

United States Environmental Protection Agency  
Region 4

Science and Ecosystem Support Division  
980 College Station Road  
Athens, Georgia 30605-2720



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**Village Creek Dieldrin Screening  
Final Report**

**Birmingham, AL  
June 2015**

**SESD Project Identification Number: 15-0308**

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**Title and Approval Sheet**

Title: Village Creek Dieldrin Screening  
Final Report

**Approving Official:**



Stacey Box, Chief  
Ecology Section  
Field Services Branch

8/11/15

Date

**SESD Project Leader:**



Jerry Ackerman, Life Scientist  
Ecology Section  
Field Services Branch

8/10/15

Date

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## **1 Introduction**

Village Creek has been classified as impaired by the Alabama Department of Environmental Management (ADEM) for the legacy pesticide dieldrin. Dieldrin is an organochlorine pesticide and by-product of the pesticide aldrin. It was used from 1950 to 1974 for insect control on cotton, corn, and citrus crops. Other uses included mosquito and termite control as well as a wood preservative. Dieldrin was banned by the EPA in 1974 for use as a pesticide and in 1987 for use in termite control. Dieldrin is no longer produced in the United States due to its harmful and bioaccumulative effects on humans, fish and wildlife. It is persistent and does not break down easily in our environment. Potential sources to our environment include: soil surrounding wooden structures treated for termites, soil or sediment, improper use or disposal, contaminated fish and shellfish (USEPA 2011a).

In collaboration with ADEM and the City of Birmingham, the Water Protection Division (WPD) requested the Science and Ecosystem Support Division (SESD) to collect and analyze surface water samples for dieldrin to assist in the possible removal of Village Creek from the 303d list of impaired waters. Prior sampling events included an extensive study conducted by the U.S. Geological Survey (USGS) in 2000-2001, which provided sufficient data to list Village Creek as impaired based on dieldrin concentrations exceeding the human health criterion of 0.00003 µg/L (0.03 ng/L), at levels up to 0.007 µg/L (7.0 ng/L; Table 4). ADEM collected additional data in 2012 at 6 stations monthly for 8 months. Concentrations of dieldrin in all samples were less than the method detection limit of 0.0028 µg/L (2.8 ng/L) but it was unknown whether concentrations exceeded the human health criteria of 0.00003 µg/L.

## **2 Methods**

### **2.1 Site Description**

The Village Creek Basin lies in the Ridge and Valley ecoregion and the Southwestern Appalachians ecoregion in Birmingham, Jefferson County, Alabama (Figure 1). The watersheds in these regions are characterized as moderate to low gradient streams with bedrock, cobble, gravel and sandy substrates (Griffith et al. 2001). Village Creek flows through an intensely urbanized watershed containing several industrial and municipal point and nonpoint sources of contamination (McPherson et al. 2002) including a golf course and Birmingham International Airport.

### **2.2 Study Design and Sampling Methods**

Assessment sites were all within the Village Creek watershed in Jefferson County, AL. These sites were the same sites that USGS sampled in the 2000-2001 water quality investigation which prompted the 303d listing for dieldrin (McPherson et al., 2002). The four stations were sampled on the afternoon of June 3, 2015 (see Table 1 and Figure 1) in accordance with the Village Creek Dieldrin Screening Quality Assurance Project Plan (QAPP) and Study Plan (USEPA 2015b). Surface water was sampled for water chemistry and water quality using a downstream to upstream

approach. Samples were collected (while wading and facing upstream) at approximately mid-stream mid-depth, by submerging sample containers into the stream and allowing bottles to fill to the appropriate level (USEPA 2013d). Surface water samples were placed in a cooler of wet ice to preserve at a temperature  $<6^{\circ}\text{C}$ . *In situ* water quality data (temperature, dissolved oxygen, pH and specific conductance) were collected using multi-parameter sondes (USEPA 2013b). Stream discharge was measured at VIL1 with an acoustic Doppler velocimeter (ADV), as described in the Operating Procedure for Hydrological Studies (USEPA 2012b). Discharge data was acquired from the U.S. Geological Survey website at <http://waterdata.usgs.gov> for the following stations: VIL2, VIL3 and VIL4 (USGS station numbers 02458300, 02458450 and 02458600, respectively). Global Positioning System (GPS) coordinates were recorded on handheld devices using map datum WGS84 in decimal degrees (USEPA 2011b). Photographs were taken at each sample site and recorded in the field logbook.

## **2.3 Analytical Methods**

Surface water samples were analyzed using EPA Method 8270D, modified for select ion monitoring (SIM) gas chromatograph/mass spectrophotometer/mass spectrophotometer (GC/MS/MS), with a minimum reporting limit (MRL) for dieldrin of  $0.000098\text{ }\mu\text{g/L}$  ( $0.098\text{ ng/L}$ ). The actual MRL for this study varied among samples and is lower than specified in the QAPP ( $0.0002\text{ }\mu\text{g/L}$ ; USEPA 2015b) due to increased sample volume and use of a lower calibration standard. This method was selected due to its low cost, as well as its lower detection limit for dieldrin compared to Method 8081. Sample analysis was performed by the SEDS laboratory and was analyzed in accordance with the Analytical Support Branch Laboratory Operations and Quality Assurance Manual (ASB LOQAM) (USEPA 2015a). The analytical method, equipment and standards, calibration procedures, extraction and digestion procedures, laboratory decontamination procedures, waste disposal procedures, corrective actions, and any specific method performance requirements are specified in the LOQAM.

## **3 Results/Discussion**

### **3.1 *In Situ* Water Quality**

*In situ* water quality data are compared to Alabama's water quality criteria in Table 2. Water quality parameters include dissolved oxygen, specific conductance, pH, and temperature. These parameters were used to assess the water quality conditions at the time of sampling. All measurement results were within acceptable limits per Alabama's water quality criteria (ADEM 2014).

### **3.2 Surface Water Results**

All stations sampled in Village Creek show levels of dieldrin detectable above the reporting limit of  $0.0001\text{ }\mu\text{g/L}$  ( $0.1\text{ ng/L}$ ; Table 3). The sample at station VIL1, along with the field duplicate collected at that site, had the highest concentrations of dieldrin, which averaged  $0.0014\text{ }\mu\text{g/L}$  ( $1.4$

ng/L). Sample VIL3 contained the lowest concentration at 0.00096 µg/L (0.96 ng/L). Each of the four samples contained dieldrin at levels above the ambient water quality criterion for protection of human health of 0.00003 µg/L (0.03 ng/L). Furthermore, these concentrations are likely biased low, since analyte recoveries were less than method control limits. This indicates that the existing concentrations in Village Creek may be slightly higher than the results of this study.

The results from the 2000-2001 USGS study along with the results of this study are presented in Table 4. However, a true comparison cannot be made due to different sample processing methods. USGS analyzed the dissolved fraction by filtering samples with a 0.7-µm pore size glass-fiber filter (Zaugg et al. 1995) whereas EPA analyzed the total fraction of the sample.

### **3.3 Quality Control**

Quality control activities for this project included a bottle blank, temperature blank and field duplicate. No dieldrin was detected in the bottle blank. The field duplicate and its associated sample had a 14.3% relative percent difference, which is within the acceptable limit of 20%. The temperature blank indicated that samples arrived at the laboratory at 1.4°C which is below the acceptable maximum temperature of 6°C. Sample custody was maintained at all times and delivered to the SEDS sample custodian. All samples arrived in good condition with correct chain-of-custody (USEPA 2013c).

Water quality instruments used during this study were maintained and calibrated according to requirements of the SEDS Operating Procedure for Equipment Inventory and Management (USEPA 2013a) and the SEDS Operating Procedure for *In Situ* Water Quality Monitoring (USEPA 2013b). At the end of the sampling event, instruments were end-checked using the appropriate standard for each parameter measured. End check results indicated all instrument measurements were within acceptable limits. Field measurement data has associated uncertainties assigned to each measurement based on instrument type. Field instrument uncertainty for field measurements can be found in Table 5: Measurement Uncertainty (USEPA 2012a).

## **4 Conclusion**

Concentrations of dieldrin measured in Village Creek samples exceeded the human health criterion for surface waters in Alabama. WPD is responsible for any decisions regarding Village Creek based on the data provided in this report.

## **5 References**

ADEM 2014. Alabama Department of Environmental Management Administrative Code 335-6-10.09, April 1, 2014.

- Griffith, G.E., J.M. Omernik, J.A. Comstock, S. Lawrence, G. Martin, A. Goddard, V.J. Hulcher and T. Foster. 2001. Ecoregions of Alabama and Georgia, (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,700,000).
- McPherson, A.K., T.A. Abrahamsen and C.A. Journey. 2002. Investigation of Water Quality and Aquatic-Community Structure in Village and Valley Creeks, City of Birmingham, Jefferson County, Alabama, 2000-01. U.S. Geological Survey.
- USEPA 2011a. Aldrin/Dieldrin website at <http://www.epa.gov/pbt/pubs/aldrin.htm>. April 2011.
- USEPA 2011b. Operating Procedure for Global Position System SESDPROC-110-R3, Region 4, SESD, Athens, GA.
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- USEPA 2013a. Operating Procedure for Equipment Inventory and management, SESDPROC-108-R4, Region 4, SESD, Athens, GA.
- USEPA 2013b. Operating Procedure for *In Situ* Water Quality Monitoring, SESDPROC-111-R3, Region 4, SESD, Athens, GA.
- USEPA 2013c. Operating Procedure for Sample and Evidence Management, SESDPROC-005-R2, Region 4 SESD, Athens, GA.
- USEPA 2013d. Operating Procedure for Surface Water Sampling SESDPROC-201-R3, Region 4, SESD, Athens, GA.
- USEPA 2015a. SESD Analytical Services Branch Laboratory Operations and Quality Assurance Manual (ASB LOQAM), February 23, 2015. United States Environmental Protection Agency. Region 4, SESD, Athens, GA.
- USEPA 2015b. Village Creek Dieldrin Screening Quality Assurance Project Plan and Sample Plan, SESD Project Identification Number 15-0308, June 2015. United States Environmental Protection Agency. Region 4, SESD, Athens, GA.
- Zaugg, S.D., M.W. Sandstrom, S.G. Smith and K.M. Fehlberg, 1995, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory — Determination of pesticides in water by C-18 solid-phase extraction and capillary-column gas chromatography/mass spectrometry with selected-ion monitoring: U.S. Geological Survey Open-File Report 95-181, 49 p.



Figure 1: Village Creek Sample Locations



Table 1: Sample Locations

Station	USGS station number	Station location	Latitude	Longitude	Drainage area (mi <sup>2</sup> )
VIL1	2458150	Village Creek at Eastlake Park in Birmingham	33.5681	-86.7252	4.9
VIL2	2458300	Village Creek at 24 <sup>th</sup> Street at Birmingham	33.5429	-86.8173	26.0
VIL3	2458450	Village Creek at Avenue W at Ensley	33.5177	-86.8796	33.5
VIL4	2458600	Village Creek near Docena	33.5481	-86.9272	52.2

Table 2: *In situ* water quality, with ADEM Water Quality Criteria (WQC) listed for comparison.

Station	Temp (°C)	Sp. Cond. (µS/cm)	pH (S.U.)	Dissolved Oxygen (mg/L)	*Discharge (ft <sup>3</sup> /s)
ADEM WQC	<32.2 (90°F)	NA	6.5-8.5	>5.0	NA
VIL1	21.68	390.6	8.07	8.38	6.9
VIL2	22.36	380.9	8.21	9.16	21
VIL3	25.40	404.5	8.30	10.95	37
VIL4	22.98	456.0	7.67	7.57	103

\*Discharge data acquired from <http://waterdata.usgs.gov> for the following stations: VIL2, VIL3 and VIL4 (USGS station numbers 02458300, 02458450, and 02458600 respectively).

Table 3. Surface Water Analytical Results

Station	Sample	Analytical Method	Analyte	HHC (µg/L)	Results (µg/L)	Qualifiers	MRL (µg/L)
VIL1	VIL10615	EPA 8270D	Dieldrin	0.00003	<b>0.00130</b>	J, QS-3, QR-1, QL-1	0.000098
VIL1	VIL0615D	EPA 8270D	Dieldrin	0.00003	<b>0.00150</b>	J, QS-3, QR-1, QL-1	0.000098
VIL2	VIL20615	EPA 8270D	Dieldrin	0.00003	<b>0.00120</b>	J, QR-1, QL-1	0.000100
VIL3	VIL30615	EPA 8270D	Dieldrin	0.00003	<b>0.00096</b>	J, QL-1, QR-1	0.000099
VIL4	VIL40615	EPA 8270D	Dieldrin	0.00003	<b>0.00130</b>	J, QS-3, QR-1, QL-1	0.000098

HHC: Human health criterion for the consumption of water and fish. **Bold** values represent exceedances.  
J: The identification of the analyte is acceptable; the reported value is an estimate.  
QL-1: Laboratory Control Spike Recovery less than method control limits.  
QR-1: MRL verification recovery less than lower control limits.  
QS-3: Surrogate recovery is lower than established control limits.

Table 4: Comparison of 2000-2001 USGS data to 2015 USEPA data [reported in nanograms per liter (ng/L)]

Station	Sample Date	Agency	Analyte	Result (ng/L)	MRL (ng/L)	Method <sup>1,2</sup>	Discharge (cfs)
VIL1	5/17/2000	USGS	Dieldrin (filtered)	<1.00	1.000	GC/MS	3.9
VIL1	8/1/2000	USGS	Dieldrin (filtered)	<b>4.69</b>	1.000	GC/MS	2.5
VIL1	8/30/2000	USGS	Dieldrin (filtered)	<1.00	1.000	GC/MS	1.3
VIL1	11/8/2000	USGS	Dieldrin (filtered)	<4.80	4.800	GC/MS	126
VIL1	1/29/2001	USGS	Dieldrin (filtered)	<4.80	4.800	GC/MS	101
VIL1	3/19/2001	USGS	Dieldrin (filtered)	<b>4.98</b>	4.800	GC/MS	7.0
VIL1 <sup>3</sup>	5/9/2001	USGS	Dieldrin (filtered)	<b>7.00</b>	4.800	GC/MS	8.3 <sup>4</sup>
VIL1	6/3/2015	USEPA	Dieldrin (unfiltered)	<b>1.30</b>	0.098	EPA 8270D	4.9
VIL1 <sup>5</sup>	6/3/2015	USEPA	Dieldrin (unfiltered)	<b>1.50</b>	0.098	EPA 8270D	4.9
VIL2	8/1/2000	USGS	Dieldrin (filtered)	<1.00	1.000	GC/MS	27.9
VIL2	8/30/2000	USGS	Dieldrin (filtered)	<1.00	1.000	GC/MS	10.5
VIL2	1/29/2001	USGS	Dieldrin (filtered)	<4.80	4.800	GC/MS	911
VIL2	6/3/2015	USEPA	Dieldrin (unfiltered)	<b>1.20</b>	0.100	EPA 8270D	26.0
VIL3	3/30/2000	USGS	Dieldrin (filtered)	<1.00	1.000	GC/MS	410
VIL3	8/2/2000	USGS	Dieldrin (filtered)	<1.00	1.000	GC/MS	413
VIL3	8/29/2000	USGS	Dieldrin (filtered)	<1.00	1.000	GC/MS	14.6
VIL3	6/3/2015	USEPA	Dieldrin (unfiltered)	<b>0.96</b>	0.099	EPA 8270D	37
VIL4	4/2/2000	USGS	Dieldrin (filtered)	<5.00	5.000	GC/MS	2440
VIL4	6/3/2015	USEPA	Dieldrin (unfiltered)	<b>1.30</b>	0.098	EPA 8270D	103

<sup>1</sup>GC/MS: C-18 Solid-Phase Extraction and Capillary-Column Gas Chromatography/Mass Spectrometry with Selected-Ion Monitoring (Zaugg et al. 1995)

<sup>2</sup>EPA Method 8270D: Gas Chromatograph/Mass Spectrophotometer/Mass Spectrophotometer modified for Select-Ion Monitoring

<sup>3</sup>Data retrieved from <http://nwis.waterdata.usgs.gov>

<sup>4</sup>Daily average for 5/9/2001 per <http://waterdata.usgs.gov>

<sup>5</sup>VIL1 duplicate field sample

Results in **bold** represent exceedances of the human health criterion of **0.03 ng/L** for the consumption of water and fish and the consumption of fish only.

Table 5: Measurement uncertainty

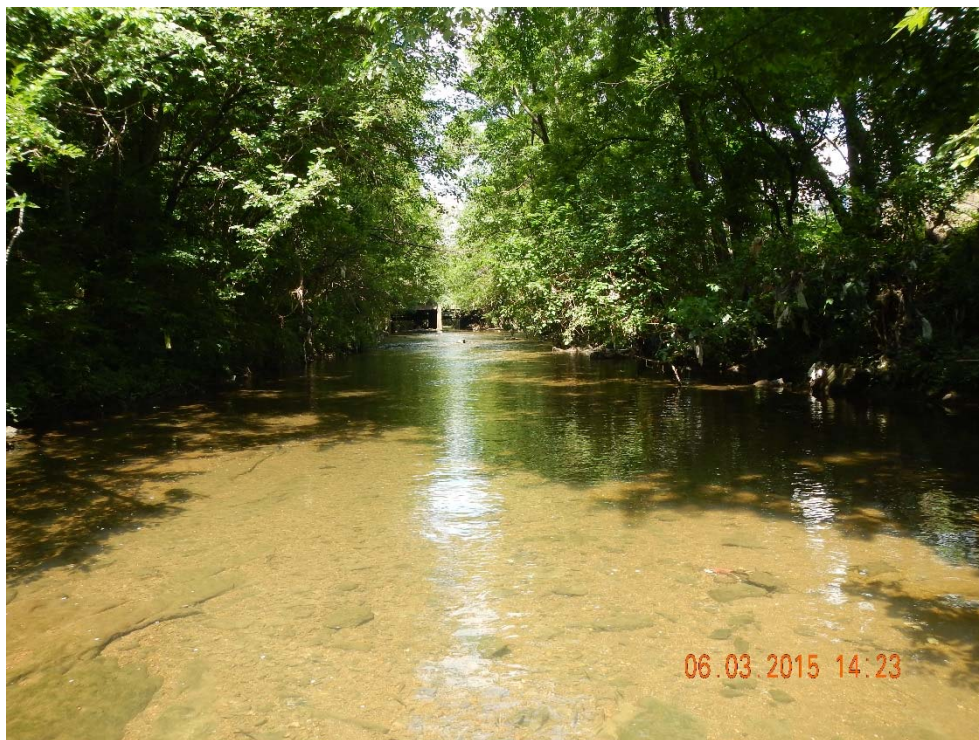
Type B Field Measurement Uncertainty	
Instrument/Measurement	Measurement Uncertainty
pH <sup>1</sup>	± 0.2 S.U.
Specific Conductance <sup>1</sup>	± 0.5%
Temperature <sup>1</sup>	±0.2°C
Dissolved Oxygen <sup>1</sup>	± 2% or 0.2 mg/l (whichever is greater)

<sup>1</sup>YSI, Inc. 2002. 6-Series Environmental Monitoring Systems Operations Manual. Revision B. Yellow Springs, OH.

## Station Photographs



VIL1: Facing upstream.



VIL2: Facing upstream.





VIL3: Facing upstream.



VIL4: Facing upstream.

## **Appendix A (Analytical Reports)**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 4 Science and Ecosystem Support Division  
980 College Station Road, Athens, Georgia 30605-2700

D.A.R.T. Id: 15-0308

Project: 15-0308, Village Creek Dieldrin - Reported by Jason Collum

July 9, 2015

4SESD-ASB

**MEMORANDUM**

**SUBJECT:** FINAL Analytical Report  
Project: 15-0308, Village Creek Dieldrin  
Surface Water Protection

**FROM:** Jason Collum  
OCS Analyst

**THRU:** Floyd Wellborn, Chief  
ASB Organic Chemistry Section

**TO:** Jerry Ackerman

Attached are the final results for the analytical groups listed below. These analyses were performed in accordance with the Analytical Support Branch's (ASB) Laboratory Operations and Quality Assurance Manual (ASB LOQAM) found at [www.epa.gov/region4/sesd/asbsop](http://www.epa.gov/region4/sesd/asbsop). Any unique project data quality objectives specified in writing by the data requestor have also been incorporated into the data unless otherwise noted in the Report Narrative. Chemistry data have been verified based on the ASB LOQAM specifications and have been qualified by this laboratory if the applicable quality control criteria were not met. Verification is defined in Section 5.2 of the ASB LOQAM. For a listing of specific data qualifiers and explanations, please refer to the Data Qualifier Definitions included in this report. The reported results are accurate within the limits of the method(s) and are representative only of the samples as received by the laboratory.

Analyses Included in this report:

Method Used:

Accreditations:

**Organochlorine Pesticides (OCP)**

Organochlorine pesticides

EPA 8270D (Water)

NR



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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D.A.R.T. Id: 15-0308

Project: 15-0308, Village Creek Dieldrin - Reported by Jason Collum

**Sample Disposal Policy**

Because of the laboratory's limited space for long term sample storage, our policy is to dispose of samples on a periodic schedule. Please note that within 60 days of this memo, the original samples and all sample extracts and/or sample digestates will be disposed of in accordance with applicable regulations. The 60-day sample disposal policy does not apply to criminal samples which are held until the laboratory is notified by the criminal investigators that case development and litigation are complete.

These samples may be held in the laboratory's custody for a longer period of time if you have a special project need. If you wish for the laboratory to hold samples beyond the 60-day period, please contact our Sample Control Coordinator by e-mail at [R4SampleCustody@epa.gov](mailto:R4SampleCustody@epa.gov), and provide a reason for holding samples beyond 60 days



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**SAMPLES INCLUDED IN THIS REPORT**

**Project: 15-0308, Village Creek Dieldrin**

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
QABB	E152305-01	Bottle Blank	6/4/15 13:00	6/4/15 14:23
VIL10615	E152305-02	Surface Water	6/3/15 15:00	6/4/15 14:23
VIL10615D	E152305-03	Surface Water	6/3/15 15:00	6/4/15 14:23
VIL20615	E152305-04	Surface Water	6/3/15 14:30	6/4/15 14:23
VIL30615	E152305-05	Surface Water	6/3/15 14:00	6/4/15 14:23
VIL40615	E152305-06	Surface Water	6/3/15 13:30	6/4/15 14:23





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### DATA QUALIFIER DEFINITIONS

U	The analyte was not detected at or above the reporting limit.
J	The identification of the analyte is acceptable; the reported value is an estimate.
QL-1	Laboratory Control Spike Recovery less than method control limits
QR-1	MRL verification recovery less than lower control limits.
QS-3	Surrogate recovery is lower than established control limits.

### ACRONYMS AND ABBREVIATIONS

CAS	Chemical Abstracts Service  Note: Analytes with no known CAS identifiers have been assigned codes beginning with "E", the EPA ID as assigned by the EPA Substance Registry System ( <a href="http://www.epa.gov/srs">www.epa.gov/srs</a> ), or beginning with "R4-", a unique identifier assigned by the EPA Region 4 laboratory.
MDL	Method Detection Limit - The minimum concentration of a substance (an analyte) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero.
MRL	Minimum Reporting Limit - Analyte concentration that corresponds to the lowest demonstrated level of acceptable quantitation. The MRL is sample-specific and accounts for preparation weights and volumes, dilutions, and moisture content of soil/sediments.
TIC	Tentatively Identified Compound - An analyte identified based on a match with the instrument software's mass spectral library. A calibration standard has not been analyzed to confirm the compound's identification or the estimated concentration reported.

#### ACCREDITATIONS:

ISO	The test, if analyzed after June 26, 2012, is accredited under the EPA Region 4 ASB's ISO/IEC 17025 accreditation issued by ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1691.
NR	The EPA Region 4 Laboratory has not requested accreditation for this test.



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D.A.R.T. Id: 15-0308

Project: 15-0308, Village Creek Dieldrin - Reported by Jason Collum

## Organochlorine Pesticides

Project: 15-0308, Village Creek Dieldrin

Sample ID: QABB

Lab ID: E152305-01

Station ID:

Matrix: Bottle Blank

Date Collected: 6/4/15 13:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
60-57-1	Dieldrin	0.00010	U, J, QR-1, QL-1	ug/L	0.00010	6/09/15 9:46	7/09/15 4:18	EPA 8270D



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D.A.R.T. Id: 15-0308

Project: 15-0308, Village Creek Dieldrin - Reported by Jason Collum

## Organochlorine Pesticides

Project: 15-0308, Village Creek Dieldrin

Sample ID: VIL10615

Lab ID: E152305-02

Station ID: VIL1

Matrix: Surface Water

Date Collected: 6/3/15 15:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
60-57-1	Dieldrin	0.0013	J, QS-3, QR-1, QL-1	ug/L	9.8E-5	6/09/15 9:46	7/09/15 4:36	EPA 8270D



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## Organochlorine Pesticides

Project: 15-0308, Village Creek Dieldrin

Sample ID: VIL10615D

Lab ID: E152305-03

Station ID: VIL1

Matrix: Surface Water

Date Collected: 6/3/15 15:00

<i>CAS Number</i>	<i>Analyte</i>	<i>Results</i>	<i>Qualifiers</i>	<i>Units</i>	<i>MRL</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Method</i>
60-57-1	Dieldrin	0.0015	J, QS-3, QR-1, QL-1	ug/L	9.8E-5	6/09/15 9:46	7/09/15 4:53	EPA 8270D



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## Organochlorine Pesticides

Project: 15-0308, Village Creek Dieldrin

Sample ID: VIL20615

Lab ID: E152305-04

Station ID: VIL2

Matrix: Surface Water

Date Collected: 6/3/15 14:30

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
60-57-1	Dieldrin	0.0012	J, QR-1, QL-1	ug/L	0.00010	6/09/15 9:46	7/09/15 5:11	EPA 8270D



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 4 Science and Ecosystem Support Division  
980 College Station Road, Athens, Georgia 30605-2700

D.A.R.T. Id: 15-0308

Project: 15-0308, Village Creek Dieldrin - Reported by Jason Collum

## Organochlorine Pesticides

Project: 15-0308, Village Creek Dieldrin

Sample ID: VIL30615

Lab ID: E152305-05

Station ID: VIL3

Matrix: Surface Water

Date Collected: 6/3/15 14:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
60-57-1	Dieldrin	0.00096	J, QL-1, QR-1	ug/L	9.9E-5	6/09/15 9:46	7/09/15 5:29	EPA 8270D



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D.A.R.T. Id: 15-0308

Project: 15-0308, Village Creek Dieldrin - Reported by Jason Collum

## Organochlorine Pesticides

Project: 15-0308, Village Creek Dieldrin

Sample ID: VIL40615

Lab ID: E152305-06

Station ID: VIL4

Matrix: Surface Water

Date Collected: 6/3/15 13:30

<i>CAS Number</i>	<i>Analyte</i>	<i>Results</i>	<i>Qualifiers</i>	<i>Units</i>	<i>MRL</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Method</i>
60-57-1	Dieldrin	0.0013	J, QS-3, QR-1, QL-1	ug/L	9.8E-5	6/09/15 9:46	7/09/15 5:47	EPA 8270D



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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D.A.R.T. Id: 15-0308

Project: 15-0308, Village Creek Dieldrin - Reported by Jason Collum

Organochlorine Pesticides (OCP) - Quality Control

US-EPA, Region 4, SESD

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch 1506037 - E 3520 LLE

Blank (1506037-BLK1)

Prepared: 06/09/15 Analyzed: 07/09/15

EPA 8270D

Surrogate: Decachlorobiphenyl (DCB)	0.00438		ug/L	0.010000		43.8	39.7-108			
Surrogate: Tetrachloro-meta-xylene	0.00246		"	0.0050000		49.1	41-86.2			
Dieldrin	U	0.00010	"							U

LCS (1506037-BS1)

Prepared: 06/09/15 Analyzed: 07/09/15

EPA 8270D

Surrogate: Decachlorobiphenyl (DCB)	0.00431		ug/L	0.010000		43.1	39.7-108			QI-1
Surrogate: Tetrachloro-meta-xylene	0.00171		"	0.0050000		34.1	41-86.2			QS-3
Dieldrin	0.00039044	0.00010	"	0.0010000		39.0	46.5-140			QI-1, QL-1

Matrix Spike (1506037-MS1)

Source: E152305-05

Prepared: 06/09/15 Analyzed: 07/09/15

EPA 8270D

Surrogate: Decachlorobiphenyl (DCB)	0.00338		ug/L	0.010582		31.9	39.7-108			QS-3
Surrogate: Tetrachloro-meta-xylene	0.00239		"	0.0052910		45.1	41-86.2			
Dieldrin	0.0013627	0.00011	"	0.0010582	0.00095870	38.2	17.4-155			

Matrix Spike Dup (1506037-MSD1)

Source: E152305-05

Prepared: 06/09/15 Analyzed: 07/09/15

EPA 8270D

Surrogate: Decachlorobiphenyl (DCB)	0.00315		ug/L	0.010363		30.4	39.7-108			QS-3
Surrogate: Tetrachloro-meta-xylene	0.00239		"	0.0051813		46.2	41-86.2			
Dieldrin	0.0012465	0.00010	"	0.0010363	0.00095870	27.8	17.4-155	8.90	22.8	

MRL Verification (1506037-PS1)

Prepared: 06/09/15 Analyzed: 07/09/15

EPA 8270D

Surrogate: Decachlorobiphenyl (DCB)	0.00345		ug/L	0.010000		34.5	39.7-108			QS-3
Surrogate: Tetrachloro-meta-xylene	0.00236		"	0.0050000		47.1	41-86.2			
Dieldrin	0.000095517	0.0	"	0.00020000		47.8	58.2-152			MRL-2, QR-1





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D.A.R.T. Id: 15-0308

Project: 15-0308, Village Creek Dieldrin - Reported by Jason Collum

**Notes and Definitions for QC Samples**

U	The analyte was not detected at or above the reporting limit.
MRL-2	MRL verification for Non-Potable Water matrix
QI-1	Internal standard was outside of method control limits.
QL-1	Laboratory Control Spike Recovery less than method control limits
QR-1	MRL verification recovery less than lower control limits.
QS-3	Surrogate recovery is lower than established control limits.

## **Appendix B (Field Logbook)**

United States Environmental Protection Agency  
Region 4

Science and Ecosystem Support Division  
980 College Station Road  
Athens, Georgia 30605-2720



PROJECT NAME: Village Creek Dieldrin Screening

PROJECT LOCATION: Village Creek, Birmingham,  
Jefferson County, AL

PROJECT ID NUMBER: 15-0308

PROJECT LEADER: Jerry Ackerman

Field and Calibration Logbook

Book 1 of 1

Inclusive Dates: 6/3/15

List of personnel in logbook:

Name	Initials	Duties	Organization
<i>Jerry Ackerman</i>	<i>JWA</i>	<i>Team Leader, sampler</i>	<i>EPA SEED</i>
<i>Susan Dye</i>	<i>SD</i>	<i>Logbook</i>	<i>EPA SEED</i>

**Unless otherwise indicated:**

- All surface water samples will be collected in accordance with the SESD Operating Procedure Surface Water Sampling SESDPROC-201-R3.
- All GPS positioning data will be collected in accordance with SESD Operating Procedure Global Positioning System SESDPROC-110-R3.
- All datasonde calibration and measurements will be conducted in accordance with SESD Operating Procedure *In Situ* Water Quality Monitoring SESDPROC-111-R3.
- All field logbooks will be completed and maintained in accordance with SESD Operating Procedure Logbooks SESDPROC-010-R5.
- All digital photos will be taken in accordance with SESD Operating Procedure for Sample and Evidence Management SESDPROC-005-R2.
- All flow measurements will be collected in accordance with SESD Operating Procedure for Hydrological Studies SESDPROC-501-R3.

**Equipment log:**

Date(s)	Equipment	Type/Model #	EPA ID# or Serial Number
6/3/15	Multi-meter	In-Situ SmartTroll	549609
6/3/15	Flow meter	Sonotek FlowTracker	102411-01
6/3/15	Camera	Nikon Coolpix AW110	549543
6/3/15	GPS unit	Garmin Montana	549607

**Sample Information:**

Media	Analysis	Container Type and Number	Preservative	Sample Method
Surface Water (SW)	Pesticides (dieldrin)	1 liter glass amber x 2	Ice	Direct fill unless otherwise noted

**Quality Assurance/Quality Control (QA/QC) associated with samples:**

QA/QC Type	Abbreviation	Frequency	Container Type and Number
Matrix Spike/Matrix Spike Duplicate	MS/MSD	1 per 20 samples	1 liter glass amber x 2
Duplicate	D	1 per 10 samples	1 liter glass amber x 2
Temperature Blank	Not applicable	1 per sample cooler	250 ml glass or poly

**Activities to conduct at each station:**

- Collect surface water samples in thalweg at mid-depth (determined by best professional judgment).
- Collect flow data within sample reach.
- Collect *in situ* water quality measurements within sample reach.
- Record GPS coordinates at sampling location.
- Take photographs facing upstream and downstream from sample reach.

Team Leader Initials: JS

## Multi-meter Calibration

### Calibration Standards Information

Conductivity Manufacturer: Myron L	Lot #:	080140EB	Exp. Date:	8/14/15
pH 4 Std. Manufacturer: Fisher	Lot #:	133082	Exp. Date:	06/2015
pH 7 Std. Manufacturer: Fisher	Lot #:	133435	Exp. Date:	06/2015
pH 10 Std. Manufacturer: Fisher	Lot #:	133404	Exp. Date:	06/2015
NIST Thermometer: Fisher	SESD ID #:	05062013-01	Exp. Date:	3/6/2016

### Data sonde mid-day calibration checks (if necessary)

Checked by \_\_\_\_\_

Date/Time							
Sonde ID							
Battery (V)	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside			
Sp. Conductivity 12,500 $\mu\text{S}/\text{cm}$	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside			
pH 7	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside			
pH 4	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside			
pH 10	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside			
Turbidity 0 NTU	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside			
Temperature $^{\circ}\text{C}$							
Barometric Pressure (mmHg)							
Chart Value							
Dissolved Oxygen mg/L	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside	<input type="checkbox"/> Within <input type="checkbox"/> Outside			
<b>Acceptable ranges</b>		<b>Additional Notes:</b> <i>Just 6/5/15</i>					
Sp. Cond: +/- 5% of 12,500 $\mu\text{S}/\text{cm}$ = 625 $\mu\text{S}/\text{cm}$							
pH: +/- 0.2 SU							
DO mg/L: +/- 0.2 mg/L							
Turbidity: +/- 10% of 126 NTU = 12.6 NTU							
Battery: > 10.5 v							

Team Leader Initials: Just

Data Sonde Calibration Form				In Situ Smartroll		Sonde# 578645	
Date and Time	Begin	6/1/15 @ 1335	6/3/15 @ 1235				
	End	6/3/15 @ 1235	6/3/15 @ 1615				
Specific Conductance 12,500 (µS/cm)	PreCal	12530	12535				
	PostCal	12500	12489				
	End Check	12535	12594				
Temp (°C) Verification NIST/Thermistor	Begin	21.7/21.5	26.7/26.4				
	End	26.7/26.4	28.0/27.56				
pH 7	PreCal	6.93	7.07				
	PostCal	7.02	6.99				
	End Check	7.07	7.07				
pH 4	PreCal	3.91	4.11				
	PostCal	4.02	3.99				
	End Check	4.11	4.07				
pH 10	PreCal	9.98	10.03				
	PostCal	10.02	10.00				
	End Check	10.03	10.13				
Barometric Pressure (mmHg) and Temperature (°C) for DO	Begin	745 @ 21.5	748 @ 27.8				
	End	748 @	743 @ 26.4				
Dissolved Oxygen (mg/L) (Compare to Chart)	PreCal	8.67	7.76				
	PostCal	8.61	7.72				
	Chart Value	8.60	7.73				
	End Check	7.76	7.83				
	Chart Value	7.73	7.87				
Dissolved Oxygen %	PreCal	100.3	100.5				
	PostCal	100.1	100.0				
	End Check	100.0	99.7				
Depth (ft)	PreCal	-0.01	-0.04				
	PostCal	0.02	0.01				
	End Check	-0.04	0.07				
Operator	Begin	JWA	JWA				
	End	JWA	JWA				

Team Leader Initials: JWA

Data Sonde Calibration Form				Sonde#		
Date and Time	Begin					
	End					
Specific Conductance 12,500 ( $\mu\text{S}/\text{cm}$ )	PreCal					
	PostCal					
	End Check					
Temp ( $^{\circ}\text{C}$ ) Verification NIST/Thermistor	Begin					
	End					
pH 7	PreCal					
	PostCal					
	End Check					
pH 4	PreCal					
	PostCal					
	End Check					
pH 10	PreCal					
	PostCal					
	End Check					
Barometric Pressure (mmHg) and Temperature ( $^{\circ}\text{C}$ ) for DO	Begin					
	End					
Dissolved Oxygen (mg/L) (Compare to Chart)	PreCal					
	PostCal					
	Chart Value					
	End Check					
	Chart Value					
Dissolved Oxygen %	PreCal					
	PostCal					
	End Check					
Depth (ft)	PreCal					
	PostCal					
	End Check					
Operator	Begin					
	End					

*JWT*  
6/15/15

Station ID: V124

Date: 6/3/15

Location Description: ~100 yards downstream of Minor Parkway

Adverse Conditions (if applicable): ☐ Rain ☐ Wind ☐ Smoke ☐ Dust ☐ Temp. Extremes ☐ Other \_\_\_\_\_

Station observations: ☐ Industrial ☐ Commercial ☐ Residential ☐ Agricultural ☒ Other Wastewater treatment  
facility approximately 1/2 mile upstream.

Description	Latitude (DD)	Longitude (DD)	Accuracy (ft)	Initials
Sample location	33.54812	-86.92724	17	JWA

**Photograph Log**      **Date and time is imprinted on photo.**

Photo #	Location	Initials
1279	Description: <input checked="" type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	JWA
1280	Description: <input type="checkbox"/> facing upstream <input checked="" type="checkbox"/> facing downstream <input type="checkbox"/> other:	
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	

**In-situ Water Quality (File Name NA) Collected by AK**

Time	Temp (°C)	Sp. cond (µS/cm)	pH (S.I. units)	Turbidity (NTU)	DO (mg/l)	Depth (ft)
19:27	22.98	456.0	7.67	NA	7.57	0.71

Sample Collection/Preservation (see page 2 for preservatives and sample containers) Collected by JWA

Sample ID	Sample Time	Media code	Pesticides (dieldrin)	Number of containers	Sample method
VIL4 -0615	13-30	SW	X	2	grab/direct fill
D-0615		SW			

Surface water sample description: ☐ Clear ☒ Slightly Turbid ☐ Turbid ☐ Odor Present ☐ Other \_\_\_\_\_

**Sample Preservation:** ☒ Ice    **Ice status:** ☒ adequate   ☐ needs ice   ☐ added ice   **Duplicate** ☐    **MS/MSD** ☐

\* USGS gauging station at this location.

**Stream Flow (File name \_\_\_\_\_) Measurements by \_\_\_\_\_**

[illegible]

See page 12 for additional notes.

Team Leader Initials: JMK



Station ID: VIL3

Date: 6/3/15

Location Description: 100 ft downstream  
upstream of bridge at Avenue W at Ensley

Adverse Conditions (if applicable): ☐ Rain ☐ Wind ☐ Smoke ☐ Dust ☐ Temp. Extremes ☐ Other

Station observations: ☐ Industrial ☒ Commercial ☐ Residential ☐ Agricultural ☐ Other

Description	Latitude (DD)	Longitude (DD)	Accuracy (ft)	Initials
Sample location	33.51773	-86.87955	13	TW14

**Photograph Log**      **Date and time is imprinted on photo.**

Photo #	Location	Initials
1281	Description: <input checked="" type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	JWA
1282	Description: <input type="checkbox"/> facing upstream <input checked="" type="checkbox"/> facing downstream <input type="checkbox"/> other:	
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	

In-situ Water Quality (File Name NA) Collected by JA

Time	Temp (°C)	Sp. cond (µS/cm)	pH (S.I. units)	Turbidity (NTU)	DO (mg/l)	Depth (ft)
13:58	25.40	404.5	8.30	NA	10.95	0.56

Sample Collection/Preservation (see page 2 for preservatives and sample containers) Collected by JUP

Sample ID	Sample Time	Media code	Pesticides (dieldrin)	Number of containers	Sample method
V1L3 -0615	14:00	SW	X	4	grab/direct fill
D-0615		SW			

Surface water sample description: ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Odor Present ☐ Other

Sample Preservation: ☒ Ice    Ice status: ☒ Adequate   ☐ needs ice   ☐ added ice   Duplicate ☐   MS/MSD ☒

\* USB gauging station at this location.

**Stream Flow (File name\_\_\_\_\_)** Measurements by \_\_\_\_\_

[illegible]

See page 12 for additional notes.

Team Leader Initials: JUN

Station ID: VILZ

Date: 6/3/15

Location Description: upstream of bridge at 24th Street

Adverse Conditions (if applicable): ☐ Rain ☐ Wind ☐ Smoke ☐ Dust ☐ Temp. Extremes ☐ Other \_\_\_\_\_

Station observations: ☒ Industrial ☒ Commercial ☒ Residential ☐ Agricultural ☐ Other \_\_\_\_\_

Description	Latitude (DD)	Longitude (DD)	Accuracy (ft)	Initials
Sample location	33.54287	-86.81729	22	Just

**Photograph Log**      **Date and time is imprinted on photo.**

Photo #	Location	Initials
1283	Description: <input checked="" type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	JWH
1284	Description: <input type="checkbox"/> facing upstream <input checked="" type="checkbox"/> facing downstream <input type="checkbox"/> other:	
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	

In-situ Water Quality (File Name NA) Collected by AD

Time	Temp (°C)	Sp. cond (µS/cm)	pH (S.I. units)	Turbidity (NTU)	DO (mg/l)	Depth (ft)
14:28	22.36	380.9	8.21	NA	9.16	1.45

Sample Collection/Preservation (see page 2 for preservatives and sample containers) Collected by JWA

Sample ID	Sample Time	Media code	Pesticides (dieldrin)	Number of containers	Sample method
V1 L2 -0615	14:30	SW	X	2	grab/direct fill
D-0615		SW			

Surface water sample description: ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Odor Present ☐ Other \_\_\_\_\_

Sample Preservation: ☒ Ice    Ice status: ☒ Adequate   ☐ needs ice   ☐ added ice   Duplicate ☐   MS/MSD ☐

\* USGS gauging station at this location.

**Stream Flow (File name \_\_\_\_\_) Measurements by**

[illegible]

See page 12 for additional notes.

Team Leader Initials: JA

Station ID: VIL1Date: 6/3/15Location Description: upstream of spillway from East Lake @ old USGS gaugeAdverse Conditions (if applicable): ☐ Rain ☐ Wind ☐ Smoke ☐ Dust ☐ Temp. Extremes ☐ OtherStation observations: ☐ Industrial ☐ Commercial ☐ Residential ☐ Agricultural ☒ Other park w/ reservoir

Description	Latitude (DD)	Longitude (DD)	Accuracy (ft)	Initials
Sample location	33.56809	-86.72519	15	JWA

## Photograph Log Date and time is imprinted on photo.

Photo #	Location	Initials
1285	Description: <input checked="" type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	JWA
1286	Description: <input type="checkbox"/> facing upstream <input checked="" type="checkbox"/> facing downstream <input type="checkbox"/> other:	
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	

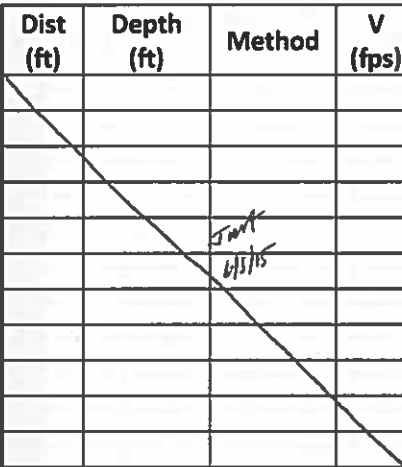
In-situ Water Quality (File Name NA) Collected by JWA

Time	Temp (°C)	Sp. cond (µS/cm)	pH (S.I. units)	Turbidity (NTU)	DO (mg/l)	Depth (ft)
15:06	21.68	390.6	8.07	NA	8.38	0.75

Sample Collection/Preservation (see page 2 for preservatives and sample containers) Collected by JWA

Sample ID	Sample Time	Media code	Pesticides (dieldrin)	Number of containers	Sample method
VIL1 -0615	15:00	SW	X	2	grab / direct fill
VIL1 D-0615		SW	X	2	grab / direct fill
Surface water sample description: <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Slightly Turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Odor Present <input type="checkbox"/> Other _____					
Sample Preservation: <input checked="" type="checkbox"/> Ice Ice status: <input checked="" type="checkbox"/> adequate <input type="checkbox"/> needs ice <input type="checkbox"/> added ice Duplicate <input checked="" type="checkbox"/> MS/MSD <input type="checkbox"/>					

Stream Flow (File name VIL1) Measurements by JWA

Current View (the home)				Measurements by								
Dist (ft)	Depth (ft)	Method	V (fps)	Dist (ft)	Depth (ft)	Method	V (fps)	Dist (ft)	Depth (ft)	Method	V (fps)	
6.2	0.95	0.60	0	17.3	1.65	0.60	0.22					
6.4	0.95		0.15	18.3	1.65		0.26					
6.9	1.00		0.22	19.3	1.65		0.23					
7.3	1.40		0.23	20.3	1.50		0.15					
8.3	1.50		0.28	21.3	1.40		0.07					
9.3	1.60		0.33	22.3	1.00		0.05					
10.3	1.60		0.35	23.3	0.80		0.03					
11.3	1.55		0.44	23.6	0.55	LEW	0					
12.3	1.50		0.45									
13.3	1.65		0.35									
14.3	1.65		0.33									
15.3	1.65		0.29									
16.3	1.70		0.27									
									Tot. Width (ft)		17.4	
									Total Q (cfs)		6.883	

See page \_\_\_\_ for additional notes.

Team Leader Initials: JWA

Date: \_\_\_\_\_

Adverse Conditions (if applicable): ☐ Rain ☐ Wind ☐ Smoke ☐ Dust ☐ Temp. Extremes ☐ Other \_\_\_\_\_

Description	Latitude (DD)	Longitude (DD)	Accuracy (ft)	Initials
Sample location				

Photo #	Location	Initials
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	

Time	Temp (°C)	Sp. cond (µS/cm)	pH (S.I. units)	Turbidity (NTU)	DO (mg/l)	Depth (ft)
			7.1			

Sample ID	Sample Time	Media code	Pesticides (dieldrin)	Number of containers	Sample method
-0615		SW			
D-0615		SW			

Surface water sample description: ☐ Clear ☐ Slightly Turbid ☐ Turbid ☐ Odor Present ☐ Other \_\_\_\_\_

Sample Preservation: ☐ Ice    Ice status: ☐ adequate ☐ needs ice ☐ added ice    Duplicate ☐    MS/MSD ☐

[illegible]

**Team Leader Initials:** \_\_\_\_\_

Date: \_\_\_\_\_

Adverse Conditions (if applicable): ☐ Rain ☐ Wind ☐ Smoke ☐ Dust ☐ Temp. Extremes ☐ Other \_\_\_\_\_

Station observations: ☐ Industrial ☐ Commercial ☐ Residential ☐ Agricultural ☐ Other

Description	Latitude (DD)	Longitude (DD)	Accuracy (ft)	Initials
Sample location				

Photo #	Location	Initials
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	
	Description: <input type="checkbox"/> facing upstream <input type="checkbox"/> facing downstream <input type="checkbox"/> other:	

Time	Temp (°C)	Sp. cond (µS/cm)	pH (S.I. units)	Turbidity (NTU)	DO (mg/l)	Depth (ft)

Sample ID	Sample Time	Media code	Pesticides (djeldrin)	Number of containers	Sample method
-0615		SW			
D-0615		SW			

Sample Preservation: ☐ Ice    Ice status: ☐ adequate ☐ needs ice ☐ added ice    Duplicate ☐    MS/MSD ☐

[illegible]

Team Leader Initials: \_\_\_\_\_

**Notes:**

VIL 4 - Discharge data was taken from the U.S. Geological Survey website.  
<http://waterdata.usgs.gov> USGS Station Number 02458600

On 6/3/15 @ 13:30 CDT staff height = 1.28 feet Discharge = 103 ft<sup>3</sup>/s

VIL 3 - On 6/3/15 @ 14:00 CDT Staff height = 2.22 ft Discharge = 37 ft<sup>3</sup>/s  
USGS Station number 02458450

VIL 2 - On 6/3/15 @ 14:30 CDT staff height = 0.31 ft Discharge = 21 ft<sup>3</sup>/s  
USGS Station number 02458300

SWA  
6/1/15

Team Leader Initials: SWA

Notes:

JWA  
elstr

Team Leader Initials: JWA

Notes:

JWH  
6/5/15

Team Leader Initials: JWH



Notes:

*Just*  
*6/5/15*

Team Leader Initials: *Just*

**End of Logbook**

## **End of Report**