South Branch Whitewater River

# **Unified Fish Kill Response**

2015









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# 1. EXECUTIVE SUMMARY

On July 30, 2015, an angler reported a fish kill on the South Branch Whitewater River near Altura, Minnesota, two days after a significant rainfall event in the Whitewater River Watershed. Dead fish were observed as far downstream as the Department of Natural Resources' Crystal Springs Fish Hatchery. Three state agencies (the Departments of Natural Resources and Agriculture, and the Pollution Control Agency) were notified and responded to the scene within hours. Agencies responded quickly and each took action according to its authority. The cause of this kill was not immediately apparent, prompting a technical working group with representation from all three agencies to work together on a joint investigation.

This report documents the information collected by the working group and provides the public with interpretations and conclusions related to the fish kill investigation. Technical experts in water quality, watershed management, feedlots, fisheries, and laboratory analyses worked together to explore possible causes of the kill throughout the investigation. Fish tissue, water, manure, soil, and bacteria samples were analyzed. No evidence points exclusively to insecticides, insecticide degradates, fungicides, illegal dumping, manure, or wastewater discharge as being responsible for the fish kill. Scientific analysis of available evidence was unable to draw a clear conclusion as to the cause of this fish kill, as a combination of biological, chemical, and environmental conditions may have led to this event. Often these lethal combinations are ephemeral and difficult to detect after the fact, even though agency response may have been quick. This report details the work done by the technical group and the processes used to make this determination.

# 2. PURPOSE

The primary purpose of this report is to document the extensive information collected as part of a multi-agency investigation and provide the public with interpretations and conclusions related to the investigation. This report presents information and data collected as part of a Unified Fish Kill Investigation conducted jointly by the Minnesota Department of Agriculture (MDA), Minnesota Department of Natural Resources (DNR) and the Minnesota Pollution Control Agency (MPCA) on the South Branch of the Whitewater River (SBWWR) near Altura, Minnesota (Figure 1-1). This investigation was conducted in response to a fish kill that occurred on July 28-29, 2015, following a rainfall event that covered much of southeastern Minnesota including the SBWWR Watershed. Information collected by each agency was integrated and compiled to provide a comprehensive review of the stream and watershed condition around the time of the fish kill. Additional background and historical data and information were compiled to provide context and aid in the interpretation of the data collected.

# 3. INTRODUCTION

### SOUTH BRANCH WHITEWATER RIVER WATERSHED OVERVIEW

The South Branch Whitewater River subwatershed stretches across eastern Olmsted County and western Winona County. The MPCA characterized the SBWWR watershed in the July 2013 Mississippi River (Winona) Watershed Monitoring and Assessment Report (MPCA, 2013):

"The watershed's land use is predominately agricultural at nearly 80% (49% cropland and 28% rangeland). In 1996, the South Branch supported roughly 110 feedlots producing a total of 700 tons of manure per day. As a result, the South Branch has the highest amount of manure per acre of cropland per year (6.6 tons/acre/year) when compared to other subwatersheds in the basin (Whitewater River Feedlot Analysis, 1996). In addition, 70% of the urban population of the Whitewater is located in the South Branch subwatershed in the rapidly growing communities of St. Charles, Dover and Eyota (Whitewater River Watershed Project, 2009). Thirteen percent of the watershed remains forested. The lower 12 mile AUID of the South Branch Whitewater is classified as a coldwater habitat while the upstream portion is classified as a warmwater habitat. The river begins northwest of Eyota and follows US Hwy 14 past Dover and St. Charles. From St. Charles the south branch flows northeast flowing through the 27,000 acre Whitewater State Wildlife Management Area. The river continues north merging with the North and Middle branches of the Whitewater in Elba. "

Several locations will be referenced throughout this report. Key locations are presented in Figure 1-1 and associated river mile distances are provided in Table 1-1.

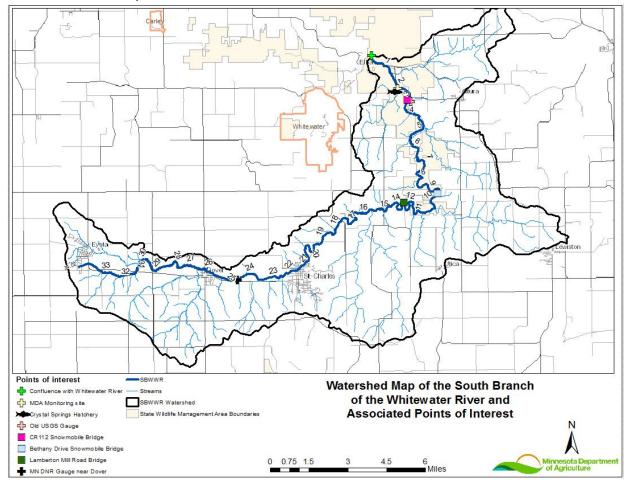


FIGURE 3-1. WATERSHED MAP OF THE SOUTH BRANCH WHITEWATER RIVER.

<b>TABLE 3.1</b> .	RIVER MILES LOCATIONS OF POINTS OF INTEREST IN THE SOUTH BRANCH WHITEWATER RIVER	
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Location	<b>River Mile</b>	Latitude	Longitude
Confluence with Whitewater River	0.0	44.0958	-92.0074
Crystal Springs Hatchery	2.5	44.0750	-91.9850
Snowmobile bridge, CR 112	3.1	44.0706	-91.9794
Old USGS Gauge 05376500	3.1	44.0706	-91.9794
Bethany Drive Snowmobile Bridge	9.7	44.0181	-91.9574
Lamberton Mill Road Bridge	13.0	44.0132	-91.9838
MN DNR Gage near Dover	24.7	44.0769	-91.9871

The SBWWR watershed is well-known for recreational activities throughout the year. The Whitewater Wildlife Management Area (WMA) and Whitewater State Park are large area attractions for tourists, hikers, and hunters. The affected stream reach is classified as a coldwater fishery, and is a popular area for trout angling.

The SBWWR has been included in several long-term fish and water monitoring projects. The DNR completes annual fish population surveys in the SBWWR to document fish populations. In addition, the SBWWR was included in MPCA's Minnesota Milestone River Monitoring Program to document water quality conditions over time. Finally, the MDA has conducted surface water pesticide monitoring of the SBWWR from 1992-2000, and from 2005 to the present. All of these activities provide context for the data collected during the investigation of the 2015 fish kill.

### **OVERVIEW OF FISH KILLS**

Fish kills are common in aquatic ecosystems and can result from a variety of causes. Potential causes range from spills associated with municipal waste, industrial, and agricultural waste to rapid temperature changes, increasing susceptibility to disease (Meyer and Barclay 1990). Anthropogenic sources are responsible for the majority of reported fish kills (La and Cooke, 2011), and the frequency and magnitude of kills are increasing (Fey et al., 2015). A review of North American fish kills in freshwater and estuary habitats from 1890-2006 found that agriculture-related contamination (19.5%), toxic plankton blooms (17.2%), and chemical pollution (7.1%) were the main causes of fish kills in the 170 reported cases (La and Cooke, 2011).

Compared to causes of reported fish kills in other Midwestern states, fish kills in Minnesota are more likely to be related to environmental conditions or fish health rather than agriculture or industry. Over a 10-year period, environmental conditions, disease, and chemicals (agricultural, industrial, and municipal) accounted for the majority of fish kills in Minnesota (33, 25, and 9% of fish kills, respectively; Bueno et al., *in prep*). In a thorough study of 20 fish kills in Iowa, 75% of fish kills were related to agriculture (IDNR, Wilton, 2002). Of 150 fish kills reported in Missouri from 2007-2011, 37% were due to environmental factors, 23% were due to municipal pollution, and 10% were due to agricultural pollution (MDC 2013). From 2005-2014, the Illinois DNR had information on 56 fish kills, with agriculture (32%) and industry (25%) accounting for the largest proportion of the kills (S. Shults, Illinois DNR, *unpublished data*). The reasons behind these patterns is not clear, but may be related to land use, as these states represent a gradient of agricultural land use from 51.1% (Minnesota) to 85.7% (Iowa) (USDA, <u>www.ers.usda.gov</u>).

Although the dominant causes of fish kills varies amongst these upper Midwestern states, the percentage of fish kills whose cause is unknown is more consistent. In Minnesota, 33% of fish kills were due to unknown causes or information was not available regarding the cause of the kill (Bueno et al., *in prep*). Unknown causes of fish kills in lowa, Illinois, and Missouri were 10, 15, and 18% respectively (IDNR 2002, MDC 2013, S. Shults, Illinois DNR, *unpublished data*), while a study of North American fish kills reported unknown causes to be 23% of all reported kills (La and Cooke 2001). The uncertainty of the cause of a fish kill is related to the nature of fish kills and the evidence associated with them, chemical and physical conditions in waterbodies changing rapidly, the consumption of dead fish by scavengers, and often a lag from the time of the kill to it being reported.

Not only is there uncertainty in the cause of a large percentage of fish kills, the actual frequency of fish kill events is unknown. An Australian study estimated that about 50% of fish kills in New South Wales are unreported (Koehn 2004), while Bueno et al. (*in prep*) estimated that up to 90% of fish kills in Minnesota may be unreported. Many kills are unreported or never witnessed at all because dead fish are rapidly consumed or the fish kill occurs in a remote area. That said, there has been an increase in public awareness of fish kills in the last two decades (La and Cooke, 2011).

### 4. BACKGROUND

### HYDROLOGY AND CLIMATE

### RAINFALL SUMMARY

Precipitation data are collected at several locations within the SBWWR watershed. Daily precipitation data has been collected at the National Weather Service (NWS) station identifier 210146: "Altura 5W" since 2003 (DNR, 2015). Daily precipitation values are presented in Figure 2-1 from this station located near the confluence of the SBWWR with the main stem Whitewater River. In addition, rainfall event data were obtained for the watershed from radar rainfall estimates on July 28, 2015.

Precipitation was frequent from April 1 through September 30, 2015, with precipitation recorded on 52% of the days (Figure 2-1). Rainfall during this period was 4.03 inches above the 30 year normal. Precipitation events were frequent but of lower intensity. As a result, surface runoff was infrequent and area streams did not experience a major flood event during this period in 2015. In general, streams in this area respond rapidly to runoff events due to the bedrock geology and topography.

On the morning of July 28, 2015, a thunderstorm produced approximately 1 to 2.5 inches of rain over an approximate three hour period in the SBWWR watershed. The largest rainfall totals occurred in the western portion of the watershed upstream of the DNR/MPCA cooperative stream gaging station (Station ID#40021001) near Dover, MN. Rainfall totals were lower in the northern and eastern portions of the SBWWR watershed. The heaviest rainfall occurred between 08:00 and 09:00 CST in the SBWWR watershed.

Radar estimated rainfall totals were obtained from the NWS (Figure 2-2). The radar estimates agree with local observations, and place the heaviest rainfall totals in the western portion of the watershed upstream of the Dover DNR/MPCA gaging station. Approximately 1.5 inches of rainfall was estimated in the eastern part of the watershed.

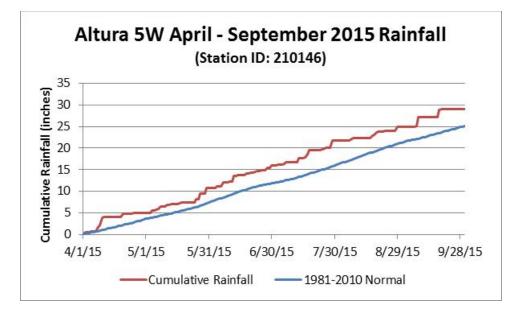


FIGURE 4-1. APRIL 1 THROUGH SEPTEMBER 30, 2015 CUMULATIVE RAINFALL.

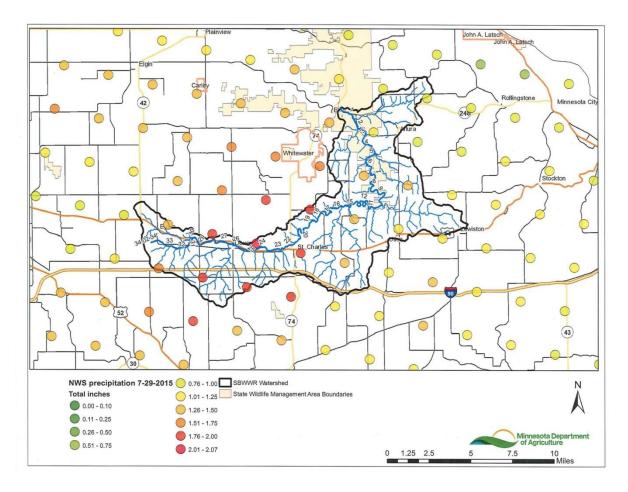


FIGURE 4-2. JULY 28, 2015 NATIONAL WEATHER SERVICE RADAR ESTIMATED RAINFALL TOTAL

### **RIVER DISCHARGE**

River discharge, or flow, is measured by the DNR near Dover, MN. This monitoring location has a period of record from May 6, 2011, to the present. The flow monitoring gage is approximately 22 miles upstream of the Crystal Springs Hatchery (CSH). The United States Geological Survey (USGS) operated a flow monitoring gage approximately 0.6 miles upstream of the CSH, from 1938 to 1971. The watershed gaged by the DNR/MPCA gage near Dover, MN, is 13,943 acres, and the watershed gaged by the USGS was 49,152 acres. In addition to the difference in watershed size, the watershed captured at the DNR/MPCA gage near Dover, MN, is located 1141.25 feet above sea level and the USGS gage near the CSH was located 761.8 feet above sea level. While the USGS historic data exists, no relationship was established between the current DNR/MPCA gage near Dover and the historic USGS gage near the CSH.

The DNR/MPCA gage near Dover, MN, was the only operating gage during the 2015 season in the SBWWR watershed. The data from the DNR/MPCA gage near Dover, MN, are presented for context; however, it is worth noting there are approximately 15 river miles between the instrument and the beginning of the confirmed dead fish zone. The provisional instantaneous river discharge from April 1 through September 30, 2015, from the DNR/MPCA gage near Dover, MN, is presented in Figure 2-3. Following a large event on April 10, 2015, the summer of 2015 was relatively uneventful. Runoff events on May 30, 2015, and July 28, 2015, were the only two discharge events exceeding 100 cubic feet per second.

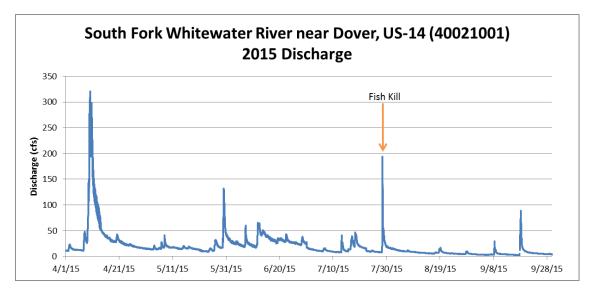


FIGURE 4-3. PROVISIONAL APRIL 1 THROUGH SEPTEMBER 30, 2015, DISCHARGE ON THE SBWWR NEAR DOVER, MN (40021001).

As discussed above, on the morning of July 28, 2015, a thunderstorm produced approximately 1 to 2.5 inches of rain over an approximate 3 hour period in the SBWWR watershed. Provisional event discharge at the DNR/MPCA gage near Dover, MN, is presented as Figure 2-4. The discharge prior to the event was below 10 cubic feet per second. The discharge began to increase around 09:00 CST, peaked at 194 cubic feet per second at 12:15 CST, and discharge had fallen to below 70 cubic feet per second by 15:45 CST. Peak stage at the DNR/MPCA gage near Dover, MN, was 14.69 feet, or about 2.5 feet above baseflow conditions prior to the event. It should be noted that the 2015 discharge data from the DNR/MPCA gage near Dover, MN, was provisional at the time this report was produced and subject to adjustment by the DNR when final review occurs.

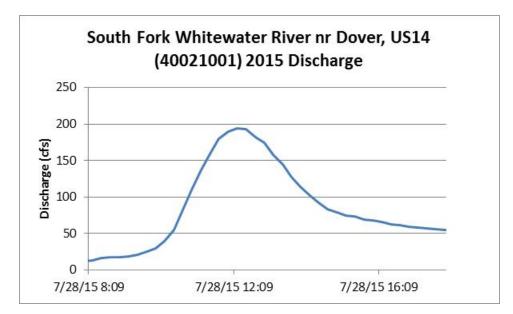


FIGURE 4-4. PROVISIONAL JULY 28, 2015 DISCHARGE ON THE SBWWR NEAR DOVER, MN (40021001).

As a part of their routine pesticide monitoring, MDA personnel visited the MDA monitoring site near the CSH on July 28 and July 29. These visits occurred prior to notification of the fish kill. The tape down water level measurement collected on July 28 at 12:45 CST was 13.23 feet while the measurement on July 29 at 14:28 CST was 13.27 feet. Between these two site visits, the river stage dropped 0.04 feet. Furthermore, duckweed was present along the upstream banks during the July 28 site visit, suggesting that there was no high flow event that occurred prior to this site visit (Figure 2-5). А transparency tube reading completed during the July 28 field visit measured 44.6 cm indicating a reduction in transparency with the rainfall earlier that day. No photographs were collected on the July 29 site visit.

There are only anecdotal observations from July 30, 2015, to estimate the change in water level and discharge near the Bethany Drive snowmobile bridge and the CSH. Field investigation notes estimated an increase of no more than 1 to 1.5 feet in the water level of this reach (Figure 2-6). Field investigation notes also indicate that there were no observable signs of runoff/flow coming out of dry runs and no evidence of grass pushed over along the stream indicating higher river levels.

Actual river discharge between the snowmobile bridge on Bethany Drive and the CSH on July 28, 2015, was not measured. Discharge data from the DNR/MPCA gage near Dover, MN, showed a large increase in discharge. However, it is unknown and unsupported by field notes that a large increase in discharge occurred downstream. The DNR/MPCA gage near Dover, MN, received the highest rainfall totals, and totals were reduced across the watersheds moving towards the confluence with the Whitewater River. There was a documented increase in flow; however, without a high water mark it is difficult to characterize this as a major runoff event.



FIGURE 4-5. PHOTOGRAPH LOOKING UPSTREAM OF BRIDGE NEAR THE CRYSTAL SPRINGS HATCHERY WHERE A SAMPLE WAS COLLECTED ON JULY 28, 2015 AT 13:25 CST. NOTE THE DUCKWEED PRESENT ALONG THE BANK AND SLIGHTLY TURBID WATER.



FIGURE 4-6. PHOTOGRAPH FROM AUGUST 4, 2015 SHOWING NO EVIDENCE OF HIGH WATER MARK IN THE FISH KILL ZONE ON JULY 28, 2015 EVENT.

### OVERVIEW OF AGENCY AUTHORITY AND RESPONSIBILITY:

This investigation was initiated when report #151973 was made to the Minnesota Duty Officer. The Minnesota Duty Officer notifies the County and DNR for every report of a fish kill. Further inquiry about possible causes of the kill leads the Minnesota Duty Officer to follow agency-established protocols to advise additional state agencies. If a cause is undetermined or unknown, the Minnesota Duty Officer will advise multiple agencies.

Upon receiving notice of the fish kill from the Minnesota Duty Officer from DNR personnel, multiple state agencies were contacted and responded to the scene. The investigation was managed by a multi-agency team that brought specific expertise to each component of the investigation. Each agency's general responsibilities are discussed below.

The Commissioner of Agriculture has sole regulatory authority over the terrestrial application of pesticides, including, but not limited to, the application of pesticides to agricultural crops, structures, and other nonaquatic environments (Minnesota Statutes 2015, 18B.03). Departmental authority to respond to and take corrective actions for agricultural chemical incidents, releases, or threatened releases falls to staff of the MDA's Pesticide & Fertilizer Management Division (Minn. Stat. 18D.1051, 2015). Trained agricultural chemical investigators are ready to deploy and able to conduct inspections following established procedures.

The Department of Natural Resources is tasked to preserve, protect, and propagate desirable species of wild animals as noted in Minn. Stat. 97A.045. In addition, Minn. Stat. 97A.025 recognizes that the ownership of the wild animals of the state is in the state in its sovereign capacity and that a person may not "destroy" a wild animal unless authorized under the game and fish laws. The agency has the authority provided in Minn. Stat. 97A.345 (2015) to assign a dollar value to the taking of wild animal species to pursue restitution for animals. Minnesota Rules 6133.0080, subpart 1 further clarifies the values assigned for fish species.

The Commissioner of Pollution Control has authority through MN Rule Ch. 7050.0210, subp. 13 (2015) to ensure general standards for waters of the state and prohibition of sewage, industrial waste or other wastes discharged from either a point or nonpoint source into the waters of the state in such quantity or in such manner alone or in combination with other substances as to cause pollution as defined by law. Investigation is authorized into the pollution of groundwater (MN Rule Ch. 7060.0500 (2015)) from sewage, industrial waste, or other wastes, as well as surface or subsurface discharges from animal feedlots and manure storage areas (MN Rule Ch. 7020.2003 (2015)).

The Minnesota Department of Health participated in the investigation as a laboratory resource according to its authority in Minn. Stat. 144.05, Subdivision 1 which states that the state commissioner of health shall have general authority as the state's official health agency and shall be responsible for the development and maintenance of an organized system of programs and services for protecting, maintaining, and improving the health of the citizens.

# 5. INVESTIGATION METHODS AND ACTIVITIES

### FIELD OBSERVATIONS

This section provides field observations that were collected prior to and during the fish kill investigation. Staff from the three state agencies responding to the fish kill (DNR, MPCA, and MDA) made numerous site visits stretching from the County Road 37 bridge near the CSH (River Mile (RM) 2.2) to the bridge on County Road 119 (RM 17.7). An inventory of field visits are provided in Table 3-1 and notes regarding each field visit are listed below.

Location / stretch	River Mile(s)	Agency	Date	Time (CST)	Purpose
MDA Monitoring Site	2.2	MDA	7/28/2015	12:45	Routine visit
MDA Monitoring Site	2.2	MDA	7/29/2015	14:28	Routine visit
Near Crystal Springs Fish Hatchery	2.2	DNR	7/30/2015	09:00-15:15	Investigation
Lanesboro Area Fisheries	na	DNR	7/30/2015	09:32	Report to Duty Officer
Kreidermacher's Campground	4.9	DNR	7/30/2015	13:00	Investigation
CR-119 Bridge	17.7	MPCA	7/30/2015	15:30	Investigation
Bethany Drive Access	n/a	MPCA	7/30/2015	16:20	Investigation
CR-112 Bridge	3.3	MDA	7/30/2015	16:45	Investigation
Kreidermacher's Campground	4.9	MPCA	7/30/2015	17:11	Investigation
Pesticide Investigation	na	MDA	7/31/2015	11:30-14:00	Investigation
Middle Branch of the Whitewater River	na	MDA	7/28 - 8/1/2015	08:47-07:47	Other – Supporting Investigation
Bethany Drive Access	9.7	DNR	8/3/2015	10:00	Investigation
St. Charles Municipal Wastewater Treatment Plant, and City of Utica Stabilization Pond	na	МРСА	8/3/2015	various	Investigation
Manure/Land application sites	na	MPCA	8/3 - 8/4/2015	various	Investigation
Pesticide Investigation	na	MDA	8/3/2015	08:00-15:00	Investigation
Pesticide Investigation	na	MDA	8/4 - 8/5/2015	08:25-16:27, 07:33-12:30	Investigation
Upstream of Bethany Drive Access	9.7	DNR	8/5/2015	10:00	Investigation
MDA Monitoring Site	2.2	MDA	8/6/2015	09:25	Routine visit / Investigation
Pesticide Investigation	na	MDA	8/6/2015	13:25-13:55	Investigation
Near Kreidermacher's Campground (Brown Foam)	6.3	MPCA	8/6/2015	14:30	Other – Supporting Investigation
Kreidermacher's Campground	5.3	MPCA	8/6 - 8/10/2015	14:40 - 09:55	Sonde Deployment
Bethany Drive Access	9.8	MPCA	8/6 - 8/10/2015	16:10 - 10:40	Sonde Deployment
Manure Investigation	na	MPCA	8/6/2015	16:00-19:30	Investigation
Manure Investigation	na	MPCA	8/7/2015	08:00-14:00	Investigation
Pesticide Investigation	na	MDA	8/7/2015	07:25-12:30	Investigation
MDA Monitoring Site	2.2	MDA	8/7/2015	07:13	Routine visit / Investigation

### SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: INVESTIGATION

Location / stretch	River Mile(s)	Agency	Date	Time (CST)	Purpose
Kreidermacher's Campground	4.9	MDA	8/7/2015	08:45	Investigation
Bethany Drive Snowmobile Bridge	9.8	MDA	8/7/2015	09:45	Investigation
Bethany Drive Ravine	9.8	MPCA	8/7/2015	10:45	Investigation
Crystal Springs Hatchery	2.2	MDA	8/11/2015	07:45	Routine visit / Investigation
Pesticide Investigation	na	MDA	8/11/2015	09:17-12:58	Investigation
Manure Investigation	na	MPCA	8/12/2015	07:30-09:00	Investigation
Pesticide Investigation	na	MDA	8/12/2015	13:48-14:05	Investigation
Pesticide Investigation	na	MDA	8/13/2015	09:02-16:33	Investigation
Pesticide Investigation	na	MDA	8/17/2015	08:32-13:28	Investigation
Ravine off Bethany Drive	9.8	MPCA	8/17/2015	18:30	Other – Supporting Investigation
Pesticide Investigation	na	MDA	8/18/2015	09:15-17:07	Investigation
Pesticide Investigation	na	MDA	8/19/2015	08:27-15:49	Investigation
MDA Monitoring Site	2.2	MDA	8/19/2015	08:33	Routine visit / Investigation
Downstream of Bethany Drive Bridge	9.4	MPCA	8/19/2015	11:30	Investigation
Upstream of Bethany Drive Bridge	9.9	MPCA	8/19/2015	11:40	Investigation
Kreidermacher's Campground	4.9	DNR	8/20/2015	na	Investigation
Pesticide Investigation	na	MDA	8/20/2015	08:27-08:54	Investigation
Pesticide Investigation	na	MDA	8/22/2015	14:24	Investigation
Pesticide Investigation	na	MDA	8/24/2015	10:34	Investigation
Kreidermacher's Campground	4.9	DNR	9/15/2015	10:00	Collect ambient Fish Tissue
Manure Sample collection	na	MPCA	10/6/2015	08:00-08:30	Investigation
Kreidermacher's Campground	4.9	DNR	10/20/2015	10:00	Fish population Estimate

### MDA MONITORING SITE, 7/28/2015 12:45(CST)

Following the early morning rainfall, MDA Monitoring and Assessment Unit staff collected routine water quality samples from the SBWWR as directed in the MDA Surface Water Design Document. This site visit was conducted prior to the reporting of a fish kill. The DNR/MPCA cooperative continuous stream monitoring gage located 23 river miles upstream showed an increase in stage of approximately 2.5 feet on July 28, 2015; however, SBWWR did not appear to have a large increase in stage from baseflow conditions. Sample SBW15006 was collected by MDA staff for routine gas chromatography with tandem mass spectrometry (GC-MS/MS) method pesticide analysis as well as nitrates and phosphorus analysis. This sample would later be analyzed for several additional pesticide and metal analytes. The sample was transported to the Rochester MDA field office and submitted for analysis to the MDA Laboratory Services (MDA Lab) on July 30, 2015.

A tape down measurement was completed during the site visit, with a measurement of 13.23 feet (stage = 36.77 feet). Although no velocity measurements were collected, the SBWWR appeared to have elevated velocity. Transparency tube reading was 44.6 cm, whereas baseflow transparency tube readings routinely exceed 60 cm. A



FIGURE 5-1 PHOTOGRAPH OF THE SBWWR COLLECTED DURING THE JULY 28, 2015 FIELD VISIT LOOKING UPSTREAM OF CR-37 BRIDGE.

moderate amount of small, floating plants, possibly duckweed, was observed at the bridge (Figure 3-1). Emergent vegetation was observed growing along the stream banks with all vegetation standing upright.

### MDA MONITORING SITE, 7/29/2015 14:28 (CST)

A field visit was completed to the SBWWR on Wednesday, July 29, 2015, to determine if the water level had increased. If it had, the stream would be resampled. This field visit was conducted prior to the reporting of the fish kill.

A tape down measurement was completed with a measurement of 13.27 feet (Stage = 36.73 feet), indicating a drop in stream level of 0.04 feet since the site visit on July 28, 14:28 (CST). Samples were not collected due to a lower stage than the previous day. Additionally, no transparency tube reading or photos were collected. Emergent vegetation was observed growing along the stream banks.

### NEAR CRYSTAL SPRINGS HATCHERY, 7/30/2015 9:00 -15:15 (CST)

On July 30, 2015, two groups of DNR Fisheries staff responded to reports of a fish kill in the SBWWR River at 09:00 and Lanesboro Area Fisheries at 11:30. They saw dead fish from the CSH upstream to Kreidermacher's property (Figure 3-16). They estimated that the fish had been dead from one to three days. They noted that the water was clear near the hatchery but became increasingly turbid as they investigated upstream. Cattle were observed immediately adjacent to the stream at the most upstream end of Kreidermacher's property, possibly causing or adding to the turbidity. The stream remained turbid to the Lamberton Mill Road bridge. It was noted that on the morning of July 28, 2015, 1.5 inches of rain fell in the area in a two-hour time period. They also noticed a large amount of senescent vegetation in the stream (Figure 3-2).



FIGURE 5-2. PHOTOGRAPH TAKEN OF THE SBWWR ON JULY 30, 2015 ON KREIDERMACHER'S PROPERTY, LOOKING DOWNSTREAM. NOTE THE TURBIDITY AND THE LARGE AMOUNTS OF SENESCENT VEGETATION IN THE STREAM.

Water samples were collected by both DNR field crews near the snowmobile bridge crossing the river at 10:00 and 15:15. CSH staff collected several dead fish of multiple species near the snowmobile bridge. DNR Lanesboro Area Fisheries staff collected all the fish they counted in two stations located on Kreidermacher's property. All samples were kept cool and in the dark until they were submitted for analysis at MDA (water) and DNR (fish). Fish collected by DNR Lanesboro Area Fisheries staff were packed in ice and delivered the following day to DNR in St. Paul. Fish collected by CSH staff were frozen, as they were held for several days at the CSH prior to delivery to DNR in St. Paul, where they were secured in the DNR evidence locker.

### KREIDERMACHER'S CAMPGROUND, 7/30/2015 13:00 (CST)

During a fish kill investigation, fish are sampled to evaluate the losses (number of fish, species affected, and economic costs) and to select specimens to obtain further evidence on the cause of the fish kill. Fish were quantified using the American Fisheries Society's method for narrow, completely accessible streams (Southwick and Loftus 2003). Briefly, representative stream reaches were chosen (Figure 3-3), where all dead fish in the reach were identified to species and enumerated. Game fish (brown trout, *Salmo trutta*, and rainbow trout, *Oncorhynchus mykiss*) were measured to the nearest millimeter (mm). White suckers (*Catostomus commersoni*) were also measured, as the stream is part of a DNR long-term monitoring project, and white sucker demographics are historically recorded.

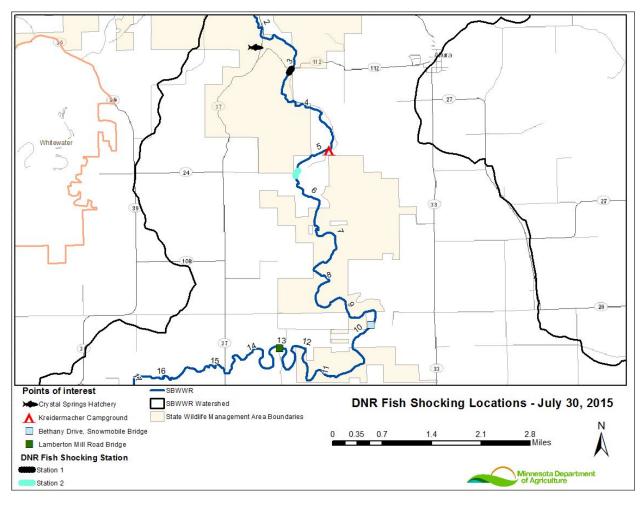


FIGURE 5-3. LOCATION OF ELECTROFISHING STATIONS IN THE SBWWR THAT WERE SAMPLED ON JULY 30, 2015.

### COUNTY ROAD 119 BRIDGE, 7/30/2015 15:30 (CST)

MPCA Emergency Response and Watershed staff responded to the report of the SBWWR fish kill and drove the watershed from the upstream areas near St. Charles to the clearly affected area at Kreidermacher's Campground. MPCA staff field-tested the water for dissolved oxygen and ammonia. MPCA staff also observed manure applications on fields along the ridge above the SBWWR at Bethany Drive.

### BETHANY DRIVE ACCESS, 7/30/2015 16:20 (CST)

Water samples were collected by MPCA and sent to the MDA lab for analysis.

### COUNTY ROAD 112 BRIDGE 7/30/2015 16:45 (CST)

MDA's Emergency Response staff visited the site to assess surface water quality and the work other agencies (MPCA and DNR) were already doing. Four 1-Liter water samples were collected at CSH, returned to St. Paul and checked into the MDA Lab the following day for agricultural chemical analysis.

### KREIDERMACHER'S CAMPGROUND 7/30/2015 17:11 (CST)

Water samples were collected by MPCA and sent to the MDA Lab for ammonia analysis.

### PESTICIDE APPLICATION INVESTIGATION, 7/31/15 11:30-14:00 (CST)

An MDA Agricultural Chemical Investigator (ACI) visited Progressive Ag/All American Cooperative in St. Charles, CHS Cooperative in St. Charles, and Benson Farm Service in Lewiston to obtain application records for pesticide applications in sections of Elba, St. Charles, and Norton Townships in Winona County from July 22-31, 2015. Aerial applications of Priaxor and Quilt Xcel were completed on properties in Elba Township. No known ground applications were conducted and there were no known issues with applications. The ACI also drove the area near Kreidermacher's Campground and observed corn fields close to the SBWWR.

### MIDDLE BRANCH OF THE WHITEWATER RIVER, 7/28/2015 08:47 - 8/1/2015 07:47 (CST)

A four-day equal time based composite sample was collected from the Middle Branch of the Whitewater River from July 28 through August 1, 2015. This sample is significant for several reasons. The Middle Branch of the Whitewater River is adjacent to SBWWR and has similar land use and topography. In addition, the Middle Branch of the Whitewater River did not experience a fish kill during the SBWWR fish kill and the water quality results can be compared to conditions in the SBWWR during the fish kill period. Finally, the composite sampling methodologies allows for a comparison of the grab sample concentrations compared to an equal time based composite sample.

Sample number MBW15019 was collected on August 3, 2015 from a refrigerated sampler. The composite sample collection period began shortly after the rainfall on July 28 2015, and continued for four days collecting 180 mL pulses of water every 60 minutes. The event on the Middle Branch of the Whitewater was of similar magnitude to the SBWWR with a temporary stage increase of less than 1 foot. The composite sample had a transparency of 20.4 cm.

### BETHANY DRIVE ACCESS, 8/3/2015 10:00 (CST)

DNR Lanesboro Area Fisheries staff returned to the field on August 3, 2015, upstream of Kreidermacher's property, but the water was still too turbid to make in-stream observations. The same staff were able to return to this location on August 5, 2015, and walked upstream.

### PESTICIDE INVESTIGATION 08/03/15 08:00-14:40 (CST)

An inspection was conducted by an MDA ACI with area property owners to gather pesticide application data, report sink holes, and collect a soil sample from the lowest point in the pasture near Kreidermacher's Campground. The property owners reported that the most recent pesticide application was completed in June, was applied in compliance with the 30 foot setback requirements, and contained only herbicides. In addition, the owners were not aware of any sink holes, misapplication, or any incidents that occurred on the property. A soil sample was collected from the southern portion of the pasture into a 500 mL amber glass bottle and identified as 08032015CDP001 (Figure 3-4). The sample and chain-of-custody form were submitted together to the MDA Lab via DNR staff on the day of collection. Additionally, DNR Wildlife personnel were contacted and it was noted that operators within the Whitewater WMA are not allowed to apply insecticides to cropped areas, but can apply herbicides and fungicides.

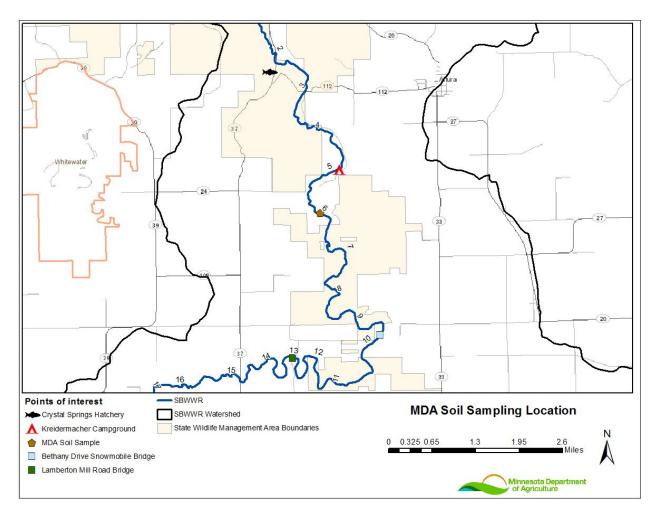


FIGURE 5-4. LOCATION OF SOIL SAMPLE THAT WAS COLLECTED DURING THE SBWWR FISH KILL INVESTIGATION.

### MANURE INVESTIGATION, 8/3/2015 AND 8/4/2015 VARIOUS TIMES

On August 3 and 4, 2015, MPCA Feedlot staff along with Emergency Response staff walked the manure land application sites identified previously by DNR. These sites were located in St. Charles Twp. (T106N. –R.10W), Sec. 2, NE QT, NE QT/QT and in St. Charles Twp. (T106N. –R.10W), Sec. 1, NW QT, NW QT/QT. Staff walked each land application field to their respective discharge points (field edges and surrounding wooded areas) and found no evidence of field runoff (matted vegetation, stained vegetation, etc.) or evidence of manure contaminated runoff from the fields (i.e. stained vegetation, puddled/ponded manure runoff, evidence of solids collecting in vegetation, etc.). The field investigation included review of a conservation runoff control pond. The pond did not show evidence of manure contamination or overflow.

### WASTEWATER INVESTIGATION, 8/3/2015

MPCA Wastewater staff contacted the two facilities in the watershed that may have or were discharging wastewater at the time of the reported SBWWR fish kill. MPCA Wastewater staff contacted Whitewater River Regional Wastewater Treatment Plant (continuous discharge) to determine if the plant was experiencing any problems at the plant and find out if QC parameters were acceptable. The plant was operating within limits and all operational parameters looked good. MPCA staff also contacted the city of Utica (stabilization ponds) to determine if the city was discharging wastewater from the ponds. No discharge was occurring at the time of the reported SBWWR fish kill.

### PESTICIDE INVESTIGATION, 8/4/2015 08:25-16:27 AND 8/5/2015 07:33-12:30

An MDA ACI visited Lewiston Feed and Produce in Lewiston and requested pesticide application records from sections within Elba, St. Charles, and Norton Townships from July 22-31, 2015. No pesticide applications were completed by Lewiston Feed and Produce during this period.

The ACI also visited the Lewiston Veterinary Clinic to inquire about reports from MPCA of sick dogs in the area. The Lewiston Veterinary Clinic stated they saw two dogs with dermatitis but none of the dogs had contact with the SBWWR.

### UPSTREAM OF BETHANY DRIVE ACCESS, 8/5/2015 10:00 (CST)

DNR Lanesboro Area Fisheries staff walked upstream from the Bethany Road access to Lamberton Mill Road to look for evidence of dead fish and sources of the kill. No dead fish were observed but about 20 dead crayfish were noted in the reach. Live fish and aquatic macroinvertebrates (mayflies (Ephemeroptera), crane flies (Tipulidae), caddisflies (Trichoptera), and black flies (Simuliidae)) were observed, as were live fish and frogs. The water color was stained, not the usual clear. There was abundant aquatic vegetation. In some pools, substrata were embedded in silt.

### MDA MONITORING SITE, 8/6/2015 09:25 (CST)

MDA collected routine water quality samples as directed in the MDA Surface Water Design Document. A tape down water level measurement was completed with a measurement of 13.61 feet (Stage = 36.39 feet), indicating a drop in stage since the July 28 site visit. The stream had a transparency tube reading greater than 60 cm; normal baseflow conditions will typically exceed 60 cm transparency tube reading. The bottom of the stream was clearly visible from the bridge. Numerous water striders and 2 or 3 live small fish were observed on the surface of the stream, both upstream and downstream of the bridge. A moderate amount of leaves were observed on the surface of the stream. A moderate amount of small, floating plants, possibly duckweed was observed at the bridge (Figure 3-5). Emergent vegetation was observed growing along the stream banks near the bridge.



FIGURE 5-5. PHOTOGRAPH OF THE SBWWR COLLECTED DURING THE AUGUST 6, 2015 FIELD VISIT LOOKING UPSTREAM OF CR-37 BRIDGE.

### BROWN FOAM AT KREIDERMACHER'S CAMPGROUND 8/6/2015 14:30 (CST)

MPCA collected a sample of "brown foam" near Kreidermacher's campground (Figure 3-6). The thick "brown foam" was collected in an area with a large amount of decomposing fish and was found floating on top of submerged aquatic vegetation that was at the surface. "Brown foam" was frequently observed on the river between Bethany Drive and Kreidermacher's Campground and is not something typically observed in cold water streams. Since this type of "foam" is not typically observed, a sample was collected in an effort to determine the source and/ or cause of the fish kill. This sample was analyzed for pesticides, nutrients, and several abiotic parameters.



FIGURE 5-6. PHOTOGRAPH OF THE "BROWN FOAM" COLLECTED NEAR KREIDERMACHER'S CAMPGROUND ON AUGUST 6, 2015.

# Sonde Deployment at Kreidermacher's Campground and Bethany Drive Access, 8/6/2015 14:40 (CST) and 16:10 (CST)

In anticipation of a significant amount of rainfall forecasted on August 7, 2015, two YSI sondes (Yellow Springs Instruments, Yellow Springs, OH) were deployed in the SBWWR on August 6 to capture a potential secondary flush of contaminants off the landscape (Figure 3-7 and 3-8). The sondes collected temperature, dissolved oxygen, conductivity and pH data in 15 minute intervals from the time of deployment on August 6 until the time of retrieval on August 10.

The first of two sondes were deployed in the SBWWR at Kriedermacher's Campground near Altura on August 6 at 14:40 (Figure 3-7). The sonde was deployed downstream of the riffle on the east bank. The second sonde was deployed at 16:10 downstream of Bethany Drive on the west bank by a large tree stump (Figure 3-8). The Kreidermacher's Campground and Bethany Drive sondes were retrieved on August 10, 2015, at 09:55 and August 10, 2015 at 10:40, respectively.



FIGURE 5-7. SONDE DEPLOYMENT AT KREIDERMACHER'S CAMPGROUND (TOP) AND AN UP-CLOSE PHOTO OF THE DEPLOYED SONDE (BOTTOM).



FIGURE 5-8. SONDE DEPLOYMENT DOWNSTREAM OF BETHANY DRIVE.

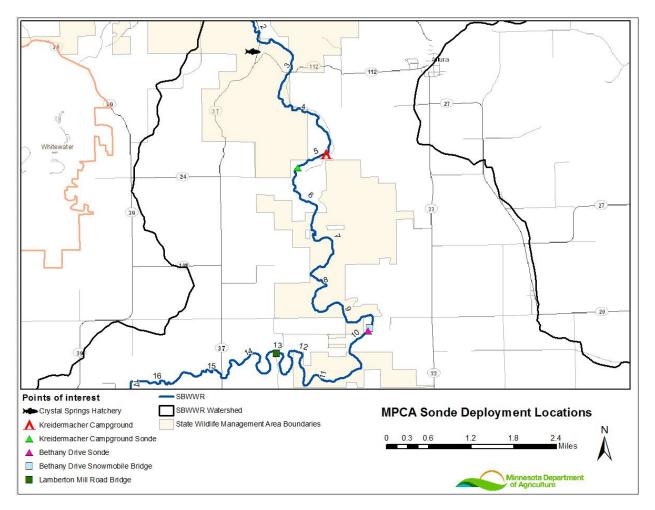


FIGURE 5-9. LOCATIONS OF MPCA SONDE DEPLOYMENT IN THE SBWWR.

### PESTICIDE INVESTIGATION, 8/6/2015 13:25-13:55 (CST)

An MDA ACI contacted or visited landowners in the SBWWR watershed.

### MANURE INVESTIGATION, 8/6/2015 16:00 - 19:30 (CST) and 8/7/2015 08:00 - 14:00 (CST)

On August 6, MPCA Feedlot staff and Watershed staff reviewed the land application site located in Utica Twp. (T106N. –R.9W), Sec. 6, NW QT., NE QT/QT (Figure 3-10). This field had been previously identified by MPCA Emergency Response staff and Watershed staff as having been recently harvested (field peas) and had recent manure applications (July 27 and 30). The field had been planted/seeded at the time of inspection on August 6. MPCA staff investigated the land application site, along with the steeply sloped and wooded ravines (discharge points) along the field's border. The discharge point along the western field boundary is located approximately 300 feet from the southwest corner of the field.

MPCA Feedlot staff also reviewed land application records for the manure land application site located in St. Charles Twp. The records indicated that manure was applied to the field areas starting on May 23 with continued applications on a daily/weekly basis up to the time of the fish kill event. Record information submitted indicated a couple field areas had been applied with two different application rates.

Both the application areas (St. Charles Section 2 and Utica Section 6) were reviewed by MPCA Feedlot staff for sensitive features/setback requirements within the application areas. Neither application area contained sensitive features requiring manure application setback requirements.

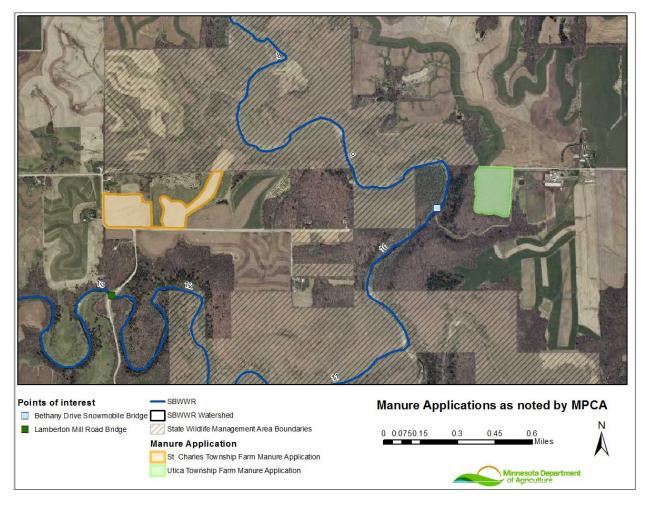


FIGURE 5-10. MANURE LAND APPLICATION SITES THAT HAD MANURE PITS SAMPLED AS A PART OF THE SBWWR INVESTIGATION.

### PESTICIDE INVESTIGATION 8/7/2015 07:25-12:30 (CST)

An ACI contacted landowners near the SBWWR and stated that they had not applied pesticides during the July 20-30, 2015 period. The last pesticide applications were herbicides on corn in June. Landowner additionally noted that he did not see any dead fish where his pasture meets the stream and the cattle on his property were "ok." One landowner noted that CHS Cooperative applied fungicide on 235 acres of corn a week or so ago but did not know the exact date.

The ACI visited CHS Cooperative and Progressive Ag/All American Cooperative in St. Charles and requested pesticide application records for sections of Elba and St. Charles Townships in Winona County from July 20-30, 2015. CHS Cooperative provided locations of ground and aerial applications and no application issues were known to have occurred. Progressive Ag/All American Cooperative provided application records and noted that applications were being conducted today in the Plainview area.

### MDA MONITORING SITE, 8/7/2015 07:13 (CST)

MDA staff collected water quality samples following light rainfall overnight to support the fish kill investigation. Samples were collected and analyzed for pesticides and nutrients. The MPCA/DNR stream gage near Dover, MN, recorded 0.23 inches of rain from 22:00 Thursday, August 6, 2015, to 6:30 on Friday, August 7, 2015. If runoff occurred overnight, additional pesticide samples were to be collected at Kreidermacher's Campground and Bethany Drive snowmobile bridge. No runoff occurred with the event, therefore pesticide samples were not collected at these locations but site visits occurred.

A tape down measurement was completed with a measurement of 13.60 feet (Stage = 36.40 feet), indicating a rise in stage (0.01 feet) since the site visit the previous day. The stream had a transparency tube reading greater than 60 cm. The bottom of the stream was visible from the bridge.

Noticeably fewer leaves were present on the surface of the stream compared to the previous day. A moderate amount of small, floating plants, possibly duckweed was observed at the bridge (Figure 3-11). Emergent vegetation was observed growing along the stream banks near the bridge.



FIGURE 5-11. PHOTOGRAPH OF THE SBWWR COLLECTED DURING THE AUGUST 7, 2015 FIELD VISIT LOOKING UPSTREAM OF CR-37 BRIDGE.

### KREIDERMACHER'S CAMPGROUND, 8/7/2015 08:45 (CST)

Approximately 5 to 10 dead, decomposing fish were observed along the slower reaches of the stream along the bank. Fish parts, including scales and tails, were observed 5 to 10 feet inland from the bank of the stream, suggesting an animal had been consuming fish. The water was clear and duckweed colonies were observed along a few stretches of stream bank (Figure 3-12). No water samples were collected during this site visit.



FIGURE 5-12. PHOTOGRAPH OF THE SBWWR COLLECTED ON AUGUST 7, 2015, LOOKING AT THE EAST BANK AT THE CAMPGROUND.

### BETHANY DRIVE SNOWMOBILE BRIDGE, 8/7/2015 09:45 (CST)

A visual site visit was conducted by MDA personnel at the Bethany Drive snowmobile bridge. The water appeared clear, with riffles downstream (Figure 3-13) and pools upstream. No water quality samples were collected during this visit.

### RAVINE OFF BETHANY DRIVE, 8/7/2015 10:45 (CST)

MPCA staff walked the ravine next to Bethany Drive to investigate evidence of potential sources. Approximately 800 feet upstream of where the ravine discharges into the SBWWR, a water quality sample was collected from a pooled area with approximately 30 gallons of water. This ravine is downstream of an agricultural field with recent manure applications. During the walk, MPCA staff noted that there were no observed signs of manure from the SBWWR to this point. Manure staining was observed from the sampling point including intermittent pool of manure to the township road. Additionally, there was a distinct manure smell during the walk up the ravine.

### PESTICIDE INVESTIGATION, 8/10/2015 08:24-13:13 (CST)

MDA's ACI visited Benson Farm Service and Lewiston Feed and Produce in Lewiston and requested pesticide application records for sections of Elba and St. Charles Townships in Winona County from July 20-30, 2015. No

### SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: INVESTIGATION

applications were made by Benson Farm Service or Lewiston Feed and Produce for the areas and timeframe requested.

### CRYSTAL SPRINGS HATCHERY, 8/11/2015 07:45 (CST)

On August 11, MDA staff collected pesticide and nitrate samples from the CSH at Spring #1. These samples were collected as part of MDA's routine groundwater sampling program. Water from the spring appeared normal. A field blank was also collected with the samples.



FIGURE 5-13. PHOTOGRAPH OF THE SBWWR COLLECTED ON AUGUST 7, 2015, LOOKING DOWNSTREAM FROM THE BETHANY DRIVE SNOWMOBILE BRIDGE.

### PESTICIDE INVESTIGATION, 8/11/2015 09:17-12:58 (CST)

The MDA ACI contacted an aerial application business which noted that pesticide applications in Minnesota started on or around July 20, 2015 and finished on August 7, 2015. Applications were made from Progressive Ag/All American Cooperative and Nerstrand Agri-Center.

### MANURE INVESTIGATION, 8/12/2015 7:30 – 09:00 (CST)

On August 12, MPCA Feedlot staff viewed cropped field areas located to the south of the fish kill area. Follow-up in this area noted three smaller feedlot operations. A small dairy had been making daily manure applications in a pasture located across from his building site (south side of Summit Drive/Utica Township 16). Application rates did not appear to be excessive and there were no signs of runoff. Based on information provided, the other two feedlots are small beef operations and do not actively apply manure during the summer months.

### PESTICIDE INVESTIGATION, 8/12/2015 13:48 – 14:05 (CST)

An MDA ACI contacted Progressive Ag/All American Cooperative and requested information about the location of mixing and loading for both ground and aerial application. Progressive Ag/All American Cooperative stated that the ground applications were mixed and loaded in the application area and the aerial applications were loaded in a flat area of the application area. The helicopter was loaded with a dry disconnect. Progressive Ag/All American Cooperative stated that were no issues or incidents with either the ground or aerial mixing and loading equipment.

An MDA ACI contacted CHS Cooperative, St. Charles and requested information about the location of mixing and loading for both ground and aerial application. CHS Cooperative stated that ground applications were mixed and loaded in the application area and the aerial applications were mixed/batched at CHS and pumped from the truck to the helicopter in the field with a dry disconnect. CHS Cooperative stated that were no issues or incidents with either the ground or aerial mixing and loading equipment.

### PESTICIDE INVESTIGATION, 8/13/2015 09:02-16:33 (CST)

The MDA ACI contacted several landowners to investigate if any pesticide applications had been made on their land by themselves or others on July 20-30, 2015. All landowners who were talked to said that no applications were made during the requested time period.

The ACI also contacted Paul Peterson Aviation and Midwest Ag Air to inquire about any aerial applications they made in St. Charles or Elba Townships. Paul Peterson Aviation stated they made applications north of the requested area, but not made any in the requested area and timeframe. Midwest Ag Air made no applications in the requested area and timeframe.

CHS cooperative confirmed that no spills or issues occurred with recent applications made by CHS cooperative.

### RAVINE OFF OF BETHANY DRIVE, 8/17/2015 18:30 (CST)

On August 6, the MPCA observed an orange substance (Figure 3-14) in the ravine that runs along the south side of Bethany Drive, where all of the dead fish were observed. The substance did not have an odor and was concentrated to an area halfway down the ravine. Discussion later from a witness saying the river looked orange the day of the fish kill led MPCA staff to investigate this orange substance further. On August 17, MPCA staff walked the top of the ravine to the bottom. The location of the orange substance was found halfway down the ravine, and was not observed anywhere else in the ravine. Grab samples were collected of the substance and analyzed for metals, ammonia, and a suite of hazardous chemicals. In addition to the orange substance, there was an oily sheen observed. This oily sheen appeared to have had an ice like layer at the surface. Approximately 20 feet up the ravine from the orange substance there was a junk pile of car parts that were well weathered and appeared to have been there for some time. After discussions between agencies, consensus on the orange substance was found to be iron oxidizing bacteria.



FIGURE 5-14. IRON OXIDIZING BACTERIA FROM A SPRING IN THE RAVINE THAT RUNS ALONG THE SOUTH SIDE OF BETHANY DRIVE.

### PESTICIDE INVESTIGATION, 8/17/2015 08:32-13:28 (CST)

The MDA ACI contacted several landowners to investigate if any pesticide applications had been made on their land by themselves or others on July 20-30, 2015. All landowners who were talked to said that no applications were made during the requested time period.

### PESTICIDE INVESTIGATION, 8/18/2015 09:15-17:07

An MDA ACI contacted a landowner in an attempt to confirm the SBWWR had turned an orange color on July 29, 2015. The first contact had not observed the SBWWR, however, provided contact information for another individual. The second contact was called and a message was left. The second contact returned the call with a message left for the MDA ACI.

An MDA ACI contacted a landowner and asked if any pesticide (herbicide/fungicide/insecticide) applications had occurred on his property by himself or others. The landowner stated that no applications were made in stated time frame.

### PESTICIDE INVESTIGATION, 8/19/2015 08:27-15:49

An MDA ACI made another attempt at contacting the second contact regarding the color of the SBWWR on July 29, 2015. A message was left, and a message was returned by the second contact.

### MDA MONITORING SITE, 8/19/2015 08:33 (CST)

Following rainfall the previous day, MDA staff collected routine water quality samples as directed in the MDA Surface Water Design Document. A tape down water level measurement was completed with a measurement of 13.56 feet (Stage = 36.44 feet). The stream had a transparency tube reading greater than 60 cm (Figure 3-15). The bottom of the stream was visible from the bridge; however water appeared more turbid than observed on the previous site visit (August 7, 2015).



FIGURE 5-15. PHOTOGRAPH OF THE SBWWR COLLECTED DURING THE AUGUST 19, 2015, FIELD VISIT LOOKING UPSTREAM OF CR-37 BRIDGE.

DOWNSTREAM OF BETHANY DRIVE BRIDGE, 8/19/2015 11:30 (CST) MPCA staff collect water samples downstream of Bethany Drive ravine entry into the SBWWR.

### UPSTREAM OF BETHANY DRIVE BRIDGE, 8/19/2015 11:40 (CST)

MPCA staff collect water samples upstream of Bethany Drive ravine entry into the SBWWR.

### PESTICIDE INVESTIGATION, 8/20/2015 08:27-08:54 (CST)

An MDA ACI contacted a landowner and asked if any pesticide (herbicide/fungicide/insecticide) applications had been made to his land by himself on July 20-30, 2015. The landowner stated he made no applications in the requested time frame; the only applications had been made by Progressive Ag/All American Cooperative. The ACI contacted a second landowner regarding pesticide applications, and the landowner provided the name of the operator of the rented land. The operator of the land stated that no pesticide applications were made to the property between July 20 and July 30, 2015. Two additional landowners were contacted regarding pesticide applicators between July 20 and July 30, 2015. Both landowners stated that no pesticide applications occurred in that period.

An MDA ACI connected with the individual, originally contacted on August 18 and 19, who noted a color change to the SBWWR on July 29, 2015. The individual stated that the color of the SBWWR was different on July 29, 2015 than what he typically observes on days following heavy rainfall. No additional or specific color details were provided.

### KREIDERMACHER'S CAMPGROUND, 8/20/2015

A DNR hydrologist from the Lake City area office followed up with a camper on Kreidermacher's property regarding a report that he had observed an unusual color to the SBWWR water on July 29, 2015. The hydrologist was requested to visit, as his line of questioning would be more informed based on his technical expertise. The citizen reported that the color was not a normal, brownish turbidity, but a light, clay-colored, slightly reddish. It caught his attention due to its uniqueness. The color was uniform and well mixed. He did not observe dead fish at that time.

### PESTICIDE INVESTIGATION, 8/22/2015 14:24 (CST)

An MDA ACI attempted to contact a landowner regarding pesticide applications.

### PESTICIDE INVESTIGATION, 8/24/2015, 10:34 (CST)

An MDA ACI connected with the landowner called on August 22, 2015 regarding pesticide applications on their property. The landowner stated that no pesticide applications were made in the noted time frame.

### UNIVERSITY OF MINNESOTA VETERINARY PATHOLOGY LABORATORY, 9/1/2015 12:00 (CST)

Fish collected by CSH staff had been frozen and were taken to the University of Minnesota Veterinary Pathology Laboratory for necropsy by Dr. Nicholas Phelps. Fish were examined both externally and internally.

### KREIDERMACHER'S CAMPGROUND, 9/15/2015 10:00 (CST)

DNR Lanesboro Area Fisheries staff returned to the SBWWR to collect trout and white suckers for background tissue analysis using electrofishers. Two brown trout and four white suckers were collected and hand delivered to the MDA Lab the following day.

### MANURE WASTE PIT SAMPLING, 10/7/2015 08:00-08:30 (CST)

Manure samples were collected from two manure waste pits on farms that had land application sites located near to the suspected start of the dead fish zone. The farm that applied manure on the Utica Township manure application area had a liquid manure sample collected, while the farm that applied manure on the St. Charles manure application site had two separate liquid manure samples collected from the waste pits.

### KREIDERMACHER'S CAMPGROUND, 10/20/2015 08:00 (CST)

DNR Fisheries has a long-term monitoring site on the SBWWR in the reach where the fish kill occurred. The fish community has been sampled annually since 1980. Since 1988, the stream has been sampled in the spring only. (During the first eight years the fish community was sampled semi-annually, in both spring and fall.) Fish are collected by electrofishing, using a barge electrofisher, anesthetized using MS-222, and measured to nearest millimeter. Trout were weighed to the nearest gram.

### ANALYTE OVERVIEW

This section of the report will review possible fish kill causes. It is intended to provide general background information for each of the various candidate causes that were evaluated. Each subsection contains the following information: the candidate cause, the reason for inclusion as a candidate cause, sources within the watershed, and toxicity information. Actual water quality laboratory results will be presented in "Findings and Results".

### PESTICIDES

A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest including insects, weeds, and plant diseases. Pesticides can be used to control a variety of pests, such as insects, weeds, rats and mice, bacteria and mold, and more. Fish kills can result from use of pesticides when toxic pesticides end up in water bodies through spray drift, improper application, pesticide overuse, spills, leaking storage tanks, rainwater runoff from over-treated areas, and improper disposal of pesticides, etc. In order to potentially cause a fish kill in a water body, a recently applied pesticide must make its way to the water body in a concentration that is considered to be toxic to fish. The MDA Lab analyzed for 137 different pesticides using Gas chromatography with tandem mass spectrometry (GC-MS/MS) and liquid chromatography with tandem mass spectrometry methods (LC-MS/MS) as part of the investigation, which includes commonly applied pesticides within its analyte list. A complete list of analytes is provided in Appendix A.

The MDA investigations found that the fungicide product "Priaxor" was applied in the agricultural fields around the river stream where the fish kill incidence occurred, and was considered the most probable pesticide to potentially affect aquatic systems at the time of the fish kill in the SBWWR. Priaxor is comprised of two fungicide active ingredients: fluxapyroxad (14.33%) and pyraclostrobin (28.58%). Fluxapyroxad is a second generation pyridine carboxamide fungicide. It is marketed as a standalone product (examples such as Imbrex and Sercadis) as well as in combination with other fungicides such as pyraclostrobin (examples such as Merivon, Priaxor, Lexicon and Xemium). Pyraclostrobin is a translaminar strobilurin fungicide. It is marketed as standalone products (examples such as Merivon, Priaxor, Lexicon and Xemium). Pyraclostrobin is a translaminar strobilurin fungicide is such as standalone products (examples such as Insignia and Headline) and also in combination with other fungicides such as fluxapyroxad (examples such as Merivon, Priaxor, Lexicon and Xemium).

Minnesota does not have water quality standards for fluxapyroxad or pyraclostrobin; however, the USEPA provides aquatic life benchmark values for these compounds (Table 3.3). Aquatic life benchmarks are USEPA-developed reference values below which pesticides are not expected to harm aquatic life such as fish or invertebrates. Acute values are developed for a short term exposure; chronic values are developed for a longer term exposure. As a result, the acute concentrations are often times higher than the chronic values given the short exposure time.

	Fluxapyroxad (ng/L)	Pyraclostrobin (ng/L)
Aquatic life benchmark fish, acute	na	3,100
Aquatic life benchmark fish,	na	2,350
chronic		
Aquatic life benchmark	na	7,850
invertebrate, acute		
Aquatic life benchmark	na	4,000
invertebrate, chronic		
TGAI* LC <sub>50</sub> **, carp	290,000	na
TGAI* LC <sub>50</sub> **, rainbow trout	na	6,200
NOAEC***, acute on carp	22,000	na
NOAEC***, chronic on rainbow	na	2,300
trout		
Toxicity to freshwater fish on an	Highly	Very Highly
acute exposure basis		
Photolysis degradation half life	> 1 year	< 2 hours
Aerobic aquatic medium half life	> 1 year	River = 8.4 days
		Pond = 26.4 days
Anaerobic aquatic medium half life	> 1 year	1.91 to 6.91 days
Major degradate and toxicity	3-(difluoro-methyl)- 1-methyl-1H-	BF500-3, similar toxicity to
compared to parent	pyrazole-4-carboxylic acid, much	pyraclostrobin
	lower toxicity than fluxapyroxad	

#### SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: INVESTIGATION

TABLE 5.2. FLUXAPYROXAD AND PYRACLOSTROBIN USEPA AQUATIC LIFE BENCHMARK REFERENCE VALUES AND CHEMICAL PROPERTIES.

\*Technical grade active ingredient

\*\* LC<sub>50</sub> is the dose required to kill half the members of a tested population after a specified test duration

\*\*\* No observable affect concentration

Source: USEPA 2013; USEPA, 2014; USEPA, 2015.

Herbicides allow rapid crop canopy development without the pressure of undesirable plant species. Herbicides and herbicide degradates are the most commonly detected class of pesticides in Minnesota waters (MDA, 2015); however, herbicide concentrations above the applicable water quality reference values are rare. In agricultural applications, most herbicide applications are completed in May and June. As a result of application timing, herbicide detections in Minnesota surface waters are very seasonal. The highest concentrations observed in Minnesota surface waters tend to occur with large rain events in May and June shortly after herbicide applications. Detection frequency and concentrations are generally much lower through the rest of the year.

#### MANURE RELATED COMPONENTS (AMMONIA, DISSOLVED OXYGEN, AND/OR HEAVY METALS)

Manure was identified as a candidate cause of the SBWWR fish kill on July 28, 2015, because of recently land applied manure acres adjacent to the kill site (Figure 3-10). Manure has the capability to kill fish (and other aquatic life) because of potentially high concentrations of ammonia and/or heavy metals, and/or elevated Biological Oxygen Demand (BOD) levels that rob the water of dissolved oxygen.

Ammonia is toxic to fish and can be lethal at low levels. The specific toxicity of ammonia in manure depends upon the pH of the manure and the water temperature, pH and dissolved oxygen levels of the receiving waters. The pH

of the manure can change the water pH, shocking the fish fatally. Additionally, a direct shock of ammonia can fatally burn the gills and respiratory systems of fish.

Heavy metals are common in manure as a result of livestock feed supplements and animal health products. Copper and aluminum are heavy metals that are a primary concern for aquatic life in streams due to high toxicity. Heavy metal concentrations in manure are known to be much higher than natural stream conditions; however, proper land application limits the risk of manure movement into surface waters. Among the heavy metals, copper was investigated as a potential cause due to the use of copper sulfate in the dairy industry. Its primary purpose is for foot/hoof health, in particular treating and controlling hairy warts and hoof rot. Most common methods for treatment application to livestock include direct application when hoof trimming occurs and in foot baths that the livestock walk through. Frequency of treatment will vary from farm to farm depending on foot/hoof health issues, but typically foot bath treatments are administered at least one to two times per month. Waste product and water from foot bath use is generally disposed of with the manure generated on the farms. In general this means disposing of the waste into a liquid manure storage area until the manure is land applied.

The organic matter in manure is associated with high BOD levels, that can lead to low dissolved oxygen levels in the receiving waters, which in turn can have lethal effects on aquatic life, including fish. Dissolved oxygen levels are depleted during the decomposition process as micro-organisms break down organic matter while using up available oxygen.

As part of the investigation, ammonia and BOD levels in water samples were measured. In addition, heavy metals were analyzed in water, manure, and fish samples. For a complete list of analytes, please refer to Appendix A.

## UNKNOWN COMPOUND SCREENING

There is a possibility that the cause of the fish kill was a single, extraordinary event. An unpredictable action, such as the illegal dumping of an unknown substance into the SBWWR or a tributary, cannot be dismissed as a candidate cause. Unfortunately, an unexpected situation is an extremely difficult scenario to investigate and to conclusively determine as the cause of the kill.

It is not feasible to enter an investigation and account for all possible chemical classes that may have contributed to the fish kill. Analytical procedures require target analytes. The MPCA contracts with the Minnesota Department of Health (MDH) Laboratory for sample analysis. For this investigation, the MDH laboratory performed an unknown compound screening on a water sample that looked for a wide range of chemicals. A complete analyte list is available in Appendix A.

## METHODOLOGY AND ANALYSIS

#### FISH KILL DICHOTOMOUS KEY

There are several dichotomous keys published that, using information from the investigation, can be used to assist in determining the cause of a fish kill. A dichotomous key is provided in Appendix B (Meyer and Barclay, 1990).

## FISH COMMUNITY

Dead fish were enumerated using standard methodology for narrow, completely accessible streams (Southwick and Lofton, 2003). The live fish community was sampled by electrofishing. In both cases, fish were measured to the nearest millimeter. Live fish were anesthetized using MS-222 prior to length measurements, and trout were weighed to the nearest gram. Anesthetized fish were allowed to recover in a container containing fresh water and then transferred to a holding pen in the stream prior to being released.

## **FISH TISSUE**

Trout and white suckers were examined both externally and internally during necropsy. Trout gill tissue was removed, cleared with formaldehyde, mounted on a slide, and inspected under 40-200x magnification. Gill tissue was also examined using microscopy prior to clearing with formaldehyde.

Fish tissue samples analyzed in August 2015 were ground and combined into a single composite sample for metal and fungicide laboratory analysis. Fish species included brown trout, rainbow trout, and white sucker. Samples were analyzed with livers included. The whole fish tissues samples that were analyzed in September 2015 were analyzed for individual species with the livers removed, and livers and whole body tissues were analyzed as separate samples by species (n=3 whole fish and n=3 liver samples) for metals and pesticides. Laboratory method reporting limits can be found in Appendix A and information regarding sample collection can be found in Appendix C.

The MDA searched for reference data for metals in fish tissues to help determine a typical, or expected, range of metals in fish. The USEPA Storage and Retrieval (STORET) database was queried for metal concentrations in fish. The search was limited to Minnesota and surrounding states including North Dakota, South Dakota, Iowa, and Wisconsin. Most of the available data originated in North Dakota, and no data were available from Minnesota. The data were further filtered by fish species and metal concentration data were obtained for white suckers and several species of trout including brown trout, brook trout, and rainbow trout. The USEPA STORET database results contained several sample types including fish fillet (both skin on and skin off), liver, muscle tissue, and whole organism. The majority of the data had a sample type of whole organism. All sample types were included in the data analysis for the whole fish statistic for all analytes except copper, which was further investigated due to concerns of copper sulfate as a possible fish kill cause. Finally, there were no data available in the USEPA STORET database for sulfur, sulfate or titanium in fish.

#### WATER SAMPLING

In an attempt to identify the cause of the fish kill, in-stream water samples were collected from the SBWWR upon receiving notice of the fish kill. Agency staff from the DNR, MPCA, and MDA collected water samples at multiple locations (Figure 3-16 and Table 3-4) on the SBWWR. In addition to the samples collected with this investigation, the MDA's routine pesticide monitoring program has collected pesticide samples in the SBWWR near the CSH (County Road 37) for several years to determine pesticide occurrence and concentration from routine use. Also, MDA routinely monitors for pesticides in Spring #1 at CSH. Information on sample collection will be presented in this section. All samples were collected following agency standard operating procedures.

Sample collection after July 30, 2015, was coordinated via conference calls between representatives from the DNR, MPCA, and MDA. This coordination ensured adequate sampling, limited duplication of activities, and allowed for the proper agency with statutory authority to lead those efforts.

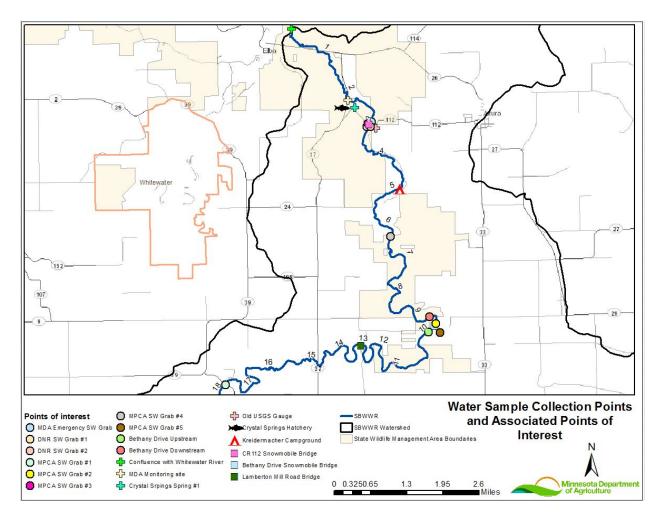


FIGURE 5-16. MAP OF WATER SAMPLE COLLECTION POINTS.

Location	River Mile	Latitude	Longitude
Confluence with Whitewater River	0.0	44.0958	-92.0074
CR-37 near Crystal Springs (MDA monitoring site)	2.2	44.0768	-91.9875
Crystal Springs Hatchery	2.5	44.0750	-91.9850
Crystal Springs Spring #1	2.5	44.0750	-91.9850
DNR SW Grab #1	2.8	44.0708	-91.9791
DNR SW Grab #2	3.1	44.0708	-91.9791
MDA Emergency SW Grab	3.1	44.0706	-91.9794
MPCA SW Grab #3	3.1	44.0038	-91.9794
Kreidermacher Campground	4.9	44.0538	-91.9850
MPCA SW Grab #4	6.3	44.0414	-91.9728
MPCA SW Grab #2	9.7	44.0180	-91.9574
Bethany Drive Downstream	9.4	44.0205	-91.9588
Bethany Drive Snowmobile Bridge	9.7	44.0181	-91.9574
MPCA SW Grab #5	9.8	44.0163	-91.9553
Bethany Drive Upstream	9.9	44.0170	-91.9585
Lamberton Mill Road Bridge	13.0	44.0132	-91.9838
MPCA SW Grab #1	17.7	44.0035	-92.0329
DNR/MPCA Gage near Dover	24.7	44.0769	-91.9871

TABLE 5.3. LOCATIONS OF WATER SAMPLE COLLECTION POINTS AND OTHER ASSOCIATED POINTS OF INTEREST.

Water samples were analyzed for nutrients, sediment, metals, and pesticides. Nutrient and sediment analyses were completed at both the MDA Laboratory and MDH Laboratory (Appendix E). Metals, including copper and aluminum, were analyzed at the MDH Laboratory (Appendix E). Pesticides, including the fungicides pyraclostrobin and fluxapyroxad, were analyzed at the MDA Laboratory for 136 pesticide compounds (Appendix E). Additionally, several samples had abiotic river parameters analyzed (Appendix C). The readings for the various parameters were either collected on site using field monitoring equipment or analyzed at the MDH Laboratory.

Sample collection information for all samples is presented in Appendix D. Sample information is sorted by collection date and time. All samples were collected as discrete grab samples. The collection method is provided, and all samples were refrigerated after collection. All samples were submitted to the MDA Laboratory at the highest priority level to expedite analysis and reporting. Samples collected as part of MDA's routine groundwater and surface water program are presented with samples collected during the fish kill investigation. Samples collected prior to and after the fish kill in 2015 provide ambient conditions in the SBWWR.

Several samples in Appendix C are noted as "Other-Supporting Investigation." These samples were water samples that were collected outside the SBWWR or collected from an unknown substance in the SBWWR. These samples included the an unknown sample of "Brown foam," a sample collected in a pooled area in a ravine adjacent to the SBWWR and from an area downstream of an agricultural field with recent manure applications. These samples should only be used for reference and should not be compared to the water quality reference values or the in-stream concentrations as they were not collected in-stream.

For sample quality assurance, one set of field replicates and two field blanks were submitted for pesticide analysis. Additionally, both the MDA and MDH performed additional quality assurance/quality control samples in the laboratory.

In addition to the samples collected in the SBWWR, MDA operates a fully automated water quality station on the Middle Branch of the Whitewater River. The Middle Branch of the Whitewater River is an adjacent watershed with similar land use activities. An equal time based composite sample began sampling after the rainfall on July 28. This sample collected water from July 28, 2015, through August 1, 2015, and provides context for the grab samples collected during the investigation as well as provides water quality conditions in a stream that did not experience a fish kill.

Historic data collected at the Lamberton Mill Road Bridge, approximately three miles upstream of Bethany Drive, were used to provide context for the samples collected as a part of the fish kill investigation. Water quality data for metals were collected from 1974-2008 through the MPCA Milestone Monitoring Program. Nutrient, sediment and abiotic river parameters were collected from 1974-2012 in the SBWWR through various MPCA projects including the Minnesota Milestone Monitoring Program, Stream Monitoring Project, Whitewater Watershed Stressor Identification and the Lower Mississippi River Basin Long Term Monitoring Project. The applicable data are displayed on the figures in the "Results" section.

Although the MDA has a long pesticide monitoring history in the SBWWR, the fungicide active ingredients that were initially targeted as potential causes of the fish kill due to the recent applications, fluxapyroxad and pyraclostrobin, had not been analyzed in the SBWWR prior to the sample collected on July 28, 2015 during the fish kill. Pesticide data were summarized into collection period sub-categories (Appendix C). These categories were established to provide the range of pesticide concentrations in the samples in different collection periods, and to provide context for detections during the fish kill period. In-stream samples from the SBWWR are grouped into three categories: Pre-Fish Kill, Fish Kill Period, and Post Fish Kill; Four categories are presented for those samples.

All pesticide samples collected in the SBWWR prior to the fish kill were analyzed with only the GC-MS/MS analytical method as defined in the 2015 MDA Surface Water Workplan. The "Fish Kill" Period and the "Post-Fish Kill" period had both the GC-MS/MS and LC-MS/MS pesticide analytical methods performed.

Pesticide results were further analyzed by pesticide type, including: fungicides and fungicide degradates, herbicides and herbicide degradates, and insecticides. Only detected compounds have been summarized. Non-detections, or samples where the analyte was not detected or below the method reporting limit, are presented as "< (MRL value)" in the tables. Finally, concentration ranges of each detected compound is presented for each collection period subcategory.

Nutrient, sediment, and abiotic river parameter data were summarized into collection period sub-categories (Appendix C). These categories were established to provide the range of pesticide concentrations in the streams in different collection periods and to provide context for detections during the fish kill period. Five categories are presented with a single sample result: Hatchery Spring Pre-Fish Kill, Hatchery Spring Post-Fish Kill, Other – Brown Foam, Other – Ravine, and Other – Adjacent Watershed. In-stream samples from the SBWWR are grouped into three categories: Pre-Fish Kill, Fish Kill Period, and Post-Fish Kill. These data are presented as the minimum and maximum values that were observed during each specified collection time period and were collected in the SBWWR in 2015.

## SOIL SAMPLING

A soil sample location was determined and documented (*i.e.*, measured, flagged, and photographed). One soil sample was collected according to the Federal Insecticide Fungicide Rodenticide Act Manual – Chapter 7 Residue and Environmental Sampling, pgs. 1-27 which mirrors the MDA Standard Operating Procedures – section Misuse, Appendix C Sampling Manual for soil sample collection. The sample was collected into a 500 mL amber glass bottle and submitted to the MDA Laboratory Services for analysis.

## MANURE SAMPLING

The feedlot owners collected manure samples from their own liquid manure storage areas located at their feedlot when the manure was being pumped and land applied. The manure samples were obtained as follows: manure was agitated, multiple samples were collected, combined and then re-sampled to obtain the final manure sample. The manure samples were then frozen and kept at the farms until they were collected by MPCA staff. The samples remained frozen until they were collected by MPCA staff, bagged, lab sheets filled out and sent via courier to the MDH Lab for analysis. The manure samples were analyzed for general nutrient content and heavy metals including copper.

# 6. FINDINGS AND RESULTS

The following section provides in-depth information on the different components that were investigated as possible causes for the fish kill on the SBWWR.

# SPATIAL EXTENT AND TIMING OF THE FISH KILL

Dead fish were found in the SBWWR from the County Road 112 bridge (RM 3.1) upstream to the access point on Bethany Drive (RM 9.8; Figure 4-1). The spatial extent of the fish kill is uncertain for several reasons. Dead fish can move downstream with the stream current, and scavenging animals can relocate fish carcasses. For purposes of this investigation the areal extent defined above was the focus since no dead fish were found upstream of the Bethany Drive access. In addition, the three miles upstream of the "dead fish zone" (RM 6.8-9.8) were identified as the "potential fish kill zone." Defining these areas provided a more focused investigation into the potential sources of the fish kill.

The fish kill was reported to the Minnesota Duty Officer on the morning of July 30, 2015, however fishermen later indicated that dead fish were observed on the afternoon/evening of July 29. Fish collected by CSH staff on July 30 were reported to be in various stages of decomposition and estimated to have been dead one to three days. Based on the evidence collected and available reports it is likely that the fish kill occurred sometime between the morning of July 28 (following the rainfall event) and the evening/night of July 29, 2015.

In the area of the fish kill, the SBWWR is surrounded by the Whitewater WMA and is heavily forested with steep bluffs on both sides. Adjacent agricultural lands typically drain to the SBWWR through a network of ravines, springs and small streams. It is likely that the source of the fish kill originated from one of the tributary ravines located near the upper extent of the fish kill defined above.

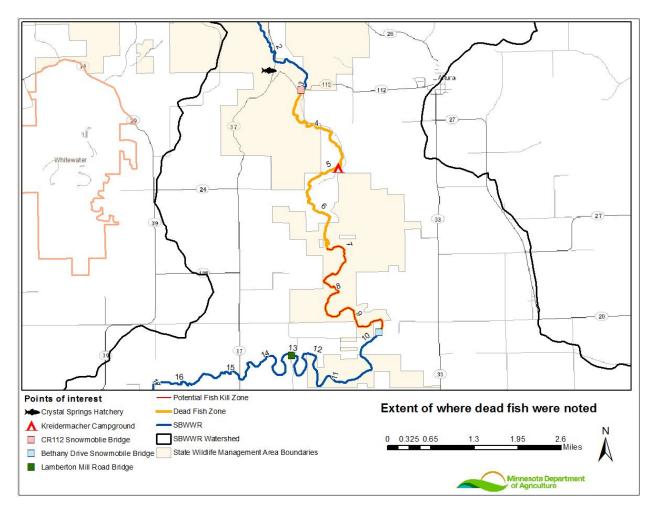


FIGURE 6-1. MAP OF THE SBWWR, WEST OF ALTURA, MN. THE EXTENT OF THE STREAM WHERE DEAD FISH WERE NOTED BY THE ORANGE COLORED "DEAD FISH ZONE" WHICH EXTENDS FROM THE BETHANY DRIVE SNOWMOBILE BRIDGE DOWNSTREAM TO THE CRYSTAL SPRINGS FISH HATCHERY.

A Geographic Information System (GIS) analysis was conducted to delineate the sub-watersheds in the area of the fish kill and assess possible source contribution areas. Subwatersheds or subbasins were identified using the GIS NRCS engineering toolbox for delineating watersheds and a three meter digital elevation model (DEM). Ten subbasins were identified that discharge just upstream or within the potential fish kill zone (Figure 4-2). Subbasins one through three discharge upstream of the suspected fish kill while subbasins four through ten discharge directly into the potential fish kill zone.

#### SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: RESULTS

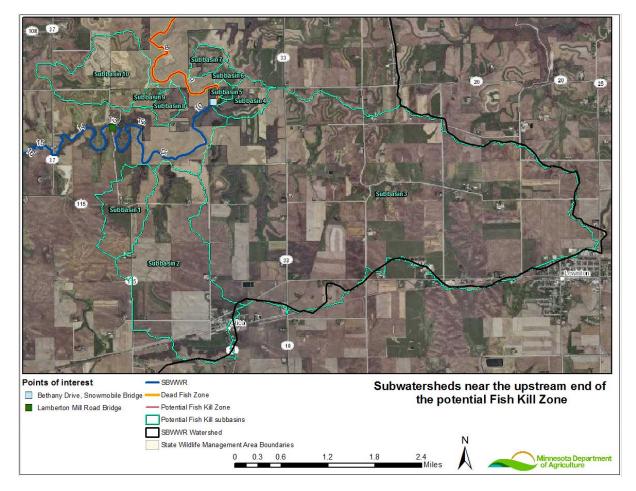


FIGURE 6-2. SUBWATERSHED DELINEATION NEAR THE UPSTREAM END OF THE POTENTIAL FISH KILL ZONE.

A Stream Power Index (SPI) assessment was conducted using digital elevation data to determine probable runoff pathways in the fish kill area (Figures 4-3 and 4-4). SPI is a calculation that provides a general indication of how erosive an area might be due to topography and the amount of land that drains into each specific area. This analysis does not use rainfall to calculate the amount of water that passes a given point based on landuse activities. Analysis showed that ravines had the highest SPI values and these areas are located within the bluff areas draining down to the SBWWR (Figures 4-3 and 4-4). Of the subbasins identified, subbasins 5 and 9 have a particularly short draw from agricultural production fields through steep ravines and directly into the SBWWR.

Although the SPI does not directly calculate the amount of water, it should be noted that fallow lands are more susceptible to overland runoff than areas with a full crop canopy or vegetation present. In this investigation, fungicides were applied to crops that were well established with full crop canopy which greatly reduces the risk of overland runoff from rainfall events. Manure was applied to fallow land that was recently harvested and had very little crop residue present on the field. The lack of crop residue greatly increases the risk of overland runoff from rainfall events.

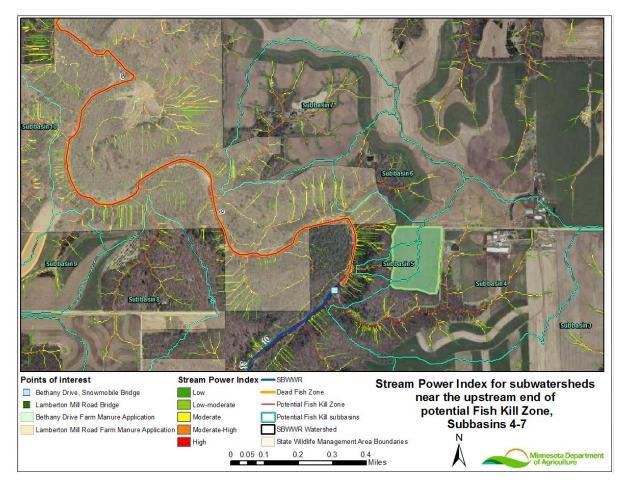


FIGURE 6-3. STREAM POWER INDEX ANALYSIS FOR THE SUBWATERSHEDS NEAR THE UPSTREAM END OF THE POTENTIAL FISH KILL ZONE FOR SUBBASINS 4-7.

#### SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: RESULTS

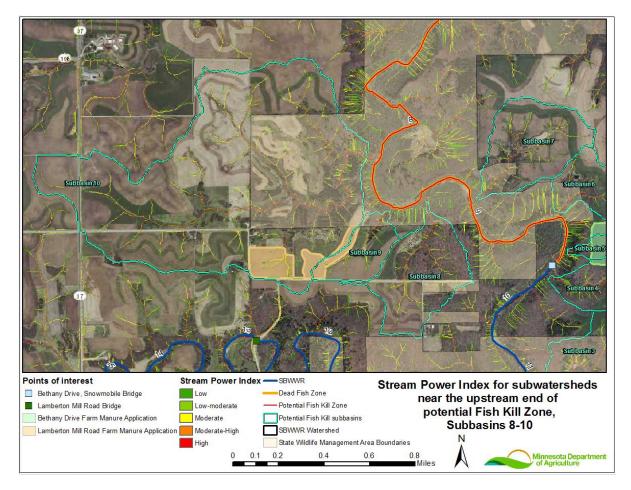


FIGURE 6-4. STREAM POWER INDEX ANALYSIS RESULTS FOR THE SUBWATERSHEDS NEAR THE UPSTREAM END OF THE POTENTIAL FISH KILL ZONE FOR SUBBASINS 8-10.

#### ESTIMATE OF DEAD FISH AND AQUATIC INVERTEBRATES

The number of dead fish (and crayfish) counted in the two stations of the river on July 30, 2015, are tabulated in Table 4-1. No dead fish were noted upstream of the Bethany Drive access, as the water was turbid. About 20 dead crayfish, however, were noted between the Bethany Drive access and Lamberton Mill Road.

	Abund	Abundance	
	(No/St	ation)	
Species	Station 1	Station 2	
Brook stickleback (Culaea inconstans)	0	1	
Brown Trout ( <i>Salmo trutta</i> )	28	43	
Creek Chub (Semotilus atromaculatus)	3	4	
Fantail Darter (Etheostoma flabellare)	4	0	
Johnny Darter ( <i>E. nigrum</i> )	7	0	
Dace (Rhinichthys spp.)	43	14	
Rainbow Trout (Oncorhynchus mykiss)	2	2	
Sculpin ( <i>Cottus</i> spp.)	11	25	
White Sucker (Catostomus commersoni)	14	45	
Crayfish (Cambarus spp; not included in total)	0	1	
Total	112	135	

TABLE 6.1. THE COUNTS OF DEAD FISH IN STATION 1 (145 M) AND STATION 2 (152 M) OF THE SBWWR ON JULY 30, 2015.

## AQUATIC MACROINVERTEBRATES

Dead crayfish were observed along the entire reach of the SBWWR that was surveyed by DNR and MPCA, from the CSH to Lamberton Mill Road. Live aquatic invertebrates were also observed in the stream upstream of the Bethany Road access point and were abundant. It is unclear if the same agent that caused the fish kill killed the crayfish or if the cause was unrelated. Crayfish densities are known to decrease after flooding events as they are susceptible to being dislodged (Parkyn and Collier 2001, Clark and Kershner 2011).

In October 2015, DNR observed the macroinvertebrate community in the stream on Kreidermacher's property. Overall, the community appeared healthy. The following taxa and their qualitative abundances (rated as qualitative quintiles of abundant, common, frequent, occasional, and rare) are presented in Table 4-2.

Species	Abundance
Baetidae	frequent
Brachycentrus	abundant
Chironomidae	frequent
Elmidae	rare
Heptageniidae	rare
Hydropsychidae	common
Limnephilidae	occasional
Leeches	common
Planaria	common
Snails	occasional
Tipula	rare

#### TABLE 6.2. MACROINVERTEBRATE COMMUNITY ABUNDANCE LEVELS IN OCTOBER 2015 IN THE SBWWR ON KREIDERMACHER'S PROPERTY.

#### **OCTOBER 2015 FISH COMMUNITY**

On October 20, 2015, the DNR completed a fish survey of the SBWWR in the fish kill zone to determine fish population characteristics. Ten species were identified in the SBWWR (Table 4-3).

#### TABLE 6.3. FISH TAXA FOUND IN THE SBWWR ON OCTOBER 20, 2015.

Species
Black bullhead (Ameiurus melas)
Brook stickleback (Culaea inconstans)
Brown trout (Salmo trutta)
Creek chub (Semotilus atromaculatus)
Fantail darter (Etheostoma flabellare)
Fathead minnow (Pimephales promelas)
Johnny darter (Etheostoma nigrum)
Dace (Rhinichthys spp.)
Sculpin ( <i>Cottus</i> spp.)
White sucker (Catostomus commersoni)

Historical brown trout population estimates from this reach of the long-term monitoring site on the SBWWR indicate that while brown trout abundance was showing a declining trend in the last three years, the brown trout abundance further decreased following the fish kill in July 2015 (Figure 4-5). Likewise, areal brown trout biomass showed a similar pattern, with biomass decreasing following the fish kill (Figure 4-6).

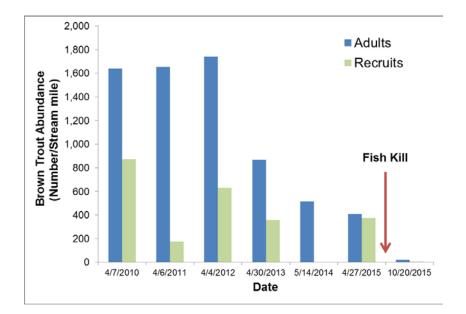


FIGURE 6-5. BROWN TROUT ABUNDANCE (NUMBER/STREAM MILE) AT THE DNR LONG-TERM MONITORING STATION ON THE SBWWR, NEAR ALTURA, MN. THE ARROW LABELED"FISH KILL" SHOWS THE RELATIVE TIMING OF THE FISH KILL EVENT THAT OCCURRED AT THE END OF JULY 2015.

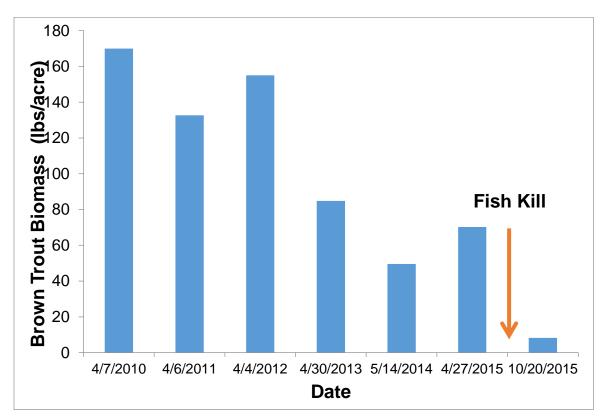
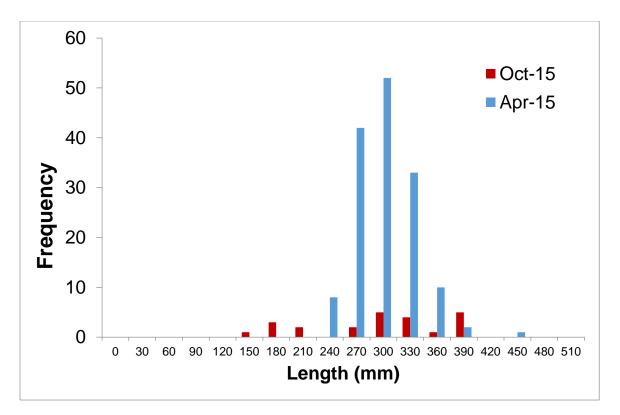


FIGURE 6-6. BROWN TROUT AREAL BIOMASS (LBS/ACRE) AT THE DNR LONG-TERM MONITORING STATION ON THE SBWWR, NEAR ALTURA, MN. THE ARROW LABELED "FISH KILL" SHOWS THE RELATIVE TIMING OF THE FISH KILL EVENT THAT OCCURRED AT THE END OF JULY 2015.

Length frequencies of brown trout sampled in the SBWWR (Long-Term Monitoring Station 3.50) on April 27, 2015 and October 20, 2015 are presented (Figure 4-7). Young-of-year brown trout are too small for capture during spring assessments, and thus, are not seen in the April data on this plot.

SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: RESULTS



#### FIGURE 6-7. LENGTH FREQUENCIES OF BROWN TROUT AS MEASURED IN THE SBWWR IN APRIL 2015 AND OCTOBER 2015.

## **PESTICIDE APPLICATIONS**

An MDA inspector checked agricultural cooperatives and individual landowners in the area who may have applied pesticides in the days prior to the fish kill. Application records were collected, reviewed, and determined to have been applied according to the requirements on their labels. The application rate of Quilt Xcel was 10.5 oz/acre and Priaxor was 4 oz/acre. In addition, most applications were found to have occurred to fields a long distance from the SBWWR and/or had a large buffer area between the field and SBWWR, or applications occurred outside of the fish kill period. As a result, pesticide applications were not suspected to have caused or contributed to the fish kill.

MDA revisited the cooperatives after the initial visit to investigate mix and load sites for pesticide applications. No spills, loss of loads, misapplications, or problems were reported nor was there evidence of any unreported spills or misapplications. Finally, there were no obvious signs of pesticide applications near the SBWWR fish kill zone.

# MANURE APPLICATION AND RUNOFF OBSERVATIONS

## UTICA TOWNSHIP INVESTIGATION

On August 6, 2015, MPCA staff found evidence of manure and manure contaminated runoff (ponded, puddled manure or manure stained rocks and vegetation) reaching approximately 200 feet off of the field into the woods. Evidence of pooled manure was found for another approximately 100 feet downslope, or a total of 300 feet off of the field into the woods. From this point down gradient to the SBWWR, the pools of liquid appeared to be clear water. MPCA staff also found evidence of pooled manure in a second ravine that runs south of the southern field border along a minimal maintenance road. Staff did not find evidence of manure or manure-contaminated runoff in the road ditch of the minimal maintenance road, indicating that it did not reach the ravine that runs along the minimum maintenance road.

MPCA Feedlot and Watershed staff returned to the field on August 7, 2015, and walked the western ravine from the edge of the SBWWR to the boundary of the field. No evidence of manure or manure-contaminated runoff was found in the lower portion of the ravine approximately 400 feet from the stream edge. In the upper portion of the ravine (located within 200 feet of the field edge) staff found a small amount of puddled manure (estimated to be < 30 gallons) and evidence of manure staining on the sandstone rock ledges.

A second ravine was walked by staff on August 7, 2015 was the discharge point off the south field boundary which is located approximately 400 feet from the southwest corner of the field. Staff found evidence of manure and manure contaminated runoff (ponded, puddled manure or manure stained rocks and vegetation) for approximately 200 feet into the woods. No evidence of manure or manure-contaminated runoff was found within approximately 50 feet of the SBWWR in the lower portion of the ravine. This ravine flows south off the field edge and its discharge point is located along the minimum maintenance road. Staff found no evidence of manure, or manure-contaminated runoff reaching the minimum maintenance road ditch. The amount of puddled manure found in the ravine was estimated to be <30 gallons.

Land application records were requested from both feedlot owners. An MPCA Feedlot staff review of land application records for the land application site located in Utica Township indicated that manure was surface-applied to the field on July 27 and July 30. The rate of application on July 27 was approximately 2,200 gallons/acre (dairy manure, surface applied) and the rate of application on July 30 was approximately 5,400 gallons/acre. The application rates combined along with the manure analysis supplied indicate that manure was applied to the field at rates that are consistent or below requirements within MN Rules Ch. 7020.2225.

## ST. CHARLES TOWNSHIP INVESTIGATION

MPCA Feedlot staff also reviewed land application records for a manure land application site located in St. Charles Township and determined that manure was applied to the field starting on May 23 with continued applications on a daily/weekly basis up to the time of the fish kill event.

Record information submitted indicated two field areas had been surface-applied with two different application rates. They determined the total application to the one field area (approximately 20.5 acres), applied prior to the fish kill, and were approximately 12,900 gallons since May 23. The 12,900 gallon application rate in combination with the manure analysis supplied, indicates that manure applied to this field area is consistent with requirements within MN Rules Ch. 7020.2225. Records information submitted included a second field area (approximately 6.23 acres) that also had manure applied after the fish kill event on August 10 and 15. Total application for this field area (approximately 6.23 acres) was approximately 17,997 gallons and 21.67 tons. The application rates combined along with the manure analysis supplied and legume credits indicate that manure applied to this field area (approximately 6.23 acres) results in nutrients (nitrogen) exceeding rates allowed within MN Rules Ch. 7020.2225 for the crop that will be grown in the 2016 cropping season. MPCA staff turned application compliance issues over to Winona County for additional follow-up.

# WATER SAMPLE RESULTS

## Metals

The reference values presented in this section were developed for only the dissolved fraction of metals in water. Stream conditions, primarily sediment concentration, will affect the amount of metals in a stream when total concentrations are reported as metals commonly bind to sediment particles. Metals are commonly detected in rivers and streams in Minnesota, and the total metal concentrations should not be directly compared to the reference values provided on the graphic.

## ALUMINUM

Four Milestone samples were collected from 1988 to 1991, and five SBWWR fish kill investigation samples were collected from July 28 through August 19, 2015 (Figure 4-7). The in-stream results from 2015 fall within the range of the 1988-1991 results; however, multiple total aluminum detections from 1988 through 2015 were frequently above the dissolved aluminum chronic standard and occasionally above the acute standard. MN 7050 Class 2A water standards for dissolved aluminum include the chronic value of 87  $\mu$ g/L and the acute value of 1,496  $\mu$ g/L. The concentrations observed during the 2015 fish kill investigation were within the range of previous samples.

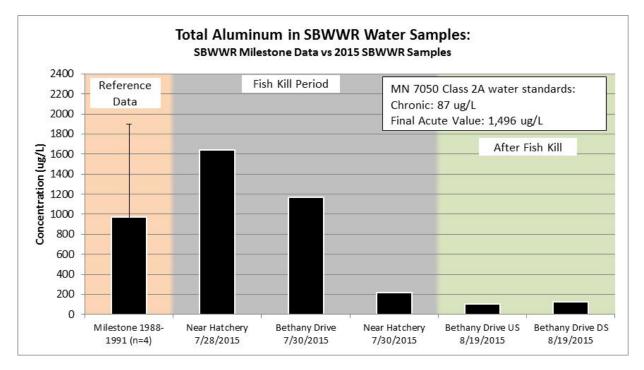


FIGURE 6-8. MEDIAN ALUMINUM (TOTAL) CONCENTRATIONS FOR REFERENCE DATA FROM THE MPCA MILESTONE PROGRAM (ORANGE AREA), WATER COLLECTED SHORTLY FOLLOWING THE FISH KILL IN THE SBWWR (GRAY AREA), AND WATER SAMPLES COLLECTED AFTER THE FISH KILL IN THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

Additional water samples were analyzed in 2015 as part of the investigation (Table 4-4). These samples were not collected directly from SBWWR and should not be compared to the above graphic; however, these data provide broader context for the investigation.

The sample collected from the Middle Branch of the Whitewater River, an adjacent watershed, during the fish kill period had a higher aluminum concentration than observed in SBWWR, and there were no reports of a fish kill in the Middle Branch of the Whitewater River. The sample collected near the agricultural field with recent manure applications had the highest aluminum concentrations, but manure is known to contain high concentrations of metals. The pooled water in the ravine also had high aluminum concentrations, but sampling of the SBWWR upstream and downstream of the ravine entry point into to the SBWWR did not result in dramatically different values.

Collection Location	Relevance	Collection Date	Aluminum (µg/L)
Middle Branch Whitewater	4-day ETI sample collected from adjacent	7/28/2015-	2,020
River	watershed	8/1/2015	
Manure runoff near Bethany	Sample collected from pooled manure	8/7/2015	33,700
Drive Ravine	near ravine		
Pooled water in Bethany Drive	Sampled collected in pool with orange tint,	8/17/2015	11,200
Ravine*	with iron bacteria present		

TABLE 6.4. TOTAL ALUMINUM WATER QUALITY RESULTS FROM ADDITIONAL LOCATIONS.

\*Note: This ravine discharges just upstream of the Bethany Drive snowmobile bridge.

#### ARSENIC

Thirty-two Milestone samples were collected from 1974 to 2009, and two SBWWR fish kill investigation samples were collected on August 19, 2015 (Figure 4-8). The in-stream results from 2015 were below laboratory analysis method reporting limits (<1  $\mu$ g/L), compared to several samples with quantifiable detections from 1974-2009. MN 7050 Class 2A water standards for dissolved arsenic include the chronic value of 2  $\mu$ g/L and the acute value of 720  $\mu$ g/L. The samples collected in 2015 were approximately three weeks after the fish kill; however, these samples provide a snapshot of baseflow conditions in the SBWWR.

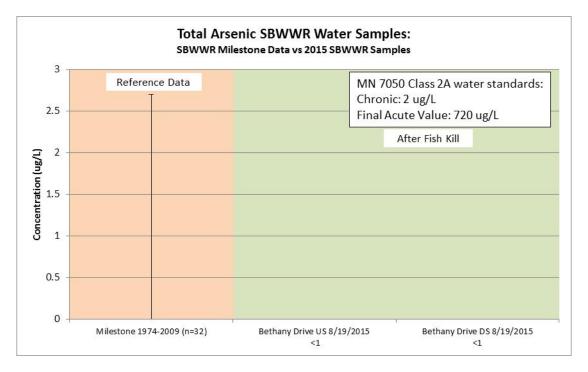


FIGURE 6-9. MEDIAN ARSENIC (TOTAL) CONCENTRATIONS FOR REFERENCE DATA FROM THE MPCA MILESTONE PROGRAM (ORANGE AREA) AND WATER SAMPLES COLLECTED AFTER THE FISH KILL IN THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

Additional water samples were analyzed in 2015 as part of the investigation (Table 4-5). These samples were not collected directly from SBWWR and should not be compared to the above graphic; however, these data provide context for the investigation.

The pooled water in the ravine had the highest arsenic concentrations, but sampling of the SBWWR upstream and downstream of the ravine both resulted in arsenic levels below the MRL (<1  $\mu$ g/L). The sample collected near the

agricultural field with recent manure applications had elevated arsenic concentrations compared to the stream samples, but manure is known to contain metals.

Collection Location	Relevance	Collection Date	Arsenic (µg/L)
Manure runoff near Bethany Drive Ravine	Sample collected from pooled manure near ravine	8/7/2015	33.6
Pooled water in Bethany Drive Ravine	Sampled collected in orange tinted pool, with iron bacteria present	8/17/2015	61.4

#### TABLE 6.5. TOTAL ARSENIC WATER QUALITY RESULTS FROM ADDITIONAL LOCATIONS.

## COPPER

Forty-eight samples were collected from 1974 to 2009, and five SBWWR fish kill investigation samples were collected from July 28 through August 19, 2015 (Figure 4-9). The in-stream results from 2015 were all below laboratory analysis method reporting limits (<10  $\mu$ g/L), compared to several samples with quantifiable detections from 1974-2009. MN 7050 Class 2A water standards for dissolved copper are based on water hardness. For water hardness of 300 and 500, the chronic values are 19 and 27  $\mu$ g/L, respectively, and the acute value of 100 and 162  $\mu$ g/L, respectively. Total copper concentration was reported. All samples collected directly from the SBWWR in 2015 were below the analytical method reporting limit (<10  $\mu$ g/L), and well below the water quality reference values.

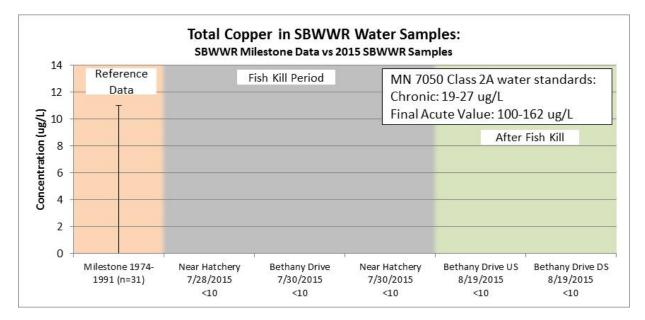


FIGURE 6-10. MEDIAN COPPER (TOTAL) CONCENTRATIONS FOR REFERENCE DATA FROM THE MPCA MILESTONE PROGRAM (ORANGE AREA), WATER COLLECTED SHORTLY FOLLOWING FISH KILL IN THE SBWWR (GRAY AREA), AND WATER SAMPLES COLLECTED AFTER THE FISH KILL IN THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

Additional water samples were analyzed in 2015 as part of the investigation (Table 4-6). These samples were not collected directly from the SBWWR and should not be compared to the above graphic; however, these data provide context for the investigation.

The sample collected from the Middle Branch of the Whitewater River, an adjacent watershed, during the fish kill period also had a copper concentration below the method reporting limit, and there were no reports of a fish kill in the Middle Branch of the Whitewater River. The sample collected near the agricultural field with recent manure applications had the highest copper concentrations, but manure is known to contain high amounts of metals. The pooled water in the ravine also had high concentrations, but sampling of the SBWWR upstream and downstream of the ravine both resulted in copper levels below the method reporting limit (<10  $\mu$ g/L).

#### TABLE 6.6. TOTAL COPPER WATER QUALITY RESULTS FROM ADDITIONAL LOCATIONS.

Collection Location	Relevance	Collection Date	Copper (µg/L)
Middle Branch Whitewater	4-day ETI sample collected from adjacent	7/28/2015-	< 10
River	watershed	8/1/2015	
Manure runoff near Bethany	Sample collected from pooled manure near	8/7/2015	12,400
Drive Ravine	ravine		
Pooled water in Bethany	Sampled collected in orange tinted pool,	8/17/2015	30.9
Drive Ravine*	with iron bacteria present		

\*Note: This ravine discharges just upstream of the Bethany Road bridge.

## Iron

Thirty-two Milestone samples were collected from 1974 to 1991, and five SBWWR fish kill investigation samples were collected from July 28 through August 19, 2015 (Figure 4-10). The in-stream results from 2015 fall within the range of the 1974-1991 results. There is no dissolved iron standard listed in MN 7050 rules for Class 2A waters. The USEPA chronic aquatic life criteria reference value for dissolved iron is 1,000  $\mu$ g/L, and two samples from 2015 had total iron concentrations that were above the dissolved iron reference value.

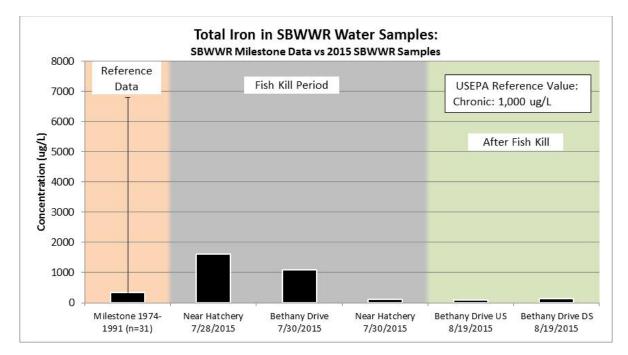


FIGURE 6-11. MEDIAN IRON (TOTAL) CONCENTRATIONS FOR REFERENCE DATA FROM THE MPCA MILESTONE PROGRAM (ORANGE AREA), WATER COLLECTED SHORTLY FOLLOWING FISH KILL IN THE SBWWR (GRAY AREA), AND WATER SAMPLES COLLECTED AFTER THE FISH KILL IN THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

Additional water samples were analyzed in 2015 as part of the investigation (Table 4-7). These samples were not collected directly from the SBWWR and should not be compared to the above graphic; however, these data provide context for the investigation.

The sample collected from the Middle Branch of the Whitewater River, an adjacent watershed, during the fish kill period had a higher iron concentration measured than the maximum in the SBWWR, and no fish kill was reported in that watershed. The pooled water in the ravine had the highest iron concentrations, but water samples collected from the SBWWR upstream and downstream of the ravine entry into the SBWWR both measured low levels of iron. The sample collected near the agricultural field with recent manure applications had the second highest iron concentrations, but manure is known to contain high concentrations of metals.

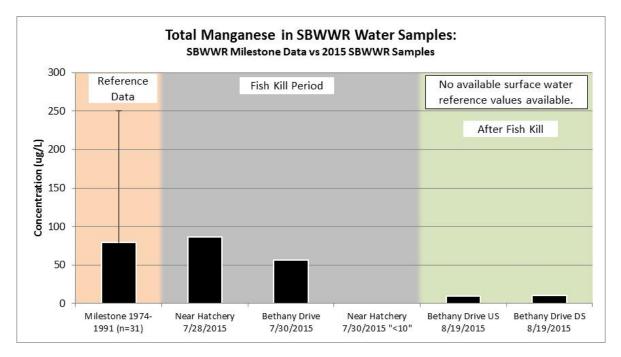
Collection Location	Relevance	Collection Date	Iron (μg/L)
Middle Branch Whitewater	4-day ETI sample collected from adjacent	7/28/2015-	2,330
River	watershed	8/1/2015	
Manure runoff near Bethany	Sample collected from pooled manure	8/7/2015	46,300
Drive Ravine	near ravine		
Pooled water in Bethany	Sampled collected in orange tinted pool,	8/17/2015	130,000
Drive Ravine*	with iron bacteria present		

#### TABLE 6.7. TOTAL IRON WATER QUALITY RESULTS FROM ADDITIONAL LOCATIONS.

\*Note: This ravine discharges just upstream of the Bethany Road bridge.

## MANGANESE

Thirty-two Milestone samples were collected from 1974 to 1991, and five SBWWR fish kill investigation samples were collected from July 28 through August 19, 2015 (Figure 4-11). The in-stream results from 2015 fell within the range of the 1974-1991 results, and no surface water reference values were found for manganese.



#### FIGURE 6-12. MEDIAN MANGANESE (TOTAL) CONCENTRATIONS FOR REFERENCE DATA FROM THE MPCA MILESTONE PROGRAM (ORANGE AREA), WATER COLLECTED SHORTLY FOLLOWING FISH KILL IN THE SBWWR (GRAY AREA), AND WATER SAMPLES COLLECTED AFTER THE FISH KILL IN THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

Additional water samples were analyzed in 2015 as part of the investigation (Table 4-8). These samples were not collected directly from the SBWWR and should not be compared to the above graphic; however, these data provide context for the investigation.

The sample collected from the Middle Branch of the Whitewater River, an adjacent watershed, during the fish kill period had a higher manganese concentration measured than the maximum concentration in the SBWWR, and no fish kill was reported in that watershed. The pooled water in the ravine had the highest manganese (and iron) concentrations, but sampling of the SBWWR upstream and downstream of the ravine entry into the SBWWR had low manganese concentrations. The sample collected near the agricultural field with recent manure applications had the second highest manganese concentration, but manure is known to contain high concentrations of metals.

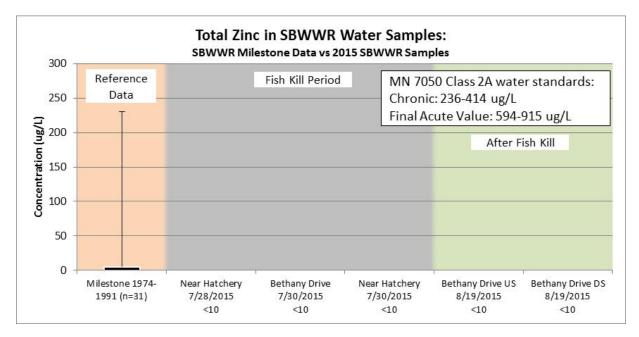
#### SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: RESULTS

Collection Location	Relevance	Collection Date	Iron (µg/L)
Middle Branch Whitewater	4-day ETI sample collected from adjacent	7/28/2015-	150
River	watershed	8/1/2015	
Manure runoff near Bethany	Sample collected from pooled manure	8/7/2015	8,870
Drive Ravine	near ravine		
Pooled water in Bethany	Sampled collected in pool with orange	8/17/2015	15,000
Drive Ravine*	tint, with iron bacteria present		

\*Note: This ravine discharges just upstream of the Bethany Drive bridge.

#### ZINC

Forty-five Milestone samples were collected from 1974 to 2009, and five SBWWR fish kill investigation samples were collected from July 28 through August 19, 2015 (Figure 4-12). The in-stream results from 2015 were all below laboratory analysis reporting limits (<10  $\mu$ g/L), compared to several samples with quantifiable detections from 1974-2009. MN 7050 Class 2A water standards for dissolved zinc are based on water hardness. For water hardness of 300 and 500, the chronic values are 269 and 414  $\mu$ g/L, respectively, and the acute values are 594 and 915  $\mu$ g/L, respectively.



# FIGURE 6-13. MEDIAN ZINC WATER (TOTAL) CONCENTRATIONS FOR REFERENCE DATA FROM THE MPCA MILESTONE PROGRAM (ORANGE AREA), WATER COLLECTED SHORTLY FOLLOWING FISH KILL IN THE SBWWR (GRAY AREA), AND WATER SAMPLES COLLECTED AFTER THE FISH KILL IN THE SBWWR (GR EEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

Additional water samples were analyzed in 2015 as part of the investigation (Table 4-9). These samples were not collected directly from the SBWWR and should not be compared to the above graphic; however, these data provide context for the investigation.

The sample collected from the Middle Branch of the Whitewater River, an adjacent watershed, during the fish kill period also had a zinc concentration below the method reporting limit, and there were no reports of a fish kill in the Middle Branch of the Whitewater River. The sample collected near the agricultural field with recent manure

applications had the highest zinc concentration, but manure is known to contain high concentrations of metals. The pooled water in the ravine also had high concentrations, but samples collected from the SBWWR upstream and downstream of the ravine entry into the SBWWR were both reported below the method reporting limit.

Collection Location	Relevance	Collection Date	Zinc (µg/L)
Middle Branch Whitewater	4-day ETI sample collected from adjacent	7/28/2015-	< 10
River	watershed	8/1/2015	< 10
Manure runoff near Bethany	Sample collected from pooled manure near	8/7/2015	4.380
Drive Ravine	ravine	8/7/2013	4,560
Pooled water in Bethany Drive	Sampled collected in orange tinted pool,	8/17/2015	80.8
Ravine*	with iron bacteria present	0/1//2015	00.8

\*Note: This ravine discharges just upstream of the Bethany Drive bridge.

## NUTRIENTS, SEDIMENTS AND ABIOTIC RIVER PARAMETERS

Many of the nutrients, sediment or abiotic parameters were not analyzed with each sample due to the investigation initially focusing on pesticides. Table 4-10 provides the results of the nutrient, sediment and abiotic parameters data collection. Although all of the data are presented in Table 4-10, only ammonia will be discussed in detail as ammonia was collected during the fish kill period to address manure runoff as a possible fish kill cause. Other parameters that were analyzed collected during the fish kill period had minimal data and are not known to be acutely toxic.

#### ΑΜΜΟΝΙΑ

Two hundred fifty-seven historic MPCA samples were collected from 1974-2008 and eight SBWWR fish kill investigation samples were collected from July 28 through August 19, 2015 (Table 4-10). All samples collected in 2015 were at very low levels compared to the historic MPCA stream monitoring results. MN 7050 Class 2A water quality standards are written as the un-ionized fraction of ammonia and include a chronic standard of 0.16 mg/L. In order to calculate un-ionized ammonia, water temperature and pH must be collected at the time of sampling. The samples collected at Bethany Drive Upstream (8/19/2015) and Bethany Drive Downstream (8/19/2015) were the only samples that had field pH and water temperature collected. The ammonia in these samples were below the method reporting limit and thus the un-ionized ammonia cannot be calculated. Additionally, un-ionized ammonia represents a fraction of the ammonia concentrations that were collected and no samples were greater than 0.16 mg/L. Henceforth, all samples had concentrations that were below the standard. Additionally, two samples collected during the post fish kill period had similar concentrations to the concentrations measured during the fish kill period.

Two additional water samples were analyzed in 2015 as part of the investigation (Table 4-10). These samples were not collected directly from SBWWR and should not be compared to the samples collected directly from the SBWWR; however, these data provide broader context for the investigation.

A brown foam was observed in the river near decomposing fish, and was sampled during the course of the investigation to observe the nutrient composition of the foam. This sample had the second highest ammonia concentration of all samples collected in the SBWWR. Additionally, this sample also had pH and temperature recorded at the time of sample collection. Although not directly applicable to water quality standard but rather as a reference, the un-ionized ammonia fraction of this sample was 0.005 mg/L. The sample collected in the Bethany Drive Ravine had the highest concentration of ammonia. Water temperature and pH were not collected when this

sample was collected. However, sample concentrations of the SBWWR upstream (<0.05 mg/L) and downstream (<0.05 mg/L) of the ravine entry point into to the SBWWR were lower than the concentrations found in the ravine.

## OTHER NUTRIENTS, SEDIMENT AND PARAMETERS

All other parameters that were analyzed post fish kill had concentrations that were within or below the ranges of the historic MPCA monitoring data and were below the applicable Minnesota Standard, if one exists. The "Other-Brown Foam" sample had higher concentrations for multiple parameters including biological oxygen demand (220 mg/L) and total solids (1,200 mg/L). Biological oxygen demand and total solids were twenty-two times and two times, respectively, greater than double the maximum historic observed concentrations. It should be noted that this sample had a matrix of organic material in addition to the water component.

			Collection period sub-Category													
	Acute MN Standards (mg/L)	Chronic MN S Standards (mg/L)	Historic MPCA River Sampling		Hatchery Spring - Pre Fish kill	Spring - Bro fish kill		Fish kill Period		Post fish Kill		Other - Brown Foam	Other - Ravine	Other- Adjacent Watershed		
Analyte / Parameter	, .		Years sampled	N	Range	Sample	Sample	Ν	Range	Ν	Range	Ν	Range		Resu	t
Ammonia (mg/L)	na	0.16 <sup>1</sup>	1974-2008	257	0.02-2.72	na	na	na	na	4	0.023-0.029	2	<0.02-0.024	0.11	1.0	na
Alkalinity (mg/L)	na	na	1974-1981	40	140-300	na	na	na	na	na	na	2	230-240	na	380	na
Biological Oxygen Demand (mg/L)	na	2 <sup>2</sup>	1974-2008	205	0.5-9.6	na	na	na	na	na	na	2	2.0-3.9	220	25	na
Chloride (mg/L)	1720	230	1974-2008	49	10-110	na	na	na	na	na	na	2	35.8-38.2	3.32	28.7	na
Escherichia coli (MPN/100mL)	Not more than 10% of all samples within a calendar month, exceed 1,260 organisms / 100 mL	Not to exceed 126 organisms / 100 mL for 5 samples within a calendar month	1985-2012	111	4-39000	na	na	na	na	na	na	na	na	4100 <sup>3</sup>	na	na
Hardness(mg/L)	na	na	1974-1991	43	160-438	na	na	na	na	na	na	2	290-310	na	500	na
Kjeldahl Nitrogen, Total (mg/L)	na	na	1979-1998	145	0.5-8.37	na	na	na	na	na	na	2	<0.2-<0.2	na	2.73	na
Nitrate (mg/L)	na	na	1974-2012	259	1.3-9.4	4.68	4.61	5	7.50-8.48	1	6.23	3	7.38-7.85	8.7	na	8.8
Nitrate + Nitrite (mg/L)	na	na	1976-2012	232	0.9-16.0	na	na	na	na	na	na	2	8.7-9.0	na	0.14	na
Phosphorus, Dissolved ortho (mg/L)	na	na	na	na	na	na	na	5	0.021-0.062	1	0.054	3	0.016-0.087	na	na	0.038
Phosphorus, Total (mg/L)	na	1.0 <sup>2</sup>	1974-2012	243	0.07-3.10	na	na	5	0.209-0.106	1	0.171	3	0.065-0.225	2.22	3.51	0.156
pH (su)	Minimum: Maximum:	,	1974-2012	289	7.2-9.58	na	na	na	na	na	na	2	8.2-8.2	8.21	7.5	na
Transparency (cm)	na	na	1998-2012	249	0->100	na	na	5	27.1->60	1	44.6	3	>60->60	na	na	20.4
Solids, Total (mg/L)	na	na	1974-1977	41	250-590	na	na	na	na	na	na	na	na	1200 <sup>3</sup>	na	0.038
Sulfate (mg/L)	na	na	1974-2008	47	15.4-52	na	na	na	na	na	na	2	13.9-14.7	na	1.28	na

#### SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: RESULTS

				Collection period sub-Category												
	(mg/L)			-	Hatchery Spring - Post Fish kill			Fish kill Period		Post fish Kill		Other - Brown Foam		Other- Adjacent Watershed		
Analyte / Parameter		(mg/L)	Years sampled	Ν	Range	Sample	Sample	Ν	Range	N	Range	N	Range		Resul	t
Suspended solids, Total (mg/L)	na	10 mg/L (for no more than 10% of time)		250	<1-1900	na	na	na	na	na	na	na	na	1600 <sup>3</sup>	na	36.4
Volatile Solids, Total (mg/L)	na	na	na	na	na	na	na	na	na	na	na	na	na	460 <sup>3</sup>	na	0.156

<sup>1</sup> Ammonia standard is written as the un-ionized fraction

<sup>2</sup> Eutrophication Standard for the Central River Nutrient Region

<sup>3</sup> This was the only sample collected during the investigation

## PESTICIDES

Pesticide analyses are separated by pesticide type (*i.e.*, fungicide, herbicide and insecticide) and further separated within each pesticide type by the period that they were collected (i.e., pre-fish kill, fish kill, post-fish kill, and other samples). The sections below describe the pesticide results.

#### FUNGICIDES

A total of five fungicide compounds were detected (Table 4-11), however, none of these detections occurred above the method reporting limit or were reported with a qualifier as an estimated concentration due to low surrogate recovery related to a matrix interference with the "Other-Brown Foam" sample. This sample had very high organic matter content, which created a problem with matrix interference. The "Other-Brown Foam" sample contained the only detections of azoxystrobin, carbendazim (estimated<MRL), and picoxystrobin (estimated<MRL). In addition, fluxapyroxad was detected at a very low concentration (estimated<MRL). Pyraclostrobin was not able to be reported due to the matrix interference with the sample. There were no fungicide detections in the Hatchery Spring "Pre-Fish Kill" and "Post-Fish Kill" periods.

Monitoring during the Pre-Fish Kill period was completed with only the GC-MS/MS pesticide analytical method, as defined in the 2015 MDA Surface Water Workplan, and did not include fluxapyroxad or pyraclostrobin. During the "Fish Kill Period", no fungicides were detected above the MRL. However, fluxapyroxad and pyraclostrobin were detected below the MRL during the "Fish Kill Period" in 100 percent and 71 percent, respectively, of the samples. It is important to note, however, that the MDA Laboratory does not report estimated detections below the MRL with routine sample analysis, so it is unknown if detections of these compounds below the MRL is unique to this watershed and/or the fish kill. All of these concentrations were estimated, and were extremely low when compared to the lowest applicable reference value. The maximum estimated fluxapyroxad concentration was 9.08 ng/L, or 0.04% of the lowest applicable reference value (22,000 ng/L). The maximum estimated pyraclostrobin concentration was 11.2 ng/L, or 0.75% of the lowest applicable reference value (1,500 ng/L). Although these compounds degrade rapidly in aquatic environments, all estimated concentrations were very low. There were no fungicide detections above the MRL in the "Post-Fish Kill" period.

The composite sample collected from the Middle Branch of the Whitewater River included an estimated concentration of fluxapyroxad of 5.09 ng/L. In addition, pyraclostrobin had a peak representing a detection below the MRL; however, a quality assurance/quality control qualifier did not meet standard for estimating the concentration and thus no estimated concentration was provided. Both fluxapyroxad and pyraclostrobin were present at very low concentrations in both the Middle Branch and the SBWWR during the fish kill period, however, only the SBWWR experienced a fish kill.

				Collection Period Sub-Category									
Fungicide	Laboratory Method Reporting	Acute Reference Value (ng/L)	Chronic Reference Value (ng/L)	Hatchery Spring Pre- Fish Kill	Hatchery Spring Post- Fish Kill	Pre-Fish Kill	Fish Kill Period	Post-Fish Kill	Other – Brown Foam	Other – Adjacent Watershed			
i anglorae	Limit (ng/L)		(8/ -/	Range (ng/L)									
Azoxystrobin	10	130,000 <sup>5</sup>	44,000 <sup>5</sup>	< 10	< 10	na	< 10	< 10	20.4**	< 10			
Carbendazim	10	2,700,0005	2,000 <sup>4</sup>	< 10	< 10	na	< 10	< 10	4.97*	< 10			
Fluxapyroxad	10	145,000 <sup>4</sup>	22,000 <sup>4</sup>	na	< 10	na	0.34 - 9.08*	< 10	2.11*	5.09*			
Picoxystrobin	50	12,000 <sup>5</sup>	1,000 <sup>5</sup>	< 50	< 50	na	< 50	< 50	10.2*	< 50			
Pyraclostrobin	25	3,100 <sup>4</sup>	1,500 <sup>6</sup>	< 25	< 25	na	< 25 – 11.2*	< 25	na	< 25***			

#### TABLE 6.11. FUNGICIDE AND FUNGICIDE DEGRADATE PESTICIDE WATER QUALITY DATA.

\*Estimated concentrations below method reporting limit

\*\*Reported with failed QA/QC due to low surrogate recovery

\*\*\*Peak representing a detection below the MRL was present, however, a quality assurance/quality control qualifier did not meet standard for estimating a concentration

<sup>1</sup> Minnesota Class 2A 4-day Chronic Standard

<sup>2</sup> Minnesota Maximum Standard

<sup>3</sup> Minnesota Class 2A 30-day Human Health Based Standard

<sup>4</sup> USEPA/OPP benchmark for fish

<sup>5</sup> USEPA/OPP benchmark for invertebrates

<sup>6</sup> USEPA/OPP benchmark for nonvascular plants

<sup>7</sup> USEPA/OPP benchmark for vascular plants

<sup>8</sup> Non-promulgated MPCA reference value

## HERBICIDES

A total of nine herbicides and an additional nine herbicide degradate compounds were detected (Table 4-12), but all detections were very low when compared to the lowest applicable reference value. Herbicide and herbicide degradate detections were limited, and very similar between the "Hatchery Spring Pre-Fish Kill" and "Hatchery Spring Post-Fish Kill" periods. The "Other - Brown Foam" sample was only analyzed using the GC-MS/MS pesticide analytical method due to matrix interference with the LC-MS/MS pesticide analytical method. The "Other – Brown Foam" sample only had two low level detections.

The "Pre-Fish Kill", "Fish Kill Period", and "Post-Fish Kill" periods resulted in six, 57, and 34 low level herbicide or herbicide degradate detections, respectively. All concentrations were less than 1% of their lowest respective reference value. Detections between the "Fish Kill Period" and "Post-Fish Kill" periods had a similar pesticide detection fingerprint and concentration magnitude range, indicating that herbicide and herbicide degradate concentrations were similar during the "Fish Kill Period" and the "Post-Fish Kill" period.

The composite sample results from the Middle Branch of the Whitewater River and the "Other - Brown Foam" had a similar pesticide detection fingerprint and concentration magnitude to the "Fish Kill Period" samples collected from the SBWWR; however, only the SBWWR experienced a fish kill.

#### TABLE 6.12. HERBICIDE AND HERBICIDE DEGRADATE PESTICIDE WATER QUALITY DATA.

				Collection Period Sub-Category									
Pesticide	Laboratory Method Reporting	Acute Reference Value (ng/L)	Chronic Reference Value (ng/L)	Hatchery Spring Pre- Fish Kill	Hatchery Spring Post- Fish Kill	Pre-Fish Kill	Fish Kill Period	Post-Fish Kill	Other – Brown Foam	Other – Adjacent Watershed			
	Limit (ng/L)						Range (ng/L)						
2,4-D	8.3	12,075,000 <sup>4</sup>	13,100 <sup>6</sup>	< 8.3	< 8.3	na	10.4 – 39.8	< 8.3 - 31	na	25.2			
Acetochlor	30	86,000 <sup>2</sup>	3,600 <sup>1</sup>	< 30	< 30	< 30 - 185	< 30	< 30	< 30	< 30			
Acetochlor ESA	30	>62,500,0005	9,900,000 <sup>6</sup>	< 30	< 30	na	41.6 - 148	51.3 - 59.9	na	93.6			
Alachlor ESA	41.6	>52,000,0004	na	207	178	na	49.1 - 200	308 - 343	na	100			
Atrazine	30	323,000 <sup>2</sup>	3,400 <sup>3</sup>	32.3	< 30	39.8 - 83.3	37.1 - 46.8	38.5 - 42.7	62.8	32.6			
Bentazon	5	>50,000,0004	4,500,000 <sup>6</sup>	< 5	< 5	na	43.4 – 97.7	20.8 - 24.6	na	< 5			
DEDI-atrazine	50	>50,000,0004	na	102	92.5	na	< 50	50.6 - 78.2	na	63.1			
Desethyl atrazine	50	na	1,000,000 <sup>6</sup>	63.6	58.9	62.7 - 80.3	69.4 – 78.2	73.8 - 91.5	87.7	73.1			
Dimethenamid	15	3,150,000 <sup>4</sup>	5,100 <sup>8</sup>	< 15	< 15	< 15 - 83	< 15	< 15	< 15	< 15			
Dimethenamid ESA	6.7	na	na	< 6.7	< 6.7	na	67.4 - 81.4	< 6.7 - 11.8	na	17			
Dimethenamid OXA	10	na	na	< 10	< 10	na	11.6 – 17	< 10	na	< 10			
Hydroxyatrazine	6.7	>1,500,0004	>10,000,0006	14.6	12.9	na	16.3 – 28.8	14.1 - 16.7	< 6.7	24.5			
Imazethapyr	6.7	120,000,000 <sup>4</sup>	59,200,000 <sup>6</sup>	< 6.7	< 6.7	na	7.19 – 10.7	< 6.7	na	< 6.7			
Metolachlor	25	na	23,000 <sup>1</sup>	< 25	< 25	< 25 - 28.1	28.6 - 35.3	< 25	< 25	< 25			
Metolachlor ESA	10	24,000,000 <sup>4</sup>	>95,100,0007	187	184	na	423 - 1,410	530 – 706	na	857			
Metolachlor OXA	10	7,700,0005	57,100,000 <sup>6</sup>	< 10	< 10	na	20.2 – 178	22.5 - 30.6	na	89.3			
Prometon	100	6,000,000 <sup>4</sup>	98,000 <sup>6</sup>	< 100	< 100	< 100 - 722	< 100	< 100	< 100	< 100			
Saflufenacil	15	>49,000,0005	42,000 <sup>6</sup>	< 15	< 15	Na	18.5 – 30.9	< 15	na	< 15			

<sup>1</sup> Minnesota Class 2A 4-day Chronic Standard

<sup>2</sup> Minnesota Maximum Standard

<sup>3</sup> Minnesota Class 2A 30-day Human Health Based Standard

<sup>4</sup> USEPA/OPP benchmark for fish

<sup>5</sup> USEPA/OPP benchmark for invertebrates

<sup>6</sup> USEPA/OPP benchmark for nonvascular plants

<sup>7</sup> USEPA/OPP benchmark for vascular plants

<sup>8</sup> Non-promulgated MPCA reference value

#### INSECTICIDES

No insecticides or insecticide degradates were detected in any samples collected during the "Pre-Fish Kill", "Fish Kill Period", or "Post-Fish Kill" periods throughout the SBWWR fish kill investigation.

## MANURE RESULTS

Lagoon manure samples were analyzed for metals. The sampled lagoons were the source of the manure that was applied in the area of interest. The Utica Township lagoon had a liquid sample analyzed, and the St. Charles Township had two liquid samples analyzed. This analysis was completed to determine if either lagoons contained metals, primarily cooper, out of the range of expected values.

The metal concentrations of each analyte in the three samples in decreasing order were: iron, aluminum, manganese, copper, and potassium (Table 4-13). Although the concentrations are much higher in manure than the metal concentrations measured in the SBWWR, the concentrations observed in these samples generally fall in the range of typical dairy manure samples (DeRouchey et. al. 2002; Ippolitto and Moore 2013). With this said, land application of dairy manure is a common practice across Minnesota, and fish kills are a rare occurrence.

Sample	Aluminum (µg/L)	Copper (µg/L)	lron (μg/L)	Manganese (µg/L)	Potassium (μg/L)
Lagoon Liquid Manure –					
Utica Township	270,000	10,900	1,440,000	93,000	3,300
Lagoon Liquid Manure –					
St. Charles Township	25,300	15,400	82,400	14,900	1,390
Lagoon Liquid Manure –					
St. Charles Township	59,700	9,840	185,000	33,700	4,410

#### TABLE 6.13. RESULTS OF MANURE TESTING FROM SAMPLES COLLECTED IN UTICA AND ST. CHARLES TOWNSHIPS.

# SOIL SAMPLE RESULTS

Nine different pesticide compounds were analyzed in a soil sample collected near the SBWWR including acetochlor, clopyralid, dicamba, diflufenzopyr, flumetsulam, fluxapyroxad, picloram, glyphosate, and AMPA (glyphosate metabolite). These analytes were selected based on pesticide detections from the SBWWR, recent pesticide applications in the watershed, and included the pesticides applied by the land owner in close proximity to the sample collection point.

The only detected compound was fluxapyroxad at a concentration of 0.13  $\mu$ g/kg. This analyte did not have a reported MRL with the method as it had not been previously analyzed in soil media. The MDA Laboratory Services targeted this compound at very low concentrations. No other pesticide compounds were detected in the soil sample and no additional soil samples were collected as background or reference sample to determine if the fluxapyroxad detection was unique to the area that was sampled.

# FISH RESULTS

## NECROPSY

Fish that were collected during the afternoon of July 30, 2015, were too decomposed when delivered to DNR in Saint Paul to analyze. Based on observations from CSH staff, the dead fish were one to two days old by the time of

collection and were subjected to daytime temperatures in the low 80s (°F), with nighttime temps around 60°F, which likely promoted decomposition.

Fish collected by CSH staff were necropsied. There was no indication of lesions or physical abrasions on the external surface of the fish. The internal organs appeared healthy and of normal size. Inspection beneath the opercula of fish revealed sediment was packed in the gill chamber (Figure 4-13), which under 10x magnification was identified as mineral particles and diatom frustules. Gill tissue was damaged, although whether the damage was ante-mortem or post-mortem could not be discerned.



FIGURE 6-14. BROWN TROUT COLLECTED ON JULY 30, 2015, IN THE SBWWR, NEAR CRYSTAL SPRINGS FISH HATCHERY. THE OPERCULUM HAS BEEN REMOVED TO EXPOSE THE GILL TISSUE. NOTE THE SEDIMENT IN THE GILLS.

## FISH TISSUE

## METALS

Metals are commonly found in the environment, and in fish; however, fish were analyzed for metals to address concerns of heavy metals as a possible fish kill cause. No standards or reference values exist for metal concentrations in fish, however, this analysis was completed to determine if metal concentrations in fish tissue during the fish kill period was abnormal. Fish tissues were analyzed for several metals including aluminum, arsenic, barium, copper, iron, manganese, sulfur, sulfate, titanium and zinc. The sections below provide an assessment of the fish tissue results.

#### Aluminum

Aluminum results in the reference data presented a large range of concentrations (Figure 4-14). While the reference data median was higher for white suckers, the trout data showed a higher maximum value. Aluminum concentrations in the whole fish samples during the "Fish Kill Period" were higher than the "After Fish Kill" period. With this said, all of the whole fish samples results were in the range for the reference data. Aluminum concentrations in both the trout and white sucker livers were low compared to the whole fish sample.

Aluminum concentrations in fish tissue collected in the SBWWR during the "Fish Kill Period" and "After Fish Kill" period were in the typical, or expected, range of the reference data.

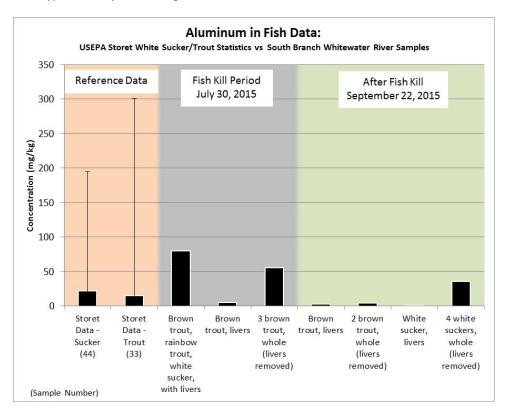


FIGURE 6-15. MEDIAN ALUMINUM CONCENTRATIONS IN FISH TISSUE FROM STORET DATA (ORANGE AREA), FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR (FOLLOWING THE FISH KILL, GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

#### ARSENIC

Arsenic results are presented in Figure 4-15. Reference data arsenic values in trout showed a higher median and maximum value than the white sucker data. All samples analyzed during the investigation, including both the whole fish and liver samples, were below the laboratory method reporting limit of 0.2 mg/kg.

Arsenic concentrations in fish tissue collected in the SBWWR were in the typical, or expected, range of the reference data.

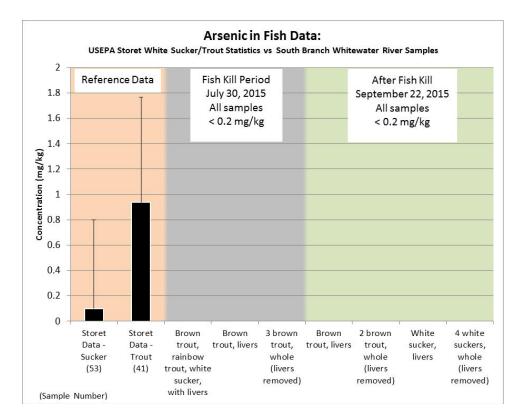


FIGURE 6-16. MEDIAN ARSENIC CONCENTRATIONS IN FISH TISSUE STORET DATA (ORANGE AREA), FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR (FOLLOWING THE FISH KILL, GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

### BARIUM

Barium results in the reference data presented a wide range of data and higher maximum for white suckers than trout (Figure 4-16). Whole fish samples analyzed during the investigation also showed higher barium concentrations in the samples that included white suckers. The barium concentrations in the brown trout during the investigation were consistent with the trout reference data. Barium was not detected in the livers of brown trout or suckers with a laboratory method reporting limit of 0.2 mg/kg.

Barium concentrations in fish tissue collected in the SBWWR were in the typical, or expected, range of the reference data.

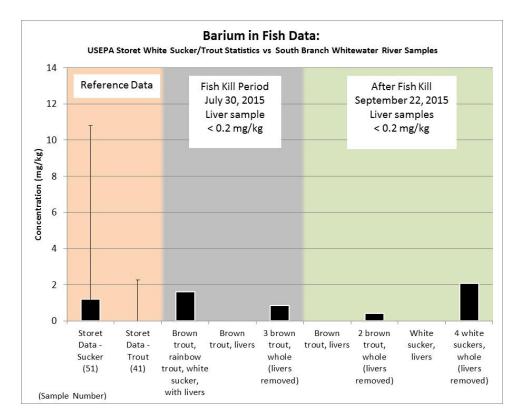


FIGURE 6-17. MEDIAN BARIUM CONCENTRATIONS IN FISH TISSUE STORET DATA (ORANGE AREA), FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR (FOLLOWING THE FISH KILL, GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

## COPPER

When compared to other fish species, copper accumulation in trout tends to be higher and is typically accumulated in the liver (Rasmussen 1999). As such, the copper in fish tissue data will be presented in two sections: whole fish and trout livers. Furthermore, USEPA STORET database had reference data available for whole fish (white suckers and trout) and trout livers, with no reference data available for white sucker livers.

## COPPER WHOLE FISH

The whole fish white sucker reference data had a higher median and maximum concentration than the trout reference data. The whole fish trout reference data median concentration was below the method reporting limit, however, copper was detected in the whole fish trout samples. Copper was not detected above the laboratory method reporting limit of 0.6 mg/kg in any of the whole fish samples collected in the SBWWR.

Copper concentrations in the whole fish samples collected in the SBWWR were in the typical, or expected, range of the reference data (Figure 4-17).

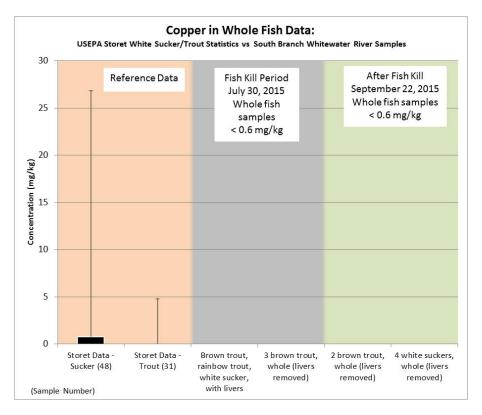


FIGURE 6-18. MEDIAN COPPER CONCENTRATIONS IN WHOLE FISH TISSUE STORET DATA (ORANGE AREA), FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR (FOLLOWING THE FISH KILL, GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

## **COPPER IN TROUT LIVERS**

Copper tends to accumulate in the livers of trout when compared to other species of fish, and as such, additional data analysis was completed. The trout liver reference data showed a wide range of concentrations that were orders of magnitude higher than the whole fish trout copper concentrations. Two brown trout liver samples were analyzed during the investigation. While these two samples represented the highest copper levels measured in fish tissue during the investigation, both concentrations were below the median of the trout liver copper reference data.

No white sucker liver copper reference data was available in the USEPA STORET database. With this said the white sucker liver sample from SBWWR analyzed with the investigation found copper at 1.18 mg/kg, or two orders of magnitude below the trout liver results.

Copper concentrations in the trout liver samples collected in the SBWWR were in the typical, or expected, range of the reference data (Figure 4-18).

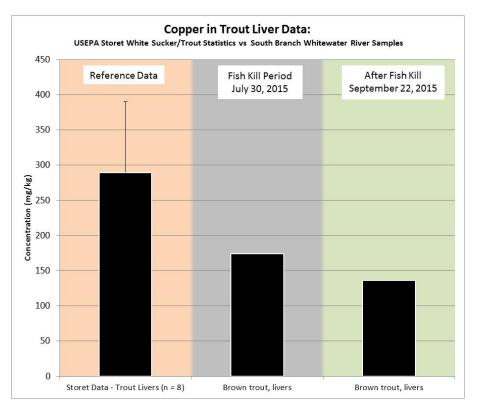


FIGURE 6-19. MEDIAN COPPER CONCENTRATIONS IN TROUT LIVERS STORET DATA (ORANGE AREA), FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR (FOLLOWING THE FISH KILL, GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

## IRON

Iron results in the reference data presented a wider range of data for trout than white suckers (Figure 4-19). Whole fish samples analyzed during the investigation also showed higher iron concentrations when compared to the liver sample results. All of the whole fish samples collected during the investigation were low when compared to the reference data.

Iron concentrations in fish tissue collected in the SBWWR were in the typical, or expected, range of the reference data.

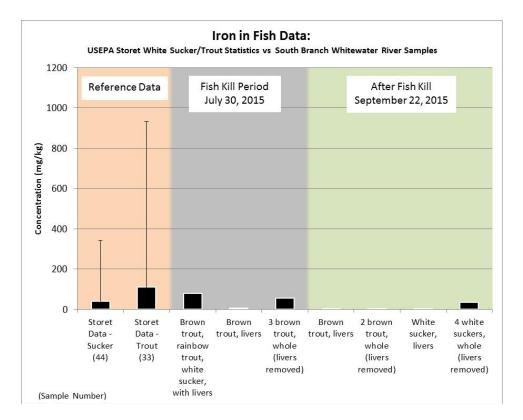


FIGURE 6-20. MEDIAN IRON CONCENTRATIONS IN FISH TISSUE STORET DATA (ORANGE AREA), FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR (FOLLOWING THE FISH KILL, GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

#### MANGANESE

Manganese results in the reference data presented a wider range of data for white suckers than trout (Figure 4-20). Median manganese reference data for both trout and white suckers were similar. Samples analyzed during the investigation also showed higher manganese concentrations in the whole fish samples that included white suckers. Whole fish trout results were within the range of the reference data. Manganese concentrations in the liver of both trout and white suckers were lower than the whole fish samples, including non-detectable concentrations (< 0.7 mg/kg) in the livers analyzed with the "After Fish Kill" samples.

Manganese concentrations in fish tissue collected in the SBWWR were in the typical, or expected, range of the reference data.

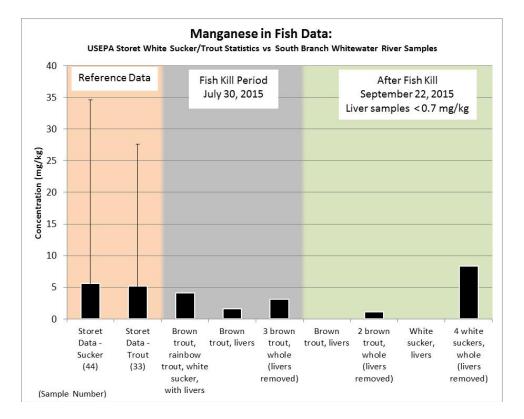


FIGURE 6-21. MEDIAN MANGANESE CONCENTRATIONS IN FISH TISSUE STORET DATA (ORANGE AREA), FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR (FOLLOWING THE FISH KILL, GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

## TITANIUM

No reference data was available in the USEPA STORET database for titanium concentrations in fish tissues. It is unknown if the concentrations of titanium presented below are unique to the SBWWR.

Since a comparison between the SBWWR and reference data was not able to be made, titanium concentrations in fish tissue were compared from the "Fish Kill Period" and the "After Fish Kill" period (Figure 4-21). Titanium concentrations were higher in the whole fish samples when compared to liver samples. Titanium concentrations were lower in the "After Fish Kill" period; however, there is no way of knowing if this difference is significant due to the small sample size.

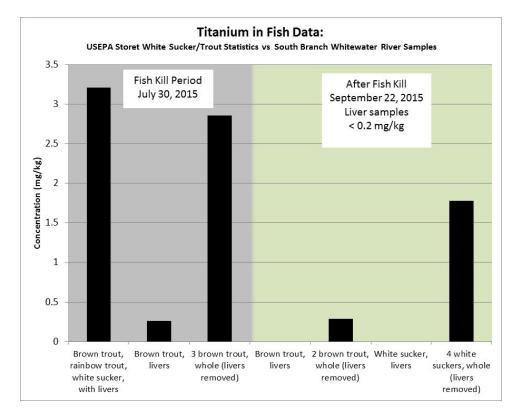


FIGURE 6-22. TITANIUM CONCENTRATIONS IN FISH TISSUE FROM FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR (FOLLOWING THE FISH KILL, GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA).

## ZINC

Zinc concentrations in the reference data presented a lower median and wider range of data for trout than white suckers (Figure 4-22). Samples analyzed during the investigation also showed generally consistent zinc values for both whole fish and livers of trout and white suckers. The white sucker and trout data collected during the investigation was similar to the zinc reference data as well as the "Fish Kill Period" samples and "After Fish Kill" samples.

Zinc concentrations in fish tissue samples collected from the SBWWR were in the typical, or expected, range of the reference data.

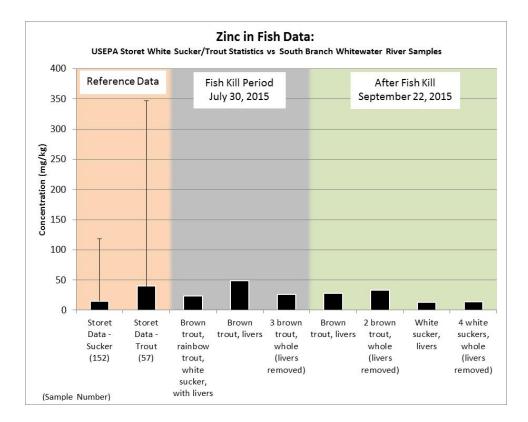


FIGURE 6-23. MEDIAN ZINC CONCENTRATIONS IN FISH TISSUE STORET DATA (ORANGE AREA), FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR FOLLOWING THE FISH KILL (GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA). THE ERROR BAR REPRESENTS THE MAXIMUM VALUE OF THE DATA.

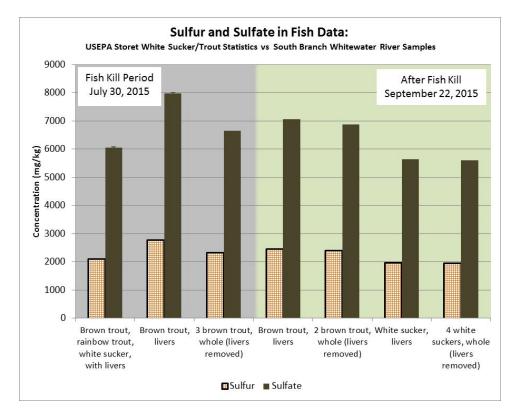
## OTHER ANALYTES

### SULFUR AND SULFATE

Sulfur and sulfate were included in the analysis because copper sulfate was considered as a possible fish kill cause.

No reference data was available in the USEPA STORET database for sulfur or sulfate concentrations in fish tissues. It is unknown if the concentrations of sulfur and sulfate presented below are unique to the SBWWR.

Since a comparison between the SBWWR and reference data was not able to be made, sulfur and sulfate concentrations in fish tissue were compared from the "Fish Kill Period" and the "After Fish Kill" period (Figure 4-23). Concentrations were comparable between the two different periods and amongst different fish species for sulfur and sulfate.



# FIGURE 6-24. SULFUR AND SULFATE CONCENTRATIONS IN FISH TISSUE FROM FISH COLLECTED ON JULY 30, 2015, IN THE SBWWR FOLLOWING THE FISH KILL (GRAY AREA), AND FISH COLLECTED ON SEPTEMBER 22, 2015, FROM THE SBWWR (GREEN AREA).

## FUNGICIDES

Whole fish laboratory analyses of five fungicides, two fungicide degradates, including azoxystrobin, carbendazim, fluxapyroxad, picoxystrobin, pyraclostrobin, pyraclostrobin metabolite #1, and pyraclostrobin metabolite #2.were completed. The fish were collected on July 30, 2015. No fungicide compounds were detected above the MRL. Laboratory results can be found in Appendix E.

## **IN-STREAM CONTINUOUS DATA COLLECTION:**

On August 7, the SBWWR near the CSH received approximately 0.43 inches of rainfall and no runoff was observed. The hydrograph from the SBWWR near Dover (see Figure 2-3) shows very little response from the rainfall event indicating no runoff occurred. The sondes recorded water temperature, specific conductivity, pH, and dissolved oxygen (Figures 4-24 and 4-25).

While there are daily oscillations in the data, all four parameters fall within the expected range of a cold water stream in southeast Minnesota. The data was collected from August 6 to August 10, 2015. Continuous data at this scale would have been invaluable to have during the fish kill period, however, it is extremely difficult to forecast such events as a fish kill. This data does not provide evidence of the conditions during the kill, but it provides evidence that the conditions had normalized in the weeks after the fish kill period.

SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: RESULTS

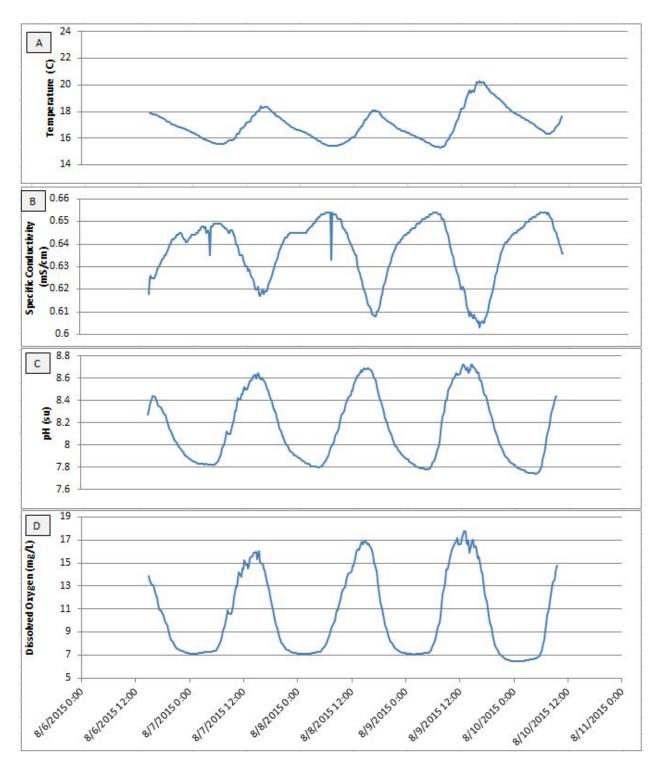


FIGURE 6-25. DIEL RESULTS FROM A DATALOGGING SONDE DEPLOYED AT KREIDERMACHER'S CAMPGROUND. PANEL A IS TEMPERATURE (°C), PANEL B IS SPECIFIC CONDUCTIVITY (μS/CM), PANEL C IS PH, AND PANEL D IS DISSOLVED OXYGEN (MG/L).

SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: RESULTS

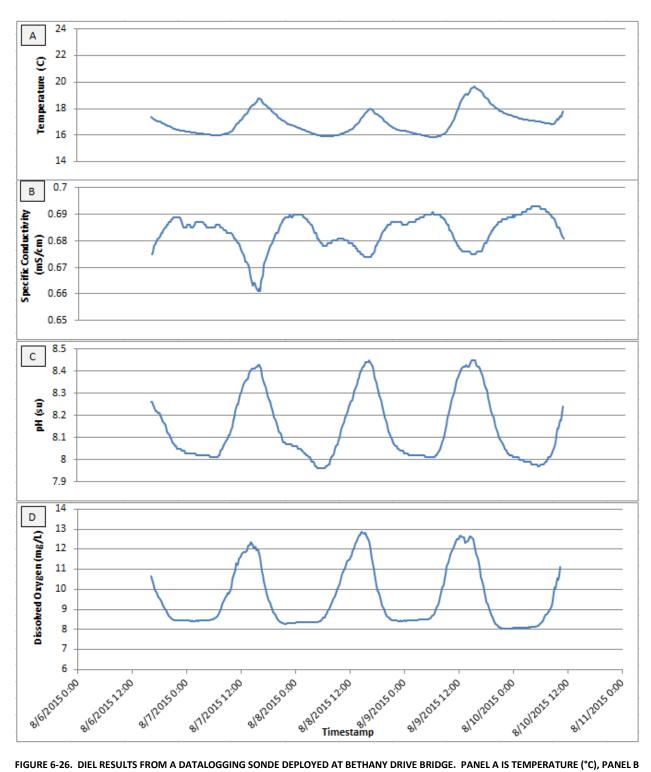


FIGURE 6-26. DIEL RESULTS FROM A DATALOGGING SONDE DEPLOYED AT BETHANY DRIVE BRIDGE. PANEL A IS TEMPERATURE (°C), PANEL B IS SPECIFIC CONDUCTIVITY (µS/CM), PANEL C IS PH, AND PANEL D IS DISSOLVED OXYGEN (MG/L).

## **UNKNOWN CHEMICAL SCREENING**

In an attempt to investigate a known dumping area off of Bethany Drive as a possible cause of the fish kill, an unknown chemical screening was performed on a sample collected from a ravine. The sample was collected from an area with orange tint, later identified as iron oxidizing bacteria. This screen included many volatile organic compounds (VOCs) and other organic compounds. There were no detections in the screening, and no physical evidence (empty containers, etc.) in the ravine. The laboratory results can be found in Appendix E.

## 7. CONCLUSIONS

At 09:32 on July 30, 2015, DNR fisheries staff reported a fish kill on the South Branch of the Whitewater River (SBWWR) to the Minnesota Duty Officer. Three state agencies, the DNR, MDA, and MPCA, responded to the report with a unified fish kill investigation. Samples of water, fish, soil, and manure were collected and potential sources including pesticide and manure applications were investigated. Samples were analyzed for pesticides, nutrients, metals and various other constituents in an effort to determine the cause of the fish kill.

Throughout the course of the investigation, a series of conference calls were held between field and lab scientists with expertise in a variety of fields, experienced professional staff, and program managers. This working group discussed possible causal options, decided how best to explore each, and thoroughly examined all leads. Scientific analysis of available evidence was unable to draw a clear conclusion as to the cause of this fish kill, as a combination of biological, chemical, and environmental conditions may have led to this event. A summary of conclusions of the investigation are presented below:

- The fish kill on the SBWWR was likely related to a high intensity rainfall event that occurred in the early morning hours of July 28, 2015. Radar estimated rainfall amounts varied from 1 to 2.5 inches across the SBWWR watershed but were highest in the upper reaches of the watershed. In the area dead fish were found, rainfall amounts were estimated in the 1 to 1.5 inches. The fish kill is estimated to have occurred sometime between the morning of July 28 and the afternoon of July 29, 2015.
- 2. Dead fish were observed from the Crystal Springs State Fish Hatchery (river mile 3.1) upstream to Bethany Drive access (river mile 9.7) representing approximately 6.5 miles of the SBWWR.
- 3. This fish kill was likely the result of a short duration, acutely toxic event. With this type of event, fish die rapidly and there is often little or no accumulation of toxic compounds in fish organs and tissue (Meyer and Barclay 1990).
- 4. The flowing nature of streams makes collection of evidence from an acute incident difficult. It is likely that the acutely toxic source material that killed the fish moved through the SBWWR as a slug and had dissipated or moved downstream of the kill area at non-lethal concentrations prior to the call to the Duty Officer on July 30, 2015.
- 5. The riparian corridor and nearby land in the area of the fish kill are designated as a State Wildlife Management Area suggesting that the toxic substance that killed the fish likely entered through a tributary creek or ravine near the upper portion of the fish kill area. A Stream Power Index assessment conducted in the area of the fish kill indicated runoff pathways from surrounding lands.
- 6. The fish kill impacted several fish species including brown and rainbow trout, dace, sculpin, and white sucker, among others. The total number of dead fish counted at Station 1 was 147 and 123 dead fish at Station 2 on July 30, 2015. Since the spatial extent of the fish kill is unknown, extrapolating these numbers to the entire stream is not reliable. Extrapolating between the two stations, gives us a minimum number of 3724 total fish killed. Extrapolating this even further from the snowmobile bridge near CSH to the Bethany Drive access point (6.5 miles) estimates the total number of fish killed as 9610 fish.
- 7. Fish necropsy indicated that the fish kill was not related to disease, but rather to an acute cause.
- 8. Fish tissue analysis was completed for fungicides with no detections.
- Fish tissue analysis was completed for metals and concentrations were compared with fish tissue samples collected several weeks after the kill as well as other Midwestern river samples available from a national database (STORET). Concentrations of metals were within the typical, or expected, range of the reference data.

- 10. A water sample was collected from the SBWWR on July 28, 2015, after the rain event but prior to any knowledge of a fish kill and analyzed for total ammonia, metals and pesticides with no unusual levels reported.
- 11. The water quality data collected following the rainfall event, prior to and following the report of the fish kill did not indicate toxic levels of ammonia, pesticides, or metals in the SBWWR. These constituents are three of the most probable candidates for acute toxicity in this instance.
- 12. Although fungicides were being applied to area agricultural fields prior to the fish kill, no evidence of illegal pesticide applications were found. The two active ingredients in the fungicides being applied (pyraclostrobin and fluxapyroxad) were detected at extremely low levels (below the laboratory method reporting limit) in water samples from the SBWWR. The levels were well below the EPA aquatic life benchmarks. Other pesticide related chemicals detected in the SBWWR water samples were similar to historical and adjacent watershed levels.
- 13. Fungicide applications prior to the rainfall event were made to crops with full canopies that greatly reduce the potential risk of overland runoff.
- 14. Manure applications in the area of the fish kill were investigated and no illegal applications were determined to have occurred prior to the fish kill. On-site inspection of a field located near the upper reaches of the kill area where manure had been applied before and after the rain event, indicated that manure had left the field with runoff and was found pooled in two different areas between the field and the SBWWR. However, no evidence (staining or pooling) was found indicating that manure made it to the SBWWR. In the lower portions of the ravines closest to the SBWWR only clear water was found pooled. These pooled areas of clear water did not have a manure odor nor did the pooled areas appear to be contaminated with manure.
- 15. Manure applications were made to fields that were fallow or had forage crops. The fallow land is much more likely to have overland runoff occur than land with crops with full canopies.
- 16. Samples collected from pooled manure areas near the SBWWR and manure pits from the respective sources indicated similar levels of metals which may suggest that the pooled material found between the point of application and the SBWWR ravine was manure from the same source. The Stream Power Index indicated the same areas would be likely runoff pathways from the point of application.
- 17. Although no evidence of manure reaching the river was noted in the areas where manure was documented leaving the application area (fallow field), field notes from August 4, indicated the presence of a manure odor while walking the SBWWR and manure like material (brown foam) in the stream. Odor from manure applications travel over long distances therefore odor observed during the walking of the stream could have been from the manure applications that had occurred on the upland areas. The brown material, observed in the stream did not exhibit elevated ammonia levels at the time of sampling but indicated a high biological oxygen demand suggesting elevated levels of organic material in the SBWWR.
- According to the summary in EPA's total aluminum criterion from 1988 (Ambient Water Quality Aluminum, 1988), fish mortality is possible at the aluminum concentrations found near the hatchery (~1600 µg/L). The criterion is most reliable in the normal pH range of 6.5-9.0.
- 19. No evidence of illegal dumping of other materials was documented.
- 20. Wastewater treatment plants that discharge to the SBWWR reported no unusual effluent releases or were not discharging at the time of the fish kill.
- 21. The limestone quarry near the area of the fish kill was investigated as a possible source. There is no major outlet that is obvious and the quarry appeared dry.
- 22. About twenty dead crayfish were noted upstream of Bethany Drive. The presence of dead crayfish is not an indicator of the cause or spatial extent of the fish kill. Crayfish body shape makes them susceptible to dislodgement so mortality during high water events is largely due to their inability to find refuge (Clark and Kersher 2011).

# 8. APPENDIX A: LABORATORY ANALYTE LISTS AND METHOD REPORTING LIMITS

Chemical	Method Reporting Limit (µg/L)
Azoxystrobin	10.0
Carbendazim	10.0
Fluxapyroxad	10.0
Picoxystrobin	10.0
Pyraclostrobin	10.0
Pyraclostrobin metabolite #1	10.0
Pyraclostrobin metabolite #2	10.0

TABLE 8.1. WHOLE FISH MDA FUNGICIDE ANALYTE LIST AND METHOD REPORTING LIMITS

#### TABLE 8.2. WHOLE FISH MDA METAL ANALYTE LIST AND METHOD REPORTING LIMITS

Chemical	Method Reporting Limit (µg/L)
Aluminum	0.2
Arsenic	0.2
Barium	0.2
Copper	0.6
Iron	0.8
Manganese	0.7
Sulfur	10
Sulfate	30
Titanium	0.2
Zinc	0.6

Parameter	Method Reporting Limit
Alkalinity	10 mg/L
Ammonia	0.02 mg/L
Biological Oxygen Demand (BOD)	0.5 mg/L
Chloride	0.5 mg/L
Escherichia coli (E. coli)	10 (MPN/100 mL)
Hardness	10 mg/L
Nitrate	0.04 mg/L
Nitrate + Nitrite	0.05 mg/L
рН	na
Phosphorus, dissolved ortho-	0.005 mg/L
Phosphorus, total	0.01 mg/L
Total Kjedhal Nitrogen	0.2 mg/L
Total Solids	125 mg/L
Total Suspended Soilds	25 mg/L
Total Volatile Solids	120 mg/L
Sulfate	0.5 mg/L

## TABLE 8.3. MDA/MDH NUTRIENT AND SEDIMENT ANALYTES AND METHOD REPORTING LIMIT FOR WATER SAMPLES.

TABLE 8.4. MDH METAL ANALYTES AND METHOD REPORTING LIMIT FOR WATER SAMPLES.

Metal	Method Reporting Limit (µg/L)
Aluminum	20
Arsenic	1
Copper	10
Iron	20
Manganese	10
Zinc	10

## TABLE 8.5. MDA PESTICIDE ANALYTES AND METHOD REPORTING LIMIT FOR WATER SAMPLES.

GC-MS/MS		
Analyte	MRL (ng/L)	
Acetochlor	30.0	
Alachlor	30.0	
Atrazine	30.0	
Benfluralin	25.0	
Bifenthrin	20.0	
Chlorothalonil	50.0	
Chlorpyrifos	40.0	
Clomazone	15.0	
Cyfluthrin	100	
Deethylatrazine	50.0	
Deisopropylatrazine	150	
Diazinon	30.0	
Diazinon Oxon	75.0	
Dichlobenil	5.0	
Dichlorvos	15.0	
Dimethenamid	15.0	
Dimethoate	100	
Disulfoton	60.0	
EPTC	10.0	
Esfenvalerate	150	
Ethalfluralin	50.0	
Ethofumesate	50.0	
Fonofos	15.0	
lambda-Cyhalothrin	75.0	
Malathion	50.0	
Methoxychlor	50.0	
Metolachlor	25.0	
Metribuzin	75.0	
Metribuzin DA	500 (estimated)	
Metribuzin DADK	500 (estimated)	
Metribuzin DK	500 (estimated)	
Oxadiazon	75.0	
Parathion-methyl	100	
Pendimethalin	75.0	
Phorate	25.0	
Prometon	100	
Propachlor	30.0	
Propazine	25.0	
Simazine	75.0	
Tebupirimphos	30.0	
Terbufos	30.0	
Tolfenpyrad	100.0	
Triallate	50.0	
Trifluralin	50.0	
zeta-Cypermethrin	500	

LC-MS/MS		
Analyte	MRL (ng/L)	
2,4,5-T	50.0	
2,4,5-TP	50.0	
2,4-D	8.3	
2,4-DB	20.0	
Acetamiprid	25.0	
Acetochlor ESA	30.0	
Acetochlor OXA	33.3	
Alachlor ESA	41.6	
Alachlor OXA	33.3	
Aldicarb Sulfone	15.0	
Aldicarb Sulfoxide	50.0	
Azoxystrobin	10.0	
Bensulfuron-methyl	16.7	
Bensulide	250.0	
Bentazon	5.0	
Boscalid	50.0	
Bromacil	30.0	
Bromoxynil	25.0	
Carbaryl	25.0	
Carbendazim	10.0	
Carbofuran	13.3	
Chlorantraniliprole	50.0	
Chlorimuron-ethyl	20.0	
Chlorpyrifos Oxon	40.0	
Clopyralid	41.6	
Clothianidin	25.0	
Cyanazine	25.0	
Cyantraniliprole	100.0	
DEDI Atrazine	50.0	
Dicamba	50.0	
Dichlorprop	50.0	
Dicrotophos	25.0	
Difenoconazole	25.0	
Dimethenamid ESA	6.7	
Dimethenamid OXA	10.0	
Dinotefuran	25.0	
Disulfoton Sulfone	20.0	
Diuron	13.3	
Flufenacet OXA	8.3	
Flumetsulam	50.0	
Flutriafol	10.0	
Fluxapyroxad	10.0	
Halosfulfuron-methyl	30.0	
Hexazinone	10.0	
Hydroxyatrazine	6.7	
Imazamox	13.3	
	13.5	

LC-MS/MS (continued)	
Analyte	MRL (ng/L)
Imazamethabenz-methyl	5.0
Imazapic	10.0
lmazapyr	8.3
Imazaquin	16.7
Imazethapyr	6.7
Imidacloprid	20.0
Imazamethabenz Acid	10.0
Isoxaflutole DKN	50.0
Isoxafultole	40.0
Linuron	20.0
МСРА	5.0
МСРВ	20.0
МСРР	50.0
Mesotrione	50.0
Metalaxyl	8.3
Metolachlor ESA	10.0
Metolachlor OXA	10.0
Metsulfuron-methyl	23.3
Myclobutanil	10.0
Neburon	10.0
Nicosulfuron	26.6
Norflurazon	20.0
Norflurazon-desmethyl	50.0
Oxydemeton-methyl	20.0
Parathion-methyl Oxon	25.0
Picloram	41.6
Picoxystrobin	50.0
Prometryn	3.3
Propachlor ESA	30.0
Propachlor OXA	10.0
Propiconazole	10.0
Pyraclostrobin	25.0
Pyroxasulfone	50.0
Saflufenacil	15.0
Sedaxane	75.0
Siduron	6.7
Sulfometuron-methyl	8.3
Tebuconazole	10.0
Tembotrione	50.0
Tetraconazole	10.0
Thiacloprid	50.0
Thiamethoxam	25.0
Thifensulfuron-methyl	16.7
Thiobencarb	8.3
Triasulfuron	23.3

1,1,1,2-Tetrachloroethane11,1,1-Trichloroethane11,1,2,2-Tetrachloroethane11,1,2-Trichloroethane11,1,2-Trichloroethane11,1-Dichloroethane11,1-Dichloroethane11,1-Dichloroethane11,1-Dichloroethane11,1-Dichloroethane11,1-Dichloroethane11,2,3-Trichloropropene11,2,3-Trichlorobenzene11,2,4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dichlorobenzene11,2-Dichlorobenzene11,2-Dichloropenane11,2-Dichloropenane11,3-Dichloropenane11,3-Dichloropenane11,3-Dichloropenane11,3-Dichloropenane11,4-Dichlorobenzene <t< th=""><th>Chemical</th><th>Method Reporting Limit (µg/L)</th></t<>	Chemical	Method Reporting Limit (µg/L)
1,1,2,2-Tetrachloroethane11,1,2-Trichloroethane11,1,2-Trichlorotrifluoroethane11,1-Dichloroethane11,1-Dichloroethane11,1-Dichloroethane11,1-Dichloropropene11,2,3-Trichlorobenzene11,2,3-Trichlorobenzene11,2,4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichloroptane11,2-Dichloroptane11,2-Dichloroptane11,3-5-Trimethylbenzene11,3-Dichloroptane11,3-Dichloroptane11,3-Dichloroptane11,3-Dichloroptane11,3-Dichloroptane11,4-Dichloroptane	1,1,1,2-Tetrachloroethane	1
1,1,2-Trichloroethane11,1,2-Trichlorotrifluoroethane11,1-Dichloroethane11,1-Dichloroethane11,1-Dichloropropene11,2,3-Trichlorobenzene11,2,3-Trichlorobenzene11,2,4-Trichlorobenzene11,2,4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromo-3-chloropropane (DBCP)51,2-Dichlorobenzene11,2-Dichlorobenzene11,2-Dichloropenae11,2-Dichloropenae11,3-Dichloropenae11,3-Dichloropenae11,3-Dichloropenae11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Dichloropenae11,4-Di	1,1,1-Trichloroethane	1
1,1,2-Trichlorotrifluoroethane11,1-Dichloroethane11,1-Dichloroethene11,1-Dichloropropene11,2,3-Trichlorobenzene11,2,3-Trichlorobenzene11,2,4-Trichlorobenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichloropropane11,3-Dichloropropane11,3-Dichloropropane11,3-Dichlorobenzene11,3-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichloropropane11,4-Dichloropropane11,4-Dichlorobenzene11,4-	1,1,2,2-Tetrachloroethane	1
1,1-Dichloroethane11,1-Dichloroethene11,1-Dichloropropene11,1-Dichloropropene11,2,3-Trichlorobenzene11,2,3-Trichloropropane11,2,4-Trinethylbenzene11,2-4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichloropropane11,2-Dichloropropane11,3-Dichloropropane11,3-Dichlorobenzene11,3-Dichlorobenzene11,4-Dichloro	1,1,2-Trichloroethane	1
1,1-Dichloroethene11,1-Dichloropropene11,2,3-Trichlorobenzene11,2,3-Trichloropropane11,2,4-Trichlorobenzene11,2,4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichloropropane11,2-Dichloropropane11,2-Dichloropropane11,3-Dichloropropane11,3-Dichlorobenzene11,3-Dichlorobenzene11,3-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene-d402,2-Dichloropropane11,4-Chlorotolene1	1,1,2-Trichlorotrifluoroethane	1
1,1-Dichloropropene11,2,3-Trichlorobenzene11,2,3-Trichloropropane11,2,4-Trichlorobenzene11,2,4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichlorobenzene11,2-Dichloropenane11,2-Dichloropenane11,2-Dichloropenane11,3-Dichloropenane11,3-Dichlorobenzene11,3-Dichlorobenzene11,3-Dichlorobenzene11,4-Dichlorobenzene1	1,1-Dichloroethane	1
1,2,3-Trichlorobenzene11,2,3-Trichloropropane11,2,3-Trichlorobenzene11,2,4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichlorobenzene11,2-Dichloropropane11,2-Dichloropropane11,3-Dichloropropane11,3-Dichlorobenzene11,3-Dichlorobenzene11,3-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene1	1,1-Dichloroethene	1
1,2,3-Trichloropropane11,2,4-Trichlorobenzene11,2,4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichloropropane11,2-Dichloropropane11,2-Dichloropropane11,3-Dichloropropane11,3-Dichloropropane11,3-Dichloropropane11,3-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene1	1,1-Dichloropropene	1
1,2,4-Trichlorobenzene11,2,4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichlorobenzene11,2-Dichloropropane11,2-Dichloropropane11,3-Dichloropropane11,3-Dichlorobenzene11,3-Dichloropropane11,3-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene1	1,2,3-Trichlorobenzene	1
1,2,4-Trimethylbenzene11,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichloropthane11,2-Dichloropthane11,2-Dichloropthane11,3,5-Trimethylbenzene11,3-Dichlorobenzene11,3-Dichlorobenzene11,3-Dichloropthane11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene1	1,2,3-Trichloropropane	1
1,2-Dibromo-3-chloropropane (DBCP)51,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichloropthane11,2-Dichloropthane11,2-Dichloropthane11,3-Dichloropthane11,3-Dichlorobenzene11,3-Dichloropthane11,3-Dichloropthane11,3-Dichloropthane11,3-Dichloropthane11,4-Dichlorobenzene11,4-Dichlorobenzene12,2-Dichloropthane12-Chlorotolene14-Chlorotolene1	1,2,4-Trichlorobenzene	1
1,2-Dibromoethane (EDB)11,2-Dichlorobenzene11,2-Dichloroethane11,2-Dichloropropane11,3-Dichloropropane11,3-Dichlorobenzene11,3-Dichlorobenzene11,3-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene12,2-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene11,4-Dichlorobenzene1	1,2,4-Trimethylbenzene	1
1,2-Dichlorobenzene11,2-Dichloroethane11,2-Dichloropropane11,3-Dichloropropane11,3-Dichlorobenzene11,3-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene-d402,2-Dichloropropane12-Chlorotolene111	1,2-Dibromo-3-chloropropane (DBCP)	5
1,2-Dichloroethane11,2-Dichloropropane11,3-Dichloropropane11,3-Dichlorobenzene11,3-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene-d402,2-Dichloropropane12-Chlorotolene14-Chlorotolene1	1,2-Dibromoethane (EDB)	1
1,2-Dichloropropane11,3,5-Trimethylbenzene11,3-Dichlorobenzene11,3-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene-d402,2-Dichloropropane12-Chlorotolene14-Chlorotolene1	1,2-Dichlorobenzene	1
1,3,5-Trimethylbenzene11,3-Dichlorobenzene11,3-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene-d402,2-Dichloropropane12-Chlorotolene14-Chlorotolene1	1,2-Dichloroethane	1
1,3-Dichlorobenzene11,3-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene-d402,2-Dichloropropane12-Chlorotolene14-Chlorotolene1	1,2-Dichloropropane	1
1,3-Dichloropropane11,4-Dichlorobenzene11,4-Dichlorobenzene-d402,2-Dichloropropane12-Chlorotolene14-Chlorotolene1	1,3,5-Trimethylbenzene	1
1,4-Dichlorobenzene11,4-Dichlorobenzene-d402,2-Dichloropropane12-Chlorotolene14-Chlorotolene1	1,3-Dichlorobenzene	1
1,4-Dichlorobenzene-d402,2-Dichloropropane12-Chlorotolene14-Chlorotolene1	1,3-Dichloropropane	1
2,2-Dichloropropane12-Chlorotolene14-Chlorotolene1	1,4-Dichlorobenzene	1
2-Chlorotolene14-Chlorotolene1	1,4-Dichlorobenzene-d4	0
4-Chlorotolene 1	2,2-Dichloropropane	1
	2-Chlorotolene	1
Acetone 20	4-Chlorotolene	1
	Acetone	20
Allyl chloride 1	Allyl chloride	1
Benzene 1	Benzene	1
Bromobenzene 1	Bromobenzene	1
Bromochloromethane 1	Bromochloromethane	1
Bromodichloromethane 1	Bromodichloromethane	1
Bromoform 1	Bromoform	1
Bromomethane 2	Bromomethane	2
Carbon tetrachloride 1	Carbon tetrachloride	1
Chlorobenzene 1	Chlorobenzene	1
Chlorobenzene-d5 0	Chlorobenzene-d5	0
Chlorodibromomethane 1	Chlorodibromomethane	1
Chloroethane 1	Chloroethane	1
Chloroform 1	Chloroform	1
Chloromethane 1	Chloromethane	1
cis-1,2-Dichloroethene 1	cis-1,2-Dichloroethene	1

## TABLE 8.6. MDH HAZARDOUS CHEMICAL SCREEN ANALYTE LIST WITH METHOD REPORTING LIMITS.

Chemical	Method Reporting Limit (µg/L)
cis-1,3-Dichloropropene	1
Dibromomethane	1
Dichlorodifluoromethane	1
Dichlorofluoromethane	1
Ethyl ether	1
Ethylbenzene	1
Fluorobenzene	0
Hexachlorobutadiene	1
Isopropylbenzene	1
Methyl ethyl ketone (MEK)	10
Methyl isobutyl ketone (MIBK)	5
Methyl tertiary butyl ether (MTBE)	2
Methylene chloride	2
Naphthalene	1
n-Butylbenzene	1
n-Propylbenzene	1
o-Xylene	1
p&m-Xylene	1
p-Isopropyltoluene	1
sec-Butylbenzene	1
Styrene	1
tert-Butylbenzene	1
Tetrachloroethene	1
Tetrahydrofuran (THF)	10
Toluene	1
trans-1,2-Dichloroethene	1
trans-1,3-Dichloropropene	1
Trichloroethene (TCE)	1
Trichlorofluoromethane	1
Vinyl chloride	1

## 9. APPENDIX B: DICHOTOMOUS KEY FOR FISH KILL INVESTIGATIONS

Taken from the FP Meyer. Chapter 3: Interpreting the Scene.

After the initial visual inspection of the scene, an investigator can sometimes make preliminary assumptions about the cause of a fish kill. By using a process of elimination based on the evidence at hand, certain types of causes may be highly unlikely. A dichotomous key is provided below as an example of how the thought process might proceed. This key is offered as a tool-not as a definitive reference-for assessing fish kills. Opportunities to use the key to help reach a presumptive conclusion concerning the cause of a fish kill are provided in Chapter 13. Seven case histories are described to help potential investigators test their skill in evaluating the information that became available during the on-site investigation. Although the thought process would be the same for ponds, lakes, streams, and estuaries, most of the examples used in preparing the key were taken from data on fish kills in ponds. In streams, where evidence at the site may be transitory because of the flow, the investigator may have to check downstream to attempt to reconstruct the scene.

<ol> <li>Kill occurred in less than 24 hours</li></ol>
<ol> <li>Kill occurred between midnight and sunrise 3</li> <li>Kill occurred at times other than between midnight and sunrise</li></ol>
<ol> <li>Water dark in color, musty odor, or odor of sour cabbage</li></ol>
4. Some fish alive         5           4. All fish dead         16
<ol> <li>5. Large fish dead, some small fish alive6</li> <li>5. Small fish dead, some large fish alive18</li> </ol>
<ul><li>6. Dissolved oxygen less than 2 ppm</li></ul>
<ol> <li>Algal cells absent or dead if present</li></ol>

	<ol> <li>Dead algal cells abundant</li> <li>Oxygen depletion due to</li> <li>Algal cells absent</li> </ol>	o enrichment
	Oxygen depletion due to algicic	al substance
	Kill occurred between 9:00 a.m. and 5:00 Kill occurred at other times as well	-
	10. pH above 9.0	
	Dissolved oxygen high, often saturated, or saturation	12 water
	<ol> <li>Heavy bloom of one or more specie green algae</li></ol>	c algal bloom
13. 13.	Vegetation dead (appears burned) Vegetation normal	
	<ul><li>14. Ammonia levels not high, near zero</li><li>14. Ammonia levels high</li><li>Anhydrous a</li></ul>	
15. 15.	pH 6.0 to 7.0 Oxyg pH below 6.0 Possible let or heavy metal poisoning; possible mine	thal low pH
	16.Some fish still alive16.All fish dead	
17. 17.	Kill size selective	
	<ol> <li>Some small fish alive, large fish dea</li> <li>Small fish dead, some large fish aliv</li> </ol>	
19. 19.	Zooplankton and insects alive Zooplankton and insects dead	
	<ol> <li>Algal cells alive</li> <li>Algal cells dead or absent</li> <li>Toxic herbicit</li> </ol>	
21. 21.	Fish showing convulsive or aberrant beh Fish seemingly normal	
	<ol> <li>Fins in normal position</li> <li>Pectoral fins of fish thrust to extrem position Organophosph</li> </ol>	ne forward

23.	Kill occurred throughout day	
23.	Kill	Pesticide poisoning         occurred between 9:00 a.m. and 5:00 p.m.
	24.	Recent temporary major change in water temperature
	24.	
		falls below or exceeds thermal tolerance-e.g., die-off of threadfin shad in cold weather; kill usually restricted to one species
25. 25.	Nos	cies selectivity evident
	26. 26.	No lesions on fish Low toxicity or low
		concentration of toxic substance (see also 23)
0		anisms in lesions visible to naked eye 28 organisms visible
	28.	Organisms wormlike, attached to external surface of fish
	28.	Leeches (not a cause of death) Organisms resemble copepods or have jointed body parts Parasitic copepods or isopods (known to kill fish)
29. 29.	Lesi	ons not hemorrhagic
	30. 30.	Lesions as small discrete bodies or masses in tissues
		Bacterial or fungal cause
31. 31.	prot	on or mass filled with cellular material 
	32. 32.	Bubbles of gas present in gills, fins, and behind eyes Gas bubble disease, due to supersaturation with a gas Odorous gas in large bubbles in necrotic lesions. .Bacterial disease caused by <i>Edwardsiella tarda</i>

# 10. APPENDIX C. SAMPLE COLLECTION AND DATA ANALYSIS INFORMATION

## TABLE 10.1. SAMPLE COLLECTION INFORMATION FOR IN-STREAM WATER SAMPLES.

Location	Agency	Sample ID	Date	Time (CST)	•	Collection Method	Preservation Method	Laboratory	Analyses Performed	Sample Collection Purpose*
Crystal Springs	MDA	DTT15001	2/13/2015		<b>Type</b> Grab	Dipper	Refrigeration	MDA	Pesticides,	Routine
#1 CR-37 near	MDA	SBW15001	5/15/2015		Grab	Van Dorn	Refrigeration	MDA	Nutrients Pesticides,	Routine
Hatchery CR-37 near Hatchery	MDA	SBW15002	5/27/2015	13:05	Grab	Dipper	Refrigeration	MDA	Nutrients Pesticides, Nutrients	Routine
CR-37 near Hatchery	MDA	SBW15003	6/12/2015	13:50	Grab	Van Dorn	Refrigeration	MDA	Pesticides, Nutrients	Routine
CR-37 near Hatchery	MDA	SBW15004	6/29/2015	14:00	Grab	Dipper	Refrigeration	MDA	Pesticides, Nutrients	Routine
CR-37 near Hatchery	MDA	SBW15005	7/13/2015	08:45	Grab	Dipper	Refrigeration	MDA	Pesticides, Nutrients	Routine
CR-37 near Hatchery	MDA	SBW15006	7/28/2015	13:00	Grab	Van Dorn	Refrigeration	MDA/MDH	Pesticides/ Metals/ Nutrients	Routine, During fish kill period
CR-119 Bridge	MPCA	Cnty Rd. 119	7/30/2015	15:30	Grab	Wading	Refrigeration	MDA	Pesticides/ Ammonia	Investigation
CR-112 Bridge	MDA	WW-01	7/30/2015	16:45	Grab	Wading	Refrigeration	MDA/MDH	Pesticides/ Metals	Investigation
Bethany Drive Access	МРСА	Bethany Drive	7/30/2015	16:20	Grab	Wading	Refrigeration	MDA/MDH	Pesticides/ Metals/ Ammonia	Investigation
Kreidermacher's Campground	MPCA	Kreidermacher's Campground, Show bridge	7/30/2015	17:11	Grab	Wading	Refrigeration	MDA	Pesticides/ Ammonia	Investigation
Near Hatchery	DNR	4	7/30/2015	10:00	Grab	Wading	Refrigeration	MDA	Pesticides	Investigation
Near Hatchery	DNR	5	7/30/2015	15:15	Grab	Wading	Refrigeration	MDA	Pesticides	Investigation
CR-37 near Hatchery	MDA	SBW15007	8/6/2015	09:45	Grab	Dipper	Refrigeration	MDA	Pesticides/ Nutrients	Routine
Field Replicate	MDA	SBW15701	8/6/2015	09:45	Grab	Dipper	Refrigeration	MDA	Pesticides/ Nutrients	Routine
Brown Foam near Kreidermacher's Campground	MPCA	SBW15010	8/6/2015	14:30	Grab	Wading	Refrigeration	MDA	Pesticides/ Ammonia/ Abiotic parameters	Other – Supporting Investigation
CR-37 near Hatchery	MDA	SBW15802	8/7/2015	07:30	Grab	Dipper	Refrigeration	MDA	Pesticides/ Nutrients	Routine
Field Blank	MDA	SBW15008	8/7/2015	07:45	Grab	Blank	Refrigeration	MDA	Pesticides	Routine
Ravine off Bethany Drive	МРСА	Bethany South Ravine (Manure)	8/7/2015	10:45	Grab	Dipper	Refrigeration	MDH	Metals	Other – Supporting Investigation

## SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: APPENDIX C

Agency	Sample ID	Date	Time (CST)	Sample Type	Collection Method	Preservation Method	Laboratory	Analyses Performed	Sample Collection Purpose*
MDA	DTT15005	8/11/2015	07:45	Grab	Dipper	Refrigeration	MDA	Pesticides Nitrate	Routine
MDA	DTT15006	8/11/2015	07:50	Grab	Blank	Refrigeration	MDA	Pesticides / Nitrate	Routine
MPCA	BR	8/17/2015	18:30	Grab	Dipper	Refrigeration	MDH	Metals/ Ammonia/ Hazardous Chemicals	Other – Supporting Investigation
MDA	SBW15011	8/19/2015	08:50	Grab	Dipper	Refrigeration	MDA	Pesticides / Nutrients	Routine
PCA	Bethany DR DS	8/19/2015	11:30	Grab	Wading	Refrigeration	MDH	Metals/ Nutrients	Investigation
PCA	Bethany DR US	8/19/2015	11:40	Grab	Wading	Refrigeration	MDH	Metals/ Nutrients	Investigation
	MDA MDA MPCA MDA PCA	MDA     DTT15005       MDA     DTT15006       MPCA     BR       MDA     SBW15011       PCA     Bethany DR DS	MDA         DTT15005         8/11/2015           MDA         DTT15006         8/11/2015           MDA         DTT15006         8/11/2015           MPCA         BR         8/17/2015           MDA         SBW15011         8/19/2015           PCA         Bethany DR DS         8/19/2015	Agency         Sample ID         Date         (CST)           MDA         DTT15005         8/11/2015         07:45           MDA         DTT15006         8/11/2015         07:50           MDA         DTT15006         8/11/2015         07:50           MPCA         BR         8/17/2015         18:30           MDA         SBW15011         8/19/2015         08:50           PCA         Bethany DR DS         8/19/2015         11:30	AgencySample IDDate(CST)TypeMDADTT150058/11/201507:45GrabMDADTT150068/11/201507:50GrabMPCABR8/17/201518:30GrabMDASBW150118/19/201508:50GrabPCABethany DR DS8/19/201511:30Grab	AgencySample IDDate(CST)TypeMethodMDADTT150058/11/201507:45GrabDipperMDADTT150068/11/201507:50GrabBlankMPCABR8/17/201518:30GrabDipperMDASBW150118/19/201508:50GrabDipperPCABethany DR DS8/19/201511:30GrabWading	AgencySample IDDate(CST)TypeMethodMethodMDADTT150058/11/201507:45GrabDipperRefrigerationMDADTT150068/11/201507:50GrabBlankRefrigerationMPCABR8/17/201518:30GrabDipperRefrigerationMDASBW150118/19/201508:50GrabDipperRefrigerationPCABethany DR DS8/19/201511:30GrabWadingRefrigeration	AgencySample IDDate(CST)TypeMethodMethodLaboratoryMDADTT150058/11/201507:45GrabDipperRefrigerationMDAMDADTT150068/11/201507:50GrabBlankRefrigerationMDAMPCABR8/17/201518:30GrabDipperRefrigerationMDHMDASBW150118/19/201508:50GrabDipperRefrigerationMDAPCABethany DR DS8/19/201511:30GrabWadingRefrigerationMDH	Agency         Sample ID         Date         (CST)         Type         Method         Method         Laboratory         Performed           MDA         DTT15005         8/11/2015         07:45         Grab         Dipper         Refrigeration         MDA         Pesticides         Nitrate           MDA         DTT15006         8/11/2015         07:50         Grab         Blank         Refrigeration         MDA         Pesticides / Nitrate           MDA         DTT15006         8/11/2015         07:50         Grab         Blank         Refrigeration         MDA         Pesticides / Nitrate           MPCA         BR         8/11/2015         07:50         Grab         Blank         Refrigeration         MDA         Pesticides / Nitrate           MPCA         BR         8/17/2015         18:30         Grab         Dipper         Refrigeration         MDH         Metals/           MDA         SBW15011         8/19/2015         08:50         Grab         Dipper         Refrigeration         MDA         Pesticides / Nitrients           PCA         Bethany DR DS         8/19/2015         11:40         Grab         Wading         Refrigeration         MDH         Metals/           Nutrients <td< td=""></td<>

# TABLE 10.2. NUTRIENT, SEDIMENT AND ABIOTIC RIVER PARAMETERS WITH THE COLLECTION PERIOD SUB-CATEGORY FOR SAMPLES COLLECTED IN THE SBWWR.

Location	Agency	Sample ID	Date	Time (CST)	<b>Collection Period</b>	Parameter analyzed*
LOCATION	Agency	Sample ID	Date	Time (CST)	Sub-Category	
						Alk, BOD, CL, E. coli, Hardness, NO3,
Lowberton Mill Deed Dridee		Mariana	1074 2012	Mariaua	Historic MPCA	$NO_3+NO_2$ , $NH_3$ , $pH$ , $TKN$ , $SO_4$ , $TP$ ,
Lamberton Mill Road Bridge	MPCA	Various	1974-2012	Various	<b>River Sampling</b>	Trans, TS, TSS,
Crystal Springs #1	MDA	DTT15001	2/13/2015	09:00	Hatchery Spring	NO <sub>3</sub>
	11D/1	51113001	2,13,2013	05.00	Pre-Fish Kill	
Crystal Springs #1	MDA	DTT15005	8/11/2015	07:45	Hatchery Spring	NO <sub>3</sub>
	WIEM	51113003	0/11/2013	07.45	Post-Fish Kill	
CR-37 near Hatchery	MDA	SBW15001	5/15/2015	06:40	Pre-Fish Kill	NO <sub>3</sub> , DOP, TP, Trans
CR-37 near Hatchery	MDA	SBW15002	5/27/2015	13:05	Pre-Fish Kill	NO <sub>3</sub> , DOP, TP, Trans
CR-37 near Hatchery	MDA	SBW15003	6/12/2015	13:50	Pre-Fish Kill	NO <sub>3</sub> , DOP, TP, Trans
CR-37 near Hatchery	MDA	SBW15004	6/29/2015	14:00	Pre-Fish Kill	NO <sub>3</sub> , DOP, TP, Trans
CR-37 near Hatchery	MDA	SBW15005	7/13/2015	08:45	Pre-Fish Kill	NO <sub>3</sub> , DOP, TP, Trans
CR-37 near Hatchery	MDA	SBW15006	7/28/2015	13:00	Fish Kill Period	NH <sub>3</sub> , NO <sub>3</sub> , DOP, TP, Trans
CR-119	MPCA	CR-119	7/30/2015	15:30	Fish Kill Period	NH <sub>3</sub>
Bethany Drive Bridge	MPCA	Bethany Drive	7/30/2015	16:20	Fish Kill Period	NH <sub>3</sub>
Kreidermacher's		Kreidermacher's				NH <sub>3</sub>
Campground	MPCA	Campground, Show	7/30/2015	17:11	Fish Kill Period	
campground		bridge				
CR-37 near Hatchery	MDA	SBW15007	8/6/2015	09:45	Post-Fish Kill	NH <sub>3</sub> , NO3, DOP, TP, Trans
CR37 near Hatchery	MDA	SBW15008	8/7/2015	07:45	Post-Fish Kill	NH <sub>3</sub> , NO3, DOP, TP, Trans
Bethany Drive Upstream	MPCA	Bethany Dr. US	8/19/2015	11:40	Post-Fish Kill	ALK, BOD, CL, Hardness, NO3+NO2,
	WIF CA	Bethany Dr. 05	3/13/2013	11.40		NH3, pH, TKN, TP, SO4

## SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: APPENDIX C

Location	Agency	Sample ID	Date	Time (CST)	Collection Period Sub-Category	Parameter analyzed*		
Bethany Drive Downstream	MPCA	Bethany Dr. DS	8/19/2015	11:10	Post-Fish Kill	ALK, BOD, CL, Hardness, NO3+NO2, NH <sub>3</sub> , pH, TKN, TP, SO <sub>4</sub>		
CR-37 near Hatchery	MDA	SBW15011	8/19/2015	08:50	Post-Fish Kill	NO3, DOP, TP, Trans		
Brown foam @ Kreidermacher's Campground	MPCA	SBW15010	8/6/2015	14:30	Other – Brown Foam	BOD, CL, <i>E. Coli</i> , NO <sub>3</sub> +NO <sub>2</sub> , NH <sub>3</sub> , pH, TP, TS, TSS,TVS		
Bethany Drive Ravine	MPCA	BR	8/17/2015	18:30	Other - Ravine	ALK, BOD, CL, Hardness, NO3+NO2, NH3, pH, TKN, TP, SO4		
Middle Branch Whitewater River MDA MBW15019 MBW15019 08:47 - 008:47 - 008:47 - 008:47 - 008:47 - 07:47 Watershed NO <sub>3</sub> , DOP, TP, Trans, TSS								
* Parameters analyzed key: ALK = alkalinity, BOD = Biological Oxygen Demand, CL = chloride, DOP=dissolved orthophosphorus, <i>E.coli</i> = <i>Escherichia coli</i> , Hardness = Hardness, NH <sub>3</sub> =ammonia, NO <sub>3</sub> +NO <sub>2</sub> = Nitrate+nitrite, NO <sub>3</sub> =nitrate, pH = pH, TKN=total kjedhal nitrogen, Trans=transparency, TP=total phosphorus, TS=total solids, TSS=total suspended solids, TVS=total volatile solids, SO <sub>4</sub> =sulfate								

## TABLE 10.3. PESTICIDE WATER SAMPLE COLLECTION PERIOD SUB-CATEGORY.

Location	Agency	Sample ID	Date	Time (CST)	Collection Period Sub- Category
Crystal Springs #1	MDA	DTT15001	2/13/2015	09:00	Hatchery Spring Pre-Fish Kill
Crystal Springs #1	MDA	DTT15005	8/11/2015	07:45	Hatchery Spring Post-Fish Kill
CR-37 near Hatchery	MDA	SBW15001	5/15/2015	06:40	Pre-Fish Kill
CR-37 near Hatchery	MDA	SBW15002	5/27/2015	13:05	Pre-Fish Kill
CR-37 near Hatchery	MDA	SBW15003	6/12/2015	13:50	Pre-Fish Kill
CR-37 near Hatchery	MDA	SBW15004	6/29/2015	14:00	Pre-Fish Kill
CR-37 near Hatchery	MDA	SBW15005	7/13/2015	08:45	Pre-Fish Kill
CR-37 near Hatchery	MDA	SBW15006	7/28/2015	13:00	Fish Kill Period
CR-119	MPCA	CR-119	7/30/2015	15:30	Fish Kill Period
CR-112	MDA	WW-01	7/30/2015	16:45	Fish Kill Period
Bethany Drive Bridge	MPCA	Bethany Drive	7/30/2015	16:20	Fish Kill Period
Kreidermacher's Campground	MPCA	Kreidermacher's Campground, Show bridge	7/30/2015	17:11	Fish Kill Period
Near Hatchery	DNR	4	7/30/2015	10:00	Fish Kill Period
Near Hatchery	DNR	5	7/30/2015	15:15	Fish Kill Period
CR-37 near Hatchery	MDA	SBW15007	8/6/2015	09:45	Post-Fish Kill
CR-37 near Hatchery	MDA	SBW15802	8/7/2015	07:30	Post-Fish Kill
CR-37 near Hatchery	MDA	SBW15011	8/19/2015	08:50	Post-Fish Kill
Brown foam @ K's Campground	MPCA	SBW15010	8/6/2015	14:30	Other – Brown Foam
Middle Branch Whitewater	MDA	MBW15019	7/28/2015 through	08:47 -	Other – Adjacent Watershed
River			8/1/2015	07:47	

Location	Agency	Date	Time (CST)	Description	Preservation Method	Laboratory	Analyses Performed	Sample Collection Purpose
Kreidermacher Campground	DNR	7/30/2015	10:00	Brown trout, brook trout, white sucker, whole fish composite, livers included	Frozen	MDA	Fungicides/ Metals	Investigation
Kreidermacher Campground	DNR	7/30/0215	10:00	Brown trout, livers	Frozen	MDA	Metals	Investigation
Kreidermacher Campground	DNR	7/30/0215	10:00	3 brown trout, whole, Livers were removed and analyzed separately	Frozen	MDA	Metals	Investigation
Kreidermacher Campground	DNR	9/22/2015	14:00	Brown trout, livers	Frozen	MDA	Metals	Background
Kreidermacher Campground	DNR	9/22/2015	14:00	2 brown trout, whole, Livers were removed and analyzed separately	Frozen	MDA	Metals	Background
Kreidermacher Campground	DNR	9/22/2015	14:00	White sucker, livers	Frozen	MDA	Metals	Background
Kreidermacher Campground	DNR	9/22/2015	14:00	4 white suckers, whole, Livers were removed and analyzed separately	Frozen	MDA	Metals	Background

# 11. <u>Appendix D. Agency Standard Operating Procedures for Sample</u> <u>Collection</u>

## TABLE 11.1. ACCESS GUIDE FOR AGENCY SAMPLE COLLECTION STANDARD OPERATING PROCEDURES

Agency	Method	Electronic Access			
DNR	Fish Sampling	Available upon request			
DNR	Water Quality Sampling	Available upon request			
MPCA	Water Quality Sampling	Available upon request			
MPCA	Manure Sampling	Available upon request			
MDA	Water Quality Sampling	http://www.mda.state.mn.us/monitoring			
MDA	Soil Sampling	Available upon request			

# 12. APPENDIX E. CHAIN-OF-CUSTODY REPORTS AND ANALYTICAL RESULTS

## TABLE 12.1. WATER SAMPLE CHAIN-OF-CUSTODY REPORTS AND ANALYTICAL RESULTS.

	INNESOTA DEPARTMENT		5/26/2015 Sample Numbers	02/13/	2015		Brennon	tact: Schaefer
	MENT OF AGRICULTU	DE	Inspector No: D	TT15001 -15-0081		DG ID	45.5	00.0504
	Analysis Report	nc.	Quantity x Sample				15-8	DG-0534
	t Street North			a size:	Projec			
	nesota 55155-2531		1x1L		Grou	nd Wat	er	
(651)	201-6010		Product Name: Water, Spring					
Water Monito	ring Final Report		Description:					
		Page 1 of 2	Collected From:					
Analysis Requested: GC			Crystal Springs	#1 / CRYSTL	1			
analysis noquosisu. GO			Temperature Rece	lved:	1	6 deg	C	
Analyte	Result	MRL	F	Result Comme	int			
GCMSMS Monitoring								
Acetochlor	ND at MRL	30 ppt						
Alachlor	ND at MRL	30 ppt						
Atrazine	32.3 ppt	30 ppt						
Benfluralin	ND at MRL	25 ppt						
Bifenthrin	ND at MRL	20 ppt						
Chlorothalonil	ND at MRL	50 ppt						
Chlorpyrifos	ND at MRL	40 ppt						
Clomazone	ND at MRI.	15 ppt						
Cyfluthrin	ND at MRL	100 ppt						
Delsopropylatrazine	ND at MRL	150 ppt						
Desethylatrazine	63.6 ppt	50 ppt						
Diazinon	ND at MRL	30 ppt						
Diazinon Oxon	ND at MRL	75 ppt						
Dichlobenli	ND at MRL	5 ppt						
Dichlorvos	ND at MRL	15 ppt						
Dimethenamid	ND at MRL	15 ppt						
Dimethoate	ND at MRL	100 ppt						
Disulfoton	ND at MRL	60 ppt						
EPTC	ND at MRL	10 ppt						
Esferivalerate	ND at MRL	150 ppt						
Ethalfluralin	ND at MRL	50 ppt						
Ethofumesate	ND at MRL	50 ppt						
Fonofos	ND at MRL	15 ppt						
Malathion Methoxychior	ND at MRL ND at MRL	50 ppt						
Metnoxycnior Metolachlor	ND at MRL	50 ppt						
Metribuzin	ND at MRL	25 ppt 75 ppt						
Metribuzin DA	ND at ERL	500 ppt						
Metribuzin DADK	ND at ERL	500 ppt						
Metribuzin DK	ND at ERL	500 ppt						
Oxadiazon	ND at MRL	75 ppt						
Parathion-methyl	ND at MRL	100 ppt						
Pendimethalin	ND at MRL	75 ppt						
Phorate	ND at MRL	25 ppt						
Prometon	ND at MRL	100 ppt						
Propachlor	ND at MRL	30 ppt						
Sample Remarks:								
Report ID:	424221	Kathryn Re	these data are corre synolds lysis Unit Supervisor	ct. Kalf	Ly	m	RE	78

			Date Printed:	Date Collec			on Contact:
	MINNESOTA DEPARTMENT		6/3/2015 Sample Numbers	02/13/	2015	8	rennon Schaefer
			Inspector No: D	TT15001	_		
	RTMENT OF AGRICULTU	JRE		-15-0085	5	SDG ID:	15-SDG-0534
Laborato		Quantity x Sample	Size:	Projec	Sur C		
	bert Street North	1x1L		Groun	nd Water		
	linnesota 55155-2531 i1) 201-6010		Product Name:		1		
(00	11/201-0010		Water, Spring				
Water Moni	toring Final Report		Description:		-		
	Page			-			**************************************
Analysis Democratical I.C.			Crystal Springs	#1 / CRYSTL	1		
Analysis Requested: LC			Temperature Rece	adalalalalalalalalalalalalalala		6 deg C	
Analyte	Result	MRL	kawaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa	lesuit Comme		0.009.0	
LCMSMS (+) Monitoring	T GOVERN	1111 644	*	oour commo	/ F ( L		
Acetamiprid	ND at MRL	25 ppt					
Aldicarb Sulfone	ND at MRL	15 ppt					
Aldicarb Sulfoxide	ND at MRL	50 ppt					
Azoxystrobin	ND at MRL	10 ppt					
Bensulfuron-methyl	ND at MRL	16.7 ppt					
Bensulide	ND at MRL	250 ppt					
Boscalid	ND at MRL	50 ppt					
Bromacil	ND at MRL	30 ppt					
Carbaryl	ND at MRL	25 ppt					
Carbendazim	ND at MRL	10 ppt					
Carbofuran	ND at MRL	13.3 ppt					
Chlorantraniliprole	ND at MRL	50 ppt					
Chlorimuron-ethyl	ND at MRL	20 ppt					
Chiorpyrifos Oxon	ND at MRL	40 ppt					
Clothianidin	ND at MRL	25 ppt					
Cyanazine	ND at MRL	25 ppt					
Cyantraniliprole	ND at MRL	100 ppt					
DEDI Atrazine	102 ppt	50 ppt					
Dicrotophos	ND at MRL	25 ppt					
Difenoconazole	ND at MRL	25 ppt					
Dinotefuran	ND at MRL	25 ppt					
Disulfoton Sulfone	ND at MRL	20 ppt					
Diuron Flumetsulam	ND at MRL ND at MRL	13.3 ppt					
Flutriafol		50 ppt					
Halosulfuron-methyl	ND at MRL ND at MRL	10 ppt 30 ppt					
Hexazinone	ND at MRL	30 ppt					
Hydroxyatrazine	14.6 ppt	10 ppt 6.7 ppt					
imazamethabenz Acid	ND at MRL	10 ppt					
mazamethabenz-methyl	ND at MRL	5 ppt					
mazamox	ND at MRL	13.3 ppt					
mazapic	ND at MRL	10 ppt					
mazapyr	ND at MRL	8.3 ppt					
mazaquin	ND at MRL	16.7 ppt					
mazethapyr	ND at MRL	6.7 ppt					
midacloprid	ND at MRL	20 ppt					
Sample Remarks:							
		I verify that	these data are corre	71.			1
Report I	D: 424225	Kathryn Re		Kal	Zam	mil	for s

MI	NNESOTA DEPARTMENT AGRICULTURE	Date Printed: 6/3/2015 Sample Numbers	Date Collect 02/13/		Division Contact: Brennon Schaefer	
MINNESOTA DEPARTI Laboratory A 601 Robert	Inspector No:         DTT15001           Lab ID:         W-15-0085         SDG ID:         15-SDG-05           Quantity x Sample Size:         Project:         1x 1 L         Ground Water					
	Saint Paul, Minnesota 55155-2531 (651) 201-6010					
Water Monitor	ing Final Report		Water, Spring Description:			
		Page 2 of 3	Collected From:			
-			Crystal Springs #	H / CRYSTL	t	
Analysis Requested: LC			Temperature Recei			deg C
Analyte	Result	MRL	R	esult Comme	ent	
LCMSMS (+) Monitoring						
Isoxaflutole	ND at MRL	40 ppt				
Linuron	ND at MRL	20 ppt				
Metalaxyl	ND at MRL	8.3 ppt				
Metsulfuron-methyl	ND at MRL	23.3 ppt				
Myclobutanil	ND at MRL	10 ppt				
Nicosulfuron	ND at MRL	26.6 ppt				
Norflurazon	ND at MRL	20 ppt				
Norflurazon-desmethyl	ND at MRL	50 ppt				
Oxydemeton-methyl	ND at MRL	20 ppt				
Parathion-methyl Oxon	ND at MRL	25 ppt				
Picoxystrobin	ND at MRL	50 ppt				
Prometryn	ND at MRL	3.3 ppt				
Propiconazole	ND at MRL	10 ppt				
Pyraclostrobin	ND at MRL	25 ppt				
Pyroxasulfone	ND at MRL	50 ppt				
Saflufenacil	ND at MRL	15 ppt				
Siduron	ND at MRL	6.7 ppt				
Sulformeturon-methyl	ND at MRL	8.3 ppt				
Tebuconazole	ND at MRL	10 ppt				
Tetraconazole	ND at MRL	10 ppt				
Thiacloprid	ND at MRL	50 ppt				
Thiamethoxam	ND at MRL	25 ppt				
Thifensulfuron-methyl	ND at MRL	16.7 ppt				
Thiobencarb	ND at MRL	8.3 ppt				
Triasulfuron	ND at MRL	23.3 ppt				
LCMSMS (-) Monitoring	THE LET THE IE	2010 Mpt				
2,4,5-T	ND at MRL	50 ppt				
2,4,5-TP	ND at MRL	50 ppt				
2,4-D	ND at MRL	8.3 ppt				
2,4-DB	ND at MRL	20 ppt				
Acetochlor ESA	ND at MRL	. 30 ppt				
Acetochlor OXA	ND at MRL	33.3 ppt				
Alachlor ESA	207 ppt	41.6 ppt				
Alachlor OXA	ND at MRL	33.3 ppt				
Bentazon	ND at MRL	5 ppt				
Bromoxynii	ND at MRL	25 ppt				

Report ID: 424225	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallang n. Ross

### SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: APPENDIX E

MINNESOTA DEPARTME	
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IN AGRICULTURE	

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: LC

Page 3 of 3

Date Printed: Date Collected: Division Contact: 6/3/2015 02/13/2015 Brennon Schaefer Sample Numbers Inspector No: DTT15001 Lab ID: W-15-0085 SDG ID: 15-SDG-0534 Quantity x Sample Size: Project: 1x1L Ground Water Product Name: Water, Spring Description: Collected From: Crystal Springs #1 / CRYSTL1

Result	MRL	Result Comm	rent	
ND at MRL				
ND at MRL				
	41.6 ppt			
ND at MRL	50 ppt			
ND at MRL	50 ppt			
ND at MRL	6.7 ppt			
ND at MRL	10 ppt			
ND at MRL	8.3 ppt			
ND at MRL	50 ppt			
ND at MRL	5 ppt			
ND at MRL	20 ppt			
ND at MRL	50 ppt			
ND at MRL	50 ppt			
187 ppt	10 ppt			
ND at MRL	10 ppt			
ND at MRL	41.6 ppt			
ND at MRL	30 ppt			
ND at MRL	10 ppt			
ND at MRL	75 ppt	,		
ND at MRL	50 ppt			
ND at MRL	50 ppt			
	ND at MRL ND at MRL 187 ppt ND at MRL ND at MRL	ND at MRL50 pptND at MRL6.7 pptND at MRL10 pptND at MRL50 pptND at MRL50 pptND at MRL20 pptND at MRL50 pptND at MRL50 pptND at MRL50 pptND at MRL50 pptND at MRL10 pptND at MRL10 pptND at MRL30 pptND at MRL30 pptND at MRL10 pptND at MRL10 pptND at MRL10 pptND at MRL10 pptND at MRL75 pptND at MRL50 ppt	ND at MRL50 pptND at MRL6.7 pptND at MRL10 pptND at MRL3.9 pptND at MRL50 pptND at MRL20 pptND at MRL50 pptND at MRL10 pptND at MRL30 pptND at MRL10 pptND at MRL10 pptND at MRL10 pptND at MRL10 pptND at MRL50 pptND at MRL50 ppt	ND at MRL       50 ppt         ND at MRL       6.7 ppt         ND at MRL       10 ppt         ND at MRL       8.3 ppt         ND at MRL       50 ppt         ND at MRL       10 ppt         ND at MRL       10 ppt         ND at MRL       30 ppt         ND at MRL       10 ppt         ND at MRL       50 ppt

Sample Remarks:

	Report ID: 424225	l verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kafan m Blogs
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								Lanesooro spring #2/ LNSBKZ	Peterson #1 - East Main Spring/ PTRSN1	Peterson #1 - East Main Spring/ PTRSN1	Crystal Springs #1/ CRYSTL1	SAMPLE LOCATION	Notes/Semple Conditions:	Brennon Schaefer David Tollefson	MINNES OF AGRIC
		'						2/13/2015	2/13/2015	2/13/2015	2/13/2015	DATE		Delivered By: David Tollefson	WATER MO 625 R St. Pau
		-					:	10:30	9;55	9:55	00:6	SAMPLE TE TIME		y: efson	NITORIN obert Stree
			•					D1715004	DTT15003	DTT15002	DTT15001	FIELD SAMPLE ID	Lab SDG Number	Delivery Method: SpeeDee Sample Type: Groundwater	WATER MONITORING PROGRAM Heather Johnson 625 Robert Street North Wilder Produck St. Paul, MN 55155-2538 Wate Deveman
								084	1083 1083	W-15-	- W-15	<u>ec</u>	<u></u>	Delivery Date Time: 024645	
								2300	08A	V-15-	2888 2987	5	<u>@ 2,7 1 ]</u>		Matt Rubikawskis David Tollefson Birennon Schaefer Russ Dendsoon Scott Matteson
												ANALYSIS REQUESTED	Temperature Received	Received By	507-206-2884 507-206-2882 517-204-5491 507-752-7035 507-344-524
			•					· · · · ·				, daj	E	X-12	Katle Rassmussen
	-							Contraction		· · ·					651-201-6331

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## SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: APPENDIX E

#### MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



## Water Monitoring Final Report

Re-issue of Report ID: DTT15001-229693

Date Reported: 10/26/2015	SDG ID: 15-SDG-0519	Page: Page 1 of 1
Division Contact:		
	Brennon Schae	fer

SDG Comments:

		DTT1500	1			
LAB Sample ID:	AR-15-0106	Quantity x Sample Size:	1 x 125 ml		Project Name: Ground W	/ater
Inspector Sample ID:	DTT15001	Date/Time Collected:	2/13/2015	0900		
Product/Description:	Water, Spring	Date/Time Received:	2/18/2015	1236	Temperature Received:	0.0 deg C
Collected From:	Crystal Springs #1 / C	RYSTL1				
Analysis Requested:	NO2+NO3					
Analyte	Result	MRL	Met	hod	Result Comment	
Nitrate/Nitrite	4.68 ppm	0.40 ppm	Std. Meth. 4 NO3 NO2	500 NO3-F,		
Nitrate/Nitrite Analysis Dat	e/Time 03/02/2015 1	10:45:00 am				
Sample Remarks:						

lau	uthorize this final report.
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Vocaste Etresmann



OF AGRIC	OTA DEPARTMENT ULTURE ID FERTILIZER MANAGEMENT	625 Ro	NITORINO bert Stree , MN 551			Matt Ribikawskis David Tollefson Brennon Schaefer Russ Derickson Scott Matteson	507-206-2884 507-206-2882 651-201-6491 507-752-7036 507-344-5261	Katie Rassmussen Date:	651-201-6331 2/13/2015
Report To:	Sampled By:	Delivered By	:	Delivery Method: SpeeDee	Delivery Date/Tim		Received By:	him	
Brennon Schaefer	David Tollefson	David Tolle	efson	Sample Type: Groundwater	02-18-15	1230	Adias	Septo-	Survey of the second second
Notes/Sample Condition	is:			Lab SDG Number: 15-SDG-0519	000		Temperature Receive		
SAMPLE LOCATI	DN	SAM	PLE	FIELD SAMPLE ID	N03/N02-N	AN	ALYSIS REQUE	STED	
Crystal Springs #1/ CRY	STL1	2/13/2015	9:00	DTT15001	AR-15- 0106				
Peterson #1 - East Main	Spring/ PTRSN1	2/13/2015	9:55	DTT15002	AR-15- 0107				
Peterson #1 - East Main	Spring/ PTRSN1	2/13/2015	9:55	DTT15003	AR-15- 0108				
Lanesboro Spring #2/ LM	ISBR2	2/13/2015	10:30	DTT15004	AR-15-				

### SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: APPENDIX E

MINNESOTA DEPARTMENT	
or AGRICULTURE	

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: GC

Page 1 of 2

Division Contact: Marie Juenemann Date Printed: Date Collected: 6/9/2015 05/15/2015 Sample Numbers Inspector No: SBW15001 Lab ID: W-15-0584 SDG ID: 15-SDG-1967 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Collected From: Whitewater River - South Branch/SBW Deceived: A 8 dog C

			Temperature Received:	4.8 deg C
Analyte	Result	MRL	Result Comm	ent
GCMSMS Monitoring				
Acetochlor	ND at MRL	30 ppt		
Alachlor	ND at MRL	30 ppt		
Atrazine	49.3 ppt	30 ppt		
Benfluralin	ND at MRL	25 ppt		
Blfenthrin	ND at MRL	20 ppt		
Chlorothalonil	ND at MRL	50 ppt		
Chlorpyrifes	ND at MRL	40 ppt		
Clomazone	ND at MRL	15 ppt		
Dyfluthrin	ND at MRL	100 ppt		
Deisopropylatrazine	ND at MRL	150 ppt		
Desethylatrazine	80.3 ppt	50 ppt		
Dlazinon	ND at MRL	30 ppt		
Diazinon Oxon	ND at MRL	75 ppt		
Dichlobenil	ND at MRL	5 ppt		
Dichlorvos	ND at MRL	15 ppt		
Dimethenamid	ND at MRL	15 ppt		
Dimethoate	ND at MRL	100 ppt		
Disulfoton	ND at MRL	60 ppt		
PTC	ND at MRL	10 ppt		
Esfenvalerate	ND at MRL	150 ppt		
Ethalfluralin	ND at MRL	50 ppt	**	
Ethofumesate	ND at MRL	50 ppt		
Fonofos	ND at MRL	15 ppt		
Valathion	ND at MRL	50 ppt		
Methoxychlor	ND at MRL	50 ppt		
/letolachlor	ND at MRL	25 ppt		
Vetribuzin	ND at MRL	75 ppt		
Vetribuzin DA	ND at ERL	500 ppt		
letribuzin DADK	ND at ERI.	500 ppt		
Aetribuzin DK	ND at ERL	500 ppt		
Dxadiazon	ND at MRL	75 ppt		,
Parathion-methyl	ND at MRL	100 ppt		
Pendimethalin	ND at MRL	75 ppt		
Phorate	ND at MRL	25 ppt		
	ND at MRL	100 ppt		
rometon				

Report ID: 430407	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallan	m. Res
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Date Printed:

6/9/2015

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: GC

Analyte

ARTMENT	00012010	0011011	.010 3	1934		
	Sample Numbers					mont
	Inspector No: SBW	5001				
AGRICULTURE	Lab ID: W-15	0584	SD	G ID:	15-SDG-1967	
Report	Quantity x Sample Siz	e:	Project:			200833
lorth 5155-2531	1x1L		Surface	Water		
0100-2001	Product Name: Water, River/Stream					
al Report	Description:					1001.77
Page 2 of 2	Collected From:					
	Whitewater River - S	South Brar	ch/SBW			
	Temperature Received	k.	4.8 (	deg C		
Result MRL	Rest	ilt Comme	nt			

Date Collected:

05/15/2015

Division Contact:

Marie Juenemann

GCMSMS Monitoring			
Propazine	ND at MRL	25 ppt	
Simazine	ND at MRL	75 ppt	
Tebupirimiphos	ND at MRL	30 ppt	
Terbutos	ND at MRL	30 ppt	
Tolfenpyrad	ND at MRL	100 ppt	
Triallate	ND at MRL	50 ppt	
Trifluralin	ND at MRL	50 ppt	
lambda-Cyhalothrin	ND at MRL	75 ppt	
zeta-Cypermethrin	ND at MRL	500 ppt	

Sample Remarks:

Report ID: 430407 I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallang no Barts	
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					-			Whitewater River-Middle Branch/MBW	Whitewater River-South Branch/SBW	Root River-South Fork-Houston/SR5	SAMPLE LOCATION	Notes/Sample Conditions:	Report To: Marie Juenemann	MINN OF AG	
								anch/MBW	anch/SBW	ston/SR5			Sampled By: David Tollefson	MINNESOTA DEPARTMENT OF AGRICULTURE PESTICIDE AND FERTILIZER MANAGEMENT	
								 5/15/2015	5/15/2015	5/13/2015	DATE TIM		Delivered By: Matthew Ri	м	
								7:15	6:40	13:30	Π		: ibikawskis	625 R St. Pau	
		-						MBW15007	SBW15001	SR515001	FIELD SAMPLE ID	Lab SDG Number:	Delivery Method: Hand Matthew Ribikawskis Sample Type: Surface Water	WATER MONITORING PROGRAM William Vanitysev 625 Robert Street North David Tolleson St. Paul, MN 55155-2538	
				, ,				2250		0223	ec	- 460	Received Date/Time:	William VanRyswyk Mike Macdonald David Totlefson	
								9350			LC A	LONH-	iam -	507-344-3203 M 651-201-6694 L 507-206-2882 R	
											ANLALYSIS REQU	43 Temperature Rece	Received By:	Matthew Ribikawskis 507-205-2864 Marte Juenemann Luke Stuewe 23-8-945-7425 Jeff Paddock Russ Derictson 507-752-7036 Brennon Schaefer Kote Rassmussen 551-201-5331 Soott Vatteson 517-334-5261	
											0 vested	<u>eceived (°C)</u>	).	507-206-2884 218-846-7425 507-752-7036 651-201-6331 507-334-5261	(0)-
											ACE/ELISA	1 		Marie Juenemann Jeff Paddock Brennon Schaefer	ORIGINAL
											Triazine/ELISA			651-201-6161 651-201-6560 651-201-6491	SIMAL

#### MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



Date Reported: 10/26/2015

Division Contact:

# Water Monitoring Final Report

Re-issue of Report ID: SBW15001-231557

SDG ID: 15-SDG-1968	Page: Page 1 of 1
Marie Juenemar	nn

SDG Comments:

		SBW1500	)1			
LAB Sample ID:	AR-15-1071	Quantity x Sample Size:	1 x 125 ml		Project Name: Surface V	Water
Inspector Sample ID:	SBW15001	Date/Time Collected:	5/15/2015	0640		
Product/Description:	Water, River/Stream	Date/Time Received:	5/20/2015	1200	Temperature Received:	0 deg C
Collected From:	Whitewater River - So	uth Branch/SBW				
Analysis Requested:	NO2+NO3					
Analyte	Result	MRL	Met	hod	Result Comment	
Nitrate/Nitrite	8.37 ppm	0.40 ppm	Std. Meth. 4 NO3 NO2	500 NO3-F,		
Nitrate/Nitrite Analysis Date	e/Time 05/22/2015 0	)9:46:00 am				
ample Remarks:						
LAB Sample ID:	AR-15-1074 SBW15001	Quantity x Sample Size: Date/Time Collected:		0640	Project Name: Surface V	Water
LAB Sample ID: Inspector Sample ID:	SBW15001	, ,	5/15/2015	0640 1200	Project Name: Surface V Temperature Received:	
LAB Sample ID: Inspector Sample ID: Product/Description:	SBW15001	Date/Time Collected: Date/Time Received:	5/15/2015			
LAB Sample ID: Inspector Sample ID: Product/Description:	SBW15001 Water, River/Stream Whitewater River - Sou	Date/Time Collected: Date/Time Received:	5/15/2015			
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From:	SBW15001 Water, River/Stream Whitewater River - Sou	Date/Time Collected: Date/Time Received:	5/15/2015	1200		
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From: Analysis Requested:	SBW 15001 Water, River/Stream Whitewater River - Son TP+DOP Result	Date/Time Collected: Date/Time Received: uth Branch/SBW	5/15/2015 5/20/2015	1200	Temperature Received:	
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv	SBW 15001 Water, River/Stream Whitewater River - Son TP+DOP Result	Date/Time Collected: Date/Time Received: uth Branch/SBW MRL 0.005 ppm	5/15/2015 5/20/2015 Meth	1200	Temperature Received:	
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Ortho Phosphorus, Dissolv	SBW 15001 Water, River/Stream Whitewater River - Son TP+DOP Result red 0.026 ppm	Date/Time Collected: Date/Time Received: uth Branch/SBW MRL 0.005 ppm	5/15/2015 5/20/2015 Meth	1200	Temperature Received:	

Sample Remarks:

l au	itnorize this final report.		
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Vocaste	Etresmann	

SOUTH BRANCH OF THE WHITEWATER F	VER UNIFIED FISH KILL RESPONSE: APPENDIX E
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						C	OP	$\mathbb{Y}$	
OF AGRIC	DTA DEPARTMENT ULTURE 5 FERTILIZER MANAGEMENT	625 Ro	bert Stree		507-344-3203 651-201-6694 507-206-2882	Matthew Ribikawskis Luke Stuewe Russ Derickson Katie Rassmussen Scott Matteson	507-206-2884 218-846-7425 507-752-7036 651-201-6331 507-334-5261	Marie Juenemann Jeff Paddock Brennon Schaefer	651-201-6161 651-201-6560 651-201-6491
Report To:	Sampled By:	Delivered By	:	Delivery Method: Hand	Received Date/T		Received By:	and the second second	
Marie Juenemann	David Tollefson	Matthew R	ibikawskis	Sample Type: Surface Water	5-2015		Cl		A CONTRACTOR
Notes/Sample Conditions:				Lab SDG Number: 1948		Lab Temp	erature Rec	eived (°C):	1
		SAMPL	F FND		0		LYSIS REQU	ECTED	Constant of the
SAMPLE LOCATIO	N	DATE	TIME	FIELD SAMPLE ID	NO2 + NO3	TP + DOP	CL	TSS	TURBIDITY
Root River-South Fork-Hou	ston/SR5	5/13/2015	13:30	SR515001	AR-15- 1070	AR-15- 1073			
Whitewater River-South Br	anch/SBW	5/15/2015	6:40	SBW15001	AR-15- /07/	AR-15- 1074			
Whitewater River-Middle B	ranch/MBW	5/15/2015	7:15	MBW15007	AR-15- 1072	AR-15- 1075			
		_							
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		1				1			1

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1	MINNESOTA DEPARTMENT
	of AGRICULTURE

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Page 1 of 2

 
 Date Printed: 8/12/2015
 Date Collected: 05/27/2015
 Division Contact: Marie Juenemann

 Sample Numbers Inspector No: Lab ID: W-15-0709
 SDG ID: 15-SDG-2169

 Quantity x Sample Size: 1 x 1 L
 Project: Surface Water

 Product Name: Water, River/Stream
 Surface Water

 Description:
 Collected From: Whitewater River - South Branch/SBW

Analysis Requested: GC			Whitewater River - South Brand	
			Temperature Received:	7.4 deg C
Analyte	Result	MRL	Result Commen	t
GCMSMS Monitoring				
Acetochlor	ND at MRL	30 ppt		
Alachlor	ND at MRL	30 ppt		
Atrazine	41.2 ppt	30 ppt		
Benfluralin	ND at MRL	25 ppt		
Bifenthrin	ND at MRL	20 ppt		
Chlorothalonil	ND at MRL	50 ppt		
Chlorpyrifos	ND at MRL	40 ppt		
Clomazone	ND at MRL	15 ppt		
Syfluthrin	ND at MRL	100 ppt		
Deisopropylatrazine	ND at MRL	150 ppt		
Desethylatrazine	67.7 ppt	50 ppt		
Diazinon	ND at MRL	30 ppt		
Jiazinon Oxon	ND at MRL	75 ppt		
lichlobenil	ND at MRL	5 ppt		
ichlorvos	ND at MRL	15 ppt		
Imethenamid	ND at MRL	15 ppt		
Imethoate	ND at MRL	100 ppt		
lsulfoton	ND at MRL	60 ppt		
PTC	ND at MRL	10 ppt		
sfenvalerate	ND at MRL	150 ppt		
thalfluralin	ND at MRL	50 ppt		
thofumesate	ND at MRL	50 ppt		
onofos	ND at MRL	15 ppt		
lalathion	ND at MRL	50 ppt		
lethoxychlor	ND at MRL	50 ppt		
letolachlor	28.1 ppt	25 ppt		
letribuzin	ND at MRL	75 ppt		
letribuzin DA	ND at ERL	500 ppt		
letribuzin DADK	ND at ERL	500 ppt		
letribuzin DK	ND at ERL	500 ppt		
xadiazon	ND at MRL	75 ppt		
arathion-methyl	ND at MRL	100 ppt		
endimethalin	ND at MRL	75 ppt		
horate	ND at MRL	25 ppt		
rometon	ND at MRL	100 ppt		
ropachlor	ND at MRL	30 ppt		
Sample Remarks:	1.400 001 1111 100			

Patient relaying of a capertain a stress of the second stress of the sec		Report ID: 431437	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffan	m	RESS
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: GC

ARTMENT		0/16/6010	0016116	-010	1910		
		Sample Numbers	7				*1400+0+4
		Inspector No: SBV	/15002				
AGRICULTUR	E	Lab ID: W-1	5-0709	SD	G ID:	15-SDG-2169	
Report		Quantity x Sample S	lze:	Project:			
lorth 5155-2531		1x1L		Surface	Water		
0100-2001		Product Name: Water, River/Strea	m				
al Report		Description:					
F	Page 2 of 2	Collected From:					
		Whitewater River -	South Brar	nch/SBW			
		Temperature Receive	ed:	7.4 (	deg C		
Result	MRI.	Res	sult Comme	nt			

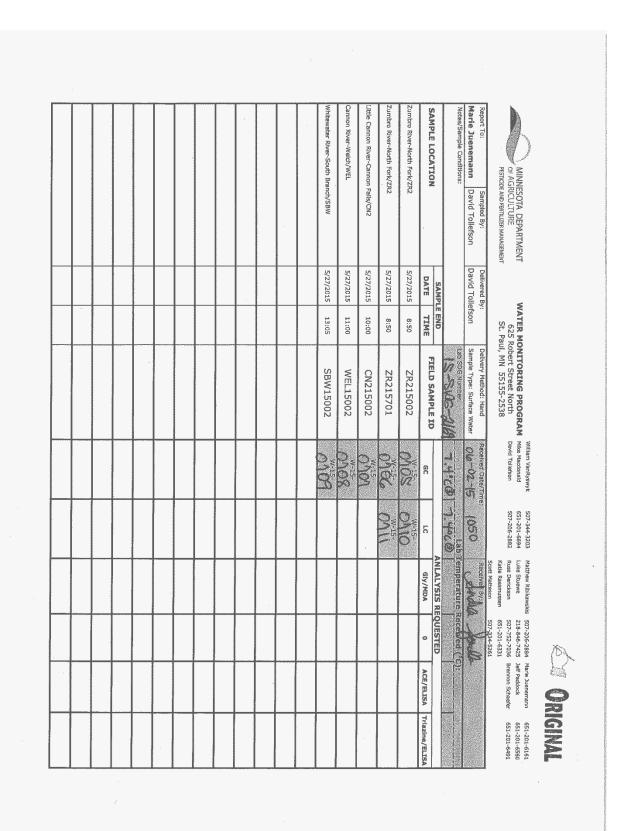
Date Collected: 05/27/2015 Division Contact: Marie Juenemann

Date Printed: 8/12/2015

Analyte	Result	MRI.	Result Comment
GCMSMS Monitoring			
Propazine	ND at MRL	25 ppt	
Simazine	ND at MRL	75 ppt	
Tebupirimiphos	ND at MRL	30 ppt	
Terbufos	ND at MRL	30 ppt	
Tolfenpyrad	ND at MRL	100 ppt	
Triallate	ND at MRL	50 ppt	
Trifluralin	ND at MRL	50 ppt	
lambda-Cyhalothrin	ND at MRL	75 ppt	
zeta-Cypermethrin	ND at MRL	500 ppt	

Sample Remarks:

Report ID: 431437 I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaftang n. Ross
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# MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



# Water Monitoring Final Report

Re-issue of Report ID: SBW15002-231793

Date Reported:		Page:
10/26/2015	15-SDG-2175	Page 1 of 1
Division Contact:		
	Marie Juenema	nn

SDG Comments:

		SBW1500	02			
LAB Sample ID:	AR-15-1353	Quantity x Sample Size:	1 x 125 ml		Project Name: Surface W	ater
Inspector Sample ID:	SBW15002	Date/Time Collected:	5/27/2015	1305		
Product/Description:	Water, River/Stream	Date/Time Received:	6/2/2015	1050	Temperature Received: (	0 deg C
Collected From:	Whitewater River - Sou	uth Branch/SBW				
Analysis Requested:	NO2+NO3					
Analyte	Result	MRL	Met	hod	Result Comment	
Nitrate/Nitrite	7.50 ppm	0.40 ppm	Std. Meth. 4 NO3 NO2	500 NO3-F,		
Nitrate/Nitrite Analysis Date	e/Time 06/03/2015 0	1:06:19 pm				
Sample Remarks:						
LAB Sample ID: Inspector Sample ID:		Quantity x Sample Size: Date/Time Collected:		1305	Project Name: Surface W	ater
	SBW15002	, ,	5/27/2015	1305 1050	Project Name: Surface W Temperature Received: 0	
Inspector Sample ID: Product/Description:	SBW15002	Date/Time Collected: Date/Time Received:	5/27/2015			
Inspector Sample ID: Product/Description:	SBW15002 Water, River/Stream Whitewater River - Sou	Date/Time Collected: Date/Time Received:	5/27/2015			
Inspector Sample ID: Product/Description: Collected From:	SBW15002 Water, River/Stream Whitewater River - Sou	Date/Time Collected: Date/Time Received:	5/27/2015	1050		
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte	SBW 15002 Water, River/Stream Whitewater River - Sou TP+DOP Result	Date/Time Collected: Date/Time Received: uth Branch/SBW	5/27/2015 6/2/2015	1050	Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Ortho Phosphorus, Dissolv	SBW 15002 Water, River/Stream Whitewater River - Sou TP+DOP Result ed 0.062 ppm	Date/Time Collected: Date/Time Received: uth Branch/SBW MRL 0.005 ppm	5/27/2015 6/2/2015 Met	1050	Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested:	SBW 15002 Water, River/Stream Whitewater River - Sou TP+DOP Result ed 0.062 ppm	Date/Time Collected: Date/Time Received: uth Branch/SBW MRL 0.005 ppm	5/27/2015 6/2/2015 Met	1050	Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Ortho Phosphorus, Dissolv Date/Time	SBW 15002 Water, River/Stream Whitewater River - Sou TP+DOP ed Analysis 06/17/2015 0 0.159 ppm	Date/Time Collected: Date/Time Received: uth Branch/SBW MRL 0.005 ppm 1:48:39 pm 0.01 ppm	5/27/2015 6/2/2015 Met EPA 365.1	1050	Temperature Received:	

l au	ithorize this final report.	
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Vocaste	Emesmann

MINNESO or AGRICU	TA DEPARTMENT		NITORIN	William VanRyswy G PROGRAM Mike Macdonald 2t North David Tollefson	651-201-6694	Matthew Ribikawskis Luke Stuewe Russ Derickson	507-206-2884 218-846-7425 507-752-7036	Marie Juenemann Jeff Paddock Brennon Schaefer	651-201-6161 651-201-6560 651-201-6491
PESTICIDE AND Report To:	FERTILIZER MANAGEMENT		, MN 551			Katie Rassmussen Scott Matteson	651-201-6331 - 507-334-5261 Received By:		
Marie Juenemann	David Tollefson	David Tolle		Sample Type: Surface Water	06-02-1		lecence or	a delle	
Notes/Sample Conditions:				Lab SDG Number:	OSCO.		erature Rec	eived (/C):	
SAMPLE LOCATION		SAMPL		FIELD SAMPLE ID			LYSIS REQU		
umbro River-North Fork/ZF	22	5/27/2015	8:50	ZR215002	AR-15- 349	TP + DOP	CL	TSS	TURBIDITY
umbro River-North Fork/ZF	22	5/27/2015	8:50	ZR215701	AR-15-	AR-15 J3SS			
ittle Cannon River-Cannon	Falls/CN2	5/27/2015	10:00	CN215002	AR-15-	AR-15- 1356			
Cannon River-Welch/WEL		5/27/2015	11:00	WEL15002	1352	1351			
Whitewater River-South Bran	nch/SBW	5/27/2015	13:05	SBW15002	1353	1358			
							· · · · · · · · · · · · · · · · · · ·		
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MINNESOTA DEPARTMENT

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Page 1 of 2

Analysis Requested: GC

Date Collected: Date Printed: Division Contact: 8/13/2015 06/12/2015 Marie Juenemann Sample Numbers Inspector No: SBW15003 Lab ID: W-15-0832 SDG ID: 15-SDG-2390 Quantity x Sample Size: Project: 1 x 1 L Surface Water Product Name: Water, River/Stream Description: **Collected From:** Whitewater River - South Branch/SBW Temperature Received: 7.0 deg C

			10 00g 0
Analyte	Result	MRL	Result Comment
GCMSMS Monitoring			
Acetochlor	185 ppt	30 ppt	
Alachlor	ND at MRL	30 ppt	
Atrazine	83.3 ppt	30 ppt	
Benfluralin	ND at MRL	25 ppt	
Bifenthrin	ND at MRL	20 ppt	
Chlorothalonil	ND at MRL	50 ppt	
Chlorpyrifos	ND at MRL	40 ppt	
Clomazone	ND at MRL	15 ppt	
Cyfluthrin	ND at MRL	100 ppt	
Deisopropylatrazine	ND at MRL	150 ppt	
Desethylatrazine	71.0 ppt	50 ppt	
Diazinon	ND at MRL	30 ppt	
Diazinon Oxon	ND at MRL	75 ppt	
Dichlobenil	ND at MRL	5 ppt	
Dichlorvos	ND at MRL	15 ppt	
Dimethenamid	83.0 ppt	15 ppt	
Dimethoate	ND at MRL	100 ppt	
Disulfoton	ND at MRL	60 ppt	
EPTC	ND at MRL	10 ppt	
Esfenvalerate	ND at MRL	150 ppt	
Ethalfluralin	ND at MRL	50 ppt	
Ethofumesate	ND at MRL	50 ppt	
Fonofos	ND at MRL	15 ppt	
Malathion	ND at MRL	50 ppt	
Vethoxychlor	ND at MRL	50 ppt	
Vietolachlor	110 ppt	25 ppt	
Vetribuzin	ND at MRL	75 ppt	
Metribuzin DA	ND at ERL	500 ppt	
Metribuzin DADK	ND at ERL	500 ppt	
Vetribuzin DK	ND at ERL	500 ppt	
Oxadiazon	ND at MRL	75 ppt	
Parathion-methy!	ND at MRL	100 ppt	·
Pendimethalin	ND at MRL	75 ppt	
Phorate	ND at MRL	25 ppt	
Prometon	ND at MRL	100 ppt	
Propachlor	ND at MRL	30 ppt	

I verify that these data are correct. 

 Report ID: 432266
 I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor
 Kathryn Ru Policies

 This report shall not be reproduced except in full, without the written approval from the laboratory. These results are only applicable to the sample(s) listed.

Date Printed:

8/13/2015

Sample Numbers

\	MINNESOTA DEPAR	TASES IT
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	OF AGRICULTURE	

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Analysis Requested: GC

Analyte

AGRICULI	URE	Lab ID: W-15-0832	SDG ID:	15-SDG-2390
eport orth		Quantity x Sample Size:	Project:	
155-2531		1x1L	Surface Water	
100-2001		Product Name: Water, River/Stream	4	
I Report		Description:	0220900111000001000001100000202099999999	24000-024002499-04499-0449-0449-0449-044
	Page 2 of 2	Collected From:		
		Whitewater River - South Bra	anch/SBW	
		Temperature Received:	7.0 deg C	
lesult	MRL	Result Comm	ent	
- + + + + FD1	DE not			

Date Collected:

06/12/2015

**Division Contact:** 

Marie Juenemann

GCMSMS Monitoring			
Propazine	ND at MRL	25 ppt	
Simazine	ND at MRL	75 ppt	
Tebupirimiphos	ND at MRL	30 ppt	
Terbufos	ND at MRL	30 ppt	
Tolfenpyrad	ND at MRL	100 ppt	
Triallate	ND at MRL	50 ppt	
Trifluralin	ND at MRL	50 ppt	
lambda-Cyhalothrin	ND at MRL	75 ppt	
zeta-Cypermethrin	ND at MRL	500 ppt	

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Sample Remarks:

	Report ID: 432266	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kalan n. Ross
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					Cannon River-Welch/WEL	Little Cannon River-Cannon Falls/CN2	Little Cannon River-Cannon Falls/CN2	Cedar River-Austin/CR1	Zumbro River Watershed/ZRP	Whitewater River-South Branch/SBW	Root River-South Fork-Houston/SR5	Root River-South Fork-Houston/SR5	Cedar River-Austin/CR1	SAMPLE LOCATION		Notes/Sample Conditions:	Marie Juenemann David Tollefson	Report To: Sampled By:	OF AGRICULTURE PESTICIDE AND FERTILIZER MANAGEMENT
	 				6/15/2015	6/15/2015	6/15/2015	6/15/2015	6/15/2015	6/12/2015	6/12/2015	6/12/2015	6/12/2015	DATE	SAMPI		David Tollefson	Delivered By:	
					14:25	25:20	12:20	9:37	8:00	13:50	12:15	12:15	00:6	TIME	SAMPLE END		efson	**	NATER MO 625 F St. Pai
		~			WEL15003	CN215701	CN215004	CR115004	ZRP15003	SBW15003	SR515701	SR515003	CR115003	FIELD SAMPLE ID		Lab SDG Number	Sample Type: Surface Water	Delivery Method: Hand	WATER MONITORING PROGRAM William VanRysw 625 Robert Street North David Tollefson St. Paul, MN 55155-2538
					6830 -12-0	9520 951-M	085 €	W-115- 2739	W-15- 0133	W-15-	073 /	W-1S OK30	630 -sr-m	GC			15451-00	3	William VanRyswyk Mike Macdonald David Tollefson
														Ŀc	The second s		1257		507-344-3203 651-201-6694 507-206-2882
															ANLALYSIS RE		- Shunda	Received By:	Matthew Ribikawiski Luke Stuewe Russ Derickson Katle Rassmussen Scott Matteson
*														0	EOUESTED	Contracting (	And Anna Anna anna ann	0	507-752- 507-752- 507-752- 507-334-1
														ACE/ELISA					884 Marie Juenemann Art Paddock 3331 Martin Paddock 3331 Art Paddock
														Triazine/ELISA					651-201-6161 651-201-6560 651-201-6491

# MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



Date Reported: 10/26/2015

# Water Monitoring Final Report

Re-issue of Report ID: SBW15003-232023

Date Reported:	SDG ID:	Page:
10/26/2015	15-SDG-2391	Page 1 of 1
Division Contact:		
	Marie Juenema	nn

SDG Comments:

		SBW1500	)3			
LAB Sample ID:	AR-15-1548	Quantity x Sample Size:	1 x 125 ml		Project Name: Surface	Nater
Inspector Sample ID:	SBW15003	Date/Time Collected:	6/12/2015	1350		
Product/Description:	Water, River/Stream	Date/Time Received:	6/15/2015	1557	Temperature Received:	0 deg C
Collected From:	Whitewater River - So	outh Branch/SBW				
Analysis Requested:	NO2+NO3					
Analyte	Result	MRL	Met	hod	Result Comment	
Nitrate/Nitrite	8.48 ppm	0.40 ppm	Std. Meth. 4 NO3 NO2	500 NO3-F,		
Nitrate/Nitrite Analysis Dat	e/Time 07/01/2015	11:55:00 am				
Sample Remarks:						
LAB Sample ID:	AR-15-1556	Quantity x Sample Size:	1 x 250 ml		Project Name: Surface	Water
•	AR-15-1556 SBW15003	Quantity x Sample Size: Date/Time Collected:		1350	Project Name: Surface	Water
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From:	SBW15003 Water, River/Stream	Date/Time Collected: Date/Time Received:	6/12/2015	1350 1557	Project Name: Surface V	
Inspector Sample ID: Product/Description: Collected From:	SBW15003 Water, River/Stream Whitewater River - So	Date/Time Collected: Date/Time Received:	6/12/2015			
Inspector Sample ID: Product/Description:	SBW15003 Water, River/Stream Whitewater River - So	Date/Time Collected: Date/Time Received:	6/12/2015	1557		
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte	SBW 15003 Water, River/Stream Whitewater River - So TP+DOP Result	Date/Time Collected: Date/Time Received: buth Branch/SBW	6/12/2015 6/15/2015	1557	7 Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Ortho Phosphorus, Dissolv	SBW 15003 Water, River/Stream Whitewater River - So TP+DOP Result red 0.059 ppm	Date/Time Collected: Date/Time Received: outh Branch/SBW MRL 0.005 ppm	6/12/2015 6/15/2015 Metl	1557	7 Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested:	SBW 15003 Water, River/Stream Whitewater River - So TP+DOP Result red 0.059 ppm	Date/Time Collected: Date/Time Received: outh Branch/SBW MRL 0.005 ppm	6/12/2015 6/15/2015 Metl	1557	7 Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Drtho Phosphorus, Dissolv Drtho Phosphorus, Dissolv Date/Time	SBW 15003 Water, River/Stream Whitewater River - So TP+DOP Result ved 0.059 ppm ved Analysis 07/01/2015 0.209 ppm	Date/Time Collected: Date/Time Received: outh Branch/SBW MRL 0.005 ppm 01:57:13 pm	6/12/2015 6/15/2015 Mett EPA 365.1	1557	7 Temperature Received:	

Sample Remarks:

lau	thorize this final report.
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Craste Etresmann

PESTICIDE AN Report To: Marie Juenemann	Sampled By: David Tollefson	Delivered By David Toll	12.00	Delivery Method: Hand Sample Type: Surface Water	Received Date/Tir	Katie Rassmussen Scott Matteson ne: /557	651-201-6331 507-334-5261 Received By:	Spell	
Notes/Sample Conditions:				Lab-SDG Number: 15-506-2391	ØcQ	Lab Temp	erature Rec	eived (°C):	
SAMPLE LOCATIO	N	DATE	E END TIME	FIELD SAMPLE ID	NO2 + NO3	TP + DOP	LYSIS REQU CL	ESTED TSS	TURBIDITY
edar River-Austin/CR1		6/12/2015	9:00	CR115003	AR-15- 1545	AR-15- 1553			
toot River-South Fork-Hou	ston/SR5	6/12/2015	12:15	SR515003	AR-15- 1546	AR-15- 1554			
Root River-South Fork-Hou	ston/SR5	6/12/2015	12:15	SR515701	AR-15- 1547	AR-15- 1555			
Whitewater River-South Br	anch/SBW	6/12/2015	13:50	SBW15003	AR-15- 1548	AR-15- , 55 b			
Cedar River-Austin/CR1		6/15/2015	9:37	CR115004	AR-15- 1549	AR-15- 1557			
Little Cannon River-Cannor	n Falls/CN2	6/15/2015	12:20	CN215004	AR-15- 1550	AR-15- 1558			
Little Cannon River-Cannor	n Falls/CN2	6/15/2015	12:20	CN215701	AR-15- 1551	AR-15-9 1559			
Cannon River-Welch/WEL		6/15/2015	第14125	WEL15003	AR-15- 1552	AR-15- 1560			

AlachlorND at MRL30 pptAtrazine39.8 ppt30 pptBenfluralinND at MRL25 pptBifenthrinND at MRL20 pptChlorophalonilND at MRL50 pptChlorophalonilND at MRL100 pptClorazoneND at MRL100 pptDesethylatrazineND at MRL100 pptDesethylatrazineND at MRL30 pptDiazinonND at MRL30 pptDiazinon OxonND at MRL50 pptDichlobenilND at MRL5 pptDichlobenilND at MRL5 pptDimethoateND at MRL15 pptDimethoateND at MRL15 pptDisaltonND at MRL15 pptDistronoND at MRL100 pptDichlobenilND at MRL15 pptDichlobenilND at MRL100 pptDistronoND at MRL50 pptForofosND at MRL50 pptFonofosND at MRL50 pptFonofosND at MRL50 pptMalthonND at MRL50 pptMethoxychlorND at MRL<	/ater
Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010       Cauantity x sample Size:       Project:         Water Monitoring Final Report         Water Monitoring Final Report         Collected From: Water, River/Stream         Description:         Water Monitoring         Analyte       Result       MRL       Result Comment         GCMSMS Monitoring         Acatochlor       43.9 ppt         No at MRL       20 ppt         Benfluralin       No at MRL       So ppt         No at MRL       20 ppt         Collocted From:         Whitewater River - South Branch/SBW         Temperature Received:       8.6 de         Analyte       Result MRL       Result Comment         GCMSMS Monitoring         Acatochlor       No at MRL       20 ppt         Analyte       Result Comment         Collocted From:         Water Analyte       Result Comment	
Saint Paul, Minnesota 55155-2531 (651) 201-6010       Product Name: Water Monitoring Final Report         Water Monitoring Final Report       Page 1 of 2         Analytis Requested:       GC         Analyte       Result         Malyte       Result         Malyte <th></th>	
Saint Paul, Minnesota 5515-2531 (651) 201-6010       Product Name: Water, River/Stream         Water Monitoring Final Report       Page 1 of 2         Page 1 of 2       Collected From: Whitewater Received: 8.6 de Analyte       GC         Analyte       Result       MRL         CCMSMS Monitoring Acatochor       43.9 ppt.       30 ppt         Analyte       39.8 ppt.       30 ppt         Benfluralin       ND at MRL       25 ppt.         Benfluralin       ND at MRL       20 ppt         Chorothalonil       ND at MRL       20 ppt         Collected From:       GCMSMS Monitoring       So ppt         Acatochor       43.9 ppt.       30 ppt         Analyte       GCMSM MARL       20 ppt         Chorothalonil       ND at MRL       20 ppt         Chorothalonil       ND at MRL       50 ppt         Chorothalonil       ND at MRL       50 ppt         Destropolytatrazine       62.7 ppt.       50 ppt         Destropolytatrazine       ND at MRL       50 ppt         Destropolytatrazine       ND at MRL       50 ppt         Destropolytatrazine       ND at MRL       50 ppt         Diationo       ND at MRL       50 ppt         Diation       ND at MRL <th></th>	
Water Monitoring Final Report       Water, Hver/Stream         Page 1 of 2       Page 1 of 2         Analysis Requested: GC       Collected From: Whitewater River - South Branch/SBW Temperature Received: 8.6 de         Analyte       Result       MRL         SCMSMS Monitoring Acetochlor       43.9 ppt       30 ppt         Analyte       Result       MRL         Senfuralin       ND at MRL       30 ppt         Anarzine       39.8 ppt       30 ppt         Benfuralin       ND at MRL       20 ppt         Bifenthrin       ND at MRL       20 ppt         Chorothaonil       ND at MRL       20 ppt         Collorophics       ND at MRL       50 ppt         Collorophics       ND at MRL       15 ppt         Desortplatrazine       ND at MRL       150 ppt         Desortplatrazine       ND at MRL       50 ppt         Discinon Oxon       ND at MRL       50 ppt         Discinon Oxon       ND at MRL       150 ppt         Discinon ND at MRL       50 ppt         Discin	g C
Page 1 of 2         Analyte       Result       MRL       Whitewater River - South Branch/SBW         Temperature Received:       8.6 de         Analyte       Result       MRL       Result Comment         GCMSMS Monitoring       43.9 ppt       30 ppt         Acetochior       43.9 ppt       30 ppt         Arazine       39.8 ppt       30 ppt         Benfluralin       ND at MRL       25 ppt         Brenthrin       ND at MRL       26 ppt         Chorothalonil       ND at MRL       26 ppt         Chorothalonil       ND at MRL       26 ppt         Chorothalonil       ND at MRL       15 ppt         Chorothalonil       ND at MRL       150 ppt         Desetypylatrazine       ND at MRL       150 ppt         Desetypylatrazine       62.7 ppt       50 ppt         Diazinon       ND at MRL       75 ppt         Diazinon       ND at MRL       50 ppt         Direkhoenii       ND at MRL       50 ppt         Direkhonaii       ND at MRL	g C
Analysis Requested:       GC         Whitewater River - South Branch/SBW Temperature Received:       8.6 de         Analyte       Result       MRL       Result Comment         GCMSMS Monitoring Acetochlor       43.9 ppt       30 ppt         Analyte       39.8 ppt       30 ppt         Alachlor       ND at MRL       30 ppt         Arazine       39.8 ppt       30 ppt         Benfluralin       ND at MRL       20 ppt         Chlorothalonil       ND at MRL       20 ppt         Chlorothalonil       ND at MRL       50 ppt         Chlorothalonil       ND at MRL       15 ppt         Colscopropitarizine       R2.7 ppt       50 ppt         Discipono       ND at MRL       30 ppt         Discipono       ND at MRL       30 ppt         Discipono       ND at MRL       15 ppt         Discipono       ND at MRL       5 ppt         Discipono       ND at MRL       15 ppt         Discipono       ND at MRL	g C
Temperature Received:       8.6 de         Analyte       Result       MRL       Result Comment         GCMSMS Monitoring       30 ppt       30 ppt         Acetochlor       43.9 ppt       30 ppt         Akachior       ND at MRL       30 ppt         Arazine       33.8 ppt       30 ppt         Benfluralin       ND at MRL       25 ppt         Bitentrinin       ND at MRL       20 ppt         Chlorothalonil       ND at MRL       50 ppt         Chlorothalonil       ND at MRL       15 ppt         Colscopropilarazine       ND at MRL       100 ppt         Desethylatrazine       62.7 ppt       50 ppt         Discipton Oxon       ND at MRL       35 ppt         Discipton Oxon       ND at MRL       35 ppt         Discipton Oxon       ND at MRL       5 ppt         Discluton Oxon       ND at MRL       15 ppt         Discluton ND at MRL       10 ppt       55 ept         Discluton	g C
Analyte         Result         MRL         Result Comment           GCMSMS Monitoring         30 ppt         30 ppt           Acetochior         MD at MRL         30 ppt           Alachior         ND at MRL         30 ppt           Anaryon         S9.8 ppt         30 ppt           Benfluralin         ND at MRL         25 ppt           Benfluralin         ND at MRL         20 ppt           Chlorpyrifos         ND at MRL         50 ppt           Chlorpyrifos         ND at MRL         15 ppt           Cyfluthrin         ND at MRL         150 ppt           Destroylatrazine         ND at MRL         30 ppt           Diazhon         ND at MRL         30 ppt           Diazhon         ND at MRL         150 ppt           Diazhon Oxon         ND at MRL         50 ppt           Dichloroin         ND at MRL         15 ppt           Direktoenamid         15.3 ppt         15 ppt           Direktoenamid         15.3 ppt         15 opt           Disulfoton	g C
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Development and the second secon	
Parathion-methyl ND at MRL 100 ppt	
Pendimethalin ND at MRL 75 ppt	
Phorate         ND at MRL         25 ppt           Prometon         722 ppt         100 ppt	
Prometon         722 ppt         100 ppt           Propachlor         ND at MRL         30 ppt	
ropaulior ND at Mint. 30 ppt	
Sample Remarks:	
I verify that these data are correct.	
Report ID: 433569 Kathryn Reynolds Water Analysis Unit Supervisor Kathay 2	The American

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### Water Monitoring Final Report

Analysis Requested: GC

	Date Printed:	Date Collec	ted:	Divisio	n Contact:	
	8/14/2015	06/29/2	2015	Ma	rie Juenemann	
URE	Sample Numbers Inspector No: SBV Lab ID: W-1		SD	G ID:	15-SDG-2659	
	Quantity x Sample S	lize:	Project:			ľ
	1x1L		Surface	Water		
	Product Name: Water, River/Strea	ım	-			
	Description:					
Page 2 of 2	Collected From:					Ī
	Whitewater River	- South Brar	nch/SBW			
	Tomporoturo Bosoly	odi	00	dee C		

			temperature neceived: 8.6 deg C
Analyte	Result	MRL	Result Comment
GCMSMS Monitoring			
Propazine	ND at MRL	25 ppt	
Simazine	ND at MRL	75 ppt	
Tebupirimiphos	ND at MRL	30 ppt	
Terbufos	ND at MRL	30 ppt	
Tolfenpyrad	ND at MRL	100 ppt	
Triallate	ND at MRL	50 ppt	
Trifluralin	ND at MRL	50 ppt	
lambda-Cyhalothrin	ND at MRL	75 ppt	
zeta-Cypermethrin	ND at MRL	500 ppt	

Sample Remarks:

Report ID: 433569	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallan 2	- REVE
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OF AGR	MINNESOTA DEPARTMENT OF AGRICULTURE PESTICOE AND FERTILIZER MANAGEMENT		<b>VATER MC</b> 625 R St. Pal	WATER MONITORING PROGRAM 625 Robert Street North St. Paul, MN 55155-2538	William VanRyswyk Mike Macdonald David Tollefson	507-344-3203	Matthew Ribikawskis Luke Stuewe	507-206-2884 218-846-7425 507-752-7036 651-201-6331	507-206-2884 Marfe Juenemann 218-946-7425 Jeff Paddock 507-752-7036 Brennon Schaefer 651-201-6331 651-201-6331	651-201-6161 651-201-6560 651-201-6491
Report To: Marie Juenemann	Sampled By: David Tollefson	Delivered By: David Tollefson	י: efson	Delivery Method: Hand Sample Type: Surface Water	Received Date/Time:	1435	Received By	2		
Notes/Sample Conditions:		Tayler Nelson	Velson	Lab SDG Number		Lab	o.)]]uniteries	S.M.EDALEDO	L. C.	
		SAMPI	SAMPLE END				ANLALYSIS REQUESTED	QUESTED		
SAMPLE LOCATION		DATE	TIME	FIELD SAMPLE ID	ଜନ	LС	GIY/MDA	0	ACE/ELISA	Triazine/ELISA
					09.8	8.63	0			
Root River-South Branch-Carimona/SR4	imona/SR4	6/26/2015	7:32	SR415013	a 1, 4/ -51-M	W-15 1052	09.e/ 51-M	-		
Root River-South Branch-Carimona/SR4	imona/SR4	6/26/2015	7:32	SR415014	1,6Q/ -51-M	W-15-3				
Root River-South Branch-Carimona/SR4	imona/SR4	6/29/2015	9:00	SR415015	W-115-	h Sal	1301 -51-M			
Root River-North Branch/NR		6/27/2015	13:03	NR15009	E k ø/ -51-M	5501 M-172	W-15-		-	
Root River-North Branch/NR		6/29/2015	10:30	NR15010	× 401	of 501	E gel			
Root River-South Fork-Houston/SR5	on/SR5	6/29/2015	12:30	SR515005	5 h o/ -51-M		142 A			
Whitewater River-South Branch/SBW	ich/SBW	6/29/2015	2:00	SBW15004	W-15-					
Whitewater River-Middle Branch/MBW	nch/MBW	6/29/2015	3:00	MBW15013	Lholm	W-15= 1057	5 20 M			
Whitewater River-Middle Branch/MBW	nch/MBW	6/29/2015	3:20	MBW15014	And/	K 501				
Zumbro River-North Fork/ZR2	2	6/30/2015	9:26	ZR215006	bh al	550%	W-15-			
Little Cannon River-Cannon Falls/CN2	alls/CN2	6/30/2015	16:30	CN215005	W-15- /050					
Cannon River-Welch/WEL		6/30/2015	05:11	WEL15004	1501					

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# Water Monitoring Final Report

Re-issue of Report ID: SBW15004-232316

Date Reported: 10/26/2015	SDG ID: 15-SDG-2654	Page: Page 1 of 1
Division Contact:		
	Marie Juenema	nn

SDG Comments:

		SBW1500	)4			
LAB Sample ID:	AR-15-1996	Quantity x Sample Size:	1 x 125 ml		Project Name: Surface \	Vater
Inspector Sample ID:	SBW15004	Date/Time Collected:	6/29/2015	0200		
Product/Description:	Water, River/Stream	Date/Time Received:	6/30/2015	1440	Temperature Received:	0 deg C
Collected From:	Whitewater River - Sou	uth Branch/SBW				
Analysis Requested:	NO2+NO3					
Analyte	Result	MRL	Met	hod	Result Comment	
Nitrate/Nitrite	8.08 ppm	0.40 ppm	Std. Meth. 4 NO3 NO2	500 NO3-F,		
Nitrate/Nitrite Analysis Dat	e/Time 07/15/2015 1	1:08:00 am				
Sample Remarks:						
LAB Sample ID:	AB-15-2009	Quantity x Sample Size:	1 x 250 ml		Project Name: Surface	Water
LAB Sample ID:	AR-15-2009 SBW 15004	Quantity x Sample Size: Date/Time Collected:		0200	Project Name: Surface V	Water
Inspector Sample ID:	SBW15004	Date/Time Collected:	6/29/2015	0200 1440	-	
Inspector Sample ID: Product/Description:	SBW15004	Date/Time Collected: Date/Time Received:	6/29/2015	0200 1440	Project Name: Surface V Temperature Received:	
Inspector Sample ID: Product/Description: Collected From:	SBW 15004 Water, River/Stream Whitewater River - Sou	Date/Time Collected: Date/Time Received:	6/29/2015		-	
Inspector Sample ID: Product/Description:	SBW 15004 Water, River/Stream Whitewater River - Sou	Date/Time Collected: Date/Time Received:	6/29/2015	1440	-	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte	SBW 15004 Water, River/Stream Whitewater River - Sou TP+DOP Result	Date/Time Collected: Date/Time Received: uth Branch/SBW	6/29/2015 6/30/2015	1440	Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Ortho Phosphorus, Dissolv	SBW 15004 Water, River/Stream Whitewater River - Sou TP+DOP Result	Date/Time Collected: Date/Time Received: uth Branch/SBW MRL 0.005 ppm	6/29/2015 6/30/2015 Meth	1440	Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv	SBW 15004 Water, River/Stream Whitewater River - Sou TP+DOP Result red 0.021 ppm	Date/Time Collected: Date/Time Received: uth Branch/SBW MRL 0.005 ppm	6/29/2015 6/30/2015 Meth	1440	Temperature Received:	
nspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Date/Time Total Phosphorus	SBW 15004 Water, River/Stream Whitewater River - Sou TP+DOP Result ved 0.021 ppm ved Analysis 07/21/2015 0	Date/Time Collected: Date/Time Received: uth Branch/SBW 0.005 ppm 0.005 ppm 0.01 ppm	6/29/2015 6/30/2015 Mett EPA 365.1	1440	Temperature Received:	

Sample Remarks:

l au	itnorize this final report.	
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Vocaste	Emesmann

OF AGRIC PESTICIDE AN	D FERTILIZER MANAGEMENT	625 Ro St. Paul	bert Stree , MN 551	55-2538	651-201-6694 507-206-2882	Matthew Ribikawskis Luke Stuewe Russ Derickson Katie Rassmussen Scott Matteson	507-206-2884 218-846-7425 507-752-7036 651-201-6331 507-334-5261	Marie Juenemann Jeff Paddock Brennon Schaefer	651-201-6161 651-201-6560 651-201-6491
Report To:	Sampled By:	Delivered By		Delivery Method: Hand	Received Date/Tin	The second s	Received By:	11 .	
Marie Juenemann Notes/Sample Conditions:	David Tollefson	David Toll		Sample Type: Surface Water Lab SDG Number:	6/30/15	1440 Lab Temp	erature Rec	eived (°C):	
notes/ oumple contributions	1	15-506-2657 0 0						174G	p
SAMPLE LOCATION	SAMPL		FIELD SAMPLE ID			YSIS REQU			
		DATE	TIME		NO2 + NO3 AR-15-	TP + DOP	CL	AR-15-	TURBIDITY
Root River-South Branch-Ca	arimona/SR4	6/26/2015	3:50	SR415012	1989	AR-15- 2002		2015	
Root River-South Branch-Ca	arimona/SR4	6/26/2015	7:32	SR415013	AR-15- (990	AR-15- 2003		AR-157	
Root River-South Branch-Ca	arimona/SR4	6/26/2015	7:32	SR415014	AR-15- 1991	AR-15- 200 4		AR-15- 2017	
Root River-South Branch-Ca	arimona/SR4	6/29/2015	9:00	SR415015	AR-15- 1992	AR-15- 2005		AR-15- 2018	
Root River-North Branch/NF	٤	6/27/2015	13:03	NR15009	AR-15- 1993	AR-15- 2006		AR-15- 2019	
Root River-North Branch/NF	2	6/29/2015	10:30	NR15010	AR-15- 1994	AR-15- 2007		AR-15- 2020	
Root River-South Fork-Hous	ston/SR5	6/29/2015	12:30	SR515005	AR-15- 1995	AR-15- 2068			
Whitewater River-South Bra	anch/SBW	6/29/2015	2:00	SBW15004	AR-15- [996	AR-15- 2009			
Whitewater River-Middle Bri	anch/MBW	6/29/2015	3:00	MBW15013	AR-15- 1997	AR-15- 20/0		AR-15-1	
Whitewater River-Middle Br	anch/MBW	6/29/2015	3:20	MBW15014	AR-15- 1998	AR-15- 2011		AR-15- 2022	
Zumbro River-North Fork/Z	R2	6/30/2015	9:26	ZR215006	AR-15- 1999	AR-15- 2012			
Little Cannon River-Cannon	Falls/CN2	6/30/2015	0:30	CN215005	AR-15-00 2000	AR-15= 2013		-	
Cannon River-Welch/WEL		6/30/2015	11:30	WEL15004	AR-15- 2-00)	AR-15- 2014			



MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report **601 Robert Street North** Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Analysis Requested: GC

Page 1 of 2

Date Collected: Date Printed: **Division Contact:** 8/13/2015 07/13/2015 Marie Juenemann Sample Numbera Inspector No: SBW15005 Lab ID: W-15-1194 SDG ID: 15-SDG-2962 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Collected From: Whitewater River - South Branch/SBW

Analysis nequested: GC			Temperature Received: 7.8 deg C
Analyte	Result	MRL	Result Comment
GCMSMS Monitoring			
Acetochlor	ND at MRL	30 ppt	
Alachior	ND at MRL	30 ppt	
Atrazine	42.3 ppt	30 ppt	
Benfluralin	ND at MRL	25 ppt	
Bifenthrin	ND at MRL	20 ppt	
Chlorothalonil	ND at MRL	50 ppt	
Chlorpyrifos	ND at MRL	40 ppt	
Clomazone	ND at MRL	15 ppt	
Cyfluthrin	ND at MRL	100 ppt	
Deisopropylatrazine	ND at MRL	150 ppt	
Desethylatrazine	74.9 ppt	50 ppt	
Diazinon	ND at MRL	30 ppt	
Diazinon Oxon	ND at MRL	75 ppt	
Dichlobenil	ND at MRL	5 ppt	
Dichlorvos	ND at MRL	15 ppt	
Dimethenamid	ND at MRL	15 ppt	
Dimethoate	ND at MRL	100 ppt	
Disulfoton	ND at MRL	60 ppt	
EPTC	ND at MRL	10 ppt	
Esfenvalerate	ND at MRL	150 ppt	
Ethaifluralin	ND at MRL	50 ppt	
Ethofumesate	ND at MRL	50 ppt	
Fonofos	ND at MRL	15 ppt	
Malathion	ND at MRL	50 ppt	
Methoxychlor	ND at MRL	50 ppt	
Metolachlor	ND at MRL	25 ppt	
Metribuzin	ND at MRL	75 ppt	
Metribuzin DA	ND at ERL	500 ppt	
Metribuzin DADK	ND at ERL	500 ppt	
Metribuzin DK	ND at ERL	500 ppt	
Oxadiazon	ND at MRL	75 ppt	
Parathion-methyl	ND at MRL	100 ppt	
Pendimethalin	ND at MRL	75 ppt	
Phorate	ND at MRL	25 ppt	
Prometon	ND at MRL	100 ppt	
Propachlor	ND at MRL	30 ppt	
Sample Remarks:			

I verify that these data are correct. 

 Report ID: 434727
 I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor
 Kathryn Rum Reference

 This report shall not be reproduced except in full, without the written approval from the laboratory. These results are only applicable to the sample(s) listed.

100 ppt

50 ppt

50 ppt

75 ppt 500 ppt

	MINNESOTA DEPARTMENT	
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MINNESOTA DEPARTMENT OF AGRICULTURE Laborate 601 Rc Saint Paul, (6

#### Water Mon

ND at MRL

Analysis Requested: GC

Analyte GCMSMS Monitoring

Propazine Simazine Tebupirimiphos Terbufos Tolfenpyrad

Triallate

Trifluralin

lambda-Cyhalothrin

zeta-Cypermethrin

Inspector No: SBW 15005 Lab ID: W-15-1194 Quantity x Sample Size: 1 x 1 L	SDG ID: Project: Surface Water	15-SDG-2962
Water, River/Stream		
Description:		1
Collected From:		
Whitewater River - South Brar	nch/SBW	
Temperature Received:	7.8 deg C	
Result Comme	nt	
	Inspector No: SBW15005 Lab ID: W-15-1194 Quantity x Sample Size: 1 x 1 L Product Name: Water, River/Stream Description: Collected From: Whitewater River - South Bran Temperature Received:	Lab ID:     W-15-1194     SDG ID:       Quantity x Sample Size:     Project:       1 x 1 L     Surface Water       Product Name:     Water, River/Stream       Description:     Collected From:       Whitewater River - South Branch/SBW

Date Printed:

8/13/2015

Sample Numbers

Date Collected:

07/13/2015

**Division Contact:** 

Marie Juenemann

Sample Remarks:

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	Report ID: 434727	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallan m. Pers
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		-			Roat River-South Fork-Houston/SRS	Root River-South Fork-Houston/SR5	Root River-North Branch/NR	Root River-South Branch-Carimona/SR4	Little Cannon River-Cannon Falls/CN2	Whitewater River-South Branch/SBW	Whitewater River-Middle Branch/MBW	Cedar River-Austin/CR1	Zumbro River-North Fork/ZR2	SAMPLE LOCATION		Notes/Sample Conditions:	Report To: Sampled By: Marie Juenemann David Tollefson	MINNESOTA DEPARTMENT OF AGRICULTURE PESTICIDE AND FERTILIZER MANAGEMENT
					7/14/2015	7/14/2015	7/14/2015	7/14/2015	7/13/2015	7/13/2015	7/13/2015	7/10/2015	7/10/2015	DATE	SAMP		Delivered By: David Tollefson	
					12:00	11:45	9:30	8:30	2:40	8;45	8:01	10:25	8:50	TIME	SAMPLE END		r; efson	MATER M 625 St. Pa
					SR515901	SR515006	NR15011	SR415016	CN215007	SBW15005	MBW15015	CR115007	ZR215008	FIELD SAMPLE ID		Lab SDG Number	Delivery Method: Hand A	WATER MONITORING PROGRAM (Milam VanRysv 625 Robert Street North David Tollefson St. Paul, MN 55155-2538
						W-15-	W-15-	W-15-	W-15 M-15	M-12-	N-US	W-15-	W-115-	вс			Received Date/Time: 67-16-15	William VanRyswyk Mike Macdonald David Tollefson
														Б		Lab	(259	507-344-3203 651-201-6694 507-206-2882
-					W-15-	C 001		W-15-			W-15-	W-15-					Received By.	Matthew Ribikawskis Luke Stuewe Russ Derickson Katle Rassmussen Scott Matteson
														0	EQUESTED	Received ("e	mar	
							,							ACE/ELISA				507-206-2894 Marie Juenemann 651-201-6151 218-94657425 Jeff Bedutter 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
														Triazìne/ELISA				651-201-6161

#### MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



# Water Monitoring Final Report

Re-issue of Report ID: SBW15005-232663

Date Reported:	SDG ID:	Page:
10/26/2015	15-SDG-2966	Page 1 of 1
Division Contact:	Marie Juenema	nn

SDG Comments:

		SBW1500	)5			
LAB Sample ID:	AR-15-2299	Quantity x Sample Size:	1 x 125 ml		Project Name: Surface V	Vater
Inspector Sample ID:	SBW15005	Date/Time Collected:	7/13/2015	0845		
Product/Description:	Water, River/Stream	Date/Time Received:	7/16/2015	1259	Temperature Received:	0 deg C
Collected From:	Whitewater River - Sou	th Branch/SBW				
Analysis Requested:	NO2+NO3					
Analyte	Result	MRL	Met	hod	Result Comment	
Nitrate/Nitrite	7.68 ppm	0.40 ppm	Std. Meth. 4 NO3 NO2	500 NO3-F,		
Nitrate/Nitrite Analysis Date	e/Time 08/04/2015 1	2:10:23 pm				
Sample Remarks:						
LAB Sample ID: Inspector Sample ID:		Quantity x Sample Size: Date/Time Collected:		0845	Project Name: Surface V	Vater
•	SBW15005	, ,	7/13/2015	0845 1259	Project Name: Surface V Temperature Received:	
Inspector Sample ID: Product/Description:	SBW15005	Date/Time Collected: Date/Time Received:	7/13/2015			
Inspector Sample ID: Product/Description:	SBW15005 Water, River/Stream Whitewater River - Sou	Date/Time Collected: Date/Time Received:	7/13/2015			
Inspector Sample ID: Product/Description: Collected From:	SBW15005 Water, River/Stream Whitewater River - Sou	Date/Time Collected: Date/Time Received:	7/13/2015	1259		
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte	SBW 15005 Water, River/Stream Whitewater River - Sou TP+DOP Result	Date/Time Collected: Date/Time Received: th Branch/SBW	7/13/2015 7/16/2015	1259	Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Ortho Phosphorus, Dissolv	SBW 15005 Water, River/Stream Whitewater River - Sou TP+DOP Result red 0.028 ppm	Date/Time Collected: Date/Time Received: hth Branch/SBW MRL 0.005 ppm	7/13/2015 7/16/2015 Met	1259	Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Ortho Phosphorus, Dissolv Date/Time	SBW 15005 Water, River/Stream Whitewater River - Sou TP+DOP Result red 0.028 ppm	Date/Time Collected: Date/Time Received: hth Branch/SBW MRL 0.005 ppm	7/13/2015 7/16/2015 Met	1259	Temperature Received:	
Inspector Sample ID: Product/Description: Collected From: Analysis Requested:	SBW 15005 Water, River/Stream Whitewater River - Sou TP+DOP Result red 0.028 ppm red Analysis 08/03/2015 0 0.115 ppm	Date/Time Collected: Date/Time Received: ith Branch/SBW MRL 0.005 ppm 1:32:07 pm 0.01 ppm	7/13/2015 7/16/2015 Met EPA 365.1	1259	Temperature Received:	

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Vocaste	Emesnam

OF AGRIC	DTA DEPARTMENT ULTURE ID FERTILIZER MANAGEMENT	625 Ro	<b>NITORIN</b> bert Stree , MN 551		507-344-3203 651-201-6694 507-206-2882	Matthew Ribikawskis Luke Stuewe Russ Derickson Katie Rassmussen Scott Matteson	507-206-2884 218-846-7425 507-752-7036 651-201-6331 507-334-5261	Starte Juenemann Jeff Paddork Brepnon Schaefer	651-201-6161 651-201-6560 651-201-6491	
Report To: Sampled By: Marie Juenemann David Tollefson		Delivered By		Delivery Method: Hand 🐙	Received Date/Til		Received By:	Q ng		
Marie Juenemann	David Tolle	efson	Sample Type: Surface Water	07-16-15	1259	erature Received (°C):				
Notes/Sample Conditions:			Lā		Lab SDG Number:	5-00	Lab Temp	erature Rec	eived (°C):	
		SAMPL	E END		200		YSIS REQU	ESTED		
SAMPLE LOCATIO	N	DATE TIME		FIELD SAMPLE ID	NO2 + NO3	TP + DOP	CL	TSS	TURBIDITY	
Zumbro River-North Fork/Z	7/10/2015	8:50	ZR215008	AR-15- 2296	AR-15- 2304					
Cedar River-Austin/CR1		7/10/2015	10:25	CR115007	AR-15- 2291	AR-15- 930\$				
Whitewater River-Middle Br	anch/MBW	7/13/2015	8:01	MBW15015	AR-15- 2298	AR-15- 2306				
Whitewater River-South Bra	anch/SBW	7/13/2015	8:45	SBW15005	AR-15-	AR-15- <b>230</b> )				
Little Cannon River-Cannon	Falls/CN2	7/13/2015	2:40	CN215007	AR-15- 2300	AR-15- 4308				
Root River-South Branch-C	arimona/SR4	7/14/2015	8:30	SR415016	AR-15- 230	AR-15- <b>230</b> AR-15-				
Root River-North Branch/N	۲	7/14/2015	9:30	NR15011	AR-15- <b>A302</b> AR-15-	AR-15- 23/0 AR-15-				
Root River-South Fork-Hou	ston/SR5	7/14/2015	11:45	SR515006	2:303	2311				
				27 27						
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	of sectors in									
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· · · · · · · · · · · · · · · · · · ·	- 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 19 1 T									
	an a			24						

\* Sample coder was delivered to lab via SpeeDee Delivery, 07-16-15 AJ

	NNESOTA DEPARTMENT		Date Printed: 8/6/2015	Date Coller 07/28/		Division Contact: Marie Juenemann		
OF	NNESOTA DEPARTMENT AGRICULTURE	Sample Numbers						
		Inspector No: SE	3W15006		DO 10-			
MINNESOTA DEPARTI		Lab ID: W			DG ID: 15-SDG-3239			
	Analysis Report		Quantity x Sample	Size:	Project	1		
	t Street North resota 55155-2531		1x1L		Surfac	e Water		
	201-6010		Product Name:		<u>.</u>	Teanne-Call-NationAnnonnanna ar annanna		
		Water, River/Stre	am					
Water Monitor	ing Final Report		Description:					
		Page 1 of 4	Collected From:			******		
Applying Pagyasteds CO			Whitewater Rive	r - South Bra	nch/SBV	V		
Analysis Requested: GC			Temperature Rece	ived:	12.4	4 deg C		
Analyte	Result	MRL	R	esult Comme				
AD-HOC Test Template								
Fluxapyroxad	0.34 ppt	0.1 ppt	ERL					
GCMSMS Monitoring	. marananangananganananga							
Acetochlor	ND at MRL	30 ppt						
Alachior	ND at MRL	30 ppt						
Atrazine	37.1 ppt	30 ppt						
Benfluralin	ND at MRL	25 ppt						
Bifenthrin	ND at MRL	20 ppt						
Chlorothalonil	ND at MRL	50 ppt						
Chlorpyrifos	ND at MRL	40 ppt						
Clomazone	ND at MRL	15 ppt						
Cyfluthrin	ND at MRL	100 ppt						
Deisopropylatrazine	ND at MRL	150 ppt						
Desethylatrazine	71.4 ppt	50 ppt						
Diazinon	ND at MRL	30 ppt						
Diazinon Oxon Dichlobenil	ND at MRL	75 ppt						
Dichlorvos	ND at MRL ND at MRL	5 ppt						
Dimethenamid	ND at MRL	15 ppt 15 ppt						
Dimethoate	ND at MRL	100 ppt						
Disulfoton	ND at MRL	60 ppt						
EPTC	ND at MRL	10 ppt						
Esfenvalerate	ND at MRL	150 ppt						
Ethalfluralin	ND at MRL	50 ppt						
Ethofumesate	ND at MRL	50 ppt						
Fonofos	ND at MRL	15 ppt						
Malathion	ND at MRL	50 ppt						
Methoxychlor	ND at MRL	50 ppt						
Metolachlor	ND at MRL	25 ppt						
Metribuzin	ND at MRL	75 ppt						
Metribuzin DA	ND at ERL	500 ppt						
Metribuzin DADK	ND at ERL	500 ppt						
Metribuzin DK	ND at ERL	500 ppt						
Oxadiazon .	ND at MRL	75 ppt						
Parathion-methyl	ND at MRL	100 ppt						
Pendimethalin	ND at MRL	75 ppt						
Phorate	ND at MRL	25 ppt						

Sample analyzed for MDA GC and MDA LC per request of PFMD. Sample scanned and negative for Diflutenzopyr and Cyproconazole.

Report ID: 435780	I verify that these data are correct. Kathryn Reynolds	Kal	n Reas
	Water Analysis Unit Supervisor	nattay	10 10 2

MINNESOTA DEPARTMENT

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Date Printed: Date Collected: Division Contact: 8/6/2015 07/28/2015 Marie Juenemann Sample Numbers Inspector No: SBW15006 Lab ID: W-15-1311 SDG ID: 15-SDG-3239 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Page 2 of 4 Collected From: Whitewater River - South Branch/SBW

Analysis Requested: GC			Whitewater River - South Branch/SBW
anagana i kagababaar - seo			Temperature Received: 12.4 deg C
Analyte	Result	MRL	Result Comment
GCMSMS Monitoring			
rometon	ND at MRL	100 ppt	
ropachlor	ND at MRL	30 ppt	
ropazine	ND at MRL	25 ppt	
imazine	ND at MRL	75 ppt	
ebupirimiphos	ND at MRL	30 ppt	
erbufos	ND at MRL	30 ppt	
olfenpyrad	ND at MRL	100 ppt	
riallate	ND at MRL	50 ppt	
rifluralin	ND at MRL	50 ppt	
ambda-Cyhalothrin	ND at MRL	75 ppt	
eta-Cypermethrin	ND at MRL	500 ppt	
LCMSMS (+) Monitoring			
cetamiprid	ND at MRL	25 ppt	
Idicarb Sulfone	ND at MRL	15 ppt	
dicarb Sulfoxide	ND at MRL	50 ppt	
zoxystrobin	ND at MRL	10 ppt	
ensulfuron-methyl	ND at MRL	16.7 ppt	
ensulide	ND at MRL	250 ppt	
oscalid	ND at MRL	50 ppt	
romacil	ND at MRL	30 ppt	
arbaryl	ND at MRL	25 ppt	
arbendazim	ND at MRL	10 ppt	
arbofuran	ND at MRL	13.3 ppt	
hlorantraniliprole	ND at MRL	50 ppt	
hlorimuron-ethyl	ND at MRL	20 ppt	
hlorpyrifos Oxon	ND at MRL	40 ppt	
lothianidin	ND at MRL	25 ppt	
yanazine	ND at MRL	25 ppt	
yantraniliprole	ND at MRL	100 ppt	
EDI Atrazine	ND at MRL	50 ppt	
crotophos	ND at MRL	25 ppt	
ifenoconazole	ND at MRL	25 ppt	
notefuran	ND at MRL	25 ppt	
isulfoton Sulfone	ND at MRL	20 ppt	
iuron	ND at MRL	13.3 ppt	
lumetsulam	ND at MRL	50 ppt	
ample Remarks:			

Sample analyzed for MDA GC and MDA LC per request of PFMD. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

	I verify that these data are correct.		n Am	
Report ID: 435780	Kathryn Reynolds	VA Z	REX	
·	Water Analysis Unit Supervisor	Tottay .	10-2	

MINNESOTA DEPARTMENT

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Analysis Requested: GC

Page 3 of

Date Printed:

8/6/2015

Sample Numbers

Inspector No: SBW15006 Lab ID: W-15-1311	SDG ID: 15-SDG-3239
Quantity x Sample Size:	Project:
1 x 1 L	Surface Water
Product Name: Water, River/Stream	
Description:	
Collected From:	
Whitewater River - South Bra	anch/SBW
Temperature Received:	12 A den C

Date Collected:

07/28/2015

**Division Contact:** 

Marie Juenemann

and provide and			Temperature Received:	12.4 deg C
Analyte	Result	MRL	Result Comme	ent
LCMSMS (+) Monitoring				
Flutriafol	ND at MRL	10 ppt		
Halosulfuron-methyl	ND at MRL	30 ppt		
Hexazinone	ND at MRL	10 ppt		
Hydroxyatrazine	16.3 ppt	6.7 ppt		
mazamethabenz Acid	ND at MRL	10 ppt		
mazamethabenz-methyl	ND at MRL	5 ppt		
mazamox	ND at MRL	13.3 ppt		
mazapic	ND at MRL	10 ppt		
mazapyr	ND at MRL	8.3 ppt		
mazaquin	ND at MRL	16.7 ppt		
mazethapyr	ND at MRI.	6.7 ppt		
midacloprid	ND at MRL	20 ppt		
soxaflutole	ND at MRL	40 ppt		
inuron	ND at MRL	20 ppt		
letalaxyl	ND at MRL	8.3 ppt		
letsulfuron-methyl	ND at MRL	23.3 ppt		
lyclobutanil	ND at MRL	10 ppt		
licosulfuron	ND at MRL	26.6 ppt		
lorflurazon	ND at MRL	20 ppt		
orflurazon-desmethyl	ND at MRL	50 ppt		
Dxydemeton-methyl	ND at MRL	20 ppt		
arathion-methyl Oxon	ND at MRL	25 ppt		
icoxystrobin	ND at MRL	50 ppt		
rometryn	ND at MRL	3.3 ppt		
ropiconazole	ND at MRL	10 ppt		7
yraclostrobin	ND at MRL	25 ppt		,
vroxasulfone	ND at MRL	50 ppt		
aflufenacil	ND at MRL	15 ppt		
lduron .	ND at MRL	6.7 ppt		
ulfometuron-methyl	ND at MRL	8.3 ppt		
ebuconazole	ND at MRL	10 ppt		
etraconazole	ND at MRL	10 ppt		
hiacloprid	ND at MRL	50 ppt		
hiamethoxam	ND at MRL	25 ppt		
hifensulfuron-methyl	ND at MRL	16.7 ppt		
hiobencarb	ND at MRL	8.3 ppt		
Sample Remarks:				

Sample analyzed for MDA GC and MDA LC per request of PFMD. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

	I verify that these data are correct.	1 - m los	
Report ID: 4357	0 Kathryn Reynolds	VA 2 REEK	
	Water Analysis Unit Supervisor	rattay in 10-2	

and a start of the		
	MINNESOTA	DEPARTMENT
	OF AGRICULT	LIDE
	OF MORICOLI	Unic

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Analysis Requested: GC

Page 4 of 4

Date Printed:	Date Collec		Division Contact:				
8/6/2015	07/28/2	2015	M	arie Juenemann			
Sample Numbers							
Inspector No: SBV	V15006						
Lab ID: W-1	5-1311	SD	G ID:	15-SDG-3239			
Quantity x Sample S	ilze:	Project:					
1 x 1 L		Surface Water					
Product Name:							
Water, River/Strea	m						
Description:							
Collected From:							
Collected From: Whitewater River	South Brar	ich/SBW					

Analyte	Result	MRL	Result Comment	
LCMSMS (+) Monitoring				
Triasulfuron	ND at MRL	23.3 ppt		
LCMSMS (-) Monitoring		,,		
2,4,5-T	ND at MRL	50 ppt		
2,4,5-TP	ND at MRL	50 ppt		
2,4-D	39.8 ppt	8.3 ppt		
2,4-DB	ND at MRL	20 ppt		
Acetochlor ESA	41.6 ppt	30 ppt		
Acetochlor OXA	ND at MRL	33.3 ppt		
Alachior ESA	181 ppt	41.6 ppt		
Alachlor OXA	ND at MRL	33.3 ppt		
Bentazon	ND at MRL	5 ppt		
Bromoxynil	ND at MRL	25 ppt		
Clopyralid	ND at MRL	41.6 ppt		
Dicamba	ND at MRL	50 ppt		
Dichlorprop	ND at MRL	50 ppt		
Dimethenamid ESA	ND at MRL	6.7 ppt		
Dimethenamid OXA	ND at MRL	10 ppt		
Flufenacet OXA	ND at MRL	8.3 ppt		
Isoxaflutole DKN	ND at MRL	50 ppt		
MCPA	ND at MRL	5 ppt		
MCPB	ND at MRL	20 ppt		
MCPP	ND at MRL	50 ppt		
Mesotrione	ND at MRL	50 ppt		
Metolachior ESA	423 ppt	10 ppt		
Metolachlor OXA	20.2 ppt	10 ppt		
Picloram	ND at MRL	41.6 ppt		
Propachlor ESA	ND at MRL	30 ppt		
Propachlor OXA	ND at MRL	10 ppt		
Sedaxane	ND at MRL	75 ppt		
Tembotrione	ND at MRL	50 ppt		
Triclopyr	ND at MRL	50 ppt		

#### Sample Remarks:

Sample analyzed for MDA GC and MDA LC per request of PFMD. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

Report ID: 435780	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kapan m. Pors
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				Cannon River-Weich/WEL 7/30	Little Cannon River-Cannon Falls/CN2 7/30	Zumbro River-North Fork/ZR2 7/30	Root River-South Fork-Houston/SR5 7/29	Root River-North Branch/NR 7/29	Root River-South Branch-Carimona/SR4 7/29	Zumbro River Watershed/ZRP 7/29	Whitewater River-South Branch/SBW 7/28	Cedar River-Austin/CR1 7/27	Cedar River-Austin/CR1 7/24	SAMPLE LOCATION	Notes/Sample Conditions:	David Tollefson	OF AGRICULTURE
	 	 		 7/30/2015	7/30/2015	7/30/2015	7/29/2015	7/29/2015	7/29/2015	7/29/2015	7/28/2015	7/27/2015	7/24/2015	DATE TIM	layor Webon	Delivered By: David Tollefson	* *
				10:45	9:45	545	13:03	9:50	8:29	13:00	13:00	8:30	8:45	TIME	)etoon	9	625 R St. Pau
				WEL15006	CN215008	ZR215009	SR515007	NR15012	SR415017	ZRP15005	SBW15006	CR115009	CR115008	FIELD SAMPLE ID	15-506-3239	Delivery Method: Hand Sample Type: Surface Water	RAM
				1318 NC-16-	1317 1317	1316 W-15-	1315 1315	W-15-	8161 M 15-	130 1315	NEA 1921	130 131-W	6001 13-00	ac	12.000	CT-30 15	William VanRyswyk Mike Macdonald David Toliefson
						1322		W-15 1321	W-15-	1319 1319				5		teet	507-344-3203 651-201-6694 507-206-2882
						1327 1327	W-15- 1326		13261 M-15-	W-15-			W-15- W-15-	GIY/MDA	0.000	Necessary 1	Matthew Ribikawskis Luke Stuewe Russ Derickson Katie Rassmussen Scott Matteson
-														0		1 May	507-206-2884 218-846-7425 507-752-7036 651-201-6331 507-324-5261
														ACE/ELISA			507-206-2884 Marie Juenemann 218-846-7425 Jeff Paddock 507-752-7036 Brennon Schaefer 651-201-6331 507-324-5261
														Triazine/ELISA			631-201-6161 651-201-6560 651-201-6491

#### MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



Date Reported: 10/26/2015

Division Contact:

# Water Monitoring Final Report

Re-issue of Report ID: SBW15006-232968

0.171 ppm

Total Phosphorus Analysis Date/Time 08/04/2015 01:17:13 pm

SDG ID:	Page:
15-SDG-3241	Page 1 of 1
Marie Juenema	nn

SDG Comments:

Date/Time Total Phosphorus

Sample Remarks:

		SBW1500	)6			
LAB Sample ID:	AR-15-2480	Quantity x Sample Size:	1 x 125 ml		Project Name: Surface	Water
Inspector Sample ID:	SBW15006	Date/Time Collected:	7/28/2015	1300		
Product/Description:	Water, River/Stream	Date/Time Received:	7/30/2015	1334	Temperature Received:	0 deg C
Collected From:	Whitewater River - So	uth Branch/SBW				
Analysis Requested:	NO2+NO3					
Analyte	Result	MRL	Meth	nod	Result Comment	
litrate/Nitrite	6.23 ppm	0.40 ppm	Std. Meth. 45 NO3 NO2	500 NO3-F,		
litrate/Nitrite Analysis Dat	e/Time 08/04/2015 1	2:10:23 pm				
LAB Sample ID:	AR-15-2489	Quantity x Sample Size:	1 x 250 ml		Project Name: Surface	Water
nspector Sample ID:	SBW15006	Date/Time Collected:	7/28/2015	1300		
	Water, River/Stream	Date/Time Received:	7/00/0015		Tamma voture Dessived.	
Product/Description:	water, niver/Stream	Date/Time Received:	7/30/2015	1334	Temperature Received:	0 deg C
Product/Description: Collected From:			7/30/2015	1334	remperature Received:	0 deg C
Collected From:	Whitewater River - So		//30/2015	1334	Temperature Received:	0 deg C
Product/Description: Collected From: Analysis Requested: Analyte	Whitewater River - So		Meth		Result Comment	0 deg C
Collected From: Analysis Requested: Analyte	Whitewater River - So TP+DOP, NH3	uth Branch/SBW		nod		0 deg C
Collected From: Analysis Requested: Analyte Ammonia-N	Whitewater River - So TP+DOP, NH3 Result 0.025 ppm	uth Branch/SBW MRL 0.02 ppm	Meth Std. Meth. 45	nod		0 deg C
Collected From: Analysis Requested:	Whitewater River - So           TP+DOP, NH3           Result           0.025 ppm           /Time         08/04/2015 1	uth Branch/SBW MRL 0.02 ppm	Meth Std. Meth. 45	nod		0 deg C

0.01 ppm

EPA 365.1

lau	thorize this final report.
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Craste Etresmann

Report To: Marie Juenemann	Sampled By: David Tollefson	Delivered By David Toll		Delivery Method: Hand Sample Type: Surface Water		Katie Rassmussen Scott Matteson 1334	651-201-6331 507-334-5261 Received By:	South	
Notes/Sample Conditions:	David Tollerson	Taylor A		Lab SDG Number: 15-5DG-3241	- 0-COT		erature Reco	eived (°C):	,
SAMPLE LOCATION	N	DATE	E END TIME	FIELD SAMPLE ID	N02 + N03		LYSIS REQU CL		TURBIDITY
Cedar River-Austin/CR1		7/24/2015	8:45	CR115008	AR-15- 2478	AR-15- 2487			
Cedar River-Austin/CR1	V.	7/27/2015	8:30	CR115009	AR-15- 2479	AR-15- 2488			
Whitewater River-South Bra	anch/SBW	7/28/2015	13:00	SBW15006	AR-15- 2480	AR-15- 2489			
							AJ-3015		
Root River-South Branch-Ci	arimona/SR4	7/29/2015	8:29	SR415017	AR-15- 2481	AR-15-9 2480			
Root River-North Branch/N	3	7/29/2015	9:50	NR15012	AR-15- 2482	AR-15- 2491	_	AR-15- 2496	
Root River-South Fork-Hou	ston/SR5	7/29/2015	13:03	SR515007	AR-15- 2483	AR-15- 2492			
Zumbro River-North Fork/Z	R2	7/30/2015	8:45	ZR215009	AR-15- 2484	AR-15- 2493			
Little Cannon River-Cannon	Falls/CN2	7/30/2015	9:45	CN215008	AR-15- 2485	AR-15- 2494			
Cannon River-Welch/WEL		7/30/2015	10:45	WEL15006	AR-15- 2486	AR-15- 2495			
								1	

	Robert Street No ul, Minnesota 551 (651) 201-6010			OF A	GRICULTURE	
	<b>、</b> ,					Page 1 of 1
Collected From:	м	anufacturer / Distributor:		Date Printed: 10/26/2015	SDG ID: 15-SDG-3309	Inspection Number:
				Assigned Inspector		
3				Heidi Rantala SDG Comments:		
Lab Sample ID:	AR-15-2531	Product Lot Code	: N/A			Project Name
Inspector Sample ID:	Cnty Rd. 119	Quantity x Sample Size:	1 x 1 L		Lab	Services No Charge
Date Collected:					(SE	WWR Fish Kill 2015-1
Product/Description:	,					
Analysis Requested: Collected By:	Heidi Rantala / DNF					
Analyte	Resul	t	Result C	omment		
Ammonia-N	0.029 ppn	n				
Ammonia-N Analysis Date	/Time 08/04/201	5 10:00:00 am				
Sample Remarks:						
Lab Sample ID:	AR-15-2532	Product Lot Code	: N/A			Project Name
Inspector Sample ID:	,	Quantity x Sample Size:	1 x 1 L			Services No Charge
Date Collected:		_			(SE	WWR Fish Kill 2015-1
Product/Description: Analysis Requested:						
	Heidi Rantala / DNF					
Analyte	Resul	t	Result C	omment		
Ammonia-N	0.023 ppn	n				
Ammonia-N Analysis Date	/Time 08/04/201	5 10:00:00 am				
Sample Remarks:						
Lab Sample ID:	AR-15-2533	Product Lot Code	: N/A			Project Name
• •	10 .	how b Quantity x Sample Size:	1 x 1 L			Services No Charge
Date Collected:					(SE	WWR Fish Kill 2015-1
Product/Description: Analysis Requested:	,					
	Heidi Rantala / DNF					
Analyte	Resul	t	Result C	omment		
Ammonia-N	0.026 ppn	n				
Ammonia-N Analysis Date	/Time 08/04/201	5 10:00:00 am				
Sample Remarks:						

Re-issue of Report ID: 233051	I verify that these data are correct. Treeske Ehresmann Chemistry Toxicology Supervisor:	Treste	Emesmann
mente de la companya			

							15	3526-3309						
									61	06	IGI	NAI	a	
A AR15-2531	в∤	FR-15-	25	32	C	AR	15	-2837 D		E	GR 10 100 11			
Minnesota Polle								n / Lake Lab Sheet			S	È	2	
Program Code:		Collecte	ed by	: Ju	ちた	n 4	MIT	Lins Dave More	502 Colle	ector	ID:	10	4	
	07/201	-214	4	MPC	A PN	1	D.	NUD MURRISON	Date/	783 CO. 100 CO.				
									Rec'd					
Sample Information	Signatu	A A	nan	<u>n oi (</u>		B B	DIOCK	is mandatory. See bac	k of this pa D	ge.^^	~ ~	E		
Project ID (ex: PRJ01234)	(ATY)	Rd 11.	1	Br	THAN	LY D	rive	K'S CAMPSOND						10000
(ex: PR001254) Location ID (ex 27-0016-00-101 or S005-515) Field Name /						7		show bridge						
Lake Name								5						
Date (MM/DD/YY)	07/30	115		Ø	7/3	0/1	5	07/30/15						
Time (Military)	15:	30		HR	يسبعلا	Ð	1620	17:11					979777 1928 a	
Quality Assurance*									5:					
Analysis Group No.**									т. Т.					
Sample Depth (Top) m (Lake Only)								2						
Sample Depth (Bot) m (Lake Only)				1 2		rege anderstade opti-						and con	er ; one distan	
Filter Volume (for chlorophyll a)		-45												
Lab Temp (°C)												er di		
Inorganics (Hold Tim		ne TOTAL MDH						e collected at the top of each as Inorganics (Hold Time) Plastic Sulfuric Acid Bottle	MDH	Contraction of the	w. B	C	D	E
Plastic General Bottle Alkalinity, Total (14 d)		# 022	_	1912/02		_	_	Carbon, Dissolved Org (28 d	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)				N. Market	
BOD, 5Day- 2L bottle		022						Carbon, Total Org (28 d)	098					
CBOD, 5Day-2L Bottle		083						COD, Total (28 d)	097					
Chloride, Total (28 d)		297						Ammonia Nitrogen, Total (2	28 d) 064	X	X	X		
Color (48 hr)		012						N-Org, Total (28 d)	065					
Chlorophyll-a, Lab Filt	er (48hr)	452						Kjeldahl Nitrogen, Total (28	and the second se				-	
Conductivity (28 d)	(40 1)	014						NO <sub>2</sub> +NO <sub>3</sub> -N, Total (28 d) Phosphorus, Total (28 d)	069					+
Nitrite, Nitrogen Total pH Lab (Immediate)	(48 nr)	067		-				Filosphorus, Total (28 d)	039					
Phos-Total Ortho (48 h	r)	063						Inorganics (Hold Time)	MDH	A	B	C	D	E
Solids, Susp. Volatile (	7 d)	004						Plastic Sterile Bottle	#			_	_	
Solids, Total Dissolved	l (7 d)	005			<i></i>			E. coli-MPN (24 hr)	335	_				
Solids, Total Susp. (7 d		003								100000000000000000000000000000000000000				
Solids, Total Volatile (	7 d)	002						Metals (Hold Time) Plastic Nitric Acid Bottle	MDH #	A	B	C	D	E
Solids, Total (7 d) Sulfate, SO <sub>4</sub> Total (28 d	4)	001 293		direction of the				Calcium, CaCO <sub>3</sub> (180 d)	# 251		_			1 Contractor
Turbidity (48 hr)	u)	011						Iron, Total (180 d)	152					1
Lab Filter (48 hr)		010						Potassium, Total (180 d)	255					
MDA GC +MDA	- LC		χ	X	X			Sodium, Total (180 d)	257					
1 Liter Unpre	Saved		X	×	×									-
250 ml - Prese			X	x	X									+
			6					BACTICHEM (Hold Time Glass Fiber Filter	e) MDH #	A _	<b>B</b>	C _	D _	E
Lab Use	only.							Chlorophyll-a, Field Filter (7 Pheophytin-a (7 d)	(d) 450 451					
					I	I	1	i noopnyun-a (/ u)			-	mlk r	evised	03/10

↓ See Back for Analysis Groups, Project Codes and Chain of Custody ↓



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 11/5/15 Client Name: RG - MPCA - EOD-Fish Kill Studies Project Code: RG Project Name: EOD-Fish Kill Studies

Work Order Number: 15H2159

Report To: RG - MPCA - EOD-Fish Kill Studies Joe Magee 520 Lafayette Rd. Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

Mas

Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

> Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164 (651) 201-5300 http://www.health.mn.us/divs/phl/environmental

> > Page 1 of 14

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

	Summary of Samples Received	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name: None	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11/05/15 9:20	

Amended Report

Work Order Comment: Non-MDH container received for all sample points, run with data qualified per J. Magee. ECB 8,01/15

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
W-15-1380	15H2159-01	Non-potable Water	08/01/15 7:47	08/28/15 9:33	7.0
W-15-1311	15H2159-02	Non-potable Water	07/28/15 13:00	08/28/15 9:33	7.0
EAR- 15-0223	15H2159-03	Non-potable Water	07.30/15 16:45	08/28/15 9:33	7.0
EAR- 15-0228	15H2159-04	Non-potable Water	07.30/15 16:20	08/28/15 9:33	7.0

Field ID	MDH Sample Number	Receiving Comments
W- 15- 1380	15H2159-01	All four samples were transfered from MDA to MDH. JJB 8/28/15 Priority one analysis.
W- 15- 1311	15H2159-02	All four samples were transfered from MDA to MDH. JJB 8/28/15 Priority one analysis.
EAR- 15-0223	15H2159-03	All four samples were transfered from MDA to MDH. JJB 8/28/15 Priority one analysis.
EAR- 15-0228	15H2159-04	All four samples were transfered from MDA to MDH. JJB 8/28/15 Priority one analysis.

Amended Report

Authorized by:

Report ID: 11052015 92049

The results in this report apply only to the sam ples analyzed. This report must not be reproduced, except in full, without the written approval of the laboratory.

Mar and Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

Page 2 of 14

15H2159			- A	01	-02 -				- 03	D	-04	E	
		MC	)H Strea	ım L		et		200		ge <u> </u> of <u> </u>			
Program Code: <u>R</u> G	- Col	lected	by:	J	ie.	Mage	ee			Pro	ject ID:	RJO	0075
Collector Phone:							N	MPCA PI Name an			(e		
Sample Information		A			14 (1964) 1	В	in the	-	C	##-02400	D		E
Location ID ex 27-0016-00-101 or S005-515)	w .1	5-1	380		W -10	5-1311		EAR-	15-0223				
Location ID Barcode									NE CE	1 States			
Field Name / Lake Name	MB	W 150	519			15006		ww	-01	BETHA			
BioDB Code Date (MM/DD/YY)	0.0	1011	1	-	071	alie	-		110				
Cime (Military)		7:4				28/15		0 + / 3	45		30/15-		
Quality Assurance*	0							10.	10	10.	40		met-m
nalysis Group No.**								The W					- 12-T
Sample Depth (Top) m Lake Only) Sample Depth (Bot) m													
Lake Only) Tilter Volume	-		-								-		
for chlorophyll a)	1. 10	anta -	- Alke		-		le Ana				Ange Lagi		11111
AIS- autoclave	Г	1	Field filte	red		rk requesting Field filte		yses with an	"X") Field filtered		Field filtered		Field filtered
Dilution			Field filte	red	H	Field filte	red		Field filtered	H	Field filtered	H	Field filtered
Fe 200.7		_	Field filte	red	X	Field filte	red	X	Field filtered		Field filtered	H	Field filtered
AL 200.8	N		Field filte	red	X	Field filte	red		Field filtered	X	Field filtered	H	Field filtered
d d		X	Field filte	red	X	Field filte	red	X	Field filtered		Field filtered	H	Field filtered
Mn 20018 Cu 200.8		K	Field filte	red	X	Field filte	red	X	Field filtered	V	Field filtered	$\vdash$	Field filtered
			Field filte	ed	V	Field filte	red	Ň	Field filtered		Field filtered	H	Field filtered
ZN 200.8		7	Field filte	ed	A	Field filte	red		Field filtered		Field filtered	H	Field filtered
		-	Field filte	ed	H	Field filte	red	H	Field filtered		Field filtered	H	Field filtered
		-	Field filte	ed	H	Field filte	red		Field filtered	H	Field filtered	H	Field filtered
		-	Field filte	ed	H	Field filter	red		Field filtered		Field filtered		Field filtered
		-	Field filter	ed		Field filter	red		Field filtered		Field filtered		Field filtered
	-	-	Field filter	ed	H	Field filter	red		Field filtered		Field filtered		Field filtered
ab Temp (°C)	L	_					-						
Relinquish	** Selec	t an Ana	plicate, SE lysis Grou	= Sam	pler Blan		ample, ' oy a Nu	TB = Trip Bl mber Code.	ARATE COLUN ank, BB = Bottle Accepted I				mlk revised 1/ Date/Time
mpler) Jolin	S.	-	2B	~			:20 am	0 11	n Bren	mer	MOH		8/28/15
Hybin	ner				8	3/28/159	7:33	Sth	ALL M	IDH	1		08/28/15
ampler Comments	-			-					-				

DEPARTMENT OF HEALTH		15H2159
	Parcel Information	
	Date & time of receipt:	AUG 28'15 9:33
Courier: 🗆 UPS 🗖	□FedEx □Spee-Dee □USPS □Other 🕅	Walk-in
	f:  Refrigerator  Freezer Unrefrigerated	
Parcel: 🗆 Plastic cod	oler 🗆 Styrofoam cooler 🗆 Cardboard box 🗆 Single mailer	🗆 Envelope 🛛 🖄 None
□ Other		
Custody seals prese	nt: □ Yes 🕅 No; Custody seals intact: □ Yes □ No 🕅 N/A	
Custody seal #	. Evidentiary samples iden	ntified: 🗆 Yes 🕅 No
-	Packaging Information	
Packing material: [	□ Bubble wrap □ Styrofoam □ Paper 🕅 None □ Other	
Cooling material.		
Cooning material.	$\Box$ Wet ice $\Box$ Ice pack $\Box$ Gel pack $\Box$ Dry ice $\boxtimes$ None $\Box$ Other_	
0	g material: □ Solid □ Partial □ Liquid; Liquid temperature: _	
Condition of cooling		°C 🖾 N/A
Condition of cooling Representative sam	g material: □ Solid □ Partial □ Liquid; Liquid temperature: _ ple temperature:7.0 °C IR thermometer instrumen	°C 🖾 N/A
Condition of cooling Representative sam	g material: 🗆 Solid 🗆 Partial 🗆 Liquid; Liquid temperature: _	°C 🖾 N/A
Condition of cooling Representative sam	g material: □ Solid □ Partial □ Liquid; Liquid temperature: _ ple temperature:7.0 °C IR thermometer instrumen	°C ⊠N/A nt used:A4
Condition of cooling Representative sam nitials of person rece	g material:  Solid  Partial Liquid; Liquid temperature: _ ple temperature: <u>7.0</u> °C IR thermometer instrumen eiving parcel: <u>94</u> Chain of Custody, Sample Container & Analysis Inform	°C ⊠N/A nt used:A4
Condition of cooling Representative sam nitials of person rece Chain of custody re-	g material:  Solid  Partial Liquid; Liquid temperature: _ ple temperature: <u>7.0</u> °C IR thermometer instrumen eiving parcel: <u>94</u> Chain of Custody, Sample Container & Analysis Inform	°C ⊠N/A at used: <u>A4</u>
Condition of cooling Representative sam itials of person rece Chain of custody re- Chain of custody ty	g material:  Solid  Partial  Liquid; Liquid temperature: _ ple temperature: _7.0 °C IR thermometer instrumen eiving parcel: Chain of Custody, Sample Container & Analysis Inform ceived: XYes  No	°C ⊠N/A nt used: <u>A4</u> ation
Condition of cooling Representative sam itials of person rece Chain of custody re Chain of custody ty Rad Chem request 1	g material:  Solid  Partial  Liquid; Liquid temperature: ple temperature:°C IR thermometer instrumen eiving parcel: Chain of Custody, Sample Container & Analysis Inform ceived:  Yes  No pe:  Standard  Civil  Criminal  Priority/Emergency	°C ⊠N/A nt used: ation
Condition of cooling Representative sam itials of person rece Chain of custody re Chain of custody ty Rad Chem request 1	g material:  Solid  Partial  Liquid; Liquid temperature: ple temperature:°C IR thermometer instrumen eiving parcel: Chain of Custody, Sample Container & Analysis Inform ceived:  Yes  No pe:  Standard  Civil  Criminal  Priority/Emergency  ceceived:  Yes  No, Sample survey results:  < .5 mrem/I	$^{\circ}$ C ⊠N/A at used: <u>A4</u> ation Unknown ar $\Box \ge .5$ mrem/hr
Condition of cooling Representative sam itials of person rece Chain of custody re Chain of custody ty Rad Chem request 1 All sample containe	g material: □ Solid □ Partial □ Liquid; Liquid temperature: _ ple temperature:7.0°C IR thermometer instrument eiving parcel:94 Chain of Custody, Sample Container & Analysis Inform ceived: ☆Yes □ No pe: ☆Standard □ Civil □ Criminal ☆Priority/Emergency □ received: □ Yes ☆No, Sample survey results: □ < .5 mrem/I rs received intact: ☆Yes □ No	•C ⊠N/A at used: <u>A4</u> ation Unknown hr □≥.5 mrem/hr tody: X Yes □ No
Condition of cooling Representative sam nitials of person rece Chain of custody re Chain of custody ty Rad Chem request 1	g material:  Solid  Partial  Liquid; Liquid temperature: ple temperature:°C IR thermometer instrumen eiving parcel: Chain of Custody, Sample Container & Analysis Inform ceived:  Yes  No pe:  Standard  Civil  Criminal  Priority/Emergency  ceceived:  Yes  No, Sample survey results:  < .5 mrem/I	°C ⊠N/A nt used:

Amended Report Case Narrative Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Program Code: RG	Project ID: PRJ00075
Program Name: EOD-Fish Kill Studies	Facility Name: None
Collected by: Joe Magee	City: None
Collector ID: None	Generated: 11/05/2015 9:20

Supplement to Test Report ID: 09022015103034

As, Ba, and Ti 200.8 were added to the all samples on this report.

Amended Report

Authorized by:

Report ID: 11052015 92049

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Program Code: RG	Project ID: PRJ00075					
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None					
Collected By: Joe Magee	City: None					
Collector ID: None	Generated: 11/05/15 9:20					
	MDH Sample Number: 15H2159-01					
Location ID: W-15-1380	Collect Date: 08/01/15	Field Residual Chlorine Result: None				
Field Name: MBW15019	Collect Time: 7:47	Field Fluoride Result: None				
Sampling Point None	Matrix: Non-potable Water	Field pH Result: None				
QA Type: None		Field PO <sub>4</sub> Result: None				

Receiving Comments: All four samples were transfered from MDA to MDH. JJB 8/28/15 Priority one analysis.

Results were produced by the Minnesota Department of Health, except where noted.

#### Metal Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
Aluminum	B4, L1, M3, Z-01a	2020	20.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 1426	EPA200.8
Arsenic		103	1.00	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 1426	EPA200.8
Barium		110	5.00	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 1426	EPA200.8
Copper	Z-01a	<	10.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 1426	EPA200.8
Iran	Z-01a	2330	20.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/150924	EPA200.7
Manganese	Z-01a	150	10.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 1426	EPA200.8
Titanium		56.6	5.00	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 1426	EPA200.8
Zinc	Z-01a	<	10.0	ug/L	1	B5H0928	08.31/15 07:07	09/01/15 14:26	EPA200.8

Amended Report

Report ID: 11052015 92049

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899

St. Paul, MN 55164-0899

651-201-5300

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Program Code: RG	Project ID: PRJ00075					
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None					
Collected By: Joe Magee	City: None					
Collector ID: None	Generated: 11/05/15 9:20					
	MDH Sample Number: 15H2159-02					
Location ID: W-15-1311	Collect Date: 07/28/15	Field Residual Chlorine Result: None				
Field Name: SBW15006	Collect Time: 13:00	Field Fluoride Result: None				
Sampling Point None	Matrix: Non-potable Water	Field pH Result: None				
QA Type: None		Field PO <sub>4</sub> Result: None				

Receiving Comments: All four samples were transfered from MDA to MDH. JJB 8/28/15 Priority one analysis.

Results were produced by the Minnesota Department of Health, except where noted.

#### Metal Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	B4, L1, Z-01a	1640	20.0	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:32	EPA200.8
Arsenic		<	1.00	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 14:32	EPA200.8
Barium		89.3	5.00	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 14:32	EPA200.8
Copper	Z-01a	<	10.0	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:32	EPA200.8
Iron	Z-01a	1620	20.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 09.31	EPA200.7
Manganese	Z-01a	86.4	10.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 14:32	EPA200.8
Titanium		46.6	5.00	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:32	EPA200.8
Zinc	Z-01a	<	10.0	ug/L	1	B5H0928	08.31/15 07:07	09/01/15 14:32	EPA200.8

Amended Report

Report ID: 11052015 92049

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899

St. Paul, MN 55164-0899

651-201-5300

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Page 7 of 14

Project ID: PRJ00075 Program Code: RG Program Name: EOD-Fish Kill Studies Facility Name/ID: None Collected By: Joe Magee City: None Collector ID: None Generated: 11/05/15 9:20 MDH Sample Number: 15H2159-03 Location ID: EAR- 15-0223 Collect Date: 07/30/15 Field Residual Chlorine Result: None Field Name: WW-01 Collect Time: 16:45 Field Fluoride Result: None Sampling Point None Matrix: Non-potable Water Field pH Result: None QA Type: None Field PO4 Result: None

Receiving Comments: All four samples were transfered from MDA to MDH. JJB 8/28/15 Priority one analysis.

Results were produced by the Minnesota Department of Health, except where noted.

#### Metal Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	B1, L1, W8, Z-01a	219	20.0	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:35	EPA200.8
Arsenic		<	1.00	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 14:35	EPA200.8
Barium		70.2	5.00	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 14:35	EPA200.8
Copper	Z-01a	<	10.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 14:35	EPA200.8
Iron	Z-01a	116	20.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 09:34	EPA200.7
Manganese	Z-01a	<	10.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 14:35	EPA200.8
Titanium		6.45	5.00	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:35	EPA200.8
Zinc	Z-01a	<	10.0	ug/L	1	B5H0928	08/31/15 07:07	09.01/15 14:35	EPA200.8

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Report ID: 11052015 92049

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Project ID: PRJ00075 Program Code: RG Program Name: EOD-Fish Kill Studies Facility Name/ID: None Collected By: Joe Magee City: None Collector ID: None Generated: 11/05/15 9:20 MDH Sample Number: 15H2159-04 Location ID: EAR- 15-0228 Collect Date: 07/30/15 Field Residual Chlorine Result: None Field Name: Bethany Drive Collect Time: 16:20 Field Fluoride Result: None Sampling Point None Matrix: Non-potable Water Field pH Result: None Field PO4 Result: None QA Type: None

Receiving Comments: All four samples were transfered from MDA to MDH. JJB 8/28/15 Priority one analysis.

Results were produced by the Minnesota Department of Health, except where noted.

#### Metal Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	B4, L1, Z-01a	1170	20.0	ug/L	1	B5H0928	08,31/15 07:07	09.01/15 14:41	EPA200.8
Arsenic	Z-01	<	1.00	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:41	EPA200.8
Barium	Z-01	93.8	5.00	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:41	EPA200.8
Copper	Z-01a	<	10.0	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:41	EPA200.8
Iran	Z-01a	1100	20.0	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 09:40	EPA200.7
Manganese	Z-01a	56.0	10.0	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:41	EPA200.8
Titanium	Z-01	27.2	5.00	ug/L	1	B5H0928	08.31/15 07:07	09.01/15 14:41	EPA200.8
Zinc	Z-01a	<	10.0	ug/L	1	B5H0928	08/31/15 07:07	09/01/15 14:41	EPA200.8

Amended Report

Report ID: 11052015 92049

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899

St. Paul, MN 55164-0899

651-201-5300

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	Amended Report Quality Control	Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: [none]	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11/05/15 9:20	
Samalas in Batak, BEU0000 - EDA 200 Basa	Batch Summary	

#### Samples in Batch: B5H0928 - EPA 200 Prep

15H2159-01 15H2159-02 15H2159-03 15H2159-04

Amended Report

Authorized by:

Report ID: 11052015 92049

Minnesota Department of Health

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

	651-201-5300	
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11.05/15 9:20	

Amended Report

Batch B5H0928 - EPA 2	UU Prep									
Blank (B5 H0928-BL K1)				Prepare	d:08/01/15	07:07 Analy	yzed: 11.0571:	5 0 9:09		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Aluminum		<	20.0	ug/L						
Arsenic		<	1.00	ug/L						
Barium		<	5.00	ug/L						
Copper		<	10.0	ug/L						
Iron		<	20.0	ug/L						
Manganese		<	10.0	ug/L						
Titanium		<	5.00	ug/L						
Zinc		<	10.0	ug/L						
Blank (B5 H0 928-BL K2)				Prepare	d:08/91/15	07:07 Analy	yzed: 09/01/1	5 14:20		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Aluminum	B1, B4	57.0	20.0	ug/L						
Arsenic		<	1.00	ug/L						
Barium		<	5.00	ug/L						
Copper		<	10.0	ug/L						
Iron		<	20.0	ug/L						
Manganese		<	10.0	ug/L						
Titanium		<	5.00	ug/L						
Zinc		<	10.0	ugЛ						
LCS (B5H0928-BS1)				Ргераге	d:08/91/15	07:07 Analy	yzed: 11.05 <i>1</i> 1:	5 09:09		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Aluminum	• •	<	20.0	ug/L				85-115		
Arsenic		<	1.00	ug/L				85-115		
Barium		<	5.00	ug/L				85-115		
Copper		<	10.0	ug/L				85-115		
Iron		964	20.0	ug/L	1,000		96	85-115		
Manganese		<	10.0	ug/L				85-115		
Titanium		<	5.00	ug/L				85-115		
Zinc		<	10.0	ug/L				85-115		

Amended Report

Report ID: 11052015 92049

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899

	Amended Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11.05/15 9:20	

Results were	produced by	/ Minnesota D	epartment of Health,	except where noted.

LCS (B5H0928-BS2)				Ргераге	d:08/31/15	07:07 Analy	yzed: 09/01/1	5 14:23		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPI Lin
Aluminum		104	20.0	ug/L	50		209	85-115		
Arsenic		502	1.00	ug/L	50		100	85-115		
Barium		52.2	5.00	ug/L	50		104	85-115		
Copper		49.0	10.0	ug/L	50		98	85-115		
Iron		<	20.0	ug/L				85-115		
Manganese		50.9	10.0	ug/L	50		102	85-115		
Titanium		53.1	5.00	ug/L	50		106	85-115		
Zinc		48.6	10.0	ug/L	50		97	85-115		

Duplicate (B5H0928-DUP1)		Source: 15H2	2159-03	Ргераге	d:08.01/15	07:07 Analy	yzed: 11.0571:	5 09:09		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PD Limit
Aluminum		<	20.0	ug∕L		219				20
Arsenic		<	1.00	ug∕L		<				20
Barium		<	5.00	ug/L		70.2				20
Copper		<	10.0	ug∕L		<				20
Iron		115	20.0	ug/L		116			0.9	20
Manganese		<	10.0	ug∕L		<				20
Titanium		<	5.00	ug/L		6.45				20
Zinc		<	10.0	ug/L		<				20

Duplicate (B5H0928-DUP2)		Source: 15H	2159-03	Prepare	d:08/91/15	07:07 Anal;	yzed: 09/01/1	5 14:38			
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	
Aluminum	W8	163	20.0	ug/L		219			29	20	
Arsenic		0.56	1.00	ug/L		<			35	20	
Barium		74.0	5.00	ug/L		70.2			5	20	
Copper		1.03	10.0	ug/L		<			17	20	
Iron		<	20.0	ug/L		116				20	
Manganese		6.60	10.0	ug/L		<			1	20	
Titanium		6.42	5.00	ug/L		6.45			0.4	20	
Zinc		1.00	10.0	ug/L		<			3	20	

Amended Report

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

	Amended Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11.05/15 9.20	

Results were i	nroduced hi	/ Minnesota D	onartment of Health	except where noted.
ICeanita were	produced by	/ winnesota D	epanneni or rieann	except where noted.

Matrix Spike (B5H0928-MS1)		Source: 15H	2159-01	Prepare	d:08/91/15	07:07 Analy	yzed: 11.0571:	5 0 9:09		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PC Lim
Aluminum		<	20.0	ug/L		2020		85-115		
Arsenic		<	1.00	ug/L		1.03		85-115		
Barium		<	5.00	ug/L		110		85-115		
Copper		<	10.0	ug/L		<		85-115		
Iron		3270	20.0	ug/L	1,000	2330	94	85-115		
Manganese		<	10.0	ug/L		150		85-115		
Titanium		<	5.00	ug/L		56.6		85-115		
Zinc		<	10.0	ugÆ		<		85-115		
Matrix Spike (B5H0928-MS2)		Source: 15H	12159-01	Ргераге	d:08/91/15	07:07 Analy	yzed: 09/01/1	5 14:29		

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Aluminum	M3	2150	20.0	ug/L	50	2020	248	85-115		
Arsenic		49.0	1.00	ug/L	50	1.03	96	85-115		
Barium		165	5.00	ug/L	50	110	110	85-115		
Copper		47.8	10.0	ug/L	50	<	91	85-115		
Iron		<	20.0	ug/L		2330		85-115		
Manganese		195	10.0	ug/L	50	150	91	85-115		
Titanium		105	5.00	ug/L	50	56.6	97	85-115		
Zinc		51.8	10.0	ug/L	50	<	87	85-115		

Amended Report

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Report ID: 11052015 92049

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Amended Report Quality Control

#### Data Qualifiers and Definitions

- Z-01a Samples received in Non-MDH container.
- Z-01 Samples received in Non-MDH
- W8 Sample/sample duplicate relative percent difference exceeded the laboratory acceptance limit.
- M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated laboratory control sample and/or laboratory controls ample duplicate recovery was acceptable.
- L1 The spike recovery was above laboratory acceptance limits for the associated laboratory control sample and/or laboratory control sample duplicate.
- B4 Target analyte detected in method blank at or above method reporting limit. Concentration found in the sample was at least 10 times the concentration found in the method blank.
- B1 Target analyte detected in method blank at or above the method reporting limit. See comments or additional qualifiers.
- Dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- %REC Percent Recovery

Amended Report

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F	100 m	Date Printed: Date Collect				
	MINNESOTA DEPARTMENT	8/6/2015 7/30/201				
MINICOOT		Inspector Name: Heidi Rantala	Inspector ID: Cnty Rd. 119			
	A DEPARTMENT OF AGRICULTURE	Customer Contact:	Sample ID: EAR-15-0227			
	601 Robert Street North	Customal Condet.	SDG ID: 15-SDG-3308			
Saint	Paul, Minnesota 55155-2531	Project: / Survey:				
	(651) 201-6010	Surface Water				
F	lesidue Final Report					
Collected From:	-	Description:				
		N/A				
		Quantity x Sample Size:				
		1x1L				
· · · · · ·			Page 1 of 5			
Analysis Requested:	GC, LC					
Analyte	Result	Result Comment				
Acetochlor	ND at MRL (30 ppt)					
Alachlor	ND at MRL (30 ppt)					
Atrazine	ND at MRL (30 ppt)					
Benfluralin	ND at MRL (25 ppt)					
Bifenthrin	ND at MRL (20 ppt)					
Chlorothalonil	ND at MRL (50 ppt)					
Chlorpyrifos	ND at MRL (40 ppt)					
Clomazone	ND at MRL (15 ppt)					
Cyfluthrin	ND at MRL (100 ppt)					
Delsopropylatrazine	ND at MRL (150 ppt)					
Desethylatrazine	ND at MRL (50 ppt)					
Diazinon	ND at MRL (30 ppt)					
Diazinon Oxon	ND at MRL (75 ppt)					
Dichlobenil	ND at MRL (5 ppt)					
Dichlorvos	ND at MRL (15 ppt)					
Dimethenamid	ND at MRL (15 ppt)	,				
Dimethoate	ND at MRL (100 ppt)					
Disulfoton	ND at MRL (60 ppt)					
EPTC	ND at MRL (10 ppt)					
Estenvalerate	ND at MRL (150 ppt)					
Ethalfluralin	ND at MRL (50 ppt)					
Ethofumesate	ND at MRL (50 ppt)					
Fonofos	ND at MRL (15 ppt)		·			
Malathion	ND at MRL (50 ppt)					
Methoxychlor	ND at MRL (50 ppt)					
Metolachlor	28.6 ppt					
Metribuzin	ND at MRL (75 ppt)					
Metribuzin DA	ND at ERL (500 ppt)					

	Report ID: 436019	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallang. In PErso
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13-16-0,	73	end of the

MINNESOTA DEPARTMENT

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

**Residue Final Report** 

Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Number:
Inspector Name	1:	Inspector ID:
Heidi Rantala		Cnty Rd. 119
Customer Cont	act:	Sample ID: EAR-15-0227
		SDG ID: 15-SDG-3308
Project: / Surve	у:	
Surface Water	r	
Description: N/A		1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.
Quantity x Sam	ple Size:	

Page 2 of 5

Analysis Requested: GC, LC

**Collected From:** 

Analyte	Result	Result Comment
Metribuzin DADK	ND at ERL (500 ppt)	
Metribuzin DK	ND at ERL (500 ppt)	
Oxadiazon	ND at MRL (75 ppt)	
Parathion-methyl	ND at MRL (100 ppt)	
Pendimethalin	ND at MRL (75 ppt)	
Phorate	ND at MRL (25 ppt)	
Prometon	ND at MRL (100 ppt)	
Propachlor	ND at MRL (30 ppt)	
Propazine	ND at MRL (25 ppt)	
Simazine	ND at MRL (75 ppt)	
Tebupirimiphos	ND at MRL (30 ppt)	
Terbufos	ND at MRL (30 ppt)	
Tolfenpyrad	ND at MRL (100 ppt)	
Triallate	ND at MRL (50 ppt)	
Trifluralin	ND at MRL (50 ppt)	
lambda-Cyhalothrin	ND at MRL (75 ppt)	
zeta-Cypermethrin	ND at MRL (500 ppt)	
2,4,5-T	ND at MRL (50 ppt)	
2,4,5-TP	ND at MRL (50 ppt)	
2,4-D	12.5 ppt	
2,4-DB	ND at MRL (20 ppt)	
Acetochlor ESA	148 ppt	
Acetochlor OXA	ND at MRL (33.3 ppt)	5
Alachlor ESA	49.1 ppt	
Alachlor OXA	ND at MRL (33.3 ppt)	
Bentazon	97.7 ppt	
Bromoxynil	ND at MRL (25 ppt)	
Clopyralid	ND at MRL (41.6 ppt)	
Sample Remarks:		

Sample Remarks:

Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

	I verify that these data are correct.	do a the
Report ID: 436019	Kathy Reynolds	Kathan han Kon 8
*	Water Analysis Unit Supervisor	
went a field at the second state of the state of the second state	At a second from the labor to be The second to be	non amhs ammBaalafa ta tha annantafa). Batad

MINNESOTA DEPARTMENT	Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Number:		
OF AGRICULTURE	Inspector Nam		Inspector ID: Cnty Rd. 119		
MINNESOTA DEPARTMENT OF AGRICULTURE	Heidi Rantala				
Laboratory Analysis Report	Customer Con	itact:	Sample ID: EAR-15-0227		
601 Robert Street North	SDG ID: 15-SDG-3308				
Saint Paul, Minnesota 55155-2531	Project: / Survey:				
(651) 201-6010	Surface Water				
Residue Final Report					
Collected From:	Description: N/A				
	Quantity x Sar	nple Size:			

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Dicamba	ND at MRL (50 ppt)	
Dichlorprop	ND at MRL (50 ppt)	
Dimethenamid ESA	81.4 ppt	
Dimethenamid OXA	15.6 ppt	
Flutenacet OXA	ND at MRL (8.3 ppt)	
soxaflutole DKN	ND at MRL (50 ppt)	
MCPA	ND at MRL (5 ppt)	
MCPB	ND at MRL (20 ppt)	
MCPP	ND at MRL (50 ppt)	
Mesotrione	ND at MRL (50 ppt)	
Metolachlor ESA	1290 ppt	
Metolachlor OXA	178 ppt	
Picloram	ND at MRL (41.6 ppt)	
Propachlor ESA	ND at MRL (30 ppt)	
Propachlor OXA	ND at MRL (10 ppt)	
Sedaxane	ND at MRL (75 ppt)	
Tembotrione	ND at MRL (50 ppt)	
Triclopyr	ND at MRL (50 ppt)	
Acetamiprid	ND at MRL (25 ppt)	
Aldicarb Suifone	ND at MRL (15 ppt)	
Aldicarb Sulfoxide	ND at MRI. (50 ppt)	
Azoxystrobin	ND at MRL (10 ppt)	
Bensulfuron-methyl	ND at MRL (16.7 ppt)	
Bensulide	ND at MRL (250 ppt)	
Boscalid	ND at MRL (50 ppt)	
Bromacil	ND at MRL (30 ppt)	
Carbaryl	ND at MRL (25 ppt)	
Carbendazim	ND at MRL (10 ppt)	

	I verify that these data are correct. Kathy Reynolds	Kallang m. Ross	
	Water Analysis Unit Supervisor	<i>v</i>	I.
This was to the first has seen abused except in full without the up	ritton approval from the laboratory. These results :	re only applicable to the sample(s) listed.	

MINNESOTA DEPARTMENT	Date Printed: Date Collecte 8/6/2015 7/30/2015	1: Top Folder Number:		
of AGRICULTURE	Inspector Name:	Inspector ID:		
MINNESOTA DEPARTMENT OF AGRICULTURE	Heidi Rantala	Cnty Rd. 119		
Laboratory Analysis Report	Customer Contact:	Sample ID: EAR-15-0227		
601 Robert Street North		SDG ID: 15-SDG-3308		
Saint Paul, Minnesota 55155-2531	Project: / Survey:			
(651) 201-6010	Surface Water			
Residue Final Report				
Collected From:	Description: N/A			
	Quantity x Sample Size: 1 x 1 L			
		Page 4 of 5		

## Analysis Requested: GC, LC

Analyte	Result	Result Comment
Carbofuran	ND at MRL (13.3 ppt)	
Chlorantraniliprole	ND at MRL (50 ppt)	
Chlorimuron-ethyl	ND at MRL (20 ppt)	
Chlorpyrifos Oxon	ND at MRL (40 ppt)	
Clothianidin	ND at MRL (25 ppt)	
Dyanazine	ND at MRL (25 ppt)	
Cyantraniliprole	ND at MRL (100 ppt)	
DEDI Atrazine	ND at MRL (50 ppt)	
Dicrotophos	ND at MRL (25 ppt)	
Difenoconazole	ND at MRL (25 ppt)	
Dinotefuran	ND at MRL (25 ppt)	
Disulfoton Sulfone	ND at MRL (20 ppt)	
Diuron	ND at MRL (13.3 ppl)	
lumetsulam	ND at MRL (50 ppt)	
lutriafol	ND at MRL (10 ppt)	
lalosulfuron-methyl	ND at MRL (30 ppt)	
lexazinone	ND at MRL (10 ppt)	
łydroxyatrazine	27.2 ppt	
mazamethabenz Acid	ND at MRL (10 ppt)	
mazamethabenz-methyl	ND at MRL (5 ppt)	
mazamox	ND at MRL (13.3 ppt)	
mazapic	ND at MRL (10 ppt)	
mazapyr	ND at MRL (8.3 ppt)	
mazaquin	ND at MRL (16.7 ppt)	
nazethapyr	10.7 ppt	
nidacloprid	ND at MRL (20 ppt)	
soxaflutole	ND at MRL (40 ppt)	
inuron	ND at MRL (20 ppt)	

# Sample Remarks:

Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diffufenzopyr and Cyproconazole.

	I verify that these data are correct.	1 man
	Kathy Reynolds Water Analysis Unit Supervisor	Kallay In RES
	water Analysis Offic Supervisor	0
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MINNESOTA DEPARTMENT	Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Number:		
of AGRICULTURE	Inspector Nam	16:	Inspector ID: Cnty Rd. 119 Sample ID: EAR-15-0227		
MINNESOTA DEPARTMENT OF AGRICULTURE	Heidi Rantala				
Laboratory Analysis Report	Customer Con	itact:			
601 Robert Street North			SDG ID: 15-SDG-3308		
Saint Paul, Minnesota 55155-2531	Project: / Survey:				
(651) 201-6010	Surface Water				
Residue Final Report					
Collected From:	Description: N/A				

Page 5 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Metalaxyl	ND at MRL (8.3 ppt)	
Metsulfuron-methyl	ND at MRL (23.3 ppt)	
Myclobutanil	ND at MRL (10 ppt)	
Nicosulfuron	ND at MRL (26.6 ppt)	
Norflurazon	ND at MRL (20 ppt)	
Norflurazon-desmethyl	ND at MRL (50 ppt)	
Oxydemeton-methyl	ND at MRL (20 ppt)	
Parathion-methyl Oxon	ND at MRL (25 ppt)	
Picoxystrobin	ND at MRL (50 ppt)	
Prometryn	ND at MRL (3.3 ppt)	
Propiconazole	ND at MRL (10 ppt)	
Pyraclostrobin	ND at MRL (25 ppt)	
Pyroxasulfone	ND at MRL (50 ppt)	
Saflufenacil	30.9 ppt	
Siduron	ND at MRL (6.7 ppt)	
Sutfometuron-methyl	ND at MRL (8.3 ppt)	
Tebuconazole	ND at MRL (10 ppt)	
Tetraconazole	ND at MRL (10 ppt)	
Thiacloprid	ND at MRL (50 ppt)	
Thlamethoxam	ND at MRL (25 ppt)	
Thifensulfuron-methyl	ND at MRL (16.7 ppt)	
Thiobencarb	ND at MRL (8.3 ppt)	
Triasulfuron	ND at MRL (23.3 ppt)	
Fluxapyroxad	2.20 ppt	ERI. (0.1 ppt)

Sample Remarks:

Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

Report ID: 436019	l verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallay	m	RESS	

MINNESOTA DEPARTMENT or AGRICULTURE
<b>MINNESOTA DEPARTMENT OF AGRICULTURE</b>
Laboratory Analysis Report
601 Robert Street North
Saint Paul, Minnesota 55155-2531
(651) 201-6010

**Residue Final Report** 

Date Printed:	Date Collected:	Top Folder Nu	mber:
8/6/2015	7/30/2015		
Inspector Name	B:	Inspector ID:	
Heidi Rantala		Beth	any Drive
<b>Customer Cont</b>	act:	Sample ID:	EAR-15-0228
		SDG ID:	15-SDG-3308
Project: / Surve	ey:		
Surface Wate	Ĩ		
Description: N/A			
Quantity x Sam	pie Size:		

Page 1 of 5

Analysis Requested: GC, LC

**Collected From:** 

Analyte	Result	Result Comment
Acetochlor	ND at MRL (30 ppt)	
Alachior	ND at MRL (30 ppt)	
Atrazine	46.8 ppt	
Benfluralin	ND at MRL (25 ppt)	
Bifenthrin	ND at MRL (20 ppt)	
Chlorothalonil	ND at MRL (50 ppt)	
Chlorpyrifos	ND at MRL (40 ppt)	
Clomazone	ND at MRL (15 ppt)	
Cyfluthrin	ND at MRL (100 ppt)	
Deisopropylatrazine	ND at MRL (150 ppt)	
Desethylatrazine	77.7 ppt	
Diazinon	ND at MRL (30 ppt)	
Diazinon Oxon	ND at MRL (75 ppt)	
Dichlobenil	ND at MRL (5 ppt)	
Dichlorvos	ND at MRL (15 ppt)	
Dimethenamid	ND at MRL (15 ppt)	
Dimethoate	ND at MRL (100 ppt)	
Disulfoton	ND at MRL (60 ppt)	
EPTC	ND at MRL (10 ppt)	
sfenvalerate	ND at MRL (150 ppt)	
Ethalfluralin	ND at MRL (50 ppt)	
thofumesate	ND at MRL (50 ppt)	
onofos	ND at MRL (15 ppt)	
Aalathion	ND at MRL (50 ppt)	
/lethoxychlor	ND at MRL (50 ppt)	
<b>Netolachior</b>	34.3 ppt	
/etribuzin	ND at MRL (75 ppt)	
Vetribuzin DA	ND at ERL (500 ppt)	

Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diffufenzopyr and Cyproconazole.

I verify that these data are correct.	10 0	ne-2-
 Kathy Reynolds	Kallay m	K
Water Analysis Unit Supervisor	0	

MINNESOTA DEPARTMENT	Date Printed: Date Collected: T 8/6/2015 7/30/2015	op Folder Number:	
OF AGRICULTURE	Inspector Name: I Heidi Rantala	Inspector ID: Bethany Drive	
Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010	Customer Contact: Sample ID: EAR-15 SDG ID: 15-SDC Project: / Survey: Surface Water		
Residue Final Report			
Collected From:	Description: N/A		
	Quantity x Sample Size: 1 x 1 L		

Page 2 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Metribuzin DADK	ND at ERL (500 ppt)	
Metribuzin DK	ND at ERL (500 ppt)	
Oxadiazon	ND at MRL (75 ppt)	
Parathion-methyl	ND at MRL (100 ppt)	
Pendimethalin	ND at MAL (75 ppt)	
Phorate	ND at MRL (25 ppt)	
Prometon	ND at MRL (100 ppt)	
Propachlor	ND at MRL (30 ppt)	
Propazine	ND at MRL (25 ppt)	
Simazine	ND at MRL (75 ppt)	
Tebupirimiphos	ND at MRL (30 ppt)	
Terbufos	ND at MRL (30 ppt)	
Tolfenpyrad	ND at MRL (100 ppt)	
Triallate	ND at MRL (50 ppt)	
Trifluralin	ND at MRL (50 ppt)	
ambda-Cyhalothrin	ND at MRL (75 ppt)	
zeta-Cypermethrin	ND at MRL (500 ppt)	
2,4,5-T	ND at MRL (50 ppt)	
2,4,5-TP	ND at MRL (50 ppt)	
2,4-D	10.4 ppt	
2,4-DB	ND at MRL (20 ppt)	
Acetochlor ESA	131 ppt	
Acetochlor OXA	ND at MRL (33.3 ppt)	
Alachlor ESA	151 ppt	
Alachlor OXA	ND at MRL (33.3 ppt)	
Bentazon	77.2 ppt	
Bromoxynil	ND at MRL (25 ppt)	
Clopyralid	ND at MRL (41.6 ppt)	

Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflutenzopyr and Cyproconazole.

Water Analysis Unit Supervisor 0
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MINNESOTA DEPARTMENT of AGRICULTURE
MINNESOTA DEPARTMENT OF AGRICULTURE
Laboratory Analysis Report

601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

**Residue Final Report** 

Collected From:

Date Printed:	Date Collected:	<b>Top Folder Nu</b>	mber:
8/6/2015	7/30/2015		
Inspector Nam	e:	Inspector ID:	
Heidí Rantala		Beth	any Drive
Customer Con	tact:	Sample ID:	EAR-15-0228
		SDG ID:	15-SDG-3308
Project: / Surve	ey:		
Surface Wate	ər		
Description: N/A			
Quantity x Sam 1 x 1 L	ple Size:		

Page 3 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Dicamba	ND at MRL (50 ppt)	
Dichlorprop	ND at MRL (50 ppt)	
Dimethenamid ESA	75.4 ppt	
Dimethenamid OXA	17.0 ppt	
Flufenacet OXA	ND at MRL (8.3 ppt)	
Isoxaflutole DKN	ND at MRL (50 ppt)	
MCPA	ND at MRL (5 ppt)	
MCPB	ND at MRL (20 ppt)	
MCPP	ND at MRL (50 ppt)	
Mesotrione	ND at MRL (50 ppt)	
Metolachlor ESA	1410 ppt	
Metolachlor OXA	158 ppt	
Picloram	ND at MRL (41.6 ppt)	
Propachlor ESA	ND at MRL (30 ppt)	
Propachlor OXA	ND at MRL (10 ppt)	
Sedaxane	ND at MRL (75 ppt)	
Tembotrione	ND at MRL (50 ppt)	
Triclopyr	ND at MRL (50 ppt)	
Acetamiprid	ND at MRL (25 ppt)	
Aldicarb Sulfone	ND at MRL (15 ppt)	
Aldicarb Sulfoxide	ND at MRL (50 ppt)	
Azoxystrobin	ND at MRL (10 ppt)	
Bensulfuron-methyl	ND at MRL (16.7 ppt)	
Bensulide	ND at MRL (250 ppt)	
Boscalid	ND at MRL (50 ppt)	
Bromacil	ND at MRL (30 ppt)	
Carbaryl	ND at MRL (25 ppt)	
Carbendazim	ND at MRL (10 ppt)	

Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diffutenzopyr and Cyproconazole.

	I verify that these data are correct.	la - men -	-
Report ID: 436020	Kathy Reynolds	Kallin m Barts	1
·	Water Analysis Unit Supervisor		-
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MINNESOTA DEPARTMENT	Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Number:
OF AGRICULTURE MINNESOTA DEPARTMENT OF AGRICULTURE	Inspector Nam Heidi Rantala		Inspector ID: Bethany Drive
Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010	Customer Contact: Sample ID: EAR-15-0228 SDG ID: 15-SDG-3308 Project: / Survey: Surface Water		
Residue Final Report	Currate Fran		
Collected From:	Description: N/A	101111111111111111111111111111111111111	
	Quantity x San	nple Size:	

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Carbofuran	ND at MRL (13.3 ppt)	
Chlorantraniliprole	ND at MRL (50 ppt)	
Chlorimuron-ethyl	ND at MRL (20 ppt)	
Chlorpyrifos Oxon	ND at MRL (40 ppt)	
Clothianidin	ND at MRL (25 ppt)	
Cyanazine	ND at MRL (25 ppt)	
Cyantraniliprole	ND at MRL (100 ppt)	
EDI Atrazine	ND at MRL (50 ppt)	
Dicrotophos	ND at MRL (25 ppt)	
Difenoconazole	ND at MRL (25 ppt)	
Dinotefuran	ND at MRL (25 ppt)	
lisulfoton Sulfone	ND at MRL (20 ppt)	
liuron	ND at MRL (13.3 ppt)	
lumetsulam	ND at MRL (50 ppt)	
lutriafol	ND at MRL (10 ppt)	
lalosulfuron-methyl	ND at MRL (30 ppt)	
exazinone	ND at MRL (10 ppt)	
ydroxyatrazine	27.5 ppt	
nazamethabenz Acid	ND at MRL (10 ppt)	
nazamethabenz-methyl	ND at MRL (5 ppt)	
nazamox	ND at MRL (13.3 ppt)	
nazapic	ND at MRL (10 ppt)	
nazapyr	ND at MRL (8.3 ppt)	
nazaquin	ND at MRL (16.7 ppt)	
nazethapyr	9.49 ppt	
nidacloprid	ND at MRL (20 ppt)	
oxaflutole	ND at MRL (40 ppt)	
inuron	ND at MRL (20 ppt)	
Sample Remarks:	Lab used 500ml a for MDA CO and	300mLs for MDA LC. Sample scanned and negative for Diflufenzopyr and

I verify that these data are correct.	10 ml	<u> </u>
Kathy Reynolds Water Analysis Unit Supervisor	Kattany han Pot	-85

MINNESOTA DEPARTMENT of AGRICULTURE
MINNESOTA DEPARTMENT OF AGRICULTURE
Laboratory Analysis Report
601 Robert Street North
Saint Paul, Minnesota 55155-2531
(651) 201-6010
<b>Residue Final Report</b>

Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Nu	mber:
Inspector Name	12	Inspector ID:	
Heidi Rantala		Beth	any Drive
Customer Cont	act:	Sample ID:	EAR-15-0228
		SDG ID:	15-SDG-3308
Project: / Surve	y:		
Surface Water	r		
Description:			
N/A			
Quantity x Sam	ple Size:		
1.0.1.			

Page 5 of 5

Analysis Requested: GC, LC

**Collected From:** 

Analyte	Result	Result Comment
Metalaxyl	ND at MRL (8.3 ppt)	
Metsulfuron-methyl	ND at MRL (23.3 ppt)	
Myclobutanil	ND at MRL (10 ppt)	
Nicosulfuron	ND at MRL (26.6 ppt)	
Norflurazon	ND at MRL (20 ppt)	
Norflurazon-desmethyl	ND at MRL (50 ppt)	
Oxydemeton-methyl	ND at MRL (20 ppt)	
Parathion-methyl Oxon	ND at MRL (25 ppt)	
Picoxystrobin	ND at MRL (50 ppt)	
Prometryn	ND at MRL (3.3 ppt)	
Propiconazole	ND at MRL (10 ppt)	
Pyraclostrobin	ND at MRL (25 ppt)	
Pyroxasulfone	ND at MRL (50 ppt)	
Saflufenacil	27.9 ppt	
Siduron	ND at MRL (6.7 ppt) +	
Sulforneturon-methyl	ND at MRL (8.3 ppt)	
Tebuconazole	ND at MRL (10 ppt)	
Tetraconazole	ND at MRL (10 ppt)	
Thiacloprid	ND at MRI. (50 ppt)	
Thiamethoxam	ND at MRL (25 ppt)	
Thifensulfuron-methyl	ND at MRL (16.7 ppt)	
Thiobencarb	ND at MRL (8.3 ppt)	
Triasulluron	ND at MRL (23.3 ppt)	
Fluxapyroxad	4.98 ppt	ERL (0.1 ppt)

Sample Remarks:

Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

Report ID: 436020	l verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kappan n. Rents	
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MINNESOTA DEPARTMENT	Date Printed: Date Collected: 8/6/2015 7/30/2015	Top Folder Number:	
of AGRICULTURE	Inspector Name:	Inspector ID:	
MINNESOTA DEPARTMENT OF AGRICULTURE	Heidi Rantala	K's Campground, Show bridge	
Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531	Customer Contact:	Sample ID: EAR-15-0229 SDG ID: 15-SDG-3308	
(651) 201-6010	Project: / Survey: Surface Water		
Residue Final Report			
Collected From:	Description: N/A		
	Quantity x Sample Size: 1 x 1 L	esenananan Manakanan Muse	

Page 1 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Acetochlor	ND at MRL (30 ppt)	
Alachior	ND at MRL (30 ppt)	
Atrazine	43.5 ppt	
Benfluralin	ND at MRL (25 ppt)	
Bifenthrin	ND at MRL (20 ppt)	
Chlorothalonil	ND at MRL (50 ppt)	
Chlorpyrifos	ND at MRL (40 ppt)	
Clomazone	ND at MRL (15 ppt)	
Cyfluthrin	ND at MRL (100 ppt)	
Deisopropylatrazine	ND at MRL (150 ppt)	
Desethylatrazine	74.2 ppt	
Diazinon	ND at MRL (30 ppt)	
Diazinon Oxon	ND at MRL (75 ppt)	
Dichlobenil	ND at MRL (5 ppt)	
Dichlorvos	ND at MRL (15 ppt)	
Dimethenamid	ND at MRL (15 ppt)	
Dimethoate	ND at MRL (100 ppt)	
Disulfoton	ND at MRL (60 ppt)	
EPTC	ND at MRL (10 ppt)	
Esfenvalerate	ND at MRL (150 ppt)	
Ethalfluralin	ND at MRL (50 ppt)	
Ethofumesate	ND at MRL (50 ppt)	
Fonotos	ND at MRL (15 ppt)	· · · · ·
Malathion	ND at MRL (50 ppt)	
Methoxychlor	ND at MRL (50 ppt)	
Metolachlor	33.1 ppt	
Metribuzin	ND at MRL (75 ppt)	
Metribuzin DA	ND at ERL (500 ppt)	

Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diffufenzopyr and Cyproconazole.

Report ID: 436021	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallang n. P. 25	
The second shall not be reproduced assert in full without the written approval from the inheratory. These reputits are only applicable to the sample(s) listed			

MINNESOTA DEPARTMENT OF AGRICULTURE
<b>MINNESOTA DEPARTMENT OF AGRICULTURE</b>
Laboratory Analysis Report
601 Robert Street North
Saint Paul, Minnesota 55155-2531
(651) 201-6010

## **Residue Final Report**

Collected From:

Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Number	f:
Inspector Nam Heidi Rantala		Inspector ID: K's Campground,	Show bridge
Customer Con	tact:	Sample ID: EAF SDG ID: 15-	
Project: / Surve Surface Wate			
Description: N/A			
Quantity x Sam 1 x 1 L	ple Size:		

Page 2 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Metribuzin DADK	ND at ERL (500 ppt)	
Metribuzin DK	ND at ERL (500 ppt)	
Oxadiazon	ND at MRL (75 ppt)	
Parathion-methyl	ND at MRL (100 ppt)	
Pendimethalin	ND at MRL (75 ppt)	
Phorate	ND at MRL (25 ppt)	
Prometon	ND at MRL (100 ppt)	
Propachlor	ND at MRL (30 ppt)	
Propazine	ND at MRL (25 ppt)	
Simazine	ND at MRL (75 ppt)	
Tebupirimiphos	ND at MRL (30 ppt)	
Terbufos	ND at MRL (30 ppt)	
Tolfenpyrad	ND at MRL (100 ppt)	
Triallate	ND at MRL (50 ppt)	
Trifluralin	ND at MRL (50 ppt)	
lambda-Cyhalothrin	ND at MRL (75 ppt)	
zeta-Cypermethrin	ND at MRL (500 ppt)	
2,4,5-T	ND at MRL (50 ppt)	
2,4,5-TP	ND at MRL (50 ppt)	
2,4-D	18.8 ppt	
2,4-DB	ND at MRL (20 ppt)	
Acetochlor ESA	104 ppt	
Acetochlor OXA	ND at MRL (33.3 ppt)	
Alachlor ESA	159 ppt	
Alachlor OXA	ND at MRL (33.3 ppt)	
Bentazon	43.4 ppt	
Bromoxynil	ND at MRL (25 ppt)	
	ND at MRL (41.6 ppt)	

Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflutenzopyr and Cyproconazole.

Report ID: 436021	l verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallang n. Ress	
we have a first of the set of the			

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010 Residue Final Report	Heidi Rantala       K's Campground, Show brid         Customer Contact:       Sample ID: EAR-15-0229         SDG ID: 15-SDG-3308         Project: / Survey:         Surface Water
Collected From:	Description: N/A Quantity x Sample Size:

Page 3 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Dicamba	ND at MRL (50 ppt)	
Dichlorprop	ND at MRL (50 ppt)	
Dimethenamid ESA	67.4 ppt	
Dimethenamid OXA	13.4 ppt	
Flufenacet OXA	ND at MRL (8.3 ppt)	
soxaflutole DKN	ND at MRL (50 ppt)	
//CPA	ND at MRL (5 ppt)	
//CPB	ND at MRL (20 ppt)	
MCPP	ND at MRL (50 ppt)	
Vesotrione	ND at MRL (50 ppt)	
vletolachlor ESA	836 ppt	
vietolachlor OXA	149 ppt	
Picloram	ND at MRL (41.6 ppt)	
Propachlor ESA	ND at MRL (30 ppt)	
Propachlor OXA	ND at MRL (10 ppt)	
Sedaxane	ND at MRL (75 ppt)	
l'embotrione	ND at MRL (50 ppt)	
Friclopyr	ND at MRL (50 ppt)	
Acetamíprid	ND at MRL (25 ppt)	
Aldicarb Sulfone	ND at MRL (15 ppt)	
Aldicarb Sulfoxide	ND at MRL (50 ppt)	
Azoxystrobin	ND at MRL (10 ppt)	
Bensulfuron-methyl	ND at MRL (16.7 ppt)	
Bensulide	ND at MRL (250 ppt)	
Boscalid	ND at MRL (50 ppt)	
Bromacil	ND at MRL (30 ppt)	
Carbaryl	ND at MRL (25 ppt)	
Carbendazim	ND at MRL (10 ppt)	
Sample Remarks:		300mLs for MDA LC. Sample scanned and negative for Diflufenzop

	I verify that these data are correct.	Va a merze
Report (D: 436021	Kathy Reynolds	Kattan in Kon S
	Water Analysis Unit Supervisor	0
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MINNESOTA DEPARTMENT OF AGRICULTURE
<b>MINNESOTA DEPARTMENT OF AGRICULTURE</b>
Laboratory Analysis Report
601 Robert Street North
Saint Paul, Minnesota 55155-2531
(651) 201-6010
<b>Residue Final Report</b>

Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Nu	mber:				
Inspector Nam	e:	Inspector ID:					
Heidi Rantala		K's Campground, Show bridge					
Customer Con	Customer Contact:		EAR-15-0229				
		SDG ID:	15-SDG-3308				
Project: / Surv	ey:						
Surface Wate	ər						
Description: N/A			*********				
Quantity x San 1 x 1 L	ple Size:						

Page 4 of 5

Analysis Requested: GC, LC

Collected From:

Analyte	Result	Result Comment
Carbofuran	ND at MRL (13.3 ppt)	
Chlorantraniliprole	ND at MRL (50 ppt)	
Chlorimuron-ethyl	ND at MRL (20 ppt)	
Chlorpyrifos Oxon	ND at MRL (40 ppt)	
Clothianidin	ND at MRL (25 ppt)	
Cyanazine	ND at MRL (25 ppt)	
Cyantraniliprole	ND at MRL (100 ppt)	
DEDI Atrazine	ND at MRL (50 ppt)	
Dicrotophos	ND at MRI. (25 ppt)	
Difenoconazole	ND at MRL (25 ppt)	
Dinotefuran	ND at MRL (25 ppt)	
Disulfoton Sulfone	ND at MRL (20 ppt)	
Diuron	ND at MRL (13.3 ppt)	
Flumetsulam	ND at MRL (50 ppt)	
Flutriafol	ND at MRL (10 ppt)	
Halosulfuron-methyl	ND at MRL (30 ppt)	
lexazinone	ND at MRL (10 ppt)	
lydroxyatrazine	26.7 ppt	
mazamethabenz Acid	ND at MRL (10 ppt)	
mazamethabenz-methyl	ND at MRL (5 ppt)	
mazamox	ND at MRL (13.3 ppt)	
mazapic	ND at MRL (10 ppt)	
mazapyr	ND at MRL (8.3 ppt)	
mazaquin	ND at MRL (16.7 ppt)	
mazethapyr	7.36 ppt	
midacloprid	ND at MRL (20 ppt)	
Isoxaflutole	ND at MRL (40 ppt)	
Linuron	ND at MRL (20 ppt)	

Sample artivities in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflutenzopyr and Cyproconazole.

 Report ID: 436021	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kapay n. RES
This report shall not be reproduced except in full, without the w	ritten approval from the laboratory. The	ase results are only applicable to the sample(s) listed

MINNESOTA DEPARTMENT or AGRICULTURE MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531	Date Printed:       Date Collect         8/6/2015       7/30/20'         Inspector Name:       Heidi Rantala         Customer Contact:       20'				
(651) 201-6010 Residue Final Report	Project: / Survey: Surface Water				
Collected From:	Description: N/A				
	Quantity x Sample Size: 1 x 1 L				

Analyte	Result	Result Comment
Metalaxyl	ND at MRL (8.3 ppt)	
Metsulfuron-methyl	ND at MRL (23.3 ppt)	· · · · · · · · · · · · · · · · · · ·
Myclobutanil	ND at MRL (10 ppt)	
Nicosulfuron	ND at MRL (26.6 ppt)	
Norflurazon	ND at MRL (20 ppt)	
Norflurazon-desmethyl	ND at MRL (50 ppt)	
Oxydemeton-methyl	ND at MRL (20 ppt)	
Parathion-methyl Oxon	ND at MRL (25 ppt)	
Picoxystrobin	ND at MRL (50 ppt)	
Prometryn	ND at MRL (3.3 ppt)	
Propiconazole	ND at MRL (10 ppt)	
Pyraclostrobin	ND at MRL (25 ppt)	
Pyroxasulfone	ND at MRL (50 ppt)	
Saflufenacil	20.6 ppt	
Siduron	ND at MRL (6.7 ppt)	
Sulfometuron-methyl	ND at MRL (8.3 ppt)	
Tebuconazole	ND at MRL (10 ppt)	
Tetraconazole	ND at MRL (10 ppt)	
Thiacloprid	ND at MRL (50 ppt)	
Thiamethoxam	ND at MRI. (25 ppt)	
Thifensulfuron-methyl	ND at MRL (16.7 ppt)	
Thiobencarb	ND at MRL (8.3 ppt)	
Triasulfuron	ND at MRL (23.3 ppt)	
Fluxapyroxad	7.28 ppt	ERL (0.1 ppt)

Sample Remarks: Sample arrived in plastic bottles. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diffurenzopyr and Cyproconazole.

	I verify that these data are correct.	10	- The -
Report ID: 436021	Kathy Reynolds	Kattam	h Krs
	Water Analysis Unit Supervisor	0	
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er So Exercised (Loid The Post Cours ) Solt Alkalinity, Total (14 d	P Back to Soly IN THE ORIA Write ( (\$)	rt sa Analys StXAL AND be TOTA MDH 022	le Grie QA SA L. NU	p Iden MPLE MBEI	Albed by 9. IN 51 1. Of co	ra Numi Opakan uch ipp	ier Cale 12 COLL	MNS e collected at the top of ea laorganics (Hold Time Paste Sathele Acid Botte Carbon, Dissolved Org	<u>ch associat</u> ) (28 d)	ed column MDH	u bels	w.			
** Se ENTR Fast games (Hold The Past Games Just: Alkalinity, Total (14 d BOD, 5Day-2 <i>L bottle</i> CBOD, 5Day-2 <i>L bottle</i>	Pack to Solution The Control Write to (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)	rt sa Analys StNAL AND he TOTA MDH	le Grie QA SA L. NU	p Iden MPLE MBEI	Albed by 9. IN 51 1. Of co	ra Numi Opakan uch ipp	ier Cale 12 COLL	MNS e collected at the top of ca Inorganics (Hold Time Planc Sublict: And Botte	<u>ch associat</u> ) (28 d)	stuck ed column MDE	u bels	w.			
Intergratics (Hold Tim Parts General Bods Alkalinity, Total (14 d BOD, 5Day-2 <i>L bottle</i> CBOD, 5Day-2 <i>L bottle</i> CBOD, 5Day-2 <i>L Bottle</i> Chloride, Total (28 d)	Pack to Solution The Control Write to (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)	rt sa Analys SENAL AND he TOTA MDH 022 096 083 297	le Grie QA SA L. NU	p Iden MPLE MBEI	Albed by 9. IN 51 1. Of co	ra Numi Opakan uch ipp	ier Cale 12 COLL	e collected at the top of ea Inorganites (Hold Time Pauls Sallute Acid Botts Carbon, Dissolved Org Carbon, Total Org (28 d) COD, Total Nitrogen, Tol	<u>ch associal</u> ) (28 d) )	MDH MDH 099 098 097 064	u bels	w.			
Energanics (Hold Tim Pinit Guard Itali Alkalinity, Total (14 d BOD, 5Day- 2L bottle CBOD, 5Day-2L Bottl Chloride, Total (28 d) Color (48 hr)	r Back to Sole in The only Write ( (48 hr) e-(48 hr)	rt se Analys SEXAL AND he TOTA MIDH 022 096 083 297 012	le Grie QA SA L. NU	p Iden MPLE MBEI	Albed by 9. IN 51 1. Of co	ra Numi Opakan uch ipp	ier Cale 12 COLL	e collected at the top of ea Laorganica (Hold Time Panto Satteric Acid Boale Carbon, Dissolved Org Carbon, Total Org (28 c COD, Total (28 d) Anmonia Nitrogen, Tot Norg, Total (28 d)	ch associat ) (28 d) [) al (28 d)	Internet MID111 # 099 098 097 064 065	u bels	w.			
Intergrander (Hold The Final General Reals Alkalinity, Total (14 d BOD, 5Day- 2L bottle CBOD, 5Day-2L Bottle Chloride, Total (28 d) Color (48 hr) Chlorophyll-a, Lab Filt	r Back to Sole in The only Write ( (48 hr) e-(48 hr)	rt sa Analys SINAL AND be TOTA BIDH U 022 096 083 297 012 452	le Grie QA SA L. NU	p Iden MPLE MBEI	Albed by 9. IN 51 1. Of co	ra Numi Opakan uch ipp	ier Cale 12 COLL	MMS e collected at the tup of ca Isorganites (Hold Time Planic Sathele Acid Botte Carbon, Dissolved Org Carbon, Total Org (24 d) Ammonia Nitrogen, Tota N-Org, Total (28 d) Kjeldahl Nitrogen, Tota	ch associat ) (28 d) ) al (28 d) I (28 d)	Bluck ed column AID38 # 099 098 097 064 065 068	u bels	w.			
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<sup>24</sup> Sec ENTE Facility General Scale Alkalinity, Total (14 BOD, 5Day-2 <i>L</i> , Bottl CBOD, 5Day-2 <i>L</i> , Bottl CBOD, 5Day-2 <i>L</i> , Bottl Chloride, Total (28 d) Color (48 hr) Chlorophyll-a; Lab Fill Conductivity (28 d) Nitrite, Nitrogen Total pit Lub (Irmnediate)	Plack to Sole at The Oath Write ( (48 hr) (48 hr) (48 hr)	rt sa Analys SixAL AND he TOTA MDH 022 096 083 297 012 452 014 067 013	le Grie QA SA L. NU	p Iden MPLE MBEI	Albed by 9. IN 51 1. Of co	ra Numi Opakan uch ipp	ier Cale 12 COLL	Annos e collected at the tup of ca Intergranics (Hold Trimy Plants Statistic Acid Boule Carbon, Dissolved Org Carbon, Total Org (28 d) Ammonia Nitrogen, Tota N-Org, Total (28 d) Kjeldahl Nitrogen, Total NO+NO,-N. Total (28 d)	ch associa ) (28 d) i) al (28 d) i (28 d) d) )	Binch ed column MDH 099 098 098 064 065 064 065 068	n bek	** •	¢ ≯-		
Intergrander (Hold The Finite General Botte Alkalinity, Total (14 d BOD, 5Day- 2L bottle CBOD, 5Day-2L bottle CBOD, 5Day-2L bottle Chlorophyll-a, Lab Fill Conductivity (28 d) Nitrite, Nitrogen Total pH Lub (Immediate) Phos-Total Ortho (48 h	Plack to Sole at The out Write ( (48 hr) (48 hr) (48 hr) (48 hr)	rt sa Analys six AL AND be TOTA MDH 022 096 083 297 012 452 014 057 013 063	le Grie QA SA L. NU	p Iden MPLE MBEI	Albed by 9. IN 51 1. Of co	ra Numi Opakan uch ipp	ier Cale 12 COLL	Annos e collected at the tup of ca Taorganiles (Hold Trans Plants Sathurk Acid Bodie Carbon, Dissolved Org Carbon, Total Org (28 d) COD, Total (28 d) Ammonia Nitrogen, Tota N-Org, Total (28 d) Kjeldah Nitrogen, Tota NO <sub>2</sub> +NO <sub>2</sub> -N. Total (28 Phosphorus, Total (28 d)	ch associa ) (28 d) i) al (28 d) i (28 d) d) )	Back ed column MD3E 099 098 099 098 099 064 065 068 069 059 059 MDE	u bels	w.			
<sup>24</sup> Sec ENTE Facility General Scale Alkalinity, Total (14 BOD, 5Day-2 <i>L</i> , Bottl CBOD, 5Day-2 <i>L</i> , Bottl CBOD, 5Day-2 <i>L</i> , Bottl Chloride, Total (28 d) Color (48 hr) Chlorophyll-a; Lab Fill Conductivity (28 d) Nitrite, Nitrogen Total pit Lub (Irmnediate)	Plack to Sel at THE ORIG Wather (48 hr) (48 hr) (48 hr) (48 hr) (48 hr) (48 hr) (47 hr) (48 hr) (48 hr) (48 hr) (48 hr) (48 hr)	rt sa Analys SixAL AND he TOTA MDH 022 096 083 297 012 452 014 067 013	le Grie QA SA L. NU	p Iden MPLE MBEI	Albed by 9. IN 51 1. Of co	ra Numi Opakan uch ipp	E Colorez Colo	Annes e collected at the top of ca Insergnatics (Hield Time Paule Statistic Acid Boste Carbon, Dissolved Org Carbon, Total Org (28 d) COD, Total (28 d) Ammonia Nitrogen, Tota N-Org, Total (28 d) Kjeldahl Nitrogen, Tota NO <sub>2</sub> +NO <sub>2</sub> -N, Total (28 Phosphorus, Total (28 d) Insergnatics (Hold Time Pauce Starts Boste	ch associa ) (28 d) i) al (28 d) i (28 d) d) )	Back ed column MD3E 099 098 097 064 065 068 069 059 MD5E 8	n bek	** •	¢ ≯-		
<sup>14</sup> Sec ENTE Beargandez (Hold The Pinite General Resite Alkalinity, Total (14 d) BOD, 5Day- 2 <i>L</i> both ChOD, 5Day-2 <i>L</i> both Chorofe, Total (28 d) Color (48 hr) Chlorophyll-ec, Lab Fili Conductivity (28 d) Nitrite, Nitrogen Total pil Lub (Immediate) Phos-Total Ortho (48 h Solids, Susp. Volatile ( Solids, Total Dissolved Solids, Total Susp. (7 d	Plack to Sele at THE outs Write ( (42 hr) - (42 hr) - (48 hr) (48 hr) (48 hr) (48 hr) (48 hr) (47 d) (7 d) (7 d)	rt as Analys RNAL AND he TOTA MIDIE # 022 096 083 297 012 014 067 013 063 004 005 003	le Grie QA SA L. NU	p Iden MPLE MBEI	Albed by 9. IN 51 1. Of co	ra Numi Opakan uch ipp	E Colorez Colo	Annos e collected at the tup of ex- Taerganiles (Hold Trans- Planis Sathele Acid Borte Carbon, Dissolved Org Carbon, Total Org (28 d) Ammonia Nitrogen, Tota N-Org, Total (28 d) Kjeldahl Nitrogen, Total Nj+NOj-N, Total (28 d) Insergnatics (Hold Trans- Planis Startis Botte E. coll-MPN (24 hr)	ch associa ) (28 d) i) al (28 d) i (28 d) d) )	Back ed column MD3E 099 098 099 098 099 064 065 068 069 059 059 MDE	n bek	** •	¢ ≯-		
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U See Back for Analysis Groups, Project Codes and Chain of Custody U mik revised 83/10

Appendix B.1: Chain of custody for PCA water samples submitted to MDA on August 4, 2015.

#### Analysis Group by Program Code

 
 Program ende:
 M1
 Program ende:

 Analysis Groups:
 Analysis Groups:
 Analysis Groups:

 6
 59, 450, 451
 B
 3, 4, 59, 64, 69

 7
 59
 B
 1, 4, 12, 22, 59, 59, 68, 69, 70, 77, 78, 59, 154, 293, 297, 450, 451, 764
 Program ende:
 BZ

 9
 3, 4, 12, 22, 59, 68, 69, 207, 450, 451
 Program ende:
 BZ

 10
 50, 70, 77, 98, 99, 154, 291, 297, 704
 5
 5
 5, 4, 42, 22, 59, 66, 69, 207, 450, 451

 7
 59
 59, 450, 451
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 59
 59
 59
 Program cude: PG Analysis Groups: 1 3, 59 2 64, 68, 69 3 J, 4, 59, 40, 457, 452 4 335

Programs code: PO Analysis Groups: 5 3, 4, 12, 22, 23, 59, 68, 69, 450, 451 6 59, 450, 451 B 3, 59, 64, 69 10 3, 14, 13, 59, 64, 68, 69, 90, 310 11 59, 64, 66, 70, 73, 77, 78

Program code: PZ Analysis Groups 5 - 3, 4, 13, 22, 23, 59, 68, 69, 450, 451 7 - 59

Program codo: QZ Analysis Geospe: 5 3, 4, 12, 22, 23, 59, 68, 69, 450, 451

Program code: RA Analysis Geosps 10 59, 68, 69, 98, 293, 297

Program codes 55 Analysis Groups 7 3, 4, 59, 63, 65 12 239, 293, 297, 694, 696 13 458, 451

Program code: 5Y Atalysis Groups 5 3, 4, 12, 22, 59, 68, 69, 297, 450, 451 6 59, 450, 451 7 59 8 98, 239, 293

Program code: TA Analysis Groups 11 3, 4, 11, 59, 63, 64, 68, 69, 239, 293, 297, 664, 696 12 3, 4, 11, 59, 63, 68, 69

Program code: XJ Analysis Groups: 1 22, 59, 63, 64, 69, 152, 166, 235, 257, 293, 296, 623, 694, 696

Program code: TT Analysis Groups: 1 22, 59, 61, 64, 69, 152, 166, 255, 257, 293, 796, 623, 694, 696

#### **Program Codes**

GN - Crow: North From TMDL	RA - Wetland Biomonitoring	5Z - Low Flow Studies
GO - Buffalo Creek TMDL	RD - Biologically Based Monitoring	TA - Major Watershed Load Monitoring
MI - Sentinal Lakes DNR PCA	RG - Fish Kill Studies	TC - MN Lake Sediment Chem Assess.
PB - Compliance Monitoring	RP - NPS Projects	TJ Phase II Watershed Investigation
PG Minnesota Milestones	RZ - Citizen Lake Monitoring-CLMP	TL - Surface Water from Outstate Lakes
PO WLA / TMDL	SH Mercury Trends	TN - Lake of the Woods Pre-TMDL
PZ Compliance Monitoring	SJ - Ruiny River	TP Gurvin Brook Turb. TMDL
QX NPS Compliance Monitoring	SS - Intensive Watershed Monitoring	TS - Whitewater River Turb. TMDL
OZ - Lake Pepin / Phosphorus Strategy	SY - CW Legacy Lake Assess. Monit.	TQ - Lower Miss. Basin Effect. Monit.

#### \*\*\*Chain of Custody\*\*\*

Dete/Time	Accepted By	/ Affiliation	Dole/Time
8/4/15 9:00	He Mat	8" 15 OND	DIN
84/15 1040	Jan R.M.	50:5	5:30m
b			
	8/4/15 9:00 814/15 1040	Detution 8/4/15 9:00 HE. UI a. T. 8/4/15 1040 Energy A.	8/4/15 900 the Might 814/15 020 8/4/15 1040 Energian States

S./QA Records Env/Projects/Update CoC Form/Current CoC forms/MDH\_Stream\_Lake 3.10

milk revised 03/10

19

	MINNESOTA DEPARTMENT	Date Printed: Date Collected: Top Folder Number: 8/6/2015 7/30/2015 T-PLK101064896	
MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010 Residue Final Report		Inspector Name:     Inspector ID:       Patrick Kelly     WW-01       Customer Contact:     Sample ID:       Patrick Kelly     SDG ID:       15-SDG-3295	
		Project: / Survey: Emergency	
Collected From: Whitewater State Park 19041 Highway 74 Altura MN 55910		Description: Surface water	
		Quantity x Sample Stze: 1 x 1 L Page 1 of 5	
Analysis Requested: GC	, LC		
Analyte	Result	Result Comment	

Acetochior ND at MRL (30 ppt) ND at MRL (30 ppt) Alachlor Atrazine 41.8 ppt Benfluralin ND at MRL (25 ppt) Bifenthrin ND at MRL (20 ppt) ND at MRL (50 ppt) ND at MRL (40 ppt) ND at MRL (15 ppt) Chlorothalonil Chlorpyrifos Clomazone 
 Comazone
 ND at MRL (15 ppt)

 Cyfluthrin
 ND at MRL (100 ppt)

 Deisopropylatrazine
 ND at MRL (150 ppt)

 Desethylatrazine
 69.4 ppt
 Diazinon ND at MRL (30 ppt) 
 Diazinon Oxon
 ND at MRL (75 ppt)

 Dichlobenil
 ND at MRL (5 ppt)

 Dichlorvos
 ND at MRL (15 ppt)

 Dimethenamid
 ND at MRL (15 ppt)

 Dimethoate
 ND at MRL (100 ppt)

 Disulfoton
 ND at MRL (60 ppt)
 ND at MRL (10 ppt) EPTC Esfenvalerate ND at MRL (150 ppt) ND at MRL (50 ppt) Ethalfluralin Ethofumesate ND at MRL (50 ppt) ND at MRL (15 ppt) Fonofos ND at MRL (50 ppt) Malathion ND at MRL (50 ppt) Methoxychlor Metolachior 35.3 ppt MetribuzIn ND at MRL (75 ppt) Metribuzin DA ND at ERL (500 ppt) Sample Remarks:

Sample scanned and negative for Diflufenzopyr and Cyproconazole.

Report ID: 435977	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallang n. Ress			
This report shall not be reproduced except in full, without the written approval from the laboratory. These results are only applicable to the sample(s) listed.					



Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

# **Residue Final Report**

Collected From:

Whitewater State Park 19041 Highway 74 Altura MN 55910

Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Number: T-PLK101064896		
Inspector Nam Patrick Kelly	0:	Inspector ID: W	/W-01	
Customer Con	tact:	Sample ID:	EAR-15-0223	
Patrick Kelly		SDG ID:	15-SDG-3295	
Project: / Surv Emergency	ey:			
Description: Surface water				
Quantity x San 1 x 1 L	nple Size:			hannedd

Page 2 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Metribuzin DADK	ND at ERL (500 ppt)	
Metribuzin DK	ND at ERL (500 ppt)	
Oxadiazon	ND at MRL (75 ppt)	
Parathion-methyl	ND at MRL (100 ppt)	
Pendimethalin	ND at MRL (75 ppt)	
Phorate	ND at MRL (25 ppt)	
Prometon	ND at MRL (100 ppt)	
Propachlor	ND at MRL (30 ppt)	
Propazine	ND at MRL (25 ppt)	
Simazine	ND at MRL (75 ppt)	
Tebupirimiphos	ND at MRL (30 ppt)	
Terbufos	ND at MRL (30 ppt)	
Tolfenpyrad	ND at MRL (100 ppt)	
Triallate	ND at MRL (50 ppt)	
Trifluralin	ND at MRL (50 ppt)	
lambda-Cyhalothrin	ND at MRL (75 ppt)	
zeta-Cypermethrin	ND at MRL (500 ppt)	
2,4,5-T	ND at MRL (50 ppt)	
2,4,5-TP	ND at MRL (50 ppt)	
2,4-D	15.9 ppt	
2,4-DB	ND at MRL (20 ppt)	
Acetochlor ESA	106 ppt	
Acetochlor OXA	ND at MRL (33.3 ppt)	
Alachlor ESA	187 ppt	
Alachlor OXA	ND at MRL (33.3 ppt)	
Bentazon	46.2 ppt	
Bromoxynii	ND at MRL (25 ppt)	
Clopyralid	ND at MRL (41.6 ppt)	
Sample Remarks:		
0	the for Differences and Opportunity and	

Sample scanned and negative for Diffufenzopyr and Cyproconazole.

	Report ID: 435977	I verify that these data are correc Kathy Reynolds Water Analysis Unit Supervisor	Kallang In RESS			
,	This most shall not be reproduced event in full without the written approval from the laboratory. These results are aply applicable to the sample(s) listed					



MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

#### **Residue Final Report**

Collected From:

Whitewater State Park 19041 Highway 74 Altura MN 55910

Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Number: T-PLK101064896		
Inspector Nam Patrick Kelly	.9:	Inspector ID: WW-01		
Customer Con	tact:	Sample ID: EAR-15-0223		
Patrick Kelly		SDG ID: 15-SDG-3295		
Project: / Surv	ey:			
Emergency				
Description: Surface water				

1x1L

Page 3 of 5

#### Analysis Requested: GC, LC

Analyte Result **Result Comment** ND at MRL (50 ppt) Dicamba ND at MRL (50 ppt) Dichlorprop Dimethenamid ESA 70.0 ppt Dimethenamid OXA 11.6 ppt Flufenacet OXA ND at MRL (8.3 ppt) Isoxaflutole DKN ND at MRL (50 ppt) MCPA ND at MRL (5 ppt) MCPB ND at MRL (20 ppt) MCPP ND at MRL (50 ppt) ND at MRL (50 ppt) Mesotrione Metolachlor ESA 990 ppt Metolachlor OXA 136 ppt Picloram ND at MRL (41.6 ppt) Propachlor ESA ND at MRL (30 ppt) Propachlor OXA ND at MRL (10 ppt) Sedaxane ND at MRL (75 ppt) Tembotrione ND at MRL (50 ppt) Triclopyr ND at MRL (50 ppt) ND at MRL (25 ppt) Acetamiprid Aldicarb Sulfone ND at MRL (15 ppt) Aldicarb Sulfoxide ND at MRL (50 ppt) ND at MRL (10 ppt) Azoxystrobin Bensulfuron-methyl ND at MRL (16.7 ppt) ND at MRL (250 ppt) Bensulide Boscalid ND at MRL (50 ppt) Bromacil ND at MRL (30 ppt) ND at MRL (25 ppt) Carbaryl ND at MRL (10 ppt) Carbendazim

#### Sample Remarks:

Sample scanned and negative for Diflufenzopyr and Cyproconazole.

Report ID: 435977	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallang Zu Plants			
This was aball not be unundread accept in full without the written approval from the inheritary. These require an only applicable to the complete (a) listed					

MINNESOTA DEPARTMENT	Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Nu	mber: 101064896	
MINNESOTA DEPARTMENT OF AGRICULTURE		Inspector Name:		Inspector ID: WW-01	
Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010	Patrick Kelly Project: / Surv	Customer Contact: Patrick Kelly Project: / Survey:		EAR-15-0223 15-SDG-3295	
Residue Final Report	Emergency				
Collected From: Whitewater State Park 19041 Highway 74	Description: Surface water Quantity x Sample Size: 1 x 1 L				
Altura MN 55910					
				Page 4 of 5	

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Carbofuran	ND at MRL (13.3 ppt)	
Chlorantraniliprole	ND at MRL (50 ppt)	
Chlorimuron-ethyl	ND at MRL (20 ppt)	
Chlorpyrifes Oxon	ND at MRL (40 ppt)	, ,
Clothianidin	ND at MRL (25 ppt)	
Cyanazine	ND at MRL (25 ppt)	
Cyantraniliprole	ND at MRL (100 ppt)	
DEDI Atrazine	ND at MRL (50 ppt)	
Dicrotophos	ND at MRL (25 ppt)	· · · · · · · · · · · · · · · · · · ·
Difenoconazole	ND at MRL (25 ppt)	
Dinotefuran	ND at MRL (25 ppt)	
Disulfoton Sulfone	ND at MRL (20 ppt)	
Diuron	ND at MRL (13.3 ppt)	
Flumetsulam	ND at MRL (50 ppt)	
Flutriafol	ND at MRL (10 ppt)	
lalosulfuron-methyl	ND at MRL (30 ppt)	
lexazinone	ND at MRL (10 ppt)	
lydroxyatrazine	28.8 ppt	
mazamethabenz Acid	ND at MRL (10 ppt)	
mazamethabenz-methyl	ND at MRL (5 ppt)	
mazamox	ND at MRL (13.3 ppt)	
mazapic	ND at MRL (10 ppt)	
mazapyr	ND at MRL (8.3 ppt)	
mazaquin	ND at MRL (16.7 ppt)	
mazethapyr	7.19 ppt	
midacloprid	ND at MRL (20 ppt)	
soxaflutole	ND at MRL (40 ppt)	
inuron	ND at MRL (20 ppt)	

# Sample Remarks:

Sample scanned and negative for Diflufenzopyr and Cyproconazole.

Report ID: 435977	l verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kalay n. PErs		
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176

	5×.		Date Printed:	Date Collected:	Top Folder Numb	
	MINNESOTA DEPARTMENT		8/6/2015	7/30/2015	T-PLK101	
of AGRICULTURE			Inspector Name:		Inspector ID:	
MINNESOTA DEF	ARTMENT OF AGRICULTURE		Patrick Kelly		WW-	01
	tory Analysis Report		Customer Con	tact:	Sample ID: EA	R-15-0223
	obert Street North		Patrick Kelly		SDG ID: 15	-SDG-3295
	Minnesota 55155-2531 651) 201-6010		Project: / Surve	ey:		
			Emergency			
	lue Final Report					
Collected From: Whitewater State Park 19041 Highway 74			Description: Surface water			
Altura MN 55910	19041 Highway 74 Altura MN 55910		Quantity x San 1 x 1 L	nple Size:		
						Page 5 of 5
nalysis Requested: GC, Li	C					
Analyte	Result	Re	sult Comment			
etalaxyl	ND at MRL (8.3 ppt)					

Metalaxyl	ND at MRL (8.3 ppt)	
Metsulfuron-methyl	ND at MRL (23.3 ppt)	
Myclobutanil	ND at MRL (10 ppt)	
Nicosulfuron	ND at MRL (26.6 ppt)	
Norflurazon	ND at MRL (20 ppt)	
Nonlurazon-desmethyl	ND at MRL (50 ppt)	
Oxydemeton-methyl	ND at MRL (20 ppt)	
Parathion-methyl Oxon	ND at MRL (25 ppt)	
Picoxystrobin	ND at MRL (50 ppt)	
Prometryn	ND at MRL (3.3 ppt)	
Propiconazole	ND at MRL (10 ppt)	
Pyraclostrobin	ND at MRL (25 ppt)	
Pyroxasulfone	ND at MRL (50 ppt)	
Saflufenacil	20.8 ppt	
Siduron	ND at MRL (6.7 ppt)	
Sulforneturon-methyl	ND at MRL (8.3 ppt)	
Tebuconazole	ND at MRL (10 ppt)	
Tetraconazole	ND at MRL (10 ppt)	
Thiacloprid	ND at MRL (50 ppt)	
Thiamethoxam	ND at MRL (25 ppt)	
Thifensulfuron-methyl	ND at MRL (16.7 ppt)	
Thiobencarb	ND at MRL (8.3 ppt)	
Triasulfuron	ND at MRL (23.3 ppt)	
Fluxapyroxad	3.80 ppt	ERL (0.1 ppt)

Sample Remarks:

Sample scanned and negative for Diflufenzopyr and Cyproconazole.

 
 Report ID: 435977
 I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor
 Kathy 7 m Plants

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SAMPLE COND/TEMP:	X MANURE	RECEIVED FROM	RECEIVED FROM	RECEIVED FROM	INSPECTOR COMMENTS	and a set	1	- WO-WW	WW-071	WW - 0 X []	10-000	INSPECTOR 5 LA SAMPLE ID	(ADDRESS	A OW	Matrick, Keing @	Alling Address & City	SITE NAME (OWNER/OPERATOR)	INSPECTOR OF THE	D PFMD FIELD PROJECT:	History of Residue Sample Form - Analysis	Pesticide and Fertilize	
		SENT VIA	SENT VIA	SENT VIA	1 = white water	Contocologia to the Lucy	and a function of the second se		Sold and a second secon		12293 12 115	LAB USE ONLY SAMPLED	RANGE, SEC; )	An example a second as the second as the second as the second as	State, m. un		SHE Park	E L	1: Omisuse Ouse Oother	due Sample Fo	Pesticide and Fertilizer Management, Ph: 651-201-6121	
		RECEIVED BY	RECEIVED BY	RECEIVED BY	. Riv	Lup Mont		4.0		1000 mary	545	SAMPLED	4, 1/4 OR LEGAL DESCRIPTION)		SEND RESULTS VIA EMAILS	STATE Z	re An an		ġ.	rm - Analy	51-201-6121	
	<u> </u>	ED BY	ED BY	Julice (	8 ·						unface was	SAMPLE	CRIPTION)			G				/sis Request a		
	TIME RECEIVED	DATE	DATE	ALC DATE 07-3/-/5							aton www Rives	SAMPLE TYPE/DESCRIPTION	DELIVERY METHOD: HAND DELIVERED US MAIL OTHER	PFMD CONTACT PATTA 2	1010 33	DER # DUV TO 10	PRIORITY: D P1 AP2 D P3	PROJECT: D ASSESSMENT D COMP		Request and Chain of Custody		
	STORAGE LOCATION	TIME	TIME	TIME		≺ Z	≺ Z	≺ &	-≺ Z)	≺ &	X X	HIGH CONC?	IVERED COA	1611	742	64896	<b>D</b> P4	CEHENSIVE		ody		
	TSS CC-PS			0837	- - -							ANALYSIS REQUESTED	COMMERCIAL CARRIER	L.	SDC NUMBER (LAB USE ONLY)	or management of the second	P5-Hold	EMERCENCY	11110000000000000000000000000000000000			
	1 coler	N	And and a second s	Non-America (Second Second				and the second sec	economic assemu TI asse		e te te	NUMBER/TYPE OF CONTAINERS/SIZE			(LAB USE ONLY)	****					M.S. § 18D.201	

## Instructions for Completing "History of Residue Sample Form"

HEADING 1.

> Inspector Name - Person obtaining sample(s). Site Name (owner/operator) - Name of the site where sample(s) was collected. Mailing Address - Mailing address of the involved facility or site of incident. Sample Location - Address, County; Twp; Range; Sec; ¼, ¼ or Legal Description. Bill to - Include responsible party name if anaylzed by private laboratory. Program - Inspections Unit or Incident Response Unit. Project - Sub-classification of program. Other - List survey name if one is assigned. SDG Number - (LABORATORY USE ONLY) Number assigned by Laboratory upon receipt. Top Folder # and Inspection # - CIS Top Folder and Inspection Number. Contact Unit - The person at 625 Robert St. N. who receives Laboratory results. Delivery Method - How was sample(s) sent to Laboratory.

#### PRIORITY AND CLASSIFICATION 2.

Priority - Check the box associated with the desired priority.

P1 Emergency ... (ONLY WITH DIVISION PRIOR APPROVAL) Immediate threat to human or animal health. Immediate environmental threat.

P2 Rush ...... Samples requiring shorter turn-around time.

- P3 Routine . . . . . Planned and/or scheduled samples related to ongoing programs and investigations.
- P4 Research . . . . . Samples which require method development or those for which the Laboratory does not have immediate capability.
- P5 Hold ..... Samples to be held for a time predetermined by PFMD.

#### SAMPLE INFORMATION 3.

Inspector Sample # - Number assigned by collector at time of sampling. Laboratory # - (LABORATORY USE ONLY) Number assigned by Laboratory upon receipt.

Date Sampled - Date sample secured by collector.

Time Sampled - Time sample secured by collector.

Sample Type/Description - Brief description of sampled material.

High Concentration - Circle Y if suspected high concentration or N if low concentration.

Rinseate	Tank Mix
Sediment	Vegetation
Soil	Other
Swab	
Mater Confere DivertStreen Contract to be Tile Davis Miss	devel Othern Michael

Water, Surface - River/Stream, Spring, Lake, Tile Drain, Wetland, Other Water

Water, Ground - Domestic Well, Monitoring Well, Municipal Well, Facility Well – Drinking, Facility Well – Commercial, Remediation Well, Commercial/Industrial Well, Temporary Well, Other Water

Water, Precipitation - Water/Liquid, Solid Phase Extract

Analysis Requested - Mark the desired analyses for the samples.

A1	MDA LIST 1	A5	MDA LIST 2 FULL SCREEN
A2	MDA LIST 2	A6	SULFONYLUREAS
A3	MDA LIST 3	A7	IMIDOZOLINONES
A4	MDA LIST 1 FULL SCREEN	A8	OTHER: SPECIFY

Number/Type/Size of Containers - The number, type and size of physical containers that constitute one sample. Inspector Comments - Brief description of why samples were taken and/or details of suspected chemicals involved, and if sample preserved.

#### 4. FIELD CHAIN OF CUSTODY

Record all transfers of sample(s) noting date, time and method of transfer.

#### 5. LABORATORY DATA (LABORATORY USE ONLY)

Receiver's Signature - Signature of person in Laboratory receiving sample. Date Received - Date of sample receipt at Laboratory. Time Received - Time that samples were received at Laboratory. Storage - Location stored upon receipt at Laboratory. Lab Comments - Observations on sample condition at time of receipt. Note sample temperature.

AG-01100 page 2

MINNESOTA DEPARTMENT OF AGRICULTURE	Date Printed: Date Collected: 8/6/2015 7/30/2015 Inspector Name: Heidi Bantala	Top Folder Number:				
MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010	Customer Contact: Project: / Survey:	4 Sample ID: EAR-15-0230 SDG ID: 15-SDG-3310				
Residue Final Report	Surface Water					
Collected From:	Description: N/A					
	Quantity x Sample Size: 1 x 1 L					
		Page 1 of 5				

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Acetochlor	ND at MRL (30 ppt)	
Alachlor	ND at MRL (30 ppt)	
Atrazine	41.2 ppt	
Senfluralin	ND at MRL (25 ppt)	
Bifenthrin	ND at MRL (20 ppt)	
Chlorothalonil	ND at MRL (50 ppt)	
Chlorpyrifos	ND at MRL (40 ppt)	
Clomazone	ND at MRL (15 ppt)	
Cyfluthrin	ND at MRL (100 ppt)	
Deisopropylatrazine	ND at MRL (150 ppt)	
Desethylatrazine	77.8 ppt	
Diazinon	ND at MRL (30 ppt)	
Jiazinon Oxon	ND at MRL (75 ppt)	
)ichlobenil	ND at MRL (5 ppt)	
Dichlorvos	ND at MRL (15 ppt)	
Dimethenamid	ND at MRL (15 ppt)	
Dimethoate	ND at MRL (100 ppt)	
Disulfoton	ND at MRL (60 ppt)	
PTC	ND at MRL (10 ppt)	
Esfenvalerate	ND at MRL (150 ppt)	
thalfluralin	ND at MRL (50 ppt)	
thofumesate	ND at MRL (50 ppt)	
onofos	ND at MRL (15 ppt)	
Alathion	ND at MRL (50 ppt)	
<b>Nethoxychlor</b>	ND at MRL (50 ppt)	
fetolachlor	ND at MRL (25 ppt)	
letribuzin	ND at MRL (75 ppt)	
fetribuzin DA	ND at ERL (500 ppt)	
Sample Remarks:		
	ttle. Lab used 500mLs for MDA GC and 30	00mLs for MDA LC. Sample scanned and negative for Diflufenzopyr and Cyproconazole

 Report ID: 436025	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kalay n. P. S.	
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_	MINNESOTA DEPARTMENT	Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Number:	
	OF AGRICULTURE	Inspector Nam		Inspector ID:	
MINNESOTA	DEPARTMENT OF AGRICULTURE	Heidi Rantala		4	
6	boratory Analysis Report 01 Robert Street North	Customer Con	Customer Contact:		
Saint	Paul, Minnesota 55155-2531	Project: / Surv	өу:	5	
_	(651) 201-6010	Surface Wate	ər		
	esidue Final Report	_			
Collected From:		Description: N/A			
		Quantity x San 1 x 1 L	nple Size:		
	20.10		· · · · · · ·	Page 2 of	
2	GC, LC				
Analyte	Result	Result Comment			
Metribuzin DADK	ND at ERL (500 ppt)				
Metribuzin DK	ND at ERL (500 ppt)				
Oxadiazon	ND at MRL (75 ppt)				
Parathion-methyl	ND at MRL (100 ppt)				
Pendimethalin	ND at MRL (75 ppt)				
DI					

Analyte	Result	Result Comment
Metribuzin DADK	ND at ERL (500 ppt)	
Metribuzin DK	ND at ERL (500 ppt)	
Oxadiazon	ND at MRL (75 ppt)	
Parathion-methyl	ND at MRL (100 ppt)	
Pendimethalin	ND at MRL (75 ppt)	
Phorate	ND at MRL (25 ppt)	
Prometon	ND at MRL (100 ppt)	
Propachlor	ND at MRL (30 ppt)	
Propazine	ND at MRL (25 ppt)	
Simazine	ND at MRL (75 ppt)	
Tebupirimiphos	ND at MRL (30 ppt)	
Terbufos	ND at MRL (30 ppt)	
Tolfenpyrad	ND at MRL (100 ppt)	
Triallate	ND at MRL (50 ppt)	
Trifluralin	ND at MRI (50 ppt)	
lambda-Cyhalothrin	ND at MRL (75 ppt)	
zeta-Cypermethrin	ND at MRL (500 ppt)	
2,4,5-T	ND at MRL (50 ppt)	
2,4,5-TP	ND at MRL (50 ppt)	
2,4-D	19.0 ppt	
2,4-DB	ND at MRL (20 ppt)	
Acetochlor ESA	142 ppt	
Acetochlor OXA	ND at MRL (33.3 ppt)	
Alachlor ESA	175 ppt	
Alachlor OXA	ND at MRL (33.3 ppt)	
Bentazon	62.2 ppt	
Bromoxynil	ND at MRL (25 ppt)	
Clopyralid	ND at MRL (41.6 ppt)	
Sample Remarks:		

Sample Remarks: Sample arrived in plastic bottle. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflutenzopyr and Cyproconazole.

	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallang no BERS
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	MINNESOTA DEPARTMENT	Date Printed: Date Colle 8/6/2015 7/30/20	
	OF AGRICULTURE	8/6/2015 7/30/20	Inspector ID:
MINNESOTA DEPARTMENT OF AGRI Laboratory Analysis Report 601 Robert Street North		1 *	4
		Customer Contact:	Sample ID: EAR-15-0230
			SDG ID: 15-SDG-3310
Saint Paul, Minnesota 55155-		Project: / Survey:	
(651) 201-6010		Surface Water	
	Residue Final Report		
Collected From:		Description: N/A	
		Quantity x Sample Size: 1 x 1 L	
,			Page 3 of 5
Analysis Requested:	GC, LC		•
Analyte	Result	Result Comment	
Dicamba	ND at MRL (50 ppt)		
Dichlorprop	ND at MRL (50 ppt)		
Dimethenamid ESA	72.6 ppt		
Dimethenamid OXA	13.4 ppt		
Flufenacet OXA	ND at MRL (8.3 ppt)		
soxaflutole DKN	ND at MRL (50 ppt)		
WCPA	ND at MRL (5 ppt)		
VCPB	ND at MRL (20 ppt)		
VCPP	ND at MRL (50 ppt)		
Viesotrione	ND at MRL (50 ppt)		
Vetolachlor ESA	828 ppt		
Vetolachior OXA	132 ppt		
Picloram	ND at MRL (41.6 ppt)		
Propachlor ESA	ND at MRL (30 ppt)		
Propachlor OXA	ND at MRL (10 ppt)		
Sedaxane	ND at MRL (75 ppt)		
Tembotrione	ND at MRL (50 ppt)		
Friclopyr	ND at MRL (50 ppt)		
Acetamiprid	ND at MRL (25 ppt)		
Idicarb Sulfone	ND at MRL (15 ppt)		
Aldicarb Sulfoxide	ND at MRL (50 ppt)		
Azoxystrobin	ND at MRL (10 ppt)		
Bensulfuron-methyl	ND at MRL (16.7 ppt)		
Bensulide	ND at MRL (250 ppt)		
Boscalid	ND at MRL (50 ppt)		
Bromacil	ND at MRL (30 ppt)	1	
Carbaryl	ND at MRL (25 ppt)		
Carbendazim	ND at MRL (10 ppt)		
Sample Remarks:			
	ttle. Lab used 500mLs for MDA GC and	300mLs for MDA LC. Sample scanned and neg	ative for Diflufenzopyr and Cyproconazol
	live	fy that these data are correct.	
Report	ID: 436025 Kat	Reynolds K	Any n. Ress
	Wat	r Analysis Unit Supervisor	0

MINNESOTA DEPARTMENT OF AGRICULTURE
<b>IINNESOTA DEPARTMENT OF AGRICULTURE</b>
Laboratory Analysis Report
601 Robert Street North
Saint Paul, Minnesota 55155-2531
(651) 201-6010

**Residue Final Report** 

 Date Printed:
 Date Collected:
 Top Folder Number:

 8/6/2015
 7/30/2015
 Inspector ID:

 Inspector Name:
 Inspector ID:

 Heidi Rantala
 4

 Customer Contact:
 Sample ID: EAR-15-0230

 SDG ID: 15-SDG-3310

 Project: / Survey:

 Surface Water

 Description:

 N/A

 Quantity x Sample Size:

 1 x 1 L

Collected From:

N

Page 4 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Carbofuran	ND at MRL (13.3 ppt)	
Chlorantraniliprole	ND at MRL (50 ppt)	
Chlorimuron-ethyl	ND at MRL (20 ppt)	
Chlorpyrifos Oxon	ND at MRL (40 ppt)	
Dothianidin	ND at MRL (25 ppt)	
yanazine	ND at MRL (25 ppt)	
yantraniliprole	ND at MRL (100 ppt)	
EDI Atrazine	ND at MRL (50 ppt)	*
licrotophos	ND at MRL (25 ppt)	
)ifenoconazole	ND at MRL (25 ppt)	
linotefuran	ND at MRI. (25 ppt)	
isuifoton Sulfone	ND at MRL (20 ppt)	
liuron	ND at MRL (13.3 ppt)	
lumetsulam	ND at MRL (50 ppt)	
lutriafol	ND at MRL (10 ppt)	
alosulfuron-methyl	ND at MRL (30 ppt)	
lexazinone	ND at MRL (10 ppt)	
lydroxyatrazine	28.5 ppt	
nazamethabenz Acid	ND at MRL (10 ppt)	
nazamethabenz-methyl	ND at MRL (5 ppt)	
hazamox	ND at MRL (13.3 ppt)	
nazapic	ND at MRL (10 ppt)	
nazapyr	ND at MRL (8.3 ppt)	
nazaquin	ND at MRL (16.7 ppt)	
nazethapyr	8.15 ppt	
nidacloprid	ND at MRL (20 ppt)	
oxaflutole	ND at MRL (40 ppt)	
inuron	ND at MRL (20 ppt)	

Sample arrived in plastic bottle. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

Report ID: 436025	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallang m. Ross
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MINNESOTA DEPARTMENT
<b>MINNESOTA DEPARTMENT OF AGRICULTURE</b>
Laboratory Analysis Report
601 Bobert Street North

Saint Paul, Minnesota 55155-2531 (651) 201-6010

**Residue Final Report** 

Collected From:

Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Nu	mber:
Inspector Nam	8:	Inspector ID:	
Heidi Rantala			4
Customer Cont	act:	Sample ID:	EAR-15-0230
		SDG ID:	15-SDG-3310
Project: / Surve	ey:		
Surface Wate	r'		
Description: N/A			***************************************
Quantity x Sam	ple Size:	71	99999500-662

Page 5 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment	
Metalaxyl	ND at MRL (8.3 ppt)		
Metsulfuron-methyl	ND at MRL (23.3 ppt)		
Myclobutanil	ND at MRL (10 ppt)		
Nicosulfuron	ND at MRL (26.6 ppt)		
Vorfiurazon	ND at MRL (20 ppt)		
orflurazon-desmethyl	ND at MRL (50 ppt)		
Dxydemeton-methyl	ND at MRL (20 ppt)		
Parathlon-methyl Oxon	ND at MRL (25 ppt)		
Picoxystrobin	ND at MRL (50 ppt)		
rometryn	ND at MRL (3.3 ppt)		
Propiconazole	ND at MRL (10 ppt)		
<sup>&gt;</sup> yraclostrobin	ND at MRL (25 ppt)		
Pyroxasulfone	ND at MRL (50 ppt)		
Saflufenacii	22.6 ppt		
Siduron	ND at MRL (6.7 ppt)		
Sulfometuron-methyl	ND at MRL (8.3 ppt)		
ebuconazole	ND at MRL (10 ppt)		
etraconazole	ND at MRL (10 ppt)		
hiacloprid	ND at MRL (50 ppt)		
hiamethoxam	ND at MRL (25 ppt)		
hifensulfuron-methyl	ND at MRL (16.7 ppt)		
hiobencarb	ND at MRL (8.3 ppt)		
rlasulfuron	ND at MRL (23.3 ppt)		
Fluxapyroxad	9.08 ppt	ERL (0.1 ppt)	

Sample Remarks:

Sample arrived in plastic bottle. Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diffufenzopyr and Cyproconazole.

Report ID: 436025	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallang n. Ress
This report shall not be reproduced except in full, without the w	ritten approval from the laboratory. Th	tese results are only applicable to the sample(s) listed.

	River, near Altura, MN			ICR/Case No:	
Evidence/Pro Seized by:	David Susa	gitroyl	LeTeune	Date & Time of Seizure: 7/3	20/15 10:00 a.m.
Source of Evidence/Pro (Person and/o Location)	or Seized fro Received Found at:	from: Wat	er sample earn of	CORDIIZ Snow	op 200 yds mobile crossing:
			LIST OF EVID	ENCE	
Item No.	Quantity	Description of E	Evidence/Property (I	nclude sample numbers and m	odel or serial numbers)
1		Bacterial sample,	250-ml plastic bottle, p	reserved	
2		Pesticide sample,	1-L amber glass bottle		
3			500-ml plastic bottle, p		0
0230 4	1	General chemistry	y sample, 2-L plastic be	ottle, SB WAIKWate	River near Crystal
0231 5	1		I-L A	mber glass furt	River near Crystal
			ne	or Crystal Springs	Hatchey 1400
	Field Tests:			Map:	
		рН	~ ~ ,		
		DO (ppm)			
		Chlorine			
		(ppm)			
		L	ABORATORY S	ERVICES	
Analyses Re	quested:				
N	IDA GC	and r	1DA LC		
Comments:					
Sommer					
Case Officer	Name and Phone	Number:			
Marilyn Danks,	MNDNR, Saint Paul 65	1-259-5087			
	<u></u>		CHAIN OF CUS		
Item No.	Released By		Delivery Via: (USPS person, other)	Received By	Date/Time
4:5	Jody Terroll	8/4/15/7:300.1		stid Det 1	A126 4 205 173
10		8/4/15 1030	In person	Child Rule	0141 5 173
4rs	Lever TI	0410 11:50			

MINNESOTA DEPARTMENT or AGRICULTURE
<b>MINNESOTA DEPARTMENT OF AGRICULTURE</b>
Laboratory Analysis Report
601 Robert Street North
Saint Paul, Minnesota 55155-2531
(651) 201-6010

**Residue Final Report** 

Collected From:

Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Nu	mber:
Inspector Nam		Inspector ID:	
Heidi Rantala			5
Customer Con	tact:	Sample ID:	EAR-15-0231
		SDG ID:	15-SDG-3310
Project: / Surv	ey:		
Surface Wate	er		
Description: N/A			
Quantity x San 1 x 1 L	nple Size:		

Page 1 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Acetochlor	ND at MRL (30 ppt)	
Alachlor	ND at MRL (30 ppt)	
Atrazine	42.9 ppt	
Benfluralin	ND at MRL (25 ppt)	
Bifenthrin	ND at MRL (20 ppt)	
Chlorothalonil	ND at MRL (50 ppt)	
Chlorpyrifos	ND at MRL (40 ppt)	
Clomazone	ND at MRL (15 ppt)	
Cyfluthrin	ND at MRL (100 ppt)	
Deisopropylatrazine	ND at MRL (150 ppt)	1
Desethylatrazine	78.2 ppt	
Diazinon	ND at MRL (30 ppt)	
Diazinon Oxon	ND at MRL (75 ppt)	
Dichlobenil	ND at MRL (5 ppt)	
Dichlorvos	ND at MRL (15 ppt)	
Dimethenamid	ND at MRL (15 ppt)	
Dimethoate	ND at MRL (100 ppt)	
Disulfoton	ND at MRL (60 ppt)	
EPTC	ND at MRL (10 ppt)	
Esfenvalerate	ND at MRL (150 ppt)	
Ethalfluralin	ND at MRL (50 ppt)	
Ethofumesate	ND at MRL (50 ppt)	
Fonofos	ND at MRL (15 ppt)	
Aatathion	ND at MRL (50 ppt)	
lethoxychlor	ND at MRL (50 ppt)	
Metolachlor	30.3 ppt	
Aetribuzin	ND at MRL (75 ppt)	
Vetribuzin DA	ND at ERL (500 ppt)	
Sample Remarks:		

Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

Report ID: 436026	l verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kathay In Polis	
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Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

**Residue Final Report** 

Collected From:

Date Printed: Date Collected 8/6/2015 7/30/2015	: Top Folder Number:
Inspector Name:	Inspector ID:
Heidi Rantala	5
Customer Contact:	Sample ID: EAR-15-0231
	SDG ID: 15-SDG-3310
Project: / Survey:	· · · · · · · · · · · · · · · · · · ·
Surface Water	
	······································
Description: N/A	
1.40.6.1	
Quantity x Sample Size: 1 x 1 L	20

Page 2 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Vetribuzin DADK	ND at ERL (500 ppt)	
Vetribuzin DK	ND at ERL (500 ppt)	
Oxadiazon	ND at MRL (75 ppt)	
<sup>o</sup> arathion-methyl	ND at MRL (100 ppt)	
Pendimethalin	ND at MRL (75 ppt)	
horate	ND at MRL (25 ppt)	
rometon	ND at MRL (100 ppt)	
ropachlor	ND at MRL (30 ppt)	
ropazine	ND at MRL (25 ppt)	
limazine	ND at MRI. (75 ppt)	
obupirimiphos	ND at MRL (30 ppt)	
erbutos	ND at MRL (30 ppt)	
olfenpyrad	ND at MRL (100 ppt)	
riallate	ND at MRL (50 ppt)	
rifluralin	ND at MRL (50 ppt)	
umbda-Cyhalothrin	ND at MRL (75 ppt)	
eta-Cypermethrin	ND at MRL (500 ppt)	
,4,5-T	ND at MRL (50 ppt)	
4,5-TP	ND at MRL (50 ppt)	
4-D	12.2 ppt	
,4-DB	ND at MRL (20 ppt)	
cetochlor ESA	74.1 ppt	
cetochlor OXA	ND at MRL (33.3 ppt)	
lachlor ESA	200 ppt	
lachlor OXA	ND at MRL (33.3 ppt)	
entazon	50.5 ppt	
romoxynil	ND at MRL (25 ppt)	
lopyralid	ND at MRL (41.6 ppt)	

Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

	Report ID: 436026	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallay In RES
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Laboratory Analysis Report
601 Robert Street North
Saint Paul, Minnesota 55155-2531
(651) 201-6010
<b>Residue Final Report</b>

7/30/2015	Top Folder Number:	
e:	Inspector ID:	
		5
tact:	Sample ID:	EAR-15-0231
	SDG ID:	15-SDG-3310
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	SB (50,000,000,000,000,000,000,000,000,000,	
ple Size:		
	e: tact: ey: er nple Size:	tact: Sample ID: SDG ID: 99:

Page 3 of 5

Analysis Requested: GC, LC

Collected From:

Analyte	Result	Result Comment	
Dicamba	ND at MRL (50 ppt)		
Dichlorprop	ND at MRL (50 ppt)		
Dimethenamid ESA	75.9 ppt		
Dimethenamid OXA	12.9 ppt		
Flufenacet OXA	ND at MRL (8.3 ppt)		
soxaflutole DKN	ND at MRL (50 ppt)		
//CPA	ND at MRL (5 ppt)		
/CPB	ND at MRL (20 ppt)		
/CPP	ND at MRL (50 ppt)		
lesotrione	ND at MRL (50 ppt)		
letolachlor ESA	904 ppt		
letolachlor OXA	155 ppt		
Picloram	ND at MRL (41.6 ppt)		
ropachlor ESA	ND at MRL (30 ppt)		
Propachlor OXA	ND at MRL (10 ppt)		
ledaxane	ND at MRL (75 ppt)		
embotrione	ND at MRL (50 ppt)		
riclopyr	ND at MRL (50 ppt)		
cetamiprid	ND at MRL (25 ppt)		
Idicarb Sulfone	ND at MRL (15 ppt)		
ldicarb Sulfoxide	ND at MRL (50 ppt)		
zoxystrobin	ND at MRL (10 ppt)		
ensulfuron-methyl	ND at MRL (16.7 ppt)		
lensulide	ND at MRL (250 ppt)		
oscalid	ND at MRL (50 ppt)		
romacil	ND at MRL (30 ppt)		
Carbaryl	ND at MRL (25 ppt)		
Carbendazim	ND at MRL (10 ppt)		
ample Remarks:			

Sample Remarks: Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diffufenzopyr and Cyproconazole.

	I verify that these data are correct.	de - nem	
Report ID: 436026	Kathy Reynolds	Kathan han REES	
	Water Analysis Unit Supervisor		
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Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

**Residue Final Report** 

Collected From:

ed: Top Folder Number:
Inspector ID:
5
Sample ID: EAR-15-0231
SDG ID: 15-SDG-3310

Quantity x Sample Size: 1 x 1 L

Page 4 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment
Carbofuran	ND at MRL (13.3 ppt)	
Chlorantraniliprole	ND at MRL (50 ppt)	
Chlorimuron-ethyl	ND at MRL (20 ppt)	
Chlorpyrifos Oxon	ND at MRL (40 ppt)	
Clothlanidin	ND at MRL (25 ppt)	
Cyanazine	ND at MRL (25 ppt)	
Cyantraniliprole	ND at MRL (100 ppt)	
DEDI Atrazine	ND at MRL (50 ppt)	
Dicrotophos	ND at MRL (25 ppt)	
Difenoconazole	ND at MRL (25 ppt)	
Dinotefuran	ND at MRL (25 ppt)	
Disulfoton Sulfone	ND at MRL (20 ppt)	
Diuron	ND at MRL (13.3 ppt)	
Flumetsulam	ND at MRL (50 ppt)	
Flutriafol	ND at MRL (10 ppt)	
Halosulfuron-methyl	ND at MRL (30 ppt)	
lexazinone	ND at MRL (10 ppt)	
-tydroxyatrazine	28.6 ppt	
mazamethabenz Acid	ND at MRL (10 ppt)	
mazamethabenz-methyl	ND at MRL (5 ppt)	
mazamox	ND at MRL (13.3 ppt)	
mazapic	ND at MRL (10 ppt)	
mazapyr	ND at MRL (8.3 ppt)	
mazaquin	ND at MRL (16.7 ppt)	
mazethapyr	7.21 ppt	
midacloprid	ND at MRI. (20 ppt)	
soxaflutole	ND at MRL (40 ppt)	
.inuron	ND at MRL (20 ppt)	

Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diffurenzopyr and Cyproconazole.

	Report ID: 436026	I verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kallang no Ports					
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**Residue Final Report** 

Collected From:

Date Printed: 8/6/2015	Date Collected: 7/30/2015	Top Folder Nu	mber:
Inspector Nam	6:	Inspector ID:	
Heidi Rantala			5
Customer Con	tact:	Sample ID:	EAR-15-0231
		SDG ID:	15-SDG-3310
Project: / Surv	ey:		
Surface Wate	ər'		
Description: N/A			
<u></u>			
Quantity x San	pie Size:		

Page 5 of 5

Analysis Requested: GC, LC

Analyte	Result	Result Comment	
Metalaxyl	ND at MRL (8.3 ppt)		
Metsulfuron-methyl	ND at MRL (23.3 ppt)		
Myclobutanil	ND at MRL (10 ppt)		
Nicosulfuron	ND at MRL (26.6 ppt)		
Norflurazon	ND at MRL (20 ppt)		
Norflurazon-desmethyl	ND at MRL (50 ppt)		
Oxydemeton-methyl	ND at MRL (20 ppt)		
Parathion-methyl Oxon	ND at MRL (25 ppt)		
Picoxystrobin	ND at MRL (50 ppt)		
Prometryn	ND at MRL (3.3 ppt)		
ropiconazole	ND at MRL (10 ppt)		
Pyraclostrobin	ND at MRL (25 ppt)		
<sup>o</sup> yroxasultone	ND at MRL (50 ppt)		
Saflufenacli	18.5 ppt		
Siduron	ND at MRL (6.7 ppt)		
Sulfometuron-methyl	ND at MRL (8.3 ppt)		
Tebuconazole	ND at MRL (10 ppt)		
Fetraconazole	ND at MRL (10 ppt)		
Thiacloprid	ND at MRL (50 ppt)		
Thiamethoxam	ND at MRL (25 ppt)		
Thifensulfuron-methyl	ND at MRL (16.7 ppt)		
Thiobencarb	ND at MRL (8.3 ppt)		
Friasulfuron	ND at MRL (23.3 ppt)		
Fluxapyroxad	7.60 ppt	ERL (0.1 ppt)	

Sample Remarks:

Lab used 500mLs for MDA GC and 300mLs for MDA LC. Sample scanned and negative for Diflufenzopyr and Cyproconazole.

Report ID: 436026	l verify that these data are correct. Kathy Reynolds Water Analysis Unit Supervisor	Kally n. RES
		N

	River, near Altura, MN			ICR/Case No:	
Evidence/Pro Seized by:	David Susa	gitroyl	LeTeune	Date & Time of Seizure: 7/3	20/15 10:00 a.m.
Source of Evidence/Pro (Person and/o Location)	or Seized fro Received Found at:	from: Wat	er sample earn of	CORDIIZ Snow	op 200 yds mobile crossing:
			LIST OF EVID	ENCE	
Item No.	Quantity	Description of E	Evidence/Property (I	nclude sample numbers and m	odel or serial numbers)
1		Bacterial sample,	250-ml plastic bottle, p	reserved	
2		Pesticide sample,	1-L amber glass bottle		
3			500-ml plastic bottle, p		0
0230 4	1	General chemistry	y sample, 2-L plastic be	ottle, SB WAIKWate	River near Crystal
0231 5	1		I-L A	mber glass furt	River near Crystal
			ne	or Crystal Springs	Hatchey 1400
	Field Tests:			Map:	
		рН	~ ~ ,		
		DO (ppm)			
		Chlorine			
		(ppm)			
		L	ABORATORY S	ERVICES	
Analyses Re	quested:				
N	IDA GC	and r	1DA LC		
Comments:					
Sommer					
Case Officer	Name and Phone	Number:			
Marilyn Danks,	MNDNR, Saint Paul 65	1-259-5087			
	<u></u>		CHAIN OF CUS		
Item No.	Released By		Delivery Via: (USPS person, other)	Received By	Date/Time
4:5	Jody Terroll	8/4/15/7:300.1		stid Det 1	A126 4 205 173
10		8/4/15 1030	In person	Child Rule	0141 5 173
4rs	Lever TI	0410 11:50			



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#### Water Monitoring Final Report

Analysis Requested: GC

Date Collected: Date Printed: Division Contact: 8/13/2015 08/01/2015 Marie Juenemann Sample Numbers Inspector No: MBW15019 Lab ID: W-15-1378 SDG ID: 15-SDG-3353 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Page 1 of 2 **Collected From:** Whitewater River - Middle Branch/MBW

		L	Temperature Received: 6.6 deg C
Analyte	Result	MRL	Result Comment
GCMSMS Monitoring			
Acetochlor	ND at MRL	30 ppt	
Alachlor	ND at MRL	30 ppt	
Atrazine	32.6 ppt	30 ppt	
3enfluralin	ND at MRL	25 ppt	
Bifenthrin	ND at MRL	20 ppt	
Chlorothalonil	ND at MRL	50 ppt	
Chlorpyrifos	ND at MRL	40 ppt	
Clomazone	ND at MRL	15 ppt	
Cyfluthrin	ND at MRL	100 ppt	
Delsopropylatrazine	ND at MRL	150 ppt	
Desethylatrazine	73.1 ppt	50 ppt	
Diazinon	ND at MRL	30 ppt	
Diazinon Oxon	ND at MRL	75 ppt	
Dichlobenil	ND at MRL	5 ppt	
Dichlorvos	ND at MRL	15 ppt	
Dimethenamid	ND at MRL	15 ppt	
Dimethoate	ND at MRL	100 ppt	
Disulfoton	ND at MRL	60 ppt	
EPTC	ND at MRL	10 ppt	
Esfenvalerate	ND at MRL	150 ppt	
Ethalfluralin	ND at MRL	50 ppt	
Ethofumesate	ND at MRL	50 ppt	
Fonofos	ND at MRL	15 ppt	
Aalathion	ND at MRL	50 ppt	
Aethoxychlor	ND at MRL	50 ppt	
letolachior	ND at MRL	25 ppt	
Metribuzin	ND at MRL	75 ppt	
fetribuzin DA	ND at ERL	500 ppt	
/letribuzin DADK	ND at ERL	500 ppt	
Aetribuzin DK	ND at ERL	500 ppt	
Dxadiazon	ND at MRL	75 ppt	
Parathion-methyl	ND at MRL	100 ppt	
Pendimethalin	ND at MRL	75 ppt	
horate	ND at MRL	25 ppt	
rometon	ND at MRL	100 ppt	
Propachlor	ND at MRL	30 ppt	

Water Analysis Onit Supervisor		Report ID: 436144	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffan	2. Ros
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### Water Monitoring Final Report

Analysis Requested: GC

	Date Printed: 8/13/2015	Date Collec 08/01/2			n Contact: rie Juenemann
	Sample Numbers	Narodo			
Ē	Lab ID: W-1	5-1378	SD	G ID:	15-SDG-3353
	Quantity x Sample S	ize:	Project:		
	1 x 1 L		Surface	Water	
	Product Name: Water, River/Strea	m	2		
	Description:				
age 2 of 2	Collected From: Whitewater River	Middle Bra	nch/MBV	v	
	Temperature Receiv	ed:	6.6	deg C	
1.4731					· · · · · · · · · · · · · · · · · · ·

Analyte	Result	MRL	Result Comment	
GCMSMS Monitoring				
Propazine	ND at MRL	25 ppt		
Simazine	ND at MRL	75 ppt		
TebupirimIphos	ND at MRL	30 ppt		
Terbufos	ND at MRL	30 ppt		
Tolfenpyrad	ND at MRL	100 ppt		
Triallate	ND at MRL	50 ppt		
Trifluralin	ND at MRL	50 ppt		
lambda-Cyhaiothrin	ND at MRL	75 ppt		
zeta-Cypermethrin	ND at MRL	500 ppt		

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Sample Remarks:

Report ID: 436144	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallan	m. Ross

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### Water Monitoring Final Report

Date Printed: 8/14/2015 Date Collected: Division Contact: 08/01/2015 Marie Juenemann Sample Numbers Inspector No: MBW15019 Lab ID: W-15-1380 SDG ID: 15-SDG-3353 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description:

		Page 1 of 3	Collected From:	ale
Analysis Requested: LC			Whitewater River - Middle E	Iranch/MBW
maiysis nequested. LO			Temperature Received:	6.6 deg C
Analyte	Result	MRL	Result Comr	nent
LCMSMS (+) Monitoring				
Acetamiprid	ND at MRL	25 ppt		
Adicarb Sulfone	ND at MRL	15 ppt		
lidicarb Sulfoxide	ND at MRL	50 ppt		
zoxystrobin	ND at MRL	10 ppt		
lensulfuron-methyl	ND at MRL	16.7 ppt		
lensulide	ND at MRL	250 ppt		
ioscalid	ND at MRL	50 ppt		
romacil	ND at MRL	30 ppt		
arbaryl	ND at MRL	25 ppt		
arbendazim	ND at MRL	10 ppt		
arbofuran	ND at MRL	13.3 ppt		
hlorantraniliprole	ND at MRL	50 ppt		
hlorimuron-ethyl	ND at MRL	20 ppt		
hlorpyrifos Oxon	ND at MRL	40 ppt		
lothianidin	ND at MRL	25 ppt		
yanazine	ND at MRL	25 ppt		
yantraniliprole	ND at MRL	100 ppt		
EDI Atrazine	63.1 ppt	50 ppt		
icrotophos	ND at MRL	25 ppt		
ifenoconazole	ND at MRL	25 ppt		
inotefuran	ND at MRL	25 ppt		
isulfoton Sulfone	ND at MRL	20 ppt		
luron	ND at MRL	13.3 ppt		
lumetsulam	ND at MRL	50 ppt		
utriafol	ND at MRL	10 ppt		
alosulfuron-methyl	ND at MRL	30 ppt		
exazinone	ND at MRL	10 ppt		
ydroxyatrazine	24.5 ppt	6.7 ppt		
azamethabenz Acid	ND at MRL	10 ppt		
nazamethabenz-methyl	ND at MRL	5 ppt		
azamox	ND at MRL	13.3 ppt		
nazapic	ND at MRL	10 ppt		
azapyr	ND at MRL	8.3 ppt		
nazaquin	ND at MRL	16.7 ppt		
nazethapyr	ND at MRL	6.7 ppt		
nidacloprid	ND at MRL	20 ppt		
ample Remarks:				
luxapyroxad - ND at ERL (10 ppt)				

Report ID: 436146	verify that these data are correct. (athryn Reynolds Water Analysis Unit Supervisor	Kallay m	RESS
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### Water Monitoring Final Report

Date Printed: 8/14/2015 Date Collected: **Division Contact:** 08/01/2015 Marie Juenemann Sample Numbers Inspector No: MBW15019 Lab ID: W-15-1380 SDG ID: 15-SDG-3353 Quantity x Sample Size: Project: 1 x 1 L Surface Water Product Name: Water, River/Stream Description: Page 2 of 3 Collected From:

Analysis Requested: I.C.	IS REQUESTED: LC		Whitewater River - Middle Brai	nch/MBW
Analysis nequested. LO			Temperature Received:	6.6 deg C
Analyte	Result	MRL	Result Commer	nt
LCMSMS (+) Monitoring				
Isoxaflutole	ND at MRL	40 ppt		
Linuron	ND at MRL	20 ppt		
Metalaxyt	ND at MRL	8.3 ppt		
Metsulfuron-methyl	ND at MRL	23.3 ppt		
Myclobutanil	ND at MRL	10 ppt		
Nicosulfuron	ND at MRL	26.6 ppt		
Norflurazon	ND at MRL	20 ppt		
Norflurazon-desmethyl	ND at MRL	50 ppt		
Oxydemeton-methyl	ND at MRL	20 ppt		
Parathion-methyl Oxon	ND at MRL	25 ppt		
Picoxystrobin	ND at MRL	50 ppt		
Prometryn	ND at MRL	3.3 ppt		
Propiconazole	ND at MRL	10 ppt		
Pyraclostrobin	ND at MRL	25 ppt		
- Pyroxasulfone	ND at MRL	50 ppt		
Saflufenacil	ND at MRL	15 ppt		
Siduron	ND at MRL	6.7 ppt		
Sulfometuron-methyl	ND at MRL	8.3 ppt		
Febuconazole	ND at MRL	10 ppt		
Tetraconazole	ND at MRL	10 ppt		
Thiacloprid	ND at MRL	50 ppt		
Thiamethoxam	ND at MRL	25 ppt		
Thifensulfuron-methyl	ND at MRL	16.7 ppt		
Thiobencarb	ND at MRL	8.3 ppt		
Triasulfuron	ND at MRL	23.3 ppt		
LCMSMS (-) Monitoring				
2,4,5-T	ND at MRL	50 ppt		
2,4,5-TP	ND at MRL	50 ppt		
2,4-D	25.2 ppt	8.3 ppt		
2,4-DB	ND at MRL	20 ppt		
Acetochlor ESA	93.6 ppt	30 ppt		
Acetochlor OXA	ND at MRL	33.3 ppt		
Alachlor ESA	100 ppt	41.6 ppt		
Alachlor OXA	ND at MRL	33.3 ppt		
Bentazon	ND at MRL	5 ppt		
Bromoxynil	ND at MRL	25 ppt		
Sample Remarks:				

Fluxapyroxad - ND at ERL (10 ppt)

Report ID: 436146	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kapan n. Ross
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### Water Monitoring Final Report

Analysis Requested: LC

Page 3 of 3

Date Printed: Date Collected: Division Contact: 8/14/2015 08/01/2015 Marie Juenemann Sample Numbers Inspector No: MBW15019 Lab ID: W-15-1380 SDG ID: 15-SDG-3353 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: **Collected From:** Whitewater River - Middle Branch/MBW Temperature Received: 6.6 deg C

Analyte	Result	MRL	Result Comment
LCMSMS (-) Monitoring			
Clopyralid	ND at MRL	41.6 ppt	
Dicamba	ND at MRL	50 ppt	
Dichlorprop	ND at MRL	50 ppt	,
Dimethenamid ESA	17.0 ppt	6.7 ppt	1
Dimethenamid OXA	ND at MRL	10 ppt	
Flufenacet OXA	ND at MRL	8.3 ppt	
Isoxaflutole DKN	ND at MRL	50 ppt	
MCPA	ND at MRL	5 ppt	
MCPB	ND at MRL	20 ppt	
MCPP	ND at MRL	50 ppt	
Mesotrione	ND at MRL	50 ppt	
Metolachlor ESA	857 ppt	10 ppt	
Metolachlor OXA	89.3 ppt	10 ppt	
Picloram	ND at MRL	41.6 ppt	
Propachlor ESA	ND at MRL	30 ppt	
Propachlor OXA	ND at MRL	10 ppt	
Sedaxane	ND at MRL	75 ppt	
Tembotrione	ND at MRL	50 ppt	
Triclopyr	ND at MRL	50 ppt	

Sample Remarks:

Fluxapyroxad - ND at ERL (10 ppt)

		*
Report ID: 436146	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kapay In Ross
		17

	-								Whitewater River-Middle Branch/MBW	Root River-North Branch/NR	SAMPLE LOCATION		Notes/Sample Conditions:	Report To: Marie Juenemann	OF AG
									nch/MBW					Sampled By: David Tollefson	MINNESOTA DEPARTMENT OF AGRICULTURE PESTICIDE AND FERTILIZER MANAGEMENT
									8/1/2015	8/2/2015	DATE	SAMPL		Delivered By: David Tollefson	Z
									7:47	10:18	TIME	SAMPLE END		efson	VATER MO 625 P St. Pau
· · · ·									MBW15019	NR15013	FIELD SAMPLE ID	NS SWE KORD	Lab SDG Number:	Delivery Method: SpeeDee Sample Type: Surface Water	WATER MONITORING PROGRAM Milliam VanRysw 625 Robert Street North David Tollefson St. Paul, MN 55155-2538
<b>14</b> - - - - - - - - - - - - - - - - - - -									1378 15-11	135	ଜନ	21202		Received Date/Times	William VanRyswyk Mike Macdonald David Tollefson
									1380 1380	130 A	۲c	2.69			507-344-3203 651-201-6694 507-206-2882
									1382	1321		ANLALYSIS REC	<b>New Person</b>	Received By:	Matthew Ribikawskis Luke Stuewe Russ Derickson Katle Rassmussen
											0	REQUESTED	e Received (°o		507-206-2884 218-846-7425 507-752-7056 551-201-6331 507-334-5261
-											ACE/ELISA				ids 507-206-2884 Marle Juenemann 218-846-7425 Jeff Paddock 507-752-7034 Terminin Katheren 507-324-5251
											Triazine/ELISA				651-201~6161 651-201-6560 651-201-6491

#### MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Re-issue of Report ID: MBW15019-233114



Date Reported: 10/26/2015	SDG ID: 15-SDG-3355	Page: Page 1 of 1
Division Contact:	Marie Juenema	20
	Marie Jueriemai	111

SDG Comments:

MBW15019									
LAB Sample ID:	AR-15-2588	Quantity x Sample Size:	1 x 125 ml		Project Name: Surface W	/ater			
Inspector Sample ID:	MBW15019	Date/Time Collected:	8/1/2015	0747					
Product/Description:	Water, River/Stream	Date/Time Received:	8/5/2015	1145	Temperature Received:	0 deg C			
Collected From:	Whitewater River - Mic	ddle Branch/MBW							
Analysis Requested:	NO2+NO3								
Analyte	Result	MRL	Met	hod	Result Comment				
Nitrate/Nitrite	8.80 ppm	0.40 ppm	Std. Meth. 4 NO3 NO2	500 NO3-F,					
Nitrate/Nitrite Analysis Dat	e/Time 08/13/2015 1	2:51:44 pm							
Sample Remarks:									
LAB Sample ID:	AR-15-2590	Quantity x Sample Size:	1 x 250 ml		Project Name: Surface W	/ater			
Inspector Sample ID:	MBW15019	Date/Time Collected:	8/1/2015	0747					
Product/Description:	,	Date/Time Received:	8/5/2015	1145	Temperature Received:	0 deg C			
Collected From:	Whitewater River - Mic	ddle Branch/MBW							
Analysis Requested:	TP+DOP								
Analyte	Result	MRL	Met	hod	Result Comment				
Ortho Phosphorus, Dissolv	ved 0.038 ppm	0.005 ppm	EPA 365.1						
Ortho Phosphorus, Dissolv Date/Time	ved Analysis 08/12/2015 1	1:07:15 am							
Total Phosphorus	0.156 ppm	0.01 ppm	EPA 365.1						
Total Phosphorus Analysis	Date/Time 08/12/2015 0	)1:27:49 pm							
Sample Remarks:									
LAB Sample ID:		Quantity x Sample Size:			Project Name: Surface W	/ater			
Inspector Sample ID:	MBW15019	Date/Time Collected:		0747					
Product/Description:		Date/Time Received:	8/5/2015	1145	Temperature Received:	6.6 deg C			
Collected From:		ddle Branch/MBW							
Analysis Requested:	TSS								
Analyte	Result	MBL	Met	hod	Result Comment				

Analyte	Result	MRL	Method	Result Comment
Total Suspended Solids	36.4 ppm	0.10 ppm	Std. Meth. 2540D, TSS	Q6
Total Suspended Solids Analysis Date/Time	08/05/2015 02:30:00 pm			
Sample Remarks:				

lau	thorize this final report.	
Treeske Ehresmann,	Tinta	Epresmann
Chemistry Toxicology Unit Supervisor:	Vocaste	Com s near

OF AGRICI PESTICIDE ANI	DTA DEPARTMENT ULTURE D FERTILIZER MANAGEMENT	625 Ro	NITORIN bert Stree , MN 551		651-201-6694 507-206-2882	Matthew Ribikawskis Luke Stuewe Russ Derickson Katie Rassmussen Scott Matteson	507-206-2884 218-846-7425 507-752-7036 651-201-6331 507-334-5261	Marie Juenemann Jeff Paddock Brention Schaefer	651-201-6161 651-201-6560 651-201-6491
Report To:	Sampled By:	Delivered By		Delivery Method: SpeeDee	Received Date/Ti	TZUS WA	Received By:	the second second	and the second second
Marie Juenemann	David Tollefson	David Tolle	efson	Sample Type: Surface Water	8-515	TRUS WA	oll_		and the second
Notes/Sample Conditions:			• <	Lab SDG Number:		Lab Temp	erature Rece	ived (°C):	
SAMPLE LOCATION	N	SAMPL		FIELD SAMPLE ID	7		LYSIS REQUE	STED	
		DATE	TIME		NO2 + NO3	TP + DOP	CL	TSS	TURBIDITY
Root River-North Branch/NF	1	8/2/2015	10:18	NR15013	AR-15- 2887	AR-15- 2589		AR-15- 2591	
Whitewater River-Middle Bra	anch/MBW	8/1/2015	7:47	MBW15019	AR-15- 8588	AR-15- 2890		2592	
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3									

MINNESOTA DEPARTMENT
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitorin

Analysis Requested: GC

Analyte GCMSMS Monitoring

Acetochlor

1-6010		Product Name: Water, River/Stream		
ng Final Report		Description:	инин	
	Page 1 of 2	Collected From: Whitewater River - South Br	anch/SBW	<b>8000000000000000000000000000000000000</b>
		Temperature Received:	4.4 deg C	
Result	MRL	Result Com	·	
ND at MRL	30 ppt			
ND at MRL	30 ppt			
42.7 ppt	30 ppt			
ND at MD	25 ppt			

Date Printed: 8/13/2015

1 x 1 L

Sample Numbers Inspector No: SBW15007 Lab ID: W-15-1405

Quantity x Sample Size:

Date Collected: 08/06/2015

Project:

Surface Water

Division Contact: Marie Juenemann

SDG ID: 15-SDG-3446

ND at MBL	30 ppt
	30 ppt
Control of the Contro	25 ppt
	20 ppt
	50 ppt
	40 ppt
	15 ppt
	100 ppt
	150 ppt
	50 ppt
	30 ppt
	75 ppt
	5 ppt
	15 ppt
ND at MRL	15 ppt
ND at MRL	100 ppt
ND at MRL	60 ppt
ND at MRL	10 ppt
ND at MRL	150 ppt
ND at MRL	50 ppt
ND at MRL	50 ppt
ND at MRL	15 ppt
ND at MRL	50 ppt
ND at MRL	50 ppt
ND at MRL	25 ppt
ND at MRI.	75 ppt
ND at ERL	500 ppt
	500 ppt
	500 ppt
	75 ppt
	100 ppt
	75 ppt
	25 ppt
ND at MRL	100 ppt
	100 000
ND at MRL	30 ppt
	ND at MRL ND at ERL ND at ERL ND at ERL ND at MRL ND at MRL ND at MRL ND at MRL ND at MRL ND at MRL ND at MRL

Report ID: 436454	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kathan n	RESS
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: GC

Date Printed: 8/13/2015 Date Collected: 08/06/2015 Division Contact: Marie Juenemann 8/13/2013 Sample Numbers Inspector No: SBW15007 Lab ID: W-15-1405 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1 x 1 L Surface Water Product Name: Water, River/Stream Description: Page 2 of 2 **Collected From:** Whitewater River - South Branch/SBW Temperature Received: 4.4 deg C

			Tomporataro ricoorroa:	4.4 uoy V
Analyte	Result	MRL	Result Commen	
GCMSMS Monitoring				
Propazine	ND at MRL	25 ppt		
Simazine	ND at MRL	75 ppt		
Tebupirimiphos	ND at MRL	30 ppt		
Terbufos	ND at MRL	30 ppt		
Tolfenpyrad	ND at MRL	100 ppt		
Triallate	ND at MRL	50 ppt		
Trifluralin	ND at MRL	50 ppt		
lambda-Cyhalothrin	ND at MRL	75 ppt		
zeta-Cypermethrin	ND at MRL	500 ppt		

Sample Remarks:

Water Analysis Unit Supervisor Tattay mis-	Report ID: 436454 Kathryn Reynolds Kathryn Reynolds	I verify that these data are correct.		•	Kathryn Reynolds Water Analysis Unit Supervisor	Kallan n. Ross	
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Analysis Requested: LC

Date Printed: 8/14/2015 Date Collected: 08/06/2015 **Division Contact:** Marie Juenemann Sample Numbers Inspector No: SBW15007 Lab ID: W-15-1410 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Page 1 of 3 Collected From: Whitewater River - South Branch/SBW

mayon requestor. Lo			Temperature Received: 4.4 deg C
Analyte	Result	MRL	Result Comment
LCMSMS (+) Monitoring			
Acetamiprid	ND at MRL	25 ppt	
Aldicarb Sulfone	ND at MRL	15 ppt	
Aldicarb Sulfoxide	ND at MRL	50 ppt	
Azoxystrobin	ND at MRL	10 ppt	
Bensulfuron-methyl	ND at MRL	16.7 ppt	
3ensulide	ND at MRL	250 ppt	
Boscalid	ND at MRL	50 ppt	
Bromacil	ND at MRL	30 ppt	
Carbaryi	ND at MRL	25 ppt	
Carbendazim	ND at MRL	10 ppt	
Carbofuran	ND at MRL	13.3 ppt	
Chlorantranlliprole	ND at MRL	50 ppt	
Chlorimuron-ethyl	ND at MRL	20 ppt	
hlorpyrifos Oxon	ND at MRL	40 ppt	
Jothianidin	ND at MRL	25 ppt	
yanazine	ND at MRL	25 ppt	
yantraniliprole	ND at MRL	100 ppt	
DEDI Atrazine	75.2 ppt	50 ppt	
licrotophos	ND at MRL	25 ppt	
ifenoconazole	ND at MRL	25 ppt	
linotefuran	ND at MRL	25 ppt	
lisuifoton Sulfone	ND at MRL	20 ppt	
luron	ND at MRL	13.3 ppt	
lumetsulam	ND at MRL	50 ppt	
lutriafol	ND at MRL	10 ppt	
alosulfuron-methyl	ND at MRL	30 ppt	
iexazinone	ND at MRL	10 ppt	
ydroxyatrazine	14.1 ppt	6.7 ppt	
nazamethabenz Acid	ND at MRL	10 ppt	
nazamethabenz-methyl	ND at MRL	5 ppt	
nazamox	ND at MRL	13.3 ppt	
nazapic	ND at MRL	10 ppt	
nazapyr	ND at MRL	8.3 ppt	
nazaquin	ND at MRL	16.7 ppt	
nazethapyr	ND at MRL	6.7 ppt	
nidacloprid	ND at MRL	20 ppt	
Sample Remarks:			

Fluxapyroxad - ND at ERL (10 ppt)

Report ID: 436459	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallang m. Ross
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Participant and a second se
MINNESOTA DEPARTMENT
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Page 2 of 3 Collected From:

 Date Printed:
 Date Collected:
 Division Contact:

 8/14/2015
 08/06/2015
 Marie Juenemann

 Sample Numbers
 Marie Juenemann

 Inspector No:
 SBW 15007

 Lab ID:
 W-15-1410
 SDG ID:

 1x 1 L
 Surface Water

 Product Name:
 Water, River/Stream

 Description:
 Image: Content of the second second

		-		
Analysis Requested: LC			Whitewater River - South Branc	h/SBW
analan nodan wa			Temperature Received:	4.4 deg C
Analyte	Result	MRL	Result Comment	
LCMSMS (+) Monitoring				
Isoxaflutole	ND at MRL	40 ppt		
Linuron	ND at MRL	20 ppt		
Metalaxyl	ND at MRL	8.3 ppt		
Metsulfuron-methyl	ND at MRL	23.3 ppt		
Myclobutanil	ND at MRL	10 ppt	P	
Nicosulfuron	ND at MRL	26.6 ppt		
Norflurazon	ND at MRL	20 ppt		
Norflurazon-desmethyl	ND at MRL	50 ppt		
Oxydemeton-methyl	ND at MRL	20 ppt		
Parathion-methyl Oxon	ND at MRL	25 ppt		
Picoxystrobin	ND at MRL	50 ppt		
Prometryn	ND at MRL	3.3 ppt		
Propiconazole	ND at MRL	10 ppt		
Pyraclostrobin	ND at MRL	25 ppt		
Pyroxasulfone	ND at MRL	50 ppt		
Saflufenacil	ND at MRL	15 ppt		
Siduron	ND at MRL	6.7 ppt		
Sulfometuron-methyl	ND at MRL	8.3 ppt		
Tebuconazole	ND at MRL	10 ppt		
Tetraconazole	ND at MRL	10 ppt		
Thiacloprid	ND at MRL	50 ppt		
Thiamethoxam	ND at MRL	25 ppt		
Thifensulfuron-methyl	ND at MRL	16.7 ppt		
Thiobencarb	ND at MRL	8.3 ppt		
Triasulfuron	ND at MRL	23.3 ppt		
LCMSMS (-) Monitoring		To:o bbr		
2,4,5-T	ND at MRL	50 ppt		
2,4,5-TP	ND at MRL	50 ppt		
2,4-D	ND at MRL	8.3 ppt		
2,4-DB	ND at MRL	20 ppt		
Acetochlor ESA	59.9 ppt	30 ppt	N	
Acetochlor OXA	ND at MRL	33.3 ppt		
Alachlor ESA	308 ppt	41.6 ppt		
Alachlor OXA	ND at MRL	33.3 ppt		
Bentazon	24.6 ppt	5 ppt		
Bromoxynil	ND at MRL	25 ppt		
Sample Remarks:				
Fluxapyroxad - ND at ERL (10 ppt)				· · ·
nuvahituvan - ivo at Ent (iv ppt)				

	I verify that these data are correct.	1 -	The land
Report ID: 436459	Kathryn Reynolds	XAD. 7	h REix
	Water Analysis Unit Supervisor	natay.	- 10- 2

MINNESOTA DEPARTMENT

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Analysis Requested: LC

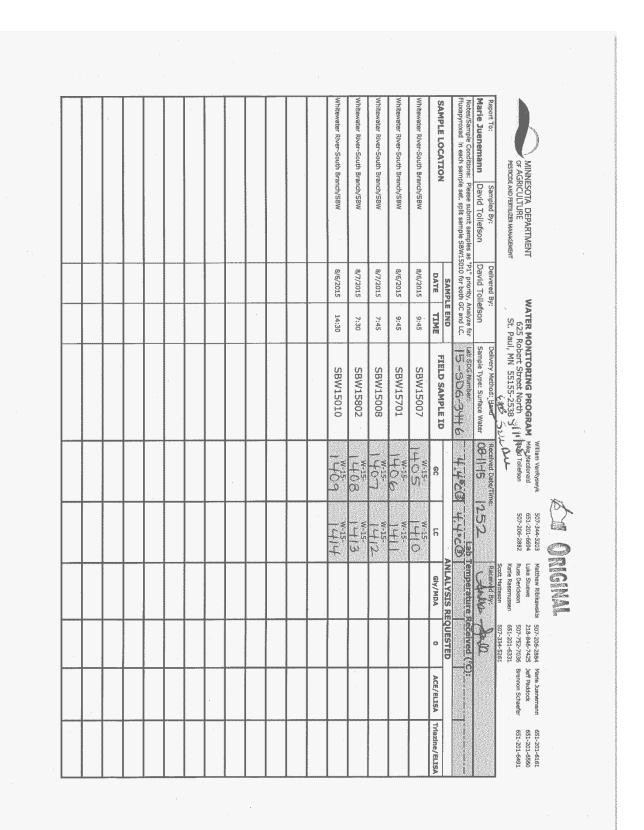
Date Printed: 8/14/2015 Date Collected: 08/06/2015 Division Contact: Marie Juenemann Sample Numbers Inspector No: SBW15007 Lab ID: W-15-1410 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Page 3 of 3 Collected From: Whitewater River - South Branch/SBW Temperature Received: 4.4 deg C

		L COLL	pointero ricoorcou.	4.4 Gey C	
Analyte	Result	MRL.	Result Comm	ent	
LCMSMS (-) Monitoring					
Clopyralid	ND at MRL	41.6 ppt			
Dicamba	ND at MRL	50 ppt			
Dichlorprop	ND at MRL	50 ppt			
Dimethenamid ESA	11.8 ppt	6.7 ppt			
Dimethenamid OXA	ND at MRL	10 ppt			
Flufenacet OXA	ND at MRL	8.3 ppt			
Isoxaflutole DKN	ND at MRL	50 ppt			
MCPA	ND at MRL	5 ppt			
MCPB	ND at MRL	20 ppt			
MCPP	ND at MRL	50 ppt			
Mesotrione	ND at MRL	50 ppt			
Metolachior ESA	530 ppt	10 ppt			
Metolachlor OXA	30.6 ppt	10 ppt			
Picloram	ND at MRL	41.6 ppt			
Propachlor ESA	ND at MRL	30 ppt			
Propachlor OXA	ND at MRL	10 ppt			
Sedaxane	ND at MRL	75 ppt			
Tembotrione	ND at MRL	50 ppt			
Triclopyr	ND at MRL	50 ppt			

Sample Remarks:

Fluxapyroxad - ND at ERL (10 ppt)

	Report ID: 436459	I verify that these data are correct. Kathryn Reynolds	Koly n. Plas
Į		Water Analysis Unit Supervisor	1 attay
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#### MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



Re-issue of Report ID: SBW15007-233230



Date Reported:	SDG ID:	Page:
10/26/2015	15-SDG-3447	Page 1 of 1
Division Contact:	7	•
	Marie Juenema	nn

SDG Comments:

		SBW1500	)7	
LAB Sample ID:	AR-15-2619	Quantity x Sample Size:	1 x 125 ml	Project Name: Surface Water
Inspector Sample ID:	SBW15007	Date/Time Collected:	8/6/2015 0945	5
Product/Description:	Water, River/Stream	Date/Time Received:	8/11/2015 1252	Temperature Received: 0 deg C
	Whitewater River - Sou	th Branch/SBW		
Analysis Requested:	NO2+NO3			
Analyte	Result	MRL	Method	Result Comment
Nitrate/Nitrite	7.85 ppm	0.40 ppm	Std. Meth. 4500 NO3 NO3 NO2	3-F,
Nitrate/Nitrite Analysis Date	e/Time 08/14/2015 08	8:00:00 am		
Sample Remarks:				
LAB Sample ID:	AR-15-2621	Quantity x Sample Size:	1 x 250 ml	Project Name: Surface Water
Inspector Sample ID:	SBW15007	Date/Time Collected:	8/6/2015 0945	5
Product/Description:		Date/Time Received:	8/11/2015 1252	2 Temperature Received: 0 deg C
	Whitewater River - Sou	th Branch/SBW		
Analysis Requested:	TP+DOP			
Analyte	Result	MRL	Method	Result Comment
Ortho Phosphorus, Dissolv	red 0.016 ppm	0.005 ppm	EPA 365.1	
Ortho Phosphorus, Dissolv Date/Time	red Analysis 08/12/2015 1	1:07:15 am		
Total Phosphorus	0.065 ppm	0.01 ppm	EPA 365.1	
Total Phosphorus Analysis	Date/Time 08/12/2015 0	1:27:49 pm		
Sample Remarks:				
LAB Sample ID:		Quantity x Sample Size:	1 x 500 ml	Project Name: Surface Water
Inspector Sample ID:		Date/Time Collected:		
Product/Description: Collected From:	Water, River/Stream Whitewater River - Sou	Date/Time Received: hth Branch/SBW	8/11/2015 1252	2 Temperature Received: 0 deg C

Analysis Requested: NO2+N	IO3, TKN, NH3				
Analyte	Result	MRL	Method	Result Comment	
Ammonia-N	0.024 ppm	0.02 ppm	Std. Meth. 4500 NH3-D, Ammonia-N		
Ammonia-N Analysis Date/Time	08/13/2015 12:30:00 pm				
Sample Remarks:					

la	uthorize this final report.	
Treeske Ehresmann,	1.	
Chemistry Toxicology Unit Supervisor:	Vocaste	Emesmann



				COF	Y					40
OF AGRICUL PESTICIDE AND F	TURE ertilizer management	625 Ro St. Paul	, MN 551	55-2538 Spil 21		Matthew Ribikawskis Luke Stuewe Russ Derickson Katie Rassmussen Scott Matteson		Marie Juenemann Jeff Paddock Brennon Schaefer	651-201-6161 651-201-6560 651-201-6491	Tellek
Report To: Marie Juenemann	Sampled By: David Tollefson	Delivered By David Toll		Delivery Method: Hand Sample Type: Surface Water	Received Date/Ti	me: 1252	Received By:	- De O		1
Notes/Sample Conditions: F Fluxapyroxad in each sample	Please submit samples as "	'P1" priority, A	nalyze for	Lab SDG Number: 15-SDG-3447	03°20	Lab Temp	erature Rece	ived (°C):	0.00	Davi 8
SAMPLE LOCATION			E END	FIELD SAMPLE ID	Dee		LYSIS REQU	STED	NH3	5
Whitewater River+South Bran	nch/SBW	<b>DATE</b> 8/6/2015	9:45	SBW15007	NO2 + NO3 AR-15- 2-619	AR-15- 2621	CL	TSS	AR-15- 2624	
Whitewater River-South Bran	nch/SBW	8/6/2015	9:45	SBW15701	2017	AR-15- 2622			LOLT	
Whitewater River-South Bran	nch/SBW	8/7/2015	7:45	SBW15008	AR-15- 2620	AR-15- 2623			AR-15- 2625	
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### Water Monitoring Final Report

Page 1 of 2

 8/13/2015
 08/06/2015
 Marie Juenemann

 Sample Numbers
 Inspector No:
 SBW15701

 Lab ID:
 W-15-1406
 SDG ID:
 15-SDG-3446

 Quantity x Sample Size:
 Project:
 1

 1 x 1 L
 Surface Water

 Product Name:
 Water, River/Stream

 Description:
 Collected From:

 W hitewater River - South Branch/SBW

Division Contact:

Date Collected:

Temperature Received:         4.4 deg C           Analyte         Result         MRL         Result Comment           GCMSMS Monitoring         Acetochior         ND at MRL         30 ppt           Acetochior         ND at MRL         30 ppt         Atrexine         4.5 ppt           Benfuralin         ND at MRL         20 ppt	lysis Requested: GC		Whi	tewater River - South Branch/SBW	
GCMSM Monitoring           Acetochlor         ND at MRL         30 ppt           Machior         ND at MRL         30 ppt           Markine         415.5ppt         30 ppt           Stentfuralin         ND at MRL         25 ppt           Stentfuralin         ND at MRL         20 ppt           Stentfurin         ND at MRL         20 ppt           Chorothalonil         ND at MRL         20 ppt           Chorothalonil         ND at MRL         40 ppt           Schorothalonil         ND at MRL         15 ppt           Opfuchrin         ND at MRL         100 ppt           Delsopropylatrazine         ND at MRL         150 ppt           Deschiptylatrazine         89.5 ppt         50 ppt           Diazinon         ND at MRL         5 ppt           Diazinon Oxon         ND at MRL         15 ppt           Directhonalid         ND at MRL         15 ppt           Directhoate         ND at MRL         10 ppt           Disulfoton         ND at MRL         10 ppt           Stenderate         ND at MRL         10 ppt           Stenderate         ND at MRL         50 ppt           Stenderate         ND at MRL         50 ppt			Temp	erature Received: 4.4 deg C	
Acetochlor         ND at MRL         30 ppt           Alachlor         ND at MRL         30 ppt           Alachlor         ND at MRL         25 ppt           Benfluralin         ND at MRL         25 ppt           Stentfuralin         ND at MRL         20 ppt           Stentfuralin         ND at MRL         20 ppt           Shorthrin         ND at MRL         40 ppt           Chorochalonii         ND at MRL         15 ppt           Schorpyrifos         ND at MRL         15 ppt           Descopropylatrazine         ND at MRL         30 ppt           Descopropylatrazine         ND at MRL         30 ppt           Descopropylatrazine         ND at MRL         30 ppt           Diazinon         ND at MRL         30 ppt           Diazinon Cxon         ND at MRL         15 ppt           Dialono Cxon         ND at MRL         15 ppt           Dialono Cxon         ND at MRL         15 ppt           Dialono Cxon         ND at MRL         10 ppt           Eaforvalerate         ND at MRL         15 ppt           Dialoton         ND at MRL         50 ppt           Stentowerate         ND at MRL         50 ppt           Adathlon	Analyte	Result	MRL.	Result Comment	
Nachior         ND at MRL         30 ppt           Arrazine         41.5 ppt         30 ppt           Barnfuralin         ND at MRL         25 ppt           Sidenthrin         ND at MRL         20 ppt           Shorthalonii         ND at MRL         50 ppt           Shorthalonii         ND at MRL         40 ppt           Somazone         ND at MRL         100 ppt           Optopyrifos         ND at MRL         150 ppt           Solesthylatrazine         ND at MRL         30 ppt           Desethylatrazine         ND at MRL         30 ppt           Diazinon         ND at MRL         50 ppt           Diazinon CXon         ND at MRL         5 ppt           Dichlobenil         ND at MRL         100 ppt           Dichlobenil         ND at MRL         15 ppt           Dimethoate         ND at MRL         10 ppt           Dimethoate         ND at MRL         10 ppt           Sielfoton         ND at MRL         50 ppt           Adethoxychlor         ND at MRL	GCMSMS Monitoring				
Atrazine41.5 ppl30 pptBenfuralinND at MRL25 pptBifenthrinND at MRL50 pptChlorothalonilND at MRL60 pptChlorotyrifosND at MRL40 pptClomazoneND at MRL15 pptOptivationalND at MRL100 pptDeisopropylatrazine89.9 ppt50 pptDiazinonND at MRL30 pptDiazinonND at MRL50 pptDiazinonND at MRL50 pptDiazinonND at MRL50 pptDiazinonND at MRL50 pptDiazinonND at MRL15 pptDinethorateND at MRL15 pptDinethorateND at MRL15 pptDinethorateND at MRL15 pptDinethorateND at MRL10 pptEfforwalerateND at MRL10 pptEfforwalerateND at MRL50 pptConofosND at MRL50 pptEthofumesateND at MRL50 pptFonofosND at MRL50 pptMetribuzinND at MRL50 pptWetribuzinND at MRL50 pptMetribuzin DAAND at ERL500 pptMetribuzin DAAND at ERL500 pptMetribuzin DAAND at ERL500 pptAdathionND at MRL75 pptParathion-methylND at MRL75 pptParathion-methylND at MRL75 pptParathion-methylND at MRL75 pptParathion-methylND at MRL	atochlor	ND at MRL	30 ppt		
Benfuralin         ND at MRL         25 ppt           Sifenthrin         ND at MRL         20 ppt           Chiorothalonil         ND at MRL         40 ppt           Chiorothalonil         ND at MRL         40 ppt           Clomazone         ND at MRL         15 ppt           Cyfluthrin         ND at MRL         150 ppt           Deisopropylatrazine         ND at MRL         30 ppt           Diazinon         ND at MRL         30 ppt           Diazinon         ND at MRL         5 ppt           Diazinon         ND at MRL         5 ppt           Diazinon         ND at MRL         5 ppt           Diazinon         ND at MRL         15 ppt           Diachodxon         ND at MRL         15 ppt           Diachodxon         ND at MRL         10 ppt           Diarethenamid         ND at MRL         10 ppt           Esfervalerate         ND at MRL         10 ppt           Esfervalerate         ND at MRL         50 ppt           Endrouesate         ND at MRL         50 ppt           Schovachior         ND at MRL         50 ppt           Walatohon         ND at MRL         50 ppt           Walatohon         ND at MRL	chlor	ND at MRL	30 ppt		
Bifenthrin     ND at MRL     20 ppt       Chloropyrifus     ND at MRL     60 ppt       Chloropyrifus     ND at MRL     40 ppt       Colmazone     ND at MRL     150 ppt       Ogluthrin     ND at MRL     150 ppt       Desopropylatrazine     ND at MRL     30 ppt       Desotropylatrazine     ND at MRL     30 ppt       Diazhon     ND at MRL     50 ppt       Diazhon Oxon     ND at MRL     5 ppt       Dichloberil     ND at MRL     5 ppt       Dichloberil     ND at MRL     15 ppt       Direthenamid     ND at MRL     15 ppt       Direthenamid     ND at MRL     100 ppt       Direthenamid     ND at MRL     100 ppt       Estervalerate     ND at MRL     100 ppt       Estervalerate     ND at MRL     150 ppt       Officitualin     ND at MRL     50 ppt       Ethofumesate     ND at MRL     50 ppt       Malathion     ND at MRL     50 ppt       Metolachlor	azine	41.5 ppt	30 ppt		
Chiorothalonil         ND at MRL         50 ppt           Chioropyrifos         ND at MRL         40 ppt           Clomazone         ND at MRL         15 ppt           Optidutrin         ND at MRL         100 ppt           Desectrylatrazine         ND at MRL         150 ppt           Desectrylatrazine         89.9 ppt         50 ppt           Diazinon         ND at MRL         30 ppt           Diazinon         ND at MRL         5 ppt           Diazinon         ND at MRL         5 ppt           Diazinon         ND at MRL         5 ppt           Diazinon         ND at MRL         15 ppt           Diazinon         ND at MRL         100 ppt           Diazinon         ND at MRL         100 ppt           Diazinon         ND at MRL         10 ppt           Diamethoata         ND at MRL         10 ppt           Dimethoata         ND at MRL         50 ppt           Stefforumesate         ND at MRL         50 ppt           Stefforumesate         ND at MRL         50 ppt           Adothorin         ND at MRL         50 ppt           Adothorin         ND at MRL         50 ppt           Adothorin         ND at MRL <t< td=""><td>ifluralin</td><td>ND at MRL</td><td>25 ppt</td><td></td><td></td></t<>	ifluralin	ND at MRL	25 ppt		
Chiorpyrifos         ND at MRL         40 ppt           Clomazone         ND at MRL         15 ppt           Cyfluthrin         ND at MRL         100 ppt           Deisopropylatrazine         ND at MRL         150 ppt           Desethylatrazine         89.9 ppt         50 ppt           Diazinon         ND at MRL         30 ppt           Diazinon Oxon         ND at MRL         5 ppt           Dichlobenil         ND at MRL         5 ppt           Dichloros         ND at MRL         15 ppt           Direthoate         ND at MRL         15 ppt           Direthoate         ND at MRL         10 ppt           Stellfoton         ND at MRL         10 ppt           Stellfoton         ND at MRL         50 ppt           Stellfoton         ND at MRL         50 ppt           Stellfoton         ND at MRL         50 ppt           Stendueste         ND at MRL         50 ppt           Adethoychlor         ND at MRL	anthrin	ND at MRL	20 ppt		
ND at MRL         15 ppt           Cyllubrin         ND at MRL         100 ppt           Desetprylatrazine         ND at MRL         150 ppt           Desetprylatrazine         89.9 ppt         50 ppt           Desetprylatrazine         89.9 ppt         50 ppt           Desetprylatrazine         89.9 ppt         50 ppt           Desetprylatrazine         ND at MRL         30 ppt           Diazinon         ND at MRL         5 ppt           Dichloberil         ND at MRL         5 ppt           Dichlorvos         ND at MRL         15 ppt           Dimethonate         ND at MRL         100 ppt           Dimethoate         ND at MRL         100 ppt           Diselforon         ND at MRL         100 ppt           Stafforon         ND at MRL         100 ppt           Stafforon         ND at MRL         50 ppt           Stafforon         ND at MRL         50 ppt           Adalathion         ND at MRL         50 ppt           Adalathion         ND at MRL         50 ppt           Adetochor         ND at MRL         50 ppt           Adetochor         ND at MRL         50 ppt           Adetobachor         ND at MRL         50 pp	orothalonil	ND at MRL	50 ppt		
Cylluthin         ND at MRL         100 ppt           Delsopropylatrazine         ND at MRL         150 ppt           Desettylatrazine         89.9 ppt         50 ppt           Diazinon         ND at MRL         30 ppt           Diazinon         ND at MRL         30 ppt           Diazinon         ND at MRL         75 ppt           Dichlobenil         ND at MRL         5 ppt           Dichlobros         ND at MRL         15 ppt           Dimethoate         ND at MRL         16 ppt           Dimethoate         ND at MRL         100 ppt           Disulfoton         ND at MRL         100 ppt           Stellforun         ND at MRL         50 ppt           Ethofumesate         ND at MRL         50 ppt           Stellforun         ND at MRL         50 ppt           Adatathion         ND at MRL         50 ppt           Adatathion         ND at MRL         50 ppt           Adetrbuzin DA         ND at MRL         50 ppt           Adetrbuzin DAN         ND at	orpyrifos	ND at MBL	40 ppt		
DescriptionND at MRL150 pptDescription89.9 ppt50 pptDescriptionND at MRL30 pptDiazinon OxonND at MRL50 pptDichobenilND at MRL5 pptDichobrosND at MRL15 pptDichobrosND at MRL15 pptDimetheanaidND at MRL100 pptDimetheateND at MRL100 pptDistributionND at MRL100 pptSteinvalerateND at MRL150 pptEfforvalerateND at MRL150 pptEthofumesateND at MRL50 pptConforsND at MRL50 pptAlathionND at MRL50 pptAdathionND at KRL500 pptAdathiourin DAANND at ERL500 pptAdathiourin DADKND at KRL75 pptParathiour-methylND at MRL75 pptParathiour-methylND at MRL75 pptParathiour-methylND at MRL75 pptParathiour-methylND at MRL75 pptPhorateND at MRL75 pptPhorateND at MRL75 ppt <td>mazone</td> <td>ND at MRL</td> <td>15 ppt</td> <td></td> <td></td>	mazone	ND at MRL	15 ppt		
Desethylatrazine89.9 pt50 ptDiazinonND at MRL30 ptDiazinon OxonND at MRL75 ptDichlobenilND at MRL5 ptDichlobenilND at MRL15 ptDirethoanidND at MRL15 ptDirethoateND at MRL100 pptDisulfotonND at MRL100 pptDirethoateND at MRL100 pptDirethoateND at MRL100 pptDirethoateND at MRL100 pptDirethoateND at MRL50 pptStanformesteND at MRL50 pptStanformesteND at MRL50 pptFonofosND at MRL50 pptAdathionND at MRL75 pptAdathionND at MRL75 pptAdathionND at KRL500 pptAdathionND at KRL500 pptAdathionND at KRL500 pptAdathionND at KRL75 pptAdathionND at KRL75 pptAdathionND at KRL75 pptAdathionND at KRL75 ppt </td <td>luthrin</td> <td>ND at MRL</td> <td>100 ppt</td> <td></td> <td></td>	luthrin	ND at MRL	100 ppt		
Diazinon         ND at MRL         30 ppt           Diazinon Oxon         ND at MRL         75 ppt           Dichloberil         ND at MRL         5 ppt           Dichlorvos         ND at MRL         15 ppt           Dimethoamid         ND at MRL         15 ppt           Dimethoate         ND at MRL         100 ppt           Disulfoton         ND at MRL         100 ppt           Disulfoton         ND at MRL         150 ppt           Esfervalerate         ND at MRL         150 ppt           Esfervalerate         ND at MRL         50 ppt           Ethoffuralin         ND at MRL         50 ppt           Fonofos         ND at MRL         50 ppt           Adatathion         ND at MRL         50 ppt           Adetolachor         ND at MRL         500 ppt           Adetolachor         ND at MRL         500 ppt           Adetolacon         ND at KRL	sopropylatrazine	ND at MRL	150 ppt		
Dazinon Oxon         ND at MRL         75 ppt           Dichlobenil         ND at MRL         5 ppt           Dichlobros         ND at MRL         15 ppt           Dimethoate         ND at MRL         100 ppt           Disulfoton         ND at MRL         100 ppt           Disulfoton         ND at MRL         100 ppt           Disulfoton         ND at MRL         100 ppt           Effervalerate         ND at MRL         150 ppt           Esfervalerate         ND at MRL         50 ppt           Ethalfuralin         ND at MRL         50 ppt           Adathion         ND at MRL         50 ppt           Adathon         ND at MRL         50 ppt           Adathon         ND at MRL         50 ppt           Adethoxychlor         ND at MRL         50 ppt           Adethoxychlor         ND at MRL         25 ppt           Adethoxychlor         ND at MRL         75 ppt           Adethoxychlor         ND at ERL         500 ppt           Adethoxychlor         ND at KRL         500 ppt           Adethoxychlor         ND at KRL         500 ppt           Adethoxychlor         ND at KRL         500 ppt           Adethouzin DAOK <t< td=""><td>sethylatrazine</td><td>89.9 ppt</td><td>50 ppt</td><td></td><td></td></t<>	sethylatrazine	89.9 ppt	50 ppt		
Dichlobernil         ND at MRL         5 ppt           Dichlorvos         ND at MRL         15 ppt           Dirnethenamid         ND at MRL         15 ppt           Dirnethoate         ND at MRL         10 ppt           Disulfoton         ND at MRL         60 ppt           EPTC         ND at MRL         150 ppt           Esfenvalerate         ND at MRL         50 ppt           Estenvalerate         ND at MRL         50 ppt           Conofos         ND at MRL         50 ppt           Conofos         ND at MRL         50 ppt           Conofos         ND at MRL         50 ppt           Adathoin         ND at MRL         50 ppt           Adethoxychlor         ND at MRL         75 ppt           Adethoxychlor         ND at MRL <td>zinon</td> <td>ND at MRL</td> <td>30 ppt</td> <td></td> <td></td>	zinon	ND at MRL	30 ppt		
DehonorsND at MRL15 pptDimethonandND at MRL15 pptDimethonateND at MRL100 pptDisulfotonND at MRL60 pptEPTCND at MRL10 pptEstensalerateND at MRL150 pptEthalfuralinND at MRL50 pptAdathonND at MRL50 pptAdethozychlorND at MRL75 pptAdetribuzin DAND at ERL500 pptAdetribuzin DADKND at ERL500 pptAdathonND at KRL75 pptAdathonND at MRL75 pptAdathonND at MRL25 pptAdathonND at MRL25 pptAdathon	zinon Oxon	ND at MRL	75 ppt		
Dimethenamid         ND at MRL         15 ppt           Dimethoate         ND at MRL         100 ppt           Disulfoton         ND at MRL         60 ppt           PTC         ND at MRL         10 ppt           Safenvalerate         ND at MRL         150 ppt           Ethafluralin         ND at MRL         50 ppt           Stensterate         ND at MRL         50 ppt           Adathfuralin         ND at MRL         50 ppt           Adetribuzin         ND at MRL         75 ppt           Adetribuzin DADK         ND at ERL         500 ppt           Adathfuralin         ND at MRL         75 ppt           Adathfuralin         ND at MRL         75 ppt           Adathfuralin         ND at MRL         75 ppt           Adathfuralin         ND at MRL         100 ppt           Pronate         ND a	hlobenil	ND at MRL	5 ppt		
ND at MRL         100 ppt           Disulfoton         ND at MRL         60 ppt           PTC         ND at MRL         10 ppt           sternvalerate         ND at MRL         50 ppt           thaffuralin         ND at MRL         50 ppt           thofumesate         ND at MRL         50 ppt           onofos         ND at MRL         50 ppt           datathion         ND at MRL         50 ppt           Aterboxychlor         ND at KRL         500 ppt           Aterboxin DADK         ND at ERL         500 ppt           Aterboxin DADK         ND at KRL         500 ppt           Aterboxin MRL         100 ppt           Aterboxin MRL         100 ppt           Aterboxin MRL         100 ppt           Aterboxin MRL         50	hlorvos	ND at MRL	15 ppt		
Disulfoton         ND at MRL         60 ppt           EPTC         ND at MRL         10 ppt           isfenvalerate         ND at MRL         150 ppt           ithalfuralin         ND at MRL         50 ppt           ithoresate         ND at MRL         50 ppt           ionofos         ND at MRL         50 ppt           idathion         ND at MRL         50 ppt           idathion         ND at MRL         50 ppt           idathon         ND at MRL         50 ppt           idatothor         ND at MRL         50 ppt           idetribuzin         ND at MRL         50 ppt           idetribuzin         ND at MRL         50 ppt           idetribuzin DA         ND at MRL         25 ppt           idetribuzin DA         ND at ERL         500 ppt           idetribuzin DAK         ND at ERL         500 ppt           idetribuzin DK         ND at KRL         500 ppt           idataon         ND at MRL         500 ppt           idataon         ND at MRL         100 ppt           idataon         ND at MRL         100 ppt           idataon         ND at MRL         75 ppt           idatonon         ND at MRL         25 ppt </td <td>tethenamid</td> <td>ND at MRL</td> <td>15 ppt</td> <td></td> <td></td>	tethenamid	ND at MRL	15 ppt		
EPTCND at MRL10 pptistervalerateND at MRL150 pptithalfluralinND at MRL50 pptithofumesateND at MRL50 pptionofosND at MRL50 pptionofosND at MRL50 pptidatathionND at MRL50 pptidethoxychlorND at MRL50 pptidethoxychlorND at MRL50 pptidethoxychlorND at MRL25 pptidethoxychlorND at KRL500 pptidethoxychlorND at ERL500 pptidetribuzin DAND at ERL500 pptidetribuzin DANKND at ERL500 pptidetribuzin DKND at MRL75 ppticatation-methylND at MRL75 ppticatathian-methylND at MRL75 ppticatathian-methylND at MRL75 pptichorateND at MRL75 pptichorateND at MRL75 pptichorateND at MRL75 pptichorateND at MRL100 pptichorateND at MRL25 pptichorateND at MRL25 pptichorateND at MRL100 ppt	tethoate	ND at MRL	100 ppt		
Esfervalerate         ND at MRL         150 ppt           Ethalfluralin         ND at MRL         50 ppt           Ethofumesate         ND at MRL         50 ppt           onofos         ND at MRL         15 ppt           Adathion         ND at MRL         50 ppt           Adethoxychlor         ND at MRL         50 ppt           Adotlochlor         ND at MRL         50 ppt           Adethoxychlor         ND at MRL         25 ppt           Adethouzin DA         ND at ERL         500 ppt           Adethouzin DA         ND at ERL         500 ppt           Adethouzin DANK         ND at ERL         500 ppt           Adethouzin DANK         ND at ERL         500 ppt           Adetribuzin DK         ND at MRL         75 ppt           oxadiazon         ND at MRL         100 ppt           arathion-methyl         ND at MRL         75 ppt           Phorate         ND at MRL         25 ppt           Phorate         ND at MRL         25 ppt	ulfoton	ND at MRL	60 ppt		
All affuralin         ND at MRL         50 ppt           Sthofumesate         ND at MRL         50 ppt           conofos         ND at MRL         15 ppt           Adathion         ND at MRL         50 ppt           Adethoxychlor         ND at MRL         25 ppt           Adethozin         ND at MRL         75 ppt           Adethozin         ND at ERL         500 ppt           Adethozin         ND at MRL         75 ppt           Adethozin         ND at MRL         75 ppt           Adataon         ND at MRL         25 ppt <tr< td=""><td>rc</td><td>ND at MRL</td><td>10 ppt</td><td></td><td></td></tr<>	rc	ND at MRL	10 ppt		
Kithofumesate         ND at MRL         50 ppt           Konorlos         ND at MRL         15 ppt           Alathion         ND at MRL         50 ppt           Alethoxychlor         ND at MRL         50 ppt           Adetoxychlor         ND at MRL         25 ppt           Adetolachlor         ND at MRL         25 ppt           Adetribuzin         ND at KRL         500 ppt           Adetribuzin DAOK         ND at ERL         500 ppt           Adetribuzin DAK         ND at ERL         500 ppt           Adetribuzin DK         ND at KRL         75 ppt           Parathlon-methyl         ND at MRL         75 ppt           Parathlon-methyl         ND at MRL         100 ppt           Prorate         ND at MRL         25 ppt	envalerate	ND at MRL	150 ppt		
FonofosND at MRL15 pptAlathionND at MRL50 pptAethoxychlorND at MRL50 pptAetolachlorND at MRL25 pptAetribuzinND at MRL75 pptAetribuzin DAND at ERL500 pptAetribuzin DADKND at ERL500 pptAetribuzin DKND at MRL75 pptAetribuzin OMKND at MRL75 pptAetribuzin MKLND at MRL75 pptArathlon-methylND at MRL100 pptPronateND at MRL25 pptPrometonND at MRL100 ppt	alfluralin	ND at MRL	50 ppt		
AlalahionND at MRL50 pptAethoxychlorND at MRL50 pptAetolachlorND at MRL25 pptAetolachlorND at MRL75 pptAetribuzinND at ERL500 pptAetribuzin DADKND at ERL500 pptAetribuzin DKND at KRL75 pptAvadiazonND at MRL75 pptArarthion-methylND at MRL100 pptPendimethalinND at MRL25 pptYrometonND at MRL100 ppt	ofumesate	ND at MRL	50 ppt	•	
AethoxychlorND at MRL50 pptAetolachlorND at MRL25 pptAetribuzinND at MRL75 pptAetribuzin DAND at ERL500 pptAetribuzin DADKND at ERL500 pptAetribuzin DAKND at KRL500 pptArathlorn-methylND at MRL75 pptArathlorn-methylND at MRL75 pptArathlorn-methylND at MRL75 pptYonateND at MRL25 pptYonateND at MRL100 ppt	iofos	ND at MRL	15 ppt		
Hetolachlor         ND at MRL         25 ppt           fetribuzin         ND at MRL         75 ppt           fetribuzin DA         ND at ERL         500 ppt           fetribuzin DADK         ND at ERL         500 ppt           fetribuzin DK         ND at ERL         500 ppt           xxadiazon         ND at MRL         75 ppt           rarathion-methyl         ND at MRL         100 ppt           rendimethalin         ND at MRL         25 ppt           rborate         ND at MRL         25 ppt	athion	ND at MRL	50 ppt		
MetribuzinND at MRL75 ptMetribuzin DAND at ERL500 pptMetribuzin DADKND at ERL500 pptMetribuzin DKND at ERL500 pptXadiazonND at MRL75 pptvarathlon-methylND at MRL75 pptVendenkalinND at MRL75 pptVendenkalinND at MRL75 pptVorateND at MRL25 pptVorateND at MRL100 ppt	hoxychlor	ND at MRL	50 ppt		
Actribuzin DAND at ERL500 pptActribuzin DADKND at ERL500 pptActribuzin DKND at ERL500 pptDxadiazonND at MRL75 pptParathion-methylND at MRL100 pptProduct HallinND at MRL75 pptProrateND at MRL25 pptPrometonND at MRL100 ppt	olachlor	ND at MRL	25 ppt		
ND at ERL     500 ppt       Metribuzin DK     ND at ERL     500 ppt       bxadiazon     ND at MRL     75 ppt       varathion-methyl     ND at MRL     100 ppt       vendimethalin     ND at MRL     75 ppt       vhorate     ND at MRL     25 ppt       rometon     ND at MRL     100 ppt	ribuzin	ND at MRL	75 ppt		
ND at ERL     500 ppt       bxadiazon     ND at MRL     75 ppt       arathion-methyl     ND at MRL     100 ppt       rendimethalin     ND at MRL     75 ppt       rhorate     ND at MRL     25 ppt       rometon     ND at MRL     100 ppt	nibuzin DA	ND at ERL	500 ppt		
Dxadiazon     ND at MRL     75 pt       Parathion-methyl     ND at MRL     100 ppt       Pendimethalin     ND at MRL     75 ppt       Phorate     ND at MRL     25 ppt       Prometon     ND at MRL     100 ppt	ribuzin DADK	ND at ERL	500 ppt		
Parathlon-methyl     ND at MRL     100 ppt       Pendimethalin     ND at MRL     75 ppt       Phorate     ND at MRL     25 ppt       Prometon     ND at MRL     100 ppt	ribuzin DK	ND at ERL	500 ppt		
Pendimethalin         ND at MRL         75 ppt           Phorate         ND at MRL         25 ppt           Prometon         ND at MRL         100 ppt	adiazon	ND at MRL	75 ppt		
ND at MRL         25 ppt           Irometon         ND at MRL         100 ppt	athion-methyl	ND at MRL	100 ppt		
rometon ND at MRL 100 ppt	ndimethalin	ND at MRL	75 ppt		
	vrate	ND at MRL	25 ppt		
	meton	ND at MRL	100 ppt		
Propachior ND at MRL 30 ppt	pachlor	ND at MRL	30 ppt		
Sample Remarks:	male Demostrat				

Report ID: 436455 Kathryn Reynolds Water Analysis Unit Supervisor	Kallan In Ports
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MINNESOTA DEPARTMENT

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: GC

	Date Printed: Date Collect 8/13/2015 08/06/2				n Contact: trie Juenemann
	Semple Numbers Inspector No: SBW15701				
TURE	Lab ID: W-15-1406		SDG ID: 15-SDG-3446		
	Quantity x Sample Size:		Project:		
	1 x 1 L		Surface Water		
	Product Name: Water, River/Strea	m			
t	Description:			88.499.009.009.009	
Page 2 of 2	Collected From:	тоталыхоскалалоскалалдоддовандор		Alderson	
	Whitewater River -	South Bran	nch/SBW		
	Temperature Receive	əd:	4.4	deg C	
MRL	Res	ult Comme	nt		

Analyte	Result	MRL	Result Comment
GCMSMS Monitoring			
Propazine	ND at MRL	25 ppt	
Simazine	ND at MRL	75 ppt	
Tebupirlmiphos	ND at MRL	30 ppt	
Terbufos	ND at MRL	30 ppt	
Tolfenpyrad	ND at MRL	100 ppt	
Triallate	ND at MRL	50 ppt	
Trifluralin	ND at MRL	50 ppt	
lambda-Cyhalothrin	ND at MRL	75 ppt	
zeta-Cypermethrin	ND at MRL	500 ppt	

Sample Remarks:

Report ID: 436455 I verify Water	Analysis Unit Supervisor	m Porto
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OF AGRICULTURE

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### Water Monitoring Final Report

Page 1 of 3

Analysis Requested: LC

Product Name: Water, River/Stream Description: **Collected From:** Whitewater River - South Branch/SBW Temperature Received:

Date Collected: 08/06/2015

Project:

Surface Water

Division Contact: Marie Juenemann

SDG ID: 15-SDG-3446

Date Printed: 8/14/2015

1x1L

Bample Numbers Inspector No: SBW15701 Lab ID: W-15-1411

Quantity x Sample Size:

Analysis Requested: LC			whitewater raver - count of	anon/ob/w	
,			Temperature Received:	4.4 deg C	
Analyte	Result	MRL	Result Comn	nent	
LCMSMS (+) Monitoring					
Acetamiprid	ND at MRL	25 ppt			
Aldicarb Sulfone	ND at MRL	15 ppt			
Aldicarb Sulfoxide	ND at MRL	50 ppt			
Azoxystrobin	ND at MRL	10 ppt			
Bensulfuron-methyl	ND at MRL	16.7 ppt			
Bensulide	ND at MRL	250 ppt			
Boscalid	ND at MRL	50 ppt			
Bromacil	ND at MRL	30 ppt			
Carbaryl	ND at MRL	25 ppt			
Carbendazim	ND at MRL	10 ppt			
Carbofuran	ND at MRL	13.3 ppt			
Chlorantraniliprole	ND at MRL	50 ppt			
Chlorimuron-ethyl	ND at MRL	20 ppt			
Chlorpyrifos Oxon	ND at MRL	40 ppt			
Clothianidin	ND at MRL	25 ppt			
Cyanazine	ND at MRL	25 ppt			
Cyantraniliprole	ND at MRL	100 ppt			
DEDI Atrazine	75.6 ppt	50 ppt			
Dicrotophos	ND at MRL	25 ppt			
Difenoconazole	ND at MRL	25 ppt			
Dinotefuran	ND at MRL	25 ppt			
Disulfoton Sulfone	ND at MRL	20 ppt			
Diuron	ND at MRL	13.3 ppt			
Flumetsulam	ND at MRL	50 ppt			
Flutriafol	ND at MRL	10 ppt			
Halosulfuron-methyl	ND at MRL	30 ppt			
Hexazinone	ND at MRL	10 ppt			
Hydroxyatrazine	14.2 ppt	6.7 ppt			
Imazamethabenz Acid	ND at MRL	10 ppt			
Imazamethabenz-methyl	ND at MRL	5 ppt			
Imazamox	ND at MRL	13.3 ppt			
Imazapic	ND at MRL	10 ppt			
Imazapyr	ND at MRL	8.3 ppt			
Imazaquin	ND at MRL	16.7 ppt			
Imazethapyr	ND at MRL	6.7 ppł			
Imidacloprid	ND at MRL	20 ppt			
Sample Remarks:					

Fluxapyroxad - ND at ERL (10 ppt)

Report ID: 436460	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kapan m. Pors	
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Date Printed: Date Collected: **Division Contact:** 8/14/2015 08/06/2015 Marie Juenemann Sample Numbers Inspector No: SBW15701 Lab ID: W-15-1411 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1 x 1 L Surface Water Product Name: Water, River/Stream Description: Page 2 of 3 Collected From: Whitewater River - South Branch/SBW

nalysis Requested: LC		Whitewater River - South Branch/SBW		
and for the second s			Temperature Received: 4.4 deg C	
Analyte	Result	MRL	Result Comment	
LCMSMS (+) Monitoring				
soxaflutole	ND at MRL	40 ppt		
_inuron	ND at MRL	20 ppt		
Vetalaxyl	ND at MRL	8.3 ppt		
Aetsulfuron-methyl	ND at MRL	23.3 ppt		
Ayclobutanil	ND at MRL	10 ppt		
licosulfuron	ND at MRL	26.6 ppt		
lorflurazon	ND at MRL	20 ppt		
lorflurazon-desmethyl	ND at MRL	50 ppt		
Dxydemeton-methyl	ND at MRL	20 ppt		
Parathion-methyl Oxon	ND at MRL	25 ppt		
lcoxystrobin	ND at MRL	50 ppt		
Prometryn	ND at MRL	3.3 ppt		
ropiconazole	ND at MRL	10 ppt		
yraclostrobin	ND at MRL	25 ppt		
yroxasulfone	ND at MRL	50 ppt		
Saflufenacil	ND at MRL	15 ppt		
Siduron	ND at MRL	6.7 ppt		
Sulforneturon-methyl	ND at MRL	8.3 ppt		
ebuconazole	ND at MRL	10 ppt		
etraconazole	ND at MRL	10 ppt		
hiacloprid	ND at MRL	50 ppt		
hiamethoxam	ND at MRL	25 ppt		
hifensulfuron-methyl	ND at MRL	16.7 ppt		
hiobencarb	ND at MRL	8.3 ppt		
riasulfuron	ND at MRL	23.3 ppt		
LCMSMS (-) Monitoring				
,4,5-T	ND at MRL	50 ppt		
,4,5-TP	ND at MRL	50 ppt		
,4-D	ND at MRL	8.3 ppt		
.4-DB	ND at MRL	20 ppt		
cetochlor ESA	58.7 ppt	30 ppt		
cetochlor OXA	ND at MRL	33.3 ppt		
lachior ESA	364 ppt	41.6 ppt		
lachlor OXA	ND at MRL	33.3 ppt		
lentazon	18.3 ppt	5 ppt		
iromoxynil	ND at MRL	25 ppt		

Fluxapyroxad - ND at ERL (10 ppt)

Repo	rt ID: 436460	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffan	m. Ress	
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Analysis Requested: LC

Page 3 of 3

 Date Printed: 8/14/2015
 Date Collected: 08/06/2015
 Division Contact: Marie Juenemann

 Sample Numbers
 Inspector No: Lab ID: W-15-1411
 SDG ID: 15-SDG-3446

 Quantity x Sample Size:
 Project: 1 x 1 L
 Surface Water

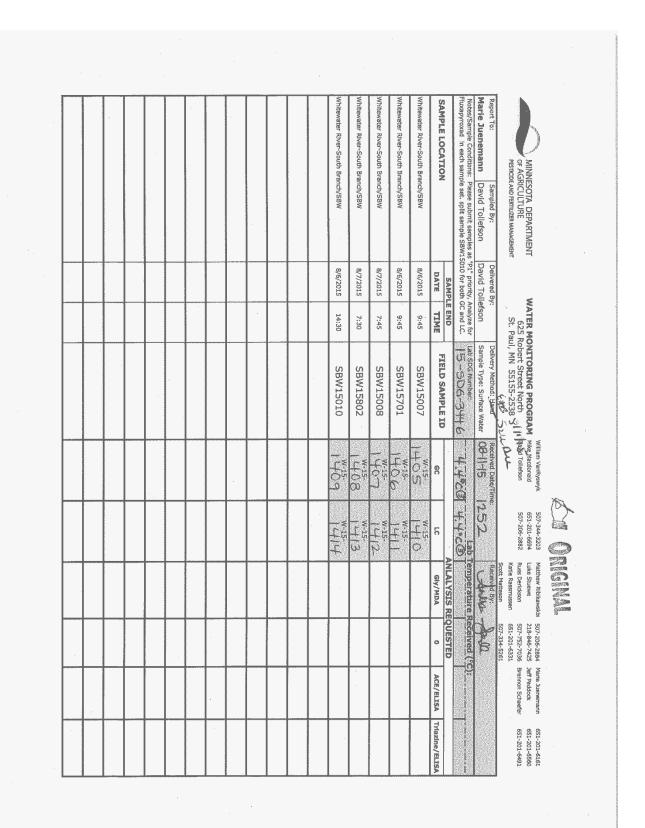
 Product Name: Water, River/Stream
 Surface From: Collected From: Whitewater River - South Branch/SBW

Analysis Requested: LU					
raidiyolo rioquotosi. Lo			Temperature Received:	4.4 deg C	
Analyte	Result	MRL	Result Comn	nent	
LCMSMS (-) Monitoring					
Clopyralid	ND at MRL	41.6 ppt			
Dicamba	ND at MRL	50 ppt			
Dichlorprop	ND at MRL	50 ppt			
Dimethenamid ESA	6.77 ppt	6.7 ppt			
Dimethenamid OXA	ND at MRL	10 ppt			
Flufenacet OXA	ND at MRL	8.3 ppt			
Isoxaflutole DKN	ND at MRL	50 ppt			
MCPA	ND at MRL	5 ppt			
MCPB	ND at MRL	20 ppt			
MCPP	ND at MRL	50 ppt			
Mesotrione	ND at MRL	50 ppt			
Metolachlor ESA	551 ppt	10 ppt			
Metolachlor OXA	35.8 ppt	10 ppt			
Picloram	ND at MRL	41.6 ppt			
Propachior ESA	ND at MRL	30 ppt			
Propachior OXA	ND at MRL	10 ppt			
Sedaxane	ND at MRL	75 ppt			
Tembotrione	ND at MRL	50 ppt			
Triclopyr	ND at MRL	50 ppt			

Sample Remarks:

Fluxapyroxad - ND at ERL (10 ppt)

Report ID: 436460	 l verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallan n. Ross



# MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



Water	Monitor	ing Final	Report
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Re-issue of Report ID: SBW15701-233230

Date Reported:	<b>SDG ID</b> :	Page:
10/26/2015	15-SDG-3447	Page 1 of 1
Division Contact:	Marie Juenema	nn

SDG Comments:

		SBW1570	)1		
LAB Sample ID:	AR-15-2622	Quantity x Sample Size:	1 x 250 ml		Project Name: Surface Water
Inspector Sample ID:	SBW15701	Date/Time Collected:	8/6/2015	0945	
Product/Description:	Water, River/Stream	Date/Time Received:	8/11/2015	1252	Temperature Received: 0 deg C
Collected From:	Whitewater River - So	uth Branch/SBW			
Analysis Requested:	TP+DOP				
Analyte	Result	MRL	Met	hod	Result Comment
Ortho Phosphorus, Dissolv	ed 0.018 ppm	0.005 ppm	EPA 365.1		
Ortho Phosphorus, Dissolv Date/Time	ed Analysis 08/12/2015 1	1:07:15 am			
Total Phosphorus	0.067 ppm	0.01 ppm	EPA 365.1		
Total Phosphorus Analysis	Date/Time 08/12/2015 0	)1:27:49 pm			
Sample Remarks:					

lau	uthorize this final report	t.
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Vocasle	Epresmann



				COP	Y					40
OF AGRICU PESTICIDE AND	LTURE Fertilizer management	625 Ro St. Paul	bert Stree , MN 551	55-2538 Spin 21	651-201-6694 507-206-2882	Matthew Ribikawskis Luke Stuewe Russ Derickson Katie Rassmussen Scott Matteson	218-846-7425 507-752-7036 651-201-6331 507-334-5261	Marie Juenemann Jeff Paddock Brennon Schaefer	651-201-6161 651-201-6560 651-201-6491	Tollek Sile
Report To: Marie Juenemann	Sampled By: David Tollefson	Delivered By David Toll		Delivery Method: Hand Sample Type: Surface Water	Received Date/TI	ime: 1252	Received By:	20		i i g
Notes/Sample Conditions: Fluxapyroxad in each sample	Please submit samples as	"P1" priority, A	nalyze for	Lab SDG Number: 15-SDG-3447	0500	Lab Temp	erature Reco	ived (°C):	ذC@	Davi
SAMPLE LOCATION		SAMPL	E END	FIELD SAMPLE ID	y)c-		LYSIS REQU	STED	NH3	2
SAMPLE LOCATION		DATE	TIME	FIELD SAMPLE ID	NO2 + NO3	TP + DOP	CL	TSS		
Whitewater River-South Bran	nch/SBW	8/6/2015	9:45	SBW15007	AR-15- 2619	AR-15- 2621			AR-15- 2624	
Whitewater River-South Bran	nch/SBW	8/6/2015	9:45	SBW15701		AR-15- 2622				
Whitewater River-South Bras	nch/SBW	8/7/2015	7:45	SBW15008	AR-15- 2620	AR-15- 2623			AR-15- 2625	
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					0				,	1
								1 N N		

Date Printed: 8/13/2015

1x1L

Product Name: Water, River/Stream Description:

Collected From:

Sample Numbers Inspector No: SBW15010 Lab ID: W-15-1409

Quantity x Sample Size:

Date Collected: 08/06/2015 Division Contact: Marie Juenemann

15-SDG-3446

SDG ID:

Surface Water

Project:

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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Page 1 of 2

Analysis Requested: GC			Whitewater River - South Bra	anch/SBW
anayoro noquotoa. Go			Temperature Received:	4.4 deg C
Analyte	Result	MRL	Result Comm	ent
GCMSMS Monitoring				
Acetochlor	ND at MRL	30 ppt		
Alachior	ND at MRL	30 ppt		
Atrazine	62.8 ppt	30 ppt		
Benfluralin	ND at MRL	25 ppt		
Sifenthrin	ND at MRL	20 ppt		
Chlorothalonil	ND at MRL	50 ppt		
Chlorpyrifos	ND at MRL	40 ppt		
lomazone	ND at MRL	15 ppt		
Cyfluthrin	ND at MRL	100 ppt		
Deisopropylatrazine	ND at MRL	150 ppt		
Desethylatrazine	87.7 ppt	50 ppt		
Diazinon	ND at MRL	30 ppt		
lazinon Oxon	ND at MRL	75 ppt		
Dichlobenil	ND at MRL	5 ppt		
Dichlorvos	ND at MRL	15 ppt		
Dimethenamid	ND at MRL	15 ppt		
)imethoate	ND at MRL	100 ppt		
Disulfoton	ND at MRL	60 ppt		
PTC	ND at MRL	10 ppt		
Esfenvalerate	ND at MRL	150 ppt		
Ethalfluralin	ND at MRL	50 ppt		
thofumesate	ND at MRL	50 ppt		
onofos	ND at MRL	15 ppt		
falathion	ND at MRL	50 ppt		
Aethoxychior	ND at MRL	50 ppt		
letolachlor	ND at MRL	25 ppt		
letribuzin	ND at MRL	75 ppł		
fetribuzin DA	ND at ERI.	500 ppt		
letribuzin DADK	ND at ERL	500 ppt		
fetribuzin DK	ND at ERL	500 ppt		
Dxadiazon	ND at MRL	75 ppt		
arathlon-methyl	ND at MRL	100 ppt		
endimethalin	ND at MRL	75 ppt		
horate	ND at MRL	25 ppt		
rometon	ND at MRL	100 ppt		
Propachlor	ND at MRL	30 ppt		
Sample Remarks:				

500mLs submitted for GC analysis.

Water Analysis Unit Supervisor Talking and Tomos	havavavavavava	Report ID: 436458	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kafan In Ross
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: GC

Date Printed: 8/13/2015 Date Collected: Division Contact: 08/06/2015 Marie Juenemann Sample Numbers Inspector No: SBW15010 Lab ID: W-15-1409 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1 x 1 L Surface Water Product Name: Water, River/Stream Description: Page 2 of 2 **Collected From:** Whitewater River - South Branch/SBW

		Ter	nperature Received:	4.4 deg C	
Analyte	Result	MRL	Result Comment		
GCMSMS Monitoring					
Propazine	ND at MRL	25 ppt			
Simazine	ND at MRL	75 ppt			
Tebupirimiphos	ND at MRL	30 ppt			
Terbufos	ND at MRL	30 ppt			
Tolfenpyrad	ND at MRL	100 ppt			
Triallate	ND at MRL	50 ppt			
Trifluralin	ND at MRL	50 ppt			
lambda-Cyhalothrin	ND at MRL	75 ppt			
zeta-Cypermethrin	ND at MRL	500 ppt			

Sample Remarks:

500mLs submitted for GC analysis.

Report ID: 436458	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallan n. Bers
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**MINNESOTA DEPARTI** Laboratory 601 Rober Saint Paul, Mini (651)

# Water Monitor

Analysis Requested: LC

MINNESOTA DEPARTMENT		0/14/2010	00/00/2	2010	EVI;	ane Juenemann	
OF AGRICULTURE		Sample Numbers					
		Inspector No: SBV	V15010				
TMENT OF AGRICULTU	IRE	Lab ID: W-1	5-1414	SD	G ID:	15-SDG-3446	
Analysis Report		Quantity x Sample S	lze:	Project:		,	*******
ert Street North		1x1L		Surface	Water		
) 201-6010		Product Name:				,	
/ 201-0010		Water, River/Strea	m.				
oring Final Report		Description:			******		_
	Page 1 of 3	Collected From:					
		Whitewater River -	South Bran	hch/SBW			
		Temperature Receive	ed:	4.4 (	deg C		
Result	MRL	Res	sult Comme	nt			
Not Analyzed	10 ppt	ERL = 10 ppt					
Not Analyzed	25 ppt						
Not Analyzed	15 ppt						
Not Analyzed	50 ppt						
Not Analyzed	10 ppt						
Not Analyzed	16,7 ppt						
Not Analyzed	250 ppt						
Not Analyzed	50 ppt						
Not Analyzed	30 ppt						
Not Analyzed	25 ppt						
Not Analyzed	10 ppt						
****							

Date Printed: 8/14/2015

Date Collected:

08/06/2015

Division Contact:

Marie Juenemann

Analyte	Result	MRL	Result Comment
AD-HOC Test Template			
Fluxapyroxad	Not Analyzed	10 ppt	ERL = 10 ppt
LCMSMS (+) Monitoring			
Acetamiprid	Not Analyzed	25 ppt	
Aldicarb Sulfone	Not Analyzed	15 ppt	
Aldicarb Sulfoxide	Not Analyzed	50 ppt	
Azoxystrobin	Not Analyzed	10 ppt	
Bensulfuron-methyl	Not Analyzed	16.7 ppt	
Bensulide	Not Analyzed	250 ppt	
Boscalid	Not Analyzed	50 ppt	
Bromacil	Not Analyzed	30 ppt	
Carbaryl	Not Analyzed	25 ppt	
Carbendazim	Not Analyzed	10 ppt	
Carbofuran	Not Analyzed	13.3 ppt	
Chlorantraniliprole	Not Analyzed	50 ppt	
Chlorimuron-ethyl	Not Analyzed	20 ppt	
Chlorpyrifos Oxon	Not Analyzed	40 ppt	
Slothlanidin	Not Analyzed	25 ppt	
Dyanazine	Not Analyzed	25 ppt	
Cyantraniliprole	Not Analyzed	100 ppt	
DEDI Atrazine	Not Analyzed	50 ppt	
Dicrotophos	Not Analyzed	25 ppt	
Difenoconazole	Not Analyzed	25 ppt	
Dinotefuran	Not Analyzed	25 ppt	
Disulfoton Sulfone	Not Analyzed	20 ppt	
Diuron	Not Analyzed	13.3 ppt	
lumetsulam	Not Analyzed	50 ppt	
lutriafol	Not Analyzed	10 ppt	
falosulfuron-methyl	Not Analyzed	30 ppt	
lexazinone	Not Analyzed	10 ppt	
lydroxyatrazine	Not Analyzed	6.7 ppt	
nazamethabenz Acid	Not Analyzed	10 ppt	
mazamethabenz-methyl	Not Analyzed	5 ppt	
mazamox	Not Analyzed	13.3 ppt	
mazapic	Not Analyzed	10 ppt	
mazapyr	Not Analyzed	8.3 ppt	
mazaquin	Not Analyzed	16.7 ppt	,
,			

Sample Remarks:

500mLs submitted for LC analysis. Sample not analyzed. Matrix problems encountered during extraction resulted in low surrogate recovery (18%). Insufficient sample size for re-extraction.

Report ID: 436463	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kapan m. Ross
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Date Printed:

1 x 1 L

Product Name: Water, River/Stream Description:

8/14/2015

Sample Numbers Inspector No: SBW15010 Lab ID: W-15-1414

Quantity x Sample Size:

Date Collected:

08/06/2015

Project:

Surface Water

Division Contact:

SDG ID: 15-SDG-3446

Marie Juenemann

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MINNESOTA DEPARTMENT
OF AGRICULTURE

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Page 2 of 3 Collected From:

		Page 2 of 3	Collected From:		
Analysis Requested: LC			Whitewater River - South B	ranch/SBW	
Analysis nequested. CO			Temperature Received:	4.4 deg C	
Analyte	Result	MRL	Result Com	nent	
LCMSMS (+) Monitoring					
Imazethapyr	Not Analyzed	6.7 ppt			
Imidacloprid	Not Analyzed	20 ppt			
Isoxaflutole	Not Analyzed	40 ppt			
Linuron	Not Analyzed	20 ppt			
Metalaxyl	Not Analyzed	8.3 ppt			
Metsulfuron-methyl	Not Analyzed	23.3 ppt			1
Myclobutanil	Not Analyzed	10 ppt			
Nicosulfuron	Not Analyzed	26.6 ppt			
Norflurazon	Not Analyzed	20 ppt			
Norflurazon-desmethyl	Not Analyzed	50 ppt			
Oxydemeton-methyl	Not Analyzed	20 ppt			
Parathion-methyl Oxon	Not Analyzed	25 ppt			
Picoxystrobin	Not Analyzed	50 ppt			
Prometryn	Not Analyzed	3.3 ppt			
Propiconazole	Not Analyzed	10 ppt			
Pyraclostrobln	Not Analyzed	25 ppt			
Pyroxasulfone	Not Analyzed	50 ppt			
Saflufenacil	Not Analyzed	15 ppt			
Siduron	Not Analyzed	6.7 ppt			
Sulfometuron-methyl	Not Analyzed	8.3 ppt			
Tebuconazole	Not Analyzed	10 ppt			
Tetraconazole	Not Analyzed	10 ppt			
Thiacloprid	Not Analyzed	50 ppt			
Thiamethoxam	Not Analyzed	25 ppt			
Thifensulfuron-methyl	Not Analyzed	16.7 ppt			
Thiobencarb	Not Analyzed	8.3 ppt			
Triasulfuron	Not Analyzed	23.3 ppt			
LCMSMS (-) Monitoring					
2,4,5-T	Not Analyzed	50 ppt			
2,4,5-TP	Not Analyzed	50 ppt			
2,4-D	Not Analyzed	8.3 ppt			
2,4-DB	Not Analyzed	20 ppt			
Acetochlor ESA	Not Analyzed	30 ppt			
Acetochlor OXA	Not Analyzed	33.3 ppt			
Alachlor ESA	Not Analyzed	41.6 ppt			
Alachlor OXA	Not Analyzed	33.3 ppt			
Comple Demarket					

Sample Remarks:

500mLs submitted for LC analysis. Sample not analyzed. Matrix problems encountered during extraction resulted in low surrogate recovery (18%). Insufficient sample size for re-extraction.

Report ID: 436463	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallang m	RESS
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

#### Water Monitoring Final Report

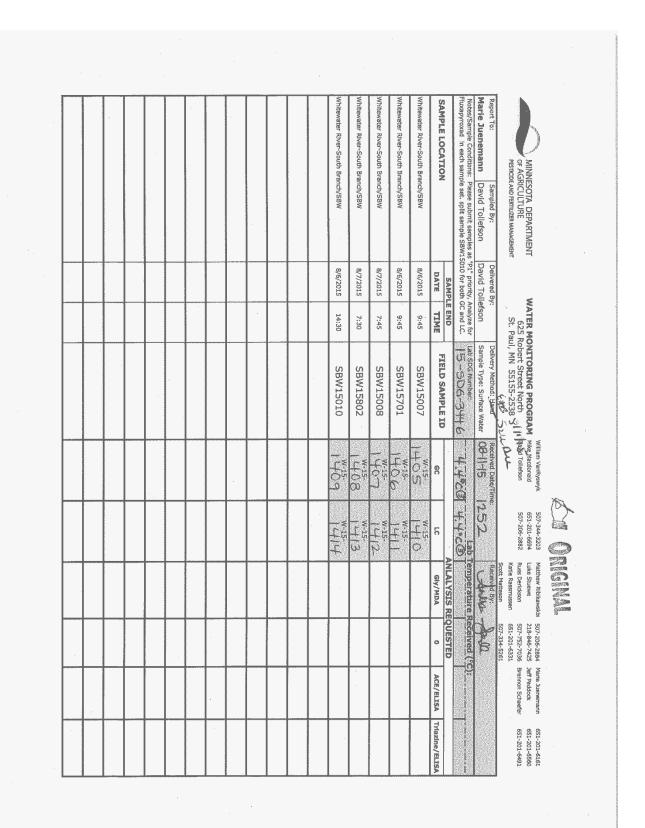
Date Printed: **Division Contact:** Date Collected: 8/14/2015 08/06/2015 Marie Juenemann Sample Numbers Inspector No: SBW15010 Lab ID: W-15-1414 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: Surface Water 1 x 1 L Product Name: Water, River/Stream Description: Page 3 of 3 Collected From: Whitewater River - South Branch/SBW

Analysis Requested: LC			Whitewater River - South Branch/SBW		
			Temperature Received:	4.4 deg C	
Analyte	Result	MRL	Result Com	ment	
LCMSMS (-) Monitoring					
Bentazon	Not Analyzed	5 ppt			
Bromoxynil	Not Analyzed	25 ppt			
Clopyralid	Not Analyzed	41.6 ppt			
Dicamba	Not Analyzed	50 ppt			
Dichlorprop	Not Analyzed	50 ppt			
Dimethenamid ESA	Not Analyzed	6.7 ppt			
Dimethenamid OXA	Not Analyzed	10 ppt			
Flufenacet OXA	Not Analyzed	8.3 ppt			
Isoxaflutole DKN	Not Analyzed	50 ppt			
MCPA	Not Analyzed	5 ppt			
MCPB	Not Analyzed	20 ppt			
MCPP	Not Analyzed	50 ppt			
Mesotrione	Not Analyzed	50 ppt			
Metolachlor ESA	Not Analyzed	10 ppt			
Metolachlor OXA	Not Analyzed	10 ppt			
Picloram	Not Analyzed	41.6 ppt			
Propachlor ESA	Not Analyzed	30 ppt			
Propachlor OXA	Not Analyzed	10 ppt			
Sedaxane	Not Analyzed	75 ppt			
Tembotrione	Not Analyzed	50 ppt			
Triclopyr	Not Analyzed	50 ppt			

#### Sample Remarks:

500mLs submitted for LC analysis. Sample not analyzed. Matrix problems encountered during extraction resulted in low surrogate recovery (18%). Insufficient sample size for re-extraction.

Water Analysis Unit Supervisor	Report ID: 436463	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffang n. Ross
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Protecting, maintaining and improving the health of all Minnesotans

Report Date: 9/16/15 Client Name: RG - MPCA - EOD-Fish Kill Studies Project Code: RG Project Name: EOD-Fish Kill Studies

Work Order Number: 15H0524

Report To: RG - MPCA - EOD-Fish Kill Studies Joe Magee 520 Lafayette Rd. Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

May

Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164 (651) 201-5300 http://www.health.mn.us/divs/phl/environmental

Page 1 of 17

	Summary of Samples Received	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 09/16/15 14:50	

Final Report

Work Order Comment: Non-MDH container received for E. Coli-MPN-QT; run with data qualified per J. Magee. Use PRJ00075 per N. Flandrick. ECB 8/11/15

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
none	15H052401	Non-potable Water	08.06/15 14:30	08/07/15 11:59	-1.3

FINALREPORT

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Report ID: 09 162015 145020

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15H0524		101								
		A	В		C		D		E	
Minnesota Pollutio	n Control Age	ency	MDH	Stream La	b She	eet			Page	of
Program Code: RG	Collecter	Joe	Mage	e, Jen E	nder		Proi	ect ID: ? - SI	3 Whitewa	ater Fish
Collector Phone: 50	7-206-2	2601		M N	PCA Plame ar	M nd Phone: Jo	e Ma	gee 507-	206-2	2601
Sample Information	A		E	•		С		D		E
Location ID (ex 27-0016-00-101 or S005-515)										
Field Name /	Campo	around				1.0	5			
Lake Name Bio Station							5			
Date (MM/DD/YY)	8/6	/15								
Time (Military)	14:	30						3		
Quality Assurance*										
Analysis Group No.**										
Sample Depth (Top) m (Lake Only)										
Sample Depth (Bot) m (Lake Only)										
Filter Volume (for chlorophyll a)										
(tor enterophynic)			and	Sample Analy			a de la comercia de l	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		Norse is
AIS- autoclave				equesting analys						
Dilution	Ē		F		Ħ				Ē	
Solids, Total (SM 2540B)	$\overline{\mathbf{X}}$	Field filtered		Field filtered	F	Field filtered	Ē	Field filtered	H	Field filt
Nitrate + Nitrite (EPA 353.2)	X	Field filtered		Field filtered	Ħ	Field filtered		Field filtered	F	Field filt
Solids, Suspended (SM 2540D)	X	Field filtered		Field filtered	Ħ	Field filtered	Ē	Field filtered		Field filt
Ammonia-N (EPA 350.1)	X	Field filtered	H	Field filtered	Ħ	Field filtered	Ē	Field filtered		Field filt
BOD (SM 5210B)	X	Field filtered	H	Field filtered	F	Field filtered	Ħ	Field filtered	Π	Field filt
Chloride (EPA 300.1)	X	Field filtered	H	Field filtered	H	Field filtered	H	Field filtered		Field filt
Phosphorus (SM 4500P I)	X	Field filtered		Field filtered	H	Field filtered	Ē	Field filtered	F	Field filt
Solids,Total Volatile (EPA 160.4)	X	Field filtered		Field filtered	Ħ	Field filtered	H	Field filtered	H	Field filt
E. Coli - MPN - QT (SM 9223)	X	Field filtered	Π	Field filtered	Ħ	Field filtered	Ē	Field filtered	П	Field filt
20 A.		Field filtered	Π	Field filtered	Π	Field filtered	Ē	Field filtered		Field filt
8		Field filtered		Field filtered		Field filtered		Field filtered	Π	Field filt
Lab Temp (°C)								dia survi		
	* FR = Field B					PARATE COLUMN lank, BB = Bottle Bla		eagent Blank	(	CAH revise
1		alysis Group by Pro	ogram Code	Identified by a Num	ber Code.					
Relinguish	ed By / Affiliat	ion		Chain of Cu ate/Time	stoay	A / Accepted By	/ Affiliatio	0		Date/Time
Sampler)	sin	(mpin		16/15 219:	30 -	KBIMDH			8/07	15 11
	0	~				1 - 1		10		
$\lor$						X				
Sampler Comments										
Receiving Comments										

224

A	B	C	D	E		
? - SB Whitewater Fish Kill						
Campground						
2						
8/6/15						
14:30						
			8			
17.03						
632						
13.89						
8.21						
			*			
			-			
		×				
	1					
			20 10			
	Campground 8/6/15 14:30 17.03 632 13.89	Campground       8/6/15       14:30       17.03       632       13.89	? - SB       Whitewater         Campground       -         8/6/15       -         14:30       -         14:30       -         17.03       -         632       -         13.89       -         8.21       -         14.10       -         11.03       -         12.04       -         13.89       -         8.21       -         11.01       -         11.02       -         11.03       -         11.04       -         11.05       -         11.04       -         11.05       -         11.04       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05       -         11.05 <td>? - SB       Whitewater Fish Kill         Campground       -         8/6/15       -         14:30       -         14:30       -         17.03       -         632       -         13.89       -         8.21       -         14.30       -         13.89       -         8.21       -         14.30       -         13.89       -         13.1       -         13.2       -         13.3       -         13.4       -         13.4       -         13.5       -         13.6       -         13.8       -         13.8       -         14.30       -         13.89       -         14.30       -         14.30       -         14.30       -         14.30       -         14.30       -         13.89       -         14.30       -         14.30       -         14.30       -         14.30       -         14.30<!--</td--></td>	? - SB       Whitewater Fish Kill         Campground       -         8/6/15       -         14:30       -         14:30       -         17.03       -         632       -         13.89       -         8.21       -         14.30       -         13.89       -         8.21       -         14.30       -         13.89       -         13.1       -         13.2       -         13.3       -         13.4       -         13.4       -         13.5       -         13.6       -         13.8       -         13.8       -         14.30       -         13.89       -         14.30       -         14.30       -         14.30       -         14.30       -         14.30       -         13.89       -         14.30       -         14.30       -         14.30       -         14.30       -         14.30 </td		

A	
в	
С	
D	
E	

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<b>Sample Condition Upon Receipt</b> Minnesota Department of Health Public Health Laborato	
Parcel Information	i
Date & time of rea	AUG 7'15 11:59
Courier: $\Box$ UPS $\Box$ FedEx $\nexists$ Spee-Dee $\Box$ USPS $\Box$ Other Tracking # $SP$ 00 714903 00 5229	🗆 Walk-in
After hours drop off:  Refrigerator  Freezer Unrefrigerated	
Parcel: A Plastic cooler □ Styrofoam cooler □ Cardboard box □ Sing □ Other	
Custody seals present:	X) N/A
Packaging Information	Sec. Sec.
Cooling material: Wet ice $\Box$ Ice pack $\Box$ Gel pack $\Box$ Dry ice $\Box$ None $\Box$ Condition of cooling material: $\Box$ Solid Partial $\Box$ Liquid; Liquid tempe Representative sample temperature: $-1.3$ °C IR thermometer in nitials of person receiving parcel: $\_$	rature:°C □ N/A
Chain of Custody, Sample Container & Analysis	Information
Chain of custody received: Yes I No	
Chain of custody type: H Standard Civil Criminal Unknown	
Radiochemistry request received & sample surveyed: $\Box$ < .5 mrem/hr	$\Box \ge .5 \text{ mrem/hr}$
All sample containers received intact: XYes 🗆 No	
All sample containers are unique to the sample point listed on the chain	-/-
All samples have been received within the specified holding time for an	
Sample submission meets the conditions of the MDH Environmental La Policy:  Yes No 'No' has been checked, details are entered in the work order memo notes.	aboratory Sample Acceptance
itials of person logging in the work order request:	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Final Report Case Narrative Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Program Code: RG	Project ID: PRJ00075
Program Name: EOD-Fish Kill Studies	Facility Name: None
Collected by: Joe Magee, Jen Ender	City: None
Collector ID: None	Generated: 09/16/2015 14:50

Except where noted in this report, no additional comments are needed for this Work Order.

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Report ID: 09 162015 145020

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Final Report Analytical Results

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Program Code: RG	Project ID: PRJ000	75
Program Name: EOD-Fish Kill Studies	Facility Name/ID: N	lone
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Gen erate d: 09/16/1	15 14:50
	MDH Sample Number: 15H05244	, D1
Location ID: none	Collect Date: 08/06/15	Field Residual Chlorine Result: None
Field Name: Campground	Collect Time: 14:30	Field Fluoride Result: None

Sampling Point None QA Type: None

Matrix: Non-potable Water

Field pH Result: None Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

# **General Chemistry Parameters**

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
Solids, Total	84, W8	1200	120	mg∕L	12.5	B5H0377	08/13/15 08:09	09/03/15 11:14	SM2540 B-1997
Ammonia Nitrogen, Total		0.11	0.05	mg/L	1	B5H0252	08/10/15 14:34	08/11/15 13:05	EPA350.1
Biochemical Oxygen Demand		220	0.5	mg/L	1	B5H0210	08.07/15 13:08	08/12/15 12:17	Hach 10360
Chloride		28.7	0.500	mg/L	1	B5H0353	08/12/15 13:35	08/12/15 22 23	EPA300.1
Nitrate + Nitrite Nitrogen, Total		8.7	0.05	mg/L	1	B5H0426	08/14/15 09:50	08/14/15 13:35	EPA353.2
Phosphorus, Total		222	0.024	mg/L	1	B5H0606	08/20/15 07:36	08/25/15 06 25	SM 4500-P I (F)
Solids, Total Volatile	W8	460	120	mg/L	12.5	B5H0377	08/13/15 08:09	09/12/15 12:09	SM2540 E-1997
Microbiological Parameters									
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
Escherichia coli	F1	4100	10	MPN/100m L	1	B5H0212	08/07/15 13:40	08.08/15 10.08	SM 9223 B

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Report ID: 09 162015 145020

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Final Report Analytical Results

Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 09/16/15 14:	50
	MDH Sample Number: 15H0524-01RE2	
Location ID: none	Collect Date: 08/06/15	Field Residual Chlorine Result: None
Field Name: Campground	Collect Time: 14:30	Field Fluoride Result: None
Sampling Point None	Matrix: Non-potable Water	Field pH Result: None

Sampling Point None QA Type: None

Field pH Result: None Field PO4 Result: None

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899

St. Paul, MN 55164-0899

651-201-5300

Results were produced by the Minnesota Department of Health, except where noted.

#### **General Chemistry Parameters**

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
Solids, Suspended	D2	1600	25	mg/L	25	B5H0319	08/12/15 07:30	08,28/15 12:46	SM2540 D-1997

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Report ID: 09 162015 145020

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		Minnesota Department of Health Public Health Laboratory
		Environmental Laboratory Section
	Einel Banart	601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899
	Final Report Quality Control	651-201-5300
Brownen Code: BC	•	
Program Code: RG Program Name: EOD-Fish Kill Studies	Project ID: PRJ00075 Facility Name/ID: [none]	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 09/16/15 14:50	
	Batch Summary	
Samples in Batch: B5H0210 - BOD Prep	-	
15H0524 01		
Samples in Batch: B5H0212 - Microbiology Pre	P	
15H0524 01		
Samples in Batch: B5H0252 - Ammonia In-line	distillation	
15H0524.01		
13102401		
Samples in Batch: B5H0319 - General Chemist	гу Ргер	
15H0524 01RE2		
Samples in Batch: B5H0353 - General Chemist	гу Ргер	
15H0524 01		
Samples in Batch: B5H0377 - General Chemist	гу Ргер	
· · ·	- ·	
15H0524 01		
Samples in Batch: B5H0426 - General Chemist	гу Ргер	
15H0524 01		
Samples in Batch: B5H0606 - Phosphorus, Tota	al Prep In-Line NP	

15H0524-01

FINALREPORT	Report ID: 09162015145020
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Paul Mon	
Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health	
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	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 09/16/15 14:50	

Final Report

Blank (B5 H0210-BLK1)				Prepare	d:08/07/15	13:08 Anal	yzed: 08/12/1	5 12:17		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Biochemical Oxygen Demand		<	0.5	mg/L						
Duplicate (B5H0210-DUP1)		Source: 15H	052401	Prepare	d:08.07/15	13:08 Anal	yzed: 08/12/1	5 12:17		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Biochemical Oxygen Demand		210	0.5	mg/L		223			6	10
Reference (B5H0210-SRM1)				Prepare	d:08/07/15	13:08 Anal	yzed: 08/12/1	5 12:17		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Biochemical Oxygen Demand		214	0.5	mg/L	198		108	84.59-115.4		
Batch B5H0252 - Ammoni	a In-line distillat	ion								
Blank (B5 H0 252-BL K1)				Prepare	d:08/10/15	14:34 Anal	yzed: 08/11/1	5 11:10		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Ammonia Nitrogen, Total		<	0.05	mg/L						
LCS (B5H0252-BS1)				Ргераге	d:08/10/15	14:34 Anal	yzed: 08/11/1	5 11:14		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Ammonia Nitrogen, Total		0.926	0.05	mg/L	1		93	90-110		
Duplicate (B5H0252-DUP1)		Source: 15H	0471-05	Prepare	d:08/10/15	14:34 Anal	yzed: 08/11/1	5 12:44		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Ammonia Nitrogen, Total		0.026	0.05	mg/L		<			2	10
		Source: 15H	0471-06	Ргераге	d:08/10/15	14:34 Anal	yzed: 08/11 /1	5 12:53		
Duplicate (B5H0252-DUP2)		Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Duplicate (B5H0252-DUP2) Analyte	Analyte Qualifier(s)	Result								
		0.034	0.05	mg/L		<			1	10

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	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 09/16/15 14:50	

Final Report

Matrix Spike (B5H0252-MS1)		Source: 15H	0471-07	Desman	4.008085	المعرف الالالله	yzed: 08/11/1:	5 4 9 04		
Analyte	Analyte	Result	Reporting	Units	Spike	Source	%REC	%REC Limits	RPD	RPD
Ammonia Nitrogen, Total	Qualifier(s)	0.972	Limit 0.05	mg/L	Level 1	Result 0.059	91	90-110	RED	Limi
		Source: 15H	œ04.04	_						
Matrix Spike (B5H0252-MS2)	Analyte	Source: 15H	Reporting	Prepare	d:08/10/15 Spike	14:34 Anal; Source	yzed: 08/11/1:	5 1 3:09		RPD
Analyte	Qualifier(s)	Result	Limit	Units	Level	Result	%REC	%REC Limits	RPD	Limi
Ammonia Nitrogen, Total		1.02	0.05	mg/L	1	0.109	91	90-110		
Batch B5H0319 - General	Chemistry Prep									
Blank (B5 H0 319-BL K1)				Prepare	d:08/12/15	07:30 Anal;	yzed: 08/20/1	5 13:59		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Suspended	-, u.u	<	1.0	mg/L						
Duplicate (B5H0319-DUP1)		Source: 15H	0330-04	Prepare	d:08/12/15	07:30 Anal;	yzed: 08/20/1	5 14:00		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Suspended	D2, W8	66.0	2.5	mg/L	20001	72.0			9	5
Duplicate (B5H0319-DUP2)		Source: 15H	0330-07	Ргераге	d:08/12/15	07:30 Anal	yzed: 08/20/1	5 14:00		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Suspended	D2	144	2.5	mg/L		139			4	5
Reference (B5H0319-SRM1)				Prepare	d:08/12/15	07:30 Anal;	yzed: 08/20/1	5 13:59		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Suspended	Quannei(3)	62.0	2.5	mg/L	65.4	nesun	95	79.8-108		
Batch B5H0353 - General	Chemistry Prep									
Blank (B5 H0 353-BL K1)				Prepare	d:08/12/15	13:35 Anal;	yzed: 08/12/1	5 18:56		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chloride	equanitor(3)	<	0.500	mg/L	20001	nooun				
FINALREPORT								Report ID:	0916201	15 1450

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	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 09/16/15 14:50	

Final Report

Batch B5H0353 - General	Chemistry Prep									
LCS (B5H0353-BS1)				Prepare	d:08/12/15	13:35 Analy	yzed: 08/12/1:	5 19:13		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chloride		103		mg/L	100.02		103	85-115		
Duplicate (B5H0353-DUP1)		Source: 15H	0330-02	Ртераге	d:08/12/15	13:35 Analy	yzed: 08/12/1:	5 19:48		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chloride		27.0	0.500	mg/L		27.1			0.3	10
Duplicate (B5H0353-DUP2)		Source: 15H	0330-03	Ргераге	d:08/12/15	13:35 Analy	yzed: 08/12/1:	5 20:22		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chloride	Quanno(0)	27.5	0.500	mg/L	20101	27.5			0.001	10
Matrix Spike (B5H0353-MS1)		Source: 15H	0330-04	Ргераге	d:08/12/15	13:35 Anah	yzed: 08/12/1:	5 20:57		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Chloride	Quannoi(b)	125	Linit	mg/L	100.02	Result	104	75-125		
Matrix Spike (ESH0353-MS2)		Source: 15H	0330-05	Prepare	d:08/12/15	13:35 Anah	yzed: 08/12/1:	5 21:31		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Chloride	Quanner(a)	126	Linit	mg/L	100.02	Reduit	105	75-125		
Batch B5H0377 - General	Chemistry Prep									
Blank (B5 H0 377-BLK1)				Proposo	4.004345	0.0.00 0.000	yzed: 09/03/1:	5 11-10		
	Analyte	Decut	Reporting		Spike	Source		%REC Limits	RPD	RPD
Analyte Solids. Total	Qualifier(s) B4	Result <	Limit 10	Units mg/L	Level	Result	%REC	WREC LIMITS	RPU	Limi
Solids, Total Volatile	D4	<	10	mg/L						
Blank (B5 H0 377-BL K2)				Proporo	4.004345	0.0.00 0.000	yzed: 09/03/1:	5 44-40		
,	Analyte		Reporting	riepaie	Spike	Source				RPD
Analyte	Qualifier(s)	Result	Limit	Units	Level	Result	%REC	% REC Limits	RPD	Limi
Solids, Total	B4	13.6	10	mg/L						
Solids, Total Volatile		<	10	mg/L						
FINALREPORT								Report ID	: 09 16201	514502
Authorized by:					71	a reculte in t	this innoit an	oly only to the sam	nke analı	701

and Mar Paul Moyer, Environmental Laboratory Manager

Public Health Laboratory, Minnesota Department of Health

	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 09/16/15 14:50	

Final Report

Batch B5H0377 - General	Chemistry Prep									
Blank ( B5 H0 377- BL K3 )				Prepare	d:08/13/15	08:09 Anal;	yzed: 09/03/1	5 11:12		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Total	B4	19.6	10	mg/L						
Solids, Total Volatile		<	10	mg/L						
Blank (B5 H0 377-BLK4)				Ргераге	d:08/13/15	08:09 Anal;	yzed: 09/03/1	5 11:12		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Total	B4	16.4	10	mg/L						
Solids, Total Volatile		<	10	mg/L						
Duplicate (B5H0377-DUP1)		Source: 15H	052401	Prepare	d:08/13/15	08:09 Anal;	yzed: 09/03/1	5 11:15		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Total	B4, W8	1110	120	mg/L		1200			8	5
Solids, Total Volatile	W8	360	120	mg/L		460			24	5
Reference (B5H0377-SRM1)				Prepare	d:08/13/15	08:09 Anal;	yzed: 09/03/1	5 11:13		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Total		326	25	mg/L	326		100	82.5-112		
Reference (B5H0377-SRM2)				Prepare	d:08/13/15	08:09 Anal	yzed: 09/03/1	5 11:14		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Total	Quarments	319	25	mg/L	Level 326	Result	98	82.5-112		
Reference (B5H0377-SRM3)				Proper		0.00 0.000	vzed: 09/03/1	5 11 1 1		
	Analyte		Reporting	Fiepale	Spike	Source	yzeu. 03/03/1	J 11.14		RPD
Analyte	Qualifier(s)	Result	Limit	Units	Level	Result	%REC	%REC Limits	RPD	Limit
Solids, Total		328	25	mg/L	326		101	82.5-112		
Reference (B5H0377-SRM4)				Prepare	d:08/13/15	08:09 Anal;	yzed: 09/03/1	5 11:14		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Solids, Total	scuarmon, aj	321	25	mg/L	326	Reduit	98	82.5-112		

FINALREPORT

Report ID: 09 162015 145020

Authorized by:

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Ma and Paul Moyer, Environmental Laboratory Manager

Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

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	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 09/16/15 14:50	

Final Report

Bark (BF0426-BLK1) Propared: 08/14/503-50 Analyzed: 08/14/513:33 Analyte Analy	%REC Limits 13:34 %REC Limits 90-110 13:42 %REC Limits	RPD	Limit RPD Limit Limit 10 RPD
Analyte         Analyte         Reporting         Unit         Ske         Source         KRED         KRED         Link         PP         PP           Nitabe + Nate Nite off, Total         <         0.05         mg/L         Prepared: 081/4/15 03:0         Analyte         Analyte         Analyte         Optimized: 081/4/15 03:0         Analyte         Analyte         Analyte         Optimized: 081/4/15 03:0         Analyte         Ske         Source:         Ske	%REC Limits 13:34 %REC Limits 90-110 13:42 %REC Limits	RPD	Limit RPD Limit Limit 10 RPD
LCS (B5H0426-B51)       Prepared: 08.4.4.5 09.50       Analyze       WREC       WREC <td< th=""><th>%REC Limits 90-110 13:42 %REC Limits 13:37</th><th>RPD</th><th>Limit RPD Limit 10 RPD</th></td<>	%REC Limits 90-110 13:42 %REC Limits 13:37	RPD	Limit RPD Limit 10 RPD
Analyte         Reputing         Units         Line         Units         Sple         Source         WHEE	%REC Limits 90-110 13:42 %REC Limits 13:37	RPD	Limit RPD Limit 10 RPD
Analyte         Reputing         Units         Line         Units         Sple         Source         WHEE	%REC Limits 90-110 13:42 %REC Limits 13:37	RPD	Limit RPD Limit 10 RPD
Nitrate + Nitrite Nitrogen, Total         Source:         15H06253 13         Prepared:         08/4 A15 09:50         Analyzed:         08/4 A15 13:42           Analyte         Analyte         Analyte         Reporting         Units         Spke         Source:         Spke         Source:         MERC WREC Limits         RPD         Limit         10           Analyte         Qualifier(5)         Resut         Limit         Units         Lawel         Resut         WREC         WREC Limits         RPD         Limit         10           Duplicate (85H0426-DUP2)         Source:         15H052510         Prepared:         08/14/1513:37         10           Analyte         Analyte         Analyte         Reputing         Units         Spke         Source:         %REC         %REC Limits         RPD         Limit           Nitrate + Nitrite Nitrogen, Total           0.05         mg/L         5         10         10           Matrix Spike (85H0426-MS1)         Source:         19H02525 11         Prepared:         08/14/15/13:40         10         10           Matrix Spike (85H0426-MS1)         Source:         10H2         Spike         Source         %REC Limits         RPD         Limit         10	90-110 13:42 %REC Limits 13:37	RPD	RPD Limit 10 RPD
Duplicate (BSH0426-DUP1)     Source: 15H052513     Prepared: 08/14/15 03:42     RPD     RPD       Analyte     Qualifie(s)     Result     Limit     Units     Source: 15H052510       Analyte     Qualifie(s)     Result     Limit     Units     Source: 15H052510       Analyte     Qualifie(s)     Result     Limit     Units     Source: 15H052510       Analyte     Analyte     Reporting     Units     Level     Result     %REC       Analyte     Qualifie(s)     Result     Limit     Units     Level     Result       Analyte     Qualifie(s)     Result     Limit     Units     Level     Result     %REC       Matrix Spike (B5H0426-MS1)     Source: 15H052511     Prepared: 08/14/15 03:40     Aralyte     No     RPD     Limit       Analyte     Analyte     Cualifie(s)     Result     Level     Result     %REC     %REC     %REC     MREC     %REC     MREC     Matrix Spike       Blach B5H0606-B     Phosphorus, Total     54     mg/L     5     108     90-110       Blach B5H0606-Bts1)     Analyte     Qualifie(s)     Result     WREC     %REC     %REC     KREC Limits     RPD     Limit       LCS (B5H0606-Bts1)     Analyte     Qualifie(s)	13:42 %REC Limits 13:37		Limit 10 RPD
Analyte     Analyte     Reporting     Units     Display and the source     Source <td>%REC Limits</td> <td></td> <td>Limit 10 RPD</td>	%REC Limits		Limit 10 RPD
Analyte         Qualifier(s)         Result         Limit         Units         Livel         Result         %/REC         %/REC Limits         RPD         Limit           Nitrabe + Nitrite Nitrogen, Total         <	13:37		Limit 10 RPD
Unite       Data life(s)       Link       Low       Low       Low       Link       Low       Link       Low       Link       Low       Link	13:37		10 RPD
Analyte         Analyte         Result         Reporting         Units         Spke         Source         %REC         %REC         MREC         Limits         RPD         Limits         Limits         RPD         Limits </td <td></td> <td>RPD</td> <td></td>		RPD	
Analyte         Analyte         Result         Reporting         Units         Spke         Source         %REC         %REC         MREC         Limits         RPD         Limits         Limits         RPD         Limits </td <td></td> <td>RPD</td> <td></td>		RPD	
Analyte         Qualifier(s)         Result         Limit         Units         Level         Result         %REC         %REC         KREC         KREC         KREC         KREC         KREC         KREC         KREC         Limit         10           Matrix Spike (BSH0426-MS1)         Source:         15H0525 11         Prepared:         08/14/15 13:40         Figure 100         Source:         10           Analyte         Qualifier(s)         Result         Limit         Units         Level         Result         %REC         %REC         Limits         RPD         Limit           Ntrate + Nitrite Nitrogen, Total         5.4         mg/L         5         108         90-110           Batch BSH0606 - Phosphorus, Total         5.4         mg/L         5         108         90-110           Batch BSH0606 - Phosphorus, Total Prep In-Line NP         Eant         Limit         Units         Level         Result         %REC         %REC Limits         RPD         Limit           Phosphorus, Total         Analyte         Result         Units         Level         Result         %REC         %REC Limits         RPD         Limit           Phosphorus, Total         0.003         mg/L         Units         Level         <	%REC Limits	RPD	
Nitrate + Nitrite Nitrogen, Total     < 0.05			
Analyte       Analyte       Reporting       Units       Spike       Source       WREC       WREC       WREC       Imits       RPD       Limit       Limit       RPD <th< td=""><td></td><td></td><td>10</td></th<>			10
Analyte       Analyte       Reporting       Units       Spke       Spice       Spice       WREC       WREC       WREC       Imits       RPD       Limit       Limit <th< td=""><td></td><td></td><td></td></th<>			
Analyte       Qualifier(s)       Result       Limit       Units       Level       Result       %/REC       %/REC       Imits       RPD       Limit         Nitrate + Nitrite Nitrogen, Total       5.4       mg/L       5       108       90-110         Batch B5H0606-BLK1)       Prepared: 08/20/15 07:36       Analyzed: 08/25/15 03:29       Result       Reporting       Spike       Source       %/REC       W/REC       W/REC       M/REC	13:40		RPD
Batch B5H0606 - Phosphorus, Total Prep In-Line NP       Bank (B5H0606 - BLK1)       Analyte       Qualifiet(s)       Result       Limit       Units       Spike       Source       WREC        WREC	%REC Limits	RPD	
Blank (B5 H0606-BLK1)       Analyte       Reporting       Units       Spike       Source       % REC       % REC Limits       RPD       Limit         Phosphorus, Total         0.003       mg/L         Reporting       Units       Level       Result       % REC       % REC Limits       RPD       Limit       Imit       Units       Level       Result       % REC       % REC Limits       RPD       Limit       Imit       Imit       Units       Level       Result       % REC       % REC Limits       RPD       Limit       Limit       Imit       Units       Level       Result       % REC       % REC Limits       RPD       Limit       Limit       Units       Level       Result       % REC       % REC Limits       RPD       Limit       Limit       Units       Level       Result       % REC       % REC Limits       RPD       Limit       Units       Level       Result       % REC       % REC Limits       RPD       Limit       Units       Level       Result       % REC       % REC Limits       RPD       Limit       Units       Level       Result       % REC       % REC Limits       RPD       Limit       Units       Level       Result       % REC	90-110		
Analyte     Analyte     Reporting Qualifier(s)     Result     Reporting Limit     Units     Spike     Source     WREC     WREC     WREC     Limit     RPD       Phosphorus, Total     <			
Analyte     Analyte     Reporting Limit     Units     Spike     Source     WREC     WREC     WREC     Limit     RPD       Phosphorus, Total     <			
Analyte         Qualifier(s)         Result         Limit         Units         Level         Result         % REC         % REC Limits         RPD Limit           Phosphorus, Total         <	03:29		PDD
LCS (B5H0606-BS1)       Prepared: 08/20/15/07:36       Analyzed: 08/25/15/03:36         Analyte       Analyte       Reputing       Units       Spike       Source       WREC       WREC Limits       RPD Limit         Phosphorus, Total       0.099       0.003       mg/L       0.1       99       90-110         Duplicate (B5H0606-DUP1)       Source: 15H046401       Prepared: 08/20/15/07:36       Analyzed: 08/25/15/03:49         FINALREPORT       Report ID: 09/1620/15/145022         Authorized by:       The results in this report apply only to the sam ples analyzed.         This report must not be reproduced, except in full, without the written approval of the laboratory.         Madded Madded	%REC Limits	RPD	
Analyte     Analyte     Reporting Limit     Units     Spike     Source     KREC     WREC     WREC     Image: Spike     Spike       Phosphorus, Total     0.099     0.003     mg/L     0.1     99     90-110       Duplicate (B5H0606-DUP1)     Source: 15H046401     Prepared: 08/20/15 07:36     Analyzed: 08/25/15 03:49       FINALREPORT     Report ID: 09 162015 14502       Authorized by.     The results in this report apply only to the sam ples analyzed.       This report must not be reproduced, except in full, without the written approval of the laboratory.			
Analyte       Analyte       Reporting       Units       Spike       Source       WREC       WREC       WREC       Imits       RPD       Limit         Phosphorus, Total       0.099       0.003       mg/L       0.1       99       90-110         Duplicate (B5H0606-DUP1)       Source: 15H046401       Prepared: 08/20/15 07:36       Analyzed: 08/25/15 03:49         FINALREPORT       Report ID: 09 162015 145022         Authorized by.       The results in this report apply only to the sam ples analyzed.         This report must not be reproduced, except in full, without the written approval of the laboratory.         Image: March 100       March 100	03:36		
Continue       Contin       Contin       Contin       Conti			RPD
Duplicate (B5H0606-DUP1)     Source: 15H046401     Prepared: 08/20/15 07:36     Analyzed: 08/25/15 03:49       FINALREPORT     Report ID: 09 162015 14502       Authorized by:     The results in this report apply only to the sam ples analyzed.       This report must not be reproduced, except in full, without the written approval of the laboratory.		RPD	Limi
FINALREPORT     Report ID: 09 162015 14502       Authorized by.     The results in this report apply only to the sam ples analyzed.       This report must not be reproduced, except in full, without the written approval of the laboratory.	00110		
Authorized by.       The results in this report apply only to the sam ples analyzed.         This report must not be reproduced, except in full, without the written approval of the laboratory.         Image: Ima	03:49		
Authorized by.       The results in this report apply only to the sam ples analyzed.         This report must not be reproduced, except in full, without the written approval of the laboratory.         Image: Ima			
This report must not be reproduced, except in full, without the written approval of the laboratory.	Report ID:	09 16201	514502
Paul Mon			
	nuen approval of t	ne labora	когу.
Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health		%REC Limits 90-110 6 03:29 %REC Limits 6 03:36 %REC Limits 90-110 6 03:49 Report ID: why only to the sam ,	% REC Limits         RPD           90-110

th Laboratory, Minnesota Department of Health

	Final Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 09/16/15 14:50	

Results were produced by Minnesota Departme	ent of Health, except where noted.
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Batch B5H0606 - Phosph	orus, Total Prep	In-Line NP								
Duplicate (B5H0606-DUP1)		Source: 15H04		Prepare	ared: 08/20/15 07:36 Analyzed: 08/25/15 03:49					
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Phosphorus, Total		0.052	0.003	mg/L		0.052			1	20
Duplicate (B5H0606-DUP2)		Source: 15H	046402	Ргераге	d:08/20/15	07:36 Anal;	yzed: 08/25/1	5 04:03		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PD Limit
Phosphorus, Total		0.068	0.003	mg/L		0.067			1	20
Matrix Spike (B5H0606-MS1)		Source: 15H	046403	Prepare	d:08/20/15	07:36 Anal;	yzed: 08/25/1	5 04:16		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Phosphorus, Total		0.143	0.003	mg/L	0.1	0.042	101	90-110		

FINALREPORT

Authorized by:

Report ID: 09 162015 145020

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Page 15 of 17

Collected By: Joe Magee, Jen Ender Collector ID: None	City:None Generated: 09/16/15 14:50	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Program Code: RG	Project ID: PRJ00075	
	Final Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
		Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899

Re	esults were produ	ced by Mini	nesota De	partment o	of Health	n, excepti	where not	ted.		
Batch B5H0212 - Microbi	iology Prep									
Blank (B5 H0212-BLK1)				Prepared	d:08.07/15	13:40 Anal	yzed: 08/08/1	5 10:08		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PD Limi
Escherichia coli		<	1	MPN/100 mL						
Duplicate (B5H0212-DUP1)		Source: 15H	052401	Ргерагес	d:08.07/15	13:40 Anal;	yzed: 08/08/1	5 10:08		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PD Lim
Escherichia coli		3400	10	MPN/100		4100			17	20

mL

FINALREPORT

Authorized by:

Report ID: 09 162015 145020

Minnesota Department of Health

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Final Report

Quality Control

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

#### Data Qualifiers and Definitions

- W8 Sample/sample duplicate relative percent difference exceeded the laboratory acceptance limit.
- F1 Sample received in inappropriate sample container.
- D2 Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.
- B4 Target analyte detected in method blank at or above method reporting limit. Concentration found in the sample was at least 10 times the concentration found in the method blank.
- Dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- %REC Percent Recovery

FINALREPORT

Authorized by:

Report ID: 09 162015 145020

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or AGRICULTURE		MINNESOTA	DEPARTMENT
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Page 1 of 2 Collected From:

Date Printed: Date Collect		ted:	Divisio	on Contact:
8/13/2015	08/07/2	2015	M	arie Juenemann
Sample Numbers				
Inspector No: SBV	V15802			
Lab ID: W-1	SD	G ID:	15-SDG-3446	
Quantity x Sample S	Project:			
1 x 1 L	Surface	Water		
Product Name:		A		
Water, River/Strea	ຫາ			
Description:				

Analysis Requested: GC Analyte <u>GCMSMS Monitoring</u> Acetochlor Alachlor Atrazine Benfluralin Bifenthrin	Result ND at MRL ND at MRL ND at MRL	MRL 30 ppt	Whitewater River - South Br Temperature Received: Result Comm	4.4 deg C
Analyte <u>GCMSMS Monitoring</u> Acetochlor Alachlor Atrazine Benfluralin	ND at MRL ND at MRL	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	· · · · · · · · · · · · · · · · · · ·	······································
<u>GCMSMS Monitoring</u> Acetochlor Alachlor Atrazine Benfluralin	ND at MRL ND at MRL	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Result Comn	nent
Acetochlor Alachlor Atrazine Benfluralin	ND at MRL	30 ppt		
Acetochlor Alachlor Atrazine Benfluralin	ND at MRL	30 ppt		
Atrazine Benfluralin				
Benfluralin	ND at MRL	30 ppt		
		30 ppt		
Bifenthrin	ND at MRL	25 ppt		
	ND at MRL	20 ppt		
Chlorothalonil	ND at MRL	50 ppt		
Chlorpyrifos	ND at MRL	40 ppt		
Jomazone	ND at MRL	15 ppt		
Cyfluthrin	ND at MRL	100 ppt		
Deisopropylatrazine	ND at MRL	150 ppt		
Desethylatrazine	ND at MRL	50 ppt		
Diazinon	ND at MRL	30 ppt		
Viazinon Oxon	ND at MRL	75 ppt		
Jichlobenil	ND at MRL	5 ppt		
Dichlorvos	ND at MRL	15 ppt		
Imethenamid	ND at MRL	15 ppt		
limethoate	ND at MRL	100 ppt		
lisulfoton	ND at MRL	60 ppt		
PTC	ND at MRL	10 ppt		
sfenvalerate	ND at MRL	150 ppt		
ithalfluralin	ND at MRL	50 ppt		
thofumesate	ND at MRL	50 ppt		
onotos	ND at MRL	15 ppt		
lalathion	ND at MRL	50 ppt		
fethoxychlor	ND at MRL	50 ppt		
letolachlor	ND at MRL	25 ppt		
fetribuzin	ND at MRL	75 ppt		
fetribuzin DA	ND at ERL	500 ppt		
fetribuzin DADK	ND at ERL	500 ppt		
fetribuzin DK	ND at ERL	500 ppt		
xadiazon	ND at MRL	75 ppt		
arathion-methyl	ND at MRL	100 ppt		
endimethalin	ND at MRL	75 ppt		
horate	ND at MRL	25 ppt		
rometon	ND at MRL	100 ppt		
Propachlor	ND at MRL	30 ppt		

Report ID: 436457	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kapan m Bars
-------------------	---	--------------

30 ppt

30 ppt 100 ppt

50 ppt

50 ppt

75 ppt

500 ppt

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

ND at MRL

Analysis Requested: GC

Analyte GCMSMS Monitoring

Propazine

Simazine

Terbufos

Triallate

Trifluralin

Tolfenpyrad

Tebupirimiphos

lambda-Cyhalothrin

zeta-Cypermethrin

VESOTA DEPARTMENT		0/10/2010	00/0774	2010	IVIA	ne anenemann
GRICULTURE		Sample Numbers				
		Inspector No: SBW	/15802			
ENT OF AGRICULTU	RE	Lab ID: W-1	5-1408	SD	G ID:	15-SDG-3446
alysis Report		Quantity x Sample S	ze:	Project:		
Street North sota 55155-2531		1x1L		Surface	Water	
01-6010		Product Name: Water, River/Stream				
ng Final Report		Description:				
	Page 2 of 2	Collected From:	48.868 486			110.000 (0.000) (0.000 (0.00) (0.000 (0.00) (0.000 (0.00) (0.000 (0.00))
		Whitewater River -	South Brar	ich/SBW		
		Temperature Receive	sd:	4.4	deg C	
Result	MRL	Res	ult Comme	nt		
ND at MRL	25 ppt					
ND at MRL	75 ppt					

Date Collected: 08/07/2015

Division Contact: Marie Juenemann

Date Printed: 8/13/2015

Sample	Remarks:



MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Page 1 of 3

Date Printed: Date Collected: **Division Contact:** 8/14/2015 08/07/2015 Marie Juenemann Sample Numbers Inspector No: SBW15802 Lab ID: W-15-1413 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1 x 1 L Surface Water Product Name: Water, River/Stream Description: Collected From:

Analysis Requested: LC		Wh	Whitewater River - South Branch/SBW		
anayoio nequesteur		Tem	verature Received: 4.4 deg C		
Analyte	Result	MRL	Result Comment		
LCMSMS (+) Monitoring					
Acetamiprid	ND at MRL	25 ppt			
Aldicarb Sulfone	ND at MRL	15 ppt			
Aldicarb Sulfoxide	ND at MRL	50 ppt			
Azoxystrobin	ND at MRL	10 ppt			
Bensulfuron-methyl	ND at MRL	16.7 ppt			
Bensulide	ND at MRL	250 ppt			
Boscalid	ND at MRL	50 ppt			
Bromacil	ND at MRL	30 ppt			
Carbaryl	ND at MRL	25 ppt			
Carbendazim	ND at MRL	10 ppt			
Carbofuran	ND at MRL	13.3 ppt			
Chlorantraniliprole	ND at MRL	50 ppt			
Chlorimuron-ethyl	ND at MRL	20 ppt			
Chlorpyrifos Oxon	ND at MRL	40 ppt			
Clothlanidin	ND at MRL	25 ppt			
Cyanazine	ND at MRL	25 ppt			
Cyantraniliprole	ND at MRL	100 ppt			
DEDI Atrazine	ND at MRL	50 ppt			
Dicrotophos	ND at MRL	25 ppt			
Difenoconazole	ND at MRL	25 ppt			
Dinotefuran	ND at MRL	25 ppt			
Disulfoton Sulfone	ND at MRL	20 ppt			
Diuron	ND at MRL	13.3 ppt			
Flumetsulam	ND at MRL	50 ppt			
Flutriafol	ND at MRL	10 ppt			
-lalosulfuron-methyl	ND at MRL	30 ppt			
lexazinone	ND at MRL	10 ppt			
-lydroxyatrazine	ND at MRL	6.7 ppt			
mazamethabenz Acid	ND at MRL	10 ppt			
mazamethabenz-methyl	ND at MRL	5 ppt			
mazamox	ND at MRL	13.3 ppt			
mazapic	ND at MRL	10 ppt			
mazapyr	ND at MRL	8.3 ppt			
mazaquin	ND at MRL	16.7 ppt			
mazethapyr	ND at MRL	6.7 ppt			
midacloprid	ND at MRL	20 ppt			
Sample Remarks:					

Report ID: 436462	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallan 2	- RE-8
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	MINNESOTA	DEPARTMENT
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

# Water Monitoring Final Report

Analusia Descuestada - LO

Date Collected: 08/07/2015 Date Printed: Division Contact: 8/14/2015 Marie Juenemann Sample Numbers Inspector No: SBW15802 Lab ID: W-15-1413 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1 x 1 L Surface Water Product Name: Water, River/Stream Description: Page 2 of 3 Collected From: Whitewater River - South Branch/SBW

Analysis Requested: LC			whitewater River - South Branch/SBW		
			Temperature Received:	4.4 deg C	
Analyte	Result	MRL	Result Comn	nent	
LCMSMS (+) Monitoring					
Isoxaflutole	ND at MRL	40 ppt			
Linuron	ND at MRL	20 ppt			
Metalaxyl	ND at MRL	8.3 ppt			
Metsulfuron-methyl	ND at MRL	23.3 ppt			
Myclobutanil	ND at MRL	10 ppt			
Nicosulfuron	ND at MRL	26.6 ppt			
Norflurazon	ND at MRL	20 ppt			
Norflurazon-desmethyl	ND at MRL	50 ppt			
Oxydemeton-methyl	ND at MRL	20 ppt			
Parathion-methyl Oxon	ND at MRL	25 ppt			
Picoxystrobin	ND at MRL	50 ppt			
Prometryn	ND at MRL	3.3 ppt			
Propiconazole	ND at MRL	10 ppt			
yraclostrobin	ND at MRL	25 ppt			
yroxasulfone	ND at MRL	50 ppt			
Saflufenacil	ND at MRL	15 ppt			
Siduron	ND at MRL	6.7 ppt			
Sulfometuron-methyl	ND at MRL	8.3 ppt			
ebuconazole	ND at MRL	10 ppt			
etraconazole	ND at MRL	10 ppt			
hiacloprid	ND at MRL	50 ppt			
hiamethoxam	ND at MRL	25 ppt			
hifensulfuron-methyl	ND at MRL	16.7 ppt			
hiobencarb	ND at MRL	8.3 ppt			
riasulfuron	ND at MRL	23.3 ppt			
LCMSMS (-) Monitoring					
9,4,5-T	ND at MRL	50 ppt			
,4,5-TP	ND at MRL	50 ppt			
,4-D	ND at MRL	8.3 ppt			
,4-DB	ND at MRL	20 ppt			
cetochlor ESA	ND at MRL	30 ppt			
cetochlor OXA	ND at MRL	33.3 ppt			
lachlor ESA	ND at MRL	41.6 ppt			
Alachlor OXA	ND at MRL	33.3 ppt			
Bentazon	ND at MRL	5 ppt			
Bromoxynii	ND at MRL	25 ppt			
ampia Domoska					
Sample Remarks:					

Fluxapyroxad - ND at ERL (10 ppt)

	Report ID: 436462	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallan n. Pors	
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Date Printed: 8/14/2015

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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: LC

Sample Numbers Inspector No: SBW15802 Lab ID: W-15-1413 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Page 3 of 3 **Collected From:** Whitewater River - South Branch/SBW Temperature Received: 4.4 deg C Result Comment MRI

Date Collected: 08/07/2015

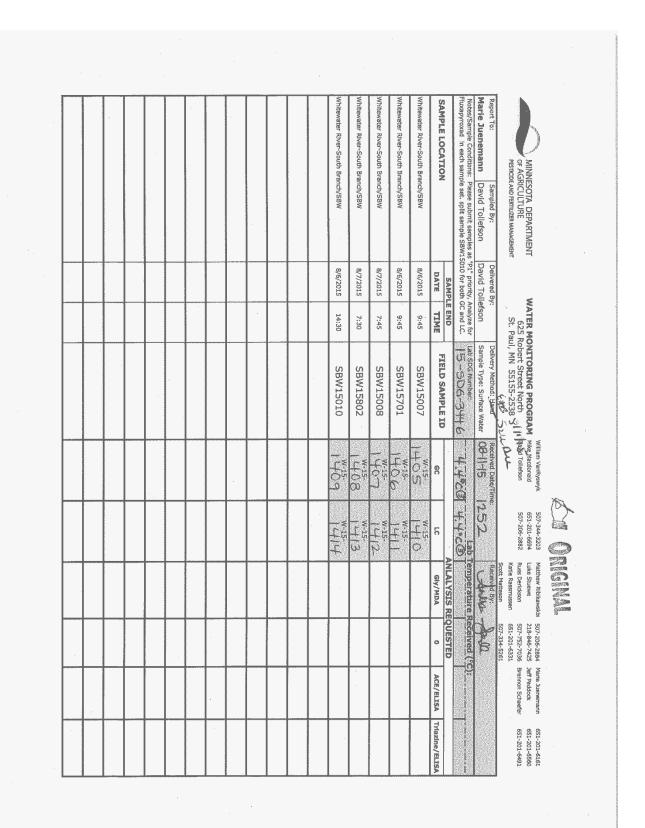
Division Contact: Marie Juenemann

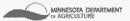
Analyte	Result	MRL	Result Com
LCMSMS (-) Monitoring			
Clopyralid	ND at MRL	41.6 ppt	
Dicamba	ND at MRL	50 ppt	
Dichlorprop	ND at MRL	50 ppt	
Dimethenamid ESA	ND at MRL	6.7 ppt	
Dimethenamid OXA	ND at MRL	10 ppt	
Flufenacet OXA	ND at MRL	8.3 ppt	
Isoxaflutole DKN	ND at MRL	50 ppt	
MCPA	ND at MRL	5 ppt	
MCPB	ND at MRL	20 ppt	
MCPP	ND at MRL	50 ppt	
Mesotrione	ND at MRL	50 ppt	
Metolachlor ESA	ND at MRL	10 ppt	
Metolachior OXA	ND at MRL	10 ppt	
Picloram	ND at MRL	41.6 ppt	
Propachlor ESA	ND at MRL	30 ppt	
Propachlor OXA	ND at MRL	10 ppt	
Sedaxane	ND at MRL	75 ppt	
Tembotrione	ND at MRL	50 ppt	
Triclopyr	ND at MRL	50 ppt	

Sample Remarks:

Fluxapyroxad - ND at ERL (10 ppt)

Report ID: 436462	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffan n. Ross
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

#### Water Monitoring Final Report

Analysis Requested: GC

Page 1 of 2

Date Printed: 8/13/2015 Division Contact: Date Collected: 08/07/2015 Marie Juenemann Sample Numbers Inspector No: SBW15008 Lab ID: W-15-1407 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Collected From: Whitewater River - South Branch/SBW rature Received 1 A d

			Temperature Received:	4.4 deg C
Analyte	Result	MRL	Result Comme	nt
GCMSMS Monitoring				
Acetochlor	ND at MRL	30 ppt		
Alachior	ND at MRL	30 ppt		
Atrazine	.38.5 ppt	30 ppt		
Benfluralin	ND at MRL	25 ppt		
Bifenthrin	ND at MRL	20 ppt		
Chlorothalonil	ND at MRL	50 ppt		
Chlorpyrifos	ND at MRL	40 ppt		
Clomazone	ND at MRL	15 ppt		
Cyfluthrin	ND at MRL	100 ppt		
Deisopropylatrazine	ND at MRL	150 ppt		
Desethylatrazine	75.9 ppt	50 ppt		
Diazinon	ND at MRL	30 ppt		
Diazinon Oxon	ND at MRL	75 ppt		
Dichiobenil	ND at MRL	5 ppt		
Dichlorvos	ND at MRL	15 ppt		
Dimethenamid	ND at MRL	15 ppt		
Dimethoate	ND at MRL	100 ppt		
Disulfoton	ND at MRL	60 ppt		
EPTC	ND at MRL	10 ppt		
Esfenvalerate	ND at MRL	150 ppt	•	
Ethalfluralin	ND at MRL	50 ppt	ł.	
Ethofumesate	ND at MRL	50 ppt		
Fonofos	ND at MRL	15 ppt		
Malathion	ND at MRL	50 ppt		
Methoxychlor	ND at MRL	50 ppt		
Metolachlor	ND at MRL	25 ppt		
Metribuzin	ND at MRL	75 ppt		
Metribuzin DA	ND at ERL	500 ppt		
Metribuzin DADK	ND at ERL	500 ppt		
Metribuzin DK	ND at ERL	500 ppt		
Oxadiazon	ND at MRL	75 ppt		
Parathion-methyl	ND at MRL	100 ppt		
Pendimethalin	ND at MRL	75 ppt		
Phorate	ND at MRL	25 ppt		
Prometon	ND at MRL	100 ppt		
Propachlor	ND at MRL	30 ppt		
Sample Remarks:				

Report ID: 436456	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffan n. Bers
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## Water Monitoring Final Report

Date Printed: 8/13/2015 Date Collected: Division Contact: 08/07/2015 Marie Juenemann Sample Numbers Inspector No: SBW15008 Lab ID: W-15-1407 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Page 2 of 2 **Collected From:** Whitewater River - South Branch/SBW

Analysis Requested: GC			Whitewater River - South Bra	anch/SBW	
			Temperature Received:	4.4 deg C	
Analyte	Result	MRL	Result Comm	ent	
GCMSMS Monitoring					
Propazine	ND at MRL	25 ppt			
Simazine	ND at MRL	75 ppt			
Tebupirimiphos	ND at MRL	30 ppt	4		
Terbufos	ND at MRL	30 ppt			
Tolfenpyrad	ND at MRL	100 ppt			
Triallate	ND at MRL	50 ppt			
Trifluralin	ND at MRL	50 ppt			
lambda-Cyhalothrin	ND at MRL	75 ppt			
zeta-Cypermethrin	ND at MRL	500 ppt			

Sample Remarks:

Report ID: 436456	l verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kapan m Ross	

M	INNESOTA DEPARTMENT		Date Printed: 8/14/2015	Date Collect 08/07/2			in Contact: arle Juenemann
OF	INNESOTA DEPARTMENT AGRICULTURE		Sample Numbers Inspector No: Si	BW15008		<u> </u>	~
MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report		Lab ID: W	-15-1412	S	DG ID:	15-SDG-3446	
		Quantity x Sample		Project			
	t Street North		1x1L		Surfac	e Water	
	1esota 55155-2531 201-6010		Product Name:				
Water Monitor	ing Final Report		Water, River/Str Description:	eam			
	•	Page 1 of 3	Collected From:				
		ragerora					
Analysis Requested: LC			Whitewater Rive				
			Temperature Rece	elved:	4.4	4 deg C	
Analyte	Result	MRL	F	Result Comme	nt		
LCMSMS (+) Monitoring Acetamiprid	ND at MRL	25 ppt					
Aldicarb Sulfone	ND at MRL	15 ppt					
Aldicarb Sulfoxide	ND at MRL	50 ppt					
Azoxystrobin	ND at MRL	10 ppt					
Bensulfuron-methyl	ND at MRL	16.7 ppt					
Bensulide	ND at MRL	250 ppt					
Boscalid	ND at MRL	50 ppt					
Bromacil	ND at MRL	30 ppt					
Carbaryl	ND at MRL	25 ppt					
Carbendazim	ND at MRL	10 ppt					
Carbofuran	ND at MRL	13.3 ppt					
Chlorantraniliprole	ND at MRL	50 ppt					
Chlorimuron-ethyl	ND at MRL	20 ppt					
Chlorpyrifos Oxon	ND at MRL	40 ppt					
Clothianidin	ND at MRL	25 ppt					
Cyanazine '	ND at MRL	25 ppt					
Cyantraniliprole	ND at MRL	100 ppt					
DEDI Atrazine	78.2 ppt	50 ppt					
Dicrotophos	ND at MRL	25 ppt					
Difenoconazole	ND at MRL	25 ppt					
Dinotefuran	ND at MRL	25 ppt					
Disulfoton Sulfone	ND at MRL	20 ppt					
Diuron	ND at MRL	13.3 ppt					
Flumetsulam	ND at MRL	50 ppt					
Flutriafol	ND at MRL	10 ppt					
Halosulfuron-methyl	ND at MRL	30 ppt					
Hexazinone	ND at MRL	10 ppt					
Hydroxyatrazine	14.5 ppt	6.7 ppt					
mazamethabenz Acid	ND at MRL	10 ppt					
Imazamethabenz-methyl	ND at MRL	5 ppt					
mazamox	ND at MRL	13.3 ppt					
Imazapic	ND at MRL	10 ppt					
mazapyr	ND at MRL	8.3 ppt					
mazaquin	ND at MRL	16.7 ppt					
mazethapyr midaeloorid	ND at MRL	6.7 ppt					
midacloprid	ND at MRL	20 ppt					
Sample Remarks:							

Report ID: 436461	I verify that these data are correct, Kathryn Reynolds Water Analysis Unit Supervisor	Kaffang non Plas	
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

#### Water Monitoring Final Report

Page 2 of 3

Date Printed: 8/14/2015 Date Collected: **Division Contact:** 08/07/2015 Marie Juenemann Sample Numbers Inspector No: SBW15008 Lab ID: W-15-1412 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: Surface Water 1 x 1 L Product Name: Water, River/Stream Description: Collected From: Whitewater River - South Branch/SBW

Analysis Requested: LC			Whitewater River - South B	ranch/SBW
			Temperature Received:	4.4 deg C
Analyte	Result	MRL	Result Comr	nent
LCMSMS (+) Monitoring				
Isoxaflutole	ND at MRL	40 ppt		
Linuron	ND at MRL	20 ppt		
Metalaxyl	ND at MRL	8.3 ppt		
Metsulfuron-methyl	ND at MRL	23.3 ppt		
Vyciobutanil	ND at MRL	10 ppt		
Vicosulfuron	ND at MRL	26.6 ppt		
Vorflurazon	ND at MRL	20 ppt		
Norflurazon-desmethyl	ND at MRL	50 ppt		
Dxydemeton-methyl	ND at MRL	20 ppt		
Parathion-methyl Oxon	ND at MRL	25 ppt		
Picoxystrobin	ND at MRL	50 ppt		
<sup>o</sup> rometryn	ND at MRL	3.3 ppt		
Propiconazole	ND at MRL	10 ppt		
Pyraclostrobin	ND at MRL	25 ppt		
Pyroxasulfone	ND at MRL	50 ppt		
Saflufenacil	ND at MRL	15 ppt		
Siduron	ND at MRL	6.7 ppt		
Sulfometuron-methyl	ND at MRL	8.3 ppt		
Febuconazole	ND at MRL	10 ppt		
letraconazole	ND at MRL	10 ppt		
Thiacloprid	ND at MRL	50 ppt		
Thiamethoxam	ND at MRL	25 ppt		
Thifensulfuron-methyl	ND at MRL	16.7 ppt		
Thiobencarb	ND at MRL	8.3 ppt		
l'riasulfuron	ND at MRL	23.3 ppt		
LCMSMS (-) Monitoring				
2,4,5-T	ND at MRL	50 ppt		
2,4,5-TP	ND at MRL	50 ppt		
2,4-D	ND at MRL	8.3 ppt		
2,4-DB	ND at MRL	20 ppt		
Acetochlor ESA	51.3 ppt	30 ppt		
Acetochlor OXA	ND at MRL	33.3 ppt		
Alachlor ESA	343 ppt	41.6 ppt		
Alachlor OXA	ND at MRL	33.3 ppt		
Bentazon	20.8 ppt	5 ppt		
	ND at MRL	25 ppt		
Sample Remarks:				
Bromoxynil Sample Remarks: Fluxapyroxad - ND at ERL (10 ppt)	ND at MRL	25 ppt		
				,

I verify that these data are correct. m. R. Kallan Report ID: 436461 Kathryn Reynolds -Water Analysis Unit Supervisor This report shall not be reproduced except in full, without the written approval from the laboratory. These results are only applicable to the sample(s) listed.

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Date Printed: Date Collected: Division Contact: 8/14/2015 08/07/2015 Marie Juenemann Sample Numbers Inspector No: SBW15008 Lab ID: W-15-1412 SDG ID: 15-SDG-3446 Quantity x Sample Size: Project: Surface Water 1 x 1 L Product Name: Water, River/Stream Description: Page 3 of 3 **Collected From:** Whitewater River - South Branch/SBW

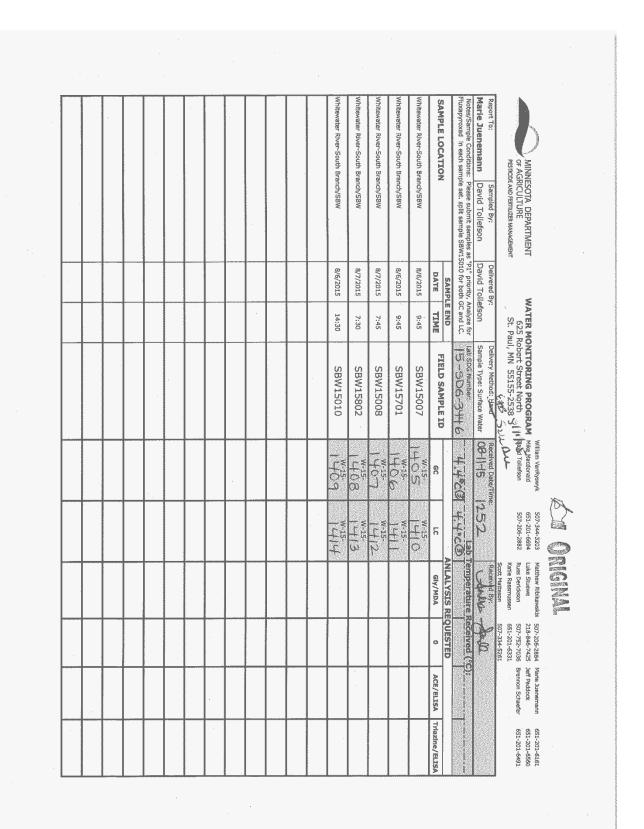
Analysis Requested: LC			Whitewater river - South Branch/SBW				
			Temperature Received:	4.4 deg C			
Analyte	Result	MRL	Result Comm	ent			
LCMSMS (-) Monitoring							
Clopyralid	ND at MRL	41.6 ppt					
Dicamba	ND at MRL	50 ppt					
Dichlorprop	ND at MRL	50 ppt					
Dimethenamid ESA	ND at MRL	6.7 ppt					
Dimethenamid OXA	ND at MRL	10 ppt					
Flufenacet OXA	ND at MRL	8.3 ppt					
Isoxaflutole DKN	ND at MRL	50 ppt					
MCPA	ND at MRL	5 ppt					
MCPB	ND at MRL	20 ppt					
MCPP	ND at MRL	50 ppt					
Mesotrione	ND at MRL	50 ppt					
Metolachlor ESA	583 ppt	10 ppt					
Metolachior OXA	24.8 ppt	10 ppt					
Picloram	ND at MRL	41.6 ppt					
Propachlor ESA	ND at MRL	30 ppt					
Propachlor OXA	ND at MRL	10 ppt					
Sedaxane	ND at MRL	75 ppt					
Tembotrione	ND at MRL	50 ppt					
Triclopyr	ND at MRL	50 ppt					

Sample Remarks:

American Description de

Fluxapyroxad - ND at ERL (10 ppt)

Report ID: 436461	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffay	m. Bors



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#### MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



MINNESOTA DEPARTMENT

Date Reported: 10/26/2015	SDG ID: 15-SDG-3447	Page: Page 1 of 1					
Division Contact:							
	Marie Juenemann						

Water Monitoring Final Report

Re-issue of Report ID: SBW15008-233230

SDG Comments:

		SBW1500	)8				
LAB Sample ID:	AR-15-2620	Quantity x Sample Size:	1 x 125 ml		Project Name: Surface Water		
Inspector Sample ID:	SBW15008	Date/Time Collected:	8/7/2015	0745			
Product/Description:	Water, River/Stream	Date/Time Received:	8/11/2015	1252	Temperature Received: 0 deg C		
Collected From:	Whitewater River - Sou	uth Branch/SBW					
Analysis Requested:	NO2+NO3						
Analyte	Result	MRL	Meth	od	Result Comment		
Nitrate/Nitrite	7.82 ppm	0.40 ppm	Std. Meth. 45 NO3 NO2	600 NO3-F,			
Nitrate/Nitrite Analysis Dat	e/Time 08/14/2015 0	8:00:00 am					
Sample Remarks:							
LAB Sample ID:	AB-15-2623	Quantity x Sample Size:	1 x 250 ml		Project Name: Surface Water		
Inspector Sample ID:		Date/Time Collected:					
Product/Description:		Date/Time Received:	8/11/2015	1252	Temperature Received: 0 deg C		
Collected From:	Whitewater River - Sou	uth Branch/SBW					
Analysis Requested:	TP+DOP						
Analyte	Result	MRL	Meth	lod	Result Comment		
Ortho Phosphorus, Dissolv	ved 0.021 ppm	0.005 ppm	EPA 365.1				
Ortho Phosphorus, Dissolv Date/Time	red Analysis 08/12/2015 1	1:07:15 am					
Total Phosphorus	0.071 ppm	0.01 ppm	EPA 365.1				
Total Phosphorus Analysis	Date/Time 08/12/2015 0	)1:27:49 pm					
Sample Remarks:							
LAB Sample ID:	AR-15-2625	Quantity x Sample Size:	1 x 500 ml		Project Name: Surface Water		
LAB Sample ID: Inspector Sample ID: Product/Description:	SBW15008	Quantity x Sample Size: Date/Time Collected: Date/Time Received:	8/7/2015	0745 1252	Temperature Received: 0 deg C		

Collected From: Whitew	/ater River - South Br	anch/SBW		
Analysis Requested: NO2+N	IO3, TKN, NH3			
Analyte	Result	MRL	Method	Result Comment
Ammonia-N	ND ppm	0.02 ppm	Std. Meth. 4500 NH3-D, Ammonia-N	
Ammonia-N Analysis Date/Time	08/13/2015 12:30:0	00 pm		
Sample Remarks:				

l a	authorize this final report.	
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Vocaste	Emesmann



				COP	Y					40
OF AGRICU PESTICIDE AND	LTURE Fertilizer management	625 Ro St. Paul	bert Stree , MN 551	55-2538 Spill QL	651-201-6694 507-206-2882	Matthew Ribikawskis Luke Stuewe Russ Derickson Katie Rassmussen Scott Matteson	218-846-7425 507-752-7036 651-201-6331 507-334-5261	Marie Juenemann Jeff Paddock Brennon Schaefer	651-201-6161 651-201-6560 651-201-6491	Tollek Sile
Report To: Marie Juenemann	Sampled By: David Tollefson	Delivered B David Toll		Delivery Method: Hand Sample Type: Surface Water	Received Date/TI	ime: 1252	Received By:	20		i i g
Notes/Sample Conditions: Fluxapyroxad in each sample	Please submit samples as	"P1" priority, A	nalyze for	Lab SDG Number: 15-SDG-3447	0500	Lab Temp	erature Reco	ived (°C):	ذC@	Davi
SAMPLE LOCATION		SAMPL	E END	FIELD SAMPLE ID	y)c-		LYSIS REQU	STED	NH3	2
SAMPLE LOCATION		DATE	TIME	FIELD SAMPLE ID	NO2 + NO3	TP + DOP	CL	TSS		
Whitewater River-South Bran	nch/SBW	8/6/2015	9:45	SBW15007	AR-15- 2619	AR-15- 2621			AR-15- 2624	
Whitewater River-South Bran	nch/SBW	8/6/2015	9:45	SBW15701		AR-15- 2622				
Whitewater River-South Bras	nch/SBW	8/7/2015	7:45	SBW15008	AR-15- 2620	AR-15- 2623			AR-15- 2625	
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Protecting, maintaining and improving the health of all Minnesotans

Report Date: 11/5/15 Client Name: RG - MPCA - EOD-Fish Kill Studies Project Code: RG Project Name: EOD-Fish Kill Studies

Work Order Number: 15H1804

Report To: RG - MPCA - EOD-Fish Kill Studies Joe Magee 520 Lafayette Rd. Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

Mas

Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164 (651) 201-5300 http://www.health.mn.us/divs/phl/environmental

Page 1 of 12

#### Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Summary of Samples Received	651-201-5300
Project ID: PRJ00075	
Facility Name: None	
City: None	
Generated: 11/05/15 9:17	
	Project ID: PRJ00075 Facility Name: None City: None

Amended Report

Work Order Comment: Run SP-01 for Cu, Fe, Mn, and Al per J. Magee. ECB 8/26/15

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
none	15H180401	Non-potable Water	08.07/15 10:45	08/25/15 11:00	0.9

Field ID	MDH Sample Number	Receiving Comments
none	15H180401	Please treat as a civil chain of custody, and run as a priority sample. Also, please test for sodium

Amended Report

Authorized by:

Report ID: 11052015 91706

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Mas and Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

Page 2 of 12

Minnesota Pollutio	on Control	A Agency	B MDH Stream	C Lab Sheet	D	E Page of
Program Code: RG			Magee			PRJ00075 (ex: PRJ01234)
Collector Phone:	7-206	5-2601		MPCA PM Name and Phone:	Joe Magee 50	7-206-2601
Sample Information		Α	В	C	D	E
(ex 27-0016-00-101 or S005-515) Field Name / Lake Name	Bethany	South Ravine				
Bio Station Date (MM/DD/YY)		8/7/15				
Time (Military)	1(	):45 CST				
Quality Assurance* Analysis Group No.**						
Sample Depth (Top) m (Lake Only) Sample Depth (Bot) m (Lake Only)						
Filter Volume (for chlorophyll a)						
			Sample A (Mark requesting and			And States
AIS- autoclave						
Dilution						
Total Nitrogen	$\times$	Field filtered	Field filtered	Field filt		
Nitrate + Nitrite (EPA 353.2)	X	Field filtered	Field filtered	Field filte	ered Field filter	ed Field filter
TKN (EPA 351.2)	X	Field filtered	Field filtered	Field filte	ered Field filter	
Organic Nitrogen	X	Field filtered	Field filtered	Field filte	ered Field filter	ed Field filtere
Phosphorus (SM 4500P I)	$\mathbf{X}$	Field filtered	Field filtered	Field filte		
Potassium	$\mathbf{X}$	Field filtered	Field filtered	Field filte		
Calcium	X	Field filtered	Field filtered	Field filte		
Copper	X	Field filtered	Field filterec	Field filte		
Iron	X	Field filtered	Field filtered	Field filte		
Magnesium	X	Field filtered	Field filtered	Field filt		
Manganese	X	Field filtered	Field filtered	Field filte	ered Field filter	ed Field filtere
Lab Temp (°C)	us million					
1		eld Replicate, SB = Sam	pler Blank, SS = Split Samp ogram Code Identified by a	Number Code.	DLUMNS*** ottle Blank, RB = Reagent Blank	CAH revised 3
	ied By / Aff	iliation	Chain of O		ted By / Affiliation	Date/Time
Sampler)	F	~ (M	21 8/24/15 216	:00 CUAR	m with	8125/15
Chito By	~ M	~	10 5/0 5/15	AB/MOM	0-1-100	8/25/1511:43
0						
Sampler Comments					nd total volatile solids on all samples	

<b>Stream Field Info</b>	A	B	C	D	E				
Project ID	PRJ00075								
Location ID (ex 27-0016-00-101 or \$005-515)			0						
Field Name /Lake Name	Bethany South Ravine								
Bio Station									
Date (MM/DD/YY)	8/7/15								
Time (Military)	10:45 CST								
Quality Assurance*		Ú							
Field Temp (°C)									
Conductivity @ 25 ° C (umho/cm)									
DO (mg/l)									
рН									
ORP-mV									
Turbidity*									
Apparent Color (PCU)					(3.)				
Tape Down Distance (decimal ft)*									
W.L. Gage (ft.)*									
W.L. Gage Type*									
Transparency* 60 cm tube (to the nearest cm)									
Transparency* 100 cm tube (to the nearest cm)									
Secchi tube transparency, cm									
Appearance *									
Recreat. Suit. *									
Stream Condition*									
Stream Flow (cfs)*									
Sampling Device*									
Sample Type*	τι,								

\*Please reference the separate Additional Instructions/Information sheet for codes and information to ensure data entry accuracy FIELD OBSERVATIONS (station name/location, weather, ice condition, stream width, picture #, GPS file name, etc.)

Water Monitoring Instrument: Make:	Model:	Number:	Turb. Units:
A .			
В			
c			
D			
E			

Page 4 of 12

<b>Sample Condition Upon Receipt</b> Minnesota Department of Health Public Health Laboratory	15H1804
Parcel Information	
Date & time of receipt:	AUG 25'15 11:00
Courier: □UPS □FedEx X Spee-Dee □USPS □Other	Walk-in
Tracking # 5P\$\$7149\$3\$\$525\$	
After hours drop off: Refrigerator Freezer Unrefrigerated	
Parcel: X Plastic cooler	r 🗆 Envelope 🖾 None
Other	
Custody seals present: $\Box$ Yes $X$ No; Custody seals intact: $\Box$ Yes $\Box$ No $X$ N/A	
Custody seal # Evidentiary samples ide	entified:XYes □No
Packaging Information	
Packing material:  Bubble wrap  Styrofoam  Paper  None  Other	
Cooling material: $\swarrow$ Wet ice $\Box$ Ice pack $\Box$ Gel pack $\Box$ Dry ice $\Box$ None $\Box$ Other	
Condition of cooling material:	
Representative sample temperature: <u>Ø.9</u> °C IR thermometer instrume	
itials of person receiving parcel:	
Chain of Custody, Sample Container & Analysis Inform	ation
Chain of custody received: XYes INo	
Chain of custody type:  Standard X Civil  Criminal Priority/Emergency [	] Unknown
Rad Chem request received:	
Rad Chem request received: □ Yes ズ No, Sample survey results: □ < .5 mrem/ All sample containers received intact: ズ Yes □ No	
All sample containers received intact: XYes 🗆 No	tody: 🖉 Yes 🗆 No
All sample containers received intact: XYes $\Box$ No All sample containers are unique to the sample point listed on the chain of cus	
All sample containers received intact: XYes $\Box$ No All sample containers are unique to the sample point listed on the chain of cus All samples have been received within the specified holding time for analysis: Sample submission meets the conditions of the MDH Environmental Laborate Policy: $\Box$ Yes X No	TYes No Unknown
	TYes No Unknown
All sample containers received intact: Yes $\Box$ No All sample containers are unique to the sample point listed on the chain of cus All samples have been received within the specified holding time for analysis: Sample submission meets the conditions of the MDH Environmental Laborate Policy: $\Box$ Yes $\Box$ No ""No" has been checked, details are entered in the work order memo notes.	TYes No Unknown

Amended Report Case Narrative Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Program Code: RG	Project ID: PRJ00075
Program Name: EOD-Fish Kill Studies	Facility Name: None
Collected by: Joe Magee	City: None
Collector ID: None	Generated: 11/05/2015 9:16

Supplement to Test Report ID: 09012015154641

As, Ba, and Ti 200.8 were added to Sample Point -01 on the attached report.

Amended Report

Authorized by:

Report ID: 11052015 9 1706

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Page 6 of 12

Amended Report Analytical Results

Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11/05/15 9	17
	MDH Sample Number: 15H1804-01	
Location ID: none	Collect Date: 08/07/15	Field Residual Chlorine Result: Non
Field Name: Bethany South Ravine	Collect Time: 10:45	Field Fluoride Result: None
Treat funce. Decharry obuit readine		
Sampling Point None	Matrix: Non-potable Water	Field pH Result: None

Results were produced by the Minnesota Department of Health, except where noted.

#### Metal Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Arsenic	D2	33.6	10.0	ug/L	10	B5H0787	08/25/15 13:44	08/26/15 17:36	EPA200.8
Barium	D2	1520	50.0	ug/L	10	B5H0787	08/25/15 13:44	08/26/15 17:36	EPA200.8
Copper	D2	12400	100	ug/L	10	B5H0787	08/25/15 13:44	08/26/15 17:36	EPA200.8
Iron		46300	20.0	ug/L	1	B5H0787	08/25/15 13:44	08/27/15 10:05	EPA200.7
Manganese	D2	8870	100	ug/L	10	B5H0787	08/25/15 13:44	08/26/15 17:36	EPA200.8
Titanium	D2	941	50.0	ug/L	10	B5H0787	08/25/15 13:44	08/26/15 17:36	EPA200.8

Amended Report

Report ID: 11062015 91706

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899

St. Paul, MN 55164-0899

651-201-5300

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Amended Report Analytical Results

Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11/05/15 9:17	
	MDH Sample Number: 15H1804-01RE1	
Location ID: none	MDH Sample Number: 15H1804-01RE1 Collect Date: 08/07/15	Field Residual Chlorine Result: None
Location ID: none Field Name: Bethany South Ravine		Field Residual Chlorine Result: None Field Fluoride Result: None
	Collect Date: 08/07/15	

Receiving Comments: Please treat as a civil chain of custody, and run as a priority sample. Also, please test for sodium

Results were produced by the Minnesota Department of Health, except where noted.

#### Metal Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
Aluminum	D2, M3, M4	33700	200	ug/L	10	B5H0787	08/25/15 13:44	08,31/15 16:16	EPA200.8

Amended Report

Authorized by:

Report ID: 11052015 91706

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899

St. Paul, MN 55164-0899

651-201-5300

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	Amended Report Quality Control	Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: [none]	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11/05/15 9:17	

Batch Summary

## Samples in Batch: B5H0787 - EPA 200 Prep

15H1804.01 15H1804.01RE1

Amended Report

Authorized by:

Report ID: 11052015 91706

Minnesota Department of Health Public Health Laboratory

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11.05/15 9:17	

Amended Report

Analyte         Qualifie(s)         Result         Limit         Units         Level         Result         % REC         % REC         % REC         WREC Limits         RPD         Lint           Iron         < 20.0         ug/L         Prepared: 0825/1513:44         Analyte         RPD         Lint         Int         Units         Spke         Source         % REC         % REC Limits         RPD         Lint           Analyte         Qualifiet(s)         Result         Units         Level         Result         % REC         % REC Limits         RPD         Lint           Analyte         Qualifiet(s)         Result         Units         Level         Result         % REC         % REC Limits         RPD         Lint           Analyte         Qualifiet(s)         < 10.0         ug/L <t< th=""><th>Batch B5H0787 - EPA 2</th><th>00 Prep</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	Batch B5H0787 - EPA 2	00 Prep									
Analyte         Qualifier(s)         Result         Limit         Units         Level         Result         %REC         %REC Limits         RPD         Limit           tron         < 20.0         ug/L         Prepared: 0825/513:44         Analyte         RF           Analyte         Qualifier(s)         Result         Units         Spke         Source         %REC Limits         RPD         Linits           Analyte         Qualifier(s)         Result         Units         Spke         Source         %REC Limits         RPD         Linits           Assenic         <         10.0         ug/L         Spke         Source         %REC Limits         RPD         Linits           Analyte         Copper         <         10.0         ug/L         Spke         Source         %REC %REC Limits         RPD         Linits           Analyte         Qualifier(s)         Result         Level         Result         Level         Result         KREC         %REC %REC Limits         RPD         Linits           Analyte         Qualifier(s)         Result         Linit         Units         Level         Result         %REC         %REC %REC Limits         RPD         Linit         Linit         Units	Blank (B5 H0 787-BL K1)				Prepare	d:08/25/15	13:44 Analy	yzed: 08/27/1	5 10:00		
Blank (B5 H0787-BLK2)         Prepared: 08,25/15 13:44         Aralyte:         NREC         % REC         % REC         Imits         PPD         Live           Arasinic         <         100         ug/L	Analyte		Result		Units			%REC	%REC Limits	RPD	R P D Limi
Analyte Qualifier(s)     Reporting Limit     Spke     Source Result     WREC     WREC Limits     RPD     RF       Asenic     < 100	Iron		<	20.0	ug/L						
Analyte         Qualifier(s)         Result         Limit         Units         Level         Result         %REC         %REC Limits         RPD         Link           Assenic         < 100	Blank ( B5 H0 787-BL K2)				Ргераге	d:08/25/15	13:44 Analy	yzed: 08/26/1	5 17:30		
Barium       <	Analyte		Result		Units			%REC	%REC Limits	RPD	R P D Limi
Copper         <         10.0         ug/L           Manganese         <	Arsenic		<	1.00	ug/L						
Analyte       < 10.0	Barium		<	5.00	ug/L						
Titanium       < 500	Copper		<	10.0	ug/L						
Blank (B5 H0787-BLK3)     Prepared: 08/25/1513:44     Analyzed: 08/31/1516:10       Analyte     Analyte     Result     Reporting     Units     Spike     Source     % REC     % REC     KEC     Limits     RPD     Limits       Aluminum     < 20.0	Manganese		<	10.0	ug/L						
Analyte     Analyte     Reputing     Limit     Units     Spke     Source     %REC     %REC     WREC     Imits     RPD     Limits       Aluminum     < 20.0	Titanium		<	5.00	ug/L						
Analyte         Qualifier(s)         Result         Limit         Units         Level         Result         % REC         % REC Limits         RPD         Limits           Aluminum         <	Blank (B5 H0 787-BL K3)				Prepare	d:08/25/15	13:44 Analy	yzed: 08/31/1	5 16:10		
LCS (B5H0787-BS1)     Prepared: 08/25/1513:44     Analyzed: 08/27/15 10:03       Analyte     Analyte     Result     Reporting     Units     Level     Result     WREC     WREC Limits     RPD     Limits       Itron     10200     20.0     ug/L     10.000     102     95-115       LCS (B5H0787-BS2)     Prepared: 08/25/1513:44     Analyte     Reporting     Spke     Source     WREC     WREC Limits     RPD     Limit       Analyte     Qualifier(s)     Result     Limit     Units     Level     Result     WREC     WREC Limits     RPD     Limit       Analyte     Qualifier(s)     Result     Limit     Units     Level     Result     WREC     WREC Limits     RPD     Limit       Analyte     Qualifier(s)     Result     Limit     Units     Level     Result     WREC     WREC Limits     RPD     Limit       Analyte     Qualifier(s)     Result     Limit     Units     Level     Result     WREC     WREC Limits     RPD     Limit       Analyte     Qualifier(s)     Result     Limit     Units     Level     Result     WREC     WREC     WREC     WREC     Limits     RPD     Limits       Analyte     Qualifier(s)	Analyte		Result		Units			%REC	%REC Limits	RPD	R P D Limi
AnalyteAnalyte Qualifier(s)ResultReporting LimitUnitsSpike LevelSource ResultWRECWREC LimitsRPDRF LimitsRPDRF LimitsIron1020020.0ug/L10.00010295.115LCS (E5H0787-ES2)Prepared: 0825/1513:44Analyzed: 0826/1517:33AnalyteAnalyte Qualifier(s)ResultReporting LimitSpike LevelSource ResultWRECWREC LimitsRPDRPDAnalyteAnalyte Qualifier(s)ResultReporting LimitUnits LevelSpike ResultSource ResultWRECWREC LimitsRPDRPDAnalyte43.41.00ug/L508785.115FBarium43.41.00ug/L508985.115FCopper44.510.0ug/L508985.115FManganese45.110.0ug/L508985.115FLCS (ESH0787-ES3)Prepared: 0825/1513:44Analyzed: 08/31/1516:13FFAnalyteAnalyteDowntReportingUnitsSpikeSourceWDECWDECNDECAnalyteAnalyteDowntReportingUnitsSpikeSourceWDECWDECNDECRECost84.65.00Ug/L508985.115FFFLCS (ESH0787-ES3)Prepared: 08/25/1513:44Analyte:NDECWDECWDEC<	Aluminum		<	20.0	ug/L						
Analyte         Qualifier(s)         Result         Limit         Units         Level         Result         %REC         %MREC         %MREC         %MREC         %MREC         %MREC         Kmrec         Kmrec	LCS (B5H0787-BS1)				Prepare	d:08/25/15	13:44 Analy	yzed: 08/27/1	5 10:03		
Incom         10200         20.0         ug/L         10,000         102         85-115           LCS (ESH0787-BS2)         Prepared: 08/25/1513:44         Analyte         Outling         Spike         Source         WREC         WREC         WREC         Limits         RPD         Limits         Limits         RPD         Limits         RPD         Limits         RPD         Limits         RPD         Limits         RPD         Limits<	Analyte		Result		Units			%REC	%REC Limits	RPD	RPD Limi
Analyte         Result         Reporting Limit         Spice         Source Result         WREC         WREC Limits         RPD         Limit           Ansenic         43.4         1.00         ug/L         50         87         85.115           Barium         43.4         5.00         ug/L         50         96         85.115           Copper         44.5         10.0         ug/L         50         89         85.115           Manganese         45.1         10.0         ug/L         50         80         85.115           LCS (B5H0787-BS3)         Prepared: 08/25/15/13:44         Aralyte         Prepared: 08/25/15/13:44         Aralyzed: 08/31/1/5 16:13	Iron		10200		ug/L			102	85-115		
Analyte Qualifier(s)         Result         Reporting Limit         Vnits         Spike Level         Source Result         WREC         WREC Limits         RPD         RF Lin           Arsenic         43.4         1.00         ug/L         50         87         85.115           Barium         43.4         5.00         ug/L         50         96         85.115           Copper         44.5         10.0         ug/L         50         89         85.115           Manganese         45.1         10.0         ug/L         50         80         85.115           Titanium         44.6         5.00         ug/L         50         88         85.115           LCS (B5H0787-BS3)         Prepared: 08/25/1513:44         Analyte         Preparing         Unit         Spike         Source         WDED         WDED         RF	LCS (B5H0787-BS2)				Prepare	d:08/25/15	13:44 Anah	vzed: 08/26/1	5 17:33		
Arsenic     43.4     1.00     ug/L     50     87     85.115       Barium     48.1     5.00     ug/L     50     96     85.115       Copper     44.5     10.0     ug/L     50     88     85.115       Manganese     45.1     10.0     ug/L     50     90     85.115       Titanium     44.6     5.00     ug/L     50     89     85.115       LCS (E5H0787-BS3)     Prepared: 08/25/15.13:44     Analyte     Prepared: 08/25/15.13:44     Analyte     Dop RF	Analyte		Result			Spike	Source	-		RPD	R P D Limi
Barium         48.1         5.00         ug/L         50         96         85.115           Copper         44.5         10.0         ug/L         50         89         85.115           Manganese         45.1         10.0         ug/L         50         90         85.115           Titanium         44.6         5.00         ug/L         50         89         85.115           LCS (B5H0787- BS3)         Prepared: 08/25/15.13:44         Analyte         Public         Spike         Source         %DEC0         NECT NET	Arsenic	scuurment of	434		ug/L		Reduit	87	85-115		
Copper         44.5         10.0         ug/L         50         89         85.115           Manganese         45.1         10.0         ug/L         50         90         85.115           Titanium         44.6         5.00         ug/L         50         89         85.115           LCS (B5H0787- BS3)         Prepared: 08/25/15.13:44         Analyte         Public Prepared: 08/25/15.13:44         Analyte         RF					-	50					
Manganese         45.1         10.0         ug/L         50         90         85.115           Titanium         44.6         5.00         ug/L         50         89         85.115           LCS (B5H0787-BS3)         Prepared: 08.25/15.13:44         Analyte         Double         RF         Spike         Source         %DEC0         NECTOR         RF					•						
Titanium         44.6         5.00         ug/L         50         89         85-115           LCS (B5H0787-BS3)         Prepared: 08/25/1513:44         Analyzed: 08/31/1516:13         Analyze         Prepared: 08/25/1513:44         Analyzed: 08/31/1516:13         RF           Analyze         Document         Reporting         Luck         Spike         Source         NDEO         RF					•	50					
Analyte Reporting Spike Source MEEQ (initial DDD)	•					50					
Analyte Reporting Unit Spike Source Analyte Days	LCS (B5H0787-BS3)				Prepare	d:08/25/15	13:44 Analy	yzed: 08/31/1	5 16:13		
	Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units		-	%REC	%REC Limits	RPD	R P D Limi

Amended Report

Report ID: 11052015 91706

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Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee	City: None	
Collector ID: None	Generated: 11.05/15 9:17	

Amended Report

Batch B5H0787 - EPA 200	Prep									
Duplicate (B5H0787-DUP1)		Source: 15H	180401	Prepare	d:08/25/15	13:44 Anal	yzed: 08/27/1	5 10:07		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Iron		46500	20.0	ug/L		46300			0.4	20
Duplicate (B5H0787-DUP2)		Source: 15H	180401	Prepare	d:08/25/15	13:44 Anal	yzed: 08/26/1	5 17:39		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Arsenic		32.1	10.0	ug/L		33.6			4	20
Barium		1440	50.0	ug/L		1520			6	20
Copper		11600	100	ug∕L		12400			6	20
Manganese		8200	100	ug/L		8870			8	20
Titanium		870	50.0	ug/L		941			8	20
Duplicate (B5H0787-DUP3)		Source: 15H	180401RE1	Ргераге	d:08/25/15	13:44 Anal	yzed: 08/31/1	5 16:19		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Aluminum		31100	200	ug/L		33700			8	20
Matrix Spike (B5H0787-MS1)		Source: 15H	180401	Prepare	ed:08/25/15	13:44 Anal	yzed: 08/27/1	5 10:11		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R P D Limi
Iron	M1	72 <b>40</b> 0	20.0	ug/L	10,000	46300	261	85-115		
Matrix Spike (B5H0787-MS2)		Source: 15H	180401	Ргераге	d:08/25/15	13:44 Anal	yzed: 08/26/1	5 17:42		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Arsenic	M4	93.6	10.0	ug/L	50	33.6	120	85-115		
Barium	M4	2210	50.0	ug/L	50	1520	NR	85-115		
Copper	M4	17 100	100	ug/L	50	12400	NR	85-115		
Manganese	M4	12200	100	ug/L	50	8870	NR	85-115		
Titanium	M4	1370	50.0	ug/L	50	941	855	85-115		
Matrix Spike (B5H0787-MS3)		Source: 15H	180401RE1	Ртераге	d:08/25/15	13:44 Anal	yzed: 08/31/1	5 16:22		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Aluminum	M3, M4	37700	200	ug/L	50	33700	NR	85-115		

Amended Report

Report ID: 11052015 91706

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and

Mas

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Amended Report Quality Control

#### Data Qualifiers and Definitions

M4	The analysis of the spked sample required a dilution such that the spke recovery calculation does not provide useful information. The associated laboratory control sample and/or laboratory control sample duplicate recovery was acceptable.
MЗ	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated laboratory control sample and/or laboratory control sample duplicate recovery was acceptable.
M1	Matrix spike and/or matrix spike duplicate recovery was high; the associated laboratory control sample and/or laboratory control sample duplicate recovery was acceptable.
D2	Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.
Dry	Sample results reported on a dry weight basis

- RPD Relative Percent Difference
- %REC Percent Recovery

Amended Report

Authorized by:

Report ID: 11052015 9 1706

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MINNESOTA DEPARTMENT

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Page 1 of 2

 Date Printed:
 Date Collected:
 Division Contact:

 8/13/2015
 08/11/2015
 Brennon Schaefer

 Sample Numbers

 Inspector No:
 DTT15005

 Lab ID:
 W-15-1432
 SDG ID:
 15-SDG-3487

 Quantity x Sample Size:
 Project:
 1 x 1 L
 Ground Water

 Product Name:
 Water, Spring
 Description:
 Collected From:

 Crystal Springs #1 / CRYSTL1
 CRYSTL1
 Collected From:

alysis Requested: GC		C	mperature Received: 8.4 deg C
Analyte	Result	MRL	Result Comment
	1 toout	1913 Star	rissia, contrion,
GCMSMS Monitoring	ND at MRL	20 mmł	
Alachlor	ND at MRL	30 ppt	
		30 ppt	
Atrazine	ND at MRL	30 ppt	
Benfluralin	ND at MRL	25 ppt	
lifenthrin	ND at MRL	20 ppt	
Chlorothalonil	ND at MRL	50 ppt	
Chlorpyrifos	ND at MRL	40 ppt	
Ciomazone	ND at MRI.	15 ppt	
Cyfluthrin	ND at MRL	100 ppt	
leisopropylatrazine	ND at MRL	150 ppt	
Desethylatrazine	58.9 ppt	50 ppt	
liazinon	ND at MRL	30 ppt	X
liazinon Oxon	ND at MRL	75 ppt	
lichlobenil	ND at MRL	5 ppt	
lichlorvos	ND at MRL	15 ppt	
Imethenamid	ND at MRI.	15 ppt	
imethoate	ND at MRL	100 ppt	
Isulfoton	ND at MRL	60 ppt	
PTC	ND at MRL	10 ppt	
stenvalerate	ND at MRL	150 ppt	
thatfluralin	ND at MRL	50 ppt	
thofumesate	ND at MRL	50 ppt	
onotos	ND at MRL	15 ppt	
lalathion	ND at MRL	50 ppt	
lethoxychlor	ND at MRL	50 ppt	
letolachlor	ND at MRL	25 ppt	
letribuzin	ND at MRL	75 ppt	
etribuzin DA	ND at ERL	500 ppt	
letribuzin DADK	ND at ERL	500 ppt	
letribuzin DK	ND at ERL	500 ppt	
xadiazon	ND at MRL	75 ppt	
arathion-methyl	ND at MRL	100 ppt	
endimethalin	ND at MRL	75 ppt	
horate	ND at MRL	25 ppt	
rometon	ND at MRL	100 ppt	
	ND at MRL		
ropachlor	IND BLIMPL	30 ppt	

	Report ID: 436683	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallang m. Ross
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Date Printed:

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: GC

	8/13/2015	08/11/2	2015	Bri	ennon Schaefer
	Sample Numbers				
	Inspector No: DTT	15005			
E	Lab ID: W-1	5-1432	SD	G ID:	15-SDG-3487
	Quantity x Sample S	izə:	Project:		
	1x1L		Ground	Water	
	Product Name: Water, Spring				
	Description:				
age 2 of 2	Collected From:				
	Crystal Springs #1	/ CRYSTL1			
	Temperature Receive	ed:	8.4 (	deg C	
Larai	D	14.0			

Date Collected: Division Contact:

			temperature received:	8.4 deg C	_
Analyte	Result	MRL	Result Comment		
GCMSMS Monitoring					
Propazine	ND at MRL	25 ppt			
Simazine	ND at MRL	75 ppt			
Tebupirimíphos	ND at MRL	30 ppt			
Terbufos	ND at MRL	30 ppt			
Tolfenpyrad	ND at MRL	100 ppt			
Triallate	ND at MRL	50 ppt			
Trifluralin	ND at MRL	50 ppt			
lambda-Cyhalothrin	ND at MRL	75 ppt			
zeta-Cypermethrin	ND at MRL	500 ppt			

Sample Remarks:

Report ID: 436683 Kathryn Reynolds Water Analysis Unit Supervisor Kaffary An Ross	Report ID: 436683		Kaffan m	RESS
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Date Printed:

8/14/2015

8/14/2010 Sample Numbers Inspector No: DTT15005 Lab ID: W-15-1434

MINNESOTA DEPARTMENT OF AGRICULTURE **Laboratory Analysis Report** 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: LC

Page 1 of 3

Quantity x Sample Size: Project: 1x1L Ground Water Product Name: Water, Spring Description: Collected From: Crystal Springs #1 / CRYSTL1 ature Received. 8.4 deg C

Date Collected:

08/11/2015

**Division Contact:** 

SDG ID:

Brennon Schaefer

15-SDG-3487

			Temperature Received:	8.4 deg C	
Analyte	Result	MRL	Result Comm	ent	
LCMSMS (+) Monitoring					
Acetamiprid	ND at MRL	25 ppt			
Aldicarb Sulfone	ND at MRL	15 ppt			
Aldicarb Sulfoxide	ND at MRL	50 ppt			
Azoxystrobin	ND at MRL	10 ppt			
Bensulfuron-methyl	ND at MRL	16.7 ppt			
3ensulide .	ND at MRL	250 ppt			
Boscalid	ND at MRL	50 ppt			
Bromacil	ND at MRL	30 ppt			
Carbaryl	ND at MRL	25 ppt			
Carbendazim	ND at MRL	10 ppt			
Carbofuran	ND at MRL	13.3 ppt			
Chlorantraniliprole	ND at MRL	50 ppt			
Chlorimuron-ethyl	ND at MRL	20 ppt			
Chlorpyrifos Oxon	ND at MRL	40 ppt			
Clothlanidin	ND at MRL	25 ppt			
Cyanazine	ND at MRL	25 ppt			
Syantraniliprole	ND at MRL	100 ppt			
DEDI Atrazine	92.5 ppt	50 ppt			
Dicrotophos	ND at MRL	25 ppt			
Difenoconazole	ND at MRL	25 ppt			
Dinotefuran	ND at MRL	25 ppt			
Disulfoton Sulfone	ND at MRL	20 ppt			
Diuton	ND at MRL	13.3 ppt			
lumetsulam	ND at MRL	50 ppt			
Flutriafol	ND at MRL	10 ppt			
lalosulfuron-methyl	ND at MRL	30 ppt			
lexazinone	ND at MRL	10 ppt			
łydroxyatrazine	12.9 ppt	6.7 ppt			
mazamethabenz Acid	ND at MRL	10 ppt			
mazamethabenz-methyl	ND at MRL	5 ppt			
mazamox	ND at MRL	13.3 ppt			
mazapic	ND at MRL	10 ppt			
mazapyr	ND at MRL	8.3 ppt			
mazaquin	ND at MRL	16.7 ppt			
mazethapyr	ND at MRL	6.7 ppt			
midacloprid	ND at MRL	20 ppt			
Sample Remarks:					

Report ID: 436685	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kalay In REES
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Date Printed: 8/14/2015 Date Collected: **Division Contact:** 08/11/2015 Brennon Schaefer Sample Numbers Inspector No: DTT15005 Lab ID: W-15-1434 SDG ID: 15-SDG-3487 Quantity x Sample Size: Project: Ground Water  $1 \times 1 L_{\rm V}$ Product Name: Water, Spring Description: Page 2 of 3 **Collected From:** Crystal Springs #1 / CRYSTL1

Analysis Requested: LC			Crystal Springs #1 / CRYSTL1			
			Temperature Received:	8.4 deg C		
Analyte	Result	MRL	Result Com	nent		
LCMSMS (+) Monitoring						
Isoxaflutole	ND at MRL	40 ppt				
Linuron	ND at MRL	20 ppt				
Metalaxyl	ND at MRL	8.3 ppt				
Metsulfuron-methyl	ND at MRL	23.3 ppt				
Myclobutanil	ND at MRL	10 ppt		5		
Nicosulfuron	ND at MRL	26.6 ppt				
Norflurazon	ND at MRL	20 ppt				
Norflurazon-desmethyl	ND at MRL	50 ppt		J		
Oxydemeton-methyl	ND at MRL	20 ppł				
Parathion-methyl Oxon	ND at MRL	25 ppt				
Picoxystrobin	ND at MRL	50 ppt				
Prometryn	ND at MRL	3.3 ppt				
Propiconazole	ND at MRL	10 ppt				
Pyraclostrobin	ND at MRL	25 ppt				
Pyroxasulfone	ND at MRL	50 ppt				
Saflufenacil	ND at MRL	15 ppt				
Siduron	ND at MRL	6.7 ppt				
Sulformeturon-methyl	ND at MRL	8.3 ppt				
Tebuconazole	ND at MRL	10 ppt				
Tetraconazole	ND at MRL	10 ppt				
Thiacloprid	ND at MRL	50 ppt				
Thiamethoxam	ND at MRL	25 ppt				
Thifensulfuron-methyl	ND at MRL	16.7 ppt				
Thiobencarb	ND at MRL	8.3 ppt				
Triasulfuron	ND at MRL	23.3 ppt				
LCMSMS (-) Monitoring						
2,4,5-T	ND at MRL	50 ppt				
2,4,5-TP	ND at MRL	50 ppt				
2,4-D	ND at MRL	8.3 ppt				
2,4-DB	ND at MRL	20 ppt				
Acetochlor ESA	ND at MRL	30 ppt				
Acetochlor OXA	ND at MRL	33.3 ppt				
Alachlor ESA	178 ppt	41.6 ppt				
Alachior OXA	ND at MRL.	33.3 ppt				
Bentazon	ND at MRL	5 ppt				
Bromoxynil	ND at MRL	25 ppt				
Sample Remarks:						
Characterized ND -4 CDL (42 - 1)						

Fluxapyroxad - ND at ERL (10 ppt)

	I verify that these data are correct.	1.	~ /
Report ID: 436685	Kathryn Reynolds	VA	2 Rest
	Water Analysis Unit Supervisor	nathan	10-0

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OF AGRICULTURE	

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## Water Monitoring Final Report

Analysis Requested: LC

 Report orth
 Quantity x Sample Size:
 Project:

 i155-2531
 1 x 1 L
 Ground Water

 Product Name: Water, Spring
 Water, Spring

 Page 3 of 3
 Collected From: Crystal Springs #1 / CRYSTL1

 Temperature Received:
 8.4 deg C

Date Printed:

8/14/2015

Inspector No: DTT15005 Lab ID: W-15-1434

Sample Numbers

Date Collected:

08/11/2015

**Division Contact:** 

SDG ID:

Brennon Schaefer

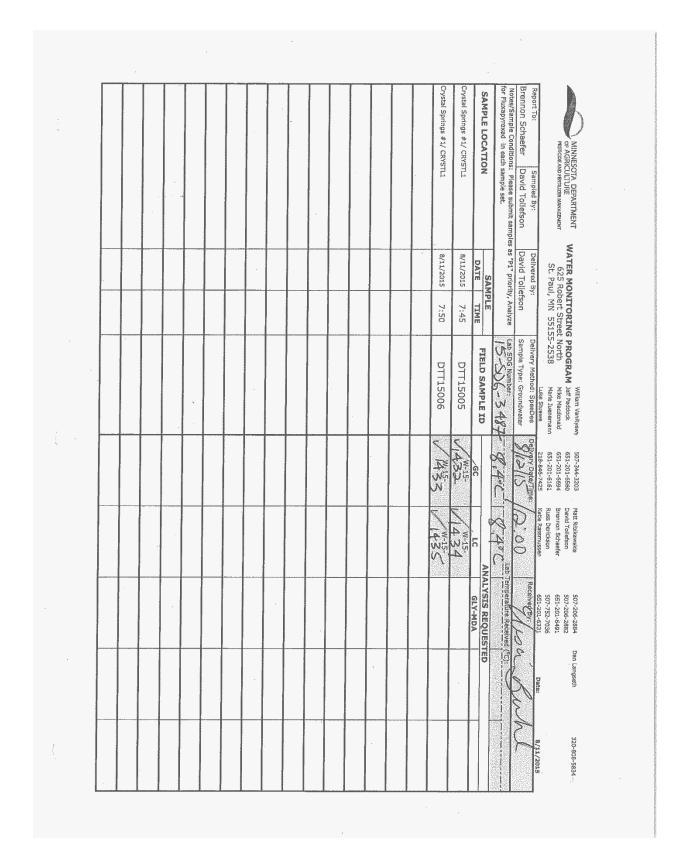
15-SDG-3487

Analyte	Result	MRL	Result Comment
LCMSMS (-) Monitoring			
Clopyralid	ND at MRL	41.6 ppt	
Dicamba	ND at MRL	50 ppt	
Dichlorprop	ND at MRL	50 ppt	
Dimethenamid ESA	ND at MRI.	6.7 ppt	
Dimethenamid OXA	ND at MRL	10 ppt	
Flufenacet OXA	ND at MRL	8.3 ppt	
Isoxaflutole DKN	ND at MRL	50 ppt	
MCPA	ND at MRL	5 ppt	
MCPB	ND at MRL	20 ppt	
MCPP	ND at MRL	50 ppt	
Mesotrione	ND at MRL	50 ppt	
Metolachlor ESA	184 ppt	10 ppt	
Metolachlor OXA	ND at MRL	10 ppt	
Picloram	ND at MRL	41.6 ppt	
Propachlor ESA	ND at MRL	30 ppt	
Propachior OXA	ND at MRL	10 ppt	
Sedaxane	ND at MRL	75 ppt	
Tembotrione	ND at MRL	50 ppt	
Triclopyr	ND at MRL	50 ppt	

Sample Remarks:

Fluxapyroxad - ND at ERL (10 ppt)

Report ID: 436685	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffang n	RES
			***************************************



#### MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



# Water Monitoring Final Report

Re-issue of Report ID: DTT15005-233276



Brennon Schaefer

SDG Comments:

		DTT1500	5		
LAB Sample ID:	AR-15-2714	Quantity x Sample Size:	1 x 125 ml		Project Name: Ground Water
Inspector Sample ID:	DTT15005	Date/Time Collected:	8/11/2015	0745	
Product/Description:	Water, Spring	Date/Time Received:	8/12/2015	1200	Temperature Received: Frozen
Collected From:	Crystal Springs #1 / CF	RYSTL1			
Analysis Requested:	NO3/N02-N				
Analyte	Result	MRL	Meth	lod	Result Comment
Nitrate/Nitrite	4.61 ppm	0.40 ppm	Std. Meth. 45 NO3 NO2	500 NO3-F,	
Nitrate/Nitrite Analysis Date	/Time 08/13/2015 12	2:51:44 pm			
Sample Remarks:					

l au	thorize this final report.	
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Voceste	Emesmann

									CO	PY	SAL
OF AGRI	OTA DEPARTMENT CULTURE ND FERTILIZER MANAGEMENT	625 R	obert Stree		William VanRyswy Jeff Paddock Mike Macdonald Marie Juenemann Luke Stuewe	651-201-6560 651-201-6694	Matt Ribikawskis David Tollefson Brennon Schaefer Russ Derickson Katle Rassmussen	507-206-2884 507-206-2882 651-201-6491 507-752-7036 651-201-6331	Dan Langseth	320-808-5834	
Report To:	Sampled By:	Delivered B		Delivery Met	hod: SpeeDee	Delivery Date/Time		Received By:	Date:	8/11/2015	
Brennon Schaefer	David Tollefson	David Toll			: Groundwater	8/2/15/	12:00	711	or R	whe	
for Fluxapyroxad in eac	ns: Please submit sample h sample set.	s as "P1" prior	ty, Analyze	Lab SDG Nur	X-3493	FROT	TLab	Temperature Receive	ed (°C):		-
SAMPLE LOCATI		SAI	1PLE		1	1000	AN	ALYSIS REQUE	STED		
SAMPLE LOCATI	ON	DATE	TIME	FIELDS	SAMPLE ID	NO3/NO2-N					
Crystal Springs #1/ CRY	STL1	8/11/2015	7:45	DTT	15005	AR-15- 2714					1
Crystal Springs #1/ CRY	STL1	8/11/2015	7:50	DTT	15006	AR-15- 2715					1
									1		
											1
											1
											1
						8 - N					
											1
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		*								-	1
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											-

Date Printed:

8/13/2015

Date Collected:

08/11/2015

Division Contact:

Brennon Schaefer

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	✓ DE AGRICUET	URE

MI	MINNESOTA DEPARTMENT			1/2015	Brennon Schaefer
156.1	tet AGRICULTURE				<u></u>
				00	GID: 15 000 2407
MINNESOTA DEPARTI		JRE	Lab ID: W-15-1433		10-500-3407
	Analysis Report		Quantity x Sample Size:	Project:	
	t Street North nesota 55155-2531		1 x 1 L Product Name:	Ground	Water
	(651) 201-6010				
Water Monitoring Final Report			Description:		
		Page 1 of 2	Collected From:		
Analysis Requested: GC			Crystal Springs #1 / CRYS	TL1	
niaiyaia nequeated. 00			Temperature Received:	8.4	deg C
Analyte	Result	MRL	Result Com	ment	
GCMSMS Monitoring					
Acetochlor	ND at MRL	30 ppt			
Alachlor	ND at MRL	30 ppt			
Atrazine	ND at MRL	30 ppt			
Benfluralin	ND at MRL	25 ppt			
Bifenthrin	ND at MRL	20 ppt	-		
Chlorothalonil	ND at MRL	50 ppt			
Chlorpyrifos	ND at MRL	40 ppt			
Clomazone	ND at MRL	15 ppt			
Cyfluthrin	ND at MRL	100 ppt			
Jelsopropylatrazine	ND at MRL	150 ppt			
Desethylatrazine	ND at MRL	50 ppt			
Jazinon	ND at MRL	30 ppt			
Diazinon Oxon	ND at MRL	75 ppt			
Dichlobenil	ND at MRL	5 ppt	<i>,</i>		
Dichlorvos	ND at MRL	15 ppt			
Dimethenamid	ND at MRL	15 ppt			
Dimethoate	ND at MRL	100 ppt			
Disulfoton	ND at MRL	60 ppt			
EPTC	ND at MRL	10 ppt			
Esfenvalerate	ND at MRL	150 ppt			
Ethalfluralin	ND at MRL	50 ppt			
Ethofumesate	ND at MRL	50 ppt			
Fonofos	ND at MRL	15 ppt			
Alathion	ND at MRL	50 ppt			
/iethoxychlor	ND at MRI.	50 ppt			
Aetolachior	ND at MRL	25 ppt			
Aetribuzin	ND at MRL	75 ppt			
/etribuzin DA	ND at ERL	500 ppt			
/etribuzin DADK	ND at ERL	500 ppt			
/etribuzin DK	ND at ERL	500 ppt			
Oxadiazon	ND at MRL	75 ppt			
Parathion-methyl	ND at MRL	100 ppt			
Pendimethalin	ND at MRL	75 ppt			
horate	ND at MRL	25 ppt			
		100			

Sample Remarks:

Prometon

Propachlor

Report ID: 436684	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kathan m. Ross
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This report shall not be reproduced except in full, without the written approval from the laboratory. These results are only applicable to the sample(s) listed.

100 ppt

30 ppt

ND at MRL

ND at MRL

Date Printed:

8/13/2015

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\ k	LEINEN/COTTA	DEPARTMENT
	3 AGRICULT	URE

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: GC

	of rolmore	0.07 1174		- wi		
	Sample Numbers	15006	<i></i>	~ **		
CULTURE	Lab ID: W-1	5-1433	SD	G ID:	15-SDG-3487	
	Quantity x Sample S	ize:	Project:			
531	1 x 1 L Ground Water					
501	Product Name: Water, Spring					
port	Description:					
Page 2 of 2	Collected From:					
	Crystal Springs #1	/ CRYSTL1				
	<b>Temperature Receive</b>	ed:	8.4 (	deg C		
MRL	Res	ult Comme	nt			

Date Collected: 08/11/2015 Division Contact: Brennon Schaefer

Analyte	Result	MRL	Result Comment	
GCMSMS Monitoring				
Propazine	ND at MRL	25 ppt		
Simazine	ND at MRL	75 ppt		
Tebupirimiphos	ND at MRL	30 ppt		
Terbufos	ND at MRL	30 ppt		
Tolfenpyrad	ND at MRL	100 ppt		
Triallate	ND at MRL	50 ppt		
Trifluralin	ND at MRL	50 ppt		
lambda-Cyhalothrin	ND at MRL	75 ppt		
zəta-Cypermethrin	ND at MRL	500 ppt		

Sample Remarks:

	Report ID: 436684	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kallang Ze	- RE-ES
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## Water Monitoring Final Report

Date Collected: 08/11/2015 Date Printed: Division Contact: Brennon Schaefer 8/14/2015 Sample Numbers Inspector No: DTT15006 Lab ID: W-15-1435 SDG ID: 15-SDG-3487 Quantity x Sample Size: Project: 1 x 1 L Ground Water Product Name: Water, Spring Description: Page 1 of 3 Collected From: Crystal Springs #1 / CRYSTL1

Analysis Requested: LC			Crystal Springs #1 / CRYSTL1
indigenes indigenesis and			Temperature Received: 8.4 deg C
Analyte	Result	MRL	Result Comment
LCMSMS (+) Monitoring			
Acetamiprid	ND at MRL	25 ppt	
Aldicarb Sulfone	ND at MRL	15 ppt	
Aldicarb Sulfoxide	ND at MRL	50 ppt	
Azoxystrobin	ND at MRL	10 ppt	
Bensulfuron-methyl	ND at MRL	16.7 ppt	
Bensulide	ND at MRL	250 ppt	
Boscalid	ND at MRL	50 ppt	
Bromacil	ND at MRL	30 ppt	
Carbaryl	ND at MRL	25 ppt	
Carbendazim	ND at MRL	10 ppt	
Carbofuran	ND at MRL	13.3 ppt	
Chlorantraniliprole	ND at MRL	50 ppt	
Chlorimuron-ethyl	ND at MRL	20 ppt	
Chlorpyrifos Oxon	ND at MRL	40 ppt	
Clothianidin	ND at MRL	25 ppt	
Cyanazine	ND at MRL	25 ppt	
Cyantraniliprole	ND at MRL	100 ppt	
DEDI Atrazine	ND at MRL	50 ppt	
Dicrotophos	ND at MRL	25 ppt	
Difenoconazole	ND at MRL	25 ppt	
Dinotefuran	ND at MRL	25 ppt	
Disulfoton Sulfone	ND at MRL	20 ppt	
Diuron	ND at MRL	13.3 ppt	
Flumetsulam	ND at MRL	50 ppt	
Flutriafol	ND at MRL	10 ppt	
Halosulfuron-methyl	ND at MRL	30 ppt	
Hexazinone	ND at MRL	10 ppt	
Hydroxyatrazine	ND at MRL	6.7 ppt	
mazamethabenz Acid	ND at MRL	10 ppt	
mazamethabenz-methyl	ND at MRL	5 ppt	
mazamox	ND at MRL	13.3 ppt	
mazapic	ND at MRL	10 ppt	
mazapyr	ND at MRL	8.3 ppt	
mazaquin	ND at MRL	16.7 ppt	
mazethapyr	ND at MRL	6.7 ppt	
Imidacloprid	ND at MRL	20 ppt	
Sample Remarks:			

Fluxapyroxad - ND at ERL (10 ppt)

	Report ID: 436686	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffan	m. Ros
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MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

#### Water Monitoring Final Report

Analysis Requested: LC

 
 AGRICULTURE
 Inspector No: DTT15006 Lab ID: W-15-1435
 SDG ID: 15-SDG-3487

 Agriculture
 Quantity x Sample Size:
 Project:

 Tth
 1 x 1 L
 Ground Water

 55-2531
 Product Name: Water, Spring
 Water, Spring

 Page 2 of 3
 Collected From: Crystal Springs #1 / CRYSTL1
 Crystal Springs #1 / CRYSTL1

Date Printed:

Sample Numbers

8/14/2015

Date Collected:

08/11/2015

Division Contact: Brennon Schaefer

			D
Analyte	Result	MRL	Result Comment
LCMSMS (+) Monitoring			
Isoxaflutole	ND at MRL	40 ppt	
Linuron	ND at MRL	20 ppt	
Metalaxyl	ND at MRL	8.3 ppt	
Metsulfuron-methyl	ND at MRL	23.3 ppt	
Myclobutanii	ND at MRL	10 ppt	
Nicosulfuron	ND at MRL	26.6 ppt	
Norflurazon	ND at MRL	20 ppt	
Norflurazon-desmethyl	ND at MRL	50 ppt	
Oxydemeton-methyl	ND at MRL	20 ppt	
Parathion-methyl Oxon	ND at MRL	25 ppt	
Picoxystrobin	ND at MRL	50 ppt	
Prometryn	ND at MRL	3.3 ppt	
Propiconazole	ND at MRL	10 ppt	
Pyraclostrobin	ND at MRL	25 ppt	
Pyroxasulfone	ND at MRL	50 ppt	
Saflufenacil	ND at MRL	15 ppt	
Siduron	ND at MRL	6.7 ppt	
Sulfometuron-methyl	ND at MRL	8.3 ppt	
Tebuconazole	ND at MRL	10 ppt	
Tetraconazole	ND at MRL	10 ppt	
Thiacloprid	ND at MRI.	50 ppt	
Thiamethoxam	ND at MRL	25 ppt	
Thifensulfuron-methyl	ND at MRI.	16.7 ppt	
Thiobencarb	ND at MRI.	8.3 ppt	
Triasulfuron	ND at MRL	23.3 ppt	
LCMSMS (-) Monitoring			
2,4,5-T	ND at MRL	50 ppt	
2,4,5-TP	ND at MRL	50 ppt	
2,4-D	ND at MRL	8.3 ppt	
2,4-DB	ND at MRL	20 ppt	
Acetochlor ESA	ND at MRL	30 ppt	
Acetochlor OXA	ND at MRL	33.3 ppt	
Alachlor ESA	ND at MRL	41.6 ppt	
Alachior OXA	ND at MRL	33.3 ppt	
Bentazon	ND at MRL	5 ppt	4
Bromoxynii	ND at MRL	25 ppt	
Sample Remarks:			
Fluxapyroxad - ND at ERL (10 ppt)			
nunapyrunau - nur ar unu (ru ppt)			

Fluxapyroxad - ND at ERL (10 ppt)

	I verify that these data are correct.	1	n Am
Report ID: 436686	Kathryn Reynolds	Kalls m	RES
• 	Water Analysis Unit Supervisor	····	·

MINNESOTA DEPARTMENT

**MINNESOTA DEPARTMENT OF AGRICULTURE** Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

## Water Monitoring Final Report

Analysis Requested: LC

Date Printed: 8/14/2015 08/11/2015 Brennon Schaefer Sample Numbers Inspector No: DTT15006 Lab ID: W-15-1435 SDG ID: 15-SDG-3487 Quantity x Sample Size: Project: 1 x 1 L Ground Water Product Name: Water, Spring Description: Page 3 of 3 Collected From: Crystal Springs #1 / CRYSTL1 Temperature Received: 8.4 deg C Result Comment

Date Collected:

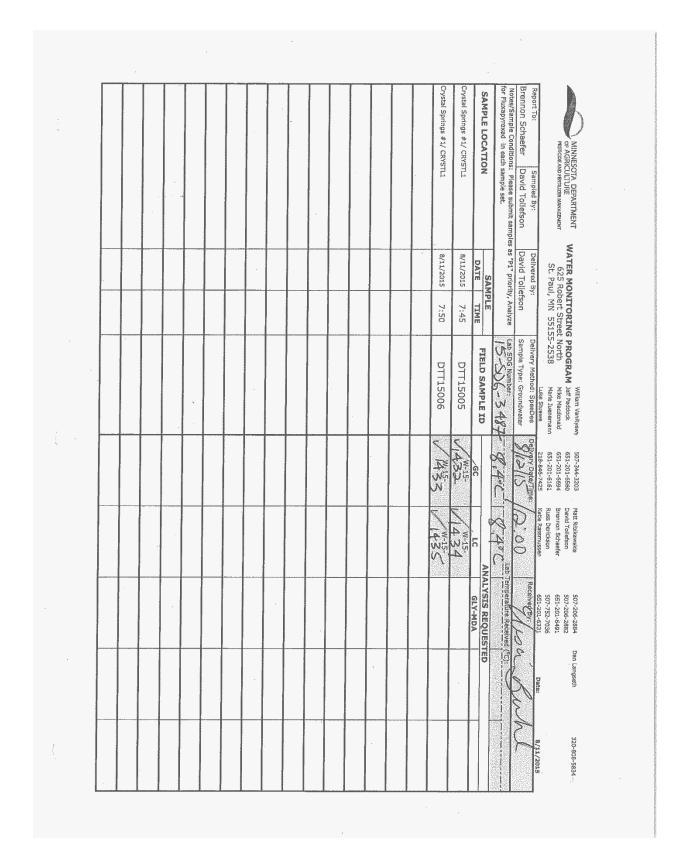
**Division Contact:** 

Analyte	Result	MRL	
LCMSMS (-) Monitoring			
Clopyralid	ND at MRL	41.6 ppt	
Dicamba	ND at MRL	50 ppt	
Dichlorprop	ND at MRL	50 ppt	
Dimethenamid ESA	ND at MRL	6.7 ppt	
Dimethenamid OXA	ND at MRL	10 ppt	
Flufenacet OXA	ND at MRL	8.3 ppt	
Isoxaflutole DKN	ND at MRL	50 ppt	
MCPA	ND at MRL	5 ppt	
MCPB	ND at MRL	20 ppt	
MCPP	ND at MRL	50 ppt	
Mesotrione	ND at MRL	50 ppt	
Metolachlor ESA	ND at MRL	10 ppt	
Metolachlor OXA	ND at MRL	10 ppt	
Picloram	ND at MRL	41.6 ppt	
Propachlor ESA	ND at MRL	30 ppt	
Propachlor OXA	ND at MRL	10 ppt	
Sedaxane	ND at MRL	75 ppt	
Tembotrione	ND at MRL	50 ppt	
Triclopyr	ND at MRL	50 ppt	

Sample Remarks:

Fluxapyroxad - ND at ERL (10 ppt)

Report ID: 436686	I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor	Kaffan	m. Res



# MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



Water	Monitoring	Final	Report
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Re-issue of Report ID: DTT15006-233276

Date Reported: 10/26/2015	SDG ID: 15-SDG-3493	Page: Page 1 of 1
Division Contact:		
	Brennon Schaet	er

SDG Comments:

		DTT1500	6			
LAB Sample ID:	AR-15-2715	Quantity x Sample Size:	1 x 125 ml		Project Name: Ground Water	
Inspector Sample ID:	DTT15006	Date/Time Collected:	8/11/2015	0750		
Product/Description:	Water, Spring	Date/Time Received:	8/12/2015	1200	Temperature Received: Frozen	
Collected From:	Crystal Springs #1 / CF	RYSTL1				
Analysis Requested:	NO3/N02-N					
Analyte	Result	MRL	Meth	hod	Result Comment	
Nitrate/Nitrite	ND	0.40 ppm	Std. Meth. 45 NO3 NO2	500 NO3-F,		
Nitrate/Nitrite Analysis Date	e/Time 08/13/2015 1	2:51:44 pm				
Sample Remarks:						

lau	thorize this final report.
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Couste Etresmann

										SAC
								$\mathbb{CO}$	PY	
OF AGRI	OTA DEPARTMENT CULTURE ND FERTILIZER MANAGEMENT	625 R	obert Stree		651-201-6560 651-201-6694	Matt Ribikawskis David Tollefson Brennon Schaefer Russ Derickson Katle Rassmussen	507-206-2884 507-206-2882 651-201-6491 507-752-7036 651-201-6331	Dan Langseth	320-808-5834	
Report To:	Sampled By:	Delivered B		Delivery Method: SpeeDee	Delivery Date/Time		Received By:	Date:	8/11/2015	191
Brennon Schaefer	David Tollefson	David Toll		Sample Type: Groundwater	8/12/15/	12:00	YUL	oc R	whe	
Notes/Sample Condition for Fluxapyroxad in eac	ns: Please submit samples h sample set.			Lab SDG Number: 15-505-3493	FROZ	Lab	emperature Receive	ed (°C):		
SAMPLE LOCATI	ON		MPLE	FIELD SAMPLE ID		AN	ALYSIS REQUE	STED		
Crystal Springs #1/ CRY	STL1	0ATE 8/11/2015	7:45	DTT15005	AR-15- 2714					
Crystal Springs #1/ CRY	STL1	8/11/2015	7:50	DTT15006	AR-15- 2715	-				-
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Protecting, maintaining and improving the health of all Minnesotans

Report Date: 11/6/15 Client Name: RG - MPCA - EOD-Fish Kill Studies Project Code: RG Project Name: EOD-Fish Kill Studies

Work Order Number: 15H1472

Report To: RG - MPCA - EOD-Fish Kill Studies Joe Magee 520 Lafayette Rd. Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

Mas

Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory . Environmental Laboratory Section . 601 Robert St. N . PO Box 64899 . St Paul, MN 55164 (651) 201-5300 http://www.health.mn.us/divs/phl/environmental

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

	Summary of Samples Received	651-201-530
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11/06/15 11:55	

Amended Report

Work Order Comment: All metals should be run under the 200 series per J. Magee. CAH 08/19/15 All samples should be priority per J. Magee. CAH 08/20/15

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
None	15H1472-01	Non-potable Water	08/17/15 18:30	08/19/15 15:23	1.8
None	15H1472-02	Non-potable Water	08/19/15 11:10	08/19/15 15:23	1.8
None	15H1472-03	Non-potable Water	08/19/15 11:40	08/19/15 15:23	1.8

Amended Report

Authorized by:

Report ID: 11062015 115532

The results in this report apply only to the samples analyzed. This report must not be reproduced, except in full, without the written approval of the laboratory.

Ma and Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

Page 2 of 38

Minnesota Pollution		A / <sup>3</sup>		B H Stream	C Lab She	_03	D		E	e_of_
				gee, Jen	ETTENE (SELENDER)			PR		
Program Code: RG	Collecte	d by:	C Mag		LIIUCI		_ Proj	ect ID: PR	PRJ0123	4)
Collector Phone:	-206-	2601			MPCA PN Name and	И d Phone: Jo	e Ma			0
		A		В		C	Les aurophysion	D	-	E
Sample Information		all some				in the second second				
Location ID (ex 27-0016-00-101 or S005-515)		1.15	1	1	5 AU		1-15			
Field Name / Lake Name	E	BR	Betha	ny Dr DS	Bethar	y Dr US				
Bio Station			1.2	244	1.1				-	
Date (MM/DD/YY)	8/1	7/15	8	3/19/15	8/1	19/15				
Time (Military)	18	3:30	-	11:10	1	1:40				The second second
Quality Assurance*	1.000									100
Analysis Group No.**			_		C Provention		11.5			
Sample Depth (Top) m (Lake Only)					1.1.1.1					
Sample Depth (Bot) m (Lake Only)			14						- 3	
Filter Volume (for chlorophyll a)										
(tor enterophyn a)	·			Sample A						
AIS- autoclave				rk requesting an	alyses with an	"X")				
Dilution		1 1 1 1 1					H		-	
BOD (SM 5210B)		Field filtered	X	Field filtered		Field filtered		Field filtered		Field filtere
Nitrate + Nitrite (EPA 353.2)		Field filtered		Field filtered		Field filtered	-	Field filtered	- 8	Field filtere
Chloride (EPA 300.1)	X	Field filtered		Fiel <u>d fil</u> tered		Field filtered	H	Field filtered	H	Field filtere
	X	Field filtered		Field filtered		Field filtered	-	Field filtered	$\square$	Field filtere
pH (SM 4500-H+B)		Field filtered		Field filtered		Field filtered	-	Fiel <u>d fil</u> tered	-	Field filtere
Ammonia-N (EPA 350.1)		Field filtered		Field filtered		Field filtered	-	Field filtered		Field filtered
Copper		Fiel <u>d fil</u> tered		Field filtered		Field filtered		Field filtered	-	Field filtered
Zinc		Field filtered		Field filtered		Field filtered		Field filtered	-	Field filterer
Iron		Field filtered		Field filtered		Field filtered		Field filtered	-	Field filterer
TKN (EPA 351.2)	X			Field filtered	X	Field filtered		Field filtered	$-\square$	Field filtered
Phosphorus (SM 4500P I)	X	Field filtered				Field filtered	$-\square$		$\square$	Field filterer
Alkalinity as CaCO3 (SM 2320B)	$\times$	Field filtered		Field filtered				Field filtered		
Lab Temp (°C)		***ENTE	THE ORIG	INAL AND OA SA	MPLES IN SEI	PARATE COLUMN	S***	and the second second		CAH revised 3
	* FR = Field * Select an A	Replicate, SB =	Sampler Blar	k, SS = Split Sampl ode Identified by a	e, TB = Trip Bl	ank, BB = Bottle Bla	ink, RB = R	eagent Blank		
				Chain of	Custody					
Sampler Relinquished	By / Affilia		A. N.	Date/Time	G	Accepted By	/ Affiliatio	1		Date/Time
The second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		MA)	8/19/15 217:50	-670	e u	~~	(MPCA)		6/14/013
Jon	CI	MPCA)		5/19/159523	Chot	By	m	H		15:23
		34.14				0		<u>. 145.</u>		
Sampler Comments							-1-1-2	4 - S (1)	1	
Please treat as a civil chain of custody. Also, please treat as a civil chain of custody. Also, please Receiving Comments	ise run an unknov	vn/nazardous scan and	test for hardness	on all samples.						

FIELD OBSERVATIONS (station name/location, weather, ice condition, stream width, picture #, GPS file name, etc.) Water Monitoring Instrument: Make: Model: Number: Turb. Units: A B	Stream Field Info	Α	B	C	D	E
Location ID microsoftware       BR       Bethany Dr DS       Bethany Dr US         Bio Station	Project ID			PR.100075	1	and the second
Field Name /Lake Name     BR     Bethany Dr DS     Bethany Dr US       Bio Station	Location ID	1				
Bio Station       8/17/15       8/19/15       8/19/15       8/19/15         Dite (MM/DD/YY)       8/17/15       8/19/15       8/19/15       1         Quality Assurance*       1       11:0       11:40       1         Quality Assurance*       1       11:0       11:40       1         Quality Assurance*       1       15:36       15:35       1       1         Quality Assurance*       663       635       1       1       1         @ 25 °C (umbo/cm)       663       635       1       1       1         @ 00 (mg/t)       9,76       10.02       1<	An and the second s	BR	Bethany Dr DS	Bethany Dr US		
Time (Military)       18:30       11:10       11:40	Bio Station					
Quality Assurance*	Date (MM/DD/YY)	8/17/15	8/19/15	8/19/15		
Field Temp (°C)       15.36       15.35	Time (Military)	18:30	11:10	11:40		
Conductivity @ 25 ° C (umho/cm)         663         635	Quality Assurance*					
Conductivity         663         635	Field Temp (°C)	8	15.36	15.35		
B.2. Cumber     9.76     10.02       pH     7.83     7.94       ORP-mV         Turbidity*         Apparent Color (PCU)         Tarbe Down Distance         (decimal ft)*         W.L. Gage Type*         W.L. Gage Type*         Transparency*         (decimal ft)*         W.L. Gage Type*         Transparency*         (or mbe (to the aurent con)         Secch tube transparency         (or mbe (to the aurent con)         Secch tube transparency         (or mbe (to the aurent con)         Secch tube transparency         (or mbe (to the aurent con)         Secch tube transparency         (mather the aurent con)         Secch tube transparency         (mather the aurent con)         Secch tube transparency         (mather the aurent con)         Stream Flow (cfs)* <td>Conductivity</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Conductivity					
pH     7,83     7,94     Image: Control of Contecontrol of Contrecontrol of Contrecontro		0				
ORP-mV						
Turbidity*			7.83	7.94		
Apparent Color (PCU)						
Tape Down Distance (decimal fly*						
(decimal f)*						*
W.L. Gage Type*	(decimal ft)*					
Transparency*	W.L. Gage (ft.)*					
00 cm tobe (00 the nearest cm)						
Secchi tube transparency, cm       Image: Constraint of the second sector of the second second sector of the second second sector of the second second second second sector of the second	60 cm tube (to the nearest cm) Transparency*					
Recreat. Suit. *	Secchi tube transparency,					1
Stream Condition*	Appearance *	1	L Der test			
Stream Flow (cfs)*	Recreat. Suit. *					
Sampling Device*     Image: Constraint of the separate Additional Instructions/Information sheet for codes and information to ensure data entry accuracy     CAH revised       Please reference the separate Additional Instructions/Information sheet for codes and information to ensure data entry accuracy     CAH revised       FIELD OBSERVATIONS (station name/location, weather, ice condition, stream width, picture #, GPS file name, etc.)     Water Monitoring Instrument: Make: Model: Turb. Units:       A	Stream Condition*					
Sample Type*     CAH revised       Please reference the separate Additional Instructions/Information sheet for codes and information to ensure data entry accuracy     CAH revised       FIELD OBSERVATIONS (station name/location, weather, ice condition, stream width, picture #, GPS file name, etc.)     Water Monitoring Instrument: Make: Model: Turb. Units:       A     B	Stream Flow (cfs)*		A PARTY AND A PARTY AND A	1		
Please reference the separate Additional Instructions/Information sheet for codes and information to ensure data entry accuracy CAH revised FIELD OBSERVATIONS (station name/location, weather, ice condition, stream width, picture #, GPS file name, etc.) Water Monitoring Instrument: Make: Model: Turb. Units: A B	Sampling Device*					
FIELD OBSERVATIONS (station name/location, weather, ice condition, stream width, picture #, GPS file name, etc.) Water Monitoring Instrument: Make: Model: Number: Turb. Units: A B	Sample Type*					
	FIELD OBSERVATION Water Monitoring Instrument:	NS (station name/le	ocation, weather, ice condition,	stream width, picture #, GPS file	name, etc.)	CAH revised 3/1
C	В					
	c					

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E

	Sample Condition Upon Receipt Minnesota Department of Health Public Health Laboratory	15H1472
	Parcel Information	
	Date & time of receipt:	AUG19'15 15:23
Courier:□UPS □Fe	dEx □Spee-Dee □USPS □Other	Walk-in
Tracking #		
After hours drop off: [	Refrigerator Freezer Unrefrigerated	
Parcel: Plastic cooler	□ Styrofoam cooler □ Cardboard box □ Single maile	r □Envelope □None
□ Other		
Custody seals present:	$\Box$ Yes $\swarrow$ No; Custody seals intact: $\Box$ Yes $\Box$ No $\varkappa$ N/A	
Custody seal #	Evidentiary samples ide	ntified: 🗆 Yes 🕅 No
2.1.4.4.1.7	Packaging Information	
Packing material: 🗆 B	ubble wrap  Styrofoam  Paper  None  Other	
Cooling material: 🕅 W	et ice $\Box$ Ice pack $\Box$ Gel pack $\Box$ Dry ice $\Box$ None $\Box$ Other	
	aterial:  Solid Partial Liquid; Liquid temperature: _	
	temperature: <u>l-</u> °C IR thermometer instrume	
itials of person receivi	ng parcel: <u>CA</u>	
(	Chain of Custody, Sample Container & Analysis Inform	ation
Chain of custody receiv		ation
Chain of custody receiv		
Chain of custody receiv Chain of custody type:	ved: X Yes 🗆 No	□ Unknown
Chain of custody receiv Chain of custody type: Rad Chem request rece	ved: X Yes □ No X Standard □ Civil □ Criminal □ Priority/Emergency [ eived: □ Yes X No, Sample survey results: □ < .5 mrem/	□ Unknown
Chain of custody receiv Chain of custody type: Rad Chem request rec All sample containers i	ved:XYes□No XStandard □Civil □Criminal □Priority/Emergency [	□ Unknown hr □≥.5 mrem/hr
Chain of custody receiv Chain of custody type: Rad Chem request rec All sample containers a All sample containers a	ved: X Yes INo X Standard I Civil I Criminal I Priority/Emergency I eived: I Yes XNo, Sample survey results: I < .5 mrem/ received intact: X Yes I No	□ Unknown hr □ ≥ .5 mrem/hr tody: $\square$ Yes □ No

Amended Report Case Narrative Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Program Code: RG	Project ID: PRJ00075
Program Name: EOD-Fish Kill Studies	Facility Name: None
Collected by: Joe Magee, Jen Ender	City: None
Collector ID: None	Generated: 11/06/2015 11:55

Supplemental ID: 1105201592741

The VOC analysis was not present on the amended report for all sample points.

For the samples in 15H1472 a quick semi-volatile semi-quantitative scan was performed to determine if any semi-volatiles were present at elevated levels. The samples were prepared using a methylene chloride liquid-liquid extraction. No semi-volatile analytes were detected at levels of concern.

Supplemental ID: 08312015124959

AI 200.8, As 200.8, Ba 200.8, Mn 200.8, Ti 200.8, and Sulfate 300.1 were added to all sample points on the report.

Amended Report

Authorized by:

Report ID: 11062015115532

The results in this report apply only to the sam ples analyzed. This report must not be reproduced, except in full, without the written approval of the laboratory.

Ma 1 a Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

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Amended Report Analytical Results

Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11/06/15 11:55	
	MDH Sample Number: 15H1472-01	
Location ID: None	Collect Date: 08/17/15	Field Residual Chlorine Result: None

Field Name: BR Sampling Point None QA Type: None

Collect Time: 18:30 Matrix: Non-potable Water

Field Fluoride Result: None Field pH Result: None Field PO+ Result: None

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899

St. Paul, MN 55164-0899

651-201-5300

Results were produced by the Minnesota Department of Health, except where noted.

## **General Chemistry Parameters**

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Alkalinity, Total		380	10	mg/L	1	B5H0624	08/20/15 09:37	08/20/15 11:17	SM2320 B-1997
Ammonia Nitrogen, Total		1.0	0.05	mg/L	1	B5H0707	08/24/15 12:22	08/24/15 15:50	EPA350.1
Biochemical Oxygen Demand	D1	25	5.0	mg/L	10	B5H0597	08/19/15 16:42	08/24/15 12:29	Hach 10360
Chloride		3.32	0.500	mg/L	1	B5H0612	08/20/15 08:18	08/20/15 22:31	EPA300.1
Nitrate + Nitrite Nitrogen, Total		0.14	0.05	mg/L	1	B5H0652	08/20/15 11 29	08/21/15 12:31	EPA353.2
рH	H5	7.5	0.0	None	1	B5H0624	08/20/15 09:37	08/20/15 11:17	SM 4500-H+ B-2000
Phosphorus, Total		3.51	0.024	mg/L	1	B5H0605	08/20/15 07:34	08/25/15 03:08	SM 4500-P I (F)
Sulfate		128	0.50	mgÆ	1	B5H0612	08/20/15 08:18	08/20/15 22:31	EPA300.1
Kjeldahl Nitrogen, Total		2.73	0.20	mg/L	1	B5H0542	08/19/15 16:45	08,20/15 14:48	EPA351.2
Metal Parameters									
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	B4, Z-01	11200	20.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:01	EPA200.8
Arsenic		61.5	1.00	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:01	EPA200.8
Barium		2530	5.00	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:01	EPA200.8
Copper		30.9	10.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:01	EPA200.8
Iron	D2	130000	100	ug/L	5	B5H0611	08/20/15 07:53	08/21/15 11:24	EPA200.7
Hardne ss	D2	500	50	mg/L	5	B5H0611	08/20/15 07:53	08/21/15 11:24	SM2340 B-1997
Manganese		15000	10.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:01	EPA200.8
Titanium		398	5.00	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:01	EPA200.8
Zinc		80.8	10.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:01	EPA200.8
VOCs by GCMS									
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,1,1,2-Tetrachloro ethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B

Amended Report

Report ID: 11062015115532

Authorized by:

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Ma and Paul Moyer, Environmental Laboratory Manager

Public Health Laboratory, Minnesota Department of Health

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Amended Report Analytical Results Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Leadin Di Mana	MDH Sample Number: 15H1472-01	Field Desidual Oblating Desult Name
Collector ID: None	Generated: 11/06/15 11:55	
Collected By: Joe Magee, Jen Ender	City: None	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Program Code: RG	Project ID: PRJ00075	

Location ID: None Field Name: BR Sampling Point None QA Type: None Collect Date: 08/17/15 Collect Time: 18:30 Matrix: Non-potable Water

Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

## VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
1,1,1-Trichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,12,2-Tetrachloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,1,2-Trichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,1-Dichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,1-Dichloroethene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,1-Dichloropropene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,2,3-Trichloropropane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
12,4 Trichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1 2-Dibromo-3-chloropropane (DBCP)		<	5.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
12-Dibromoethane (EDB)		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,2-Dichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1.2-Dichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,2-Dichloropropane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,3-Dichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,3-Dichloropropane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,4-Dichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
1,4-Dichlorobenzene-d4		0.0		ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
2,2-Dichloropropane	L1, V1	<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
2-Chlorotoluene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
4-Chlorotoluene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Acetone		<	20	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Allyl chloride		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B

Amended Report

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Report ID: 11062015115532

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Program Code: RG	Project ID: PRJ000	075
Program Name: EOD-Fish Kill Studies	Facility Name/ID:	None
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11/D6/	/15 11:55
	MDH Sample Number: 15H1472-	
Location ID: None	Collect Date: 08/17/15	Field Residual Chlorine Result: None

Field Name: BR Sampling Point None QA Type: None

Collect Time: 18:30 Matrix: Non-potable Water

Field Fluoride Result: None Field pH Result: None Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

### VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Unins	Dilution	Batch	Prepared	Analyzed	Method
Benzene	Guarmon(3)	<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Bromobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Bromo chlor ometha ne		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
B romo dichl orom ethan e		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Bromoform		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Bromomethane		<	2.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPAS260B
Carbon tetrachloride		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Chlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Chlorobenzene-d5		0.0		ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPAS260B
C h loro dib romo methan e		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Chloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Chloroform		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPAS260B
Chloromethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
cis-1,3-Dichloropropene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPAS260B
Dibromomethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Dich loro difluo rome thane	L3, V4, Z-01c	<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Dichlorofluoromethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Ethylether		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Ethylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Fluorobenzene		0.0		ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Hexachlorobutadiene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPAS260B
lsopropylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Methylethylketone (MEK)		<	10	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Methylene chloride		<	2.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Amended Report								Report ID	: 110620151155

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Program Code: RG		Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies		Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender		City: None	
Collector ID: None		Generated: 11/06/15 11:55	
	MDH Sample Num	ber: 15H1472-01	
Location ID: None	Collect Date: 08/17.	45	Field Residual Chlorine Result: None

Field Name: BR Sampling Point None QA Type: None Collect Date: 08/17/15 Collect Time: 18:30 Matrix: Non-potable Water

Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO+ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

### VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
Naphthalene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
n-Butylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
n-Propylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
o-Xylene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
p&m-Xylene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
p-lsopropyttoluene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
sec-Butylbenzen e		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Styrene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
tert Butylbenzen e		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Tetrachloroethene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Tetrahydrofuran (THF)		<	10	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Toluene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
trans-1,2-Dichloroethene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
trans-1,3-Dichlor opropene		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Trichloroethene (TCE)		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Trichlorofluoromethane	Z-01b	<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B
Vinyl chloride		<	1.0	ug/L	1	B5H0633	08/20/15 12:16	08/20/15 12:16	EPA8260B

Amended Report

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Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11/06/15 11:	:55
	MDH Sample Number: 15H1472-02	
Location ID: None	Collect Date: 08/19/15	Field Residual Chlorine Result: None

Field Name: Bethany Dr DS Sampling Point None QA Type: None Collect Date: 08/19/15 Collect Time: 11:10 Matrix: Non-potable Water Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

#### General Chemistry Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Alkalinity, Total		240	10	mg∕L	1	B5H0624	08/20/15 09:37	08/20/15 11:29	SM2320 B-1997
Ammonia Nitrogen, Total		<	0.05	mgÆ	1	B5H0708	08/24/15 12:27	08/24/15 19:39	EPA350.1
Biochemical Oxygen Demand	D1, K1	3.9	15	mg/L	з	B5H0597	08/19/15 16:42	08/24/15 12:29	Hach 10360
Chloride		38.2	0.500	mg/L	1	B5H0612	08/20/15 08:18	08,20/15 22:49	EPA300.1
Nitrate + Nitrite Nitrogen, Total		9.0	0.05	mg/L	1	B5H0652	08/20/15 11 29	08/21/15 12:32	EPA353.2
рН	H5	8.2	0.0	None	1	B5H0624	08/20/15 09:37	08/20/15 11:29	SM 4500-H+ B-2000
Pho sphorus, Total		0 225	0.003	mg/L	1	B5H0605	08/20/15 07:34	08/25/15 03:02	SM 4500-P I (F)
Sulfate		14.7	0.50	mg/L	1	B5H0612	08/20/15 08:18	08,20/15 22:49	EPA300.1
Kjeldahl Nitrogen, Total		<	0.20	mg/L	1	B5H0542	08/19/15 16:45	08/20/15 14:49	EPA351.2
Metal Parameters									
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	B1, Z-01	128	20.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:04	EPA200.8
Arsenic		<	1.00	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:04	EPA200.8
Barium		75.0	5.00	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:04	EPA200.8
Copper		<	10.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:04	EPA200.8
Iron		136	20.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 11:07	EPA200.7
Hardne ss		310	10	mgÆ	1	B5H0611	08/20/15 07:53	08/21/15 11:07	SM2340 B-1997
Manganese		10.8	10.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:04	EPA200.8
Titanium		10.3	5.00	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:04	EPA200.8
Zinc		<	10.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:04	EPA200.8
VOCs by GCMS									
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,1,1,2-Tetrachloro ethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,1,1-Trichloroethane	M1	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Amended Report								Report I	D: 11062015115532

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Program Code: RG	Project ID: PRJ	00075
Program Name: EOD-Fish Kill Studies	Facility Name/II	D: None
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11/	06/15 11:55
	MDH Sample Number: 15H147	72-02
Location ID: None	Collect Date: 08/19/15	Field Residual Chlorine Result: None

Field Name: Bethany Dr DS Sampling Point None QA Type: None Collect Date: 08/19/15 Collect Time: 11:10 Matrix: Non-potable Water Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO+ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

### VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,1,2,2-Tetrachloro ethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,1,2-Trichloroethane		<	1.0	ug/L	1	B5H0633	08.20/15 12:39	08/20/15 12:39	EPA8260B
1,1,2-Trichlorotrifluoroethane	M1	<	1.0	ug/L	1	B5H0633	08.20/15 12:39	08/20/15 12:39	EPA8260B
1,1-Dichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,1-Dichloroethene	M1	<	1.0	ug/L	1	B5H0633	08.20/15 12:39	08/20/15 12:39	EPA8260B
1,1-Dichloropropene	M1	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,2,3-Trichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,2,3-Trichloropropane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,2,4 Trichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1 2-Dibromo-3-chloropropane (DBCP)		<	5.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,2-Dibromoethane (EDB)		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,2-Dichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,2-Dichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,2-Dichloropropane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,3-Dichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,3-Dichloropropane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,4-Dichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
1,4-Dichlorobenzene-d4		0.0		ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
2.2-Dichloropropane	L1, V1, Z-01a	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
2-Chlorotoluene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
4-Chlorotoluene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Acetone		<	20	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Allyl chloride	M1	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Benzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B

Amended Report

Authorized by:

Report ID: 11062015115532

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Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11/06/15 11:55	5
	MDH Sample Number: 15H1472-02	
Location ID: None	Collect Date: 08/19/15	Field Residual Chlorine Result: None

Field Name: Bethany Dr DS Sampling Point None QA Type: None Collect Date: 08/19/15 Collect Time: 11:10 Matrix: Non-potable Water Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

### VOCs by GCMS - Continued

Analyte	Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method
Bromobenzene	Qualifier(s)	<	Limit 1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Bromochloromethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B EPA8260B
Bromodichloromethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Bromotorm		<	1.0	ug/L		B5H0633		08/20/15 12:39	EPA8260B
Bromomethane	M1		2.0	-	1		08/20/15 12:39		
Carbon tetrachloride	M1	<	2.0 1.0	ug/L ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
	1011		1.0	•	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Chlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Chlorobenzene-d5 Chlorodibromomethane		0.0	4.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
	M1	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Chloroethane	IVI I	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Chloroform		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Chloromethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
cis-1,3-Dichloropropene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Dibromomethane		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Dichloro difluo romethane	L3, V4, Z-01c	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Dichlorofluoromethane	M1	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Ethylether		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Ethylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Fluorobenzene		0.0		ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Hexachlorobutadiene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
ls opropylb enze ne		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Methylethylketone (MEK)		<	10	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Methylene chloride		<	2.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Naphthalene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Amended Report								Report ID	: 11062015115532

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Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Program Code: RG	Р	roject ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	F	acility Name/ID: None	
Collected By: Joe Magee, Jen Ender	C	ity: None	
Collector ID: None	G	en erate d: 11/06/15 11:55	
		- 45114470.00	
	MDH Sample Numbe	er: 15H1472-02	
Location ID: None	Collect Date: 08/19/15		Field Residual Chlorine Result: None

Field Name: Bethany Dr DS Sampling Point None QA Type: None Collect Date: 08/19/15 Collect Time: 11:10 Matrix: Non-potable Water Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

### VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
n-Butylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
n-Propylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
o-Xylene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
p&m-Xylene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
p-lsopropyttoluene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
sec Butylbenzen e		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Styrene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
tert: Butylbenzen e		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Tetrachloroethene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Tetrahydrofuran (THF)		<	10	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Toluene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
trans-1,2-Dichlor oethe ne	M1	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
trans-1,3-Dichlor opropene		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Trichloroethene (TCE)	M1	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Trichlorofluoromethan e	Z-01b	<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B
Vinyl chloride		<	1.0	ug/L	1	B5H0633	08/20/15 12:39	08/20/15 12:39	EPA8260B

Amended Report

Report ID: 11062015 115532

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Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: Nor	ne
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11/06/15	11:55
	MDH Sample Number: 15H1472-03	
Location ID: None	Collect Date: 08/19/15	Field Residual Chlorine Result: None

Field Name: Bethany Dr US Sampling Point None QA Type: None Collect Date: 08/19/15 Collect Time: 11:40 Matrix: Non-potable Water Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

#### **General Chemistry Parameters**

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Alkalinity, Total		230	10	mg∕L	1	B5H0624	08/20/15 09:37	08/20/15 11:42	SM2320 B-1997
Ammonia Nitrogen, Total		<	0.05	mgÆ	1	B5H0708	08/24/15 12:27	08/24/15 19:43	EPA350.1
Biochemical Oxygen Demand	D1, K1, WB	2.0	1.5	mg/L	з	B5H0597	08/19/15 16:42	08/24/15 12:29	Hach 10360
Chloride		35.8	0.500	mgÆ	1	B5H0612	08/20/15 08:18	08/20/15 23:06	EPA300.1
Nitrate + Nitrite Nitrogen, Total		8.7	0.05	mgÆ	1	B5H0652	08/20/15 11 29	08/21/15 12:34	EPA353.2
pН	H5	8.2	0.0	None	1	B5H0624	08/20/15 09:37	08/20/15 11:42	SM 4500-H+ B-2000
Phosphorus, Total		0 21 4	0.003	mgÆ	1	B5H0605	08/20/15 07:34	08/25/15 02:55	SM 4500-P I (F)
Sulfate		13.9	0.50	mg/L	1	B5H0612	08/20/15 08:18	08/20/15 23:06	EPA300.1
Kjeldahl Nitrogen, Total		<	0.20	mg/L	1	B5H0542	08/19/15 16:45	08/20/15 14:49	EPA351.2
Metal Parameters									
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	B1, W8, Z-01	103	20.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:07	EPA200.8
Arsenic	WB	<	1.00	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:07	EPA200.8
Barium		70.1	5.00	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:07	EPA200.8
Copper	WB	<	10.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:07	EPA200.8
Iran		102	20.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 11:11	EPA200.7
Hardne ss		290	10	mg/L	1	B5H0611	08/20/15 07:53	08/21/15 11:11	SM2340 B-1997
Manganese		<	10.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:07	EPA200.8
Titanium	M1	<	5.00	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:07	EPA200.8
Zinc		<	10.0	ug/L	1	B5H0611	08/20/15 07:53	08/21/15 12:07	EPA200.8
VOCs by GCMS									
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
1,1,1,2-Tetrachloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B

Amended Report

Authorized by:

Report ID: 11062015115532

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Lessier ID, Name	MDH Sample Number: 15H1472-03	
Collector ID: None	Generated: 11/06/15 11:55	
Collected By: Joe Magee, Jen Ender	City: None	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Program Code: RG	Project ID: PRJ00075	

Location ID: None Field Name: Bethany Dr US Sampling Point None QA Type: None Collect Date: 08/19/15 Collect Time: 11:40 Matrix: Non-potable Water

Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

### VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
1,1,1-Trichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,1,2,2-Tetrachloro ethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,1,2-Trichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,1-Dichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,1-Dichloroethene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,1-Dichloropropene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,2,3-Trichlorobenzen e		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,2,3-Trichloropropane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,2,4-Trichlorobenzen e		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,2,4-Trimethylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,2-Dibromo-3-chloropropane (DBCP)		<	5.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,2-Dibromoethane (EDB)		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,2-Dichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,2-Dichloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,2-Dichloropropane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,3,5-Trimethylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,3-Dichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,3-Dichloropropane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,4-Dichlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
1,4-Dichlorobenzene-d4		0.0		ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
2,2-Dichloropropane	L1, V1	<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
2-Chlorotoluene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
4-Chlorotoluene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Acetone		<	20	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Allyl chloride		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B

Amended Report

Authorized by:

Report ID: 11062015115532

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Program Code: RG	Project	ID: PRJ00075
Program Name: EOD-Fish Kill Studies	Facility	Name/ID: None
Collected By: Joe Magee, Jen Ender	City: No	one
Collector ID: None	Genera	ted: 11/06/15 11:55
	MDH Sample Number: 1	5H1472-03
Location ID: None	Collect Date: 08/19/15	Field Residual Chlorine Result: None

Field Name: Bethany Dr US Sampling Point None QA Type: None Collect Date: 08/19/15 Collect Time: 11:40 Matrix: Non-potable Water

Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO+ Result: None

Results were produced by the Minnesota Department of Health, except where noted.

### VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
Benzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Bromobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Bromo chlor ometha ne		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Bromo dichlorom ethan e		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Bromoform		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Bromomethane		<	2.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Carbon tetrachloride		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Chlorobenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Chlorobenzene-d5		0.0		ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
C h loro dib romo methan e		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Chloroethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Chloroform		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Chloromethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
cis-1,2-Dichloroethene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
cis-1,3-Dichloropropene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Dibromomethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Dichloro difluo romethane	L3, V4, Z-01c	<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Dichlorofluoromethane		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Ethylether		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Ethylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Fluorobenzene		0.0		ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Hexachlorobutadiene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
lsopropylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Methylethylketone (MEK)		<	10	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Methylene chloride		<	2.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Amended Report								Report IC	: 11062015 115532

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Program Code: RG	Project IC	): PRJ00075						
Program Name: EOD-Fish Kill Studies	Facility N	ame/ID: None						
Collected By: Joe Magee, Jen Ender	City: Non	e						
Collector ID: None	Generate	d: 11/06/15 11:55						
MDH Sample Number: 15H1472-03								
Location ID: None	Collect Date: 08/19/15	Field Residual Chlorine Result: None						

Field Name: Bethany Dr US Sampling Point None QA Type: None Collect Date: 08/19/15 Collect Time: 11:40 Matrix: Non-potable Water

Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO4 Result: None

Results were produced by the Minnesota Department of Health, except where noted.

### VOCs by GCMS - Continued

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Metho d
Naphthalene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
n-Butylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
n-Propylbenzene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
o-Xylene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
p&m-Xylene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
p-lsopropyttoluene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
sec Butylbenzen e		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Styrene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
tert Butylbenzen e		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Tetrachloroethene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Tetrahydrofuran (THF)		<	10	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Toluene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
trans-1,2-Dichlor oethe ne		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
trans-1,3-Dichlor opropene		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Trichloro ethene (TCE)		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Trichlorofluoromethane	Z-01b	<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B
Vinyl chloride		<	1.0	ug/L	1	B5H0633	08/20/15 13:01	08/20/15 13:01	EPA8260B

Amended Report

Report ID: 11062015115532

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			Amended Report Quality Control	Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300
Program Code: F			Project ID: PRJ00075	
-	EOD-Fish Kill Studies		Facility Name/ID: [none] City: None	
Collected By: Joe Magee, Jen Ender Collector ID: None			Generated: 11/06/15 11:55	
			Batch Summary	
Samples in B	atch: B5H0542 -	TKN Prep		
15H1472-01	15H1472-02	15H1472-03		
Samples in B	atch: B5H0597 -	BOD Prep		
15H1472-01	15H1472-02	15H1472-03		
Samples in B	atch: B5H0605 ·	Phosphorus, Tot	al Prep In-Line NP	
15H1472-01	15H1472-02	15H1472-03		
Samples in B	atch: B5H0611 -	EPA 200 Prep		
15H1472-01	15H1472-02	15H1472-03		
Samples in B	atch: B5H0612 -	General Chemist	try Prep	
			· ·	
15H1472-01	15H1472-02	15H1472-03		
Samples in B	atch: B5H0624 -	General Chemist	try Prep	
15H1472-01	15H1472-02	15H1472-03		
Samples in B	atch: B5H0633 ·	EPA 5030B Prep	aration	
15H1472-01	15H1472-02	15H1472-03		
Samples in B	atch: B5H0652 -	General Chemist	try Prep	
15H1472-01	15H1472-02	15H1472-03		
Samples in B	atch: B5H0707 ·	Ammonia In-line	distillation	
15H1472-01				
Amorda d D				
Amended Repo	/IL			Report ID: 11062015 115532

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		winnesora Department of Health
		Public Health Laboratory
		Environmental Laboratory Section
		601 Robert St. N., P.O. Box 64899
	Amended Report	St. Paul, MN 55164-0899
	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: [none]	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11/06/15 11:55	

Batch Summary

Samples in Batch: B5H0708 - Ammonia In-line distillation

15H1472-02 15H1472-03

Amended Report

Authorized by:

Report ID: 11062015 115532

Minnesota Department of Health

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	Quality Control				
Program Code: RG	Project ID: PRJ00075				
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None				
Collected By: Joe Magee, Jen Ender	City: None				
Collector ID: None	Generated: 11.06/15 11.55				

Amended Report

Batch B5H0542 - TKN Pre	p									
Blank (B5 H0542-BLK1)				Ргераге	d:08/18/15	13:29 Anal;	yzed: 08/20/1	5 14:36		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Kjeldahl Nitrogen, Total		<	0.20	mg/L						
Blank (B5H0542-BLK2)				Prepare	d:08/24/15	13:29 Anal	yzed: 08/25/1	5 13:00		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Kjeldahl Nitrogen, Total	o, wai in cit cy	<	0.20	mg/L	Letter					
Blank (B5 H0 542-BLK3)				Prepare	d:08/27/15	13:29 Anal;	yzed: 08/28/1	5 12:42		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Kjeldahl Nitrogen, Total	Quannei(3)	<	0.20	mg/L	Level	Reduit				
LCS (B5H0542-BS1)				Ртераге	d:08/18/15	13:29 Anal	yzed: 08/20/1	5 14:37		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Kjeldahl Nitrogen, Total		2.06	0.20	mg/L	2		103	90-110		
LCS (B5H0542-BS2)				Prepare	d:08/24/15	13:29 Anal	yzed: 08/25/1	5 13:01		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Kjeldahl Nitrogen, Total		1.82	0.20	mg/L	2		91	90-110		
LCS (B5H0542-BS3)				Ргераге	d:08/27/15	13:29 Anal	yzed: 08/28/1	5 12:43		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Kjeldahl Nitrogen, Total		2.02	0.20	mg/L	2		101	90-110		
Duplicate (B5H0542-DUP3)		Source: 15H	1152-25RE2	Ртераге	d:08/27/15	13:29 Anal	yzed: 08/28/1	5 13:00		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Kjeldahl Nitrogen, Total		2.32	0.20	mg/L		2.60			11	20
Matrix Spike (B5H0542-MS1)		Source: 15H	1152-27	Prepare	d:08/18/15	13:29 Anal	yzed: 08/20/1	5 14:47		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Kjeldahl Nitrogen, Total	scoon of 3	3.01	0.20	mg/L	2	0.889	106	90-110		
Amended Report								Report ID	1106201	15 11 553

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	Amended Report Quality Control	St. Paul, MN 55164-0899 651-201-5300			
Program Code: RG	Project ID: PRJ00075				
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None				
Collected By: Joe Magee, Jen Ender	Collected By: Joe Magee, Jen Ender City: None				
Collector ID: None	Generated: 11.06/15 11.55				

### Results were produced by Minnesota Department of Health, except where noted.

Batch B5H0597 - BOD Pr	ер									
Blank (B5 H0 597-BL K1)				Prepare	d:08/19/15	16:42 Anal	yzed: 08/24/1	5 12:29		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Biochemical Oxygen Demand		<	0.5	mg/L						
Duplicate (B5H0597-DUP1)		Source: 15H	1472-02	Prepare	d:08/19/15	16:42 Anal	yzed: 08/24/1	5 12:29		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Biochemical Oxygen Demand	D1, K1, WB	1.6	1.5	mg/L		39			82	10
Reference (B5H0597-SRM1)				Prepare	d:08/19/15	16:42 Anal	yzed: 08/24/1	5 12:29		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
		177	0.5	mg/L	198		90	84.59-115.4		
	anna Tatal Dava I		0.0							
Biochemical Oxygen Demand Batch B5H0605 - Phosphi Blank (B6H0605-BLK1)	orus, Total Prep			-	d:08/20/15	07:34 Anal	yzed: 08/25/1			
Batch B5H0605 - Phosph	orus, Total Prep   Analyte Qualifien(s)		Reporting	-	d:08/20/15 Spike Level	07:34 Anal Source Result	yzed: 08/25/1 %REC		RPD	RPD Limit
Batch B5H0605 - Phosphi Blank (B5H0605-BLK1) Analyte	Analyte	n-Line NP	Reporting	Prepare	Spike	Source	-	5 00:13	RPD	
Batch B5H0605 - Phosphi Blank (B5H0605-BLK1)	Analyte	n-Line NP Result	Reporting Limit	Prepare Units mg/L	Spike Level	Source Result	-	5 00:13 %REC Limits	RPD	
Batch B5H0605 - Phosphi Blank (B5H0605-BLK1) Analyte Phosphorus, Total	Analyte Qualifier(s) Analyte	n-Line NP Result	Reporting Limit 0.003 Reporting	Prepare Units mg/L	Spike Level d:08/20/15 Spike	Source Result 07:34 Anal Source	%REC	5 00:13 %REC Limits	RPD	Limit RPD
Batch B5H0605 - Phosphe Blank (B5H0605-BLK1) Analyte Phosphorus, Total LCS (B5H0605-BS1) Analyte	Analyte Qualifier(s)	n-Line NP Result	Reporting Limit 0.003	Prepare Units mg/L Prepare	Spike Level	Source Result 07:34 Anal	%REC yzed: 08/25/1	5 00:13 %REC Limits 5 00:19		Limit
Batch B5H0605 - Phospha Blank (B5H0605-BLK1) Analyte Phosphorus, Total LCS (B5H0605-BS1)	Analyte Qualifier(s) Analyte	n-Line NP Resutt < Resutt	Reporting Limit 0.003 Reporting Limit 0.003	Prepare Units mg/L Prepare Units mg/L	Spike Level d:08/20/15 Spike Level 0.1	Source Result 07:34 Anal Source Result	%REC yzed: 08/25/1 %REC	5 00:13 %REC Limits 5 00:19 %REC Limits 90-110		Limit RPD
Batch B5H0605 - Phosphe Blank (B5H0605-BLK1) Analyte Phosphorus, Total LCS (B5H0605-BS1) Analyte Phosphorus, Total	Analyte Qualifier(s) Analyte Qualifier(s) Analyte	In-Line NP Result < Result 0.009	Reporting Limit 0.003 Reporting Limit 0.003 0346-01 Reporting	Prepare Units mg/L Prepare Units mg/L	Spike Level d: 08/20/15 Spike Level 0.1 d: 08/20/15 Spike	Source Result 07:34 Anal Source Result 07:34 Anal Source	%REC yzed: 08/25/1 %REC 99	5 00:13 %REC Limits 5 00:19 %REC Limits 90-110		Limit RPD Limit
Batch B5H0605 - Phosphi Blank (B6 H0605-BLK1) Analyte Phosphorus, Total LCS (B5H0605-BS1) Analyte Phosphorus, Total Duplicate (B5H0605-DUP1) Analyte	Analyte Qualifier(s) Analyte Qualifier(s)	n-Line NP Result Result 0.069 Source: 15H	Reporting Limit 0.003 Reporting Limit 0.003 0346-01	Prepare Units mg/L Prepare Units mg/L Prepare	Spike Level d: 08/20/15 Spike Level 0.1 d: 08/20/15	Source Result 07:34 Anal Source Result 07:34 Anal	%REC yzed: 08/25/4 %REC 99 yzed: 08/25/4	5 00:13 %REC Limits 5 00:19 %REC Limits 90-110 5 00:33	RPD	Limit RPD Limit
Batch B5H0605 - Phosphi Blank (B6 H0605-BLK1) Analyte Phosphorus, Total LCS (B5H0605-BS1) Analyte Phosphorus, Total Duplicate (B5H0605-DUP1)	Analyte Qualifier(s) Analyte Qualifier(s) Analyte	n-Line NP Result Result 0.099 Source: 15H Result	Reporting Limit 0.003 Reporting Limit 0.003 03:46-01 Reporting Limit 0.003	Prepare Units mg/L Prepare Units Prepare Units mg/L	Spke Level Spke Level 0.1 d: 08/20/15 Spke Level	Source Result 07:34 Anal Source Result 07:34 Anal Source Result 0.052	%REC yzed: 08/25/4 %REC 99 yzed: 08/25/4	5 00:13 %REC Limits 5 00:19 %REC Limits 90-110 5 00:33 %REC Limits	RPD	Limit RPD Limit RPD Limit
Batch B5H0605 - Phosphi Blank (B5H0605-BLK1) Analyte Phosphorus, Total LCS (B5H0605-BS1) Analyte Phosphorus, Total Duplicate (B5H0605-DUP1) Analyte Phosphorus, Total	Analyte Qualifier(s) Analyte Qualifier(s) Analyte	n-Line NP Result Result 0.099 Source: 15H Result 0.052	Reporting Limit 0.003 Reporting Limit 0.003 03:46-01 Reporting Limit 0.003	Prepare Units mg/L Prepare Units Prepare Units mg/L	Spke Level Spke Level 0.1 d: 08/20/15 Spke Level	Source Result 07:34 Anal Source Result 07:34 Anal Source Result 0.052	%REC yzed: 08/25/4 %REC 99 yzed: 08/25/4 %REC	5 00:13 %REC Limits 5 00:19 %REC Limits 90-110 5 00:33 %REC Limits	RPD	Limit RPD Limit RPD Limit

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	Quality Control			
Program Code: RG	Project ID: PRJ00075			
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None			
Collected By: Joe Magee, Jen Ender	City: None			
Collector ID: None	Generated: 11.06/15 11.55			

Amended Report

Matrix Spike (B5H0605-MS1)									-	
		Source: 15H	0347-03	Prepare	d:08/20/15	07:34 Anal	yzed: 08/25/1	15 01:00		
	Analyte		Reporting		Spike	Source				RPD
Analyte	Qualifier(s)	Result	Limit	Units	Level	Result	%REC	%REC Limits	RPD	Limi
Phosphorus, Total		0.160	0.003	mg/L	0.1	0.059	101	90-110		
Batch B5H0612 - General	l Chemistry Prep									
Blank (B5 H0 612-BL K1)				Prepare	d:08/20/15	.08:18 Anal)	yzed: 08/20/1	5 15:18		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Chloride		<	0.500	mg/L					_	_
Sulfate		<	0.50	mg/L						
LCS (B5H0612-BS1)				Prepare	d:08/20/15	08:18 Analy	yzed: 08/20/1	5 15:35		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limi
Chloride		102		mg/L	100.02		102	85-115		
Sulfate		103		mg/L	100.02		103	85-115		
Duplicate (B5H0612-DUP1)		Source: 15H	1152-55	Prepare	d:08/20/15	08:18 Anal;	yzed: 08/20/1	5 16:10		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Chloride		13.8	0.500	mg/L		13.9			0.2	10
Sulfate		1.65	0.50	mg/L		1.68			2	10
Duplicate (B5H0612-DUP2)		Source: 15H	1152-57	Prepare	d:08/20/15	08:18 Anal;	yzed: 08/20/1	5 16:45		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Chloride		142	0.500	mg/L		14.2			0.1	10
Sulfate		92.6	0.50	mg/L		92.6			0.03	10
Matrix Spike (B5H0612-MS1)		Source: 15H	1152-59	Prepare	d:08/20/15	08:18 Analy	yzed: 08/20/1	15 17:19		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R P D Limi
Chloride		120		mg/L	100.02		107	75-125		
Sulfate		245		mg/L	100.02		96	75-125		
Matrix Spike (B5H0612-MS2)		Source: 15H	1152-61	Ргераге	d:08/20/15	08:18 Anal)	yzed: 08/20/1	15 17:54		
Amended Report								Report ID	: 1106201	15 11 55

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	Quality Control		
Program Code: RG	Project ID: PRJ00075		
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None		
Collected By: Joe Magee, Jen Ender	City: None		
Collector ID: None	Generated: 11.06/15 11.55		

Amended Report

Batch B5H0612 - General	Chemistry Prep									
Matrix Spike (E5H0612-MS2)		Source: 15H	1152-61	Prepare	d:08/20/15	08:18 Anal;	yzed: 08/20/1	5 17:54		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Chloride		114		mg/L	100.02		100	75-125		
Sulfate		139		mg/L	100.02		100	75-125		
Batch B5H0624 - General	Chemistry Prep									
Blank (B5H0624-BLK1)				Prepare	d:08/20/15	09:37 Anal;	yzed: 08/20/1	5 10:55		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Alkalinity, Total	Quannen(a)	<	10	mg/L	Level	Result				
Duplicate (B5H0624-DUP1)		Source: 15H	1472-01	Prepare	d:08/20/15	09:37 Anal	yzed: 08/20/1	5 11:23		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Alkalinity, Total	Quannei(a)	377	10	mg/L	Level	380			0.8	10
рН		7.53	0.0	None		7.49			0.5	10
Duplicate (B5H0624-DUP2)		Source: 15H	1472-02	Prepare	d:08/20/15	09:37 Anal	yzed: 08/20/1	5 11:36		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Alkalinity, Total		247	10	mg/L		243			2	10
рН		8.21	0.0	None		8.21			0.04	10
Reference (B5H0624-SRM1)				Prepare	d:08/20/15	09:37 Anal;	yzed: 08/20/1	5 11:10		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
рН	Quannei(a)	5.64	0.0	None	5.57	Reault	101	98.1-101.8		
Batch B5H0652 - General	Chemistry Prep									
Blank (B5H0652-BLK1)				Prepare	d:08/20/15	11:29 Anal	yzed: 08.2171	5 12:04		
0	Analyte	D	Reporting	U site	Spike	Source	W DEO	N DEO Limite		RPD
Analyte Nitrate + Nitrite Nitrogen, Total	Qualifier(s)	Result <	Limit 0.05	Units mg/L	Level	Result	%REC	%REC Limits	RPD	Limit
LCS (B5H0652-BS1)				Ргераге	d:08/20/15	11:29 Anal	yzed: 08./21./1	5 12:06		
Amended Report								Report ID	1106201	15 11 553
Augusta and the s						he results in	this menant			
Authorized by:			This report m	ust not be re				oly only to the sam, witten approval of i		
$\cap$	Mor									

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	Amended Report Quality Control				
Program Code: RG	Program Code: RG Project ID: PRJ00075				
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None				
Collected By: Joe Magee, Jen Ender	Collected By: Joe Magee, Jen Ender City: None				
Collector ID: None	Generated: 11.06/15 11.55				

	Chemistry Prep									
LCS (B5H0652-BS1)				Prepare	d:08/20/15	11:29 Anal	yzed: 08,21,4	5 12:06		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Nitrate + Nitrite Nitrogen, Total		5.1		mg/L	5		101	90-110		
Duplicate (B5H0652-DUP1)		Source: 15H	1077-06	Prepare	d:08/20/15	11:29 Anal	yzed: 08./21./1	5 12:08		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Nitrate + Nitrite Nitrogen, Total		0.10	0.05	mg/L		0.11			7	10
Duplicate (B5H0652-DUP2)		Source: 15H	1077-07	Prepare	d:08/20/15	11:29 Anal	yzed: 08 <i>1</i> 2171	5 12:10		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Nitrate + Nitrite Nitrogen, Total		0.06	0.05	mg/L		0.06			5	10
Matrix Spike (B5H0652-MS1)		Source: 15H	1077-08	Prepare	d:08/20/15	11:29 Anal	yzed: 08 <i>1</i> 2171	5 12:12		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Nitrate + Nitrite Nitrogen, Total		59		mg/L	5		105	90-110		
Batch B5H0707 - Ammoni	a In-line distillati	on								
Blank (B5 H0 707-BL K1)				Prepare	d:08/24/15	12:22 Anal	yzed: 08/24/1	5 15:18		
Blank (B5 H0707-BLK1) Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Prepare Units	d:08/24/15 Spike Level	12:22 Anal Source Result	yzed: 08/24/1 %REC	5 15:18 %REC Limits	RPD	RPD Limit
Analyte		Result <			Spike	Source	-		RPD	RPD Limit
			Limit	Units mg/L	Spike Level	Source Result	-	%REC Limits	RPD	
Analyte Ammonia Nitrogen, Total			Limit	Units mg/L	Spike Level	Source Result	%REC	%REC Limits	RPD	
Analyte Ammonia Nitrogen, Total LCS (E5H0707- BS1) Analyte	Qualifier(s) Analyte	<	Limit 0.05 Reporting	Units mg/L Prepare	Spike Level d:08/24/15 Spike	Source Result 12:22 Anal Source	%REC yzed: 08/24/1	%REC Limits		Limit
Analyte Ammonia Nitrogen, Total LCS (B5H0707-BS1)	Qualifier(s) Analyte	< Result	Limit 0.05 Reporting Limit 0.05	Units mg/L Prepare Units mg/L	Spike Level d: 08/24/15 Spike Level 1	Source Result 12:22 Anal Source Result	%REC yzed: 08/24/1 %REC	%REC Limits 5 15:22 %REC Limits 90-110		Limit
Analyte Ammonia Nitrogen, Total LCS (B5H0707- BS1) Analyte Ammonia Nitrogen, Total	Qualifier(s) Analyte	< Result 0.979	Limit 0.05 Reporting Limit 0.05	Units mg/L Prepare Units mg/L	Spike Level d: 08/24/15 Spike Level 1	Source Result 12:22 Anal Source Result	%REC yzed: 08/24/1 %REC 98	%REC Limits 5 15:22 %REC Limits 90-110		Limit
Analyte Ammonia Nitrogen, Total LCS (ESH0707- ES1) Analyte Ammonia Nitrogen, Total Duplicate (ESH0707-DUP1)	Qualifier(s) Analyte Qualifier(s) Analyte	< Result 0.979 Source: 15H	Limit 0.05 Reporting Limit 0.05 159404 Reporting	Units mg/L Prepare Units mg/L Prepare	Spike Level d: 08/24/15 Spike Level 1 d: 08/24/15 Spike	Source Result 12:22 Anal Source Result 12:22 Anal Source	%REC yzed: 08/24/1 %REC 96 yzed: 08/24/1	%REC Limits           5 15:22         %REC Limits           90-110         90-110           5 16:43         5 16:43	RPD	Limit RPD Limit
Analyte Ammonia Nitrogen, Total LCS (ESH0707-ES1) Analyte Ammonia Nitrogen, Total Duplicate (ESH0707-DUP1) Analyte	Qualifier(s) Analyte Qualifier(s) Analyte	< Result 0.979 Source: 15H Result	Limit 0.05 <u>Limit</u> 0.05 159404 Reporting Limit 0.05	Units mg/L Prepare Units Prepare Units mg/L	Spike Level Spike Level 1 d: 08/2 4/1 5 Spike Level Level	Source Result 12:22 Anal Source Result 12:22 Anal Source Result <	%REC yzed: 08/24/1 %REC 96 yzed: 08/24/1	%REC Limits 5 15:22 90-110 5 16:43 %REC Limits	RPD	Limit RPD Limit RPD Limit
Analyte Ammonia Nitrogen, Total LCS (ESH0707- BS1) Analyte Ammonia Nitrogen, Total Duplicate (BSH0707-DUP1) Analyte Ammonia Nitrogen, Total	Qualifier(s) Analyte Qualifier(s) Analyte	< Result 0.979 Source: 15H Result 0.042	Limit 0.05 <u>Limit</u> 0.05 159404 Reporting Limit 0.05	Units mg/L Prepare Units Prepare Units mg/L	Spike Level Spike Level 1 d: 08/2 4/1 5 Spike Level Level	Source Result 12:22 Anal Source Result 12:22 Anal Source Result <	%REC yzed: 08/24/4 %REC 98 yzed: 08/24/4 %REC	%REC Limits 5 15:22 90-110 5 16:43 %REC Limits	RPD RPD 1	Limit RPD Limit RPD Limit

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	Quality Control		
Program Code: RG	Project ID: PRJ00075		
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None		
Collected By: Joe Magee, Jen Ender	City: None		
Collector ID: None	Generated: 11.06/15 11.55		

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Duplicate (B5H0707-DUP2)		Source: 15H	1613-01	Prepare	d:08/24/15	12:22 Anal	yzed: 08/24/1	5 16:52		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ammonia Nitrogen, Total		0.022	0.05	mg/L		<			7	10
Matrix Spike (B5H0707-MS1)		Source: 15H	161401	Prepare	d:08/24/15	12:22 Anal	yzed: 08/24/1	5 17:00		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ammonia Nitrogen, Total		0.959	0.05	mg/L	1	<	92	90-110		
Matrix Spike (B5H0707-MS2)		Source: 15H	1615-01	Prepare	d:08/24/15	12:22 Anal	yzed: 08/24/1	5 17:08		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ammonia Nitrogen, Total		0.972	0.05	mg/L	1	<	95	90-110		
Batch B5H0708 - Ammon	ia In-line distillati	on								
Biank (B5 H0 708-BL K1 )				Prepare	d:08/24/15	12:27 Anal	yzed: 08/24/1	5 19:31		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Ammonia Nitrogen, Total	G dd mol ( )	<		mg/L	20001	Roodin				
LC\$ (B5H0708-B\$1)				Prepare	d:08/24/15	12:27 Anal	yzed: 08/24/1	5 19:35		
LCS (B5H0708-BS1) Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Prepare Units	Spike	Source	yzed: 08/24/1 %REC	5 19:35 %REC Limits	RPD	RPD Limit
Analyte	Analyte Qualifier(s)	Result 0.961	Reporting Limit 0.05						RPD	RPD Limit
			Limit 0.05	Units mg/L	Spike <u>Level</u> 1	Source Result	%REC 95	%REC Limits 90-110	RPD	
Analyte Ammonia Nitrogen, Total	Qualifier(s) Analyte	0.951	Limit 0.05 1479-16 Reporting	Units mg/L	Spike Level 1 d:08/24/15 Spike	Source Result 12:27 Anal Source	%REC	%REC Limits 90-110	RPD	Limit RPD
Analyte Ammonia Nitrogen, Total Duplicate (B5H0708-DUP1) Analyte	Qualifier(s)	0.951 Source: 15H	Limit 0.05 1479-16	Units mg/L Prepare	Spike Level 1 d:08/24/15	Source Result 12:27 Anal	%REC 96 yzed: 08/24/1	%REC Limits 90-110 5 20:57		Limit
Analyte Ammonia Nitrogen, Total Duplicate (B5H0708-DUP1)	Qualifier(s) Analyte	0.951 Source: 15H Result	Limit 0.05 1479-16 Reporting Limit 0.05	Units mg/L Prepare Units mg/L	Spike Level 1 d:08/24/15 Spike Level	Source Result 12:27 Anal Source Result <	%REC 96 yzed: 08/24/1	%REC Limits 90-110 5 20:57 %REC Limits	RPD	Limit RPD Limit
Analyte Ammonia Nitrogen, Total Duplicate (BSH0708-DUP1) Analyte Ammonia Nitrogen, Total	Qualifier(s) Analyte Qualifier(s) Analyte	0.951 Source: 15H Result 0.040	Limit 0.05 1479-16 Reporting Limit 0.05 1479-17 Reporting	Units mg/L Prepare Units mg/L	Spike Level 1 d:08/24/15 Spike Level d:08/24/15 Spike	Source Result 12:27 Anal Source Result < 12:27 Anal Source	%REC 95 yzed: 08/24/1 %REC	%REC Limits 90-110 5 20:57 %REC Limits	RPD	Limit RPD Limit 10 RPD
Analyte Ammonia Nitrogen, Total Duplicate (BSH0708-DUP1) Analyte Ammonia Nitrogen, Total Duplicate (BSH0708-DUP2)	Qualifier(s) Analyte Qualifier(s)	0.951 Source: 15H Result 0.040 Source: 15H	Limit 0.05 1479-16 Reporting Limit 0.05 1479-17	Units mg/L Prepare Units mg/L Prepare	Spike Level 1 d:08/24/15 Spike Level d:08/24/15	Source Result 12:27 Anal Source Result < 12:27 Anal	%REC 96 yzed: 08/24/1 %REC yzed: 08/24/1	%REC Limits 90-110 5 20:57 %REC Limits 5 21:05	RPD 2	Limit RPD Limit 10

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	Amended Report Quality Control	St. Paul, MN 55164-0899 651-201-5300				
Program Code: RG	Program Code: RG Project ID: PRJ00075					
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None					
Collected By: Joe Magee, Jen Ender	Collected By: Joe Magee, Jen Ender City: None					
Collector ID: None	Generated: 11.06/15 11.55					

Results were prov	duced by Minnesota	epartment of Health,	except where noted.
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Matrix Spike (B5H0708-MS2)		Source: 15H	159402	Prepare	ed:08/24/15	12:27 Anal;	yzed: 08/24/1	5 21:30		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PC Lim
Ammonia Nitrogen, Total		0.921	0.05	mg/L	1	<	90	90-110		
Matrix Spike (B5H0708-MS3)		Source: 15H	159401RE1	Prepare	ed:08/91/15	10:27 Anal;	yzed: 09/01/1	5 14:17		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PC Lim
Ammonia Nitrogen, Total	D1	2.08	0.10	mg/L	2	<	102	90-110		

Amended Report

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Report ID: 11062015 115532

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Quality Control		651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

Amended Report

Batch B5H0611 - EPA 20	10 Prep									
Blank (B5 H0 611-BLK1)				Prepare	d:08/20/15	07:53 Anal	vzed: 08/21/1	5 10:48		
Analyte	Analyte	Result	Reporting	Units	Spike	Source	%REC	%REC Limits	RPD	RPD
Hardness	Qualifier(s)	Kesuii	Limit 10	mg/L	Level	Result	MINEG	WREC LINIS	RFD	Limi
ron		<	20.0	ug/L						
1011			20.0	ugre						
Blank (B5 H0611-BLK2)				Prepare	d:08/20/15	07:53 Anal	yzed: 08/21/1	5 11:55		
Anakta	Analyte	Result	Reporting	Units	Spike	Source	%REC	%REC Limits	RPD	RPD
Analyte	Qualifier(s)		Limit		Level	Result	18 KEU	WREC LIMILS	RPD	Limi
Aluminum	B1, Z-01	37.3	20.0	ug/L						
Arsenic		<	1.00	ug/L						
Barium		<	5.00	ug/L						
Copper		<	10.0	ug/L						
Manganese		<	10.0	ug/L						
Titanium		<	5.00	ug/L						
Zinc		<	10.0	ug∕L						
.CS (B5H0611-BS1)				Prepare	d:08/20/15	07:53 Anal;	yzed: 08/21/1	5 10:53		
	Analyte		Reporting		Spike	Source				RPD
Analyte	Qualifier(s)	Result	Limit	Units	Level	Result	%REC	%REC Limits	RPD	Limi
Hardness		67	10	mg/L	66.15		102	85-115		
Iron		1020	20.0	ug/L	1,000		102	85-115		
LCS (B5H0611-BS2)				Prepare	d:08/20/15	07:53 Anal;	yzed: 08/21/1	5 11:58		
	Analyte		Reporting		Spike	Source				RPD
Analyte	Qualifier(s)	Result	Limit	Units	Level	Result	%REC	%REC Limits	RPD	Limit
Aluminum	L1, Z-01	96.0	20.0	ug/L	50		192	85-115		
Arsenic		51.8	1.00	ug/L	50		104	85-115		
Barium		50.8	5.00	ug/L	50		102	85-115		
Copper		51.0	10.0	ug/L	50		102	85-115		
Manganese		51.9	10.0	ug/L	50		104	85-115		
Titanium		54.6	5.00	ug/L	50		109	85-115		
Zinc		50.9	10.0	ug/L	50		102	85-115		
			10.0	3			102	00110		
Duplicate (B5H0611-DUP1)		Source: 15H	1472-03	Prepare	d:08/20/15	07:53 Anal;	yzed: 08/21/1	5 11:15		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PD Limit
Hardness	Statum of D)	300	10	mg/L	20001	290			2	20
ron		123	20.0	ug/L		102			19	20
Amended Report								Report ID	1106201	15 11 553

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	Amended Report Quality Control	
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility NameAD: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

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Duplicate (B5H0611-DUP2)		Source: 15H	1472-03	Prepare	d:08/20/15	07:53 Anal;	yzed: 08/21/1	5 12:10		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Aluminum	W8	159	20.0	ug/L		103			43	20
Arsenic	WB	0.42	1.00	ug/L		<			43	20
Barium		71.5	5.00	ug/L		70.1			2	20
Copper	WB	1.25	10.0	ug/L		<			25	20
Manganese		9.67	10.0	ug/L		<			5	20
Titanium		5.26	5.00	ug/L		<			18	20
Zinc		1.81	10.0	ug/L		<			8	20

Matrix Spike (E5H0611-MS1)		Source: 15H	1472-03	Prepare	d:08/20/15	07:53 Anal;	yzed: 08/21/1	5 11:20		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Hardness		360	10	mg/L	66.15	290	101	85-115		
Iron		1130	20.0	ug/L	1,000	102	103	85-115		

Matrix Spike (B5H0611-MS2)		Source: 15H1472-03				Prepared: 08/20/15 07:53 Analyzed: 08/21/15 12:13						
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit		
Aluminum		235	20.0	ug/L	50	103	264	85-115				
Arsenic		52.7	1.00	ug/L	50	<	105	85-115				
Barium		123	5.00	ug/L	50	70.1	106	85-115				
Copper		51.1	10.0	ug/L	50	<	100	85-115				
Manganese		63.3	10.0	ug/L	50	<	108	85-115				
Titanium	M1	62.2	5.00	ug/L	50	<	115	85-115				
Zinc		49.5	10.0	ug/L	50	<	96	85-115				

Amended Report

Report ID: 11062015115532

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Batch B5H0611 - EPA 200 Prep

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	Amended Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

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Blank (B5 H0 633-BL K1)			5 11:53							
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PC Lim
Surrogate: 1,2-Dichlorobenzene-d 4		101	70-130	%	25					
Surrogate: 1,2-Dickloroethane-d4		100	70-130	%	25					
Surrogate: 4-Brom ofluoro benzene		96	70-130	%	25					
Surrogate: Dibrom ofluorom ethane		102	70-130	%	25					
Surrogate: Toluene-d8		93	70-130	%	25					
1,1,1-Trichloroethane		<	1.0	ug/L						
1,1,2-Trichloroethane		<	1.0	ug/L						
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L						
1,1-Dichloroethane		<	1.0	ug/L						
1,1-Dichloroethene		<	1.0	ug/L						
1,1-Dichloropropene		<	1.0	ug/L						
1,2-Dichloroethane		<	1.0	ug/L						
1,2-Dichloropropane		<	1.0	ug/L						
1,3-Dichloropropane		<	1.0	ug/L						
2,2-Dichloropropane	L1, V1	<	1.0	ug/L						
Acetone		<	20	ug/L						
Allyl chloride		<	1.0	ug/L						
Benzene		<	1.0	ug/L						
Bromochloromethane		<	1.0	ug/L						
Bromo dichlorom ethan e		<	1.0	ug/L						
Bromomethane		<	2.0	ug/L						
Carbon tetrachloride		<	1.0	ug/L						
Chloro dibromo methan e		<	1.0	ug/L						
Chloroethane		<	1.0	ug/L						
Chloroform		<	1.0	ug/L						
Chloromethane		<	1.0	ug/L						
cis-1,2-Dichloroethene		<	1.0	ug/L						
cis-1,3-Dichloropropene		<	1.0	ug/L						
Dibromomethane		<	1.0	ug/L						
Dich loro difluo rometh ane	L3, V4, Z-01c	<	1.0	ug/L						
Dichlorofluoromethane		<	1.0	ug/L						
Ethyl ether		<	1.0	ug/L						
Methylethylketone (MEK)		<	10	ug/L						
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L						
Methyl tertiary butyl ether (MTBE)		<	2.0	ug/L						

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Report ID: 11062015115532

	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

Amended Report

Results were produced by Minnesota	Department of Health, except where noted.
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Blank (B5 H0 633-BL K1)				Ргераге	d:08/20/15	11:53 Anal	yzed: 08./20./1	5 11:53		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PC Lim
Methylene chloride		<	2.0	ug/L						
Tetrachloroethene		<	1.0	ug/L						
Tetrahydrofuran (THF)		<	10	ug/L						
Toluene		<	1.0	ug/L						
trans-1,2-Dichlor oethe ne		<	1.0	ug/L						
trans-1,3-Dichloropropene		<	1.0	ug/L						
Trichloroethene (TCE)		<	1.0	ug/L						
Trichlorofluoromethan e	Z-01b	<	1.0	ug/L						
Vinyl chloride		<	1.0	ug/L						

LCS (B5H0633-BS1)				Prepare	d:08/20/15	11:31 Anal;	yzed: 08.20 /1:	5 11:31		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1,1,2-Tetrachloro ethane		10	1.0	ug/L	10		105	70-130		
1,1,1-Trichloroethane		11	1.0	ug/L	10		115	70-130		
1,1,2,2-Tetrachloro ethane		10	1.0	ug/L	10		100	70-130		
1,1,2-Trichloroethane		10	1.0	ug/L	10		102	70-130		
1,1,2-Trichlorotrifluoroethane		12	1.0	ug/L	10		121	70-130		
1,1-Dichloroethane		11	1.0	ug/L	10		114	70-130		
1,1-Dichloroethene		11	1.0	ug/L	10		113	70-130		
1,1-Dichloropropene		12	1.0	ug/L	10		116	70-130		
1,2,3-Trichlorobenzene		10	1.0	ug/L	10		103	70-130		
1,2,3-Trichloropropane		10	1.0	ug/L	10		102	70-130		
12,4 Trichlorobenzene		10	1.0	ug/L	10		102	70-130		
12,4 Trimethylbenzene		10	1.0	ug/L	10		103	70-130		
1.2-Dibromo-3-chloropropane (DBCP)		10	5.0	ug/L	10		100	70-130		
1,2-Dibromoethane (EDB)		10	1.0	ug/L	10		101	70-130		
1,2-Dichlorobenzene		10	1.0	ug/L	10		100	70-130		
1,2-Dichloroethane		12	1.0	ug/L	10		116	70-130		
1.2-Dichloropropane		11	1.0	ug/L	10		113	70-130		
1,3,5-Trimethylbenzene		10	1.0	ug/L	10		103	70-130		
1,3-Dichlorobenzene		10	1.0	ug/L	10		102	70-130		
1,3-Dichloropropane		10	1.0	ug/L	10		102	70-130		
1,4-Dichlorobenzene		10	1.0	ug/L	10		100	70-130		
2,2-Dichloropropane	L1, V1	18	1.0	ug∕L	10		175	70-130		
Amended Report								Report ID	1106201	5 11 5532

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	Amended Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

Results were	produced by	· Minnesota De	epartment of Health,	except where noted.

LCS (E5H0633-ES1)				Prepare	d:08/20/15	11:31 Anal	yzed: 08./20./1	5 11:31		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPI Lim
2-Chlorotoluene		99	1.0	ug/L	10		99	70-130		
4-Chlorotoluene		10	1.0	ug/L	10		102	70-130		
Acetone		130	20	ug/L	100		127	70-130		
Allyl chloride		12	1.0	ug/L	10		118	70-130		
Benzene		11	1.0	ug/L	10		113	70-130		
Bromobenzene		10	1.0	ug/L	10		102	70-130		
Bromo chlor ometha ne		12	1.0	ug/L	10		117	70-130		
Bromo dichlorom ethan e		11	1.0	ug/L	10		114	70-130		
Bromoform		10	1.0	ug/L	10		102	70-130		
Bromomethane		12	2.0	ug/L	10		119	70-130		
Carbon tetrachloride		12	1.0	ug/L	10		119	70-130		
Chlorobenzene		10	1.0	ug/L	10		103	70-130		
Chloro dibromo methan e		10	1.0	ug/L	10		105	70-130		
Chloroethane		12	1.0	ug/L	10		116	70-130		
Chloroform		11	1.0	ug/L	10		112	70-130		
Chloromethane		8.7	1.0	ug/L	10		87	70-130		
cis-1,2-Dichloroethene		12	1.0	ug/L	10		116	70-130		
cis-1,3-Dichloropropene		11	1.0	ug/L	10		107	70-130		
Dibromomethane		11	1.0	ug/L	10		115	70-130		
Dichloro difluo romethane	L3, V4, Z-01c	6.8	1.0	ug/L	10		68	70-130		
Dichlorofluoro methane		12	1.0	ug/L	10		116	70-130		
Ethyl ether		11	1.0	ug/L	10		112	70-130		
Ethylbenzene		10	1.0	ug/L	10		103	70-130		
Hexachlorobutadiene		11	1.0	ug/L	10		107	70-130		
ls op ropylb enze ne		10	1.0	ug/L	10		100	70-130		
Methylethylketone (MEK)		56	10	ug/L	50		111	70-130		
Methyl isobutyl ketone (MIBK)		53	5.0	ug/L	50		105	70-130		
Methyl tertiary butyl ether (MTBE)		11	2.0	ug/L	10		108	70-130		
Methylene chloride		11	2.0	ug/L	10		106	70-130		
Naphthalene		10	1.0	ug/L	10		104	70-130		
n-Butylbenzene		11	1.0	ug/L	10		107	70-130		
n-Propylbenzene		10	1.0	ug/L	10		102	70-130		
o-Xylene		10	1.0	ug/L	10		103	70-130		
p&m-Xylene		10	1.0	ug/L	10		103	70-130		
p-lsopropyttoluene		10	1.0	ug/L	10		104	70-130		

Amended Report

Authorized by:

Report ID: 11062015115532

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	Amended Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

Results were i	nroduced hy	/ Minnesota De	nartment of Health	except where noted.
IX COULD WOLC		r Minniesota Be	puttiniont of figuitin	except where noted.

LCS (B5H0633-BS1)	LCS (B5H0633-BS1)					Prepared: 08/20/1511:31 Analyzed: 08/20/1511:31							
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R PC Lim			
sec-Butylbenzen e		10	1.0	ug/L	10		102	70-130					
Styrene		11	1.0	ug/L	10		106	70-130					
tert Butylbenzen e		10	1.0	ug/L	10		100	70-130					
Tetrachloroethene		11	1.0	ug/L	10		108	70-130					
Tetrahydrofuran (THF)		120	10	ug/L	100		120	70-130					
Toluene		10	1.0	ug/L	10		102	70-130					
trans-1,2-Dichloroethene		11	1.0	ug/L	10		114	70-130					
trans-1,3-Dichloropropene		11	1.0	ug/L	10		106	70-130					
Trichloroethene (TCE)		12	1.0	ug/L	10		117	70-130					
Trichlorofluoromethane	Z-01b	11	1.0	ug/L	10		110	70-130					
Vinvl chloride		9.8	1.0	ug/L	10		98	70-130					

Duplicate (B5H0633-DUP1)		Source: 15H1472-01			ed:08/20/15	13:24 Anal	yzed: 08/20/1	5 13:24		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1,1,2-Tetrachloro ethane		<	1.0	ug∕L		<				30
1,1,1-Trichloroethane		<	1.0	ug/L		<				30
1,122-Tetrachloro ethane		<	1.0	ug/L		<				30
1,1,2-Trichloroethane		<	1.0	ug/L		<				30
1,1,2-Trichlorotrifluoroethane		<	1.0	ug/L		<				30
1,1-Dichloroethane		<	1.0	ug/L		<				30
1,1-Dichloroethene		<	1.0	ug/L		<				30
1,1-Dichloropropene		<	1.0	ug/L		<				30
1,2,3-Trichlorobenzene		<	1.0	ug/L		<				30
1,2,3-Trichloropropane		<	1.0	ug/L		<				30
12,4 Trichlorobenzene		<	1.0	ug/L		<				30
12,4-Trimethylbenzene		<	1.0	ug/L		<				30
1,2-Dibromo-3-chloropropane (DBCP)		<	5.0	ug/L		<				30
1,2-Dibromoethane (EDB)		<	1.0	ug/L		<				30
1,2-Dichlorobenzene		<	1.0	ug/L		<				30
1,2-Dichloroethane		<	1.0	ug/L		<				30
1,2-Dichloropropane		<	1.0	ug/L		<				30
1,3,5-Trimethylbenzene		<	1.0	ug/L		<				30
1,3-Dichlorobenzene		<	1.0	ug/L		<				30
1,3-Dichloropropane		<	1.0	ug/L		<				30
Amended Report								Report ID	: 1106201	15 11 553 2

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	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

Amended Report

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Duplicate (B5H0633-DUP1)		Source: 15H1472-01		Ргераге	Prepared: 08/20/1513:24 Analyzed: 08/20/1513:24							
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPI Lin		
1,4-Dichlorobenzene		<	1.0	ug/L		<				З		
2,2-Dichloropropane	L1, V1	<	1.0	ug/L		<				з		
2-Chlorotoluene		<	1.0	ug/L		<				з		
4-Chlorotoluene		<	1.0	ug/L		<				З		
Acetone		<	20	ug/L		<				3		
Allyl chloride		<	1.0	ug/L		<				з		
Benzene		<	1.0	ug/L		<				3		
Bromobenzene		<	1.0	ug/L		<				з		
Bromo chlor ometha ne		<	1.0	ug/L		<				з		
Bromo dichl orom ethan e		<	1.0	ug/L		<				з		
Bromoform		<	1.0	ug/L		<				з		
Bromomethane		<	2.0	ug/L		<				3		
Carbon tetrachloride		<	1.0	ug/L		<				3		
Chlorobenzene		<	1.0	ug/L		<				3		
Chloro dibromo methan e		<	1.0	ug/L		<				3		
Chloroethane		<	1.0	ug/L		<				3		
Chloroform		<	1.0	ug/L		<				3		
Chloromethane		<	1.0	ug/L		<				3		
cis-1,2-Dichloroethene		<	1.0	ug/L		<				:		
cis-1,3-Dichloropropene		<	1.0	ug/L		<				:		
Dibromomethane		<	1.0	ug/L		<				:		
Dichlorodifluoromethane	L3, V4, Z-01c	<	1.0	ug/L		<				:		
Dichlorofluoromethane		<	1.0	ug/L		<				:		
Ethylether		<	1.0	ug/L		<				:		
Ethylbenzene		<	1.0	ug/L		<				:		
Hexachlorobutadiene		<	1.0	ug/L		<				;		
sopropylbenzene		<	1.0	ug/L		<				3		
Methylethylketone (MEK)		<	10	ug/L		<				:		
Methyl isobutyl ketone (MIBK)		<	5.0	ug/L		<				;		
Methyltertiary butyl ether (MTBE)		<	2.0	ug/L		<				:		
Methylene chloride		<	2.0	ug/L		<				:		
Naphthalene		<	1.0	ug/L		<				;		
n-Butylbenzene		<	1.0	ug/L		<				:		
n-Propylbenzene		<	1.0	ug/L		<				:		
o-Xylene		<	1.0	ug/L		<				3		

Amended Report

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Report ID: 11062015115532

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	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

Amended Report

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Results were	produced p	v iviinnesota.	Department of	t Health,	except where noted.

Duplicate (B5H0633-DUP1)		Source: 15H	1472-01	Ргераге	d:08/20/15	13:24 Anal;	yzed: 08/20/1	5 13:24		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RP Lir
p&m-Xylene		<	1.0	ugÆ		<				0
p-Isopropyttoluene		<	1.0	ug/L		<				З
se o Butylbenzen e		<	1.0	ug/L		<				з
Styrene		<	1.0	ug/L		<				3
tert-Butylbenzen e		<	1.0	ug/L		<				з
Tetrachloroethene		<	1.0	ug/L		<				3
Tetrahydrofuran (THF)		<	10	ug/L		<				з
Toluene		<	1.0	ug/L		<				З
trans-1,2-Dichlor oethe ne		<	1.0	ug/L		<				З
trans-1,3-Dichloropropene		<	1.0	ug/L		<				з
Trichloroethene (TCE)		<	1.0	ug/L		<				3
Trichloroflu oro methan e	Z-01b	<	1.0	ug/L		<				з
Vinyl chloride		<	1.0	ug/L		<				3

Matrix Spike (B5H0633-MS1)		Source: 15H	1472-02	Prepare	d:08/20/15	13:46 Anal	yzed: 08/20/1	5 13:46		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane		11	1.0	ugÆ	10	<	114	70-130		
1,1,1-Trichloroethane	M1	13	1.0	ug/L	10	<	132	70-130		
1,122-Tetrachloroethane		11	1.0	ug/L	10	<	106	70-130		
1,1,2-Trichloroethane		11	1.0	ug/L	10	<	110	70-130		
1,1,2-Trichlorotrifluoroethane	M1	14	1.0	ug/L	10	<	144	70-130		
1,1-Dichloroethane		13	1.0	ug/L	10	<	127	70-130		
1,1-Dichloroethene	M1	13	1.0	ug/L	10	<	132	70-130		
1,1-Dichloropropene	M1	13	1.0	ug/L	10	<	133	70-130		
1,2,3-Trichlorobenzene		11	1.0	ug/L	10	<	105	70-130		
1,2,3-Trichloropropane		11	1.0	ug/L	10	<	108	70-130		
12,4 Trichlorobenzene		11	1.0	ug/L	10	<	106	70-130		
12,4 Trimethylbenzene		11	1.0	ug/L	10	<	113	70-130		
1,2-Dibromo-3-chloropropane (DBCP)		10	5.0	ug/L	10	<	100	70-130		
1,2-Dibromoethane (EDB)		11	1.0	ug/L	10	<	112	70-130		
1,2-Dichlorobenzene		11	1.0	ug/L	10	<	106	70-130		
1,2-Dichloroethane		13	1.0	ug/L	10	<	128	70-130		
1,2-Dichloropropane		13	1.0	ug/L	10	<	127	70-130		
1,3,5-Trimethylbenzene		12	1.0	ug/L	10	<	115	70-130		
Amended Report								Report ID	: 1106201	15115532

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Report ID. 11062015115032

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	Amended Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

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Matrix Spike (B5H0633-MS1)		Source: 15H	1472-02	Prepare	d:08/20/15	13:46 Anal;	yzed: 08/20/1	5 13:46		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPI Lin
1,3-Dichlorobenzene		11	1.0	ug/L	10	<	109	70-130		
1,3-Dichloropropane		11	1.0	ug/L	10	<	111	70-130		
1,4-Dichlorobenzene		11	1.0	ug/L	10	<	108	70-130		
2,2-Dichloropropane	L1, V1, Z-01a	20	1.0	ug/L	10	<	201	70-130		
2-Chlorotoluene		11	1.0	ug/L	10	<	107	70-130		
4 Chlorotoluene		11	1.0	ug/L	10	<	112	70-130		
Acetone		130	20	ug/L	100	<	125	70-130		
Allyl chloride	M1	13	1.0	ug/L	10	<	133	70-130		
Benzene		13	1.0	ug/L	10	<	128	70-130		
Bromobenzene		11	1.0	ug/L	10	<	109	70-130		
Bromo chlor ometha ne		13	1.0	ug/L	10	<	130	70-130		
B romo dichlorom ethan e		13	1.0	ug/L	10	<	126	70-130		
Bromoform		11	1.0	ug/L	10	<	108	70-130		
Bromomethane	M1	13	2.0	ug/L	10	<	133	70-130		
Carbon tetrachloride	M1	13	1.0	ug/L	10	<	133	70-130		
Chlorobenzene		11	1.0	ug/L	10	<	115	70-130		
Chloro dibromo methan e		11	1.0	ug/L	10	<	112	70-130		
Chloroethane	M1	13	1.0	ug/L	10	<	130	70-130		
Chloroform		13	1.0	ug/L	10	<	128	70-130		
Chloro methane		9.7	1.0	ug/L	10	<	97	70-130		
cis-1,2-Dichloroethene		13	1.0	ug/L	10	<	128	70-130		
cis-1,3-Dichloropropene		12	1.0	ug/L	10	<	117	70-130		
Dibromomethane		13	1.0	ug/L	10	<	126	70-130		
Dichloro difluo rometh ane	L3, V4, Z-01c	79	1.0	ug/L	10	<	79	70-130		
Dichlorofluoromethane	M1	13	1.0	ug/L	10	<	134	70-130		
Ethylether		12	1.0	ug/L	10	<	123	70-130		
Ethylbenzene		12	1.0	ug/L	10	<	116	70-130		
Hexachlorobutadiene		12	1.0	ug/L	10	<	118	70-130		
Is opropylbenze ne		11	1.0	ug/L	10	<	112	70-130		
Methylethylketone (MEK)		58	10	ug/L	50	<	116	70-130		
Methyl isobutyl ketone (MIBK)		56	5.0	ug/L	50	<	112	70-130		
Methyltertiary butyl ether (MTBE)		12	2.0	ug/L	10	<	117	70-130		
Methylene chloride		12	2.0	ug/L	10	<	119	70-130		
Naphthalene		10	1.0	ug/L	10	<	104	70-130		
n-Butylbenzene		12	1.0	ug/L	10	<	119	70-130		

Amended Report

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Report ID: 11062015 115532

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Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

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	Amended Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Joe Magee, Jen Ender	City: None	
Collector ID: None	Generated: 11.06/15 11.55	

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Matrix Spike (B5H0633-MS1)		Source: 15H	1472-02	Prepare	d:08/20/15	13:46 Analy	yzed: 08/20/1	5 13:46		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RP Lir
n-Propylbenzene		12	1.0	ug/L	10	<	115	70-130		
o-Xylene		12	1.0	ug/L	10	<	115	70-130		
o&m-Xylene		12	1.0	ug/L	10	<	116	70-130		
p-lsopropyttoluene		12	1.0	ug/L	10	<	116	70-130		
ec Butylbenzen e		12	1.0	ug/L	10	<	116	70-130		
Styrene		12	1.0	ug/L	10	<	117	70-130		
ert-Butylbenzen e		11	1.0	ug/L	10	<	110	70-130		
letra chloroethe ne		12	1.0	ug/L	10	<	123	70-130		
Tetrahydrofuran (THF)		120	10	ug/L	100	<	124	70-130		
Foluene		11	1.0	ug/L	10	<	113	70-130		
rans-1,2-Dichloroethene	M1	13	1.0	ug/L	10	<	130	70-130		
rans-1,3-Dichlor opropene		12	1.0	ug/L	10	<	117	70-130		
Frichloro ethen e (TCE)	M1	13	1.0	ug/L	10	<	134	70-130		
Frichlorofluoromethan e	Z-01b	13	1.0	ug/L	10	<	128	70-130		
√inyl chloride		11	1.0	ug/L	10	<	112	70-130		

Amended Report

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Report ID: 11062015115532

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Amended Report

Quality Control

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

#### Data Qualifiers and Definitions

V1	Calibration verification standard recovery was above method acceptance limits. This target analyte was not detected in the sample.
B4	Target analyte detected in method blank at or above method reporting limit. Concentration found in the sample was at least 10 times the concentration found in the method blank.
D1	Sample required dilution due to matrix. Reporting limit has been raised.
D2	Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
К1	The sample dilutions set up for the BOD/CBOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L Any reported result is an estimated value.
L1	The spike recovery was above laboratory acceptance limits for the associated laboratory control sample and/or laboratory control sample duplicate.
B1	Target analyte detected in method blank at or above the method reporting limit. See comments or additional qualifiers.
M1	Matrix spike and/or matrix spike duplicate recovery was high; the associated laboratory control sample and/or laboratory control sample duplicate recovery was acceptable.
Z-01c	This analyte is unpredictable due to reactivity issues.
V4	Calibration verification standard recovery was below method acceptance limits. See comments or additional qualifiers.
W8	Sample/sample duplicate relative percent difference exceeded the laboratory acceptance limit.
WB	Relative percent difference exceeded the laboratory acceptance limit. Result less than 5 times the RL
Z-01	Aluminum not originally requested. Added since 15H1472-01 was significantly higher than samples 15H1472-02 and 15H1472-03.
Z-01a	Matrix spike and/or matrix spike duplicate recovery was high; the associated laboratory control sample and/or laboratory control sample duplicate recovery was also high.
Z-01b	Second-source calibration verification standard recovery was above method acceptance limits. The result is considered estimated.
L3	The spike recovery was below laboratory acceptance limits for the associated laboratory control sample and/or laboratory control sample duplicate.

- Dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- %REC Percent Recovery

Amended Report

Report ID: 11062015115532

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Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

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Report ID: 4		I verify that Kathryn Re	these data are correc	t. /		h. Hors
Sample Remarks:						
Propachlor	ND at MRL	30 ppt				
Prometon	ND at MRL	100 ppt				
Phorate	ND at MRL	25 ppt				
Pendimethalin	ND at MRL	75 ppt				
Parathion-methyl	ND at MRL	100 ppt				
Oxadiazon	ND at MRL	75 ppt				
Metribuzin DK	ND at ERL	500 ppt				
Metribuzin DADK	ND at ERL	500 ppt				
Metribuzin DA	ND at ERL	500 ppt				
Vetribuzin	ND at MRL	75 ppt				
Vetolachlor	ND at MRL	25 ppt				
Methoxychlor	ND at MRL	50 ppt				
Valathion	ND at MRL	50 ppt				
Fonofos	ND at MRL	15 ppt				
Ethofumesate	ND at MRL	50 ppt				
Ethalfluralin	ND at MRL	50 ppt				
Esfenvalerate	ND at MRL	150 ppt				
EPTC	ND at MRL	10 ppt				
Disulfoton	ND at MRL	60 ppt				
Dimethoate	ND at MRL	100 ppt	4			
Dimethenamid	ND at MRL	15 ppt				
Dichlorvos	ND at MRL	15 ppt				
Dichlobenil	ND at MRL	5 ppt				
Diazinon Oxon	ND at MRL	75 ppt				
Diazinon	ND at MRL	30 ppt				
Desethylatrazine	73.8 ppt	50 ppt				
Delsopropylatrazine	ND at MRL	150 ppt				
Cyfluthrin	ND at MRL	100 ppt				
Clomazone	ND at MRL	15 ppt				
Chlorpyrifos	ND at MRL	40 ppt				
Chlorothalonil	ND at MRL	50 ppt				
Bifenthrin	ND at MRL	20 ppt				
Benfluralin	ND at MRL	25 ppt				
Atrazine	38.9 ppt	30 ppt				
Alachlor	ND at MRL	30 ppt				
Acetochlor	ND at MRL	30 ppt				
GCMSMS Monitoring						
Analyte	Result	MRL	R	esult Comme	nt	
	_				n a faria fa faria dako kakaka karia k	
Analysis Requested: GC			Temperature Recei	tut afaa		deg C
Analysis Demonstration 202			Whitewater River	- South Brai	nch/SBW	1
		Page 1 of 2	Collected From:			
Water Monitor	ing Final Report		Description:			
(651) 201-6010			Water, River/Stre	am		
	esota 55155-2531		Product Name:			
	Street North		1x1L		Surfac	e Water
	nalysis Report		Quantity x Sample	Size:	Project:	
MINNESOTA DEPARTM		RE	Lab ID: W-			DG ID: 15-SDG-3734
			Inspector No: SB	W15011	~	0.010
OF	AGRICULTURE		Sample Numbers			
	NNESOTA DEPARTMENT AGRICULTURE		8/25/2015	08/19/		Marie Juenemann
			Date Printed:	Date Collec	tea:	Division Contact:

State Concernence
MINNESOTA DEPARTMENT
OF AGRICULTURE

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### Water Monitoring Final Report

Analysis Requested: GC

	Date Printed: 8/25/2015	Date Collec 08/19/2		Division Contact: Marie Juenemann								
RE	Sample Numbers Inspector No: SBV Lab ID: W-1	V15011 5-1529	SD	IG ID: 15-SDG-3	734							
	Quantity x Sample S	ize:	Project:									
	1x1L		Surface Water									
	Product Name: Water, River/Strea	ım										
	Description:											
Page 2 of 2	Collected From:											
	Whitewater River -	Whitewater River - South Branch/SBW										
	Temperature Receive	ed:	7.4	deg C								

		1	7.4 dog o	4
Analyte	Result	MRL	Result Comment	
GCMSMS Monitoring				
Propazine	ND at MRL	25 ppt		
Simazine	ND at MRL	75 ppt		
Tebupirimiphos	ND at MRL	30 ppt		
Terbufos	ND at MRL	30 ppt		
Tolfenpyrad	ND at MRL	100 ppt		
Triallate	ND at MRL	50 ppt		
Trifluralin	ND at MRL	50 ppt		
lambda-Cyhalothrin	ND at MRL	75 ppt		
zeta-Cypermethrin	ND at MRL	500 ppt		

Sample Remarks:

Water Analysis Unit Supervisor 7940 miles C	Report ID: 437415 Ka	verify that these data are correct. athryn Reynolds Vater Analysis Unit Supervisor	Kaffam m. R.	28
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	INNESOTA DEPARTMENT		Date Printed: 8/26/2015	Date Collecte 08/19/20		Division Contact: Marie Juenemann
MINNESOTA DEPART		JRE		W15011 15-1530	SE	DG ID: 15-SDG-3734
	Analysis Report		Quantity x Sample	Size:	<sup>o</sup> roject:	
	t Street North		1x1L		Surface	e Water
	nesota 55155-2531		Product Name:			
(651)	201-6010		Water, River/Stre	am		
Water Monito	ring Final Report		Description:			
		Page 1 of 3	Collected From:	11.00000000000000000000000000000000000		
Analysis Requested: LC			Whitewater River	- South Brand	h/SBW	1
analysis insquests at the			Temperature Receiv	ved:	7.4	deg C
Analyte	Result	MRL	Re	esult Commen	ł	
	FIGODI	21199 33m	I R,	Jour Common		
LCMSMS (+) Monitoring	ND at MDI					
Acetamiprid Aldicarb Sulfone	ND at MRL ND at MRL	25 ppt				
Aldicarb Sulfoxide	ND at MRL	15 ppt 50 ppt				
Aluicarb Sulloxide Azoxystrobin	ND at MRL	ou ppt 10 ppt				
Bensulfuron-methyl	ND at MRL	16.7 ppt				
Bensulide	ND at MRL	250 ppt				
Boscalid	ND at MRL	200 ppt 50 ppt				
Bromacil	ND at MRL	30 ppt				
Carbaryl	ND at MRL	25 ppt				
Carbendazim	ND at MRL	10 ppt				
Carbofuran	ND at MRL	13.3 ppt				
Chlorantraniliprole	ND at MRL	50 ppt				
Chlorimuron-ethyl	ND at MRL	20 ppt				
Chlorpyrifos Oxon	ND at MRL	40 ppt				
Clothianidin	ND at MRI.	25 ppt				
Cyanazine	ND at MRL	25 ppt				
Cyantraniliprole	ND at MRL	100 ppt				
DEDI Atrazine	50.6 ppt	50 ppt				
Dicrotophos	ND at MRL	25 ppt				
Difenoconazole	ND at MRL	25 ppt				
Dinotefuran	ND at MRL	25 ppt				
Disulfoton Sulfone	ND at MRL	20 ppt				
Diuron	ND at MRL	13.3 ppt				
Flumetsulam	ND at MRL	50 ppt				
Flutriafol	ND at MRL	10 ppt				
Fluxapyroxad	ND at ERL	10 ppt				
Halosulfuron-methyl	ND at MRL	30 ppt				
lexazinone	ND at MRL	10 ppt				
Hydroxyatrazine	16.7 ppt	6.7 ppt				
mazamethabenz Acid	ND at MRL	10 ppt				
mazamethabenz-methyl	ND at MRL	5 ppt				
mazamox mazapic	ND at MRL ND at MRL	13.3 ppt				
mazapic mazapyr	ND at MRL	10 ppt 8.3 ppt				
mazapyr	ND at MRL	16.7 ppt				
mazethapyr	ND at MRL	6.7 ppt				
Sample Remarks:	. ver tal 1919 Ba	an bhr				
ландао полна но.						
		I verify that	these data are correct	L .		~
Report ID:	437416	Kathryn Re		VA	-	m Bos
compare the company			lysis Unit Supervisor	nall	in "	m Por CO

Date Printed:

MINNESOTA DEPARTMENT

MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

# Water Monitoring Final Report

Division Contact: Marie Juenemann 8/26/2015 08/19/2015 B/20/2013 Sample Numbers Inspector No: SBW15011 Lab ID: W-15-1530 SDG ID: 15-SDG-3734 Quantity x Sample Size: Project: 1x1L Surface Water Product Name: Water, River/Stream Description: Page 2 of 3 Collected From: Whitewater River - South Branch/SBW

Date Collected:

Analysis Requested: LC			Whitewater River - South Branch/	/SBW
			Temperature Received:	7.4 deg C
Analyte	Result	MRI.	Result Comment	
LCMSMS (+) Monitoring				
Imidacloprid	ND at MRL	20 ppt		
Isoxaflutole	Not Analyzed	40 ppt	QC Recovery below 40%	
Linuron	ND at MRL	20 ppt		
Metalaxyl	ND at MRL	8.3 ppt		
Metsulfuron-methyl	ND at MRL	23.3 ppt		
Myclobutanil	ND at MRL	10 ppt		
Nicosulfuron	ND at MRL	26.6 ppt		
Norflurazon	ND at MRL	20 ppt		
Norflurazon-desmethyl	ND at MRL	50 ppt		
Oxydemeton-methyl	ND at MRL	20 ppt		
Parathion-methyl Oxon	ND at MRL	25 ppt		
Picoxystrobin	ND at MRL	50 ppt		
Prometryn	ND at MRL	3.3 ppt		
Propiconazole	ND at MRL	10 ppt		
Pyraclostrobin	ND at MRL	25 ppt		
yroxasulfone	ND at MRL	50 ppt		
Saflutenacil	ND at MRL	15 ppt		
Siduron	ND at MRL	6.7 ppt		
Sulfometuron-methyl	ND at MRL	8.3 ppt		
Tebuconazole	ND at MRL	10 ppt		
Fetraconazole	ND at MRL	10 ppt		
Thiacloprid	ND at MRL	50 ppt		
Thiamethoxam	ND at MRL	25 ppt		
Fhifensulfuron-methyl	ND at MRL	16.7 ppt		
Thiobencarb	ND at MRL	8.3 ppt		
Friasulfuron	ND at MRL	23.3 ppt		
LCMSMS (-) Monitoring				
2,4,5-T	ND at MRL	50 ppt		
2,4,5-TP	ND at MRL	50 ppt		
2,4-D	31.0 ppt	8.3 ppt		
2,4-DB	ND at MRL	20 ppt		
Acetochlor ESA	56.5 ppt	30 ppt		
Acetochlor OXA	ND at MRL	33.3 ppt		
Alachlor ESA	337 ppt	41.6 ppt		
Alachlor OXA	ND at MRL	33.3 ppt		
Bentazon	ND at MRL	5 ppt		
Sample Remarks:				

Report ID: 437416 I verify that these data are correct. Kathryn Reynolds Water Analysis Unit Supervisor Kathryn Ref	DS
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and the second second			Date Printed: 8/26/2015	Date Collect 08/19/2		Division Contact: Marie Juenemann				
Min	NESOTA DEPARTMENT GRICULTURE		Sample Numbers	06/19/2	010					
			Inspector No: SI	BW15011	-	0.10.				
MINNESOTA DEPARTN		JRE	Lab ID: W			3G ID: 15-SDG-3734				
	nalysis Report Street North		Quantity x Sample	e Size:	Project:					
	esota 55155-2531		1x1L		Surface	e Water				
	01-6010		Product Name: Water, River/Str	eam						
Water Monitori	ng Final Report		Description:							
		Page 3 of 3	Collected From:		EMMAN Protocol and a second					
Analysis Requested: LC			Whitewater Rive	er - South Bran	ch/SBW	1				
niaysis nequested. LO			Temperature Rece	vived:	7.4	deg C				
Analyte	Result	MRL	F	Result Commer	nt					
LCMSMS (-) Monitoring		-								
Bromoxynil	ND at MRL	25 ppt								
Clopyralid	ND at MRL	41.6 ppt								
Dicamba	ND at MRL	50 ppt								
Dichlorprop	ND at MRL	50 ppt								
Dimethenamid ESA	ND at MRL	6.7 ppt								
Dimethenamid OXA	ND at MRL	10 ppt								
Flufenacet OXA	ND at MRL	8.3 ppt								
Isoxaflutole DKN	ND at MRL	50 ppt								
MCPA	ND at MRL	5 ppt								
MCPB	ND at MRL	20 ppt								
MCPP	ND at MRL	50 ppt								
Mesotrione	ND at MRL	50 ppt								
Metolachlor ESA	706 ppt	10 ppt								
Metolachlor OXA	22.5 ppt	10 ppt								
Picloram	ND at MRL	41.6 ppt								
Propachlor ESA	ND at MRL	30 ppt								
Propachior OXA	ND at MRL	10 ppt								
Sedaxane Tembotrione	ND at MRL ND at MRL	75 ppt								
Triclopyr	ND at MRL	50 ppt 50 ppt								
Sample Remarks:										
Report ID: 4	37416	Kathryn Re	verify that these data are correct. Kathryn Reynolds Vater Analysis Unit Supervisor							

									Whitewater River-South Branch/SBW	SAMPLE LOCATION		Notes/Sample Conditions: Sample should be analyzed as "P2 Status".	Sampled By: David Tollefson	OF AGRICULTURE PETICIE AND FERTILIZES MANAGEMENT		
									8/19/2015	DATE	SAMPL	as "P2 Statu	Delivered By: David Tollefson	e		
									8:50	TIME	SAMPLE END	S <sup>#</sup> .	r: efson	VATER MO 625 F St. Pai	P	
									SBW15011	FIELD SAMPLE ID		Lab SDG Number	Delivery Method: SpeeDee Sample Type: Surface Water	3	ORIGINA	
			-						57%  57%	98			Received Date/Time:	Wiłliam VanRyswyk Mike Macdonaid David Tollefson		
									IN W-15				E S	507-344-3203 651-201-6694 507-206-2882		
				-						Gly/MDA	ANLALYSIS REOU	Temperature Received (2):	Received By:	Matthew Ribikawskis Luke Stuewe Russ Derickson Katle Rassmussen Scott Mattason		
										0	DUESTED	<u>eceived</u> (	1 Van	507-206-2884 218-846-7425 507-752-7036 651-201-6331 507-334-5261	<i>a</i> .	
										ACE/ELISA		60	•	507-206-2884 Marie Juenemann 218-646-7425 Jeff Paddock 507-752-7036 Brennon Schaefer 651-201-6331 507-334-5261	to -sys-	
										Triazine/ELISA				651-201-6161 651-201-6560 651-201-6491		

#### MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010



### Water Monitoring Final Report

Re-issue of Report ID: SBW15011-233526

Date Reported: 10/26/2015	SDG ID: 15-SDG-3735	Page: Page 1 of 1
Division Contact:		
	Marie Juenema	nn

SDG Comments:

		SBW1501				
LAB Sample ID:	AR-15-2862	Quantity x Sample Size:	1 x 125 ml		Project Name: Surface W	Vater
Inspector Sample ID:	SBW15011	Date/Time Collected:	8/19/2015	0850		
Product/Description:	Water, River/Stream	Date/Time Received:	8/20/2015	1215	Temperature Received:	0 deg C
Collected From:	Whitewater River - So	uth Branch/SBW				
Analysis Requested:	NO2+NO3					
Analyte	Result	MRL	Met	hod	Result Comment	
Nitrate/Nitrite	7.38 ppm	0.40 ppm	Std. Meth. 4 NO3 NO2	500 NO3-F,		
Nitrate/Nitrite Analysis Date	e/Time 08/26/2015 1	2:59:40 pm				
Sample Remarks:						
LAB Sample ID:		Quantity x Sample Size: Date/Time Collected:		0850	Project Name: Surface W	Vater
	SBW15011	• •	8/19/2015	0850 1215	Project Name: Surface W Temperature Received:	
LAB Sample ID: Inspector Sample ID: Product/Description:	SBW15011	Date/Time Collected: Date/Time Received:	8/19/2015			
LAB Sample ID: Inspector Sample ID: Product/Description:	SBW15011 Water, River/Stream Whitewater River - Son	Date/Time Collected: Date/Time Received:	8/19/2015			
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From:	SBW15011 Water, River/Stream Whitewater River - Son	Date/Time Collected: Date/Time Received:	8/19/2015	1215		
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte	SBW15011 Water, River/Stream Whitewater River - Son TP+DOP Result	Date/Time Collected: Date/Time Received: uth Branch/SBW	8/19/2015 8/20/2015	1215	Temperature Received:	
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Ortho Phosphorus, Dissolv	SBW15011 Water, River/Stream Whitewater River - Sou TP+DOP Result red 0.087 ppm	Date/Time Collected: Date/Time Received: uth Branch/SBW MRL 0.005 ppm	8/19/2015 8/20/2015 Met	1215	Temperature Received:	
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From: Analysis Requested: Analyte Ortho Phosphorus, Dissolv Ortho Phosphorus, Dissolv Date/Time	SBW15011 Water, River/Stream Whitewater River - Sou TP+DOP Result red 0.087 ppm	Date/Time Collected: Date/Time Received: uth Branch/SBW MRL 0.005 ppm	8/19/2015 8/20/2015 Met	1215	Temperature Received:	
LAB Sample ID: Inspector Sample ID: Product/Description: Collected From: Analysis Requested:	SBW 15011 Water, River/Stream Whitewater River - Son TP+DOP red Analysis 08/24/2015 0 0.144 ppm	Date/Time Collected: Date/Time Received: uth Branch/SBW 0.005 ppm 11:29:30 pm 0.01 ppm	8/19/2015 8/20/2015 Met EPA 365.1	1215	Temperature Received:	

la	uthorize this final report	
Treeske Ehresmann, Chemistry Toxicology Unit Supervisor:	Come	Epesmann

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			Ц	L				-15-5D	a-3735
OF AGRICU PESTICIDE AND	JLTURE D FERTILIZER MANAGEMENT	625 Ro St. Paul	bert Stree I, MN 551	55-2538	651-201-6694 507-206-2882	Matthew Ribikawskis Luke Stuewe Russ Derickson Katie Rassmussen Scott Matteson	507-206-2884 218-846-7425 507-752-7036 651-201-6331 507-334-5261	Marie Juenemann Jeff Paddock Brennon Schaefer	651-201-6161 651-201-6560 651-201-6491
eport To:	Sampled By:	Delivered B	-	Delivery Method: SpeeDee	Received Date/TI		Received By:	11	
larie Juenemann	David Tollefson Sample should be analyzed	David Toll		Sample Type: Surface Water Lab SDG Number:	8/20/1		Jen	ylan	All and the second
stes/sample conditions:	Sample should be analyzed	as P2 Status	5.	15-506-3735		Lab Temp	erature Reco	rived (°C):	1
		SAMP	E END		$\mathcal{O}$		LYSIS REQU	CTED	
SAMPLE LOCATION	N	DATE	TIME	FIELD SAMPLE ID	NO2 + NO3	TP + DOP	CL	TSS	TURBIDITY
hitewater River-South Bra	anch/SBW	8/19/2015	8:50	SBW15011	AR-15- 2862	AR-15- 2863	CL .	135	TURBIDITY
							-		
			1. J.						

# TABLE E2. MANURE SAMPLE CHAIN-OF-CUSTODY REPORTS AND ANALYTICAL RESULTS.



Protecting, maintaining and improving the health of all Minnesotans

Report Date: 10/27/15 Client Name: RG - MPCA - EOD-Fish Kill Studies Project Code: RG Project Name: EOD-Fish Kill Studies

Work Order Number: 15J0964

Report To: RG - MPCA - EOD-Fish Kill Studies Joe Magee 520 Lafayette Rd. Saint Paul, MN 55155

The MDH Public Health Laboratory performs chemical, bacteriological and radiological analyses of environmental samples including water, waste water, sediment, air, soil and hazardous material. The laboratory provides testing services in accordance with standard operating procedures referencing approved methodology as defined in Standard Methods for the Examination of Water and Wastewater, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods: EPA SW-846, and 40 Code of Federal Regulation (CFR) parts 136, 141, and 261. In cases where analytes of interest do not have corresponding EPA approved methodology, the MDH Public Health Laboratory uses in-house methods that have undergone rigorous validation and documentation.

The results within this report are in compliance with the terms and conditions stated in the standard operating procedures, reference methodologies, and quality assurance project plan; unless otherwise narrated in the attached report.

Release of the data contained in this report has been authorized by laboratory management and is verified with the following signature affirmation. Thank you for using the MDH Public Health Laboratory.

Sincerely,

Ma

Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

Public Health Laboratory , Environmental Laboratory Section , 601 Robert St. N , PO Box 64899 , St Paul, MN 55164 (651) 201-5300 http://www.health.mn.us/divs/phl/environmental

Page 1 of 13

	Final Report Summary of Samples Received	Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name: None	
Collected By: Mark Gernes	City: None	
Collector ID: None	Generated: 10/27/15 10:43	

Work Order Comment: Do not run lodine analyses per K. Logan. -CTS 10/19/15 Run metals analyses only per S. Schmidt. -CTS 10/20/15

Field ID	MDH Sample Number	Matrix	Date & Time Collected	Date & Time Received	Receipt °C
none	15J096401	Non-potable Water	10/07/15 8:00	10/16/15 11:17	5.8
none	15J096402	Non-potable Water	10/07/15 8:15	10/16/15 11:17	5.8
none	15J096403	Non-potable Water	10/07/15 8:30	10/16/15 11:17	5.8

E de la la la	MDH Sample	Parallelan Original
Field ID	Number	Receiving Comments
none	15J096401	Run Metals only per client -CTS
none	15J096402	Run Metals only per client -CTS
none	15J096403	Run Metals only per client - CTS

FINALREPORT

Report ID: 10272015104309

Page 2 of 13

Minnesota Department of Health Public Health Laboratory

Authorized by:

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Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

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Minnesota Pollution	Control Ag	gency	MDH	l Stream I	_ab She	eet				eof
Program Code: RG	Collecte	d hy: Ma	ark Ger	nes			Proje	ect ID: PR	1000	)75
2										
Collector Phone: 507	7-206-	2643		1	MPCA PN	M Id Phone: JO	e Mag	gee 507-	206-	2601
Conector Phone.				B	Traine an	C		D	-	E
Sample Information		A		D				D		L
Location ID										
(ex 27-0016-00-101 or S005-515) Field Name /	Hoim	Liquid	Horbo	r Liquid	Hoim	Scraper				
Lake Name	пеш	Liquid	neibe		TIEIIII	Sciapei				
Bio Station Date (MM/DD/YY)	10/5	12015	10/5	7/2015	10/	7/2015				
Time (Military)	A DEMONSTRA	7/2015 ::00	1.0807.1	3:15	2023	8:30				
Quality Assurance*						11111111111111111111111111111111111111				
Analysis Group No.**		-								
Sample Depth (Top) m (Lake Only)										
Sample Depth (Bot) m (Lake Only)										
Filter Volume										
(for chlorophyll a)	ST. ST. ST.			Sample A						
AIS- autoclave		11100	(Mark	requesting ana	lyses with an	<u>n "X")</u>				the state
							H		H	
Dilution	X	Field filtered	X	Field filtered	X	Field filtered		Field filtered	H	Field fil
Copper (EPA 200.8)		Field filtered	X	Field filtered	X	Field filtered	H	Field filtered	H	Field fil
Fe (EPA 200.7)		Field filtered		Field filtered	X	Field filtered	H	Field filtered	H	Field fil
Mn (EPA 200.8)		Field filtered		Field filtered	X	Field filtered		Field filtered	H	Field fil
Nitrate + Nitrite (EPA 353.2)		Field filtered		Field filtered	X	Field filtered		Field filtered	H	Field fil
Aluminum (EPA 200.8)		Field filtered		Field filtered	X	Field filtered	H	Field filtered	H	Field filt
Phosphorus (SM 4500P I)	X	Field filtered		Field filtered		Field filtered		Field filtered	- H	Field filt
potassium (EPA 200.7)	X	Field filtered		Field filtered		Field filtered		Field filtered	H	Field filt
iodine	X	Field filtered		Field filtered	<u> </u>	Field filtered	H	Field filtered	$\dashv$	Field filt
		Field filtered		Field filtered		Field filtered	- H	Field filtered	-	Field filt
				Field filtered		Field filtered		Field filtered	H	Field filt
1 L T (0C)		Field filtered		State of the second						
Lab Temp (°C)		***ENTER	THE ORIGIN	NAL AND QA SA	MPLES IN SE	EPARATE COLUMN	NS***		100	CAH revise
	* FR = Field ** Select an	l Replicate, SB = S Analysis Group by	ampler Blank	, SS = Split Sampl	e, TB = Trip E	Blank, BB = Bottle Bl	ank, RB = F	leagent Blank		
		52		Chain of O	Custody	Accepted By	Affiliatio			Date/Tim
Relinquishe	d By / Affili	ation			C +	Accepted by	7 Arman	///		10/15/15
ZAJOEn			10	15/15 16:30	Spect	Dec		1		10/15/15
					V	vn	MPI			onons
Sampler Comments										
Receiving Comments	51.00.00		Sin has		alle Posts	COLUMNON !!			•	

Stream Field Info	Α	В	С	D	Е
Project ID	THE SECOND		PRJ00075		
Location ID					
(ex 27-0016-00-101 or S005-515) Field Name /Lake Name					
	Heim Liquid	Herber Liquid	Heim Scraper		
Bio Station		Lange and the second			
Date (MM/DD/YY)	10/7/2015	10/7/2015	10/7/2015		1. 2°, 6 - 3
Time (Military)	8:00	8:15	8:30		1 the Same
Quality Assurance*					1.000
Field Temp (°C)	Summer State		1.2	9.47	
Conductivity		· · · · · · · · · · · · · · · · · · ·	1		
@ 25 ° C (umho/cm) DO (mg/l)					
				the second second	
рН					A COLORE DATE
ORP-mV		and the second	242		
Turbidity*		a.		1	
Apparent Color (PCU)	The Manager			the second second	
Tape Down Distance (decimal ft)*	de seta real				
W.L. Gage (ft.)*		12 M 1 M 1 M 1 M 1 M 1 M 1 M 1 M 1 M 1 M		11	
W.L. Gage Type*					
Transparency* 50 cm tube (to the nearest cm)		1 1 1 1 1 1	and the second second second	CONTRACTOR AND	
Transparency* 100 cm tube (to the nearest cm)					
Secchi tube transparency,				1. 1	
cm					
Appearance *					
Recreat. Suit. *					
Stream Condition*					
Stream Flow (cfs)*					-
Sampling Device*					
Sample Type* Please reference the separate Add					CAH revised 3/13
TELD OBSERVATIO	DNS (station name/locati	on, weather, ice condition, s	tream width, picture #, GPS	5 file name, etc.)	ırb. Units:
A	A disable	0			
В			de la seconda		
с			Stat Las		
D	24072				
E	The second				
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		Ń	ΛĪ	ИD	<b>MD</b>	<b>MDH</b>

# Sample Condition Upon Receipt

Minnesota Department of Health Public Health Laboratory

**Parcel Information** 



# 0CT16'15 11:17 Date & time of receipt: **Courier:** $\Box$ UPS $\Box$ FedEx $\blacksquare$ Spee-Dee $\Box$ USPS $\Box$ Other 🗆 Walk-in Tracking # Sp uni490009 20 After hours drop off: Refrigerator Freezer Unrefrigerated Parcel: 🔁 Plastic cooler 🗆 Styrofoam cooler 🗆 Cardboard box 🗆 Single mailer 🗆 Envelope 🗖 None □ Other Custody seals present: Yes No; Custody seals intact: Yes No X/A Evidentiary samples identified: Yes No Custody seal # **Packaging Information Packing material:** $\Box$ Bubble wrap $\Box$ Styrofoam $\Box$ Paper $\blacktriangleright$ None $\Box$ Other Cooling material: Wet ice 🗆 Ice pack 🗆 Gel pack 🗆 Dry ice 🗆 None 🗆 Other Condition of cooling material: Solid D Partial D Liquid; Liquid temperature: °C □N/A Representative sample temperature: 5.8 °C IR thermometer instrument used: 83

Initials of person receiving parcel:

Chain of Custody, Sample Container & Analysis Information

Chain of custody received: Yes INo

Chain of custody type: 🛱 Standard 🗆 Civil 🗆 Criminal 🗆 Priority/Emergency 🗆 Unknown

Rad Chem request received:  $\Box$  Yes  $\times$  No, Sample survey results:  $\Box$  < .5 mrem/hr  $\Box$   $\geq$  .5 mrem/hr

All sample containers received intact: XYes  $\Box$  No

All sample containers are unique to the sample point listed on the chain of custody: 
Yes X No

All samples have been received within the specified holding time for analysis: Yes INO Unknown

Sample submission meets the conditions of the MDH Environmental Laboratory Sample Acceptance Policy: 
Yes X No If "No" has been checked, details are entered in the work order memo notes.

Initials of person logging in the work order request:

**DOC-84** Revision: 1

Page 5 of 13

Final Report Case Narrative Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Program Code: RG	Project ID: PRJ00075
Program Name: EOD-Fish Kill Studies	Facility Name: None
Collected by: Mark Gernes	City: None
Collector ID: None	Generated: 10/27/2015 10:42

Except where noted in this report, no additional comments are needed for this Work Order.

FINALREPORT

Authorized by:

Report ID: 10272015104309

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Ma and Paul Moyer, Environmental Laboratory Manager Public Health Laboratory, Minnesota Department of Health

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Final Report Analytical Results Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Program Code: RG	Project ID: PRJ00075			
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None			
Collected By: Mark Gernes	City: None			
Collector ID: None	Generated: 10/27/15 10:43			
	MDH Sample Number: 15J0964-01			
Location ID: none	Collect Date: 10/07/15	Field Residual Chlorine Result: Non		
	Collect Time: 8:00	Field Fluoride Result: None		
Field Name: Heim Liquid	Solie at Inne. Expe	Tield Thuonde Resource Rome		
Field Name: Heim Liquid Sampling Point None	Matrix: Non-potable Water	Field pH Result: None		

Results were produced by the Minnesota Department of Health, except where noted.

#### Metal Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	D2, Z-01	270000	5750	ug/L	20	B5J0498	10/22/15 15:00	10/26/15 18:18	EPA200.8
Copper	D2, Z-01	10900	2870	ug/L	20	B5J0498	10/22/15 15:00	10.26/15 18:18	EPA200.8
Iron	D2, Z-01	1440000	2870	ug/L	10	B5J0498	10/22/15 15:00	10.23/15 12:16	EPA200.7
Potassium	D2, Z-01	3300	71.8	mg/L	10	B5J0498	10/22/15 15:00	10/23/15 12:16	EPA200.7
Manganese	D2, Z-01	93000	2870	ug/L	20	B5J0498	10/22/15 15:00	10/26/15 18:18	EPA200.8

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Report ID: 10272015104309

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Final Report Analytical Results

Project ID: PRJ00075

City: None

Facility Name/ID: None

Generated: 10/27/15 10:43

Program Code: RG Program Name: EOD-Fish Kill Studies Collected By: Mark Gernes Collector ID: None

### MDH Sample Number: 15J0964-02

Location ID: none Field Name: Herber Liquid Sampling Point None QA Type: None Collect Date: 10/07/15 Collect Time: 8:15 Matrix: Non-potable Water Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None

Field PO4 Result: None

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899

St. Paul, MN 55164-0899

651-201-5300

Receiving Comments: Run Metals only per client -CTS

Results were produced by the Minnesota Department of Health, except where noted.

#### Metal Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	D2, M3	25300	400	ug/L	20	B5J0498	10/22/15 15:00	10/26/15 18:21	EPA200.8
Copper	D2, M3	15400	200	ug/L	20	B5J0498	10/22/15 15:00	10/26/15 18:21	EPA200.8
Iron	D2, M3	82400	200	ug/L	10	B5J0498	10/22/15 15:00	10/23/15 12:20	EPA200.7
Potassium	D2, M3	1390	5.00	mg/L	10	B5J0498	10/22/15 15:00	10/23/15 12:20	EPA200.7
Manganese	D2, M3	14900	200	ug/L	20	B5J0498	10/22/15 15:00	10/26/15 18:21	EPA200.8

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Authorized by:

Report ID: 10272015104309

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Final Report Analytical Results

Project ID: PRJ00075

City: None

Facility Name/ID: None

Generated: 10/27/15 10:43

Program Code: RG Program Name: EOD-Fish Kill Studies Collected By: Mark Gernes Collector ID: None

# MDH Sample Number: 15J0964-03

Location ID: none Field Name: Heim Scraper Sampling Point. None QA Type: None Collect Date: 10/07/15 Collect Time: 8:30 Matrix: Non-potable Water

Field Residual Chlorine Result: None Field Fluoride Result: None Field pH Result: None Field PO4 Result: None

Receiving Comments: Run Metals only per client - CTS

Results were produced by the Minnesota Department of Health, except where noted.

#### Metal Parameters

Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Aluminum	D2, Z-01	59700	3760	ug/L	20	B5J0498	10/22/15 15:00	10/26/15 18:27	EPA200.8
Соррег	D2, Z-01	9840	1880	ug/L	20	B5J0498	10/22/15 15:00	10.26/15 18:27	EPA200.8
Iran	D2, Z-01	185000	1880	ug/L	10	B5J0498	10.22/15 15:00	10.23/15 12:28	EPA200.7
Patassium	D2, Z-01	4410	47.0	mg/L	10	B5J0498	10/22/15 15:00	10.23/15 12:28	EPA200.7
Manganese	D2, Z-01	33700	1880	ug/L	20	B5J0498	10/22/15 15:00	10/26/15 18:27	EPA200.8

FINALREPORT

Authorized by:

Report ID: 10272015104309

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

		Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899
	Final Report	St. Paul, MN 55164-0899
	Quality Control	651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: [none]	
Collected By: Mark Gernes	City: None	
Collector ID: None	Generated: 10/27/15 10:43	
	Batch Summary	

#### Samples in Batch: B5J0498 - EPA 200 Prep

15J096401 15J096402 15J096403

FINALREPORT

Authorized by:

Report ID: 10272015104309

Minnesota Department of Health

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

	651-201-5300	
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Mark Gernes	City: None	
Collector ID: None	Generated: 10/27/15 10:43	

Final Report

Batch B5J0498 - EPA 200	) Prep									
Blank (B5J0498-BLK1)				Prepare	d:10/22/15	15:00 Anal	yzed: 10/23/1	5 12:08		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R P D Limi
Iron		<	20.0	ug/L						
Potassium		<	0.50	mg/L						
Blank (B5J0498-BLK2)				Ртераге	d:10/23/15	07:24 Anal;	yzed: 10/26/1	5 18:12		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	R P D Limi
Aluminum		<	20.0	ug/L						
Copper		<	10.0	ug∕L						
Manganese		<	10.0	ug/L						
LCS (B5J0498-BS1)				Prepare	d:10/22/15	15:00 Anal;	yzed: 10/23/1	5 12:12		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
ron		999	20.0	ug/L	1,000		100	85-115		
Potassium		10.1	0.50	mg/L	10		101	85-115		
LCS (B5J0498-BS2)				Prepare	d:10/23/15	07:24 Anal;	yzed: 10/26/1	5 18:15		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Aluminum		542	20.0	ug/L	50		108	85-115		
Copper		49.1	10.0	ug/L	50		98	85-115		
Manganese		51.6	10.0	ug/L	50		103	85-115		
Duplicate (B5J0 498-DUP1)		Source: 15J	096403	Prepare	d:10/22/15	15:00 Anal;	yzed: 10/23/1	5 12:32		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
ron	D2	174000	1970	ug/L		185000			6	20
Potæssium	D2	4320	49.3	mg/L		4410			2	20
Duplicate (B5J0 498-DUP2)		Source: 15J	096403	Prepare	d:10/23/15	07:24 Anal;	yzed: 10/26/1	5 18:30		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limi
Aluminum	D2, Z-01	54600	3940	ug∕L		59700			9	20
Copper	D2, Z-01	8870	1970	ug/L		9840			10	20
Manganese	D2, Z-01	31400	1970	ug/L		33700			7	20

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Public Health Laboratory, Minnesota Department of Health

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Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

	Final Report Quality Control	St. Paul, MN 55164-0899 651-201-5300
Program Code: RG	Project ID: PRJ00075	
Program Name: EOD-Fish Kill Studies	Facility Name/ID: None	
Collected By: Mark Gernes	City: None	
Collector ID: None	Generated: 10/27/15 10:43	

#### Results were produced by Minnesota Department of Health, except where noted.

Batch B5J0498 - EPA 200	Prep									
Matrix Spike (B5J0 498-MS1 )		Source: 15J0	196402	Prepare	+d:10/22/15	15:00 Anal;	yzed: 10/23/1	5 12:24		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Iron	D2, M3	85000	200	ug/L	1,000	82400	256	85-115		
Potassium	D2, M3	1510	5.00	mg/L	10	1390	NR	85-115		
Matrix Spike (B5J0 498-MS2)		Source: 15J0	196402	Ргераге	vd:10/23/15	07:24 Anal;	yzed: 10/26/1	5 18:24		
Analyte	Analyte Qualifier(s)	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Aluminum	D2, M3	26400	400	ug/L	50	25300	NR	85-115		
Copper	D2, M3	15800	200	ug/L	50	15400	832	85-115		
Manganese	D2, M3	16600	200	ug/L	50	14900	NR	85-115		

FINALREPORT

Authorized by:

Report ID: 10272015104309

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Final Report

Minnesota Department of Health Public Health Laboratory Environmental Laboratory Section 601 Robert St. N., P.O. Box 64899 St. Paul, MN 55164-0899 651-201-5300

Quality Control

#### Data Qualifiers and Definitions

- Z-01
   Concentration estimated. Sample was a solid and dient insisted analyze as a non-potable. Assume one gram equals one milliliter. Liquid extraction method performed on sample.

   M3
   The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated laboratory control sample and/or laboratory control sample duplicate recovery was acceptable.

   D2
   Sample required dilution due to high concentration of target analyte(s). Reporting limit has been raised.

   Dry
   Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- %REC Percent Recovery

FINALREPORT

Authorized by:

Report ID: 10272015104309

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SAMPLE CONDITEMP: 11/1//	RECEIVERSIGNATURE	RECEIVED FROM	RECEIVED FROM TRUE IN RULE T							08052015 CD P001 - 0926	INSPECTOR LABORATORY ID SAMPLE ID LAB USE ONLY	SE O				JA 60 A - AMARAN	INSPECTOR COMMAC dw	PFMD FIELD PROJECT: CMISUSE	story of Residue S	Pesticide and Fertilizer Management, Ph: 651-201-6121	
	S	SENT VIA	SENT VIA NO	Set in 1						6 09/03/2es	D DATE SAMPLED	WP; RANGE; SEC; 14			JAR RAL ALINIA	CAL YMACH	Preez	SE 🗍 USE 🕅 OTHER	ample Foi	gement, Ph: 65	
		RE	T							2:40	TIME SAMPLED	, % OR LEGAL		SEND RESU	-	Merris		2.2 V V 3	r <b>m -</b> Ana	1-201-6121	
	$\mathcal{O} \mathcal{E}, \mathcal{O}$ more received	RECEIVED BY DATE	RECEIVED BY KAT KAAL DATE DB/DH/2.215	re 1230-40" from river		651-201-6390	Christian Willia	contact		8 T	SAMPLE TYPE/DESCRIPTION	SCRIPTION) DELIVERY METHOD: DIAND DELIVERED (	PRMO CONTACT Pat Kelly	UYE IND EMALLY INSP CDP 103 000153	0	PRIORITY: 2 P1 D P2 D P3	VOLUNTARY OTHER	1.1	History of Residue Sample Form - Analysis Request and Chain of Custody		
	STORAGE LOCATION	TIME			× z	≺ Z	≺ Z	≺ Z	×	X X	CONC?			5 65	096	O P4	O OTHER	WELLSNen/E	ď		
	OCATION		nme 08:25								ANALYSIS			SDG NUMBER (LA		C P5-Hold	C PARAGRACI				
		1							2440	SOO a lamba	NUMBER/TYPE OF CONTAINERS/SIZE			NUMBER (LAB USE ONLY)						M.S. § 18D.201	

TABLE E3. SOIL SAMPLE CHAIN-OF-CUSTODY REPORTS AND ANALYTICAL RESULTS.

MINNESOTA DEPARTMENT

**MINNESOTA DEPARTMENT OF AGRICULTURE** Laboratory Analysis Report **601 Robert Street North** Saint Paul, Minnesota 55155-2531 (651) 201-6010

**Residue Approval Report** 

**Collected From:** 

Jason and Adam Kreidermacher 18319 Crystal Ridge Rd. Altura MN 55910

Date Printed:	Date Collected:	Top Folder Nu	mber:
8/6/2015	8/3/2015		101064896
Inspector Nam	e:	Inspector ID:	
Corinne duPre	eez	080320	15CDP001
Customer Con	tact:	Sample ID:	EAR-15-0226
Patrick Kelly		SDG ID:	15-SDG-3306
Project: / Surv	ey:	3	
Other (PFMD	-Assign Survey)		
Description:			
Soll			
Quantity y San	nole Size		

Joke S. Johnson

1 x 500 ml

Page 1 of 1

Analysis Requested:

Analyte	Result	Result Comment	
Acetochlor	ND at EDL (0.016 mg/kg)		
Clopyralid	ND at EDL (0.016 mg/kg)		
Dicamba	ND at EDL (0.016 mg/kg)		
Diflufenzopyr	ND at EDL (0.4 ug/kg)		
Flumetsulam	ND at EDL (0.4 ug/kg)		
Fluxapyroxad	0.13 ug/kg		
Picloram	ND at EDL (0.016 mg/kg)		
AMPA	ND at MRL (0.61 mg/kg)		
Glyphosate	ND at MRL (0.37 mg/kg)		

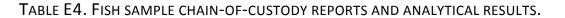
Sample Remarks:

EDLs are calciulated based on the lowest concentration of the analytical standard observed on the instrument.

	I verify that these data are correct.
	Yoko Johnson
*	Environmental Analysis Unit Supervisor

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these data are correct.



15-5D6- 4058 DIMINIA SCANNED ( EVIDENCE INVENTORY AND TRANSMITTAL Whitewate River ICR/Case Case Title: Sout Date & Time of Selzure: 30 Tulls Evidence/Prop eTrune + David Suso 1000 Seized by: YOY Source of □ Seized from: Evidence/Property Received from: (Person and/or Schound at: Sta Location) LIST OF EVIDENCE Item No. Quantity Description of Evidence/Property (Include sample numbers and model or serial numbers) Bacterial sample, 250-ml plastic bottle, preserved 1 2 Pesticide sample, 1-L amber glass bottle 3 Nutrient sample, 500-ml plastic bottle, preserved General chemistry sample, 2-1, plastic bottle đ 5 necropsied EAR - 15-0301 6sh Field Tests: Temperature Site Map: pН DO (ppm) Chlorine (ppm) LABORATORY SERVICES Analyses Requested: Comments: These fish were removed from DNR evidence locker and will be analyzed by MOX. The original COC and These remaining tish are still used of the story. Here 25ep15 **Case Officer Name and Phone Number:** CHAIN OF CUSTODY Delivery Via: (USPS, in **Received** By Date/Time Item No. Released ate/Time person, other) 5 Andre 09-02-15 1453 Final Disposition of Property: Original is retained with evidence

	MINNESOTA DEPARTMENT of AGRICULTURE TA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North at Paul, Minnesota 55155-2531 (651) 201-6010	Ir D C H	ate Printed: 10/19/2015 ispector Nam bavid Susag ustomer Con leidi Rantala roject: / Surv Other (PFMD	ntact:	SDG ID:	NA
	Residue Final Report	5	SBWWR Fis	h Kill 2015-1		
Collected From: River/Stream		1	escription: Necropsied Fis			
		1	1			
						Page 1 of 1
Analysis Requested:	Select Fungicides, Metals					
Analyte	Result	Resu	lt Comment			
Azoxystrobin	ND at quantitation limit of 10ppb					
Carbendazim	ND at quantitation limit of 10ppb					
Fluxapyroxad	ND at quantitation limit of 10ppb					
Picoxystrobin	ND at quantitation limit of 10ppb					
Pyraclostrobin	ND at quantitation limit of 10ppb					

Analyte	Result	Result Comment
Azoxystrobin	ND at quantitation limit of 10ppb	
Carbendazim	ND at quantitation limit of 10ppb	
Fluxapyroxad	ND at quantitation limit of 10ppb	
Picoxystrobin	ND at quantitation limit of 10ppb	
Pyraclostrobin	ND at quantitation limit of 10ppb	
Pyraclostrobin metabolite #1	ND at quantitation limit of 10ppb	
Pyraclostrobin metabolite #2	ND at quantitation limit of 10ppb	
Aluminum	79.8 ppm	% recovery of 1 of 2 blank spike samples was above laboratory acceptance limits due to inadvertent cross-contamination.
Arsenic	< 0.2 ppm	
Barium	1.6 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Copper	< 0.6 ppm	
Iron	72.6 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Manganese	4.07 ppm	
Sulfur	2100 ppm	Sulfate = 6055 ppm (determined by converting concentration of sulfur to sulfate). %recovery of the matrix spike is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Titanium	3.21 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Zinc	23.4 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.

Sample Remarks:

	I verify that these data are correct.
Report ID: 438841 Supervise	or: Redu Elexan

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	INFORMATIC	DN 🧏	Plea	se Print HR	1	RECEIVING INFORM	ATION	non	5
lient Name	MA		Collected B	Heidi Vauah		Received 9/24/15	Temp. P Received	12.6	Delivery HAnd
ddress			City	State dip		Time Received 12/17	Temp. Control?	Yes	Fee For Service? Yes
ogram/Project	SRIVINA	Fish	Kill Survey Nan	ne .	2/01-1	SDG Number	Jeennen	Lab Unit:	м сл Х
Emp	PEMO-A	ssigned	Cirves			185106-44	41	EA 🗍	
SAMPLE #	COLLECTION	COLLECTION	PRODUCT / DESCRIP	TION		19 4		TAINER	ANALYSIS
B SAMPLE #	# DATE	TIME	FISH, FRES	H				IBER /	REQUESTED
. /	205115	1200	Bown to	nt liver SP	Shihl	River			
10+15-0003	pro-	,	Fiskil	1, 11, 04	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
2	305115	1200	Roubt	nit whate:	BWW	Rivefish			
1104-120004			Diover	ini) vonorere		Kill			
3	ZZSEPIS	400	Brown to	ut liver S	BWh	J RIVE			
10A13-0005		100			Fish	Kill			
4	22Sept5	1400	Brinin tr	int whole;	SB 1	WW Rive			
110A15-0006		1100	12100011	· )	n.	shkill			
5	2Septs	1400	White S	ucker, live	:SB	WW River	1		
NVA-15-0001				i	-	Fish Kill			
6	22Jep15	1400	White SI	scher, Wholt	SB	WW RIVE			
1107-15-000	8		¥		J	hsh kill			
	2			2					
aboratory Comm	nents: <	nnple	s where a	Meeted 1		1 ( 1	1	0	and the second second second
eld Chain Of Custo	the second s	onpre	s mere a	plucted by	Vaug	the Snowly	ANT	C	
OLLECTED BY/	\$1- t016	1-10	9/22/	51207 1	) (if applica	able)			
ECEIVED FROM:	they	(gru	DATE/TIME: 4201	5 150 SENT VIA: VG	RECEIVE	ED FROM:			DATE/TIME:
EC EIVED FROM:	6		DATE/TIME:	SENT VIA:	RECEIVE	ED FROM:		1	DATE/TIME:

HR OS O telebir
numbers)
numbers)
6 11 1 1
near
1100
Date/Time
Date/Time
Date/Time
Date/Time 6/4/15 3/4/15
Date/Time 8/4/15 8/4/15 1/15

25epis XIL but 3 fish were renared to be reliquised to MOA For analysis Item relinquishby: 5 Herdr MRATI 9/24/15 1310 Lyhad received by: Elsi Buhl 9/24/15 13/0 Frozen AN AND AND

Evidence/Pro	South Br	anch h	thite week	River	ICR/Case No: Date & Time	Sile Mar
Seized by: Source of Evidence/Pro (Person and/ Location)	perty Bereived f	Rarta ni Vav	ughn Si ca off	nocik, Pice	of Seizure: 22 MN DR	Sep15 1400 Lanesboro
			LIST OF EV	IDENCE		
Item No.	Quantity	Description of	Evidence/Propert	y (Include samp	le numbers and mode	l or serial numbers)
1		Bacterial sampl	e, 250-ml plastic bott	le, preserved		
2		Pesticide samp	le, 1-L amber glass b	ottle		
3		Nutrient sampl	e, 500-ml plastic bott	le, preserved		
4	1/0 .		try sample, 2-L plast	. /.	101	
5	to thish	2 B	own tra	T, YW	nite Sucker	2
	(Field Tests:	Temperature pH DO (ppm) Chlorine (ppm)		Site Map: 4 H	2	
Analyses Re	quested:		LABORATORY	SERVICES	- Alexandre	
	questeur					
comments: The De			e colfe	ected 1 Y DNR	or the pesone	MN
comments: The De	se fish pt of		e Colfe altive b CHAIN OF C	/	or the pesone	MN
comments: The De	se fish pt of	Number: Date/Time	CHAIN OF C Delivery Via: (U person, other)	CUSTODY SPS, in	or the persone	MN 21 Date/Time
Comments: The De Case Officer	Se fish pt of Name and Phone	Number:	CHAIN OF C Delivery Via: (U person, other)	CUSTODY SPS, in Rece	ived By	

22 Sep 2015 South Branch White water River, at snothobile bridge (ONR station #1) Collected by Vaughn Snook + William Wayne, MN IN DNR HUR Sy White Sickers 2 Brown Trout Received by Relinquished by lapitute on 9-22-15 byhand Heidi effet 22, Sep15



MINNESOTA DEPARTMENT OF AGRICULTURE Laboratory Analysis Report 601 Robert Street North Saint Paul, Minnesota 55155-2531 (651) 201-6010

### **Residue Final Report**

Collected From:

MN Department of Agriculture 625 Robert Street North Saint Paul MN 55155

Date Printed: 10/19/2015	Date Collected: 7/30/2015	Top Folder Nu	mber:
Inspector Nam	e:	Inspector ID:	
			1
Customer Con	tact:	Sample ID:	MDA-15-0003
	r e	SDG ID:	15-SDG-4441
Project: / Surv	ey:		
Other (PFMD	-Assign Survey)		
SBWWR Fisl	h Kill 2015-1		
Description: Brown trout, liv	er; SBWW River fi	sh kill	-
Quantity x Sam	nle Size		<b>1</b>
1			

Analysis Requested:

Page 1 of 1

Analyte	Result	Result Comment
Aluminum	5.31 ppm	% recovery of 1 of 2 blank spike samples was above laboratory acceptance limits due to inadvertent cross-contamination.
Arsenic	< 0.2 ppm	
Barium	< 0.2 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Copper	174 ppm	
Iron	154 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Manganese	1.62 ppm	
Sulfur	2775 ppm	Sulfate = 7985 ppm (determined by converting concentration of sulfur to sulfate). %recovery of the matrix spike is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Titanium	0.26 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Zinc	49.1 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Sample Preparation	See Comment.	Liver was removed from whole fish with sample ID MDA-15-0004.

Sample Remarks:

	I verify that these data are correct.
Report ID: 440265	Supervisor: Freeshe Eherman
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 Date Printed: 10/19/2015
 Date Collected: 7/30/2015
 Top Folder Number: 10,19/2015

 Inspector Name:
 Inspector ID: 2

 Customer Contact:
 Sample ID: MDA-15-0004 SDG ID: 15-SDG-4441

 Project: / Survey:
 Other (PFMD-Assign Survey) SBWWR Fish Kill 2015-1

 Description: Brown trout, whole; SBWW River fish kill

 Quantity x Sample Size: 1

Page 1 of 1

Analysis Requested:

Analyte	Result	Result Comment
Aluminum	55.9 ppm	% recovery of 1 of 2 blank spike samples was above laboratory acceptance limits due to inadvertent cross-contamination.
Arsenic	< 0.2 ppm	
Barium	0.85 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Copper	< 0.6 ppm	
Iron	62.8 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Manganese	3.09 ppm	•
Sulfur	2310 ppm	Sulfate = 6650 ppm (determined by converting concentration of sulfur to sulfate). %recovery of the matrix spike is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Titanium	2.86 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Zinc	26.4 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Detailed description	See Comment.	Sample consists of three (3) brown trout. Standard lengths = 11 1/4", 12 1/4". 11 1/4"
Sample Preparation	See Comment.	Whole fish was dissected prior to analysis. Liver was removed and analyzed separately as sample MDA-15-0003.

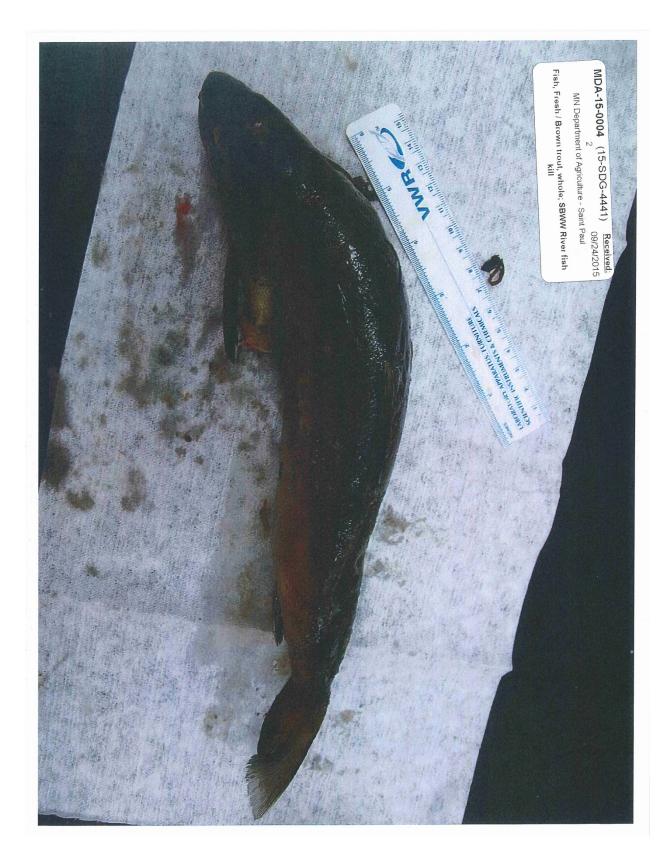
-

Sample Remarks:

For elemental analysis: % recovery of the laboratory control sample was below	laboratory acceptance limits due to loss of material during digestion.
5	
	I verify that these data are correct.
Report ID: 440266	Supervisor: Needer Chegman
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Date Printed:	Date Collected:	Top Folder Nu	mber:
10/19/2015	9/22/2015		
Inspector Nam	e:	Inspector ID:	
			3
Customer Con	tact:	Sample ID:	MDA-15-0005
		SDG ID:	15-SDG-4441
Project: / Surve	ey:	L	
Other (PFMD	-Assign Survey)		
SBWWR Fish	n Kill 2015-1		
Description: Brown trout, liv	er; SBWW River fi	sh kill	
Quantity x Sam	ple Size:		

Page 1 of 1

#### Analysis Requested:

Analyte	Result	Result Comment
Aluminum	3.15 ppm	% recovery of 1 of 2 blank spike samples was above laboratory acceptance limits due to inadvertent cross-contamination.
Arsenic	< 0.2 ppm	
Barium	< 0.2 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Copper	136 ppm	
Iron	143 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Manganese	< 0.7 ppm	
Sulfur	2455 ppm	Sulfate = 7060 ppm (determined by converting concentration of sulfur to sulfate). %recovery of the matrix spike is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Titanium	< 0.2 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Zinc	27.9 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Sample Preparation	See Comment.	Liver was removed from whole fish with sample ID MDA-15-0006.

Sample Remarks:

			I verify that these data are correct.	
	Report ID: 440267	Supervisor:	Rede Shesman	
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Date Printed: 10/19/2015	Date Collected: 9/22/2015	Top Folder Nu	mber:	
Inspector Nam	e:	Inspector ID:		
		-	4	
Customer Con	tact:	Sample ID:	MDA-15-0006	
		SDG ID:	15-SDG-4441	
Project: / Survey:				
Other (PFMD-Assign Survey)				
SBWWR Fish Kill 2015-1				
Description: Brown trout, whole; SBWW River fish kill				
Quantity x San	ple Size:	· · · · · · · · · · · · · · · · · · ·		

Page 1 of 1

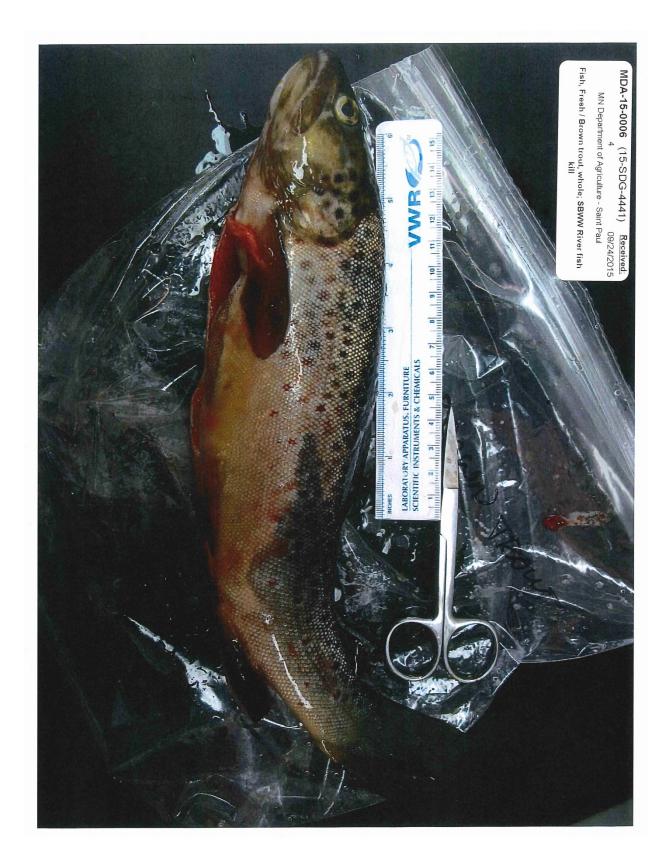
#### Analysis Requested:

Analyte	Result	Result Comment
Aluminum	4.70 ppm	% recovery of 1 of 2 blank spike samples was above laboratory acceptance limits due to inadvertent cross-contamination.
Arsenic	< 0.2 ppm	
Barium	0.41 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Copper	< 0.6 ppm	
Iron	15.6 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level
Manganese	1.08 ppm	
Sulfur	2390 ppm	Sulfate = 6880 ppm (determined by converting concentration of sulfur to sulfate). %recovery of the matrix spike is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Titanium	0.29 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Zinc	33.0 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Detailed description	See Comment.	Sample consists of two (2) brown trout. Standard lengths: 8 1/4", 10 3/4".
Sample Preparation	See Comment.	Whole fish was dissected prior to analysis. Liver was removed and analyzed separately as sample MDA-15-0005.

#### Sample Remarks:

	I verify that these data are correct.	
Report ID: 440268	Supervisor: Rentu Elugeneur	
	Supervisor: Offender Chegemen	
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MN Department of Agriculture 625 Robert Street North Saint Paul MN 55155

Date Printed: Date Collected:		Top Folder Nu	mber:
10/19/2015	9/22/2015		
Inspector Nam	e:	Inspector ID:	
			5
Customer Contact:		Sample ID:	MDA-15-0007
		SDG ID:	15-SDG-4441
Project: / Survey:			
Other (PFMD	-Assign Survey)		
SBWWR Fish Kill 2015-1			
Description: White sucker, liver; SBWW River fish kill			
· · · · · · · · · · · · · · · · · · ·			
Quantity x Sam 1	ple Size:		

Page 1 of 1

#### Analysis Requested:

Analyte	Result	Result Comment
Aluminum	1.35 ppm	% recovery of 1 of 2 blank spike samples was above laboratory acceptance limits due to inadvertent cross-contamination.
Arsenic	< 0.2 ppm	
Barium	< 0.2 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Copper	1.18 ppm	
Iron	199 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Manganese	< 0.7 ppm	
Sulfur	1960 ppm	Sulfate = 5640 ppm (determined by converting concentration of sulfur to sulfate). %recovery of the matrix spike is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Titanium	< 0.2 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Zinc	13.3 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Sample Preparation	See Comment.	Liver was removed from whole fish with sample ID MDA-15-0008.

Sample Remarks:

	I verify that these data are correct.	
Report ID: 440269	Supervisor: Trache Elusneur	
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### **Residue Final Report**

Collected From:

MN Department of Agriculture 625 Robert Street North Saint Paul MN 55155

ate Collected: 9/22/2015	Top Folder Nu	mber:	
	Inspector ID:		
		6	
Customer Contact:		MDA-15-0008	
	SDG ID:	15-SDG-4441	
:	L		
ssign Survey)			
<ill 2015-1<="" td=""><td></td><td></td></ill>			
Description: White sucker, whole; SBWW River fish kill			
	9/22/2015 ct: : :ssign Survey) Kill 2015-1	9/22/2015 Inspector ID: Sample ID: SDG ID: : : : : : : : : : : : : :	

Page 1 of 1

Analysis Requested:

Analyte	Result	Result Comment
Aluminum	36.2 ppm	% recovery of 1 of 2 blank spike samples was above laboratory acceptance limits due to inadvertent cross-contamination.
Arsenic	< 0.2 ppm	
Barium	2.09 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Copper	< 0.6 ppm	
Iron	45.1 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Manganese	8.35 ppm	
Sulfur	1950 ppm	Sulfate = 5605 ppm (determined by converting concentration of sulfur to sulfate). %recovery of the matrix spike is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Titanium	1.78 ppm	% recovery for laboratory control sample not determined because the material's certificate of analysis does not list a value for this element.
Zinc	14.0 ppm	% recovery of 1 of 2 matrix spikes is unusable since the analyte concentration in the sample is disproportionate to the spike level.
Detailed description	See Comment.	Sample consists of four (4) white suckers. Standard lengths: 8 3/4", 8", 9", 11 $1/2^{\prime\prime}$
Sample Preparation	See Comment.	Whole fish was dissected prior to analysis. Liver was removed and analyzed separately as sample MDA-15-0007.

Sample Remarks:

	I verify that these data are correct.	
Report ID: 440270		
	Supervisor: Theeder Shermen	
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SOUTH BRANCH OF THE WHITEWATER RIVER UNIFIED FISH KILL RESPONSE: APPENDIX E





# 13. <u>REFERENCES</u>

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