

**2006 Study Plan for the
White Oak Creek Watershed
(Highland and Brown Counties, OH)**

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Monitoring Rationale

Introduction

During the 2006 field season (June thru October) chemical, physical, and biological sampling will be conducted in the White Oak Creek basin to assess and characterize all of the various potential sources of water quality impairment in the watershed. As a Total Maximum Daily Load (TMDL) basin, this survey will incorporate a drainage area stratified systematic study design. Additional sites will be situated to assess specific concerns.

The Village of Mount Orab obtains drinking water from Sterling Run. Atrazine concentrations in excess of the MCL have been recorded in some compliance sample reports. Apparently, the combination of poorly drained soils and the inappropriate fall application of the herbicide have contributed to this dilemma. Thus, ambient organic water and sediment pollution in the Sterling Run and adjacent sub-basins will be investigated more thoroughly than is typical for OEPA studies.

Several small municipal WWTP point source discharges exist in the basin. Some of these WWTP's and a large landfill will be targeted for evaluation of their potential water quality impact. Otherwise, the sampling effort is structured to characterize non point source impacts including those from unsewered communities and from agricultural or industrial activities. Streams, locations and types of sampling scheduled for the study area are listed in Table 1. Lab effort is detailed in Table 2.

Sampling Objectives:

Qualify organic water and sediment pollution in support of improving assessment of Mount Orab's drinking water use attainment status.

Evaluate all streams in the basin which drain at least 4 mi² to determine the status of the aquatic community.

Characterize the amount of aquatic resource degradation attributable to various land uses including agricultural or from rural community development.

Investigate the potential for use impairment induced by minor WWTP's or industrial activities including septage land application.

Determine any potential recreational impacts from unsewered communities including Buford, New Hope, and from pump station overflow at the Brown County Mobile Home Park.

Chemical/Physical Water and Sediment Quality

Chemical sampling locations within the study area are listed in Table 1. Conventional chemical/physical water quality samples will be collected five times. Three of the samples will be submitted for mercury concentration analysis. Five samples will also be collected from five permitted entities and three of these samples will be analyzed for mercury content.

In support of a statewide study to assess nutrient assimilation, dissolved P, water column chlorophyll, and periphyton samples will be collected at three sites. The sampling protocol for determination of chlorophyll a concentrations requires that these samples be collected between late July and early September following a minimum of two weeks of stable, low-flow conditions. For a given sampling event (either water column chlorophyll or periphyton), one composite sample per site will be split among three filters for later analysis. The dissolved P and water column chlorophyll samples should be collected during the same sampling event.

Nutrient sampling will occur at: White Oak Creek - RM 6.64, East Fork White Oak Creek - RM 5.81 and North Fork White Oak Creek - RM 6.98.

Bacteriological water samples will be collected five times at locations where drainage areas are $\approx 16 \text{ mi}^2$ or 32 mi^2 (8 locations), at reference sites (4 locations), and at sentinel sites (3 locations, one of these is also a reference site and another is included among those draining 32 mi^2). Three additional sites were identified to determine whether there is an excessive presence of water borne pathogens in proximity to specific communities or potential sources; White Oak Creek - RM 20.2, Sterling Run - RM 11.35 and Bells Run RM 1.97. Beyond the drainage area stratified and priority sites, five samples from five permitted entities will also be evaluated for bacteria concentrations.

Dependent on field investigations of various unsewered areas, intensive livestock collections, or upon confirmation of sewer overflows, additional bacteria samples will be collected as necessary.

Organic water samples will be collected twice, and sediment metal and organic samples will be collected once at reference sites (4 locations), sentinel sites (3 locations, one of these is also a reference site), nutrient sites (3 locations, two are these are also reference sites), White Oak Creek - RM 20.2, North Fork White Oak Creek - RM 18.1, Little North Fork White Oak Creek - RM 2.94, Flat Run- RM 3.39, Sterling Run- RMs 11.35, 9.65 & 6.74 and at Sterling Run Tributary at RM 6.68 - RMs 2.41 & 0.68. Additionally, organic water samples will be submitted twice from five permitted entities.

Recognizing the importance of contributing to the assessment of Mt. Orab's drinking water and contingent on initial sample results, a third organic water sample pass may be considered helpful. Sample totals in Tables 1 and 2 do not include this possibility. However, preparation to facilitate this effort should be coordinated.

Datasonde© sampling will be completed by the Modeling Unit. One deployment run is anticipated at all sites where drainage areas are $\geq 32 \text{ mi}^2$ (10 locations). The Modeling Unit will calibrate discharge correlated to stream height at the three sentinel sites. These stations will be chemically sampled six times during which stream height will be recorded. Subsequently, loading calculations will be possible for these locations.

Macroinvertebrate and Fish Assemblages

Quantitative macroinvertebrate sampling methods and two fish sampling passes will be conducted at all sites where drainage areas are ≥ 32 mi² (13 locations). Qualitative macroinvertebrate sampling methods and one fish sampling pass will be conducted at all sites where drainage areas are ≈ 4 mi², 8 mi² and 16 mi². (29 locations). Habitat assessment will occur at all fish sampling locations.

To recommend or assess the appropriateness of aquatic life use designations, a primary headwater evaluation will be conducted at Walnut Creek - RM 0.57 and at sites which bracket WWTP's on Snapping Turtle and Town Runs. Subsequently if warmwater habitat (WWH) is deemed applicable, then fish community evaluation will be arranged.

Collection of fish tissue samples is anticipated at five White Oak Creek locations: RMs 20.6, 15.2, 10.0, 6.6 and 0.5.

Quality Assurance / Sampling Methods

Ohio EPA Manuals

All biological, chemical, EPA laboratory, data processing, and data analysis methods and procedures adhere to those specified in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio Environmental Protection Agency 2006), Biological Criteria for the Protection of Aquatic Life, Volumes II - III (Ohio Environmental Protection Agency 1987, 1989a, 1989b), The Qualitative Habitat Evaluation Index (QHEI); Rationale, Methods, and Application (Rankin 1989) for habitat assessment, and Ohio EPA Sediment Sampling Guide and Methodologies (Ohio EPA 2001).

Quality Control Samples

Ten percent of the sediment, water, and bacteria samples will be submitted to the lab as field duplicates. One Datasonde® recorder site will have two instruments placed in the river as field duplicates.

Surface Water

Surface water grab samples will be collected from the upper 12 inches of river water and sampled directly into appropriate containers. Collected water will be preserved using appropriate methods, as outlined in Parts II and III of the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio EPA 2006) and delivered to the Ohio EPA lab for analysis. Datasonde® continuous recorders will be placed at select locations to evaluate diurnal measurements of dissolve oxygen, pH, temperature, and conductivity.

Bacteria

Water samples will be collected directly from the river into sterilized polyethylene containers, cooled to 4°C, and transported to the Ohio EPA lab in Columbus for analysis within 6 hours of sample collection. All samples will be analyzed for fecal coliform and *E. coli* bacteria using U.S.EPA approved methods (STORET Parameter Codes 31611 and 31633). Samples may be processed in the field using standard incubation methods before delivery to the Ohio EPA lab.

Sediment

Fine grained multi-incremental sediment samples will be collected in the upper 4 inches of bottom material using either decontaminated stainless steel scoops or Ekman dredges. Collected sediment will be placed into glass jars with teflon lined lids, placed on ice (to maintain 4°C) and delivered to the Ohio EPA lab. Sampling and decontamination protocols will follow those listed in the Ohio EPA Sediment Sampling Guide and Methodologies, November, 2001.

Biological Community Assessment

Macroinvertebrates will be collected from artificial substrates and from the natural habitats. The artificial substrate collection provides quantitative data and consists of a composite sample of 5 modified Hester-Dendy (HD) multiple-plate samplers colonized for six weeks. At the time of the artificial substrate collection, a qualitative multihabitat composite sample is also collected. This sampling effort consists of an inventory of all observed macroinvertebrate taxa from the natural habitats at each site with no attempt to quantify populations other than notations on the predominance of specific taxa or taxa groups within major macrohabitat types (e.g., riffle, run, pool, margin). Fish will be sampled once or twice at each sampling location with pulsed DC current. Detailed biological sampling protocols are documented in the Ohio EPA manual Biological Criteria for the Protection of Aquatic Life, Volume III (1989).

Stream Habitat Evaluation

Physical habitat is evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Rankin 1989). Various attributes of the available habitat are scored based on their overall importance to the establishment of viable, diverse aquatic faunas. Evaluations of type and quality of substrate, amount of instream cover, channel morphology, extent of riparian canopy, pool and riffle development and quality, and stream gradient are among the metrics used to evaluate the characteristics of a stream segment, not just the characteristics of a single sampling site. As such, individual sites may have much poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values higher than 60 were generally conducive to the establishment of warmwater faunas while those which scored in excess of 75-80 often typify habitat conditions which have the ability to support exceptional faunas.

Use Attainment

Attainment/non-attainment of aquatic life uses will be determined by using biological criteria codified in Ohio Administrative Code (OAC) 3745-1-07, Table 7-17. Numerical biological criteria are based on multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), indices measuring the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community.

Performance expectations for the basic aquatic life uses (Warmwater Habitat [WWH], Exceptional Warmwater Habitat [EWH], and Modified Warmwater Habitat [MWH] were

developed using the regional reference site approach (Hughes et al. 1986; Omernik 1988). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981). Attainment of an aquatic life use is FULL if all three indices (or those available) meet the applicable criteria, PARTIAL if at least one of the indices did not attain and performance did not fall below the fair category, and NON if all indices either fail to attain or any index indicates poor or very poor performance. The results will be compared to WWH biocriteria for the Western Allegheny Plateau ecoregion.

Recreational use attainment will be determined using fecal coliform bacteria and *E. coli* bacteria. Both types of organisms are indicator organisms for the potential presence of pathogens in surface water resulting from the presence of untreated human or animal wastes, and they are the basis for recreational use water quality criteria in Rule 3745-1-07 of the Ohio Administrative Code (OAC).

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Table 1. List of sampling locations in the 2006 White Oak Creek study area. Sample type acronyms and number of sites follow:

RM	Sample Type	Location / Notes	Mi²	Map#	Lat.-Long.
<i>White Oak Creek</i>					
27.50	C,D,M,F	New Hope White Oak Station Rd.	150.0	727	38.9901-83.8896
20.20	C,O,S,D,B,M,F	Bethel New Hope Rd., Tissue site	188.0	727	38.9594-83.9157
16.60	C,D,M,F	McCall Rd., Tissue site	190.0	727	38.9261-83.9254
12.70	C,N,O,S,D,B,M,F	end of Barnes Rd., Reference, Nutrient & Tissue site	213.0	727	38.8952-83.9226
6.64	C,O,S,D,B,M,F	St. Rt. 221, Reference, Sentinel & Tissue site	222.0	747	38.8448-83.9213
2.20	C,M,F	Adj St. Rt. 221, Tissue site	232.0	747	38.8059-83.9573
<i>North Fork White Oak Creek</i>					
19.67	C,m,f	Cochran Rd.	4.4	680	39.1708-83.7583
18.10	C,O,S,m,f	Dawson Rd.	7.2	680	39.1657-83.7810
15.35	C,B,m,f	dst. St. Rt. 131, dst. Barr Run	12.0	680	39.1421-83.8049
9.70	C,B,D,M,F	St. Rt. 134	37.1	706	39.0942-83.8457
6.98	C,N,O,S,D,B,M,F	Sicily Rd., Reference & Nutrient site	46.0	706	39.0646-83.8499
1.50	C,O,S,D,B,M,F	Mt. Orab Sardinia Rd, Sentinel site	53.6	706	39.0162-83.8710
<i>Little North Fork White Oak Creek</i>					
5.06	C,m,f	St. Rt. 134	3.6	680	39.1594-83.8419
2.94	C,O,S,m,f	St. Rt. 131	7.3	680	39.1312-83.8440
0.28	C,B,m,f	Rosselott Rd.	13.8	706	39.0963-83.8424
<i>Flat Run</i>					
4.80	C,m,f	gravel lane off Gath Rd.	3.9	706	39.0486-83.8124
3.39	C,O,S,m,f	St. Rt. 134	7.4	706	39.0385-83.8303
0.15	C,B,m,f	Tri-County Highway	12.3	706	39.0166-83.8681
<i>East Fork White Oak Creek</i>					
19.50	C,m,f	Ust. Trib at RM 19.36, access is uncertain	3.6	681	39.1272-83.6834
18.69	C,m,f	Haigh Rd. (Co. Rd. 72)	6.7	707	39.1178-83.6885
16.53	C,B,m,f	dst. Sorg Rd., dst. trib.	12.7	707	39.0972-83.7080
10.48	C,D,B,M,F	Mowrystown Delphi Park, ust dam	39.0	707	39.0778-83.7386
	C,O,B	Mowrystown WWTP effluent			
5.81	C,N,O,S,D,M,F	Sardinia-Mowrystown Rd., Nutrient site	52.0	706	39.0153-83.7953
3.20	C,O,S,D,B,M,F	From Wardlow or Stephan Rd. Reference site	70.0	706	39.0086-83.8319
<i>East Fork White Oak Creek Tributary at RM 15.52</i>					
2.10	C,m,f	New Market Rd.	4.6	707	39.1168-83.7315
0.26	C,m,f	Robinson Rd.	7.1	707	39.0935-83.7207

Table 1. continued

RM	Sample Type	Location	Notes		
<i>East Fork White Oak Creek Tributary at RM 14.35</i>					
0.01	C,m,f	at mouth (access upst. Edwards Rd.)	3.2	707	39.0791-83.7378
<i>East Fork White Oak Creek Tributary at RM 12.38</i>					
2.42	C,m,f	Ridge Rd.	3.4	707	39.0761-83.7075
0.30	C,m,f	near mouth, at end of farm lane	6.7	707	39.0598-83.6834
<i>Plum Run</i>					
0.95	C,m,f	Roberts Cem Road	4.2	707	39.0388-83.7308
0.32	C,m,f	Stivers Rd.	6.3	707	39.0349-83.7403
<i>Bells Run</i>					
1.97	C,B,m,f	Twp. Rd. 142A	4.0	706	39.0354-83.7843
<i>Slabcamp Run</i>					
1.93	C,m,f	Fite Hauck Rd.	3.3	728	38.9908-83.7848
1.13	C,m,f	Purdy Rd.	7.8	706	39.0038-83.8085
	C,O,B	Sardinia WWTP effluent			
<i>Browns Run</i>					
0.10	C,m,f	Stephan Rd.	3.9	728	38.9968-83.8541
<i>Sterling Run</i>					
11.35	C,O,S,B,m,f	Moon Rd.	3.4	705	39.0923-83.8914
9.65	C,O,S,m,f	Greenbush East Rd.	6.1	705	39.0693-83.8973
6.74	C,O,S,B,m,f	U.S. Rt. 68	11.8	705	39.0387-83.9199
6.47	C,O,B	Mt. Orab Water intake			
3.08	C,m,f	From St. Rt. 774	26.3	727	38.9962-83.9290
0.34	C,O,S,D,B,M,F	Sterling Rd. (lower crossing), Sentinel site	29.7	727	38.9652-83.9184
<i>Sterling Run Tributary at RM 6.68</i>					
2.41	C,O,S,m,f	Waits Rd., Ust. Trib at RM 2.40	3.7	705	39.0661-83.9271
0.68	C,O,S,m,f	Bardwell West Rd.	6.9	705	39.0470-83.9247
<i>Snapping Turtle Run</i>					
0.50	C,m	Ust. Mount Orab WWTP	1.3	727	38.9922-83.9222
	C,O,B	Mount Orab WWTP effluent			
0.20	C,m	Dst. Mount Orab WWTP	1.4	727	38.9922-83.9261
<i>Miranda Run</i>					
0.69	C,m,f	Smoky Row Rd.	5.8	727	38.9343-83.9236
<i>Walnut Creek</i>					
1.40	C	Adj. Sunshine Rd	0.4	727	38.9021-83.9046
0.57	C,m	Sunshine Rd	1.4	727	38.9047-83.9169
<i>Walnut Creek Tributary at RM 1.2</i>					
0.19	C	Sunshine Rd	0.2	727	38.9022-83.9080

Table 1. continued

RM	Sample Type	Location	Notes
<i>Town Run</i>			
0.90	C,m C,O,B	Ust. Georgetown WWTP Georgetown WWTP effluent	1.3 747 38.8525-83.9083
0.63	C,m	Dst. Georgetown WWTP	1.4 747 38.8514-83.9125

Sample type acronyms and number of sites:

C - Conventional water chemistry, 5 passes - 55 sites (275 samples)

N - Nutrient assimilation (dissolved P, water column chlorophyll, & periphyton), 1 pass - 3 sites

O - Organic water chemistry, 2 passes - 21 sites (42 samples).

S - Sediment inorganic, organic and metal concentrations, 1 pass - 16 sites (16 samples).

B - Bacteriological analysis, 5 passes - 20 sites (100 samples)

D - Datasonde (areas of algal activity may require units with stirrers) 1 pass - 12 sites

M - macroinvertebrates, quantitative, 13 sites (9 samples).

m - macroinvertebrates, qualitative, 29 sites (29 samples).

5 primary headwater evaluations

F - fish, 2 pass, 13 sites (26 samples).

f - fish, 1 pass, 29 sites (29 samples).

P - Permit compliance, 5 sites (c, O,b - 10 samples) sample amounts are included above.

Reference site: Data from these locations was used to derive ecoregional biological expectations. Generally, a robust sampling effort is conducted at these sites to support future calibration needs (4 sites).

Nutrient site: Ohio EPA is evaluating data from these locations toward developing nutrient concentration water quality criteria in correlation with aquatic life use performance (3 sites).

Sentinel site: Location where modeling unit will calibrate flow with stage height. Water level will be measured on each chemistry sample pass (3 sites).

Fish Tissue site: Fish from these locations will be analyzed to provide relative human consumption risk information (5 sites).

Table 2. Ohio EPA chemistry lab sampling effort for the 2006 White Oak Creek study area (See attached mock lab report forms).

Type of sample	# DES Parameters	# Sites	# Passes	Total #
Water Chemistry				
<u>Conventional (Inorganic Samples)</u>				
<i>Demand</i>	4	55	5	1100
<i>oil & grease</i>	1	5	5	25
<i>Nutrients</i>	9	55	5	2475
<i>dissolved P</i>	1	3	1	3
<i>Bacteria</i>	3	20	5	300
<i>Metals / Low Level</i>	18	55	5	4950
<i>mercury</i>	1	55	3	165
<u>Organic Scan</u>				
<i>Volatiles (VOC)</i>	1 (59 compounds)	21	2	42
<i>Cyanazine / Herbicides</i>	2 (13 compounds)	21	2	84
<i>Semivolatiles (BNA)</i>	1 (54 compounds)	21	2	42
<i>PCBs, Pesticides</i>	4 (27 compounds)	21	2	168
<i>Carbamates</i>	1 (10 compounds)	21	2	42
<i>Glyphosate</i>	1 (1 compound)	21	2	42
<hr style="border-top: 1px dashed black;"/>				
Sediment Chemistry				
<u>Conventional (Inorganic Samples)</u>				
<i>Demand</i>	3	16	1	48
<i>Nutrients</i>	2	16	1	32
<i>Metals / Low Level</i>	17	16	1	272
<i>mercury</i>	1	16	1	16
<u>Organic Scan</u>				
<i>Volatiles (VOC)</i>	1 (64 compounds)	16	1	16
<i>Semivolatiles (BNA)</i>	1 (86 compounds)	16	1	16
<i>PCBs, Pesticides</i>	4 (31 compounds)	16	1	64
<hr style="border-top: 1px dashed black;"/>				
Chlorophyll A				
<i>Fluorometer test</i>	1	3	1	3

Table 3. Ohio EPA test methods for the 2006 White Oak Creek study area.

Parameters	Water column field method	Water column lab test method	Sediment lab test method
Percent Solids			SM 2540G
BOD, 5-Day		USEPA 405.1, SM 5210B	
Conductivity	Hanna HI9811 meter	USEPA 120.1	
Oil & Grease		USEPA 1664	
Particle Size			OEPA 160.1
pH	Hanna HI9811 meter		
Solids, Dissolved (TDS)		USEPA 160.1	
Solids, Suspended (TSS)		USEPA 160.2	
Total Organic Carbon (TOC)			OEPA 335.2
Acidity, Total CaCO ₃		USEPA 305.1	
Alkalinity, Total CaCO ₃		USEPA 310.1	
Chloride, Cl		USEPA 325.1	
COD		USEPA 410.4	
Nitrite		USEPA 354.1	
Ammonia		USEPA 350.1	SM 4500 -NH ₃ B&E
Nitrate+Nitrite		USEPA 353.1	
Phosphorus, Dissolved		USEPA 365.4	
Sulfate		USEPA 375.4	
TKN (Total Kjeldahl Nitrogen)		USEPA 351.2	
Phosphorus, Total		USEPA 365.4	USEPA 365.4
E.coli		USEPA 1103.1/ 640.1	
Fecal coliform		SM 9222 D/ 610.1	
Total Coliform		SM 9222 B	
ICP 1 (Al,Ba,Ca,Cr,Cu,Fe, Mg, Mn, Na, Ni, K, Sr, Zn, Hardness)		USEPA 200.7	
ICP 3 (Al,Ba,Ca,Cr,Cu,Fe,Mg,Mn,Na,Ni,K,Sr,Zn,Pb)			USEPA 200.7
GFAA/SIMA 1 (As,Cd,Pb,Se)		USEPA 200.9, SM 3113B	
GFAA/SIMA 2 (As, Cd, Se)			USEPA 200.9, SM 3113B
Mercury, Total		USEPA 245.1,7470A	USEPA 7471A
Chlorophyll A		USEPA 445	
Dissolved Oxygen	YSI 55 meter		
Temperature	YSI 55 meter		
VOCs		USEPA 624	USEPA 8260B
Cyanazine (Bladex)		USEPA 525.2	
Herbicides (Atrazine, etc.)		USEPA 525.2	
BNA Organics (SVOCs)		USEPA 625	USEPA 8270C
Pesticides/ PCBs/ Chlordane		USEPA 608	USEPA 8081A, 8082
Carbamates (Sevin)		USEPA 531.1	
Glyphosate (Roundup)		USEPA 547	



Inorganic Sample Submission Form

DW Certification #4105

DES Use Only

Sample # MM DD YY

Date Received

Sample Information

(INSTRUCTIONS ON BACK)

Parameters

Client (Bill to)

Special Project Identity (project identity requires prior approval)

Division (check one) OEPA District (check one)
DAPC CO
DDAGW CDO
DERR NEDO
DHWM NWDO
DSW SEDO
DSIWM SWDO
Other Other

Sample Type (check one) Matrix (check one)
Ambient Air Filter
Complaint Drinking water
Compliance Ground water
Litigation Sediment
NPS Soil
Survey Surface water
Raw Waste water
Plant Reagent Water
Distribution Other
Other Other

Collection Date Grab (or) Composite
Begin End
Frequency & Duration of Composite Sample:

Table with 4 columns: Qty., Type, Pres., Field QC (Check one). Rows include Air Filter, Cubitainer (NaOH, HNO3, HNO3 Filt, H2SO4, H2SO4 Filt, N/P, N/P Filt), Jar (H2SO4 Phenol, H2SO4 O&G), Sed (Frozen), and Bacteria (Sterile).

Sample Location County:

Template White Oak Creek TMDL Water Column

- Demand: % Solids, Sed only, BOD-20 day, BOD-5 day, BOD-Ultimate, CBOD-20 day, CBOD-5 day, CBOD-Ultimate, Conductivity, Flashpoint, Oil & Grease, Solids Suspended (nonfilter), Solids Total, Solids Total Volatile, TOC.
Nutrients: Acidity, Total CaCO3, Alkalinity Total CaCO3, Bicarbonate, Chloride, COD, Chromium, Hexavalent (N/P, Filtration), Cyanide Free (WAD), Cyanide Total, Fluoride, Nitrite, Ammonia/Nitrate + nitrite, Phenolics, Total w/man dist., Phosphorus, Dissolved (Filter), Sulfate, TKN / Phosphorous, Total.

- Microbiology: E. coli, Fecal Coliform, Fecal Streptococcus, MMO-MUG, Total Coliform.
Misc: Turbidity.

- Metals: ICP 1, Water only (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Sr, Zn, Hardness), ICP 2, Water only (Ca, Mg, Hardness), ICP 3, Sediment only (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Sr, Zn, Pb), ICP 4, SW846 only (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Sr, Zn, V, Cd, Co, Ti, Be, Hardness), ICP 5, SW846 SED only (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Pb, Sr, Zn, V, Co, Ti, Be), ICP 6, Air Filters only (Cr, Ni, Pb, Zn, Mn), Vanadium, Titanium.
Single ICP Metals Or SIMA - Please list only if not using Metals packages above.

- Metals- Low Level: SIMA 1, Water only (As, Cd, Pb, Se), L L; SIMA 2, Sed only (As, Cd, Se), L L; SIMA 3, Air only (As, Cd), L L; Arsenic, SW846 only, L L; Cadmium, SW846 only, L L (Sed only); Lead, SW846 only, L L; Selenium, SW846 only, L L.

The following require prior notification to DES before submittal:

- Antimony, L L; Beryllium, L L, Water, Sed, & Air only; Cobalt, L L, Water, Sed, & Air only; Copper, L L, Water only; Silver, L L; Thallium, L L; Tin, L L; Mercury.

Only 2 or 3 samples per site need Hg analysis

Bioassay

Field Comments

Lab Comments

Table with 9 columns: Chlorine, Cond, DO, Flow, Gage Ht., pH, % Sat, Temp, Corr. Cond. with corresponding codes (P50060, P94, P299, P61, P65, P400, P10, P94).



Division of Environmental Services

Organic Sample Submission Form

DW Certification #4105

DES Use Only

Sample # _____

MM DD YY

Date Received _____

Sample Information

(INSTRUCTIONS ON BACK)

Parameters

Client (Bill to) _____

Special Project Identity
(project identity requires prior approval)

Division (check one)

DAPC
 DDAGW
 DERR
 DHWM
 DSW
 DSIWM
 Other _____

OEPA District (check one)

CO
 CDO
 NEDO
 NWDO
 SEDO
 SWDO
 Other _____

Sample Type (check one)

Ambient
 Complaint
 Compliance
 Litigation
 NPS
 Survey
 Raw
 Plant
 Distribution
 Other _____ } DW only

Matrix (check one)

Air Canister
 Drinking water
 Ground water
 Oil Wipe
 Sediment
 Soil
 Surface water
 Waste water
 Reagent water
 Other _____

Collection Date

Grab MM / DD / YY HH / MM
 (or)
 Composite Begin _____ / _____ / _____
 End _____ / _____ / _____

Frequency & Duration of Composite Sample:

Container Information			Field QC (Check one)
Qty.	Type	Pres.	
	Air Canister		Field Duplicate <input type="radio"/>
	Amber, 525	N/P	Field/Equip/Acid Blank <input type="radio"/>
	Amber, 525	HCl & Na ₂ SO ₃	Trip Blank <input type="radio"/>
	Amber, 515	HCl & Na ₂ SO ₃	MSD <input type="radio"/>
	Amber, BNA	N/P	
	Amber, BNA	Na ₂ S ₂ O ₃	
	Amber, P/P	N/P	
	Amber, P/P	Na ₂ S ₂ O ₃	
	Vial, VOC	HCl / Na ₂ S ₂ O ₃	
	Vial, VOC		
	Vial, 504	Na ₂ S ₂ O ₃	
	Vial, 505	Na ₂ S ₂ O ₃	
	Jar, Oil Wipe		
	Encore Sampler		

Collected By _____

Customer ID # _____

Referred By _____

Station ID # _____

Sample Location _____

County: _____

Template White Oak Creek TMDL
Water Column 1

----- % Solids, Sed only

Volatiles

----- VOC, 524.2 } Drinking Water Analysis

----- VOC, 624 } Waste Water Analysis

----- VOC, 8260 } SW846 Analysis

Semivolatiles / Herbicides

----- Cyanazine, 525.2 } Drinking Water Analysis

----- Herbicides, 525.2 }

----- BNA, 625 } Waste Water Analysis

----- BN (PAHs) only, 625 }

----- Acids (Phenols) only, 625 }

----- BNA, 8270 } SW846 Analysis

----- BN (PAHs) only, 8270 }

----- Acids (Phenols) only, 8270 }

----- SAS-305

----- SAS-310

Pesticides / PCBs / Herbicides

----- Pesticides, 505 } Drinking Water Analysis

----- PCBs, 508 (508A) }

----- Chlordane, 505 }

----- Toxaphene, 505 }

----- EDB/DBCP, 504 }

----- Acid Herbicides, 515 }

----- Pesticides, 608 } Waste Water Analysis

----- PCBs, 608 }

----- Chlordane, 608 }

----- Toxaphene, 608 }

----- Pesticides, 8081 } SW846 Analysis

----- PCBs, 8082 }

----- Chlordane, 8081 }

----- Toxaphene, 8081 }

----- PCBs, Oil Wipe }

Air Canister

----- TO-14A } Air Analysis

----- Canister Cleaning, Only }

Other

Field Comments

Lab Comments

Chlorine, mg/l P50060	Cond, umho/cm P94	DO, mg/l P299	Flow, cfs P61	Gage Ht, ft P65	pH, su P400	% Sat P10	Temp, oC P10	Corr. Cond, umho/cm P94
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Organic Sample Submission Form

DW Certification #4105

DES Use Only

Sample # _____

MM DD YY

Date Received _____

Sample Information

(INSTRUCTIONS ON BACK)

Parameters

Client (Bill to) _____

Special Project Identity
(project identity requires prior approval)

Division (check one)

DAPC
 DDAGW
 DERR
 DHWM
 DSW
 DSIWM
 Other _____

OEPA District (check one)

CO
 CDO
 NEDO
 NWDO
 SEDO
 SWDO
 Other _____

Sample Type (check one)

Ambient
 Complaint
 Compliance
 Litigation
 NPS
 Survey
 Raw
 Plant
 Distribution
 Other _____ } DW only

Matrix (check one)

Air Canister
 Drinking water
 Ground water
 Oil Wipe
 Sediment
 Soil
 Surface water
 Waste water
 Reagent water
 Other _____

Collection Date

Grab MM / DD / YY HH / MM
 (or)
 Composite Begin _____ / _____ / _____
 End _____ / _____ / _____

Frequency & Duration of Composite Sample:

Container Information			Field QC (Check one)
Qty.	Type	Pres.	
	Air Canister		Field Duplicate <input type="radio"/>
	Amber, 525	N/P	Field/Equip/Acid Blank <input type="radio"/>
	Amber, 525	HCl & Na ₂ SO ₃	Trip Blank <input type="radio"/>
	Amber, 515	HCl & Na ₂ SO ₃	MSD <input type="radio"/>
	Amber, BNA	N/P	
	Amber, BNA	Na ₂ S ₂ O ₃	
	Amber, P/P	N/P	
	Amber, P/P	Na ₂ S ₂ O ₃	
	Vial, VOC	HCl / Na ₂ S ₂ O ₃	
	Vial, VOC		
	Vial, 504	Na ₂ S ₂ O ₃	
	Vial, 505	Na ₂ S ₂ O ₃	
	Jar, Oil Wipe		
	Encore Sampler		

Collected By _____

Customer ID # _____

Referred By _____

Station ID # _____

Sample Location _____

County: _____

Template White Oak Creek TMDL
Water Column 2

----- % Solids, Sed only

Volatiles

----- VOC, 524.2 } Drinking Water Analysis
 ----- VOC, 624 } Waste Water Analysis
 ----- VOC, 8260 } SW846 Analysis

Semivolatiles / Herbicides

----- Cyanazine, 525.2 } Drinking Water Analysis
 ----- Herbicides, 525.2 }
 ----- BNA, 625 } Waste Water Analysis
 ----- BN (PAHs) only, 625 }
 ----- Acids (Phenols) only, 625 }
 ----- BNA, 8270 } SW846 Analysis
 ----- BN (PAHs) only, 8270 }
 ----- Acids (Phenols) only, 8270 }
 ----- SAS-305
 ----- SAS-310

Pesticides / PCBs / Herbicides

----- Pesticides, 505 } Drinking Water Analysis
 ----- PCBs, 508 (508A) }
 ----- Chlordane, 505 }
 ----- Toxaphene, 505 }
 ----- EDB/DBCP, 504 }
 ----- Acid Herbicides, 515 }
 ----- Pesticides, 608 } Waste Water Analysis
 ----- PCBs, 608 }
 ----- Chlordane, 608 }
 ----- Toxaphene, 608 }
 ----- Pesticides, 8081 } SW846 Analysis
 ----- PCBs, 8082 }
 ----- Chlordane, 8081 }
 ----- Toxaphene, 8081 }
 ----- PCBs, Oil Wipe }

Air Canister

----- TO-14A } Air Analysis
 ----- Canister Cleaning, Only }

Other

----- Glyphosate 547
 ----- Carbamates 531.1
 ----- _____
 ----- _____
 ----- _____

Field Comments

Lab Comments

Chlorine, mg/l P50060	Cond, umho/cm P94	DO, mg/l P299	Flow, cfs P61	Gage Ht, ft P65	pH, su P400	% Sat P10	Temp, oC P10	Corr. Cond, umho/cm P94



Organic Sample Submission Form

DW Certification #4105

DES Use Only

Sample # _____

MM DD YY

Date Received ____/____/____

Sample Information

(INSTRUCTIONS ON BACK)

Parameters

Client (Bill to) _____

Special Project Identity
(project identity requires prior approval)

Division (check one)

DAPC
DDAGW
DERR
DHWM
DSW
DSIWM
Other _____

OEPA District (check one)

CO
CDO
NEDO
NWDO
SEDO
SWDO
Other _____

Sample Type (check one)

Ambient
Complaint
Compliance
Litigation
NPS
Survey
Raw
Plant
Distribution
Other _____ } DW only

Matrix (check one)

Air Canister
Drinking water
Ground water
Oil Wipe
Sediment
Soil
Surface water
Waste water
Reagent water
Other _____

Template White Oak Creek TMDL Sediment

- % Solids, Sed only
- Volatiles**
- VOC, 524.2 } Drinking Water Analysis
- VOC, 624 } Waste Water Analysis
- VOC, 8260 } SW846 Analysis
- Semivolatiles / Herbicides**
- Cyanazine, 525.2 } Drinking Water Analysis
- Herbicides, 525.2 }
- BNA, 625 } Waste Water Analysis
- BN (PAHs) only, 625 }
- Acids (Phenols) only, 625 }
- BNA, 8270 } SW846 Analysis
- BN (PAHs) only, 8270 }
- Acids (Phenols) only, 8270 }
- SAS-305
- SAS-310
- Pesticides / PCBs / Herbicides**
- Pesticides, 505 } Drinking Water Analysis
- PCBs, 508 (508A) }
- Chlordane, 505 }
- Toxaphene, 505 }
- EDB/DBCP, 504 }
- Acid Herbicides, 515 }
- Pesticides, 608 } Waste Water Analysis
- PCBs, 608 }
- Chlordane, 608 }
- Toxaphene, 608 }
- Pesticides, 8081 } SW846 Analysis
- PCBs, 8082 }
- Chlordane, 8081 }
- Toxaphene, 8081 }
- PCBs, Oil Wipe }
- Air Canister**
- TO-14A } Air Analysis
- Canister Cleaning, Only }
- Other**
- _____
- _____
- _____
- _____
- _____

Collection Date

Grab MM / DD / YY HH / MM

(or)

Composite Begin _____ / _____ / _____

End _____ / _____ / _____

Frequency & Duration of Composite Sample:

Container Information			Field QC (Check one)
Qty.	Type	Pres.	
	Air Canister		Field Duplicate <input type="radio"/>
	Amber, 525	N/P	Field/Equip/Acid Blank <input type="radio"/>
	Amber, 525	HCl & Na ₂ SO ₃	Trip Blank <input type="radio"/>
	Amber, 515	HCl & Na ₂ SO ₃	MSD <input type="radio"/>
	Amber, BNA	N/P	
	Amber, BNA	Na ₂ S ₂ O ₃	
	Amber, P/P	N/P	
	Amber, P/P	Na ₂ S ₂ O ₃	
	Vial, VOC	HCl / Na ₂ S ₂ O ₃	
	Vial, VOC		
	Vial, 504	Na ₂ S ₂ O ₃	
	Vial, 505	Na ₂ S ₂ O ₃	
	Jar, Oil Wipe		
	Encore Sampler		

Collected By _____

Customer ID # _____

Referred By _____

Station ID # _____

Sample Location _____

County: _____

Field Comments

Chlorine, mg/l	Cond, umho/cm	DO, mg/l	Flow, cfs	Gage Ht, ft	pH, su	% Sat	Temp, oC	Corr. Cond, umho/cm
P50060	P94	P299	P61	P65	P400		P10	P94

Lab Comments



Inorganic Sample Submission Form

DW Certification #4105

DES Use Only

Sample # _____

MM DD YY

Date Received ____/____/____

Sample Information

(INSTRUCTIONS ON BACK)

Parameters

Client (Bill to) _____

Special Project Identity (project identity requires prior approval)

Division (check one): DAPC, DDAGW, DERR, DHWM, DSW, DSIWM, Other

OEPA District (check one): CO, CDO, NEDO, NWDO, SEDO, SWDO, Other

Sample Type (check one): Ambient, Complaint, Compliance, Litigation, NPS, Survey, Raw, Plant, Distribution, Other

Matrix (check one): Air Filter, Drinking water, Ground water, Sediment, Soil, Surface water, Waste water, Reagent Water, Other

Collection Date: Grab (or) Composite

MM DD YY HH MM

Begin: ____/____/____

End: ____/____/____

Frequency & Duration of Composite Sample:

Container Information			Field QC (Check one)	
Qty.	Type	Pres.		
	Air Filter		Field Duplicate	<input type="checkbox"/>
	Cubitainer	NaOH	Field/Equip/Acid Blank	<input type="checkbox"/>
	Cubitainer	HNO ₃	MSD	<input type="checkbox"/>
	Cubitainer	HNO ₃ Filt		
	Cubitainer	H ₂ SO ₄	Collected By _____	
	Cubitainer	H ₂ SO ₄ Filt		
	Cubitainer	N/P	Customer ID # _____	
	Cubitainer	N/P Filt		
	Jar	H ₂ SO ₄ Phenol	Referred By _____	
	Jar	H ₂ SO ₄ O&G		
	Sed	Frozen	Station ID # _____	
	Sed			
	Bacteria	Sterile		

Sample Location _____

County: _____

Template White Oak Creek Sediment

- Demand**
- % Solids, Sed only
 - BOD-20 day
 - BOD-5 day
 - BOD-Ultimate
 - CBOD-20 day
 - CBOD-5 day
 - CBOD-Ultimate
 - Conductivity
 - Flashpoint
 - Oil&Grease
 - Particle Size, Sed only
 - pH
 - Solids_Diss(filt)
 - Solids_Suspd(nonfilt)
 - Solids_Total
 - Solids_Total Volatile
 - TOC
- Nutrients**
- Acidity, Total CaCO₃
 - Alkalinity Total CaCO₃
 - Bicarbonate
 - Chloride
 - COD
 - Chromium, Hexavalent (N/P_Filt)
 - Cyanide_Free (WAD)
 - Cyanide_Total
 - Fluoride
 - Nitrite
 - Ammonia/Nitrate+nitrite
 - Phenolics, Total w/man dist.
 - Phosphorus, Dissolved (Filt)
 - Sulfate
 - TKN / Phosphorous, Total
- Microbiology**
- E. coli
 - Fecal Coliform
 - Fecal Streptococcus
 - MMO-MUG
 - Total Coliform
- Misc.**
- Turbidity

- Metals**
- ICP 1, Water only (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Sr, Zn, Hardness)
 - ICP 2, Water only (Ca, Mg, Hardness)
 - ICP 3, Sediment only (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Sr, Zn, Pb)
 - ICP 4, SW846 only (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Sr, Zn, V, Cd, Co, Ti, Be, Hardness)
 - ICP 5, SW846 SED only (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Pb, Sr, Zn, V, Co, Ti, Be)
 - ICP 6, Air Filters only (Cr, Ni, Pb, Zn, Mn)
 - Vanadium
 - Titanium
- Single ICP Metals Or SIMA - Please list only if **not** using Metals packages above

- Metals- Low Level**
- SIMA 1, Water only (As, Cd, Pb, Se), L L
 - SIMA 2, Sed only (As, Cd, Se), L L
 - SIMA 3, Air only (As, Cd), L L
 - Arsenic, SW846 only, L L
 - Cadmium, SW846 only, L L (Sed only)
 - Lead, SW846 only, L L
 - Selenium, SW846 only, L L

- The following require **prior notification** to DES before submittal:
- Antimony, L L
 - Beryllium, L L, Water, Sed, & Air only
 - Cobalt, L L, Water, Sed, & Air only
 - Copper, L L, Water only
 - Silver, L L
 - Thallium, L L
 - Tin, L L
 - Mercury

Field Comments _____

Lab Comments _____

Bioassay

Chlorine, mg/l P50060	Cond, umho/cm P94	DO, mg/l P299	Flow, cfs P61	Gage Ht, ft P65	pH, su P400	% Sat P10	Temp, °C P10	Corr. Cond, umho/cm P94
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c.c. TMDL Study Team Members
J. DeShon
D. Mishne
M. Silagy
M. Smith

Please notify Brian Alsdorf (614) 836-8770 if there are any changes to this study plan, sampling problems, or additional information.