

Appendix H
PADEP D.O. Study
July 1999
and
McLaren/Hart D.O. Study
August 1999

PADEP Dissolved Oxygen Study
July 22, 1999

**Preliminary Report
Dissolved Oxygen Study
Pools 7 and 8-Allegheny River**

August 23, 1999

by

**Pennsylvania Department of Environmental Protection
Field Operations—Water Management Program
Southwest Regional Office**

Dissolved Oxygen Study—Allegheny River—Pools 7 and 8

Purpose

The purpose of this study is to determine dissolved oxygen (D.O.) levels in deep areas of Allegheny River Pools 7 and 8 and to examine the relationship between water depth and D.O. under low flow conditions. Although the primary focus of the study is D.O., temperature, turbidity and pH data were also collected and are tabulated along with D.O. in the attached tables.

The Department of Environmental Protection (DEP) intends to expand this study to the Ohio River and to additional segments of the Allegheny River. This preliminary report is being released prior to those data collection activities and prior to a detailed analysis of results in order that the data may be incorporated into the Phase 3 National Environmental Policy Act (NEPA) analysis and documentation for sand and gravel dredging in the Allegheny and Ohio Rivers along with data previously collected by Tetra Tech and the U.S. Army Corps of Engineers.

Introduction

One of the major questions to be considered in assessing the environmental impacts of sand and gravel dredging is the effect on D.O. levels when river depth is increased by excavation of the sand and gravel substrate. Both the Allegheny and Ohio Rivers contain significant areas of deep water as a result of past dredging. Continued dredging will result in progressive deepening of these rivers as more material is removed.

Ambient D.O. data has been collected over time at various locations on both rivers by the Corps of Engineers and DEP. However, the locations sampled and the data collection methods used were not primarily aimed at investigating deeper areas; therefore, most of the historic ambient data is not useful for examining the effects of dredging on D.O.

Previous studies of D.O. in deeper areas were conducted by the Corps of Engineers in 1988 and by Tetra Tech as part of the Phase 2 Field Data Collection effort in 1998. The current ongoing study is intended to supplement and expand upon those efforts.

Methods

Several deep areas in Allegheny Pools 7 and 8 were selected from references in sand and gravel company annual reports and the NEPA Phase 2 Field Data Collection Report. A boat-mounted depth finder was used to position a boat at these sites and measurements of depth, D.O., temperature, turbidity and pH were then taken at various depths with a Yellow Springs Instrument Co. Model 6820 multi-parameter instrument with Model 610-DM display unit.

The location of each sampling site was noted by river mile, landmark description and GPS latitude/longitude readings taken with a Magellan GPS unit. The river width was also determined at most sites using a laser rangefinder.

Calibration for depth, pH, turbidity and D.O. was performed at the beginning of each day and again at mid-day per YSI's instructions. In addition, D.O. calibration was done prior to sampling each site. The air calibration option, employing a water-saturated atmosphere, was used for D.O. calibration, using the default barometric pressure of 760 mm Hg.

Dissolved Oxygen Study—Allegheny River—Pools 7 and 8

The boat was anchored at each sampling location and the sonde lowered to take instrument readings at various depth intervals. Readings were taken near the surface and at intervals to the bottom. Whenever a reading was taken on the river bottom, an additional reading was also taken a short distance above as a check against possible interference with the probes by bottom sediments. Where D.O. showed a steep drop between intervals, a number of readings were taken at closer intervals to profile the D.O. gradient more precisely.

Results

Instrument readings for depth, D.O., temperature, turbidity and pH are shown in the attached tables, arranged in order of decreasing river mile. Of the 13 sites sampled, 9 had D.O. lower than Pennsylvania's minimum criterion of 4.0 at some depth. Two others had D.O. greater than 4.0, but lower than Pennsylvania's daily average criterion of 5.0 at some depth; however, it is noted that only one set of D.O. readings was taken, therefore a daily average value was not established for those two sites. All sites with 30 foot or greater depths showed a violation of either the minimum or average daily D.O. criteria (again noting that only one set of measurements was taken at each site) except Site 1 where readings deeper than 29.8 feet were prevented by the boat drifting out of position.

During the survey period, river flow measured at the gage station located at Lock & Dam 7 ranged from a low of 2654 cfs at 0400 on 7/22/99 to a high of 4979 at 1200 on 7/22/99. Flow remained above 3000 cfs during most of the study period. The seven-day, ten-year low flow (with river regulated) at this gage station is 2250 cfs (information from U.S. Army Corps of Engineers). Flow data is attached.

River D.O. Study

River: Allegheny				Location/Comments				Weather		Personnel		River Depth= At L&D		Bottom Depth (feet)		Sample Depth (feet)		D.O. (ppm) Temp (°C)		Turbidity (NTU)	
Site	M.P.	Pool	Date	Time																	
1	58.2	8	7/22/99	1540	Small hole. Beneath power lines. lat: 40° 55' 19" long: 79° 29' 29"	p.cloudy 90° F	Brethauer Brief, intense storm @ 0630	Brandt upper: 9.5 lower: 10.3 L&D 8	54.3 10 20	2.9 8.6 8.39	28.1 8.43 27.8	4.7 3.9 2.3									
2	57.6	8	7/22/99	1520	1.75 mile above power station at Reesedale. Current stronger lat: 40° 55' 52" long: 79° 29' 10"	p.cloudy 90° F	Brethauer Brief, intense storm @ 0630	Brandt upper: 9.5 lower: 10.3 L&D 8	43.6 10.2 20	3.1 8.35 8.18	28.2 27.8 27.7	1.6 2.9 3									
3	55.2	8	7/22/99	1450	0.5 mile below power station lat: 40° 55' 30" long: 79° 27' 54" River width: 257 yards	p.cloudy 90° F	Brethauer Brief, intense storm @ 0630	Brandt upper: 9.5 lower: 10.3 L&D 8	50.5 10.3 29.9	2.9 10.1 5.03	29.6 27.9 25.1	2.5 3 3.2									
4	54.3	8	7/22/99	1440	Near old refractory at Templeton 0.5 mile above Glacial dredge lat: 40° 54' 46" long: 79° 27' 50"	p.cloudy 90° F	Brethauer Brief, intense storm @ 0630	Brandt upper: 9.5 lower: 10.3 L&D 8	23.7 9.9 19.8 23.7	3 8.34 5.92 4.79	29.8 27.7 26.5 25.6	2 2.6 16.2 35.9									

River D.O. Study

River: Allegheny														
Site	M.P.	Pool	Date	Time	Location/Comments	Weather	Personnel	River Depth= At L&D	Bottom Depth (feet)	Sample Depth (feet)	D.O. (ppm)	Temp (°C)	Turbidity (NTU)	pH (SU)
5	53.7	8	7/22/99	1415	330 yards below Glacial dredge lat: 40° 54' 28" long: 79° 27' 52"	p.cloudy 90° F Brief, intense storm @ 0630	Brandt Brethauer	upper: 9.5 lower: 10.3 L&D 8	41.6 9.9 20.1	3.1 7.99 4.76	8.62 27.7 26.2	29.4 4.6 42.9	8.01 7.59 7.09	
6.a	53.7	8	7/22/99	1640	58 Yards from right descending bank, 320 yards below Glacial dredge. lat: 40° 54' 25" long: 79° 27' 57"	p.cloudy 90° F Brief, intense storm @ 0630	Brandt Brethauer	Upper: 9.5 Lower: 10.3 L&D 8	11 6.4	3 6.4	9.5 8.96	24.9 24.7	18.5 11.1	6.96 6.96
6.b	53.7	8	7/22/99	1645	140 yards from right descending bank 362 yards below Glacial dredge lat: 40° 54' 23" long: 79° 27' 54" River width 427 yards	p.cloudy 90° F Brief, intense storm @ 0630	Brandt Brethauer	Upper: 9.5 Lower: 10.3 L&D 8	22.3 6.2 9.9	3 6.2 8.05	8.42 8.39 28	30.1 29 17.3	29.8 31.7 13.2	8.28 8.13 8.04
6.c	53.7	8	7/22/99	1650	171 yards from right descending bank 360 yards below Glacial dredge River width 428 yards lat: 40° 54' 23" long: 79° 27' 56"	p.cloudy 90° F Brief, intense storm @ 0630	Brandt Brethauer	Upper: 9.5 Lower: 10.3 L&D 8	27.7 9.9 20.3	3.1 9.9 6.09	7.98 7.85 24.2	30.1 28 25	29.7 31.7 13.2	8.19 8.13 7.65
7	52.3	7	7/23/99	1110	0.5 mile below L&D 8 72 yards from left descending bank River width: 287 yards lat: 40° 53' 32" long: 79° 28' 58"	Sunny 85° F	Brandt Brethauer	Upper: 10.1 L&D 7	28.2 10.1	3.2 7.61	7.87 28.8	29 6	7.88 7.87	

River D.O. Study

River: Allegheny									
Site	M.P.	Pool	Date	Time	Location/Comments	Weather	Personnel	River Depth= At L&D	Bottom Depth (feet)
8	51.5	7	7/23/99	1140	77 yards from right descending bank River width: 199 yards	Sunny 85° F	Brandt Breithauer	Upper: 10.1 L&D 7	2.9 10
					Boat drifted lat: 40° 53' 07" long: 79° 29' 07"			8.04 8.12	28.7 28.7
								20.2 30 41.1	8.03 7.77 0.86
								29 28.7 25.2	6.2 8.8 7.9
									Turbidity (NTU)
									pH (SU)
9	51.5	7	7/23/99	1200	77 yards from right descending bank River width: 199 yards	Sunny 85° F	Brandt Breithauer	upper: 10.1 L&D 7	39.8 30
					lat: 40° 53' 07" long: 79° 29' 09"			6.91 7.38	28.3 28.5
					Attempted to find exact depth of D.O. break			31.1 32.2 32.8 32.9 34.9 35	5.6 5.6 5.6 5.3 0.79 0.81
								28.1 27.9 26.8 2.9 26.7 26	7.62 7.44 7.41 4.7 7 4.5
									7.57
10	49.8	7	7/23/99	1030	96 yards from right descending bank River width: 260 yards	Sunny 85° F	Brandt Breithauer	upper: 10.1 L&D 7	3 10
					lat: 40° 51' 45" long: 79° 29' 08"			7.92 7.85	28.9 28.7
								19.9 29.9 30.2 30.9 31.9 33 34 35.2 40.1	10.2 5.5 27.3 27.1 4.59 3.99 3.03 26.5 26.3 26.1
									6.5 7.83 1.3 2.7 1.8 1.8 2.3 2 3 3
									7.09 7.06 7.05 7.05

River D.O. Study

River: Allegheny															
Site	M.P.	Pool	Date	Time	Location/Comments	Weather	Personnel	River Depth= At L&D	Bottom Depth (feet)	Sample Depth (feet)	D.O. (ppm)	Temp (°C)	Turbidity (NTU)	pH (SU)	
11	47.3	7	7/22/99	1200	75 Yards downstream from overhead power lines lat: 40° 50' 32" long: 79° 31' 39"	P. Cloudy 90° F Brief, intense storm @ 0600	Brandt Brethauer	Upper: 10.2 L&D 7	44.9 10	1 7.96 7.8	28.5 28.2	2.6 3.6	7.72 7.68		
									20	7.1	27.9	12.3	7.56		
									30	4.24	26.5	5.7	7.29		
									30.2	3.81	26.6	5	7.09		
									33.6	2.76	26	3.9	7.05		
									37.4	1.75	25.7	4.4	7.1		
									39	1.83	25.7	5.3	7		
									40	1.43	25.5	5.7	7.14		
									41.4	0.71	25.3	8.7	7.1		
									44.9	0.43	24.9	20	7.1		
12	47.3	7	7/23/99	1000	Mid-Channel River width: 305 yards lat: 40° 50' 29" long: 79° 31' 43"	Sunny 85° F	Brandt Brethauer	Upper: 10.1 L&D 7	36.5	2.9 10.5 20.3 24.9 30 33.3 36.5	8 7.85 7.19 5.86 4.46 3.04 2.26	28.7 28.5 28.1 27.4 26.5 26 25.7	3.5 2.3 3.9 3.3 2 5.6 39.4	7.8 7.74 7.57 7.33 7.27 7.11 7.13	
13	46.6	7	7/23/99	925	Mid-channel River width: 242 yards lat: 40° 50' 01" long: 79° 31' 51"	Sunny 85° F	Brandt Brethauer	Upper: 10.1 L&D 7	41.3	3.1 8.9 20.4 25.3 29.9 30.2 34.9 41.3	7.93 7.9 6.7 5.15 3.14 1.79 0.89 0.28	28.5 28.5 27.8 27.2 26.1 25.9 25.5 24.8	3 2.5 3.5 2.2 0.6 2.3 2.2 43	7.95 7.83 7.58 7.29 7.12 7.19 7.02 7.03	

**McLaren/Hart Dissolved Oxygen
Study
August 24, 1999**



**TETRA TECH, INC.
SAND & GRAVEL DREDGING EIS
DISSOLVED OXYGEN MEASUREMENTS
ALLEGHENY RIVER - POOL 8**

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DATE: 8-24-99 TIME: 1030 WAYPOINT: 164 LAT: 40°55.749'N LONG: 079°29.167'W
 LOCATION: ALLEGHENY RIVER POOL 8 MILE POINT: 57.6
 DESCRIPTION: MIDCHANNEL - GREY SIDED HOUSE WITH WHITE TRIM ON LEFT
 DESCENDING SHORE

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	24.2	8.1
3.0	24.2	8.1
5.0	24.2	8.1
10.0	24.1	8.2
15.0	24.1	8.0
20.0	24.1	8.1
25.0	24.1	8.1
30.0	24.1	8.1
35.0	24.0	8.1
40.0	24.0	8.1
45.0	24.0	8.1
50.0	24.0	8.1
53.0 (BOTTOM)	24.0	8.1

WINKLER D.O. SAMPLE TITRATION FOR VERIFICATION
 50.0 NA 8.2

COMMENTS: BAROMETRIC PRESSURE 29.95" STEADY WEATHER: SUNNY, UPPER 70'S
 @ 1030; AFTERNOON HIGH MID 80'S °F. KEMMERER SAMPLE COLLECTED AT 50 FEET
 DEPTH FOR WINKLER D.O. TITRATION; RESULT WAS 8.2 mg/L

DATE: 8-24-99 TIME: 1133 WAYPOINT: 165 LAT: 40°55.499'N LONG: 079°27.829'W
 LOCATION: ALLEGHENY RIVER POOL 8 MILE POINT: 55.2
 DESCRIPTION: MIDCHANNEL - 1/2 MILE DOWNRIVER OF WEST PENN POWER PLANT ON
 RIGHT DESCENDING SHORE

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	27.5	7.8
3.0	26.0	8.0
5.0	25.0	8.2
10.0	24.5	8.2
15.0	24.4	8.2
20.0	24.4	8.1
25.0	24.3	8.1
30.0	24.3	8.0
35.0	24.3	8.0
40.0	24.3	7.9
45.0	24.2	7.7
48.0	24.0	6.9
50.0 (BOTTOM)	24.0	6.6



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DISSOLVED OXYGEN MEASUREMENTS

ALLEGHENY RIVER - POOL 8

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DATE: 8-24-99 TIME: 1157 WAYPOINT: 166 LAT: 40°54.625'N LONG: 079°27.829'W
 LOCATION: ALLEGHENY RIVER POOL 8 MILE POINT: 54.3
 DESCRIPTION: MIDCHANNEL - AT NAUTICAL MILE MARINA BOAT LAUNCH RAMP ALONG LEFT DESCENDING SHORE

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	26.5	8.0
3.0	26.4	8.2
5.0	25.4	8.3
10.0	24.8	8.1
15.0	24.5	7.5
20.0	24.3	7.1
25.0	24.1	6.2
30.0	24.0	5.4
31.0	24.0	5.1
32.0	24.0	5.1
33.0	24.0	4.6
34.0	24.0	4.1
35.0	23.9	4.1
36.0	23.9	4.1
37.0	23.9	3.8
38.0	23.8	3.4
39.0*	23.8	3.3

WINKLER D.O. SAMPLE TITRATION FOR VERIFICATION

40.5 (BOTTOM)* NA 2.8

COMMENTS: KEMMERER SAMPLE COLLECTED AT 40.5 FEET DEPTH FOR WINKLER D.O. TITRATION, RESULT WAS 2.8 mg/L

* Boat position moved slightly between final D.O. reading at bottom depth 39 feet, and collection of Kemmerer sample for D.O. titration (Bottom depth 40.5 feet).



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ALLEGHENY RIVER - POOL 8

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DATE: 8-24-99 TIME: 1227 WAYPOINT: 167 LAT: 40°54.573'N LONG: 079°27.845'W
 LOCATION: ALLEGHENY RIVER POOL 8 MILE POINT: 54.1
 DESCRIPTION: MIDCHANNEL - AT NAUTICAL MILE MARINA (MID POINT) ON LEFT
 DESCENDING SHORE

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	26.4	8.2
3.0	26.4	8.3
5.0	26.0	8.3
10.0	24.7	8.2
15.0	24.5	7.7
20.0	24.2	6.8
25.0	24.1	6.1
30.0	24.0	5.6
31.0	24.0	5.0
32.0	24.0	5.0
33.0	24.0	4.9
34.0	24.0	4.7
35.0	24.0	4.4
36.0	23.9	4.1
37.0	23.9	3.7
38.0	23.9	3.5
39.0	23.9	3.4
40.0	23.9	3.3
41.0 (BOTTOM)	23.9	3.2



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DISSOLVED OXYGEN MEASUREMENTS
ALLEGHENY RIVER - POOL 8**

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**DATE: 8-24-99 TIME: 1249 WAYPOINT: 169 LAT: 40°54.344'N LONG: 879°27.980'W
LOCATION: ALLEGHENY RIVER POOL 8 MILE POINT: 53.7
DESCRIPTION: MIDCHANNEL**

DEPTH (FT.)	WATER TEMP (°C)	D.O. (PPM)
SURFACE	26.1	8.3
3.0	26.0	8.4
5.0	25.5	8.3
10.0	24.8	8.1
15.0	24.5	7.6
20.0	24.3	7.2
25.0	24.2	6.3
30.0	24.2	6.0
35.0	24.0	5.0
36.0	24.0	4.7
37.0	24.0	4.7
38.0	24.0	4.5
39.0	24.0	4.5
40.0	24.0	4.3
41.0	24.0	4.3
42.0	24.0	4.2
43.0	24.0	4.2
44.0	24.0	4.0
45.0	23.9	3.9
46.0	23.9	3.9
47.0	24.0	3.9
48.0	23.9	3.7
49.0	23.9	3.7
50.0 (BOTTOM)	23.9	3.6

WINKLER D.O. SAMPLE TITRATION FOR VERIFICATION

46.0	NA	3.5
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**COMMENTS: KEMMERER SAMPLE COLLECTED AT 46 FEET DEPTH FOR WINKLER D.O.
TITRATION; RESULT WAS 3.5 mg/L**

**TO EVALUATE EFFECT OF STIRRER ON D.O. READINGS, TURNED STIRRER OFF AT 50 FEET
DEPTH. THE D.O. READING DROPPED TO 3.3 mg/L WITHOUT STIRRER OPERATING.**



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 DISSOLVED OXYGEN MEASUREMENTS
 ALLEGHENY RIVER - POOL 7

PAGE 1 OF 2

DATE: 8-24-99 TIME: 1410 WAYPOINT: 170 LAT: 40°52.922'N LONG: 079°29.061'W
 LOCATION: ALLEGHENY RIVER POOL 7 MILE POINT: 51.5
 DESCRIPTION: MIDCHANNEL

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	25.9	7.9
3.0	25.8	8.0
5.0	25.8	8.1
10.0	25.8	8.1
15.0	25.3	8.0
20.0	25.2	7.9
25.0	25.2	7.8
30.0	25.2	7.7
35.0	25.2	7.6
40.0	25.1	7.7
43.0 (BOTTOM)	25.1	7.5

COMMENTS: CALIBRATION CHECK OF D.O. METER IN SATURATED AIR CHAMBER:
 TIME: 1406 TEMP: 29°C D.O.: 7.8 mg/L Solubility of Oxygen Table: 7.7 mg/L

DATE: 8-24-99 TIME: 1432 WAYPOINT: 172 LAT: 40°51.709'N LONG: 079°29.195'W
 LOCATION: ALLEGHENY RIVER POOL 7 MILE POINT: 49.8
 DESCRIPTION: MIDCHANNEL - AT GLACIAL SAND & GRAVEL OFFLOADING AREA ALONG
 RIGHT DESCENDING SHORE

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	26.0	7.9
3.0	26.0	8.0
5.0	25.5	7.8
10.0	25.4	7.7
15.0	25.3	7.7
20.0	25.3	7.6
25.0	25.3	7.6
30.0	25.2	7.6
35.0	25.2	7.6
40.0	25.2	7.6
45.0	25.1	7.4
47.0 (BOTTOM)	25.1	7.2

WINKLER D.O. SAMPLE TITRATION FOR VERIFICATION
 40.0 NA 7.6

COMMENTS: KEMMERER SAMPLE COLLECTED AT 40 FEET DEPTH FOR WINKLER D.O.
 TITRATION; RESULT WAS 7.6 mg/L



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ALLEGHENY RIVER - POOL 7

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DATE: 8-24-99 TIME: 1516 WAYPOINT: 173 LAT: 40°50.599'N LONG: 079°31.734'W
 LOCATION: ALLEGHENY RIVER POOL 7 MILE POINT: 47.3
 DESCRIPTION: RIGHT CENTER OF CHANNEL - 200' DOWNRIVER OF OVERHEAD
 POWERLINE CROSSING

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	25.5	7.7
3.0	25.5	7.7
5.0	25.4	7.7
10.0	25.4	7.7
15.0	25.4	7.8
20.0	25.2	7.6
25.0	25.2	7.7
30.0	25.2	7.6
35.0	25.1	7.6
40.0	25.1	7.5
43.5 (BOTTOM)	25.0	7.4

ALLEGHENY RIVER, POOL 7, M.P. 47.0

THIS RIVER MILE POINT WAS ESTIMATED FROM A TOPOGRAPHIC MAP BASED ON THE PADEP LAT/LONG. COORDINATES (DEP M.P. WAS NOT RECORDED FROM THEIR HANDWRITTEN DATA SHEETS IN ERROR). THERE ARE PIPELINE CROSSINGS AT M.P 47.0. THEREFORE, BASED ON THE DEPTH, THE DEP DID NOT SAMPLE THERE, AND WERE PROBABLY CLOSER TO M.P. 46.6 BASED ON THE LAT/LONG COORDINATES.

DATE: 8-24-99 TIME: 1538 WAYPOINT: 175 LAT: 40°50.164'N LONG: 079°31.855'W
 LOCATION: ALLEGHENY RIVER POOL 7 MILE POINT: 46.6
 DESCRIPTION: MIDCHANNEL - AT KITTANNING MARINA BOAT LAUNCH RAMP ALONG LEFT DESCENDING SHORE

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	25.8	7.9
3.0	25.8	8.0
5.0	25.8	8.0
10.0	25.8	8.0
15.0	25.8	8.0
20.0	25.8	7.9
25.0	25.8	7.9
30.0	25.5	7.9
35.0	25.6	8.0
40.0	25.2	7.5
45.0	25.1	7.4
46.5 (BOTTOM)	25.1	7.4

WINKLER D.O. SAMPLE TITRATION FOR VERIFICATION

43.0 NA 7.4

COMMENTS: KEMMERER SAMPLE COLLECTED AT 43 FEET DEPTH FOR WINKLER D.O. TITRATION; RESULT WAS 7.4 mg/L



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SAND & GRAVEL DREDGING EIS
DISSOLVED OXYGEN MEASUREMENTS
ALLEGHENY RIVER - POOL 5**

PAGE 1 OF 3

**DATE: 8-25-99 TIME: 0919 WAYPOINT: 176 LAT: 40°42.155'N LONG: 079°36.002'W
LOCATION: ALLEGHENY RIVER POOL 5 MILE POINT: 34.6
DESCRIPTION: MIDCHANNEL - AT SOUTH BUFFALO TOWNSHIP RAMPS**

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	25.1	7.9
3.0	25.1	7.9
5.0	25.1	7.9
10.0	25.1	7.9
15.0	25.0	7.9
20.0	25.0	7.9
25.0	25.0	7.9
30.0	25.0	7.9
35.0	25.0	7.9
40.0	25.0	7.9
41.5 (BOTTOM)	25.0	7.9

**COMMENTS: BAROMETRIC PRESSURE 29.99" WEATHER: LIGHT TO MODERATE RAIN
DURING D.O. SURVEY (D.O. METER PROTECTED IN BOAT CABIN), AIR TEMPERATURE
UPPER 60'S (°F).**

**DATE: 8-25-99 TIME: 0940 WAYPOINT: 177 LAT: 40°41.474'N LONG: 079°38.058'W
LOCATION: ALLEGHENY RIVER POOL 5 MILE POINT: 32.7
DESCRIPTION: MIDCHANNEL - 250' DOWNRIVER FROM HEAD OF MURPHY ISLAND**

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	25.0	7.7
3.0	25.0	7.7
5.0	24.9	7.8
10.0	24.9	7.7
15.0	24.9	7.7
20.0	24.9	7.7
25.0	24.9	7.7
30.0	24.9	7.7
35.0	24.9	7.6
40.0	24.8	7.6
45.0	24.8	7.6
46.0	24.9	7.5
47.0	24.8	7.4
48.0	24.8	7.3
49.0 (BOTTOM)	24.8	7.0



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DATE: 8-25-99 TIME: 1002 WAYPOINT: 178 LAT: 40°41.520'N LONG: 079°38.547'W
 LOCATION: ALLEGHENY RIVER POOL 5 MILE POINT: 32.2
 DESCRIPTION: MIDCHANNEL - BELOW PIPELINE CROSSING

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	24.9	7.5
3.0	24.9	7.7
5.0	24.9	7.7
10.0	24.9	7.7
15.0	24.9	7.7
20.0	24.9	7.7
25.0	24.9	7.7
30.0	24.9	7.7
35.0	24.9	7.7
40.0	24.8	7.7
45.0	24.8	7.7
50.0	24.8	7.7
55.5 (BOTTOM)	24.8	7.8

WINKLER D.O. SAMPLE TITRATION FOR VERIFICATION
 52.0 NA 7.8

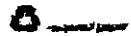
COMMENTS: ALLEGHENY DREDGE WAS POSITIONED AT M.P. 32.2. COULD NOT SAMPLE IN AREA UPSTREAM OF DREDGE (DEPTH TOO SHALLOW DUE TO PIPELINE CROSSING: DEPTH 12-19 FEET). SAMPLED NEAR MIDCHANNEL ADJACENT TO DREDGE BUT UPSTREAM OF DREDGE DISCHARGE (DIFFUSER). KEMMERER SAMPLE COLLECTED AT 52 FEET DEPTH FOR WINKLER D.O. TITRATION, RESULT WAS 7.8 mg/L.

DATE: 8-25-99 TIME: 1026 WAYPOINT: 179 LAT: 40°41.654'N LONG: 079°38.921'W
 LOCATION: ALLEGHENY RIVER POOL 5 MILE POINT: 31.8
 DESCRIPTION: MIDCHANNEL

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	24.9	7.7
3.0	24.8	7.7
5.0	24.8	7.7
10.0	24.8	7.7
15.0	24.8	7.7
20.0	24.8	7.7
25.0	24.8	7.7
30.0	24.8	7.7
35.0	24.8	7.6
40.0	24.8	7.3
45.0	24.7	6.8
50.0	24.7	6.8
55.0	24.6	6.2
56.0 (BOTTOM)	24.6	6.1



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**DATE: 8-25-99 TIME: 1050 WAYPOINT: 180 LAT: 40°41.680'N LONG: 079°38.094'W
LOCATION: ALLEGHENY RIVER POOL 5 MILE POINT: 31.7
DESCRIPTION: MIDCHANNEL - IN LINE WITH LARGE BOULDER ON RIGHT DESCENDING
SHORE JUST UP RIVER OF M.P. 31.7 DAYMARK (THOMAS E. CLARK)**

<u>DEPTH (FT.)</u>	<u>WATER TEMP (°C)</u>	<u>D.O. (PPM)</u>
SURFACE	24.8	7.6
3.0	24.8	7.8
5.0	24.8	7.8
10.0	24.8	7.7
15.0	24.8	7.7
20.0	24.8	7.7
25.0	24.8	7.6
30.0	24.8	7.5
35.0	24.8	7.3
40.0	24.8	6.6
45.0	24.8	6.3
50.0	24.8	
54.0 (BOTTOM)	24.6	5.4



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TOTAL P.24