



**2025 Watershed Characterization Work Plan for Indian Creek
Monroe Watershed
(Hydrologic Unit Code 0512020809)**

PREPARED BY

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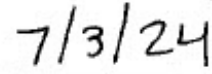
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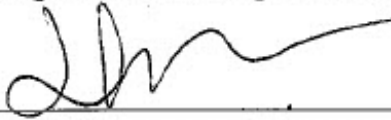
Approval Signatures



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Date



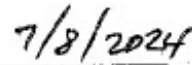
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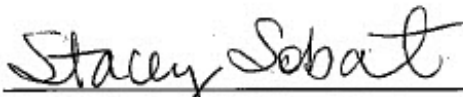
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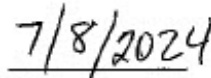
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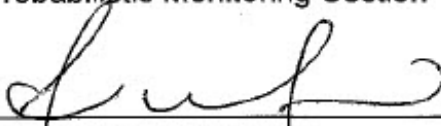
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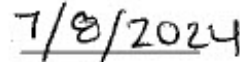
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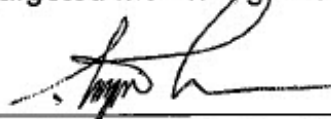
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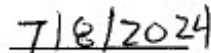
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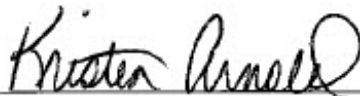
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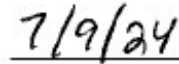
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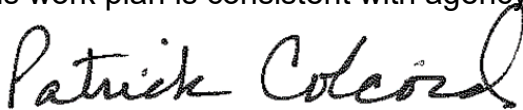


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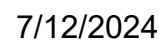


Date

This work plan is consistent with agency requirements.



Quality Assurance Staff
IDEM Office of Program Support



Date

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Work Plan Organization

This work plan is an extension of the existing Indiana Department of Environmental Management (IDEM) Office of Water Quality (OWQ) Watershed Assessment and Planning Branch (WAPB) Quality Assurance Project Plan (QAPP) for Indiana Surface Water Programs (Surface Water QAPP) (IDEM 2023a) and QAPP for Biological Community and Habitat Measurements (IDEM 2020a); and serves as a link to the existing QAPP as well as an independent QAPP of the project. Per the United States Environmental Protection Agency (U.S. EPA) Guidance on Systematic Planning Using the Data Quality Objectives (DQO) Process (U.S. EPA 2006) and the U.S. EPA Guidance for Quality Assurance Project Plans (U.S. EPA 2002), this work plan establishes criteria and specifications pertaining to a specific water quality monitoring project usually described in the following four QAPP groups and associated elements.

Group A. Project Management

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- Special Training Needs or Certification
- Documents and Records

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- Sample Handling and Custody
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- Instrument or Equipment Calibration and Frequency
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A

List of Acronyms

AIMS	Assessment Information Management System
ASTM	American Society for Testing and Materials
AUID	Assessment Unit IDs
CFU	Colony Forming Units
DO	Dissolved Oxygen
DQA	Data Quality Assessment
DQO	Data Quality Objectives
<i>E. coli</i>	<i>Escherichia coli</i>
GPS	Global Positioning System
HUC	Hydrologic Unit Code
IAC	Indiana Administrative Code
IBI	Index of Biotic Integrity
IDEM	Indiana Department of Environmental Management
μS/cm	Micro Siemens per Centimeter
mg/L	Milligram per liter
MHAB	Multihabitat
mL	Milliliter
NTU	Nephelometric Turbidity Unit(s)
OHEPA	Ohio Environmental Protection Agency
OWQ	Office of Water Quality
PPE	Personal Protective Equipment
QA/QC	Quality Assurance and Quality Control
QAPP	Quality Assurance Project Plan
QHEI	Qualitative Habitat Evaluation Index
S.U.	Standard Units
SM	Standard Methods
SOP	Standard Operating Procedures
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
U.S. EPA	United States Environmental Protection Agency
WAPB	Watershed Assessment and Planning Branch

DEFINITIONS

Assessment Unit	Reaches of waterbodies, with similar features, assigned unique identifiers to which all assessment information for that specific reach is associated and which allow for mapping with geographic information systems.
Elutriate	To purify, separate, or remove lighter or finer particles by washing, decanting, and settling.
15-minute pick	A component of the multihabitat macroinvertebrate sampling method, used to maximize taxonomic diversity while in the field, in which the one-minute kick sample and fifty-meter sweep sample collected at a site are first combined and elutriated. Macroinvertebrates are then manually removed from the resulting sample for 15 minutes.
50-meter sweep sample	A component of the multihabitat macroinvertebrate sampling method in which approximately 50 meters of all available habitat in a stream or river is sampled with a standard 500 micrometer mesh width D-frame dip net by taking 20 to 25 individual “jab” or “sweep” samples, which are then composited.
Geometric site	Sampling site chosen according to its drainage area within a watershed.
Macroinvertebrate	Aquatic animals which lack a backbone, are visible without a microscope, and spend some period of their lives in or around water.
1-minute kick sample	A component of the multihabitat macroinvertebrate sampling method in which approximately 1 m ² of riffle or run substrate habitat in a stream or river is sampled with a standard 500 µm mesh width D-frame dip net for approximately 1 minute.
Pour point	An outlet of a subwatershed or the common point where all the water flows out of any given subwatershed.
Reach	A segment of a stream used for sampling.
Targeted site	A sampling site intentionally selected based on specific monitoring objectives or decisions to be made.

A. PROJECT MANAGEMENT

A.1. Project Objective

IDEM selected the Indian Creek Monroe watershed (10-digit Hydrologic Unit Code, HUC 0512020809) in 2023 for the 2025 watershed characterization project. The main objective of the watershed characterization monitoring project is to use an intensive targeted watershed design which characterizes the current condition of an individual watershed. This type of monitoring provides valuable data for the purposes of assessment, TMDL development and, watershed planning; and allows for future comparisons to evaluate changes in the water quality within the watershed studied. Selecting a spatial monitoring design, with sufficient sampling density to accurately characterize water quality conditions, is a critical step in the process of developing an adequate local scale watershed study.

The water quality data generated from this monitoring effort is anticipated to provide information needed to characterize the watershed for the TMDL program and local water quality managers; to identify sources of impairment; to designate critical areas; and to enable users in making valid and informed watershed decisions. By design, this project also adds new stream reaches which allow for assessment of aquatic life use support, recreational use support, and future comparisons to evaluate changes in water quality.

The 303(d) list for 2024 submitted to the U.S. EPA (IDEM 2024) identifies 65.4 miles of impaired streams in the Indian Creek Monroe watershed. The total number of miles per each impairment in the Indian Creek Monroe watershed is reported in the following ways:

- Category 5(a): *Escherichia coli* (*E. coli*), 45.12 miles
- Category 5(a) Biological Integrity: 11.6 miles
- Category 5(b) Mercury in Fish Tissue: 31.9 miles
- Category 5(b): PCBs in Fish Tissue, 8.8 miles

Assessment data have been collected in this watershed from multiple IDEM programs and projects.

A.2. Project Organization and Schedule

The main project objective is to provide a comprehensive assessment of the Indian Creek Monroe watershed streams' capability to support aquatic life and recreational uses.

Sampling will begin in November 2024 and end in October 2025. Barring any hazardous weather conditions or unexpected physical barriers to access a site, sampling activities will be conducted for physical, chemical and bacteriological parameters, and biological communities.

Sampling activity timeframes include:

1. Site reconnaissance activities were completed in February and March 2024. Reconnaissance activities were conducted in the office and through physical site visits.
2. Water chemistry will be sampled monthly at all watershed sites during the recreational season, defined as April through October in [327 IAC 2-1-6]. During the months of November through March, only sites at the pour point of each 12-digit HUC will be sampled monthly (six sites for this project). The first sampling event will be conducted in November 2024 and the study will conclude in October 2025.
3. Biological sampling activities will begin in the summer of 2025 and end no later than October 18, 2025. Fish and macroinvertebrate community sampling will be conducted at all watershed sites via the observation, counting, and collection techniques described in section B.2 Sampling Methods and Sample Handling. Habitat quality will also be assessed at all watershed sites. Fish and macroinvertebrate community collection specific dates cannot be given, since sampling may be postponed due to a high-water event resulting in scouring of the stream substrate or instream cover creating nonrepresentative samples. Bacteriological sampling for *E. coli* at all sites in the watershed will take place monthly from April through October of 2025. In addition, *E. coli* samples will be collected five times from each site at equally spaced intervals over a 30-day period during the recreational season of April to October 2025 to determine a geometric mean.

A.3. Background and Project Description

The Watershed Characterization Monitoring program was instituted to assist in characterizing existing conditions in watersheds throughout the state. The Indian Creek Monroe watershed data set will be utilized by the TMDL program and shared with local watershed groups and any other interested parties. The monitoring will provide data for TMDL development and watershed planning and will aid in future evaluations of changes within the basin. For this study, the following data will be used for assessment purposes: water chemistry, bacteriological contamination in the form of *E. coli*, fish community, macroinvertebrate community, and habitat evaluations.

A.4. Data Quality Objectives (DQOs)

The DQO process (U.S. EPA 2006) is a planning tool for data collection activities. The process provides a basis for balancing decision uncertainty with available resources. The DQO process is recommended by U.S. EPA when selecting between two alternatives or deriving an estimate of contamination. The DQO process is a seven-step systematic planning process used to clarify study objectives; define the types of data needed to achieve the objectives; and establish decision criteria for evaluating data quality. Results of the DQO seven-step process for the watershed characterization monitoring of the Indian Creek Monroe watershed are documented in the following sections.

1. State the Problem

Indiana is required to assess all waters of the state to determine their designated use attainment status. Surface waters of the state are designated for full-body contact recreation; will be capable of supporting a well-balanced, warm water aquatic community; and put-and-take trout fishing [\[327 IAC 2-1-3\]](#) in some northern portions of the state. Data from the intensive sampling of the Indian Creek Monroe watershed is needed to fully characterize the current water quality of the watershed. This project will gather water chemistry, bacteriological, biological (fish and macroinvertebrates), and habitat data for the purpose of assessing the designated use attainment status of the Indian Creek Monroe watershed.

2. Identify the Goals of the Study

The main objective of this study is to fully assess whether the surface waters in this watershed are supporting or nonsupporting for aquatic life use and recreational use. In addition, the data from the watershed characterization monitoring will be used for TMDL development and may also be used for watershed planning and future comparisons to evaluate changes in water quality within the watershed studied.

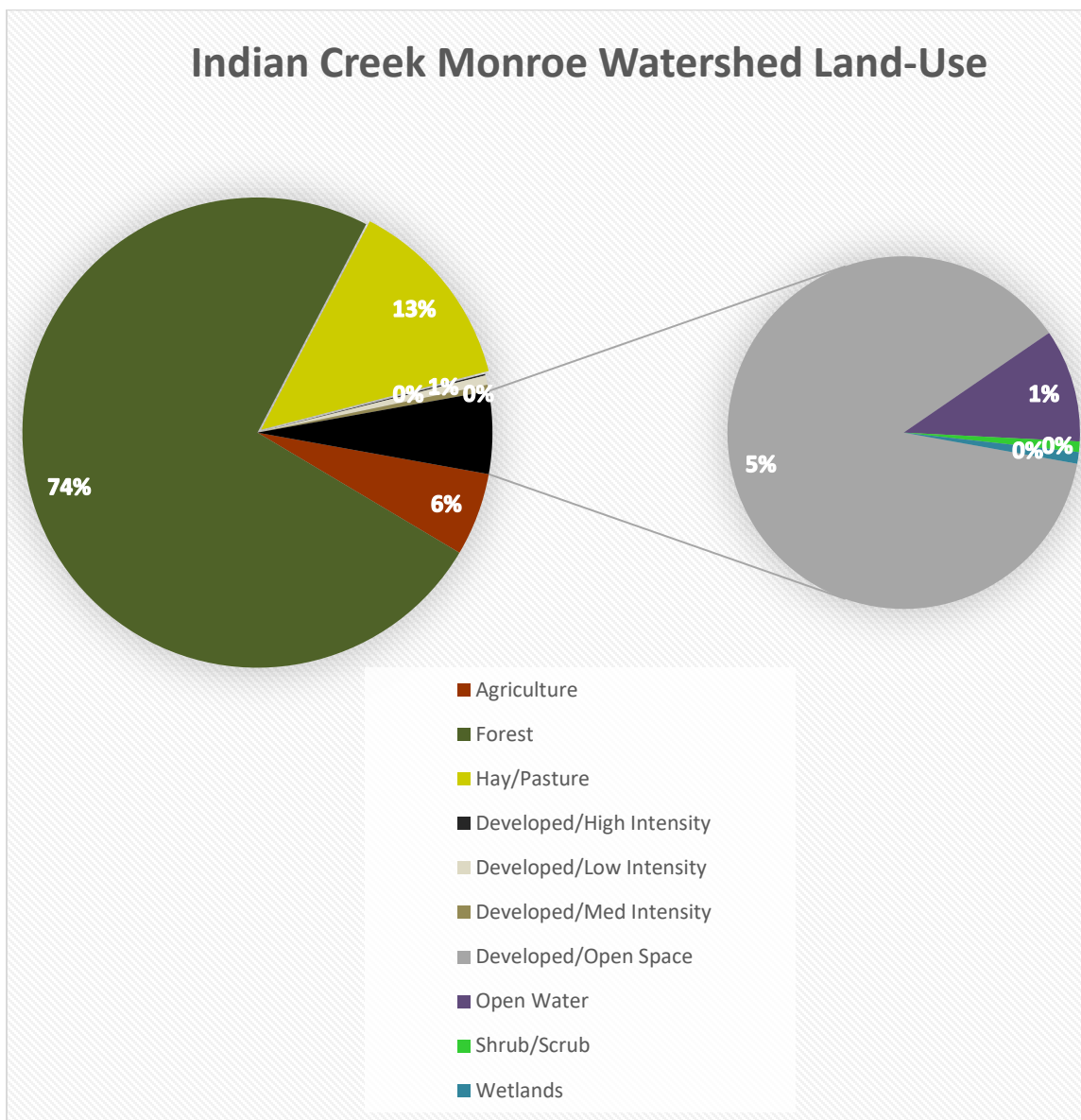
3. Identify Information Inputs

Collect grab samples at the surface water sampling locations for *E. coli* and the parameters listed in Section B.3. Conduct field measurements listed in Section B.3 at each site during each sampling event. Include visual field observations of weather conditions, stream conditions, and percentage of stream canopy at each sampling location. Analyze all *E. coli* samples using SM9223B IDEXX Colilert Enzyme Substrate Standard Method per *E. coli* Field Sampling and Analysis (IDEM 2023c). Collect surface water chemistry samples monthly. Pace Analytical Services will process and analyze samples using the analytical methods listed in Section B.3. Collect a fish and a macroinvertebrate community sample once at each site and perform a corresponding habitat evaluation.

4. Define the Boundaries of the Study

The Indian Creek Monroe watershed covers 172.41 square miles and is located in Monroe, Greene, Lawrence and Martin counties. The watershed is approximately 6% Agriculture, 75% Forest, 13% Hay/Pasture, 6% Developed Land (combined types), >0% Open Water, >0% Wetlands, >0% Shrub/Scrub (Figure 1) (George Mason University 2023).

Figure 1. Indian Creek Monroe Watershed Land Use



⁴ Data collected/calculated from USDA National Agricultural Statistics Service 2024 Cropland Data Layer

Sampling locations for the 2025 Indian Creek Monroe watershed characterization study are listed in Section B.1 and can be viewed spatially in Figure 2.

Site reconnaissance activities were completed in February and March 2024. Sampling activities will begin in November 2024 and will conclude in October 2025. Water chemistry will be sampled monthly during the recreational season, defined as April through October in [327 IAC 2-1-6]. Biological sampling activities will be conducted in the summer of 2025 and end no later than October 18, 2025. Bacteriological sampling activities will be conducted from April through October of 2025.

Sampling activities will not be conducted when stream flow is potentially too dangerous for staff to enter the stream, hazardous weather conditions (e.g. thunderstorms or heavy rain in the vicinity) exist, or unexpected physical barriers to accessing the site exist. The field crew chief will make the final determination as to whether a stream is safe to enter.

Even when weather conditions and stream flow are safe, sample collections for biological communities may be postponed at a particular site for one to four weeks. The cause of the postponement would be a high-water event resulting in scouring of the stream substrate or instream cover creating nonrepresentative samples.

5. Develop the Analytical Approach

Collect samples for physical and chemical parameters, *E. coli*, and biological communities. Analyze *E. coli* samples in the IDEM mobile laboratory or IDEM Shadeland laboratory with the IDEXX™ Colilert Test. The Colilert Test is a multiple-tube enzyme substrate standard method SM-9223B (Clesceri et al. 2012). Pace Analytical Services analyzes samples for nutrient and general chemistry parameters. Section B.3 lists the nutrient and general chemistry parameters and respective test methods. Measure field parameters of dissolved oxygen (DO), pH, water temperature, specific conductance, and DO percent saturation with a data sonde. Measure turbidity with a Hach™ turbidity kit.

6. Specify Performance or Acceptance Criteria

Utilizing a comprehensive checklist of informational sources, evaluation of historical information, and a thorough watershed presurvey minimizes sampling design error. The Surface Water QAPP (IDEM 2023a) Section A.6.3 describes the sampling design which is formulated to address data deficiencies and render the optimum amount of data needed to fill gaps in the decision process.

Good quality data are essential for minimizing decision error. Place more confidence in the conclusions drawn on the stressors and sources affecting the water quality by minimizing both sampling design error and measurement error for physical and biological parameters.

Site specific aquatic life use and recreational use assessments include program specific controls to identify the introduction of errors. These controls include blanks and duplicates for water chemistry and bacteriological samples; biological site revisits or

duplicates; and laboratory controls through verification of species identifications as described in field procedure manuals (IDEM 2020a, 2020b, 2020c, 2023a, 2023c, 2023d, 2023e, 2023f, 2023g).

The Quality Assurance and Quality Control (QA/QC) process detects deficiencies in the data collection as set forth in the Surface Water QAPP (IDEM 2023a) and QAPP for Biological Community and Habitat Measurement (Biological and Habitat QAPP) (2020a). The QAPPs require all contract laboratories to adhere to rigorous standards during sample analyses and to provide good quality usable data. Verify laboratory accreditation (Attachment 10) before awarding the lab contract and before beginning the project. Review laboratory performance studies annually in October. Chemists within the WAPB review the laboratory analytical results for quality assurance. Compare lab QA/QC for each data set against acceptance limits specified in the laboratory methods, the laboratory's QA Manual, and the Surface Water QAPP Section B5.3 Laboratory Quality Control Checks, and the Surface Water QAPP Section D3 Reconciliation with DQO. Laboratory Quality Control Checks and Reconciliation with the DQOs. Validate the data based on the QA/QC review. Do not use any data which is "Rejected" due to analytical problems or errors for water quality assessment decisions. Use any data flagged as "Estimated" on a case-by-case basis and note in the QA/QC report. The Surface Water QAPP (IDEM 2023a pp 106-107), Biological and Habitat QAPP (IDEM 2020a pp 32–36) present criteria for acceptance or rejection of results as well as application of data quality flags. The Surface Water QAPP Table 3: Performance, Acceptance, and Decision Criteria for this Study; and Table 14: Field Parameters showing method and IDEM quantification limit (IDEM 2023a, p 37 and p 91) provide precision and accuracy goals with acceptance limits for applicable analytical methods.

Conduct further investigation in response to consistent "Rejected" data to determine the source of error. Both the WAPB QA manager and project manager evaluate field techniques used during sample collection and preparation along with laboratory procedures to troubleshoot errors introduced throughout the entire data collection process. Implement corrective actions upon determination of the source of error per the Surface Water QAPP (IDEM 2023a) and Biological and Habitat QAPP (IDEM 2020a).

Evaluate sites as supporting or nonsupporting following the decision-making processes described in Indiana's 2024 Consolidated Assessment Listing Methodology (CALM) and based upon the water quality criteria in Table 1.

Base recreational use attainment decisions on bacteriological criteria developed to protect primary contact recreational activities [[327 IAC 2-1-6](#)]. Aquatic life use support decisions will include independent evaluations of biological and chemical data. Evaluate the fish assemblage data at each site using the appropriate Index of Biotic Integrity (IBI) (Simon and Dufour 1998, 2005). Also evaluate macroinvertebrate multihabitat (MHAB) samples using a statewide IBI developed for lowest practical taxonomic level identifications.

Indiana narrative biological criteria [\[327 IAC 2-1-3\]](#) states “(2) All waters, except [limited use waters] will be capable of supporting: (A) a well-balanced, warm water aquatic community.” The water quality standard definition of a “well-balanced aquatic community” is “[\[327 IAC 2-1-9 \(59\)\]](#) An aquatic community which: (A) is diverse in species composition; (B) contains several different trophic levels; and (C) is not composed mainly of pollution tolerant species.” An interpretation or translation of narrative biological criteria into numeric criteria is as follows: A stream segment is nonsupporting for aquatic life use when the monitored fish or macroinvertebrate community receives an IBI score of less than 36 (on a scale of 0 – 60 for fish and 12 – 60 for macroinvertebrate communities), which is considered “Poor” or “Very Poor” (IDEM 2024).

In addition, evaluate data for several nutrient parameters with the benchmarks listed below (IDEM 2024). Assuming a minimum of three sampling events, if two or more of the conditions below are met on the same date, classify the waterbody as nonsupporting due to nutrients:

- Total Phosphorus (TP):
 - One or more measurements greater than 0.3 mg/L
- Nitrogen (measured as Nitrate + Nitrite):
 - One or more measurements greater than 10.0 mg/L
- Dissolved Oxygen (DO):
 - One or more measurements below the water quality standard of 4.0 mg/L or
 - Measurements are consistently at or close to the standard, in the range of 4.0 – 5.0 mg/L
- DO Percent Saturation
 - One or more measurements greater than 120%
- pH:
 - One or more measurements greater than the water quality standard of 9.0 SU or
 - Measurements are consistently at or close to the standard, in the range of 8.7 – 9.0 S.U.
- Algal conditions
 - Algae are described as “excessive” based on field observations by IDEM scientists

Assessment of each site sampled will be reported to U.S. EPA in the 2026 update of [Indiana’s Integrated Water Monitoring and Assessment Report](#) (Integrated Report). Site-specific data will be used to classify associated assessment units into one of five major categories in the State’s Consolidated 303(d) list. Category definitions are available in Indiana’s CALM (IDEM 2024).

Table 1. Water Quality Criteria [327 IAC 2]

Parameters	Water Quality Criteria	Criterion
<i>E. coli</i> (April-October Recreational season)	≤125 MPN/100 mL	5-Sample Geometric mean
	≤235 MPN/100 mL	Single sample maximum
Total ammonia (NH ₃ -N)	Calculated based on pH and temperature	Calculated CAC
Nitrate+Nitrite-Nitrogen	≤10 mg/L	Human health point of drinking water intake
Sulfate	Calculated based on hardness and chloride	In all waters outside of a mixing zone
Dissolved oxygen	At least 5.0 mg/L (Warm Waters)	Daily average
	Not less than 4.0 mg/L at any time	Single reading
pH	6.0 – 9.0 S.U. except for daily fluctuations that exceed 9.0 due to photosynthetic activity	Single reading
Temperature	Varies monthly	1% Annual; Maximum Limits
Chloride	Calculated based on hardness and sulfate values	Calculated CAC
Dissolved solids	750 mg/L	Public water supply

MPN = Most Probable Number, CAC = Chronic Aquatic Criterion, S.U. = Standard Units

7. Optimize the Plan for Obtaining Data

The modified geometric design (OHEPA 2012, 2022) site selection process described in Attachment 1 will be used in this study to obtain the necessary spatial representation of the entire study area. Sites within this watershed have been selected based on a geometric progression of drainage areas and then located to the nearest bridge. Sample sites at road crossings allow for more efficient sampling of the watershed.

A.5. Training and Staffing Requirements

Table 2. Project Roles, Experience, and Training

Role	Required Training or Experience	Responsibilities	Training References
Project manager	- AIMS II database experience - Demonstrated experience in project management and QA/QC procedures	- Establish Project in the AIMS II database - Oversee development of project work plan - Oversee entry and QC of field data - Querying data from AIMS II to determine results not meeting Water Quality Criteria	- IDEM 2023h, 2020a, 2022a, 2023a, 2024 - U.S. EPA 2002, 2006
Field crew chief Biological community sampling	- At least one year of experience in sampling methodology and taxonomy of aquatic communities in the region - Annually review the Principles and Techniques of Electrofishing - Annually review relevant safety procedures - Annually review relevant SOP documents for field operations	- Completion of field data sheets - Taxonomic accuracy - Sampling efficiency and representation - Voucher specimen tracking - Overall operation of the field crew when remote from central office - Adherence to safety and field SOP procedures by crew members - Ensure that multiprobe analyzers are calibrated weekly prior to field sampling activities - Ensure that field sampling equipment is functioning properly and loaded into field vehicles prior to field sampling activities	- IDEM 2024a, 2010, 2024b, 2019a, 2022b, 2020a, 2023l, 2023b, 2023d, 2023e, 2023g -Simon DRAFT -Simon and Dufour 1998, 2005 - YSI 2017, 2018
Field crew members biological community sampling	- Hands-on training for sampling methodology prior to participation in field sampling activities - Review the Principles and Techniques of Electrofishing - Review relevant safety procedures - Review relevant SOP documents for field operations	- Follow all safety and SOP procedures while engaged in field sampling activities - Follow direction of field crew chief while engaged in field sampling activities	- IDEM 2024a, 2010, 2024b, 2019a, 2022b, 2020b, 2023l, 2023d, 2023e, 2023g - YSI 2017, 2018
Field crew chief – water chemistry or bacteriological sampling	- At least one year of experience in sampling methodology - Annually review relevant safety procedures - Annually review relevant SOP documents for field operations	-Complete field data sheets. -Ensure sampling efficiency and representation. -Ensure overall operation of the field crew when remote from central office. -Ensure crew members adherence to safety and field SOP procedures. -Ensure weekly calibration of multiprobe analyzers prior to field sampling activities. -Ensure field sampling equipment is functioning properly and loaded into field vehicles prior to field sampling activities.	- IDEM 2024a, 2010, 2024b, 2019a, 2022b, 2020b, 2023l, 2023a, 2023b, 2023c - YSI 2017, 2018

Role	Required Training or Experience	Responsibilities	Training References
Field crew members – water chemistry or bacteriological sampling	- Hands-on training for sampling methodology prior to participation in field sampling activities - Review relevant safety procedures - Review relevant SOP documents for field operations	- Follow all safety and SOP procedures while engaged in field sampling activities - Follow direction of field crew chief while engaged in field sampling activities	- IDEM 2024a, 2010, 2024b, 2019a, 2022b, 2020b, 2023l, 2023b, 2023c - YSI 2017, 2018
Laboratory supervisor – biological community sample processing	- At least one year of experience in taxonomy of aquatic communities in the region - Annually review relevant safety procedures - Annually review relevant SOP documents for laboratory operations	- Ensure laboratory staff adherence to safety and SOP procedures. - Assist with identification of fish or macroinvertebrate specimens. - Verify taxonomic accuracy of samples. - Ensure voucher specimen tracking. - Ensure QC calculations on data sheets, check for completeness. - Ensure data are entered into AIMS II correctly.	- IDEM 2024a, 2010, 2024b, 2019a, 2022b, 2020a, 2021b, 2022a, 2023f, 2024
Laboratory staff – biological community sample processing	- Hands-on training for laboratory sample processing methodology prior to laboratory sample processing activities - Annually review relevant safety procedures and relevant SOP documents for laboratory operations	- Adhere to safety and SOP procedures - Follow Laboratory Supervisor direction while processing samples - Identify fish or macroinvertebrate specimens - Perform necessary calculations on data, enter field sheets	- IDEM 2024a, 2010, 2024b, 2019a, 2022b, 2021b, 2022a, 2023f
Laboratory supervisor – water chemistry or bacteriological sample processing	- Annually review relevant safety procedures - Annually review relevant SOP documents for field operations	- Ensure laboratory staff adherence to safety and SOP procedures. - Ensure completion of laboratory data sheets. - Check data for completeness. - Perform all necessary calculations on the data. - Ensure data are entered into the AIMS II database.	- IDEM 2024a, 2010, 2024b, 2019a, 2022b, 2021b, 2022a, 2023a, 2023c, 2023f, 2024
Quality assurance officer	- Familiarity with QA/QC practices and methodologies - Familiarity with the Surface Water QAPP and data qualification methodologies	- Ensure adherence to QA/QC requirements of Surface Water QAPP - Evaluate data collected by sampling crews for adherence to project work plan - Review data collected by field sampling crews for completeness and accuracy - Perform a data quality analysis of data generated by the project - Assign data quality levels based on the data quality analysis - Import data into the AIMS II database - Ensure field sampling methodology audits are completed according to WAPB procedures	- IDEM 2023h, 2020a, 2021a, 2022a, 2023a, 2023b, 2024 - U.S. EPA 2006

B. DATA GENERATION AND ACQUISITION

B.1. Sampling Sites and Sampling Design

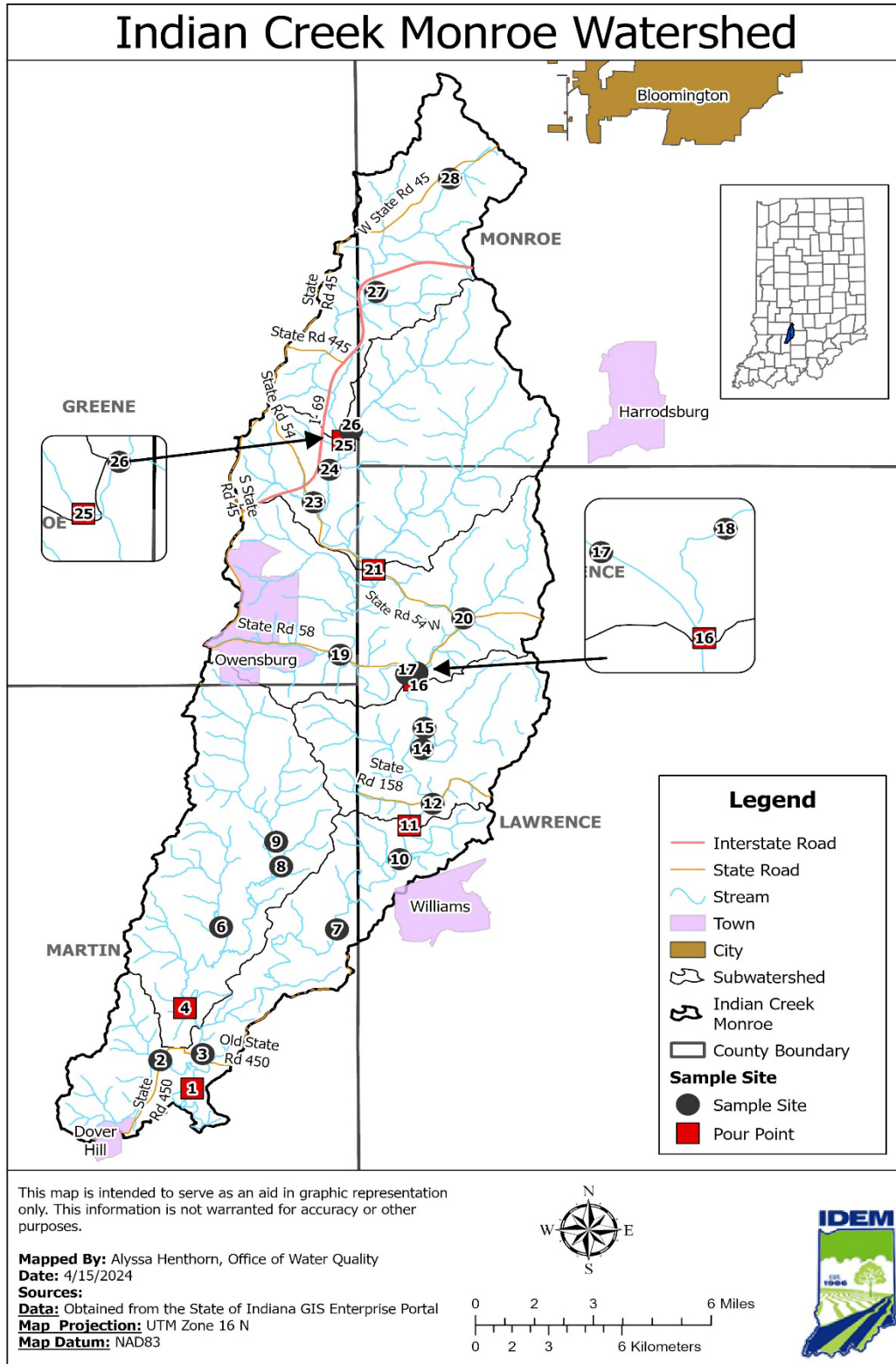
Chose sample sites using a modified geometric site selection process and targeted site selection to obtain the necessary spatial representation of the entire watershed. Site selection within the watershed is based on a geometric progression of drainage areas starting with the area at the mouth of the main stem stream and then working upstream through the tributaries to the headwaters. Establish monitoring sites at the nearest bridge.

Modified Geometric Design Steps for Watershed Characterization Studies (Attachment 1) is a more complete description of the selection process. Also, choose sample sites at the bridge nearest to the pour point of each 12-digit HUC in the watershed or choose to characterize sources for TMDL development.

Conduct site reconnaissance activities in-house and through physical site visits. In-house activities include preparation and review of site maps and aerial photographs. Physical site visits include verification of accessibility, safety considerations, equipment needed to properly sample the site, and property owner consultations, if required. Record all information on the IDEM Office of Water Quality (OWQ) Site Reconnaissance Form (Attachment 2) and enter into the AIMS II database. Determine precise coordinates for each site during the physical site visits or at the beginning of the sampling phase. Use an agency approved handheld Global Positioning System (GPS) unit which can verify horizontal precision within five meters or less (IDEM 2023b). Enter the coordinates into the AIMS II database. Also take digital photos upstream and downstream of the site during reconnaissance. Store digital photos on the shared drive upon return to the office in a specific folder for the Indian Creek Monroe watershed characterization. Label photos with the site number and indication of whether the photo faces upstream or downstream.

Table 3 provides a list of the selected sampling sites with the stream name, Assessment Unit IDs (AUID), AIMS Site Number, County Name, and the latitude and longitude of each site. Figure 2 gives a spatial overview of the site locations for this project.

Figure 2. Indian Creek Monroe Watershed Characterization Sampling Area



¹ Map site numbers refer to Site # from Table 3.

Table 3. Sampling Locations for Watershed Characterization of Indian Creek Monroe Watershed (HUC 0512020809)

Site #	EPA Site ID	IDEM Station ID	Stream Name	Location	County	Latitude	Longitude	AUID
T01	25T-001	WEL-09-0009	Indian Creek	McBride Bluff Road	Martin	38.741886	-86.761651	INW0896_02
T02	25T-002	WEL-09-0010	Opossum Creek	SR 450	Martin	38.753314	-86.776615	INW0896_T1006
T03	25T-003	WEL110-0002	Indian Creek	SR 450, near Trinity Springs	Martin	38.75574389	-86.75669293	INW0896_02
T04	25T-004	WEL-09-0011	Sulphur Creek	Indian Springs Road	Martin	38.774322	-86.765002	INW0895_03
T06	25T-006	WEL110-0003	Little Sulphur Creek	Hollow Lane	Martin	38.806937	-86.747778	INW0895_T1003
T07	25T-007	WEL-09-0013	Indian Creek-Mt. Olive	Mount Olive Quarry Road	Martin	38.805812	-86.693084	INW0896_04
T08	25T-008	WEL-09-0014	Sulphur Creek	Valley Avenue	Martin	38.83123	-86.719383	INW0895_02
T09	25T-009	WEL-09-0015	Sulphur Creek	Misty Road	Martin	38.841314	-86.721644	INW0895_02
T10	25T-010	WEL-09-0016	Indian Creek-Mt. Olive	Williams Silversville Road	Lawrence	38.834013	-86.663549	INW0896_03
T11	25T-011	WEL-09-0017	Indian Creek-Mt. Olive	Williams Silversville Road	Lawrence	38.847601	-86.65884	INW0896_03
T12	25T-012	WEL-09-0018	Indian Creek	SR 158	Lawrence	38.856388	-86.647782	INW0894_04
T14	25T-014	WEL-09-0020	Indian Creek	Indian Creek Road	Lawrence	38.87837	-86.652739	INW0894_03
T15	25T-015	WEL-09-0021	Indian Creek	Indian Creek Road	Lawrence	38.886944	-86.651426	INW0894_02
T16	25T-016	WEL-09-0022	Indian Creek	Armstrong Station Road	Lawrence	38.90598	-86.655934	INW0894_02
T17	25T-017	WEL-09-0023	Indian Creek	Boone Hollow Road	Lawrence	38.908534	-86.659494	INW0893_03
T18	25T-018	WEL110-0005	Spring Creek	Armstrong Station Road	Lawrence	38.909217	-86.655177	INW0893_T1005
T19	25T-019	WEL110-0001	Indian Creek	SR 58	Greene	38.916482	-86.691104	INW0893_02
T20	25T-020	WEL-09-0024	Spring Creek	SR 54	Lawrence	38.930883	-86.632872	INW0893_T1005
T21	25T-021	WEL110-0006	Indian Creek	SR 54	Lawrence	38.9507	-86.675214	INW0893_02
T23	25T-023	WEL-09-0026	Mitchell Branch	SR 54	Greene	38.977933	-86.703448	INW0892_T1002
T24	25T-024	WEL110-0007	Indian Creek	CR 235 South	Greene	38.9911	-86.695923	INW0892_02
T25	25T-025	WEL110-0008	Indian Creek	Rockeast Road	Greene	39.00277	-86.689157	INW0891_03
T26	25T-026	WEL-09-0027	Little Indian Creek	Rockeast Road	Greene	39.00716	-86.685588	INW0892_T1001
T27	25T-027	WEL-09-0028	Indian Creek	Breeden Road	Monroe	39.062579	-86.673412	INW0891_02
T28	25T-028	WEL-09-0029	Indian Creek	Harmony Road	Monroe	39.10824	-86.638251	INW0891_02

¹T## gray shading of the Site # denotes that these are the selected pour points for this project (6 sites).

B.2. Sampling Methods and Sample Handling

1. Water Chemistry Sampling

One team of two staff will collect water chemistry grab samples, record water chemistry field measurements, and record physical site descriptions on the IDEM OWQ Stream Sampling Field Data Sheet (Attachment 3). All water chemistry sampling will adhere to the Water Chemistry Field Sampling Procedures (IDEM 2020b). Samples will be preserved as specified below in Table 4, and all applicable holding times will be followed.

Table 4. Water Chemistry Sample Handling

Parameter	Preservative	Holding Times
Alkalinity (as CaCO ₃)	Ice	14 days
Solids, total residue (TS)	Ice	7 days
Solids, nonfilterable residue (TSS)	Ice	7 days
Solids, filterable residue (TDS)	Ice	7 days
Sulfate (dissolved)	Ice	28 days
Chloride	Ice	28 days
Hardness (as CaCO ₃)	HNO ₃	6 months
Nitrogen, as ammonia	H ₂ SO ₄	28 days
Nitrogen, Kjeldahl (TKN)	H ₂ SO ₄	28 days
Nitrogen, Nitrate-nitrite	H ₂ SO ₄	28 days
Phosphorous (Applicable to all)	H ₂ SO ₄	28 days
Total organic carbon (TOC)	H ₂ SO ₄	28 days
Chemical oxygen demand	H ₂ SO ₄	28 days
Calcium	HNO ₃	6 months
Magnesium	HNO ₃	6 months

2. Bacteriological Sampling

One team consisting of one or two staff will conduct bacteriological sampling. Process samples in an IDEM fixed or mobile *E. coli* laboratory equipped with all materials and equipment necessary to perform the Colilert® Test Method (Standard Method 9223B), per Project Organization and Schedule (IDEM 2023c). The expected time frame for bacteriological sampling is April through October of 2025. If the stream is wadeable, collect samples in a 120 mL prepreserved wide-mouth container from the center of flow, or if the stream is not wadeable, collect from the shoreline using a pole sampler.

Wadeability is subject to field staff determination based on available personal protective

equipment (PPE), turbidity, and other factors. However, streams waist deep or shallower are generally considered wadeable. Consistently label bottles and hold all samples at a temperature less than 10°C during transport. Preserve samples with 0.0008% Na₂S₂O₃ for residual chlorine. While still in the field and at the end of each sampling run, process and analyze water samples for *E. coli* within the six-hour holding time for collection and transportation, and the two-hour holding time for sample processing (IDEM 2023c).

Use of the IDEM mobile laboratory facilitates *E. coli* testing to eliminate the necessity of transporting samples to distant contract laboratories within a six-hour holding time. The IDEM mobile *E. coli* laboratory (van) provides a workspace containing sample storage, supplies for Colilert® Quanti-tray testing, and all equipment needed for collecting, preparing, incubating, and analyzing results in the same manner as the IDEM fixed *E. coli* laboratory. Obtain all supplies from IDEXX Laboratories, Inc., Westbrook, Maine.

3. Fish Community Measurements

Teams of three to five staff complete the fish community sampling. Perform sampling using various standardized electrofishing methodologies dependent upon the stream size and site accessibility. Perform fish assemblage assessments in a sampling reach of 15 times the average wetted width, with a minimum reach of 50 meters and a maximum reach of 500 meters (IDEM 2023d). Attempt to sample all habitat types available within the sample reach to ensure adequate representation of the fish community present at the time of the sampling event. The list of possible electrofishers for utilization include: the Smith-Root LR-24, Smith-Root LR-20B, or Midwest Lake Electrofishing System (MLES) Infinity XStream backpack electrofisher; the Smith-Root model 2.5 Generator Powered Pulsator electrofisher, with RCB-6B junction box and rat-tail cathode cable; or MLES Infinity Control Box with MLES junction box and rat-tail cathode cable assembled in a canoe. If parts of the stream are not wadeable, the system may require the use of a dropper boom array outfitted in a canoe or possibly a 12 or 14-foot Loweline[®] boat; or for nonwadeable sites, the Smith-Root Type VI-A or MLES Infinity Control Box electrofisher assembled in a 16-foot boat (IDEM 2023d).

Avoid sample collections during high flow or turbid conditions due to 1) low collection rates which result in nonrepresentative samples and 2) safety considerations for the sampling team. Avoid sample collection during late autumn due to the cooling water temperature, which may affect the responsiveness of some species to the electrical field. This lack of responsiveness can result in samples which are not representative of the streams' fish assemblage (IDEM 2023d).

Collect fish using dip nets with fiberglass handles and netting of 1/8 inch mesh bag. Sort fish collected in the sampling reach by species into baskets or buckets. Do not retain young-of-the-year fish less than 20 millimeters (mm) total length in the community sample (IDEM 2023d).

For each field taxonomist, generally the crew leader, retain a complete set of fish vouchers for each new or different species encountered during the summer sampling season. Vouchers may consist of either preserved specimens or digital images. Prior to processing fish specimens and completion of the IDEM OWQ Fish Collection Data Sheet (Attachment 4), preserve one to two individuals per new species encountered. If the fish specimens can be positively identified and the individuals for preservation are small enough to fit in a 2000 mL jar, preserve in 3.7% formaldehyde solution to serve as representative fish vouchers. If, however, the specimens are too large to preserve, take a photo of key characteristics (e.g., fin shape, size, body coloration) for later examination (IDEM 2023d). Also, prior to sampling, randomly select 10% of the sites for a revisit, and preserve or photograph a few representative individuals of all species found at the site to serve as vouchers (IDEM 2020a). Review, prior to field work, taxonomic characteristics of possible species encountered in the basin of interest.

Also preserve fish specimens if positive identification cannot be made in the field (e.g., those co-occurring like the Striped and Common Shiners or are difficult to identify when immature); individuals which appear to be hybrids or have unusual anomalies; dead specimens which are taxonomically valuable for undescribed taxa (e.g., Red Shiner or Jade Darter); life history studies; or research projects (IDEM 2023d).

Record data for fish, which are not preserved, on the IDEM OWQ Fish Collection Data Sheet (Attachment 4) consisting of: number of individuals; minimum and maximum total length in millimeters (mm); mass weight in grams (g); and number of individuals with deformities, eroded fins, lesions, tumors, and other anomalies (DELTs). Once the data are recorded, release specimens within the sampling reach from which they were collected, when possible. Record data for preserved fish specimens following taxonomic identification in the laboratory (IDEM 2023d).

4. Macroinvertebrate Community Measurements

Crews of two to three staff conduct macroinvertebrate community sampling immediately following the fish community sampling event or on a different date. Collect samples using a modification of the U.S. EPA Rapid Bioassessment Protocol MHAB approach using a D-frame dip net with 500 µm mesh (Plafkin et al. 1989; Klemm et al. 1990; Barbour et al. U.S. EPA 1999; IDEM 2022b). The IDEM MHAB approach (IDEM 2023e) is composed of a 1-minute “kick” sample within a riffle or run. Collect, if the stream is wadeable, by disturbing one square meter of stream bottom substrate in a riffle or run habitat and collecting the dislodged macroinvertebrates within a dip net. Also, collect a 50-meter “sweep” sample of all available habitats. Collect by disturbing habitat such as emergent vegetation, root wads, coarse particulate organic matter, depositional zones, logs, and sticks. Then collect the dislodged macroinvertebrates within the dip net. Define the 50-meter length of riparian corridor sampled at each site using a rangefinder or tape measure. If the stream is too deep to wade, use a boat or canoe to sample the

50-meter zone along the shoreline with the best available habitat. In addition, do not collect a 1-minute kick sample if the stream is too deep to wade and no available shoreline to collect the sample exists. Combine the 1-minute “kick” and 50-meter “sweep” samples in a bucket of water. Elutriate the combined sample through a U.S. Standard Number 35 (500 µm) sieve a minimum of five times to remove all rocks, gravel, sand, and large pieces of organic debris from the sample. Then transfer the remaining sample from the sieve to a white plastic tray. The collector, while still on-site, will conduct a 15-minute pick of macroinvertebrates at a single organism rate attempting to pick for maximum organism diversity, and relative abundance through turning and examining the entire sample in the tray. Preserve the resulting picked sample in 80% isopropyl alcohol. Return the sample to the laboratory for identification at the lowest practical taxonomic level (usually genus or species level, if possible; IDEM 2023f). Evaluate the sample using the MHAB macroinvertebrate IBI.

5. Habitat Assessments

Complete habitat assessments immediately following macroinvertebrate and fish community sample collections at each site using a modification of the Ohio Environmental Protection Agency (OHEPA) Qualitative Habitat Evaluation Index (QHEI), 2006 edition (OHEPA 2006; Rankin 1995). Complete a separate IDEM QHEI (Attachment 6) for each sample type, since the sampling reach length may differ (i.e., 50 meters for macroinvertebrates and between 50 and 500 meters for fish). IDEM 2023g describes the method used in completing the QHEI.

6. Field Parameter Measurements

Measure DO, pH, water temperature, specific conductance, and DO percent saturation with a data sonde, during each sampling event regardless of the sample type collected. Perform measurement procedures and operation of the data sonde according to the manufacturers’ manuals (YSI 2017; YSI 2018) and the Water Chemistry Field Sampling Procedures TSOP (IDEM 2020b, 2.0 and 4.0). Measure turbidity with a Hach™ turbidity kit and write the meter number in the comments under the field parameter measurements. If a Hach™ turbidity kit is not available, record the data sonde measurement for turbidity and note in the comments. During each sampling run, note and document field observations from each site and ambient weather conditions at the time of sampling on IDEM Stream Sampling Field Data Sheets (Attachment 3).

B.3. Analytical Methods

1. Laboratory Procedure for *E. coli* Measurements:

Process and analyze all waters sampled for *E. coli* in the IDEM *E. coli* mobile laboratory or IDEM Shadeland laboratory, which is equipped with required materials and equipment necessary for the IDEXX™ Colilert Test. The Colilert Test is a multiple-tube enzyme substrate standard method SM-9223B Enzyme Substrate Coliform Test Method (Clesceri et al., 2012). Table 5 identifies the *E. coli* test method and quantification limit.

2. Nutrient and General Chemistry Parameters Measurements:

Pace Analytical Services performs analyses of nutrient and general chemistry parameters, in accordance with preapproved test methods and within the allotted time frames. Table 5 identifies the nutrient and general chemistry parameters, and respective test methods and quantification limits.

Table 5. *E. coli*, Nutrient, and General Chemistry Parameters Test Methods⁴

Parameter	Method	Lab Reporting Limit	Units
<i>E. coli</i>	SM-9223B Enzyme Substrate Test	1.0	*MPN/100 mL
Alkalinity (as CaCO ₃)	SM2320B	2.0	mg/L
Solids, total residue (TS)	SM 2540B	10.0	mg/L
Solids, nonfilterable residue (TSS)	SM 2540D	2.5	mg/L
Solids, filterable residue (TDS)	SM 2540C	10.0	mg/L
Sulfate	EPA 300.0	0.25	mg/L
Chloride	EPA 300.0	0.25	mg/L
Hardness (as CaCO ₃)	SM 2340B	1.0	mg/L
Nitrogen, as ammonia	EPA 350.1	0.10	mg/L
Nitrogen, Kjeldahl (TKN)	EPA 351.2	0.50	mg/L
Nitrogen, Nitrate-nitrite	EPA 353.2	0.10	mg/L
Phosphorous, total	EPA 365.1	0.05	mg/L
Total organic carbon (TOC)	SM 5310C	1.0	mg/L
Chemical oxygen demand	EPA 410.4	10.0	mg/L
Calcium	EPA 200.7	1.0	mg/L
Magnesium	EPA 200.7	1.0	mg/L

* Clesceri et al., 2017. 1 MPN = 1 CFU/100 mL

⁴ Methods accredited by NELAP (State of Kansas, 2023)

3. Field Parameters Measurements:

Take the field measurements of DO, DO percent saturation, temperature, pH, conductivity, and turbidity each time a sample is collected. Table 6 identifies the field parameters, respective test methods, and sensitivity limits. Locate the data sonde in the center of flow during sampling. The field staff member collecting the sample shall wait for all readings to stabilize before recording the readings on the IDEM Stream Sampling Field Data Sheet (Attachment 3).

Table 6. Field Parameters Test Methods

Parameter	Method	Sensitivity Limit	Units
DO (data sonde optical)	ASTM D888-09(C)	0.01	mg/L
DO (membrane probe)	SM4500-OG ⁵	0.03	mg/L
DO % Saturation (data sonde optical)	ASTM D888-09(C)	0.01	%
Turbidity (data sonde)	SM 2130B Mod	0.02	NTU
Turbidity (Hach turbidimeter)	EPA 180.1 ⁵	0.01	NTU
Specific conductance (data sonde)	SM 2510B	1.0	µmho/cm
Temperature (data sonde)	SM 2550B(2)	0.1	°C
Temperature (field meter)	SM 2550B(2) ⁵	0.1	°C
pH (data sonde)	EPA 150.2	0.01	SU
pH (field meter)	SM 4500-HB ⁵	0.01	SU

⁵ Method used for Field Calibration Verification

B.4. Quality Control and Custody Requirements

Quality assurance protocols will follow part B5 of the Surface Water QAPP (IDEM 2023a, pp 92-94) and of the Biological and Habitat QAPP (IDEM 2020a, p 27).

1. Field Instrument Testing and Calibrations

Calibrate the data sonde prior to each week's sampling (IDEM 2023I). Record, maintain, store, and archive calibration results and drift values in logbooks located in the calibration laboratories at the Shadeland facility. The drift value is the difference between two successive calibrations. Field parameter calibrations will conform to the procedures as described in the instrument users' manuals (YSI 2017; YSI 2018). Field check the unit for accuracy once during the week by comparison with a YSI EcoSense DO200A DO Probe or the YSI ProSolo Probe (IDEM 2020b, p 24), Hach™ turbidity, and an Oaktown Series 5 pH meter. Record weekly calibration verification results on the field calibrations portion of the IDEM OWQ Stream Sampling Field Data Sheets (Attachment 3) and enter into the AIMS II database. At field sites where the DO concentration is 4.0 mg/L or less, use the YSI EcoSense DO meter.

2. Field Measurement Data

Collect in-situ water chemistry data using calibrated or standardized equipment and record on the IDEM OWQ Stream Sampling Field Data Sheet (Attachment 3). The same staff member collects and records the data. Perform calculations either in the field or later at the office. Include analytical results, which have limited QC checks, in this category. Detection limits and ranges are set for each analysis (Table 6). Quality control checks (such as duplicate measurements, measurements of a secondary standard, or measurements using a different test method or instrument) performed on field or laboratory data, are usable for estimating precision, accuracy, and completeness for the project, as described in the Surface Water QAPP (IDEM 2023a Section D. pp 102-110).

3. Bacteriological Measurement Data

Analytical results, from an IDEM fixed or mobile *E. coli* laboratory, include QC check sample results from which precision, accuracy, and completeness can be determined for each batch of samples. Archive raw data by analytical batch for easy retrieval and review. Follow chain of custody (COC) procedures, including time of collection, time of setup, time of reading the results, and time and method of disposal (IDEM 2020b). The field staff member collecting the samples signs the COC form upon delivery of samples to the laboratory. Thoroughly document any method deviations in the raw data. Test all QA/QC samples according to the following guidelines:

Field Duplicate: Field Duplicates will be collected at a frequency of one per batch or at least one for every 25 samples collected ($\geq 5\%$).

Field Blank: Field Blanks will be collected at a frequency of one per batch or at least one for every 25 samples collected ($\geq 5\%$).

Laboratory Blank: Laboratory Blanks (sterile laboratory water blanks) will be tested at a frequency of one per day.

Positive Control: Each lot of media will be tested for performance using *E. coli* bacterial cultures.

Negative Controls: Each lot of media will be tested for performance using non-*E. coli* and noncoliform bacterial cultures.

4. Water Chemistry Measurement Data

The manufacturer certifies sample bottles and preservatives for purity. Do not use damaged sample and preservatives bottles, and do not use preservatives past their stated expiration date. Field blanks check the purity of sample bottles and preservatives. Sample collection containers for each parameter, preservative, and holding time (Table 4) will adhere to U.S. EPA requirements. Collect field duplicates and matrix spike and matrix spike duplicates at the rate of one per sample analysis set or one per every 20 samples, whichever is greater. Additionally, take field blank samples at a rate of one set per sample analysis set or one per every 20 samples, whichever is greater. An IDEM COC form created by the AIMS II database (Attachment 7) and an IDEM Water Sample Analysis Request form (Attachment 8) accompany each sample set through the analytical process. The field staff member collecting the samples signs the COC form upon delivery of samples to the laboratory.

5. Fish Community Measurement Data

Perform fish community sampling revisits at a rate of 10% of the total fish community sites sampled, in this case, two in the watershed (IDEM 2020a). Perform revisit sampling with at least two weeks of recovery between the initial and revisit sampling events. Perform the fish community revisit sampling and habitat assessment with either a partial or complete change in field team members (IDEM 2020a). Use the resulting IBI and QHEI total score between the initial visit and the revisit to evaluate precision, as

described in the Biological and Habitat QAPP (IDEM 2020a). Use the IDEM OWQ COC form (Attachment 7) to track samples from the field to the laboratory. A field staff member from the crew signs the COC form after completion of sampling. The samples and COC form are relinquished to a lab custodian to verify the sampling information is accurate. For all raw data: 1) check for completeness 2) utilize to calculate derived data (e.g., total weight of all specimens of a taxon), which is entered into the AIMS II database and 3) check again for data entry errors.

6. Macroinvertebrate Community Measurement Data

Collect duplicate macroinvertebrate field samples at a rate of 10% of the total macroinvertebrate community sites sampled (in this case, two sites) in the watershed. Perform the macroinvertebrate community duplicate sample and corresponding habitat assessment by the same team member performing the original sample, immediately after the initial sample collection. The 50-meter section of stream and riffle area utilized for the duplicate sample are different from those used for the original sample but have features as similar to the habitat types and availability of the original as possible. This will result in a precision evaluation based on duplicates of 10% of samples collected, as described in the Biological and Habitat QAPP (IDEM 2020a).

Use the IDEM COC form (Attachment 7) to track samples from the field to the laboratory. A field staff member from the crew completes the COC form after sampling is complete. After completion of weekly field sampling activities, the laboratory custodian uses the COC form to check in samples prior to long-term storage. The IDEM Probabilistic Monitoring Section laboratory supervisor maintains laboratory identifications and QA/QC of taxonomic work.

C. ASSESSMENT AND OVERSIGHT

C.1. Field and laboratory performance and system audits

Conduct performance and system audits to ensure good quality data. The field and laboratory performance checks include precision measurements by relative percent difference of field and laboratory duplicates (IDEM 2023a, pp 37, 105-106); accuracy measurements by percent of recovery of matrix spike and matrix spike duplicate samples analyzed in the laboratory (IDEM 2023a, pp 47-48, 105); and completeness measurements by the percent of planned samples versus the actual number collected, analyzed, reported, and usable for the project (IDEM 2023a, p 37).

Biological and habitat measurements, field performance measurements include:

- Completeness (IDEM 2020a, pp 10 – 11, 14)
- Examination of fish IBI score differences and the relative percent difference (RPD) for number of fish species at the revisit sites (IDEM 2020a, pp 9 – 10)
- RPD for number of taxa for macroinvertebrate duplicate samples (IDEM 2020a, p 13)

- RPD between the two total QHEI scores (IDEM 2020a, p 18)

Lab performance measurements include:

- Percent taxonomic difference (PTD) for fish (IDEM 2020a, p 12)
- PTD for macroinvertebrates (IDEM 2020a, pp 15 – 16)
- Percent difference in enumeration (PDE) and percent sorting efficiency (PSE) for macroinvertebrates (IDEM 2020a, pp 14 – 16)

A regionally recognized non-IDEM freshwater fish taxonomist may verify fish taxonomic identifications made by IDEM staff in the laboratory. Send ten percent of macroinvertebrate samples, the “normal” samples from sites where duplicate samples were collected, to Rhithron Associates, Inc. (Missoula, MT) for verification by an outside taxonomist (IDEM 2020a). For macroinvertebrate verifications by an external lab, the lab’s taxonomists must maintain Society for Freshwater Science taxonomic certifications. Genus level taxonomic certifications are required for (1) Eastern General Arthropods; (2) Eastern Ephemeroptera, Plecoptera, and Trichoptera; (3) Chironomidae; and (4) Oligochaeta.

Require contract laboratories to have National Environmental Laboratory Accreditation Conference (NELAC) audits at the beginning of a laboratory contract and at least once per year during the contract. In addition, IDEM QA staff annually review performance studies conducted by the contract laboratories. Audits include any or all of the operational quality control elements of the laboratory’s quality assurance system. Audits address all applicable elements of this QAPP and the laboratory contract requirements including but not limited to: sample handling, sample analysis, record keeping, preventative maintenance, proficiency testing, personnel requirements, training, and workload. (IDEM 2023a, p 99).

IDEM WAPB staff conduct field audits every other year to ensure sampling activities adhere to approved SOPs. WAPB staff systematically conduct audits to include all WAPB personnel engaging in field sampling activities. Staff trained in the associated sampling SOPs and in the processes related to conducting an audit evaluate WAPB field staff involved with sample collection and preparation. Audit staff produce an evaluation report documenting each audit for review by those field staff audited and WAPB management. Communicate corrective actions to field staff who implement the corrective actions as a result of the audit process (IDEM 2023a, pp 99-100; IDEM 2020a, p 31).

The QA officer submits quality assurance reports upon completion of a dataset’s validation to the program manager or WAPB branch chief. The QA manager, relevant section chief, project manager, any technical staff working on corrective actions, and quality assurance staff receive copies of the progress reports when new developments arise. The section chief, project officer, or QA officer is responsible for working with relevant staff members to develop corrective actions and notifying the QA manager of corrective action progress. Depending on the associated corrective actions, either the section chief or the QA officer approves the final corrective action (IDEM 2023a, p 101).

C.2. Data Quality Assessment Levels

The intention for samples and various types of data collected by this program are to meet the quality assurance criteria and rated DQA Level 3, as described in the Surface Water QAPP (IDEM 2023a, p 108) and the Biological and Habitat QAPP (IDEM 2020a, pp 34 – 35).

D. DATA VALIDATION AND USABILITY

Quality assurance reports to management; and data validation and usability are also important components of Indiana's Surface Water QAPP which ensures good quality data for this project. Quality assurance reports are submitted by the QA officer upon completion of the data validation of a dataset to the program manager or WAPB branch chief. This is done to ensure problems arising during the sampling and analysis phases of the project are investigated and corrected (IDEM 2023a, p 102). As described in Section D of the Surface Water QAPP (IDEM 2023a), data are reduced (converted from raw analytical data into final results in proper reporting units); validated (qualified based on the performance of field and laboratory QC measures incorporated into the sampling and analysis procedures); and reported (described so as to completely document the calibration, analysis, QC measures, and calculations). These steps allow users to assess the data ensuring the project DQOs have been met.

D.1. Quality Assurance, Data Qualifiers, and Flags

The various data qualifiers and flags will be used for quality assurance and validation of the data and are found on pages 108-109 of the Surface Water QAPP (IDEM 2023a pp 108-109a) and the Biological and Habitat QAPP (IDEM 2020a pp 33-34).

D.2. Data Usability

Qualify the environmental data's collection and usability per each lab or field result obtained and classify into one or more of the four categories: Acceptable Data, Enforcement Capable Results, Estimated Data, and Rejected Data as described in the Biological and Habitat QAPP (IDEM 2020a, pp 35 – 36).

D.3. Information, Data, and Reports

Record data collected in 2024 – 2025 in the AIMS II database and present in two compilation summaries. The first summary is a general compilation of the watershed field and water chemistry data prepared for use in the 2026 Integrated Report. The second summary is in database report format containing biological results and habitat evaluations, produced for inclusion in the Integrated Report as well as individual site folders. Maintain all site folders at the WAPB facility. All data and reports are available to public and private entities, which may find the data useful for municipal, industrial, agricultural, and recreational decision-making processes (TMDL, National Pollutant Discharge Elimination System (NPDES) permit modeling, watershed restoration projects, water quality criteria

refinement, etc.). Upload the work plan into the virtual file cabinet. Store all field sheets in the AIMS II database. Upload chemistry, fish community, and macroinvertebrate results to U.S. EPA's Water Quality Portal via the Water Quality Exchange (formerly STORET), which allows the data to be shared with U.S. EPA and others. The Water Quality Exchange is a framework which allows states, tribes, and other data partners to submit and share water quality monitoring data via the web to the Water Quality Portal.

D.4. Laboratory and Estimated Cost

Laboratory analysis and data reporting for this project will comply with the Surface Water QAPP (IDEM 2023a); Request for Proposals 22-68153 (see IDEM 2021a); the IDEM QMP (IDEM 2023h); and Pace-Indy contract PO # 20003041-7. Analytical tests on general chemistry and nutrient parameters outlined in Table 5 will be performed by Pace Analytical Services in Indianapolis, Indiana with a total estimated cost of \$60,038.00. IDEXX Laboratories, Inc., Westbrook, Maine supplies bacteriological sampling supplies, with a total estimated cost of \$1,932.50. Bacteriological samples will be tested and analyzed by IDEM staff. All fish and macroinvertebrate samples will be collected and analyzed by IDEM staff. Ten percent of macroinvertebrate samples will be verified by Rhithron Associates, Inc. in Missoula, Montana (IDEM 2020a) with a total estimated cost of \$690. The anticipated total budget for laboratory costs for the project is \$62,660.50.

D.5. Reference Manuals and Personnel Safety

Table 7. Personnel Safety and Reference Manuals

Role	Required Training or Experience	Training References	Training Notes
All Staff that participate in field activities	- Basic First Aid and Cardio-Pulmonary Resuscitation (CPR) - Personal Protective Equipment (PPE) Policy - Personal Flotation Devices	- A minimum of 4 hours of in-service training provided by WAPB (IDEM 2010c) - IDEM 2024a - February 29, 2000 WAPB internal memorandum regarding use of approved Personal Flotation Devices	- WAPB staff meeting Health and Safety Training requirements will accompany staff lacking 4 hours of in-service training or appropriate certification in the field at all times. - When working on boundary waters as defined by Indiana Code (IC) 14-8-2-27 or between sunset and sunrise on any waters of the state, all personnel in the watercraft must wear a high intensity whistle and Safety of Life at Sea (SOLAS) certified strobe light.

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ATTACHMENTS

Attachment 1: Modified Geometric Design Steps for Watershed Characterization Studies

Introduction

The Modified Geometric Site Selection process is employed within watersheds which correspond to the 12-14-digit HUC scale in order to fulfill multiple water quality management objectives, not just the conventional focus on status assessment. The design is employed at a spatial scale which is representative of the scale at which watershed management is generally being conducted.

Sites within the watershed are allocated based on a geometric progression of drainage areas starting with the area at the mouth of the main stem river or stream (pour point) and working “upwards” through the various tributaries to the primary headwaters. This approach allocates sampling sites in a semirandom fashion and according to the stratification of available stream and river sizes based on drainage area. The Geometric Site Selection process is then modified by adding a targeted selection of additional sampling sites used to focus on localized management issues such as point source discharges, habitat modifications, and other potential impacts within a watershed. These sites are then “snapped” to the nearest bridge to facilitate safe and easy access to the stream. This design also fosters data analysis which takes into consideration overlying natural and human caused influences within the streams of a watershed. The design has been particularly useful for watersheds targeted for TMDL development because missing, incomplete, or outdated assessments can be addressed prior to TMDL development.

Selection Process

In ArcGIS, download from NHD Plus site (<http://www.horizon-systems.com/nhdplus/HSC-wthMS.php>) the following files for Region 5 (and then again for Region 7) and zip them into the appropriate file structure.

File Description	File Name (.zip***)	Format
Region 05, Version 01_01, Catchment Grid	NHDPlus05V01_01_Catgrid	ESRI Grid
Region 05, Version 01_01, Catchment Shapefile	NHDPlus05V01_01_Catshape	Shapefile
Region 05, Version 01_02, Catchment Flowline Attributes	NHDPlus05V01_02_Cat_Flowline_Attr	DBF
Region 05, Version 01_02, Elevation Unit a	NHDPlus05V01_02_Elev_Unit_a	ESRI Grid
Region 05, Version 01_02, Elevation Unit b	NHDPlus05V01_02_Elev_Unit_b	ESRI Grid
Region 05, Version 01_02, Elevation Unit c	NHDPlus05V01_02_Elev_Unit_c	ESRI Grid
Region 05, Version 01_01, Flow Accumulation and Flow Direction Unit a	NHDPlus05V01_01_FAC_FDR_Unit_a	ESRI Grid
Region 05, Version 01_01, Flow Accumulation and Flow Direction Unit b	NHDPlus05V01_01_FAC_FDR_Unit_b	ESRI Grid
Region 05, Version 01_01, Flow Accumulation and Flow Direction Unit c	NHDPlus05V01_01_FAC_FDR_Unit_c	ESRI Grid
Region 05, Version 01_02, National Hydrography Dataset	NHDPlus05V01_03_NHD	Shapefile and DBF
Region 05, Version 01_01, Stream Gage Events	NHDPlus05V01_01_StreamGageEvent	Shapefile
Region 05, Version 01_01, QAQC Sinks Spreadsheet	NHDPlus05V01_01_QAQC_Sinks	Excel Spreadsheet

Create a new point shapefile (or geodatabase featureclass) named Geometric Design within ArcCatalog with the same projection as the unzipped layers above.

Within an ArcMap project, add the following:

- nhdfowline layer
- Geometric Design layer
- catchment shapefile
- the FlowlineAttributesFlow table

Add the following fields to the nhdfowline layer:

- LENGTHMi (type: double, precision: 9, scale 4)
- DrainMi (type: double, precision: 9, scale 4)
- MinElev (type: double, precision: 9, scale 4)
- MaxElev (type: double, precision: 9, scale 4)
- Gradient (type: double, precision: 9, scale 4)

Add the following field to the GeometricDesign layer (use the add field-batch tool):

- Geometric (type: double, precision: 5, scale 2)
- Lat (type: double, precision: 8, scale 5)
- Long (type: double, precision: 8, scale 5)
- COMID (type: long, precision: 9)

Join the nhdfowline layer with the FlowlineAttributesFlow table based on the COMID field.

Use the field calculator within the nhdfowline attribute table, with the appropriate metric to imperial conversion to populate the following fields:

- LENGTHMi (from LENGTHKM – kilometers to miles)
- DrainMia (from CumDrainage – square kilometers to square miles (sq mi))
- MinElev (from MinElevSmo – meters to feet)
- MaxElev (from MaxElevSmo – meters to feet)

- Gradient ((MaxElev-MinElev)/LENGTHMI).

Unjoin the FlowlineAttributesFlow table.

Label the “nhdfLOWline” layer based new “LengthMi” field – note: this field shows the cumulative drainage at the *end* of the line segment, which is rarely more than 2-3 miles in between nodes.

Calculate the geometric break points (i.e., for a 500 sq mi watershed: 500, 250, 125, 62.5, 31, 15, 7, 4, 2).

It is recommended to change the symbology (Symbology: Show Quantities: Classification (Manual)) of the actual flowline to reflect the drainage. This will help identify when and where sites need to be allocated.

Start a new editing session, with the GeometricDesign layer as your target layer.

Add a new point within this layer to the pour point for the watershed (500 sq mi in this case).

Travel upstream through the main stem and “find” the next place on the stream where the river drainage brackets 250 sq mi. Use the catchment shapefile layer to identify more precisely the drainage value, if needed.

Populate the “Geometric” field within the GeometricDesign layer accordingly to the identified drainage level, then change the symbology (Symbology: Categories: Unique Values: Geometric field) of this layer to reflect the drainage levels.

Proceed through the watershed (either around the outer portions or start with largest values and work in), adding points accordingly to each geometric level. Change the symbology to find areas or levels that were missed. Note – the drainage level must be exact. Use the catchment shapefile to subtract drainage areas from larger drainage areas until the exact drainage level is reached. It is ok to “skip” a geometric level if it is not exactly reached. Sometimes there are large tributaries whose contribution to the main stem skips a drainage level.

Populate the COMID (manually), and Lat/Long (right click on field and select calculate geometry – lat = x-coordinates and long = y-coordinates) accordingly for reference within the GeometricDesign Layer.

Once sites are selected in this fashion, they will need to be snapped to a bridge or access point.

Additional sites should be placed at pour points of subwatersheds (12-digit HUCs) to meet TMDL document requirements.

Once the initial sites are selected, the following features are taken into account to move or add sites:

- Permitted facilities
- Urban areas
- Historical sampling sites
- Assessment Unit IDs (AUID)
- External stakeholder information
- Resources - maximum of 35 sites per project

After refining site selections, there may be additional sites added to ensure spatial representation of the project area.

Sites may be removed or changed after site reconnaissance if there are problems accessing the site or if sites are dry.

Notes regarding the NHD dataset:

All units are initially set to metric and need to be converted to imperial.

Within the nhdfLOWline layer, the GNIS_Name/ID refers to the whole river name and ID, while the COMID is a unique identifier for the particular segment.

There is *not* a value GNIS_Name/ID for every river, especially where primary streams and ditches are concerned.

Segments within the nhdfLOWline layer are based on linear miles between “nodes,” which are broken up (typically) by tributary. Typically these lengths are less than 2-3 miles.

The cumulative drainage values in the NHD dataset have been compared against other and deemed “reasonable” (read – not statistically compared). Also note that the drainage is calculated through the model to be at the pour point of that segment.

The elevation values, however, are **not** reliable and require supervision. These values are calculated from the associated digital elevation model (DEM) and sometimes have null values for either the maximum or minimum elevation values. In addition, the length of the stream is not long enough (i.e. >1 mile) to calculate gradient. In either case, this associated value is helpful to identify contour changes against a USGS contour map. However, to note the calculated gradient from the NHD information has been observed to be within several tenths of mile compared to a manual calculation of gradient.

Important tables from NHD

- FlowlineAttributesFlow (found in: Region 05, Version 01_02, Catchment Flowline Attributes)
- Key fields: CumDrainag, Max ElevRaw, MinElevSmo,

Important Layers from NHD

- Region 05, Version 01_01, Catchment Shapefile
- Region 05, Version 01_02, National Hydrography Dataset

Attachment 2: IDEM OWQ Site Reconnaissance Form



Site Reconnaissance Form

EPA Site Identifier	Rank
Recon #:	
Trip #:	

Site Number: Stream: County:

Location Description:

Reconnaissance Data Collected				Landowner/Contact Information		
Recon Date		Crew Members		First Name	Last Name	
Avg. Width (m)	Avg. Depth (m)	Max. Depth (m)	Nearest Town	Street Address		
Water Present?	Site Wadeable?	Riffle/Run Present?	Road/Public Access Possible?	City	State	Zip
☐	☐	☐	☐			
Site Impacted by Livestock?	Collect Sediment?	Gauge Present?		Telephone	E-Mail Address	
☐	☐	☐				
				Pamphlet Distributed?	Please Call in Advance?	Results Requested?
				☐	☐	☐

Rating, Results, Comments, and Planning									
Site Rating By Category (1=easy, 10=difficult) <table border="1"> <tr><td>Access Route</td></tr> <tr><td></td></tr> <tr><td>Safety Factor</td></tr> <tr><td></td></tr> <tr><td>Sampling Effort</td></tr> <tr><td></td></tr> </table>	Access Route		Safety Factor		Sampling Effort		Reconnaissance Decision Pre-Recon Recon In process Approved Site No, Landowner denied access No, Dry No, Stream channel missing No, Physical barriers No, Impounded stream No, Marsh/Wetland No, Bridge gone or not accessible No, Unsafe due to traffic or location No, Site Impacted by backwater No, Other	Equipment Selected 	Circle Equipment Needed Backpack Boat Towbarge Longline Scanoes Seine Weighted Handline Waders Gill Net
Access Route									
Safety Factor									
Sampling Effort									

Comments

Sketch of Stream & Access Route – Indicate Flow, Direction, Obstacles, & Land Use (Use Back of Page, if Necessary)

Attachment 3: IDEM OWQ Stream Sampling Field Data Sheet

IDEM Stream Sampling Field Data Sheet										Analysis Set #	EPA Site ID	Rank
Sample #	Site #		Sample Medium				Sample Type		Duplicate Sample #			
Stream Name:							River Mile:		County:			
Site Description:												
Survey Crew Chief	Sample Collectors			Sample Collected		Hydrolab #	Water Depth/Gage Ht (ft)	Water Flow (cfs/sec)	Flow Estimated?	Algae?	Aquatic Life?	
	1	2	3	4	Date							Time
Sample Taken?		Aliquots		Water Flow Type		Water Appearance		Canopy Closed %				
☐ Yes ☐ No; Frozen ☐ No; Stream Dry ☐ No; Other ☐ No; Owner refused Access		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 8 ☐ 8 ☐ 12 ☐ 24 ☐ 48 ☐ 72 ☐ All-Flow		☐ Riffle ☐ Dry ☐ Stagnant ☐ Pool ☐ Run ☐ Flood ☐ Glide ☐ Eddy ☐ Other		☐ Clear ☐ Green ☐ Sheen ☐ Murky ☐ Black ☐ Other ☐ Brown ☐ Gray (Septic/Sewage)		☐ 0-20% ☐ 60-80% ☐ 20-40% ☐ 80-100% ☐ 40-80%				
Special Notes:												

Field Data:

Date (m/d/yyyy)	24-hr Time (hh:mm)	D.O. (mg/l)	pH	Water Temp (°C)	Spec Cond (µmhos/cm)	Turbidity (NTU)	% Sat.	Chlorine (mg/l)	Chloride (mg/l)	Chlorophyll (mg/l)	Weather Codes			
											SC	WD	WS	AT
Comments														
Comments														
Comments														
Comments														
Comments														
Comments														
Comments														

Measurement Flags	< > E R	< Min. Meter Measurement > Max. Meter Measurement Estimated (See Comments) Rejected (See Comments)	Weather Code Definitions			
			SC Sky Conditions	WD Wind Direction	WS Wind Strength	AT Air Temp
			1 Clear 2 Scattered 3 Partly 4 Cloudy 5 Mist 6 Fog 7 Shower	8 Rain 9 Snow 10 Sleet	00 North (0 degrees) 09 East (90 degrees) 18 South (180 degrees) 27 West (270 degrees)	0 Calm 1 Light 2 Mod./Light 3 Moderate 4 Mod./Strong 5 Strong 6 Gale
						1 < 32 2 33-45 3 46-60 4 61-75 5 76-85 6 > 85

Field Calibrations:

Date (m/d/yyyy)	Time (hh:mm)	Calibrator Initials	Type	Meter #	Value	Units

Calibration Type	pH DO Turbidity

Preservatives/Bottle Lots:

Group: Preservative	Preservative Lot #	Bottle Type	Bottle Lot #

Group: Preservatives	Bottle Types
GC General Chemistry: Ice	2000P 2000mL Plastic, Narrow Mouth
Nr Nutrients: H2SO4	1000P 1000mL Plastic, Narrow Mouth
Metals Metals: HNO3	500P 500mL Plastic, Narrow Mouth
CN Cyanide: NaOH	250P 250mL Plastic, Narrow Mouth
Oil & Grease: H2SO4	1000G 1000mL Glass, Narrow Mouth
Toxics Toxics: Ice	500G 500mL Glass, Wide Mouth
Ecol Bacteriology: Ice	250G 250mL Glass, Wide Mouth
VOA Volatile Organics: HCl & Thiosulfate	125G 125mL Glass, Wide Mouth
Pest Pesticides: Ice	40GV 40mL Glass Vial
Phen Phenols: H2SO4	120PB 120mL Plastic (Bacteria Only)
Sed Sediment: Ice	1000PF 1000mL Plastic, Coming Filter
Gly Glyphosate: Thiosulfate	500PF 500mL Plastic, Coming Filter
Hg Mercury(1631): HCl	60P 60mL Plastic
Cr6 Chromium(VI)(1636): NaOH	250T 250mL Teflon
MeHg Methyl Mercury(1630): HCl	500T 500mL Teflon
	125T 125mL Teflon

Data Entered By: _____ QC1: _____
QC2: _____

Stream Sampling Field Data Sheet

Attachment 4: IDEM OWQ Fish Collection Data Sheet

IDEM
 OWQ-WATERSHED ASSESSMENT AND PLANNING BRANCH

Event ID _____ Voucher jars _____ Unknown jars _____ Equipment _____ Page _____ of _____
 Voltage _____ Time fished (sec) _____ Distance fished (m) _____ Max. depth (m) _____ Avg. depth (m) _____
 Avg. width (m) _____ Bridge in reach _____ Is reach representative _____ If no, why _____
 Elapsed time at site (hh:mm) _____: _____ Comments _____

Museum data: Initials _____ ID date _____ Jar count _____ Fish Total _____

Coding for Anomalies: D – deformities E – eroded fins L – lesions T – tumor M – multiple DELT anomalies O – other (A – anchor worm C – leeches
 W – swirled scales Y – popeye S – emaciated F – fungus P – parasites) H – heavy L – light (these codes may be combined with above codes)

TOTAL # OF FISH				WEIGHT (s)				ANOMALIES						
				(mass g)				(length mm)						
								Min length	D	E	L	T	M	O
								Max length						
V		P												
								Min length	D	E	L	T	M	O
								Max length						
V		P												
								Min length	D	E	L	T	M	O
								Max length						
V		P												
								Min length	D	E	L	T	M	O
								Max length						
V		P												
								Min length	D	E	L	T	M	O
								Max length						
V		P												
								Min length	D	E	L	T	M	O
								Max length						
V		P												

KRW: Rev/09.26.18 Calculation: _____ QC1 + Entry _____ QC 1 _____ QC 2 _____

Attachment 5: IDEM OWQ Biological Qualitative Habitat Evaluation Index (front)

IDEM		OWQ Biological QHEI (Qualitative Habitat Evaluation Index)			
Sample #	bioSample #	Stream Name	Location		
Surveyor	Sample Date	County	Macro Sample Type	☐ Habitat Complete	QHEI Score:

1] SUBSTRATE Check ONLY Two predominant substrate TYPE BOXES and check every type present

BEST TYPES <table border="0"><tr><td style="width: 50%;">PREDOMINANT</td><td style="width: 50%;">PRESENT</td></tr><tr><td>☐ BLDR/SLABS [10]</td><td>☐ P/G</td></tr><tr><td>☐ BOULDER [9]</td><td>☐ R/R</td></tr><tr><td>☐ COBBLE [8]</td><td>☐</td></tr><tr><td>☐ GRAVEL [7]</td><td>☐</td></tr><tr><td>☐ SAND [6]</td><td>☐</td></tr><tr><td>☐ BEDROCK [5]</td><td>☐</td></tr></table>	PREDOMINANT	PRESENT	☐ BLDR/SLABS [10]	☐ P/G	☐ BOULDER [9]	☐ R/R	☐ COBBLE [8]	☐	☐ GRAVEL [7]	☐	☐ SAND [6]	☐	☐ BEDROCK [5]	☐	OTHER TYPES <table border="0"><tr><td style="width: 50%;">PREDOMINANT</td><td style="width: 50%;">PRESENT</td></tr><tr><td>☐ HARDPAN [4]</td><td>☐ P/G</td></tr><tr><td>☐ DETRITUS [3]</td><td>☐ R/R</td></tr><tr><td>☐ MUCK [2]</td><td>☐</td></tr><tr><td>☐ SILT [2]</td><td>☐</td></tr><tr><td>☐ ARTIFICIAL [0]</td><td>☐</td></tr></table>	PREDOMINANT	PRESENT	☐ HARDPAN [4]	☐ P/G	☐ DETRITUS [3]	☐ R/R	☐ MUCK [2]	☐	☐ SILT [2]	☐	☐ ARTIFICIAL [0]	☐	ORIGIN <table border="0"><tr><td>☐ LIMESTONE [1]</td><td>☐ TILLS [1]</td></tr><tr><td>☐ WETLANDS [0]</td><td>☐ HARDPAN [0]</td></tr><tr><td>☐ SANDSTONE [0]</td><td>☐ RIP/RAP [0]</td></tr><tr><td>☐ LACUSTRINE [0]</td><td>☐ SHALE [-1]</td></tr><tr><td>☐ COAL FINES [-2]</td><td></td></tr></table>	☐ LIMESTONE [1]	☐ TILLS [1]	☐ WETLANDS [0]	☐ HARDPAN [0]	☐ SANDSTONE [0]	☐ RIP/RAP [0]	☐ LACUSTRINE [0]	☐ SHALE [-1]	☐ COAL FINES [-2]	
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☐ COAL FINES [-2]																																						

Check ONE (Or 2 & average)

QUALITY <table border="0"><tr><td style="width: 50%;">US</td><td style="width: 50%;">T</td></tr><tr><td>☐ HEAVY [-2]</td><td>☐ MODERATE [-1]</td></tr><tr><td>☐ MODERATE [-1]</td><td>☐ NORMAL [0]</td></tr><tr><td>☐ FREE [1]</td><td></td></tr></table>	US	T	☐ HEAVY [-2]	☐ MODERATE [-1]	☐ MODERATE [-1]	☐ NORMAL [0]	☐ FREE [1]		Substrate <table border="0"><tr><td style="width: 50%;">MINOR</td><td style="width: 50%;">MAJOR</td></tr><tr><td>☐ EXTENSIVE [-2]</td><td>☐ MODERATE [-1]</td></tr><tr><td>☐ MODERATE [-1]</td><td>☐ NORMAL [0]</td></tr><tr><td>☐ NORMAL [0]</td><td>☐ NONE [1]</td></tr></table>	MINOR	MAJOR	☐ EXTENSIVE [-2]	☐ MODERATE [-1]	☐ MODERATE [-1]	☐ NORMAL [0]	☐ NORMAL [0]	☐ NONE [1]
US	T																
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☐ EXTENSIVE [-2]	☐ MODERATE [-1]																
☐ MODERATE [-1]	☐ NORMAL [0]																
☐ NORMAL [0]	☐ NONE [1]																

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☐ 3 or less [0] (Score natural substrates; ignore sludge from point-sources)

Comments

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed root wad in deep/fast water, or deep, well-defined, functional pools.)

UNDERCUT BANKS [1]	POOLS > 70cm [2]	OXBOWS, BACKWATERS [1]
OVERHANGING VEGETATION [1]	ROOTWADS [1]	AQUATIC MACROPHYTES [1]
SHALLOWS (IN SLOW WATER) [1]	BOULDERS [1]	LOGS OR WOODY DEBRIS [1]
ROOTMATS [1]		

AMOUNT Check ONE (Or 2 & average)

☐ EXTENSIVE > 75% [11]
☐ MODERATE 25 - 75% [7]
☐ SPARSE 5 - < 25% [3]
☐ NEARLY ABSENT < 5% [1]

Cover Maximum 20

Comments

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

SINUOSITY <table border="0"><tr><td>☐ HIGH [4]</td></tr><tr><td>☐ MODERATE [3]</td></tr><tr><td>☐ LOW [2]</td></tr><tr><td>☐ NONE [1]</td></tr></table>	☐ HIGH [4]	☐ MODERATE [3]	☐ LOW [2]	☐ NONE [1]	DEVELOPMENT <table border="0"><tr><td>☐ EXCELLENT [7]</td></tr><tr><td>☐ GOOD [5]</td></tr><tr><td>☐ FAIR [3]</td></tr><tr><td>☐ POOR [1]</td></tr></table>	☐ EXCELLENT [7]	☐ GOOD [5]	☐ FAIR [3]	☐ POOR [1]	CHANNELIZATION <table border="0"><tr><td>☐ NONE [6]</td></tr><tr><td>☐ RECOVERED [4]</td></tr><tr><td>☐ RECOVERING [3]</td></tr><tr><td>☐ RECENT OR NO RECOVERY [1]</td></tr></table>	☐ NONE [6]	☐ RECOVERED [4]	☐ RECOVERING [3]	☐ RECENT OR NO RECOVERY [1]
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☐ GOOD [5]														
☐ FAIR [3]														
☐ POOR [1]														
☐ NONE [6]														
☐ RECOVERED [4]														
☐ RECOVERING [3]														
☐ RECENT OR NO RECOVERY [1]														

STABILITY

☐ HIGH [3]
☐ MODERATE [2]
☐ LOW [1]

Channel Maximum 20

Comments

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream <table border="0"><tr><td style="width: 50%;">L</td><td style="width: 50%;">R</td></tr><tr><td>☐ EROSION</td><td>☐ WIDE > 50m [4]</td></tr><tr><td>☐ NONE/LITTLE [3]</td><td>☐ MODERATE 10-50m [3]</td></tr><tr><td>☐ MODERATE [2]</td><td>☐ NARROW 5-10m [2]</td></tr><tr><td>☐ HEAVY/SEVERE [1]</td><td>☐ VERY NARROW [1]</td></tr><tr><td></td><td>☐ NONE [0]</td></tr></table>	L	R	☐ EROSION	☐ WIDE > 50m [4]	☐ NONE/LITTLE [3]	☐ MODERATE 10-50m [3]	☐ MODERATE [2]	☐ NARROW 5-10m [2]	☐ HEAVY/SEVERE [1]	☐ VERY NARROW [1]		☐ NONE [0]	FLOOD PLAIN QUALITY <table border="0"><tr><td style="width: 50%;">L</td><td style="width: 50%;">R</td></tr><tr><td>☐ FOREST, SWAMP [3]</td><td>☐ CONSERVATION TILLAGE [1]</td></tr><tr><td>☐ SHRUB OR OLD FIELD [2]</td><td>☐ URBAN OR INDUSTRIAL [0]</td></tr><tr><td>☐ RESIDENTIAL, PARK, NEW FIELD [1]</td><td>☐ MINING /CONSTRUCTION [0]</td></tr><tr><td>☐ FENCED PASTURE [1]</td><td></td></tr><tr><td>☐ OPEN PASTURE, ROWCROP [0]</td><td></td></tr></table>	L	R	☐ FOREST, SWAMP [3]	☐ CONSERVATION TILLAGE [1]	☐ SHRUB OR OLD FIELD [2]	☐ URBAN OR INDUSTRIAL [0]	☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ MINING /CONSTRUCTION [0]	☐ FENCED PASTURE [1]		☐ OPEN PASTURE, ROWCROP [0]	
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☐ OPEN PASTURE, ROWCROP [0]																									

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10

Comments

5] POOL/GLIDE AND RIFFLE/RUN QUALITY

MAXIMUM DEPTH Check ONE (ONLY!) <table border="0"><tr><td>☐ > 1m [6]</td></tr><tr><td>☐ 0.7 - < 1m [4]</td></tr><tr><td>☐ 0.4 - < 0.7m [2]</td></tr><tr><td>☐ 0.2 - < 0.4m [1]</td></tr><tr><td>☐ < 0.2m [0] [metric = 0]</td></tr></table>	☐ > 1m [6]	☐ 0.7 - < 1m [4]	☐ 0.4 - < 0.7m [2]	☐ 0.2 - < 0.4m [1]	☐ < 0.2m [0] [metric = 0]	CHANNEL WIDTH Check ONE (Or 2 & average) <table border="0"><tr><td>☐ POOL WIDTH > RIFFLE WIDTH [2]</td></tr><tr><td>☐ POOL WIDTH = RIFFLE WIDTH [1]</td></tr><tr><td>☐ POOL WIDTH < RIFFLE WIDTH [0]</td></tr></table>	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ POOL WIDTH = RIFFLE WIDTH [1]	☐ POOL WIDTH < RIFFLE WIDTH [0]	CURRENT VELOCITY Check ALL that apply <table border="0"><tr><td>☐ TORRENTIAL [-1]</td><td>☐ SLOW [1]</td></tr><tr><td>☐ VERY FAST [1]</td><td>☐ INTERSTITIAL [-1]</td></tr><tr><td>☐ FAST [1]</td><td>☐ INTERMITTENT [-2]</td></tr><tr><td>☐ MODERATE [1]</td><td>☐ EDDIES [1]</td></tr></table> Indicate for reach - pools and riffles.	☐ TORRENTIAL [-1]	☐ SLOW [1]	☐ VERY FAST [1]	☐ INTERSTITIAL [-1]	☐ FAST [1]	☐ INTERMITTENT [-2]	☐ MODERATE [1]	☐ EDDIES [1]
☐ > 1m [6]																		
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☐ FAST [1]	☐ INTERMITTENT [-2]																	
☐ MODERATE [1]	☐ EDDIES [1]																	

Recreation Potential (Check one and comment on back)

☐ Primary Contact
☐ Secondary Contact

Pool/Current Maximum 12

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

RIFFLE DEPTH <table border="0"><tr><td>☐ BEST AREAS > 10cm [2]</td></tr><tr><td>☐ BEST AREAS 5 - 10cm [1]</td></tr><tr><td>☐ BEST AREAS < 5cm [metric = 0]</td></tr></table>	☐ BEST AREAS > 10cm [2]	☐ BEST AREAS 5 - 10cm [1]	☐ BEST AREAS < 5cm [metric = 0]	RUN DEPTH <table border="0"><tr><td>☐ MAXIMUM > 50cm [2]</td></tr><tr><td>☐ MAXIMUM < 50cm [1]</td></tr></table>	☐ MAXIMUM > 50cm [2]	☐ MAXIMUM < 50cm [1]	RIFFLE/RUN SUBSTRATE <table border="0"><tr><td>☐ STABLE (e.g., Cobble, Boulder) [2]</td></tr><tr><td>☐ MOD. STABLE (e.g., Large Gravel) [1]</td></tr><tr><td>☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]</td></tr></table>	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]
☐ BEST AREAS > 10cm [2]										
☐ BEST AREAS 5 - 10cm [1]										
☐ BEST AREAS < 5cm [metric = 0]										
☐ MAXIMUM > 50cm [2]										
☐ MAXIMUM < 50cm [1]										
☐ STABLE (e.g., Cobble, Boulder) [2]										
☐ MOD. STABLE (e.g., Large Gravel) [1]										
☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]										

Check ONE (Or 2 & average)

RIFFLE/RUN EMBEDDEDNESS <table border="0"><tr><td>☐ NONE [2]</td></tr><tr><td>☐ LOW [1]</td></tr><tr><td>☐ MODERATE [0]</td></tr><tr><td>☐ EXTENSIVE [-1]</td></tr></table>	☐ NONE [2]	☐ LOW [1]	☐ MODERATE [0]	☐ EXTENSIVE [-1]	Riffle/Run Maximum 8
☐ NONE [2]					
☐ LOW [1]					
☐ MODERATE [0]					
☐ EXTENSIVE [-1]					

Comments

6] GRADIENT (ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (mi²) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

%POOL: **%GLIDE:** **%RUN:** **%RIFFLE:**

Gradient Maximum 10

Comments

Entered _____ QC1 _____ QC2 _____

IDBM 02/28/2018

Attachment 5 (continued): IDEM OWQ Biological Qualitative Habitat Evaluation Index (back)



OWQ Biological QHEI (Qualitative Habitat Evaluation Index)

COMMENT _____

A-CANOPY

- ☐ > 85% - Open
☐ 55% - < 85%
☐ 30% - < 55%
☐ 10% - < 30%
☐ < 10% - Closed

B-AESTHETICS

- ☐ Nuisance algae
☐ Invasive macrophytes
☐ Excess turbidity
☐ Discoloration
☐ Foam/Scum
☐ Oil sheen
☐ Trash/Litter
☐ Nuisance odor
☐ Sludge deposits
☐ CSOs/SSOs/Outfalls

C-RECREATION

- Area Depth
 Pool: ☐ > 100 ft² ☐ > 3 ft

D-MAINTENANCE

- ☐ Public ☐ Private
☐ Active ☐ Historic
 Succession: ☐ Young ☐ Old
☐ Spray ☐ Islands ☐ Scoured
 Snag: ☐ Removed ☐ Modified
 Leveed: ☐ One sided ☐ Both banks
☐ Relocated ☐ Cutoffs
 Bedload: ☐ Moving ☐ Stable
☐ Armoured ☐ Slumps
☐ Impounded ☐ Desiccated
☐ Flood control ☐ Drainage

E-ISSUES

- ☐ WWTP ☐ CSO ☐ NPDES
☐ Industry ☐ Urban
☐ Hardened ☐ Dirt & Grime
☐ Contaminated ☐ Landfill
 BMPs: ☐ Construction ☐ Sediment
☐ Logging ☐ Irrigation ☐ Cooling
 Erosion: ☐ Bank ☐ Surface
☐ False bank ☐ Manure ☐ Lagoon
☐ Wash H₂O ☐ Tile ☐ H₂O Table
 Mine: ☐ Acid ☐ Quarry
 Flow: ☐ Natural ☐ Stagnant
☐ Wetland ☐ Park ☐ Golf
☐ Lawn ☐ Home
☐ Atmospheric deposition
☐ Agriculture ☐ Livestock

Looking upstream (> 10m, 3 readings; ≤ 10m, 1 reading in middle); Round to the nearest whole percent

% open	Right %	Middle %	Left %	Total Average %
	X	X	X	

Stream Drawing:

Attachment 7: IDEM OWQ Water Sample Analysis Request Form



Indiana Department of Environmental Management
Office of Water Quality
Watershed Planning and Assessment Branch
www.idem.IN.gov

Water Sample Analysis Request

Project Name: 2024 Indian Creek Monroe ☐ Composite ☐ Grab ☒

OWQ Sample Set	<u>23SPW001</u>	IDEM Sample Nos.	[]
Crew Chief	[]	Lab Sample Nos.	[]
Collection Date	[]	Lab Delivery Date	[]

Anions and Physical Parameters

Parameter	Test Method	Total	Dissolved
Alkalinity (as CaCO ₃)	SM2320B	☒ **	☐
Total Solids	SM2540B	☒ **	
Suspended Solids	SM2540D	☒ **	
Dissolved Solids	SM2540C		☒ **
Sulfate (as SO ₄)	300.0	☐ **	☒ **
Chloride (as Cl)	300.0	☐ **	☒ **
Hardness (Calculated)	SM-2340B	☒ **	☐ **
Fluoride (as F)	SM4500-F-C	☐ **	☐ **

Priority Pollutant Metals Water Parameters

Parameter	Test Method	Total	Dissolved
Antimony (as Sb)	200.8	☒	☒
Arsenic (as As)	200.8	☒	☒
Beryllium (as Be)	200.8	☐	☐
Cadmium (as Cd)	200.8	☒	☒
Chromium (as Cr)	200.8	☒	☒
Copper (as Cu)	200.8	☒	☒
Lead (as Pb)	200.8	☒	☒
Mercury, Low Level	1631, Rev E.	☐	☐
Nickel (as Ni)	200.8	☒	☒
Selenium (as Se)	200.8	☒	☒
Silver (as Ag)	200.8	☒	☒
Thallium (as Tl)	200.8	☐	☐
Zinc (as Zn)	200.8	☒	☒

Cations and Secondary Metals Parameters

Parameter	Test Method	Total	Dissolved
Aluminum (as Al)	<u>200.8</u>	☒	☒
Barium (as Ba)	200.8	☐	☐
Boron (as B)	200.8	☐	☐
Calcium (as Ca)	<u>200.7</u>	☒ ***	☐
Cobalt (as Co)	200.8	☐	☐
Iron (as Fe)	200.7	☐	☐
Magnesium (as Mg)	<u>200.7</u>	☒ ***	☐
Manganese (as Mn)	200.8	☐	☐
Sodium (as Na)	200.7	☐	☐
Silica, Total Reactive (as SiO ₂)	200.7	☐	☐
Strontium (as Sr)	200.8	☐	☐

Send reports (Fed. Ex. or UPS) to:

Tim Bowren - IDEM
Bldg. 20, STE 100
2525 North Shadeland Ave.
Indianapolis, IN 46219

Deliver reports to:

Tim Bowren - IDEM
Bldg. 20, STE 100
2525 North Shadeland Ave.
Indianapolis, IN 46219

Organic Water Parameters

Parameter	Test Method	Total
Priority Pollutants: Oranochlorine Pesticides and PCBs	608	☐
Priority Pollutants: VOCs - Purgeable Organics	624	☐
Priority Pollutants: Base/Neutral Extractables	625	☐
Priority Pollutants: Acid Extractables	625	☐
Phenolics, 4AAP	420.4	☐
Oil and Grease, Total	1664A	☐

Nutrient & Organic Water Chemistry Parameters

Parameter	Test Method	Total	Dissolved
Ammonia Nitrogen	<u>350.1</u>	☒	☐
BOD ₅	SM5210B	☐	
Total Kjeldahl Nitrogen (TKN)	<u>351.2</u>	☒	☐
Nitrogen, Nitrate + Nitrite as N	353.2	☒	☐
Total Phosphorus	365.1	☒	☐
TOC (Total Organic Carbon)	SM 5310C	☒	
DOC (Dissolved Organic Carbon)	SM 5310C		☒
COD	410.4	☒	☐
Cyanide (Total)	335.4	☐	☐
Cyanide (Free)	SM4500CN-I	☒ *	☐
Cyanide (Amenable)	SM4500CN-G	☒ *	☐
Sulfide, Total	376.2	☐	☐

RFP 22-68153	58463 (Pace-Indy)
Contract Number:	PO # 20003041 Line #7 (Pace-Indy)

30 day reporting time required.

Notes:

** = DO NOT RUN PARAMETER IF SAMPLE IDENTIFIED AS A BLANK ON THE CHAIN OF CUSTODY

* = RUN ONLY IF TOTAL CYANIDE IS DETECTED

*** = Report Calcium, Magnesium components of Total Hardness (Calculated)

Testing Laboratory: Pace Analytical Services, Inc.
Attn: Olivia Deck
Phone: 317-228-3102
7726 Moller Road
Indianapolis, IN 46268

Attachment 8: Pace Analytical Services Indianapolis Laboratory Accreditation



Attachment 8: Pace Analytical Services Indianapolis Laboratory Accreditation (cont.)

Division of Environment
Kansas Health and Environmental Laboratories
Environmental Laboratory Improvement Program
6810 SE Dwight Street
Topeka, KS 66620

Janet Stanek, Secretary



Phone: 785-296-3811
Fax: 785-559-5207
KDHE.ELIPO@KS.GOV
www.kdheks.gov/envlab

Laura Kelly, Governor

The Kansas Department of Health and Environment encourages all clients and data users to verify the most current scope of accreditation for certification number E-10177

The analytes tested and the corresponding matrix and method which a laboratory is authorized to perform at any given time will be those indicated in the most recently issued scope of accreditation. The most recent scope of accreditation supersedes all previously issued scopes of accreditation. It is the certified laboratory's responsibility to review this document for any discrepancies. This scope of accreditation will be recalled in the event that your laboratory's certification is revoked.

Accreditation Start: 5/1/2023 Accreditation End: 4/30/2024

EPA Number: IN00043

Scope of Accreditation for Certification Number: E-10177

Page 1 of 26

Pace Analytical Services, Inc - Indianapolis

Primary AB

Program/Matrix: CWA (Non Potable Water)

Method ASTM D516-16

Sulfate

KS

Method EPA 120.1

Conductivity

KS

Method EPA 1631E

Mercury

KS

Method EPA 1664A

Oil & Grease

KS

Method EPA 1664A (SGT-HEM)

n-Hexane Extractable Material - Silica Gel Treated (HEM-SGT)

KS

Method EPA 180.1 Rev. 2 - 1993

Turbidity

KS

Method EPA 200.7 Rev 4.4

Aluminum

KS

Antimony

KS

Arsenic

KS

Barium

KS

Beryllium

KS

Boron

KS

Cadmium

KS

Calcium

KS

Chromium

KS

Cobalt

KS

Copper

KS

Copper

KS

Iron

KS



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Attachment 8: Pace Analytical Services Indianapolis Laboratory Accreditation (cont.)

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Pace Analytical Services, Inc - Indianapolis				Primary AB
Program/Matrix: CWA (Non Potable Water)				
Lead				KS
Magnesium				KS
Manganese				KS
Molybdenum				KS
Nickel				KS
Potassium				KS
Selenium				KS
Silver				KS
Sodium				KS
Strontium				KS
Thallium				KS
Tin				KS
Titanium				KS
Vanadium				KS
Zinc				KS
Method EPA 200.8 Rev 5.4				
Aluminum				KS
Antimony				KS
Arsenic				KS
Barium				KS
Beryllium				KS
Boron				KS
Cadmium				KS
Chromium				KS
Cobalt				KS
Copper				KS
Lead				KS
Manganese				KS
Molybdenum				KS
Nickel				KS
Selenium				KS
Silver				KS
Thallium				KS
Tin				KS
Titanium				KS
Vanadium				KS
Zinc				KS
Method EPA 245.1				
Mercury				KS
Method EPA 300.0				
Bromide				KS
Chloride				KS
Fluoride				KS
Nitrate				KS
Nitrate plus Nitrite as N				KS
Nitrite				KS



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Pace Analytical Services, Inc - Indianapolis		Primary AB
Program/Matrix: CWA (Non Potable Water)		
Sulfate		KS
Method EPA 335.4		
Amenable cyanide		KS
Cyanide		KS
Method EPA 350.1		
Ammonia as N		KS
Method EPA 351.2		
Total Kjeldahl Nitrogen (TKN)		KS
Method EPA 351.2 minus EPA 350.1		
Organic nitrogen		KS
Method EPA 353.2		
Nitrate		KS
Nitrate plus Nitrite as N		KS
Nitrite		KS
Method EPA 365.1		
Phosphorus		KS
Method EPA 410.4		
Chemical oxygen demand		KS
Method EPA 420.4		
Total phenolics		KS
Method EPA 6010B		
Arsenic		KS
Cadmium		KS
Copper		KS
Lead		KS
Molybdenum		KS
Nickel		KS
Selenium		KS
Strontium		KS
Total chromium		KS
Zinc		KS
Method EPA 6020		
Arsenic		KS
Cadmium		KS
Copper		KS
Lead		KS
Nickel		KS
Selenium		KS
Total chromium		KS
Zinc		KS
Method EPA 608.3 GC-ECD		
4,4'-DDD		KS
4,4'-DDE		KS
4,4'-DDT		KS



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Pace Analytical Services, Inc - Indianapolis		Primary AB
Program/Matrix: <i>CWA (Non Potable Water)</i>		
Aldrin		KS
alpha-BHC (alpha-Hexachlorocyclohexane)		KS
Aroclor-1016 (PCB-1016)		KS
Aroclor-1221 (PCB-1221)		KS
Aroclor-1232 (PCB-1232)		KS
Aroclor-1242 (PCB-1242)		KS
Aroclor-1248 (PCB-1248)		KS
Aroclor-1254 (PCB-1254)		KS
Aroclor-1260 (PCB-1260)		KS
beta-BHC (beta-Hexachlorocyclohexane)		KS
Chlordane (tech.)(N.O.S.)		KS
delta-BHC		KS
Dieldrin		KS
Endosulfan I		KS
Endosulfan II		KS
Endosulfan sulfate		KS
Endrin		KS
Endrin aldehyde		KS
gamma-BHC (Lindane, gamma-HexachlorocyclohexanE)		KS
Heptachlor		KS
Heptachlor epoxide		KS
Methoxychlor		KS
Toxaphene (Chlorinated camphene)		KS
Method EPA 624.1		
1,1,1-Trichloroethane		KS
1,1,2,2-Tetrachloroethane		KS
1,1,2-Trichloroethane		KS
1,1-Dichloroethane		KS
1,1-Dichloroethylene		KS
1,2-Dichlorobenzene (o-Dichlorobenzene)		KS
1,2-Dichloroethane (Ethylene dichloride)		KS
1,2-Dichloropropane		KS
1,3-Dichlorobenzene		KS
1,4-Dichlorobenzene		KS
2-Chloroethyl vinyl ether		KS
Acrolein (Propenal)		KS
Acrylonitrile		KS
Benzene		KS
Bromodichloromethane		KS
Bromoform		KS
Carbon tetrachloride		KS
Chlorobenzene		KS
Chlorodibromomethane		KS
Chloroethane (Ethyl chloride)		KS
Chloroform		KS
cis-1,3-Dichloropropene		KS



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Pace Analytical Services, Inc - Indianapolis		Primary AB
Program/Matrix: <i>CWA (Non Potable Water)</i>		
Ethylbenzene		KS
Methyl bromide (Bromomethane)		KS
Methyl chloride (Chloromethane)		KS
Methylene chloride (Dichloromethane)		KS
Naphthalene		KS
Tetrachloroethylene (Perchloroethylene)		KS
Toluene		KS
trans-1,2-Dichloroethylene		KS
trans-1,3-Dichloropropylene		KS
Trichloroethene (Trichloroethylene)		KS
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)		KS
Vinyl chloride		KS
Xylene (total)		KS
Method EPA 625.1		
1,2,4-Trichlorobenzene		KS
1,2-Dichlorobenzene (o-Dichlorobenzene)		KS
1,3-Dichlorobenzene		KS
1,4-Dichlorobenzene		KS
2,2'-Oxybis(1-chloropropane), bis(2-Chloro-1-methylethyl)ether		KS
2,4,6-Trichlorophenol		KS
2,4-Dichlorophenol		KS
2,4-Dimethylphenol		KS
2,4-Dinitrophenol		KS
2,4-Dinitrotoluene (2,4-DNT)		KS
2,6-Dinitrotoluene (2,6-DNT)		KS
2-Chloronaphthalene		KS
2-Chlorophenol		KS
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)		KS
2-Methylphenol (o-Cresol)		KS
2-Nitrophenol		KS
3,3'-Dichlorobenzidine		KS
4-Bromophenyl phenyl ether		KS
4-Chloro-3-methylphenol		KS
4-Chlorophenyl phenylether		KS
4-Methylphenol (p-Cresol)		KS
4-Nitrophenol		KS
Acenaphthene		KS
Acenaphthylene		KS
Anthracene		KS
Benzidine		KS
Benzo(a)anthracene		KS
Benzo(a)pyrene		KS
Benzo(b)fluoranthene		KS
Benzo(g,h,i)perylene		KS
Benzo(k)fluoranthene		KS
bis(2-Chloroethoxy)methane		KS



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Pace Analytical Services, Inc - Indianapolis IN	Primary AB	
Program/Matrix: <i>CWA (Non Potable Water)</i>		
Dimethyl phthalate	KS	
Di-n-butyl phthalate	KS	
Di-n-octyl phthalate	KS	
Fluoranthene	KS	
Fluorene	KS	
Hexachlorobenzene	KS	
Hexachlorobutadiene	KS	
Hexachloroethane	KS	
Indeno(1,2,3-cd) pyrene	KS	
Isophorone	KS	
Naphthalene	KS	
Nitrobenzene	KS	
n-Nitrosodimethylamine	KS	
n-Nitrosodi-n-propylamine	KS	
n-Nitrosodiphenylamine	KS	
Pentachlorophenol	KS	
Phenanthrene	KS	
Phenol	KS	
Pyrene	KS	
Method EPA 7470A		
Mercury	KS	
Method EPA 7471A		
Mercury	KS	
Method EPA 8015D		
Propylene glycol	KS	
Method EPA 8260C		
1,1,2-Trichloro-1,2,2-trifluoroethane	KS	
1,3,5-Trichlorobenzene	KS	
Method EPA 8270C		
1-Methylnaphthalene	KS	
Carbazole	KS	
Method OIA 1677-09		
Available Cyanide	KS	
Free cyanide	KS	
Method SM 2310 B-2011		
Acidity, as CaCO ₃	KS	
Method SM 2320 B-2011		
Alkalinity as CaCO ₃	KS	
Method SM 2340 B-2011		
Hardness	KS	
Method SM 2510 B-2011		
Conductivity	KS	
Method SM 2540 B-2011		
Residue-total	KS	



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Pace Analytical Services, Inc - Indianapolis IN		Primary AB
Program/Matrix: <i>CWA (Non Potable Water)</i>		
Method <i>SM 2540 C-2011</i>		
Residue-filterable (TDS)		KS
Method <i>SM 2540 D-2011</i>		
Residue-nonfilterable (TSS)		KS
Method <i>SM 2540 F-2011</i>		
Residue-settleable		KS
Method <i>SM 3500-Cr B-2011</i>		
Chromium VI		KS
Method <i>SM 4500-Cl G-2011</i>		
Total residual chlorine		KS
Method <i>SM 4500-Cl⁻ E-2011</i>		
Chloride		KS
Method <i>SM 4500-CN⁻ C-2011</i>		
Cyanide		KS
Method <i>SM 4500-CN⁻ E-2011</i>		
Cyanide		KS
Method <i>SM 4500-CN⁻ G-2011</i>		
Amenable cyanide		KS
Method <i>SM 4500-F⁻ C-2011</i>		
Fluoride		KS
Method <i>SM 4500-H⁺ B-2011</i>		
pH		KS
Method <i>SM 4500-NH3 G-2011</i>		
Ammonia as N		KS
Method <i>SM 4500-P E-2011</i>		
Orthophosphate as P		KS
Method <i>SM 4500-S2⁻ D-2011</i>		
Sulfide		KS
Method <i>SM 5210 B-2011</i>		
Biochemical oxygen demand		KS
Carbonaceous BOD, CBOD		KS
Method <i>SM 5310 C-2011</i>		
Total organic carbon		KS
Method <i>SM 5540 C-2011</i>		
Surfactants - MBAS		KS
Method <i>TKN-NH3-CAL</i>		
Organic nitrogen		KS



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Pace Analytical Services, Inc - Indianapolis IN

Primary AB

Program/Matrix: **RCRA (Non Potable Water)**

Method EPA 1010A

Ignitability KS

Method EPA 1311

Toxicity Characteristic Leaching Procedure (TCLP) KS

Method EPA 1312

Synthetic Precipitation Leaching Procedure (SPLP) KS

Method EPA 6010B

Aluminum KS

Antimony KS

Arsenic KS

Barium KS

Beryllium KS

Boron KS

Cadmium KS

Calcium KS

Chromium KS

Cobalt KS

Copper KS

Iron KS

Lead KS

Lithium KS

Magnesium KS

Manganese KS

Molybdenum KS

Nickel KS

Potassium KS

Selenium KS

Silicon KS

Silver KS

Sodium KS

Strontium KS

Thallium KS

Tin KS

Titanium KS

Vanadium KS

Zinc KS

Method EPA 6020

Aluminum KS

Antimony KS

Arsenic KS

Barium KS

Beryllium KS

Cadmium KS

Chromium KS

Cobalt KS

Copper KS



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Pace Analytical Services, Inc - Indianapolis IN		Primary AB
Program/Matrix: <i>RCRA (Non Potable Water)</i>		
Lead		KS
Manganese		KS
Molybdenum		KS
Nickel		KS
Selenium		KS
Silver		KS
Thallium		KS
Thorium		KS
Uranium		KS
Vanadium		KS
Zinc		KS
Method EPA 7196A		
Chromium VI		KS
Method EPA 7470A		
Mercury		KS
Method EPA 7471A		
Mercury		KS
Method EPA 8011		
1,2-Dibromo-3-chloropropane (DBCP)		KS
1,2-Dibromoethane (EDB, Ethylene dibromide)		KS
Method EPA 8015D		
Diesel range organics (DRO)		KS
Ethanol		KS
Ethylene glycol		KS
Gasoline range organics (GRO)		KS
Isobutyl alcohol (2-Methyl-1-propanol)		KS
Isopropyl alcohol (2-Propanol, Isopropanol)		KS
Methanol		KS
n-Butyl alcohol (1-Butanol, n-Butanol)		KS
n-Propanol (1-Propanol)		KS
Propylene glycol		KS
Method EPA 8081B		
4,4'-DDD		KS
4,4'-DDE		KS
4,4'-DDT		KS
Aldrin		KS
alpha-BHC (alpha-Hexachlorocyclohexane)		KS
alpha-Chlordane, cis-Chlordane		KS
beta-BHC (beta-Hexachlorocyclohexane)		KS
Chlordane (tech.)(N.O.S.)		KS
delta-BHC		KS
Dieldrin		KS
Endosulfan I		KS
Endosulfan II		KS
Endosulfan sulfate		KS



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Pace Analytical Services, Inc - Indianapolis IN

Primary AB

Program/Matrix: **RCRA (Non Potable Water)**

Endrin	KS
Endrin aldehyde	KS
Endrin ketone	KS
gamma-BHC (Lindane, gamma-HexachlorocyclohexanE)	KS
gamma-Chlordane	KS
Heptachlor	KS
Heptachlor epoxide	KS
Methoxychlor	KS
Toxaphene (Chlorinated camphene)	KS

Method **EPA 8082A**

Aroclor-1016 (PCB-1016)	KS
Aroclor-1221 (PCB-1221)	KS
Aroclor-1232 (PCB-1232)	KS
Aroclor-1242 (PCB-1242)	KS
Aroclor-1248 (PCB-1248)	KS
Aroclor-1254 (PCB-1254)	KS
Aroclor-1260 (PCB-1260)	KS

Method **EPA 8141B**

Atrazine	KS
Azinphos-methyl (Guthion)	KS
Chlorpyrifos	KS
Chlorpyrifos-methyl	KS
Demeton-o	KS
Demeton-s	KS
Diazinon	KS
Dichlorovos (DDVP, Dichlorvos)	KS
Dimethoate	KS
Disulfoton	KS
Famphur	KS
Malathion	KS
Merphos	KS
Methyl parathion (Parathion, methyl)	KS
Naled	KS
Parathion, ethyl	KS
Phorate	KS
Ronnel	KS
Simazine	KS
Terbufos	KS
Tetrachlorvinphos (Stirophos, Gardona) E-isomer	KS

Method **EPA 8151A**

2,4,5-T	KS
2,4-D	KS
2,4-DB	KS
3,5-Dichlorobenzoic acid	KS
Acifluorfen	KS
Bentazon	KS



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Pace Analytical Services, Inc - Indianapolis IN		Primary AB
Program/Matrix: RCRA (Non Potable Water)		
Dalapon		KS
DCPA di acid degradate		KS
Dicamba		KS
Dichloroprop (Dichlorprop)		KS
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)		KS
MCPA		KS
MCPP		KS
Pentachlorophenol		KS
Picloram		KS
Silvex (2,4,5-TP)		KS
Method EPA 8260C		
1,1,1,2-Tetrachloroethane		KS
1,1,1-Trichloroethane		KS
1,1,2,2-Tetrachloroethane		KS
1,1,2-Trichloro-1,2,2-trifluoroethane		KS
1,1,2-Trichloroethane		KS
1,1-Dichloroethane		KS
1,1-Dichloroethylene		KS
1,1-Dichloropropene		KS
1,2,3-Trichlorobenzene		KS
1,2,3-Trichloropropane		KS
1,2,4-Trichlorobenzene		KS
1,2,4-Trimethylbenzene		KS
1,2-Dibromo-3-chloropropane (DBCP)		KS
1,2-Dibromoethane (EDB, Ethylene dibromide)		KS
1,2-Dichlorobenzene (o-Dichlorobenzene)		KS
1,2-Dichloroethane (Ethylene dichloride)		KS
1,2-Dichloropropane		KS
1,3,5-Trichlorobenzene		KS
1,3,5-Trimethylbenzene		KS
1,3-Dichlorobenzene		KS
1,3-Dichloropropane		KS
1,4-Dichlorobenzene		KS
1,4-Dioxane (1,4- Diethyleneoxide)		KS
1-Methylnaphthalene		KS
2,2-Dichloropropane		KS
2-Butanone (Methyl ethyl ketone, MEK)		KS
2-Chloroethyl vinyl ether		KS
2-Chlorotoluene		KS
2-Hexanone		KS
2-Methylnaphthalene		KS
4-Chlorotoluene		KS
4-Isopropyltoluene (p-Cymene,p-Isopropyltoluene)		KS
4-Methyl-2-pentanone (MIBK)		KS
Acetone		KS
Acetonitrile		KS



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Primary AB

Program/Matrix: *RCRA (Non Potable Water)*

Acrolein (Propenal)	KS
Acrylonitrile	KS
Allyl chloride (3-Chloropropene)	KS
Benzene	KS
Bromobenzene	KS
Bromochloromethane	KS
Bromodichloromethane	KS
Bromoform	KS
Carbon disulfide	KS
Carbon tetrachloride	KS
Chlorobenzene	KS
Chlorodibromomethane	KS
Chloroethane (Ethyl chloride)	KS
Chloroform	KS
Chloroprene (2-Chloro-1,3-butadiene)	KS
cis-1,2-Dichloroethylene	KS
cis-1,3-Dichloropropene	KS
Cyclohexane	KS
Dibromomethane (Methylene bromide)	KS
Dichlorodifluoromethane (Freon-12)	KS
Diethyl ether	KS
Ethyl acetate	KS
Ethyl methacrylate	KS
Ethylbenzene	KS
Hexachlorobutadiene	KS
Iodomethane (Methyl iodide)	KS
Isobutyl alcohol (2-Methyl-1-propanol)	KS
Isopropylbenzene	KS
Methacrylonitrile	KS
Methyl acetate	KS
Methyl bromide (Bromomethane)	KS
Methyl chloride (Chloromethane)	KS
Methyl methacrylate	KS
Methyl tert-butyl ether (MTBE)	KS
Methylcyclohexane	KS
Methylene chloride (Dichloromethane)	KS
m-Xylene	KS
Naphthalene	KS
n-Butyl alcohol (1-Butanol, n-Butanol)	KS
n-Butylbenzene	KS
n-Hexane	KS
n-Propylbenzene	KS
o-Xylene	KS
Propionitrile (Ethyl cyanide)	KS
p-Xylene	KS
sec-Butylbenzene	KS
Styrene	KS



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Pace Analytical Services, Inc - Indianapolis IN

Primary AB

Program/Matrix: *RCRA (Non Potable Water)*

tert-Butyl alcohol	KS
tert-Butylbenzene	KS
Tetrachloroethylene (Perchloroethylene)	KS
Tetrahydrofuran (THF)	KS
Toluene	KS
trans-1,2-Dichloroethylene	KS
trans-1,3-Dichloropropylene	KS
trans-1,4-Dichloro-2-butene	KS
Trichloroethene (Trichloroethylene)	KS
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	KS
Vinyl acetate	KS
Vinyl chloride	KS
Xylene (total)	KS

Method EPA 8270C

1,2,4,5-Tetrachlorobenzene	KS
1,2,4-Trichlorobenzene	KS
1,2-Dichlorobenzene (o-Dichlorobenzene)	KS
1,2-Diphenylhydrazine	KS
1,3,5-Trinitrobenzene (1,3,5-TNB)	KS
1,3-Dichlorobenzene	KS
1,3-Dinitrobenzene (1,3-DNB)	KS
1,4-Dichlorobenzene	KS
1,4-Naphthoquinone	KS
1,4-Phenylenediamine	KS
1-Methylnaphthalene	KS
1-Naphthylamine	KS
2,2'-Oxybis(1-chloropropane), bis(2-Chloro-1-methylethyl)ether	KS
2,3,4,6-Tetrachlorophenol	KS
2,4,5-Trichlorophenol	KS
2,4,6-Trichlorophenol	KS
2,4-Dichlorophenol	KS
2,4-Dimethylphenol	KS
2,4-Dinitrophenol	KS
2,4-Dinitrotoluene (2,4-DNT)	KS
2,6-Dichlorophenol	KS
2,6-Dinitrotoluene (2,6-DNT)	KS
2-Acetylaminofluorene	KS
2-Chloronaphthalene	KS
2-Chlorophenol	KS
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	KS
2-Methylaniline (o-Toluidine)	KS
2-Methylaniline (o-Toluidine)	KS
2-Methylnaphthalene	KS
2-Methylphenol (o-Cresol)	KS
2-Naphthylamine	KS
2-Nitroaniline	KS



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Pace Analytical Services, Inc - Indianapolis IN

Primary AB

Program/Matrix: **RCRA (Non Potable Water)**

2-Nitrophenol	KS
2-Picoline (2-Methylpyridine)	KS
3,3'-Dichlorobenzidine	KS
3,3'-Dimethylbenzidine	KS
3-Methylcholanthrene	KS
3-Methylphenol (m-Cresol)	KS
3-Nitroaniline	KS
4-Aminobiphenyl	KS
4-Bromophenyl phenyl ether	KS
4-Chloro-3-methylphenol	KS
4-Chloroaniline	KS
4-Chlorophenyl phenylether	KS
4-Dimethyl aminoazobenzene	KS
4-Methylphenol (p-Cresol)	KS
4-Nitroaniline	KS
4-Nitrophenol	KS
4-Nitroquinoline 1-oxide	KS
5-Nitro-o-toluidine	KS
7,12-Dimethylbenz(a) anthracene	KS
a-a-Dimethylphenethylamine	KS
Acenaphthene	KS
Acenaphthylene	KS
Acetophenone	KS
Aniline	KS
Anthracene	KS
Aramite	KS
Atrazine	KS
Benzaldehyde	KS
Benzidine	KS
Benzo(a)anthracene	KS
Benzo(a)pyrene	KS
Benzo(b)fluoranthene	KS
Benzo(g,h,i)perylene	KS
Benzo(k)fluoranthene	KS
Benzoic acid	KS
Benzyl alcohol	KS
Biphenyl	KS
bis(2-Chloroethoxy)methane	KS
bis(2-Chloroethyl) ether	KS
Butyl benzyl phthalate	KS
Caprolactam	KS
Carbazole	KS
Chlorobenzilate	KS
Chrysene	KS
Di(2-ethylhexyl) phthalate (bis(2-Ethylhexyl)phthalate, DEHP)	KS
Diallate	KS
Dibenz(a,h) anthracene	KS



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Pace Analytical Services, Inc - Indianapolis IN

Primary AB

Program/Matrix: *RCRA (Non Potable Water)*

Dibenzofuran	KS
Diethyl phthalate	KS
Dimethoate	KS
Dimethyl phthalate	KS
Di-n-butyl phthalate	KS
Di-n-octyl phthalate	KS
Diphenylamine	KS
Disulfoton	KS
Ethyl methanesulfonate	KS
Famphur	KS
Fluoranthene	KS
Fluorene	KS
Hexachlorobenzene	KS
Hexachlorobutadiene	KS
Hexachlorocyclopentadiene	KS
Hexachloroethane	KS
Hexachlorophene	KS
Hexachloropropene	KS
Indeno(1,2,3-cd) pyrene	KS
Isodrin	KS
Isophorone	KS
Isosafrole	KS
Kepone	KS
Methapyrilene	KS
Methyl methanesulfonate	KS
Methyl parathion (Parathion, methyl)	KS
Naphthalene	KS
Nitrobenzene	KS
n-Nitrosodiethylamine	KS
n-Nitrosodimethylamine	KS
n-Nitroso-di-n-butylamine	KS
n-Nitrosodi-n-propylamine	KS
n-Nitrosodiphenylamine	KS
n-Nitrosomethylethalamine	KS
n-Nitrosomorpholine	KS
n-Nitrosopiperidine	KS
n-Nitrosopyrrolidine	KS
o,o,o-Triethyl phosphorothioate	KS
Parathion, ethyl	KS
Pentachlorobenzene	KS
Pentachloronitrobenzene	KS
Pentachlorophenol	KS
Phenacetin	KS
Phenanthrene	KS
Phenol	KS
Phorate	KS
p-Phenylenediamine	KS



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Primary AB

Program/Matrix: *RCRA (Non Potable Water)*

Pronamide (Kerb)	KS
Pyrene	KS
Pyridine	KS
Safrole	KS
Sulfotep (Tetraethyl dithiopyrophosphate)	KS
Thionazin (Zinophos)	KS
Method EPA 8270C SIM	
1-Methylnaphthalene	KS
2-Methylnaphthalene	KS
Acenaphthene	KS
Acenaphthylene	KS
Anthracene	KS
Benzo(a)anthracene	KS
Benzo(a)pyrene	KS
Benzo(b)fluoranthene	KS
Benzo(g,h,i)perylene	KS
Benzo(k)fluoranthene	KS
Chrysene	KS
Dibenz(a,h) anthracene	KS
Fluoranthene	KS
Fluorene	KS
Indeno(1,2,3-cd) pyrene	KS
Naphthalene	KS
Phenanthrene	KS
Pyrene	KS
Method EPA 9012A	
Amenable cyanide	KS
Cyanide	KS
Method EPA 9038	
Sulfate	KS
Method EPA 9056A	
Bromide	KS
Chloride	KS
Fluoride	KS
Iodide	KS
Nitrate	KS
Nitrite	KS
Sulfate	KS
Method EPA 9066	
Total phenolics	KS
Method EPA 9095B	
Paint Filter Test	KS
Method EPA RSK-175 (GC/FID)	
Ethane	KS
Ethene	KS



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Pace Analytical Services, Inc - Indianapolis IN		Primary AB
Program/Matrix: <i>RCRA (Non Potable Water)</i>		
Methane		KS



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Pace Analytical Services, Inc - Indianapolis IN **Primary AB**

Program/Matrix: *RCRA (Solid & Hazardous Material)*

Method EPA 1010A

Ignitability KS

Method EPA 1311

Toxicity Characteristic Leaching Procedure (TCLP) KS

Method EPA 1312

Synthetic Precipitation Leaching Procedure (SPLP) KS

Method EPA 6010B

Aluminum KS

Antimony KS

Arsenic KS

Barium KS

Beryllium KS

Boron KS

Cadmium KS

Calcium KS

Chromium KS

Cobalt KS

Copper KS

Iron KS

Lead KS

Magnesium KS

Manganese KS

Molybdenum KS

Nickel KS

Potassium KS

Selenium KS

Silver KS

Sodium KS

Strontium KS

Thallium KS

Tin KS

Titanium KS

Vanadium KS

Zinc KS

Method EPA 6020

Aluminum KS

Antimony KS

Arsenic KS

Barium KS

Beryllium KS

Cadmium KS

Chromium KS

Cobalt KS

Copper KS

Lead KS

Manganese KS



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Primary AB

Program/Matrix: *RCRA (Solid & Hazardous Material)*

Nickel	KS
Selenium	KS
Silver	KS
Thallium	KS
Vanadium	KS
Zinc	KS
Method EPA 7196A	
Chromium VI	KS
Method EPA 7470A	
Mercury	KS
Method EPA 7471A	
Mercury	KS
Method EPA 8015D	
Diesel range organics (DRO)	KS
Ethanol	KS
Ethylene glycol	KS
Gasoline range organics (GRO)	KS
Isobutyl alcohol (2-Methyl-1-propanol)	KS
Isopropyl alcohol (2-Propanol, Isopropanol)	KS
Methanol	KS
n-Butyl alcohol (1-Butanol, n-Butanol)	KS
n-Propanol (1-Propanol)	KS
Propylene glycol	KS
Method EPA 8081B	
4,4'-DDD	KS
4,4'-DDE	KS
4,4'-DDT	KS
Aldrin	KS
alpha-BHC (alpha-Hexachlorocyclohexane)	KS
alpha-Chlordane, cis-Chlordane	KS
beta-BHC (beta-Hexachlorocyclohexane)	KS
Chlordane (tech.)(N.O.S.)	KS
delta-BHC	KS
Dieldrin	KS
Endosulfan I	KS
Endosulfan II	KS
Endosulfan sulfate	KS
Endrin	KS
Endrin aldehyde	KS
Endrin ketone	KS
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	KS
gamma-Chlordane	KS
Heptachlor	KS
Heptachlor epoxide	KS
Methoxychlor	KS
Toxaphene (Chlorinated camphene)	KS



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Pace Analytical Services, Inc - Indianapolis IN

Primary AB

Program/Matrix: RCRA (Solid & Hazardous Material)

Method EPA 8082A

Aroclor-1016 (PCB-1016)	KS
Aroclor-1221 (PCB-1221)	KS
Aroclor-1232 (PCB-1232)	KS
Aroclor-1242 (PCB-1242)	KS
Aroclor-1248 (PCB-1248)	KS
Aroclor-1254 (PCB-1254)	KS
Aroclor-1260 (PCB-1260)	KS

Method EPA 8141B

Atrazine	KS
Azinphos-methyl (Guthion)	KS
Chlorpyrifos	KS
Chlorpyrifos-methyl	KS
Demeton-o	KS
Demeton-s	KS
Diazinon	KS
Dichlorovos (DDVP, Dichlorvos)	KS
Dimethoate	KS
Disulfoton	KS
Famphur	KS
Malathion	KS
Merphos	KS
Methyl parathion (Parathion, methyl)	KS
Naled	KS
Parathion, ethyl	KS
Phorate	KS
Ronnel	KS
Simazine	KS
Terbufos	KS
Tetrachlorvinphos (Stirophos, Gardona) E-isomer	KS

Method EPA 8151A

2,4,5-T	KS
2,4-D	KS
2,4-DB	KS
3,5-Dichlorobenzoic acid	KS
Acifluorfen	KS
Bentazon	KS
Dalapon	KS
DCPA di acid degradate	KS
Dicamba	KS
Dichloroprop (Dichlorprop)	KS
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	KS
MCPA	KS
MCPP	KS
Pentachlorophenol	KS
Picloram	KS



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Pace Analytical Services, Inc - Indianapolis IN

Primary AB

Program/Matrix: *RCRA (Solid & Hazardous Material)*

Silvex (2,4,5-TP)

KS

Method EPA 8260C

1,1,1,2-Tetrachloroethane

KS

1,1,1-Trichloroethane

KS

1,1,2,2-Tetrachloroethane

KS

1,1,2-Trichloro-1,2,2-trifluoroethane

KS

1,1,2-Trichloroethane

KS

1,1-Dichloroethane

KS

1,1-Dichloroethylene

KS

1,1-Dichloropropene

KS

1,2,3-Trichlorobenzene

KS

1,2,3-Trichloropropane

KS

1,2,4-Trichlorobenzene

KS

1,2,4-Trimethylbenzene

KS

1,2-Dibromo-3-chloropropane (DBCP)

KS

1,2-Dibromoethane (EDB, Ethylene dibromide)

KS

1,2-Dichlorobenzene (o-Dichlorobenzene)

KS

1,2-Dichloroethane (Ethylene dichloride)

KS

1,2-Dichloropropane

KS

1,3,5-Trichlorobenzene

KS

1,3,5-Trimethylbenzene

KS

1,3-Dichlorobenzene

KS

1,3-Dichloropropane

KS

1,4-Dichlorobenzene

KS

1,4-Dioxane (1,4- Diethyleneoxide)

KS

1-Methylnaphthalene

KS

2,2-Dichloropropane

KS

2-Butanone (Methyl ethyl ketone, MEK)

KS

2-Chloroethyl vinyl ether

KS

2-Chlorotoluene

KS

2-Hexanone

KS

2-Methylnaphthalene

KS

4-Chlorotoluene

KS

4-Isopropyltoluene (p-Cymene,p-Isopropyltoluene)

KS

4-Methyl-2-pentanone (MIBK)

KS

Acetone

KS

Acetonitrile

KS

Acrolein (Propenal)

KS

Acrylonitrile

KS

Allyl chloride (3-Chloropropene)

KS

Benzene

KS

Bromobenzene

KS

Bromochloromethane

KS

Bromodichloromethane

KS

Bromoform

KS

Carbon disulfide

KS



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Primary AB

Program/Matrix: *RCRA (Solid & Hazardous Material)*

Carbon tetrachloride	KS
Chlorobenzene	KS
Chlorodibromomethane	KS
Chloroethane (Ethyl chloride)	KS
Chloroform	KS
cis-1,2-Dichloroethylene	KS
cis-1,3-Dichloropropene	KS
Dibromomethane (Methylene bromide)	KS
Dichlorodifluoromethane (Freon-12)	KS
Diethyl ether	KS
Ethyl acetate	KS
Ethyl methacrylate	KS
Ethylbenzene	KS
Hexachlorobutadiene	KS
Iodomethane (Methyl iodide)	KS
Isopropylbenzene	KS
Methacrylonitrile	KS
Methyl bromide (Bromomethane)	KS
Methyl chloride (Chloromethane)	KS
Methyl methacrylate	KS
Methyl tert-butyl ether (MTBE)	KS
Methylene chloride (Dichloromethane)	KS
m-Xylene	KS
Naphthalene	KS
n-Butyl alcohol (1-Butanol, n-Butanol)	KS
n-Butylbenzene	KS
n-Hexane	KS
n-Propylbenzene	KS
o-Xylene	KS
Propionitrile (Ethyl cyanide)	KS
p-Xylene	KS
sec-Butylbenzene	KS
Styrene	KS
tert-Butyl alcohol	KS
tert-Butylbenzene	KS
Tetrachloroethylene (Perchloroethylene)	KS
Toluene	KS
trans-1,2-Dichloroethylene	KS
trans-1,3-Dichloropropylene	KS
trans-1,4-Dichloro-2-butene	KS
Trichloroethene (Trichloroethylene)	KS
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	KS
Vinyl acetate	KS
Vinyl chloride	KS
Xylene (total)	KS

Method EPA 8270C



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Pace Analytical Services, Inc - Indianapolis IN

Primary AB

Program/Matrix: **RCRA (Solid & Hazardous Material)**

1,2,4,5-Tetrachlorobenzene	KS
1,2,4-Trichlorobenzene	KS
1,2-Dichlorobenzene (o-Dichlorobenzene)	KS
1,2-Diphenylhydrazine	KS
1,3-Dichlorobenzene	KS
1,3-Dinitrobenzene (1,3-DNB)	KS
1,4-Dichlorobenzene	KS
1,4-Naphthoquinone	KS
1,4-Phenylenediamine	KS
1-Methylnaphthalene	KS
1-Naphthylamine	KS
2,2'-Oxybis(1-chloropropane), bis(2-Chloro-1-methylethyl)ether	KS
2,3,4,6-Tetrachlorophenol	KS
2,4,5-Trichlorophenol	KS
2,4,6-Trichlorophenol	KS
2,4-Dichlorophenol	KS
2,4-Dimethylphenol	KS
2,4-Dinitrophenol	KS
2,4-Dinitrotoluene (2,4-DNT)	KS
2,6-Dichlorophenol	KS
2,6-Dinitrotoluene (2,6-DNT)	KS
2-Acetylaminofluorene	KS
2-Chloronaphthalene	KS
2-Chlorophenol	KS
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	KS
2-Methylaniline (o-Toluidine)	KS
2-Methylaniline (o-Toluidine)	KS
2-Methylnaphthalene	KS
2-Methylphenol (o-Cresol)	KS
2-Naphthylamine	KS
2-Nitroaniline	KS
2-Nitrophenol	KS
2-Picoline (2-Methylpyridine)	KS
3,3'-Dichlorobenzidine	KS
3,3'-Dimethylbenzidine	KS
3-Methylcholanthrene	KS
3-Methylphenol (m-Cresol)	KS
3-Nitroaniline	KS
4-Aminobiphenyl	KS
4-Bromophenyl phenyl ether	KS
4-Chloro-3-methylphenol	KS
4-Chloroaniline	KS
4-Chlorophenyl phenylether	KS
4-Dimethyl aminoazobenzene	KS
4-Methylphenol (p-Cresol)	KS
4-Nitroaniline	KS
4-Nitrophenol	KS



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Primary AB

Program/Matrix: *RCRA (Solid & Hazardous Material)*

4-Nitroquinoline 1-oxide	KS
5-Nitro-o-toluidine	KS
7,12-Dimethylbenz(a) anthracene	KS
a-a-Dimethylphenethylamine	KS
Acenaphthene	KS
Acenaphthylene	KS
Acetophenone	KS
Aniline	KS
Anthracene	KS
Aramite	KS
Benzidine	KS
Benzo(a)anthracene	KS
Benzo(a)pyrene	KS
Benzo(b)fluoranthene	KS
Benzo(g,h,i)perylene	KS
Benzo(k)fluoranthene	KS
Benzoic acid	KS
Benzyl alcohol	KS
bis(2-Chloroethoxy)methane	KS
bis(2-Chloroethyl) ether	KS
Butyl benzyl phthalate	KS
Carbazole	KS
Chlorobenzilate	KS
Chrysene	KS
Di(2-ethylhexyl) phthalate (bis(2-Ethylhexyl)phthalate, DEHP)	KS
Diallate	KS
Dibenz(a,h) anthracene	KS
Dibenzofuran	KS
Diethyl phthalate	KS
Dimethoate	KS
Dimethyl phthalate	KS
Di-n-butyl phthalate	KS
Di-n-octyl phthalate	KS
Diphenylamine	KS
Disulfoton	KS
Ethyl methanesulfonate	KS
Famphur	KS
Fluoranthene	KS
Fluorene	KS
Hexachlorobenzene	KS
Hexachlorobutadiene	KS
Hexachlorocyclopentadiene	KS
Hexachloroethane	KS
Hexachlorophene	KS
Hexachloropropene	KS
Indeno(1,2,3-cd) pyrene	KS
Isodrin	KS



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Primary AB

Program/Matrix: *RCRA (Solid & Hazardous Material)*

Isophorone	KS
Isosafrole	KS
Kepone	KS
Methapyrilene	KS
Methyl methanesulfonate	KS
Methyl parathion (Parathion, methyl)	KS
Naphthalene	KS
Nitrobenzene	KS
n-Nitrosodiethylamine	KS
n-Nitrosodimethylamine	KS
n-Nitroso-di-n-butylamine	KS
n-Nitrosodi-n-propylamine	KS
n-Nitrosodiphenylamine	KS
n-Nitrosomethylethylamine	KS
n-Nitrosomorpholine	KS
n-Nitrosopiperidine	KS
n-Nitrosopyrrolidine	KS
o,o,o-Triethyl phosphorothioate	KS
Parathion, ethyl	KS
Pentachlorobenzene	KS
Pentachloronitrobenzene	KS
Pentachlorophenol	KS
Phenacetin	KS
Phenanthrene	KS
Phenol	KS
Phorate	KS
Pronamide (Kerb)	KS
Pyrene	KS
Pyridine	KS
Safrole	KS
Sulfotep (Tetraethyl dithiopyrophosphate)	KS
Thionazin (Zinophos)	KS

Method EPA 8270C SIM

1-Methylnaphthalene	KS
2-Methylnaphthalene	KS
Acenaphthene	KS
Acenaphthylene	KS
Anthracene	KS
Benzo(a)anthracene	KS
Benzo(a)pyrene	KS
Benzo(b)fluoranthene	KS
Benzo(g,h,i)perylene	KS
Benzo(k)fluoranthene	KS
Chrysene	KS
Dibenz(a,h) anthracene	KS
Fluoranthene	KS



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Primary AB

Program/Matrix: RCRA (Solid & Hazardous Material)

Fluorene	KS
Indeno(1,2,3-cd) pyrene	KS
Naphthalene	KS
Phenanthrene	KS
Pyrene	KS

Method EPA 9012A

Amenable cyanide	KS
Cyanide	KS

Method EPA 9045C

pH	KS
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Method EPA 9066

Total phenolics	KS
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Method EPA 9095B

Paint Filter Test	KS
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End of Scope of Accreditation



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