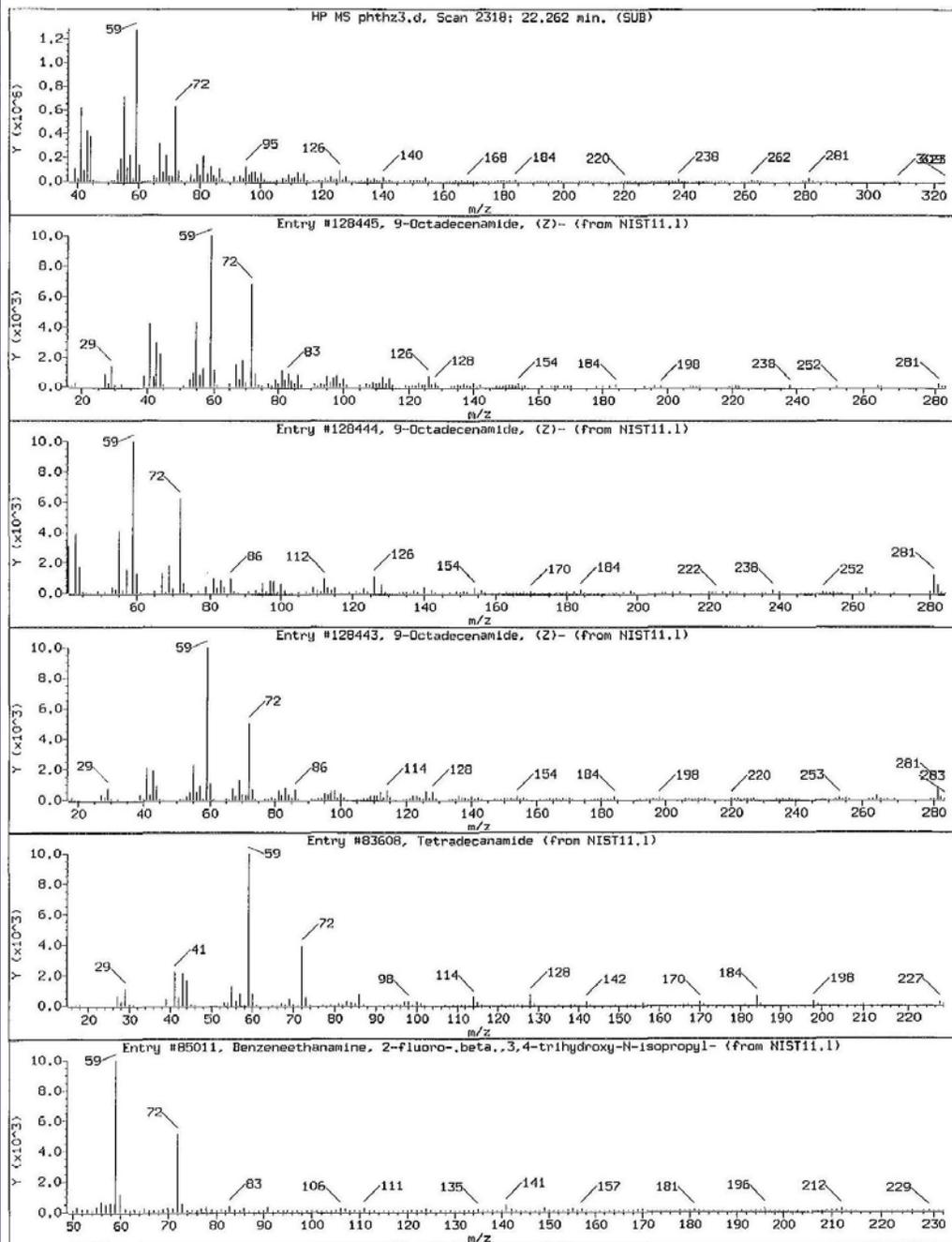


Results for Dual Scan SVOCs

- “Jar 1” had a low-level detection of bis(2-ethylhexylphthalate), but was below the MDL and would be considered non-detected
- “Zip 3” sample with MeOH was non-detect for all DMMP SVOCs.
- However, one large unknown peak was on the chromatograph.
 - ◆ TIC as 9-Octadecenamide



Data File: /chem1/nt10.i/20140916_b/phthz3.d
Injection Date: 16-SEP-2014 13:24
Instrument: nt10.1
Client Sample ID:



- Peak 59 tentatively identified as 9-Octadecenamide



Results for SIM SVOCs

- “Zip 1” had low-level detections of phenol, di-ethylphthalate, and butylbenzylphthalate
- “Zip 2” also had low-level detections of phenol and butylbenzylphthalate
- All were well below the DMMP SL



Results for SIM SVOCs

- “Jar 1” had low-level detections of phenol, diethylphthalate, and butylbenzylphthalate
- “Zip 3” with methanol had a single low-level detection of diethylphthalate
- The levels detected in Jar 1 and Zip 3 were approximately at the levels reported in both the “Zip 1” and “Zip 2” samples
- All were below the DMMP SL



Conclusions

- No SVOCs were detected at levels that exceeded the DMMP SLs
- Measured levels in the Ziploc bags were similar to those in the jar with water only – suggesting background or laboratory contamination



Chemical	DMMP SL	SVOC MDL	DUAL SVOC				SIM SVOC MDL	SIM SVOC			
			ZIP 1	ZIP 2	JAR 1	ZIP 3		ZIP 1	ZIP 2	JAR 1	ZIP 3
			Value	Value	Value	Value		Value	Value	Value	Value
Polycyclic Aromatic Hydrocarbons (µg/kg)											
Naphthalene	2100	5.25	< MDL	< MDL	< MDL	< MDL	2.26	< MDL	< MDL	< MDL	< MDL
Acenaphthylene	560	4.77	< MDL	< MDL	< MDL	< MDL	1.61	< MDL	< MDL	< MDL	< MDL
Acenaphthene	500	5.13	< MDL	< MDL	< MDL	< MDL	1.49	< MDL	< MDL	< MDL	< MDL
Fluorene	540	4.95	< MDL	< MDL	< MDL	< MDL	1.47	< MDL	< MDL	< MDL	< MDL
Phenanthrene	1500	4.69	< MDL	< MDL	< MDL	< MDL	1.58	< MDL	< MDL	< MDL	< MDL
Anthracene	960	5.93	< MDL	< MDL	< MDL	< MDL	1.78	< MDL	< MDL	< MDL	< MDL
2-Methylnaphthalene ⁽²⁾	670	5.67	< MDL	< MDL	< MDL	< MDL	1.69	< MDL	< MDL	< MDL	< MDL
Fluoranthene	1700	4.52	< MDL	< MDL	< MDL	< MDL	1.87	< MDL	< MDL	< MDL	< MDL
Pyrene	2600	5.55	< MDL	< MDL	< MDL	< MDL	2.26	< MDL	< MDL	< MDL	< MDL
Benzo(a)anthracene	1300	5.18	< MDL	< MDL	< MDL	< MDL	2.22	< MDL	< MDL	< MDL	< MDL
Chrysene	1400	5.22	< MDL	< MDL	< MDL	< MDL	1.92	< MDL	< MDL	< MDL	< MDL
Benzo(b)fluoranthene	---	7.02	< MDL	< MDL	< MDL	< MDL	2.11	< MDL	< MDL	< MDL	< MDL
Benzo(k)fluoranthene	---	5.01	< MDL	< MDL	< MDL	< MDL	2.28	< MDL	< MDL	< MDL	< MDL
Total Benzofluoranthenes (b+k+j)	3200	10.2	< MDL	< MDL	< MDL	< MDL	6.14	< MDL	< MDL	< MDL	< MDL
Benzo(a)pyrene	1600	6.48	< MDL	< MDL	< MDL	< MDL	2.38	< MDL	< MDL	< MDL	< MDL
Indeno(1,2,3-cd)pyrene	600	5.99	< MDL	< MDL	< MDL	< MDL	3.01	< MDL	< MDL	< MDL	< MDL
Dibenz[a,h]anthracene	230	6.16	< MDL	< MDL	< MDL	< MDL	1.38	< MDL	< MDL	< MDL	< MDL
Benzo(g,h,i)perylene	670	5.82	< MDL	< MDL	< MDL	< MDL	2.79	< MDL	< MDL	< MDL	< MDL
Chlorinated Hydrocarbons (µg/kg)											
1,4-Dichlorobenzene	110	4.39	< MDL	< MDL	< MDL	< MDL	1.91	< MDL	< MDL	< MDL	< MDL
1,2-Dichlorobenzene	35	4.66	< MDL	< MDL	< MDL	< MDL	1.32	< MDL	< MDL	< MDL	< MDL
1,2,4-Trichlorobenzene	31	5.96	< MDL	< MDL	< MDL	< MDL	1.51	< MDL	< MDL	< MDL	< MDL
Hexachlorobenzene	22	4.74	< MDL	< MDL	< MDL	< MDL	2.11	< MDL	< MDL	< MDL	< MDL
Phthalate Esters (µg/kg)											
Dimethylphthalate	71	6.44	< MDL	< MDL	< MDL	< MDL	1.21	< MDL	< MDL	< MDL	< MDL
Diethylphthalate	1200	17.7	< MDL	< MDL	< MDL	< MDL	19.9	3.38 J	< MDL	2.78 J	3.17 J
Di-n-Butylphthalate	1400	5.31	< MDL	< MDL	< MDL	< MDL	---	---	---	---	---

Butylbenzyl phthalate	63	8.05	< MDL	< MDL	< MDL	< MDL	2.18	10.04	8.04	6.54	< MDL
bis(2-Ethylhexyl)phthalate	1300	28.8	12.98 J	< MDL	9.64 J	< MDL	---	---	---	---	---
Di-n-Octyl phthalate	6200	8.72	< MDL	< MDL	< MDL	< MDL	---	---	---	---	---
Phenols and Substituted Phenols (µg/kg)											
Phenol	420	8.23	< MDL	< MDL	< MDL	< MDL	3.67	6.87	6.78	5.97	< MDL
2-Methylphenol	63	7.84	< MDL	< MDL	< MDL	< MDL	1.92	< MDL	< MDL	< MDL	< MDL
4-Methylphenol	670	14.7	< MDL	< MDL	< MDL	< MDL	2.53	< MDL	< MDL	< MDL	< MDL
2,4-Dimethylphenol	29	26.8	< MDL	< MDL	< MDL	< MDL	10.2	< MDL	< MDL	< MDL	< MDL
Pentachlorophenol	400	31.3	< MDL	< MDL	< MDL	< MDL	10.4	< MDL	< MDL	< MDL	< MDL
Miscellaneous Extractables (µg/kg)											
Benzyl Alcohol	57	14.9	< MDL	< MDL	< MDL	< MDL	2.31	< MDL	< MDL	< MDL	< MDL
Benzoic Acid	650	59.1	79.1 J	144.9 J	< MDL	< MDL	---	---	---	---	---
Dibenzofuran	540	4.61	< MDL	< MDL	< MDL	< MDL	1.41	---	---	---	---
Hexachlorobutadiene	11	5.01	< MDL	< MDL	< MDL	< MDL	1.42	< MDL	< MDL	< MDL	< MDL
N-Nitrosodiphenylamine	28	22.4	< MDL	< MDL	< MDL	< MDL	3.15	< MDL	< MDL	< MDL	< MDL
Notes:	Validation Qualifiers (VQ):										
Zip 1 and Zip 2 represent sand + deionized water in a Ziploc bag	J - The reported concentration is an estimated value.										
Jar 1 is sand + deionized water in a borosilicate jar	U - The analyte was analyzed for, but was considered not detected at the reporting limit or reported value.										
Zip 3 is methanol in a Ziploc bag	< MDL is less than the Method Detection Limit										