Phase II Proposed Sampling for Lower Herrington Lake
Herrington Lake Corrective Action Plan Phase 1 Technical Memorandum
Mercer County, Kentucky

Notes:
Lake miles begin at Dix Dam and extend Southward to the Hwy 52 Upper Herrington Lake limit

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AaeronetVFE, IGN, and the GIS User Community

Former Main Ash Pond and Current Landfill
Auxiliary Pond
E.W. Brown Station

Cane Run-Dix River Subwatershed
Mallard Cove
LHL-6 Cove (YOY Bass, Adult Bluegill, and Surface Water)
LHL-3 Cove (YOY Bass, Adult Bluegill, and Surface Water)
CI-1, CI-2, CI-2.1, CI-2.2, CI-3, CI-3.1, CI-3.2
CI-4
HQ-1
LHL-1
LHL-1.1
LHL-2
LHL-3
LHL-4
LHL-5
LHL-6 Cove (Multi-species Adult Fish)
HQ Inlet
Cane Run
Cane Run
Former Main Ash Pond and Current Landfill

Phase II Proposed Sample Locations
- Proposed Phase II Sediment Sample
- Proposed Phase II Pore Water Sample
- Proposed Phase II Sediment and Pore Water Sample
- Phase II Young Of the Year (YOY) Bass
- Phase II Fish Tissue (Bluegill)
- Phase II Fish Tissue (Multi-Species)
- Phase I Surface Water Transect (for reference)
- Phase II Surface Water Transect
- Lake Mile Marker (Miles Begin at Dix Dam)
- Former Main Ash Pond and Current Landfill
- Auxiliary Pond
- E.W. Brown Station

Map Design: AJS, Date: Mar 22, 2017

FIGURE 6-1B
### Table 6-1: Phase II Proposed Sample Locations and Types

**E.W. Brown Station Phase I Technical Memorandum Herrington Lake**  
**Mercer County, Kentucky**

<table>
<thead>
<tr>
<th>Focus Regions</th>
<th>Herrington Lake Areas</th>
<th>Number of Samples for Each Sample Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sampling Location ID</td>
<td>Location Description</td>
</tr>
<tr>
<td>Curds Inlet</td>
<td>CI-1, Curds NB</td>
<td>Upper Curds Inlet</td>
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<td>CI-2, CI-2.1, CI 2.2</td>
<td>Middle Curds Inlet</td>
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<td>CI-3, CI-3.1, CI 3.2</td>
<td>Lower / Mouth of Curds Inlet</td>
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<td></td>
<td>HQ-1</td>
<td>HQ Inlet</td>
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<td></td>
<td>LHL-1</td>
<td>Rocky Run Embayment</td>
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<td></td>
<td>LHL-2</td>
<td>Dix Dam</td>
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<tr>
<td></td>
<td>LHL-3 Cove</td>
<td>Lower Herrington Lake Main Channel Southside Cove</td>
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<tr>
<td></td>
<td>LHL-6 Cove</td>
<td>Lower Herrington Lake Main Channel Eastside Cove</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total for each Sample Type</th>
<th>12</th>
<th>4</th>
<th>4</th>
<th>6</th>
<th>13</th>
<th>18</th>
<th>15</th>
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</thead>
</table>

**Total # of proposed samples = 72**

**Notes:**

- Water sampling during summer stratification will involve one sample for each stratified surface water layer.
- Fish sampling will include the three main target species, bluegill, bass, and catfish. Larger bass and catfish samples will consist of single-fish or be composited from 2–5 fish wherever required for sufficient sample volume. All bluegill samples will be composite samples.
- One Young Of the Year (YOY) fish sample will consist of a minimum of 500 young bass, including largemouth and spotted (Kentucky) bass wherever available. If sufficient sample sizes are not reached within Curds Inlet, then the samples may be combined to reach the minimum sample requirement of 500 fish. The 500 fish samples are planned for the deformities assessment. YOY fish tissue residue samples will be whole body and will be comprised of approximately 10 fish in each composite sample with 12 samples (120 YOY fish).

**Acronyms:**

- # Number
- CI Curds Inlet
- ID Identifier
- NB North Bank
- LHL Lower Herrington Lake
## FISH COLLECTION EFFORT FORM

### YOY Bass Sampling Region (circle one):

<table>
<thead>
<tr>
<th>Curds Inlet</th>
<th>HQ Inlet</th>
<th>LHL1 (Rocky Arm)</th>
<th>LHL2 (Dix Dam)</th>
<th>LHL3 Cove</th>
<th>LHL 6 Cove</th>
</tr>
</thead>
</table>

### Sample ID:
- e.g. (YOYBASS-001-LHL6), or (YOYBASS - 001TS - LHL6)

### Sampling Location Description
- e.g. 50' north of CI2, west shore

### Sampling Method
- (Seine, Electrofish, Minnow Trap etc.)

### Start Time
- (24hr clock)

### Sampling Duration
- (in hrs)

### Sample Size
- (N=)

### Notes:

#### a) For unaffected YOY Bass, a maximum of 100 individuals will fit within 20" X 10" image field, providing detailed imagery of both the left and right sides of the fish (two photos).

#### b) For the YOY analytical subsample of approximately 10 YOY bass (minimum 5 grams total weight), detailed imagery will be captured of both the left and right sides of each individual (two photos) before they are frozen for shipment to the laboratory.
# Fish Anatomy Anatomical Anomaly of fish

- **Eyes**
  - Both normal:
  - Left:
    - Normal:
    - Exophthalmic:
    - Opque:
    - Missing:
  - Right:
    - Normal:
    - Exophthalmic:
    - Opque:
    - Missing:
  - Other (list):

- **Fins**
  - All normal:
  - Left pectoral:
    - Partly missing:
    - Missing:
    - Twisted:
  - Right pectoral:
    - Partly missing:
    - Missing:
    - Twisted:
  - Caudal fin (tail):
    - Partly missing:
    - Missing:
    - Twisted:
  - Dorsal fin:
    - Partly missing:
  - Anal fin:
    - Partly missing:
    - Twisted:
    - Fins other (list):

- **Spine**
  - Normal:
  - Kyphosis:
  - Lordosis:
  - Scoliosis:
  - Other (list):

- **Craniofacial**
  - Head normal:
  - Mouth:
  - Jaw:
  - Gill cover:
  - Other (list):

- **Edema**
  - Normal:
  - Edema:
  - Other (list):

- **Other (List)**
  - ____________

---

**YOY Fish Sampling Location:**

**Species distribution in sample (e.g. 80% percent largemouth bass):**

**# of Normal Fish (no visible deformities):** __________

**Assessment Guide for YOY Centrarchidae**

- Eye abnormalities - including lens cataracts and exophthalmos
- Fin irregularities - missing, misshaped, partly missing (aka vestigial)
- Spinal curvature - kyphosis, lordosis, and scoliosis
- Craniofacial defects - mouth, jaw, and gill cover
- Edema - fluid accumulation

Note: To avoid multiple-counting of fish with multiple deformities, this form counts the prominent deformity and digital images and details of specific fish will also be recorded.

---

**Herrington Lake Young-Of-The-Year (YOY) FISH HEALTH EXAMINATION FORM**

**Record:**

**Primary Fish Health Assessor:**

**Third-Party Assessor:**

**Assessment Date(s):**

**YOY Fish Sampling Location:**

**Species distribution in sample (e.g. 80% percent largemouth bass):**

**# of Normal Fish (no visible deformities):** __________

**Assessment Guide for YOY Centrarchidae**

- Eye abnormalities - including lens cataracts and exophthalmos
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- Edema - fluid accumulation

Note: To avoid multiple-counting of fish with multiple deformities, this form counts the prominent deformity and digital images and details of specific fish will also be recorded.

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**Other (List)**

__________

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**Length is measured from tip of lower jaw to tip of tail with fish laid flat and tail lobes squeezed together.**
**Herrington Lake Young-Of-The-Year (YOY) GROUP or INDIVIDUAL FISH - INSPECTION FORM**

<table>
<thead>
<tr>
<th>Recorder:</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Fish Health Assessor:</td>
<td></td>
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<td>Third-Party Assessor:</td>
<td></td>
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<tr>
<td>Assessment Date(s):</td>
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</table>

**Anatomical Category (e.g. spine, fin(s)):**

<table>
<thead>
<tr>
<th>Examples From YOY Bass Sampling Region (circle one):</th>
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</thead>
<tbody>
<tr>
<td>Curds Inlet</td>
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</table>

<table>
<thead>
<tr>
<th>Individual Sample ID:</th>
<th>Species:</th>
<th>Photo Number(s):</th>
</tr>
</thead>
</table>

**Abnormality Description(s) (e.g. Top image displays right side tail deformity(ies)):**

> insert Group or Individual YOY Bass Digital Image(s) Here

**Abnormality Description(s) (e.g. Bottom image displays left side fin deformity(ies)):**

> insert Group or Individual YOY Bass Digital Image(s) Here

Page __ of __
## Herrington Lake Adult Fish Tissue Collection and Chain-Of-Custody Form

### Study Lake or River: Sampling Location ID (e.g. LHL-2):

**Fish Sampling Location Description (e.g. Above Dix Dam):**

<table>
<thead>
<tr>
<th>KDFWR Wildlife Collection Permit#</th>
<th>Notes / Observations:</th>
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</thead>
<tbody>
<tr>
<td>Date:</td>
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</table>

**Start Time:**

**GPS Coordinates** (or where they can be found if collected electronically):

**Investigators:**

**Weather at Start:**

**Flow status (circle one):** runoff event high flow low flow normal other

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Fish #</th>
<th>Genus</th>
<th>Species</th>
<th>Length (mm)</th>
<th>Weight (grams)</th>
<th>Comments</th>
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**Length (mm) of 75%tile of Longest Fish:**

**Total # Fish Collected in Sample:**

**Collected by:**

**Relinquished by:**

**Received by:**

**Date:**

**Time:**
<table>
<thead>
<tr>
<th>YSI / SW Sample Depth (feet bws)</th>
<th>Dissolved Oxygen (DO in mg/L)</th>
<th>Conductivity (mS/cm)</th>
<th>Water Temperature (°C or °F)</th>
<th>pH</th>
<th>Stratification Layer (if known)</th>
<th>Surface Water Sample? (Y/N)</th>
<th>SW Sample ID</th>
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Notes:

- **°C**: Degrees Celsius
- **°F**: Degrees Fahrenheit
- **bws**: below water surface
- **mg/L**: milligrams per liter
- **mS/cm**: milliSiemens per centimeter
- **pH**: Potential of Hydrogen
- **Y/N**: Yes or No

Stratification Layers for Reference:

- **Epilimnion**: Sunlight zone with higher DO and water temp.
- **Metalimnion (Thermocline)**: water temp and DO drops.
- **Hypolimnion**: Deep zone - lower stable DO and water temp.
# Herrington Lake Sediment Collection Form

## Sampling Region (e.g. Curds Inlet):  
### GPS Coordinates (or file location if collected digitally):  
### REH Investigator(s):  
### Dive Crew; Diver(s) down:  
### Start Time (Boat Launched):  
### Weather at Start:  
### Notes or Observations:  

<table>
<thead>
<tr>
<th>Sample Location/Transect</th>
<th>Sample Time</th>
<th>Water Depth (in feet)</th>
<th>Local Bottom Substrate (Rocky, Silty, etc..)</th>
<th>Field Dup or MS/MSD?</th>
<th>Jar #s and size collected</th>
<th>PW Peeper Deployed? (Y or N)</th>
<th>Sediment Sample ID</th>
<th>Location Notes</th>
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## Notes:
- °C Degrees Celsius
- °F Degrees Fahrenheit
- bws below water surface
- mg/L milligrams per liter
- mS/cm milliSiemens per centimeter
- pH Potential of Hydrogen
- Y/N Yes or No

## Sediment Collection / Pore Water Deployment
### Configuration Sketch and/or Relocation Notes: