

# TEST REPORT

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**Report Number:** 1569-11001

**Report Issued:** April 15, 2011

**Client:** GoodEarth AgroChem  
Plot No. 51, Mouza Brahmanwada Village  
Taq & Dist. Nagpur - 441 501  
Maharashtra  
Contact: Rahul Budhreja

**Project No.:** 18764

**Source of Samples:** The sample was delivered to IAPMO R&T Lab by GoodEarth AgroChem on March 11, 2011. The sample was received in good condition.

**Date of Evaluation:** March 21, 2011 to April 15, 2010.

**Sample Description:** Manganese Dioxide M.dox 80.

**Scope of Testing:** The purpose of this testing was to determine if the sand met the requirements of ANSI/NSF61- 2010a, section 7.

**CONCLUSION:** **Samples tested of the GoodEarth AgroChem Manganese Dioxide M.dox 80 COMPLIED with ANSI/NSF61 – 2010a, section 7. Please refer to pages 2 to 7 for more detailed findings.**

By our signatures below we certify that all the testing and sample preparation for this report was performed under continuous, direct supervision of IAPMO R&T Lab.

Tested by,

A handwritten signature in black ink, appearing to read "Lin Nguyen".

Lin Nguyen, Chemist

Reviewed by,

A handwritten signature in black ink, appearing to read "Michael N. Briggs".

Michael N. Briggs, Manager, Analytical Lab

**Primary Standards:** ANSI/NSF-61-2010a, section 7:

### **Preparation of Test Samples**

Test samples were rinsed and conditioned as described in ANSI/NSF61-2010a, Sections 7.4 and 7.5.

### **Conditioning and Exposure**

Process media (Redox/filtration media as described in specification document) exposures were run on this material as described in Section 7 of the standard. After backwashing, two samples were exposed to reagent water described in Section 7.5.4.3. The media was exposed at the rate indicated in Table 7.2 or 625 g/liter. One sample was analyzed for metals and semi-volatile organics, the other was sent to Pace Analytical for gross alpha and gross beta analysis.

### **Exposure and Normalization**

Following conditioning, the samples were exposed to extraction water according to the applicable scheme detailed in table 7.4

The concentration of extracted contaminants were normalized according to the normalization procedure outlined in section 7.7.1.

The laboratory concentration was normalized using the equation of:

$$\frac{\text{Lab concentration (ug/L)} \times \text{weight per volume ratio (g/L)}}{\text{Laboratory evaluation ratio (g/L)}}$$

According to the documentation the media is used at 6 gal/min/cu. ft. and if used properly will last indefinitely.

A cubic foot has a mass of 114 pound or a mass of 51710 grams. If all water is collected for 1 hour this would be 360 gallons or 1,363 liters. The weight/volume will continue to decrease with time, but for the purpose of this evaluation, we are considering the material is used for 1 hour the weight per volume becomes 51710grams/1363 liters or 37.9 grams/liter.

The normalization becomes:

$$\text{Laboratory concentration ug/L} \times \frac{37.9}{625}$$

Or laboratory concentration ug/L x 0.0606

### **Extraction Water**

Section 7.5.4.3 Reagent water

### **Collection/Preservation of Extraction Water**

Immediately following the exposure period, extraction waters collected for analysis were poured into previously prepared sample containers for storage until analysis, as specified in annex B, Section B.6 and Table B8.

Extracts for metal analysis were acidified with nitric acid as specified in EPA 200.8 protocols.

Samples for semi-volatile organic contaminants were preserved with sulfuric acid then refrigerated, as described in EPA 525.2 and SW-846 8270 protocol

### **Evaluation of Contaminant Concentrations**

Metal and organic contaminants, were determined as single point determinations. The normalized results were compared to SPAC level.

#### **Analytical methodology**

Metal determinations:	EPA 200.8, Metal determinations by ICP/MS
Semi-volatile contaminants:	EPA 8270, EPA525.2 Semi-volatile organic determinations by liquid/liquid extraction followed by GC/MS determinations.

#### **Analytical Instrumentation**

Metal determinations:	Thermo Electron X7 ICP/MS with CCT
Semi-volatile organic determinations:	Thermo Electron DSQ GC/MS with AS2000 auto sampler.

#### **Discussion:**

The product is M.dOX80 which is a process media that works by a combination oxidation reduction process and filtration. The material literature indicated the material has a virtually unlimited life and is used in flowing conditions. For normalization, the parameters are discussed above.

This material does not fit the description of an adsorption material so reagent water was used for conditioning and exposure.

Regulated metals, semi-volatile organics and radionuclides were monitored as required in Table 7.1.

As this is a process media SPAC acceptance criteria is used.

The normalized metal concentrations observed were all less than the SPAC.

No target analytes were observed in the semi-volatile GC/MS analysis. No non target analytes were observed in the resulting semi-volatile GC/MS chromatogram.

Radionuclides were measured by Pace Analytical.

Evaluation of the data from Pace is based on a June 23, 2009 memo for TOXservices.

Gross alpha particle activity was detected at  $0.0532 \pm 0.700$  pCi/L in the sample forwarded. Without normalization to the mass/L recommended by the manufacturer, this level is less than the 1.5 pCi/L SPAC level set in Annex D1 of the NSF/ANSI 61 standard.

Gross beta activity was detected at  $0.783 \pm 0.989$  pCi/liter. The SPAC for Gross beta is 0.4 mrems/year. The TOXservices memo indicates that for static conditions 8pCi/liter is based on the concentration of Strontium 90 that

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yields a dose of 4 millirems per year to the body or any critical organ. The SPAC is 10% of the TAC or 0.4 mrem/year, which would be equivalent to 0.8 pCi/liter which is close to the level found in the static sample. Normalizing to the weight /volume for recommended use (multiply by 0.0606), would make the observed counts well below the level indicated as acceptable.

## Regulated Metals Results

		Analytical Data	Normalized
Metal	(ug/L)	(ug/L)	(ug/L)
Aluminum	2000	571.400	34.650
Antimony	0.60	0.265	0.016
Arsenic	1	9.779	0.593
Barium	200	807.800	48.985
Beryllium	0.40	0.416	0.025
Bismuth	50	ND (< 0.0555)	ND (< 0.0034)
Cadmium	0.50	0.088	0.005
Chromium	10	4.572	0.277
Copper	130	15.900	0.964
Mercury	0.20	0.074	0.004
Nickel	10	8.760	0.531
Selenium	5	2.686	0.163
Thallium	0.20	0.124	0.008
Tin	20	ND (< 4.7052)	ND (< 0.2853)
Zinc	300	21.970	1.332
Lead	1	0.411	0.025

## Test Result of Organics:

Target Analyte	EPA 8270/EPA 625	Result	Normalized
Semi-Volatile Organics	C.A.S. Number	(ug/L)	Result (ug/L)
1,2,4-Trichlorobenzene	120-82-1	ND < 0.50	ND < 0.0303
1,3-Dichlorobenzene	541-73-1	ND < 0.50	ND < 0.0303
1,4-Dichlorobenzene	106-46-7	ND < 0.50	ND < 0.0303
1,2-Dichlorobenzene	95-50-1	ND < 0.50	ND < 0.0303
2,3,4,6-Tetrachlorophenol	58-90-2	ND < 0.50	ND < 0.0303
2,4,5-Trichlorophenol	95-95-4	ND < 1.20	ND < 0.0727
2,4,6-Trichlorophenol	88-06-2	ND < 1.00	ND < 0.0606
2,4-Dichlorophenol	120-83-2	ND < 0.50	ND < 0.0303
2,4-Dimethylphenol	105-67-9	ND < 0.50	ND < 0.0303
2,4-Dinitrophenol	51-28-5	ND < 10.00	ND < 0.6060
2,4-Dinitrotoluene	121-14-2	ND < 0.50	ND < 0.0303
2,6-Dichlorophenol	87-65-0	ND < 0.50	ND < 0.0303
2,6-Dinitrotoluene	606-20-2	ND < 0.50	ND < 0.0303
2-Chlorophenol	95-57-8	ND < 0.50	ND < 0.0303
2-Chloronaphthalene	91-58-7	ND < 0.50	ND < 0.0303
2-Ethylhexylmethacrylate	688-84-6	ND < 0.50	ND < 0.0303
2-Methylphenol	95-48-7	ND < 0.50	ND < 0.0303
2-Nitrophenol	88-75-5	ND < 10.00	ND < 0.6060
2-Phenyl 2-Propanol	617-94-7	ND < 0.50	ND < 0.0303
3-and 4-Methylphenol	108-39-4, 106-44-5	ND < 1.00	ND < 0.0606
4,6-Dinitro-2-methylphenol	534-52-1	ND < 0.70	ND < 0.0424
4-Bromophenylphenylether	101-55-3	ND < 0.50	ND < 0.0303
4-Chloro-3-methylphenol	59-50-7	ND < 0.50	ND < 0.0303
4-Chlorophenyl phenyl ether	7005-72-3	ND < 0.50	ND < 0.0303
4-Nitrophenol	100-02-7	ND < 10.00	ND < 0.6060
a,a,a'-Tetramethyl-1,4-benzenedimethanol	2948-46-1	ND < 0.50	ND < 0.0303
a,a,a'-Tetramethyl-1,3-benzenedimethanol	1999-85-5	ND < 0.50	ND < 0.0303
Acenaphthene	83-32-9	ND < 0.50	ND < 0.0303
Acenaphthylene	208-96-8	ND < 0.50	ND < 0.0303
Acetophenone	98-86-2	ND < 0.50	ND < 0.0303
Anthracene	120-12-7	ND < 0.50	ND < 0.0303
Azobenzene	103-33-3	ND < 0.50	ND < 0.0303
Benzo(a)anthracene	50-32-8	ND < 0.50	ND < 0.0303
Benzo(a)pyrene	56-55-3	ND < 0.50	ND < 0.0303
Benzo(b)fluoranthene	205-59-2	ND < 0.50	ND < 0.0303
Benzo(ghi)perylene	191-24-2	ND < 0.50	ND < 0.0303

## Test Result of Organics:

Target Analyte Semi-Volatile Organics	EPA 8270/EPA 625 C.A.S.Number	Result (ug/L)	Normalized Result (ug/L)
Benzo(k)fluoranthene	207-08-9	ND < 0.50	ND < 0.0303
Benzylbutylphthalate	85-68-7	ND < 5.00	ND < 0.3030
Bis(2-Ethylhexyl)adipate	103-23-1	ND < 0.70	ND < 0.0424
bis-2-Chloroethoxy methane	111-91-1	ND < 0.50	ND < 0.0303
bis-2-Chloroethyl ether	111-44-4	ND < 0.50	ND < 0.0303
bis-2-Chloroisopropyl ether	108-60-1	ND < 0.50	ND < 0.0303
bis-2-ethylhexyl phthalate	117-81-7	ND < 1.00	ND < 0.0606
Caprolactam	105-60-2	ND < 0.50	ND < 0.0303
Carbazole	86-74-8	ND < 0.50	ND < 0.0303
Chrysene	218-01-9	ND < 0.50	ND < 0.0303
Dibenz(ah)anthracene	53-70-3	ND < 0.50	ND < 0.0303
Diethylphthalate	84-66-2	ND < 0.50	ND < 0.0303
Dimethylphthalate	131-11-3	ND < 0.50	ND < 0.0303
Di-n-butylphthalate	84-74-2	ND < 1.60	ND < 0.0970
Di-n-octylphthalate	117-84-0	ND < 0.50	ND < 0.0303
Dinoseb	88-85-7	ND < 1.00	ND < 0.0606
Fluoranthene	206-44-0	ND < 0.50	ND < 0.0303
Fluorene	86-73-7	ND < 0.50	ND < 0.0303
Hexachlorobenzene	118-74-1	ND < 0.50	ND < 0.0303
Hexachlorobutadiene	87-68-3	ND < 0.50	ND < 0.0303
Hexachlorocyclopentadiene	77-47-4	ND < 0.50	ND < 0.0303
Hexachloroethane	67-72-1	ND < 0.50	ND < 0.0303
Indeno(1,2,3-cd)pyrene	193-39-5	ND < 0.50	ND < 0.0303
Isophorone	78-58-1	ND < 0.50	ND < 0.0303
Methyl 4-methoxysalicylate	5446-02-6	ND < 0.50	ND < 0.0303
Naphthalene	91-20-3	ND < 0.50	ND < 0.0303
Nitrobenzene	98-95-3	ND < 0.50	ND < 0.0303
N-Nitrosodimethylamine	62-75-9	ND < 0.50	ND < 0.0303
N-Nitroso-di-n-propylamine	621-64-7	ND < 0.50	ND < 0.0303
N-Nitrosodiphenylamine	86-30-6	ND < 0.50	ND < 0.0303
Pentachlorophenol	87-86-5	ND < 1.20	ND < 0.0727
Phenanthrene	85-01-8	ND < 0.50	ND < 0.0303
Phenol	108-95-2	ND < 0.50	ND < 0.0303
Pyrene	129-000-0	ND < 0.50	ND < 0.0303

No non-target analytes observed in the chromatogram