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August 30, 2018

- TO: Scott Hansen and Jamie Dunn
- CC: Scott Inman, Eric Ealy, Terry Coss, Pat Carr, Denis Roznowski, Alan Buell, Brad Hay, Kris Gamble, Brian Bell, Steve Laszewski
- FR: Steve Garbaciak, Steve Lehrke, and Ken Aukerman
- RE: Post-dredging Surface-Weighted Average Concentration (SWAC) Calculation Ashland/NSP Lakefront Site - Phase 2

Dredging was completed at the Phase 2 site on Saturday, August 25, 2018, and the final confirmation core was collected on that day. The dimensions and locations of the final grid cells after redredging and collection of final confirmation samples are shown on Figure 1. The final confirmation sample results used in the SWAC calculation are shown in Table 1. The final post dredge SWAC for Phase 2 is 2.38 parts per million (ppm) total polynuclear aromatic hydrocarbon (tPAH), four times below the stated performance standard of 9.5 ppm tPAH.

Final Post-dredge SWAC Calculation

As final confirmation samples were collected in accordance with the *Final Design*, several grid cells required redredging and resampling. A small number of grid cells were further reduced in area for subsequent redredging passes to maximize efficiencies. Final tPAH concentrations for each grid cell were based on the last confirmation sample(s) collected from that grid, with the average of sample results used as appropriate in accordance with Section 4.2.3 of the *Monitoring Plan (Appendix C to the Final (100%) Design for Phase 2 Wet Dredge)*.

In a February 10, 2017 memorandum prepared by Scott Inman (WDNR, 2017), EPA and WDNR's proposed a methodology for calculation of the post-dredging SWAC that defined the areas at the site that should be included in that calculation. Specifically, WDNR 2017 identified two areas that should be included in the post-dredge SWAC:

- 1. Sediment inventory, defined as DMU 1 and DMU 2 as shown on Drawing 11 of the *Final Design*; and
- 2. Null areas, as shown on Drawing 11 of the Final Design.

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Therefore, the final post-dredge SWAC was calculated as:

$$\overline{x}_w = \sum_{i=1}^n A_i x_i$$

Where x_i is the tPAH concentration (in ppm) of the surface interval of the *i*th confirmation core, and A_i is the representative area (i.e., the grid area) of the i^{th} confirmation core. For null area grids, the historic pre-dredge concentration was used. The final confirmation sample results used in the SWAC calculation are shown in Table 1.

With achievement of the SWAC, placement of the 6-inch thick restorative layer will be conducted as described in Section 9.2 of the Final Design.

Attachments: Table 1 and Figure 1

Table 1

Final Confirmation SWAC Ashland/NSP Lakefront Site

		Final	
		Confirmation	
		tPAH	
Confirmation	Area	Concentration	
Grid Cell	(Sq. Ft.)	(mg/Kg)	
1	5687	3.98	
2	5175	13.93	
3	8712	0.11	
4	8391	0.06	
5	3653	1.69	
6	2482	0.86	
7	4564	15.53	
8	8712	1.64	
9	8712	0.20	
10	6262	13.94	
11	1992	0.10	
12	8663	12.28	
13	8712	0.30	
14	6545	1.62	
15	8081	2.58	
16	4278	0.45	
16A	3744	0.33	
17	5507	0.95	
18	8712	19.08	
19	8712	1.24	
20	6505	2.78	
20A	3213	0.24	
21	8190	1.46	
22	5311	13.10	
23	6228	7.26	
24	8689	3.54	
25	8712	0.13	
26	8712	0.07	
27	3037	1.08	
28	4082	0.21	
29	3323	4.96	
30	2036	5.88	
31	1469	6.58	
32	1229	5.22	
33	4911	10.75	
34	3745	2.58	
35	7335	0.46	

		Final
		Confirmation
		tPAH
Confirmation	Area	Concentration
Grid Cell	(Sq. Ft.)	(mg/Kg)
57A	4695	1.06
58	8712	2.18
59	8712	2.33
60	4729	1.83
61	1446	0.88
62	1440	1.76
63	6346	0.49
64	7235	14.43
65	6631	0.07
66	7647	2.13
67	8712	2.27
68	8200	0.08
69	5214	0.27
70	3826	0.66
70A	4886	1.43
71	6848	0.94
72	6222	0.34
73	7492	7.04
74	5238	0.26
75	5336	1.62
76	7421	0.74
77	5426	1.87
78	1724	0.09
78A	3637	0.45
79	6229	0.16
80	8712	0.87
81	4685	0.08
82	5222	0.49
82A	3490	0.38
83	7808	0.09
84	8224	0.30
85	5035	3.01
86	7358	1.02
87	7326	0.07
88	5553	0.09
89	7693	0.06
90	<u>417</u> /	0.05
70	71/7	0.05

		Final Confirmation tPAH				Final Confirmation tPAH
Confirmation	Area	Concentration ¹		Confirmation	Area	Concentration
Grid Cell	(Sq. FL)		╡		(34. Ft.)	(iiig/Kg)
36	3665	1.33	┥	91	/9/5	6.56
37	3945	2.40	-	92	6817	2.49
38	8712	0.12	┥	93	7223	2.34
39	4346	0.78	╎└	94	7413	2.81
40	4891	0.78		95	8078	0.11
41	2905	0.26	L	96	8712	0.08
42	8712	0.47		97	8022	1.08
43	8523	0.06		98	8649	0.25
44	4577	3.88	[99	8712	0.04
45	1574	0.23		100	7758	0.15
46	1585	17.10		101	8258	0.80
47	5908	0.79		102	8707	0.02
48	8712	0.65		103	7984	3.39
49	8048	5.88		104	7467	0.61
50	6523	0.31		105	8350	1.66
51	8712	0.05		106	8712	1.43
52	6720	0.79		107	7291	4.76
53	4667	1.78] [108	6843	0.27
54	8712	2.10		109	8712	0.18
55	8712	1.86		110	4201	0.27
56	8712	7.01		111	6401	2.47
57	4017	3.59				

Note:

Final SWAC:

2.38

1- In accordance with Section 4.2.3 of the Monitoring Plan (Appendix C to the Final (100%) Design for Phase 2 Wet Dredge), when two or more final reconfirmation cores were collected, the accepted value for the location is the average of the results.

Prepared by: KDA1 Checked by: SDG



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GEOTUBE GAP CLOSURE
APPROXIMATE DMU BOUNDARY/ DAYLIGHT LIMIT

PHASE 2 WET DREDGE AREA

BULKHEAD WALL LOCATION

APPROXIMATE WEST PENINSULA BULKHEAD LINE LOCATION WATER TREATMENT DISCHARGE PIPE (LTWTS)

MECHANICAL RE-DREDGE SUB-GRID

ORIGINAL FINAL CONFIRMATION SAMPLE LOCATION

2ND FINAL CONFIRMATION SAMPLE LOCATION

3RD FINAL CONFIRMATION SAMPLE LOCATION

4TH FINAL CONFIRMATION SAMPLE LOCATION



NOTES:

- HORIZONTAL DATUM: NAD83 WISCONSIN PLANE, NORTH ZONE, U.S. FEET.
- 2. VERTICAL DATUM: NAVD88 USING GEOID 12A.

Foth Servirocon Joint Venture	Foth Infrastructure & Environment, LLC 2121 Innovation Court, Suite 300 P.O. Boso: Witchits 51-26 Dia Boso: Witchits 51-26	Phone: 920497-53016 Fax: 920497-8516 REUSE OF DOCUMENTS	THIS DOCUMENT HAS BEEN DEVELOPED FOR A SPECIFIC APPLICATION AND NOT FOR GENERAL USE. THEREFORE MAY NOT BE USED WITHOUT THE WRITTEN APPROVAL OF FOR THE RARESTRUCTURE AND ENVIRONMENT, LLC. UMAPPROVED USES 15 THE SOLE RESPONSIBILITY OF THE UMANTHAPIZED USER.	
ASHLAND/NSP LAKEFRONT SITE	PHASE 2 WET DREDGE	NORTHERN STATES POWER COMPANY	ASHLAND COUNTY WISCONSIN	
NO. BY DATE DESCRIPTION	OF PREPA BY	RECORD DRAWING OF COMPLETED CONSTRUCTION BY:	RECORD DRAWINGS OF COMPLETED CONSTRUCTION CONFORMING TO CONTRACTOR AND/OR OWNERS RECORDS. BY DATE	
SURVEYED DRAWN DESIGNED	WOL	JUN	E 2018	
2018 CONFIRMATION SAMPLE LOCATIONS				
2018 C SAMPL	IZONTAL	SCALE	ONS	