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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:

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

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

Confirmation Grid Cell	Area (Sq. Ft.)	Final Confirmation tPAH Concentration ¹ (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

Confirmation Grid Cell	Area (Sq. Ft.)	Final Confirmation tPAH Concentration ¹ (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	4174	0.05

Confirmation Grid Cell	Area (Sq. Ft.)	Final Confirmation tPAH Concentration ¹ (mg/Kg)
36	3665	1.33
37	3945	2.40
38	8712	0.12
39	4346	0.78
40	4891	0.78
41	2905	0.26
42	8712	0.47
43	8523	0.06
44	4577	3.88
45	1574	0.23
46	1585	17.10
47	5908	0.79
48	8712	0.65
49	8048	5.88
50	6523	0.31
51	8712	0.05
52	6720	0.79
53	4667	1.78
54	8712	2.10
55	8712	1.86
56	8712	7.01
57	4017	3.59

Confirmation Grid Cell	Area (Sq. Ft.)	Final Confirmation tPAH Concentration ¹ (mg/Kg)
91	7975	6.56
92	6817	2.49
93	7223	2.34
94	7413	2.81
95	8078	0.11
96	8712	0.08
97	8022	1.08
98	8649	0.25
99	8712	0.04
100	7758	0.15
101	8258	0.80
102	8707	0.02
103	7984	3.39
104	7467	0.61
105	8350	1.66
106	8712	1.43
107	7291	4.76
108	6843	0.27
109	8712	0.18
110	4201	0.27
111	6401	2.47

Final SWAC: 2.38

Note:

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

