FINAL REPORT

Lake Glenn Shoals/Hillsboro Old Lake Atrazine Total Maximum Daily Load (TMDL)

IEPA/BOW/13-002

August 2014

Hillsboro Old Lake (IEPA 2007)

Illinois EPA High Priority TMDL Watershed

Public Water Supply Designated Use Impairment

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 29 2014

REPLY TO THE ATTENTION OF:
WW-16J

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Surface Water Section
BUREAU OF WATER

Marcia Willhite, Chief
Bureau of Water
Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, Illinois 62794-9276

Dear Ms. Willhite:

The U.S. Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) for Spring Lake and Lake Glenn Shoals, including supporting documentation and follow up information. The lakes are located in southern and western Illinois. The two atrazine TMDLs submitted by the Illinois Environmental Protection Agency address the impaired designated Public and Food Processing Water Supply Use in the two lakes.

These TMDLs meet the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, EPA hereby approves Illinois's two TMDLs for atrazine in Spring Lake and Lake Glenn Shoals. The statutory and regulatory requirements, and EPA' s review of Illinois's compliance with each requirement, are described in the enclosed decision document.

We wish to acknowledge Illinois's effort in submitting these TMDLs and look forward to future TMDL submissions by the State of Illinois. If you have any questions, please contact Mr. Peter Swenson, Chief of the Watersheds and Wetlands Branch at 312-886-0236.

Sincerely,

Tinka G. Hyde
Director, Water Division

Enclosure

cc: Abel Haile, IEPA
Jennifer Clarke, IEPA

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EXECUTIVE SUMMARY

Section 303(d) of the 1972 Clean Water Act requires States to define impaired waters and identify them on a list, which is referred to as the 303(d) list. The Illinois Environmental Protection Agency's (IEPA) 303(d) list is available on the web at: http://www.epa.state.il.us/water/tmdl/303d-list.html. Section 303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to develop Total Maximum Daily Loads (TMDLs) for water bodies that are not meeting designated uses under technology-based controls. The TMDL process establishes the allowable loading of pollutants or other quantifiable parameters for a water body based on the relationship between pollution sources and instream conditions. This allowable loading represents the maximum quantity of the pollutant that the waterbody can receive without exceeding water quality standards. The TMDL also takes into account a margin of safety, which reflects scientific uncertainty, as well as the effects of seasonal variation.

Lake Glenn Shoals and Old Lake Hillsboro are listed on the Draft 2014 Illinois Integrated Water Quality Report Section 303(d) List of Impaired Waters as water bodies that are not meeting their public water supply designated uses. As such, these lakes have been targeted as high priority waters for TMDL development. This document presents the TMDLs designed to allow these two lakes to fully support their designated uses. The report covers each step of the TMDL process and is organized as follows:

- Problem Identification
- Required TMDL Elements
- Watershed Characterization
- Description of Applicable Standards and Numeric Targets
- TMDL Development
- Public Participation and Involvement
- Adaptive Implementation Process

1 PROBLEM IDENTIFICATION

Both Glenn Shoals Lake and Old Hillsboro Lake are impaired for public water supply use due to atrazine.

Lake Glenn Shoals	
Waterbody Segment	ROL
Size (Acres)	1,350
Listed For	**Atrazine**
Use Support	Public water supply- not supporting
Old Hillsboro Lake	
Waterbody Segment	ROT
Size (Acres)	108.7
Listed For	**Atrazine**
Use Support	Public water supply- not supporting

2 REQUIRED TMDL ELEMENTS

USEPA guidance for TMDL development requires TMDLs to contain specific components. Each of those components is summarized here, by waterbody.

Lake Glenn Shoals

1. **Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking:** Lake Glenn Shoals is located in the Hydrologic Unit Code (HUC) 0714020302 drainage area. The pollutant of concern addressed in this TMDL is atrazine. The source is application to row crop agriculture.
2. **Description of Applicable Water Quality Standards and Numeric Water Quality Target:** The water quality maximum contaminant level (MCL) for atrazine is 0.003 mg/L. For this TMDL, the numeric water quality target was set at the MCL for atrazine of 0.003 mg/l.
3. **Loading Capacity – Linking Water Quality and Pollutant Sources:** Load calculations determined that the maximum atrazine load that will maintain compliance with the atrazine standard is 88 lbs/day. This allowable load corresponds to an approximately 50% reduction from existing loads.
4. **Load Allocations (LA):** The load allocation given to non-point source loads from watershed sources is 88 lbs/day.
5. **Wasteload Allocations (WLA):** No point sources of atrazine exist in the Glenn Shoals watershed, and the wasteload allocation for this TMDL is zero.
6. **Margin of Safety:** The TMDL contains an implicit margin of safety.
7. **Seasonal Variation:** The critical period takes place in spring and early summer when runoff is greatest. The TMDL takes this into account.
8. **Reasonable Assurances:** In terms of reasonable assurances for point sources, Illinois EPA has the NPDES permitting program for wastewater discharge from water plants, stormwater permitting and CAFO permitting. There are no point sources of atrazine in the watershed.

   In terms of reasonable assurances for nonpoint sources, Illinois EPA is committed to:
   - Convene local experts familiar with nonpoint sources of pollution in the watershed
   - Ensure that they define priority sources and identify restoration alternatives
   - Develop a voluntary implementation plan that includes accountability.

Local agencies and institutions with an interest in watershed management will be important for successful implementation of this TMDL.

9. **Monitoring Plan to Track TMDL Effectiveness:** The implementation plan includes a monitoring plan to track effectiveness.
10. **Public Participation:** A public meetings will be conducted in Hillsboro, Illinois.
11. **Transmittal Letter:** A transmittal letter will be prepared and accompanied the TMDL submitted to US EPA Region V.

Old Lake Hillsboro

1. **Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking:** Old Lake Hillsboro is located in HUC 0714020302 drainage area. The pollutant of concern addressed in this TMDL is atrazine. The source of atrazine is application to row crop agriculture.
2. **Description of Applicable Water Quality Standards and Numeric Water Quality Target:** The water quality maximum contaminant level (MCL) for atrazine is of 0.003 mg/L.
3. **Loading Capacity – Linking Water Quality and Pollutant Sources:** Load calculations were not developed. It was determined that the water used by the water supply was from Lake Glenn Shoals.

3 TOTAL MAXIMUM DAILY LOAD (TMDL) OVERVIEW

A Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards. TMDLs are a requirement of Section 303(d) of the Clean Water Act (CWA). To meet this requirement, the Illinois Environmental Protection Agency (Illinois EPA) must identify water bodies not meeting water quality standards and then establish TMDLs for restoration of water quality. Illinois EPA lists water bodies not meeting water quality standards every two years. This list is called the 303(d) list and water bodies on the list are then targeted for TMDL development.

In general, a TMDL is a quantitative assessment of water quality problems, contributing sources, and pollution reductions needed to attain water quality standards. The TMDL specifies the amount of pollution or other stressor that needs to be reduced to meet water quality standards, allocates pollution control or management responsibilities among sources in a watershed, and provides a scientific and policy basis for taking actions needed to restore a water body.

Water quality standards are laws or regulations that states authorize to enhance water quality and protect public health and welfare. Water quality standards provide the foundation for accomplishing two of the principal goals of the CWA. These goals are:

- Restore and maintain the chemical, physical, and biological integrity of the nation's waters
- Where attainable, to achieve water quality that promotes protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water

Water quality standards consist of three elements:

- The designated beneficial use or uses of a water body or segment of a water body
- The water quality criteria necessary to protect the use or uses of that particular water body
- An antidegradation policy

Examples of designated uses are recreation and protection of aquatic life. Water quality criteria describe the quality of water that will support a designated use. Water quality criteria can be expressed as numeric limits or as a narrative statement. Antidegradation policies are adopted so that water quality improvements are conserved, maintained, and protected.

3.1 TMDL Goals and Objectives for Lake Glenn Shoals and Old Hillsboro Lake Watershed

The Illinois EPA has a three-stage approach to TMDL development. The stages are:

- Stage 1 – Watershed Characterization, Data Analysis, Methodology Selection
- Stage 2 – Data Collection (optional)
- Stage 3 – TMDL Analysis, TMDL Scenarios, Implementation Plan

The impaired water bodies in the watershed are Lake Glenn Shoals (ROL) and Old Hillsboro Lake (ROT) (see Figure 1). Table 1 lists the water body ID, water body size, and potential causes of impairment for the water body in the Integrated Report (IEPA 2014).

Lake Glenn Shoals (ROL), Old Lake Hillsboro (ROT)

Table 1. Lake Impairment Information

Water Body ID	Water Body Name	Size	Causes of Impairment with Numeric Water Quality Standards/ MCL	Causes of Impairment with Assessment Guidelines
ROL	Lake Glenn Shoals	1350 acres	Atrazine^, Manganese, Phosphorus (Total)*	Aquatic Algae*, Mercury, Total Suspended Solids (TSS)*
ROT	Hillsboro Old Lake	109 acres	Atrazine^, Manganese*, Phosphorus (Total)*	Aquatic Algae*, Aquatic Plants, Total Suspended Solids (TSS)*

*TMDLs are approved for these parameters
^Atrazine was inadvertently left out from the 2012 IR, but has been added to the Draft 2014 IR

A previous TMDL included aquatic algae, total phosphorus and total suspended solids for Glenn Shoals Lake. Hillsboro Old Lake had TMDLs for aquatic algae, manganese, total phosphorus and total suspended solids. All parameter were approved in September of 2005. The final TMDL for the Glenn Shoals/ Old Hillsboro Lakes Watershed is available at http://www.epa.state.il.us/water/tmdl/report-status.html#gle. Information from the approved TMDL was used for this TMDL. This current TMDL report will focus on atrazine only. Atrazine was mistakenly not listed in the 2012 Integrated Report as a potential cause of impairment, but has since been added. The Draft 2014 Integrated Report includes these impairments for both lakes based on new available data.

The data for the assessment of public water supply designated use was from the public water supply intake. Illinois EPA recognizes both water bodies as being sources of water for the water plant. At the public meeting, IEPA was informed by the City of Hillsboro that water has not been used from the Hillsboro Old Lake for about 10-12 years. The TMDL allocations and reduction will apply towards Lake Glenn Shoals as it is the source of water for the water supply plant.

The TMDL for the segments listed above will specify the following elements:

- Loading Capacity (LC) or the maximum amount of pollutant loading a water body can receive without violating water quality standards
- Waste Load Allocation (WLA) or the portion of the TMDL allocated to existing or future point sources
- Load Allocation (LA) or the portion of the TMDL allocated to existing or future nonpoint sources and natural background
- Margin of Safety (MOS) or an accounting of uncertainty about the relationship between pollutant loads and receiving water quality

These elements are combined into the following equation:

$$\mathbf{TMDL = LC = \Sigma WLA + \Sigma LA + MOS}$$

The TMDL developed must also take into account the seasonal variability of pollutant loads so that water quality standards are met during all seasons of the year. An allowance for increased atrazine loading (reserve capacity) was not included in this TMDL. Lake Glenn Shoals and Old Hillsboro Lake are drinking water sources and atrazine is a chemical of concern; therefore, it is unlikely that capacity changes in the lakes would result in an increased assimilative capacity of the lake. Reasonable assurance that the TMDL will be achieved is described in the implementation plan. The implementation plan for the watershed describes how water quality standards will be attained. This implementation plan includes recommendations for implementing best management practices (BMPs) and cost estimates.

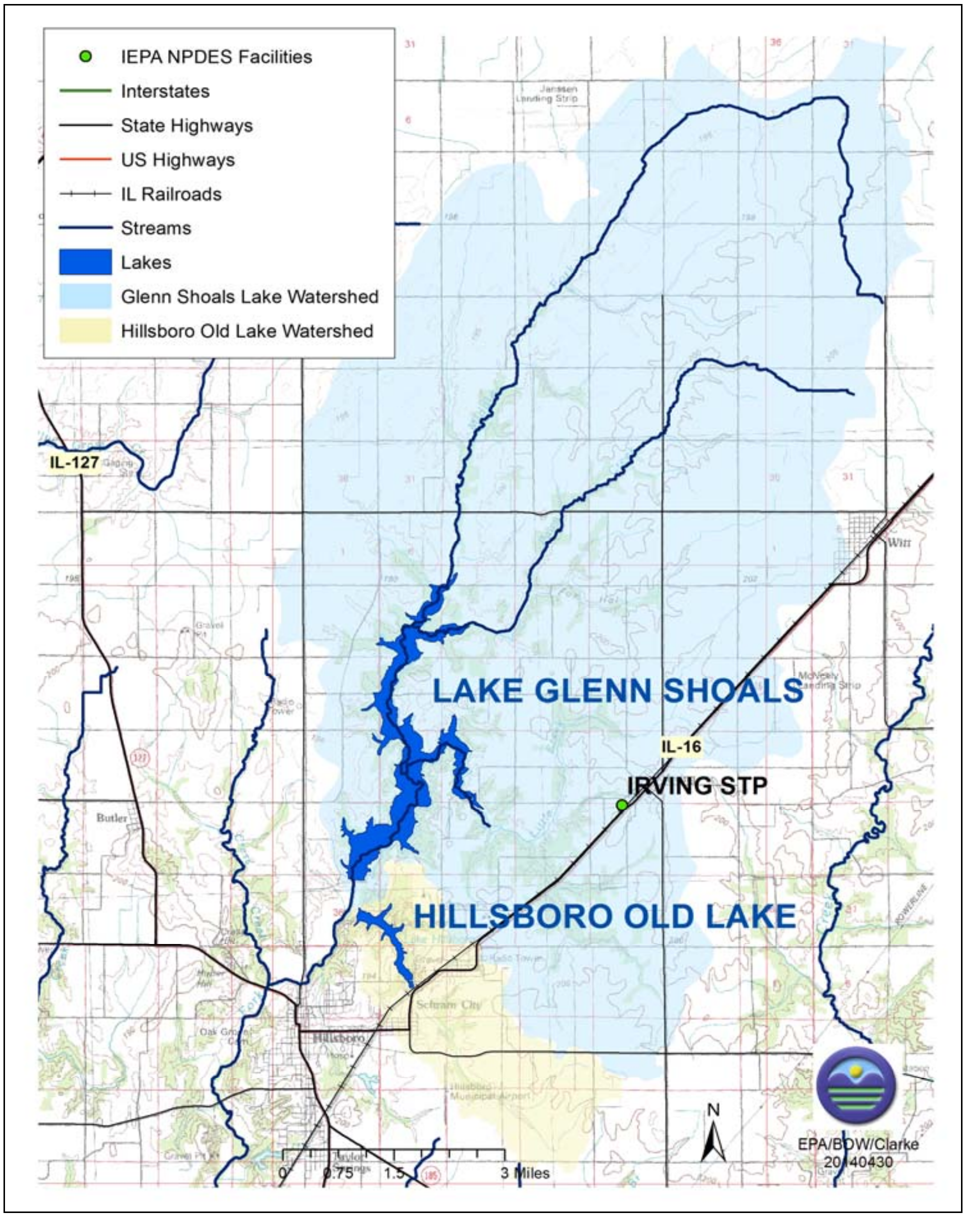


Figure 1. Base Map of Lake Glenn Shoals and Old Lake Hillsboro Old Watersheds

4 WATERSHED CHARACTERIZATION

The Glenn Shoals/Hillsboro watershed is located in Central Illinois, approximately 40 miles south of Springfield and 60 miles northeast of St. Louis. Lake Glenn Shoals is a 1,350-acre impoundment constructed in the 1970s for flood control, water supply, and recreational uses. It has an average depth of 10 feet, and nearly 27 miles of shoreline (City of Hillsboro, 2004). The lake storage capacity is 10,800 acre-feet. Lake Hillsboro, often referred to as the "Old Lake," was created in 1918 (City of Hillsboro, 2004) and served as the primary water supply for the area until construction of Lake Glenn Shoals. Currently, both lakes can be used as water supply for the City of Hillsboro and several neighboring communities. Lake Glenn Shoals is the primary water supply with Lake Hillsboro a emergency back-up supply. Lake Hillsboro has a surface area of approximately 110 acres. The combined drainage area for the two lakes covers 53,039 acres (83 square miles), primarily in Montgomery County. The lake storage capacity is 1,152 acre-feet. A very small portion of the watershed lies in Christian County.

The watershed map (Figure 1) shows the waterways, impaired waterbodies, roads, and other key features. The map also shows the location of a point source discharge that has a permit to discharge under the National Permit Discharge Elimination System (NPDES). The City of Irving is the sole NPDES discharge in the watershed.

4.1 Land Cover and Use

The predominant land use in the watershed is agriculture. According to the USDA 2011 NASS Cropland Data Layer (http://www.nass.usda.gov/research/Cropland/metadata/metadata_il11.htm), approximately 79% of the Glenn shoals watershed is cropland and 37% of crops are corn. According to the Illinois Transect Surveys (IDOA 2004, 2006, 2011 and 2013), Table 2 contains the corn tillage information for Montgomery County. Statistics are county-wide and are not available for the Glenn Shoals watershed.

Table 2. Corn Tillage Percentages for Montgomery County

Transect Survey	Conventional	Reduced	Mulch	No-till
2004	76	9	8	7
2006	67	23	5	6
2011	61	14	24	1
2013	80	6	11	2

4.2 Point Sources

Permitted facilities must provide Discharge Monitoring Reports (DMRs) to Illinois EPA as part of their NPDES permit compliance. DMRs contain effluent discharge sampling results that are then maintained in a database by the state. There is one point source located within the watershed. Figure 1 shows the permitted facility whose discharge potentially reaches impaired segments. Table 3 contains the NPDES information for Irving Sewage Treatment Plant. It is assumed that this facility does not use atrazine and is not a source. There is also one facility outside of the watershed that is relevant. Hillsboro Water Plant (ILG640236) is south of the watershed but uses water from Lake Glenn Shoals and Hillsboro Old Lake for the water supply facility. As mentioned previously, water is typically from Lake Glenn Shoals and Hillsboro Old Lake is used as a back-up in case of an emergency.

Table 3. Effluent Data from Point Sources Discharging to Lake Glenn Shoals/ Hillsboro Lakes Watershed

Facility Name Period of Record Permit Number	Receiving Water/ Downstream Impaired Waterbody	Constituent	Average Value	Average Atrazine Loading (lb/d)
Irving Sewage Treatment Plant ILG580198	Unnamed Tributary of Little Creek/ Lake Glenn Shoal	Average Daily Flow	.0093 mgd	NA

4.3 Nonpoint Sources

Atrazine is an herbicide that is widely used to kill weeds mostly on farms. It is used on crops such as sugarcane, corn, pineapples sorghum and macadamia nuts. Out of the 60-80 million pounds of atrazine used annually in the United States, 85% are used for corn fields (Sass and Colangelo 2006). It is a Restricted Use Pesticide (RUP) and can only be purchased or used by certified herbicide users. Atrazine is usually used in the spring and summer months (ATSDR 2003). Atrazine adsorbs into the leaves and roots when applied postemergent and stops photosynthesis. The corn plant can detoxify atrazine and are able to grow. The application of atrazine to crops as an herbicide accounts for almost all of the atrazine that enters the environment, but some may be released from manufacture, formulation, transport and disposal (ATSDR 2003). In most cases atrazine will be broken down in the soil over one growing season but if carried by runoff into waterways, the breakdown is slowed. The more moisture in soil, the longer it takes to degrade. The approximate half-life in aerobic soil is 146 days but in water the half-life is 742 days. Atrazine weakly adsorbs to soil particles. Refer to section 7.1 for pollutant sources and linkages.

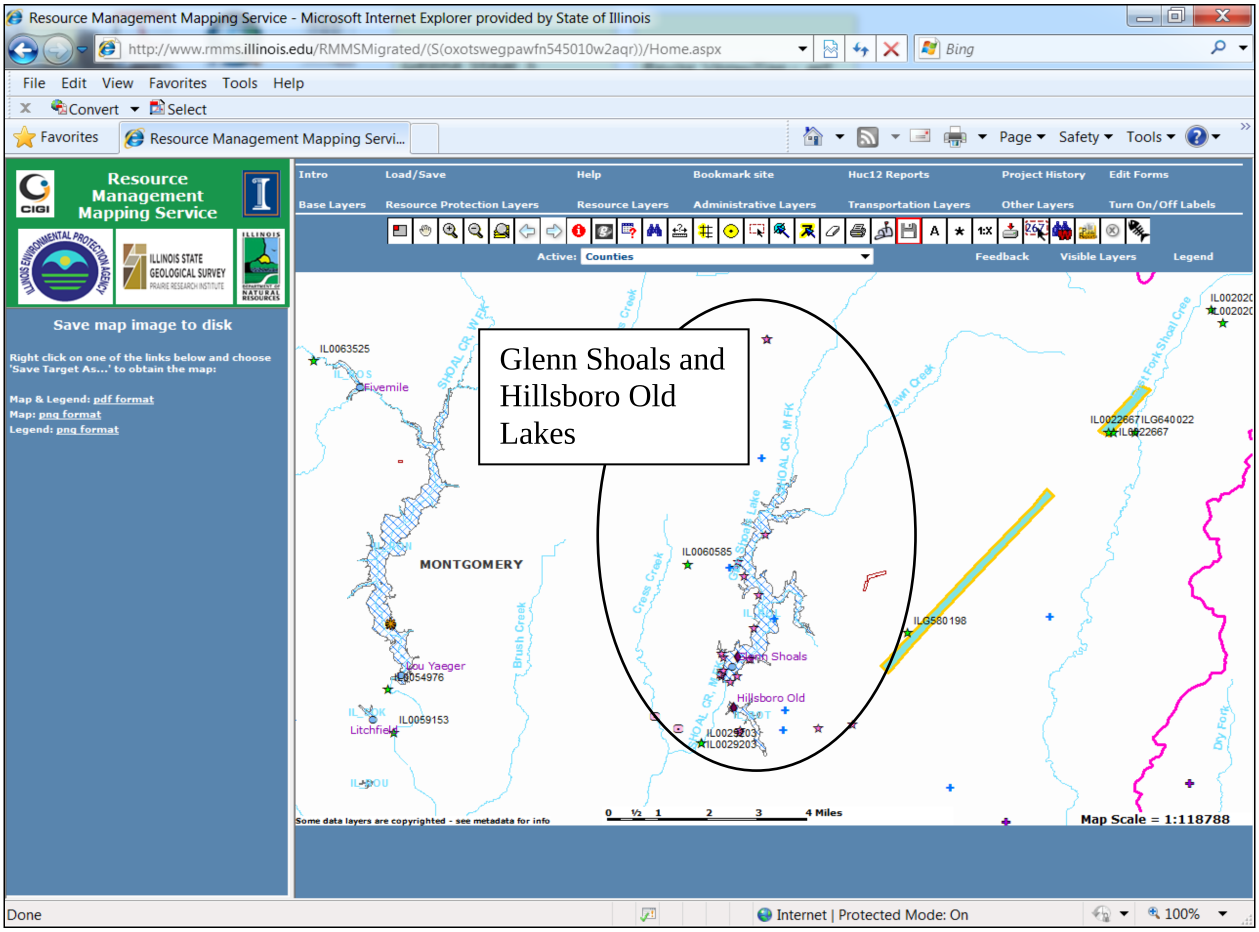
4.4 Watershed Projects

Previous planning and implementation efforts have been conducted within Lake Glenn Shoals and Old Hillsboro Lake watershed. From the IEPA Resource Management Mapping Service (RMMS) website (refer to Figure 2), projects in the watershed are listed in Table 4 (http://www.rmms.illinois.edu/RMMSMigrated/(S(1vaiw33f0g5fqe45hrsyxuqd))/Home.aspx). The City of Hillsboro and the Montgomery County SWCD have done numerous projects throughout the watershed including over 3600 feet in shoreline stabilization. In 2006, through the Illinois Clean Lakes Program (ICLP), the City of Hillsboro developed a Clean Lake Feasibility Study for Glenn Shoals Lake-http://www.epa.state.il.us/water/tmdl/implementation/glenn-shoals/glenn-shoals-phase1-study.pdf. In 2008, the City of Hillsboro developed a Clean Lake Feasibility Study for Hillsboro Old Lake- http://www.epa.state.il.us/water/tmdl/implementation/glenn-shoals/hillsboro-old-lake-phase1-study.pdf.

Table 4. Planning and Implementation Projects in Glenn Shoals and Old Hillsboro Watersheds

Program	Project Name	Description	Recipient/Grantee	Year	Receiving Water
NCED Conservation Easements	Farm Service Agency Interest of IL	Private easement- 25 acres	US Fish and Wildlife Service	N/A	Glenn Shoal Lake watershed
IDA Well Decommissioning	Well decommissioning	One well decommissioned	Montgomery County SWCD	2011	Middle Fork Shoal Creek
IDA Well Decommissioning	Well decommissioning	One well decommissioned	Montgomery County SWCD	2009	Glenn Shoals Lake
IDA Well Decommissioning	Well decommissioning	Two wells decommissioned	Montgomery County SWCD	2008	Glenn Shoals Lake
IEPA NPS (319)	Priority Lake & Watershed Implementation	Streambank and shoreline protection/1000 feet of shoreline stabilization	Illinois EPA	2007	Glenn Shoals Lake- unknown locations
IEPA Lakes	Monitoring	Monitoring (Diagnostic/ Feasibility Study)	City of Hillsboro	2006	Glenn Shoals Lake
IEPA NPS (319)	Nutrient Management Plan Implementation- Phase 2	Grassed waterway on 0.4 acre and a water and sediment control basin	IDOA	2006	Middle Fork Shoal Creek
IEPA NPS (319)	Hillsboro Lake Stormwater Wetland No. 1	Stormwater wetland (earthen berm and catch basin) and grade stabilization structures (3 rock checks)	City of Hillsboro	2005	Glenn Shoal Lake watershed
IEPA NPS (319)	Glenn Shoals Restoration	Streambank and shoreline protection/ rip rap on 3605 feet (15 project areas around lake)	Montgomery County SWCD	1999	Glenn Shoals Lake
IEPA NPS (319)	Glenn Shoals Restoration	Streambank and shoreline protection/ rip rap on ? Feet	Montgomery County SWCD	1999	Glenn Shoals Lake
IDA Well Decommissioning	Well decommissioning	Two wells decommissioned	Montgomery County SWCD	2010	Hillsboro Old Lake watershed
IEPA Lakes	Monitoring	Monitoring (Diagnostic/ Feasibility Study)	City of Hillsboro	2008	Hillsboro Old Lake
IEPA NPS (319)	Hillsboro Lake Stormwater Wetland No. 1	Grade stabilization structures (4 rock checks) and a sediment basin (dry bottom)	City of Hillsboro	2005	Hillsboro Old Lake watershed

Figure 2. RMMS Website Displaying Planning and Implementation Projects



5 DESCRIPTION OF APPLICABLE STANDARDS AND NUMERIC TARGETS

A water quality standard includes the designated uses of the waterbody, water quality criteria to protect designated uses, and an antidegradation policy to maintain and protect existing uses and high quality waters. This section discusses the applicable designated uses, use support, and criteria for Lake Glenn Shoals and Old Lake Hillsboro.

5.1 Designated Uses and Use Support

The waters of Illinois are classified by designated uses, which include: General Use, Public and Food Processing Water Supplies, Lake Michigan, and Secondary Contact and Indigenous Aquatic Life Use. The designated use applicable to Lake Glenn Shoals and Hillsboro Old Lake is the Public and Food Processing Water Supplies Use.

The Public and Food Processing Water Supplies Use is defined by IPCB as standards that "are cumulative with the general use standards of Subpart B and must be met in all waters designated in Part 303 at any point at which water is withdrawn for treatment and distribution as a potable supply or for food processing."

Attainment of public and food processing water supply use is assessed only in waters in which the use is currently occurring, as evidenced by the presence of an active public-water-supply intake. The assessment of public and food processing water supply use is based on conditions in both untreated and treated water. By incorporating data through programs related to both the federal Clean Water Act and the federal Safe Drinking Water Act, Illinois EPA believes that these guidelines provide a comprehensive assessment of public and food processing water supply use.

Assessments of public and food processing water supply use recognize that characteristics and concentrations of substances in Illinois surface waters can vary and that a single assessment guideline may not protect sufficiently in all situations. Using multiple assessment guidelines helps improve the reliability of these assessments. When applying these assessment guidelines, Illinois EPA also considers the water-quality substance, the level of treatment available for that substance, and the monitoring frequency of that substance in the untreated water.

One of the assessment guidelines for untreated water relies on a frequency-of-exceedance threshold (10%) because this threshold represents the true risk of impairment better than does a single exceedance of a water quality criterion. Assessment guidelines also recognize situations in which water treatment that consists only of "*...coagulation, sedimentation, filtration, storage and chlorination, or other equivalent treatment processes*"(35 Ill. Adm. Code 302.303; hereafter called "conventional treatment") may be insufficient for reducing potentially harmful levels of some substances. To determine if a Maximum Contaminant Level (MCL) violation in treated water would likely occur if treatment additional to conventional treatment were not applied (see 35 Ill. Adm. Code 302.305), the concentration of the potentially harmful substance in untreated water is examined and compared to the MCL threshold concentration. If the concentration in untreated water exceeds an MCL-related threshold concentration, then an MCL violation could reasonably be expected in the absence of additional treatment.

Compliance with an MCL for treated water is based on a running 4-quarter (i.e., annual) average, calculated quarterly, of samples collected at least once per quarter (Jan.-Mar., Apr.-Jun., Jul.-Sep., and Oct.-Dec.). However, for some untreated-water intake locations sampling occurs less frequently than once per quarter; therefore, statistics comparable to quarterly averages or running 4-quarter averages cannot be determined for untreated water. Rather, for substances not known to vary regularly in concentration in Illinois surface waters (untreated) throughout the year, a simple arithmetic average concentration of all available results is used to compare to the MCL threshold. For substances known to vary regularly in concentration in surface waters during a typical year (e.g., atrazine), average concentrations within the relevant sub-annual (e.g., quarterly) periods are used. Refer to Table 5 for assessment information.

Table 5. Guidelines for Assessing Public Water Supply in Waters of the State (IEPA 2012)

Degree of Use Support	Guidelines
Fully Supporting (Good)	For each substance in untreated water (1), for the most-recent three years of readily available data or equivalent dataset, a) ≤ 10% of observations exceed an applicable Public and Food Processing Water Supply Standard (2); and b) for which the concentration is not readily reducible by conventional treatment, i) no observation exceeds by at least fourfold the treated-water Maximum Contaminant Level threshold concentration(3) for that substance; and ii) no quarterly average concentration exceeds the treated-water Maximum Contaminant Level threshold concentration(3) for that substance; and iii) no running annual average concentration exceeds the treated-water Maximum Contaminant Level threshold concentration(4) for that substance. and (4), For each substance in treated water, no violation of an applicable Maximum Contaminant Level (3) occurs during the most recent three years of readily available data.
Not Supporting (Fair)	For any single substance in untreated water, (1) for the most-recent three years of readily available data or equivalent dataset, a) > 10% of observations exceed a Public and Food Processing Water Supply Standard (2); or b) for which the concentration is not readily reducible by conventional treatment, i) at least one observation exceeds by at least fourfold the treated-water Maximum Contaminant Level threshold concentration(3) for that substance; or ii) the quarterly average concentration exceeds the treated-water Maximum Contaminant Level threshold concentration(3) for that substance; or iii) the running annual average concentration exceeds the treated-water Maximum Contaminant Level threshold concentration(3) for that substance. or, For any single substance in treated water, at least one violation of an applicable Maximum Contaminant Level (3) occurs during the most recent three years of readily available data.
Not Supporting (Poor)	Closure to use as a drinking-water resource (cannot be treated to allow for use).

Table 6 present the MCL for the cause of impairment for Lake Glenn Shoals and Hillsboro Old Lake. EPA has set an enforceable regulation for atrazine at 0.003 mg/L or 3µg/L. MCLs are from 35 Ill. Adm. Code 611, Subpart F: MCLs and Maximum Residual Disinfectant Levels (MRDLs). The MCL is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology. If a facility exceeds the MCL, the facility must immediately investigate treatment options to reduce the level of the contaminant in the water supply. The MCLG or maximum contaminant level goal is the level of a contaminant in drinking water below which there is no known or expected risk to health.

Some people who drink water containing atrazine well in excess of the MCL for many years could experience problems with their cardiovascular system or reproductive difficulties. For more information see the EPA website at http://water.epa.gov/drink/contaminants/basicinformation/atrazine.cfm. One of the primary ways that atrazine can affect your health is by altering the way that the reproductive system works (ATSDR 2003). Data regarding the health effects of atrazine in humans are limited and the bulk of the available toxicity data is from oral exposure studies in animals (ATSDR 2003).

Table 6. MCL applicable for Lake Glenn Shoals and Hillsboro Old Lake Impairment

Parameter	Units	Public and Food Processing Water Supplies
Atrazine	µg/L	3 µg/L (Maximum Contaminant Level)

µg/L = micrograms per liter

5.2 Development of TMDL Targets

The TMDL target is a numeric endpoint specified to represent the level of acceptable water quality that is to be achieved by implementing the TMDL. Where possible, the water quality criterion for the pollutant of concern is used as the numeric endpoint.

For the Lake Glenn Shoals atrazine TMDL, the target is set at the MCL for atrazine of 3µg/L.

6 WATER QUALITY DATA

Data were collected and reviewed from many sources in order to further characterize the watershed. This information is presented and discussed in further detail in the remainder of this section. Atrazine data is contained in the following tables for Lake Glen Shoals and Hillsboro Old Lakes. This is raw waters samples taken from the lake and not finished water. Tables 7 and 8 contain water quality data monitored by IEPA Lake Monitoring Unit. Red indicates samples over 0.3 mg/L atrazine. Lake Hillsboro is not currently used as a water supply source, the data is included since it is an emergency back-up supply.

Table 7. Glenn Shoal Data (ug/L)

7/6/2000	Atrazine	1.8
4/18/2000	Atrazine	2.2
6/5/2000	Atrazine	2.3
8/23/2000	Atrazine	1.3
10/4/2000	Atrazine	0.82
5/9/2001	Atrazine	1.4
06/18/2001	Atrazine	4.2
07/20/2001	Atrazine	0.7
08/24/2001	Atrazine	2
10/17/2001	Atrazine	1.1
04/14/2003	Atrazine	0.33
04/14/2003	Atrazine	0.48
06/09/2003	Atrazine	3.6
06/09/2003	Atrazine	3.8
07/17/2003	Atrazine	1.3
07/17/2003	Atrazine	2
08/12/2003	Atrazine	1.3
08/12/2003	Atrazine	1.4
7/13/2006	Atrazine	0.41
4/26/2006	Atrazine	0.25
6/15/2006	Atrazine	3
8/22/2006	Atrazine	0.33
10/3/2006	Atrazine	0.27
5/6/2008	Atrazine	0.063
6/10/2008	Atrazine	4.1
7/1/2008	Atrazine	0.22
8/6/2008	Atrazine	0.75
10/6/2008	Atrazine	0.11
4/19/12	Atrazine	2.0
6/14/12	Atrazine	0.3
7/24/12	Atrazine	0.31
8/15/12	Atrazine	0.38
10/11/12	Atrazine	0.26

Table 8. Hillsboro Old Data (ug/L)

4/18/2000	Atrazine	3.7
7/5/2000	Atrazine	1.6
8/23/2000	Atrazine	1.4
10/4/2000	Atrazine	0.73
5/8/2001	Atrazine	0.3
6/22/2001	Atrazine	1.6
7/20/2001	Atrazine	1.5
8/16/2001	Atrazine	1.8
4/29/2004	Atrazine	ND
6/18/2004	Atrazine	1.3
7/16/2004	Atrazine	1.3
8/19/2004	Atrazine	1
10/21/2004	Atrazine	0.92
7/16/2004	Atrazine	ND
4/23/2007	Atrazine	0.11
6/15/2007	Atrazine	0.14
7/17/2007	Atrazine	0.33
8/15/2007	Atrazine	0.15
10/18/2007	Atrazine	0.11
4/19/12	Atrazine	5.2
6/14/12	Atrazine	0.62
7/24/12	Atrazine	0.66
8/15/12	Atrazine	0.81
10/18/12	Atrazine	0.43

Syngenta provided atrazine data from 2006- 2012 from the Hillsboro water plant. At the TMDL public meeting, the City explained that the Hillsboro Old Lake has not been used for about 10-12 years and is back-up for emergencies only. Since no water has been used from Hillsboro Old, we assume all raw and finished Syngenta water data are from the Glenn Shoals Lake. Data from 2009-2011 was used for the public water supply use assessment for the 2014 Draft IR. All Syngenta data is included in Attachment 1. Table 9 has water data with exceedences in either raw or finished. Values in red are over 3 ug/L. All data is included in the Appendix.

Table 9. Syngenta Hillsboro Water Plant Data (Glenn Shoals Lake Data)

Date	Raw	Finished
5/26/09	3.01	1.78
6/1/09	3.37	2.82
6/8/09	3.40	2.45
5/3/10	6.31	4.51
5/10/10	7.46	7.04
5/17/10	18.28	7.04
5/24/10	8.11	6.48
6/1/10	1.73	4.15
5/31/11	3.56	2.84
6/6/11	3.43	3.61
6/13/11	4.70	4.15
6/20/11	4.33	4.95

Illinois EPA assessment for public water supply use considers both the raw and finished water quality data for the last three years of data. No more than 10 percent of the raw water samples exceed the MCL or there can be no exceedences of the MCL for the quarterly average concentration. For Glenn Shoals lake assessment, the quarterly average raw water was 3.59 ug/L in 2010 (April-June) which exceeds the MCL of 3 ug/L. There was also an exceedance of 18.28 on 5/17/10 that exceeded the MCL fourfold.

7 TMDL DEVELOPMENT

This section presents the development of the total maximum daily load for Lake Glenn Shoals. It begins with a description of how the total loading capacity was calculated for the lake, and then describes how the loading capacity is allocated among point sources, non-point sources, and the margin of safety. A discussion of critical conditions and seasonality considerations is also provided.

7.1 Pollutant Sources and Linkages

Atrazine is a widely used product for selective control of broadleaf weeds in crops, specifically corn for this watershed. Atrazine is an inexpensive, effective herbicide for weeds and no alternative herbicide is as economical as atrazine. Transport mechanisms include controlling overland runoff, discharge from drainage tiles and atrazine contaminated dust that is delivered to the lake through wet and dry atmospheric deposition. No known point sources of atrazine occur within the watershed and point source discharges of atrazine are assumed not to occur. Cropland accounts for 79 percent in Lake Glenn Shoals watershed. Water from the lake is used by the water plant for human consumption. This water is impaired for public water supply use with atrazine as a cause.

7.2 TMDL Allocations

The loading capacity is defined as the maximum pollutant load that a waterbody can receive and still maintain compliance with water quality standards.

The TMDL for Lake Glenn Shoals address the following equation:

$$\textbf{TMDL} = \textbf{LC} = \Sigma\textbf{WLA} + \Sigma\textbf{LA} + \textbf{MOS}$$

where	LC	=	Maximum amount of pollutant loading a water body can receive without violating water quality standards
	WLA	=	The portion of the TMDL allocated to existing or future point sources
	LA	=	Portion of the TMDL allocated to existing or future nonpoint sources and natural background
	MOS	=	An accounting of uncertainty about the relationship between pollutant loads and receiving water quality

Each of these elements will be discussed in this section as well as consideration of seasonal variation in the TMDL calculation.

Loading Capacity

The loading capacity (LC) of the waterbody is the amount of atrazine that can be allowed in the lake and still meet the water quality standard of 0.003-mg/L atrazine. The storage capacity of Lake Glenn Shoal is 3,519 million gallons. Using conversion factors, the allowable atrazine loads that can be in the lake and still maintain water quality standards was determined to be 88 pounds at storage capacity water level for Glenn Shoals.

Glenn Shoals Lake-

Storage- 3519 MG * 0.003 mg/l atrazine * 2.2 lbs/mg * 3.785 l/gal = 88 lbs atrazine

Seasonal Variation and Critical Condition

A season is represented by changes in weather; for example, a season can be classified as warm or cold as well as wet or dry. Since the pollutant source can be expected to contribute loadings in different quantities during different time periods (e.g., various portions of the growing season resulting in different runoff characteristics), the loadings for these TMDLs will focus on the lake storage capacity. Atrazine runoff from upstream is expected in spring and early summer when flows are higher.. The spring and early summer are considered the critical condition and water quality data shows this is when exceedences have taken place.

Margin of Safety

A margin of safety (MOS) is required in a TMDL to account for uncertainty about the relationship between pollutant loads and attainment of water quality standards. The margin of safety (MOS) can be implicit (incorporated into the TMDL analysis through conservative assumptions) or explicit (expressed in the TMDL as a portion of the loadings).

The Illinois EPA public water supply assessment methodology guidelines takes into account the water-quality substance, the level of treatment provided for finished water (conventional treatment, per 35 Ill. Adm. Code 302.303) for that substance, and the monitoring frequency of that substance in the untreated water, and this approach provides a conservative assumption for the implicit margin of safety. To determine if a Maximum Contaminant Level (MCL) violation in treated water would likely occur if treatment additional to conventional treatment were not applied (see 35 Ill. Adm. Code 302.305), the concentration of the potentially harmful substance in untreated water is examined and compared to the MCL threshold concentration (IEPA 2014). With this conservative approach, lower levels of atrazine in raw water will reduce the cost of extra treatment in finished water.

The MOS for the Lake Glenn Shoals TMDL is implicit. The load calculation is based on exceedances during the months of June and July when exceedances were highest. This timeframe represents the critical condition when runoff and exceedances of atrazine are likely to occur. The source of atrazine, which is an herbicide applied onto agricultural land, is known with certainty. The implementation plan contains best management practices for source reductions.

Additional MOS is provided by how the TMDL is calculated. The loading capacity is calculated as the lake volume multiplied by the MCL of 0.003 mg/L which results in the daily load of atrazine. However, the public water supply assessment process uses a rolling annual average of quarterly samples for raw water (as does the EPA for finished water compliance). Use of an average will by definition have some values above the mean. By using the daily load calculation, the TMDL loading capacity is more protective.

Waste Load Allocation

There are no point sources within the watershed that discharge atrazine. Therefore, the waste load allocations (WLAs) were set to zero for the point source dischargers.

Load Allocation and TMDL Summary

Table 10 shows a summary of the TMDL for Lake Glenn Shoals. Load capacity was determined based on the average exceedences from the raw water samples from Table 9. The average based on the data from the last assessment of 2009-2011 was 6 ug/L or 0.006 mg/L atrazine. On average, a total reduction of 50 percent of atrazine loads to Lake Glenn Shoals would result in compliance with the water quality standard of 0.003 mg/L atrazine. The percent reduction would need to come from the nonpoint sources.

Table 10. TMDL Summary for Glenn Shoals Lake

Load Source	LC (lb/day)	WLA (lb/day)	LA (lb/day)	MOS (lb/day)	Current Load (lb/day)	Reduction Needed (lb/day)	Reduction Needed (percent)
Normal	88	0	88	Implicit	176	88	50

8 PUBLIC PARTICIPATION AND INVOLVEMENT

Public knowledge, acceptance, and follow through are necessary to implement a plan to meet recommended TMDLs. It is important to involve the public as early in the process as possible to achieve maximum cooperation and counter concerns as to the purpose of the process and the regulatory authority to implement any recommendations.

Illinois EPA held a public meeting to present the TMDL for Lake Glenn Shoals and Hillsboro Old Lake watershed at 6 p.m. on August 20, 2013 at the University of Illinois Extension Office (1 Industrial Park Drive, Hillsboro). Approximately 12 people attended the meeting and it was advertised in *The Journal –News* in Hillsboro.

9 IMPLEMENTATION PROCESS

Implementation actions, management measures, or best management practices (BMPs) in the watershed are used to control the generation or distribution of pollutants. BMPs are either structural, such as filter strips; or managerial, such as conservation tillage, public outreach and education. According to the TMDL summary in Table 10, there needs to be a 50 percent reduction for Lake Glenn Shoals. The remainder of this section will discuss implementation actions and management measures for atrazine sources in the watershed.

9.1 Nonpoint Sources of Atrazine

Atrazine is applied to agricultural land, specifically corn in this watershed. Surface runoff, tile drainage and atmospheric deposition deliver atrazine to the lake. BMPs evaluated that could be utilized to treat these nonpoint sources are careful pesticide application practices and controlling runoff. Fields closer to surface water can be targeted for BMPs. Another option is filtering water at the treatment plant.

Pesticide Application Practices

Delay herbicide application if heavy rain is forecast. Pesticides are most susceptible to runoff during the first several hours after application. Atrazine is highly soluble in water and applications should be delayed as long as the soils are saturated and more rain is predicted (Purdue 2004). Atrazine should not be applied within 50 feet of abandoned/current wells, drainage wells or sinkholes. This applies to drinking water wells, irrigation wells, livestock water wells, abandoned wells and agricultural drainage wells. Figure 3 displays the wells in the Lake Glenn Shoals watershed. Sinkholes refer to surface depressions that permit direct runoff of surface water into groundwater. Atrazine should not be applied within 66 feet of the points where field surface water runoff enters streams or rivers. This applies to both perennial and intermittent streams. The USGS topographic maps (http://topomaps.usgs.gov/) show perennial streams as solid blue lines and intermittent streams as dashed blue lines. You should not apply within 200 feet around a lake or reservoir. Filter strips are recommended around lakes. Atrazine should not be mixed or loaded within 50 feet of any waterbody. Atrazine cannot be applied within 66 feet of a tile inlet in terraced fields unless atrazine is incorporated and or greater than 30 percent residue is present. A 66 foot filter strip is recommended around the outlet.

For pre-emergent application in highly erodible soils, a maximum of 2 pounds per acre of atrazine can be sprayed on fields with 30 percent or more of plant residue or 1.6 pounds where there is less than 30 percent plant residue. For pre-emergent application on soils not highly erodible, a maximum of 2 pounds of atrazine can be used. For post-emergent application, if there was no pre-application, a maximum of 2 pounds can be used per acre. The total amount of atrazine applied to a field may not exceed 2.0 pounds of active ingredient in a single pre- or post-emerge application or 2.5 pounds (pre- and post-emergence combined) per acre per calendar year. Applying post emergent can reduce rates up to 75 percent (McKenna and Czapar 2009). Atrazine rates are reduced 30 to 75

percent if application is delayed until the weeds emerge because the herbicide can be placed directly on the weed foliage, which is preferable to relying on uptake from the soil (Purdue 2004). Because there is a narrower window of opportunity for application, fields with greatest runoff potential can be targeted for postemergence application. For more information on atrazine application information, refer to *Using Atrazine and Protecting Water Quality.*
(http://www.atrazine.com/Atrazine/images/using_atrazine_protecting_water.pdf).

The following information is taken from the label of the Syngenta herbicide AAtrex 4L in which atrazine is the active ingredient-
www.syngentacropprotection.com/pdf/labels/SCP497AL38TT1112.pdf

Environmental Hazards
Atrazine can travel (seep or leach) through soil and can enter ground water which may be used as drinking water. Atrazine has been found in ground water. Users are advised not to apply atrazine to sand and loamy sand soils where the water table (ground water) is close to the surface and where these soils are very permeable, i.e., well-drained. Your local agricultural agencies can provide further information on the type of soil in your area and the location of ground water.

This product must not be mixed/loaded, or used within 50 feet of all wells, including abandoned wells, drainage wells, and sink holes. Operations that involve mixing, loading, rinsing, or washing of this product into or from pesticide handling or application equipment or containers within 50 feet of any well are prohibited, unless conducted on an impervious pad constructed to withstand the weight of the heaviest load that may be positioned on or moved across the pad. Such a pad shall be designed and maintained to contain any product spills or equipment leaks, container or equipment rinse or wash water, and rain water that may fall on the pad. Surface water shall not be allowed to either flow over or from the pad, which means the pad must be self-contained. The pad shall be sloped to facilitate material removal. An unroofed pad shall be of sufficient capacity to contain at a minimum 110% of the capacity of the largest pesticide container or application equipment on the pad. A pad that is covered by a roof of sufficient size to completely exclude precipitation from contact with the pad shall have a minimum containment capacity of 100% of the capacity of the largest pesticide container or application equipment on the pad. Containment capacities as described above shall be maintained at all times. The above specified minimum containment capacities do not apply to vehicles when delivering pesticide shipments to the mixing/loading sites.

Additional State imposed requirements regarding well-head setbacks and operational area containment must be observed.

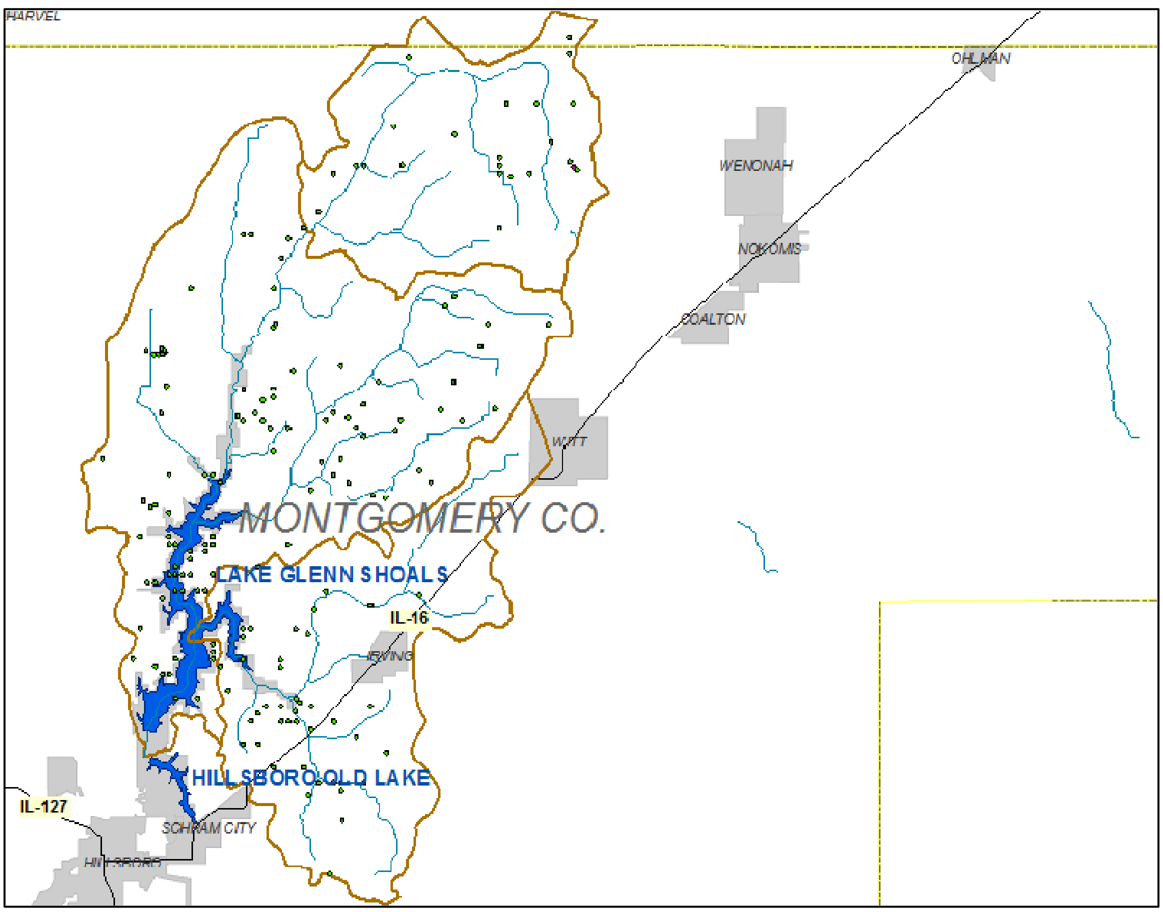
This product must not be mixed or loaded within 50 feet of intermittent streams and rivers, natural or impounded lakes and reservoirs. This product may not be applied aerially or by ground within 66 feet of the points where field surface water runoff enters perennial or intermittent streams and rivers or within 200 feet around natural or impounded lakes and reservoirs. If this product is applied to highly erodible land, the 66 foot buffer or setback from runoff entry points must be planted to crop, seeded with grass or other suitable crop.

Tile-Outletted Terraced Fields Containing Standpipes
One of the following restrictions must be used in applying atrazine to tile-terraced fields containing standpipes:

1. Do not apply this product within 66 feet of standpipes in tile-outletted terraced fields.
2. Apply this product to the entire tile-outletted terraced field and immediately incorporate it to a depth of 2-3 inches in the entire field.
3. Apply this product to the entire tile-outletted terraced field under a no-till practice only when a high crop residue management practice is practiced. High crop residue management is described as a crop management practice where little or no crop residue is removed from the field during and after crop harvest.

This pesticide is toxic to aquatic invertebrates. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor drift from treated areas. Runoff and drift from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment wash water.

Figure 3. Wells in the lake Glenn Watershed



Controlling Runoff

Leaving crop residue on the fields and No-till agriculture can reduce pesticide runoff over conventional tillage. The residue slows the movement of water across the field and can increase infiltration. According to county wide statistics, almost half of the corn crops are farmed conventionally. Conversion from conventional to no- till should result in a reduction in phosphorus for the watershed. So this practice could not only reduce phosphorus and total suspended solids, but atrazine also. Other practices to control runoff are terraces, contour farming and grade stabilization. Also allowing soils to dry before tilling or other operations can help reduce compaction and allow better infiltration.

Conservation practices such as buffers and riparian corridors can be used to control runoff (refer to figures 6 and 7). The ground has the filtering capacity to drain water and absorb atrazine. Buffers implemented along stream segments and around waterbodies slow and filter nutrients, pesticides and sediment out of runoff. Greater biological activity in a soil improves its ability to effectively deal with pesticides and pollutants, and that is more prevalent in a soil rich in plant roots and organisms (Grismer 2006). A recent study in Iowa indicated a 28 to 35 percent removal for the pesticide atrazine for a 15-foot long filter, compared to a 51 to 60 percent removal for a 30-foot filter (Leed et all 1994).

Riparian buffers, including both the stream channel and adjacent land areas, are important components of watershed ecology. Preserving natural vegetation along stream corridors and around waterbodies can effectively reduce water quality degradation associated with development. The root structure of the vegetation in a buffer enhances infiltration of runoff and subsequent trapping of nonpoint source pollutants. However, the buffers are only effective in this manner when the runoff enters the buffer as a slow moving, shallow "sheet;" concentrated flow in a ditch or gully will quickly pass through the buffer offering minimal opportunity for retention and uptake of pollutants.

Table 11. Filter Strip Flow Lengths Based on Land Slope

Percent Slope	**0.5%**	**1.0%**	**2.0%**	**3.0%**	**4.0%**	**5.0% or greater**
Minimum (feet)	36	54	72	90	108	117
Maximum (feet)	72	108	144	180	216	234

Table 11 above outlines the guidance for filter strip flow length by slope (NRCS 1999). There are areas within the watershed that could be converted to buffer strips. Landowners and property managers should evaluate the land near tributaries and surrounding the lakes and consider installation of filter strips according to the NRCS guidance. Programs available to fund the construction of these filter strips are discussed in Section 9.2. According to the atrazine label, atrazine should not be applied within 66 feet of where field surface water runoff enters streams or rivers or within 50 feet of a waterbody. Using GIS, a buffer can be geoprocessed around the stream shapefile. Figure 4 is an example of using the buffer tool to put a 66 foot buffer around the NHD streams. This buffer area could be used as a filter strip or riparian corridor. Figure 5 is a larger area of the Lake Glenn Shoals watershed with the filter strips shapefile.

Figure 4. Buffer Strip Area Drawn Around NHD Stream Coverage Using ArcGIS Geoprocessing Tool

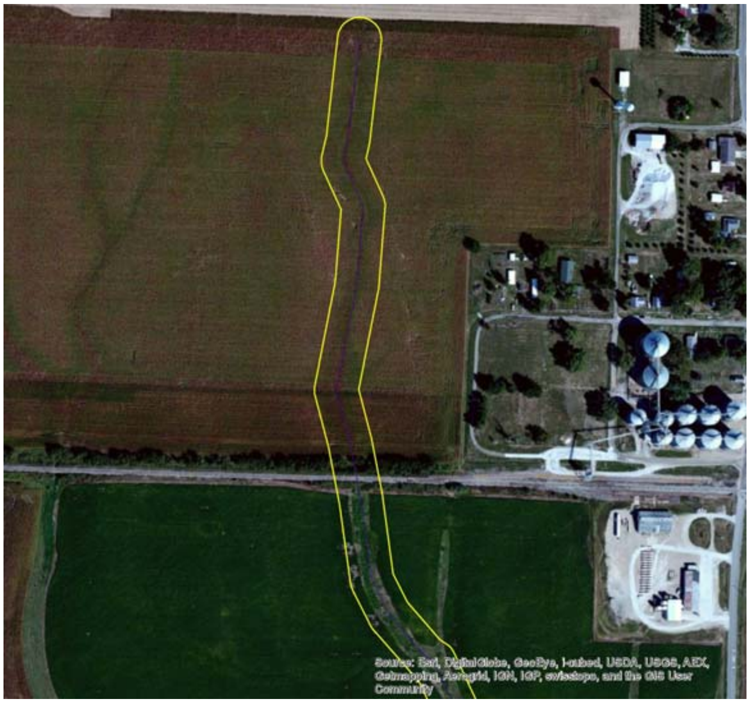
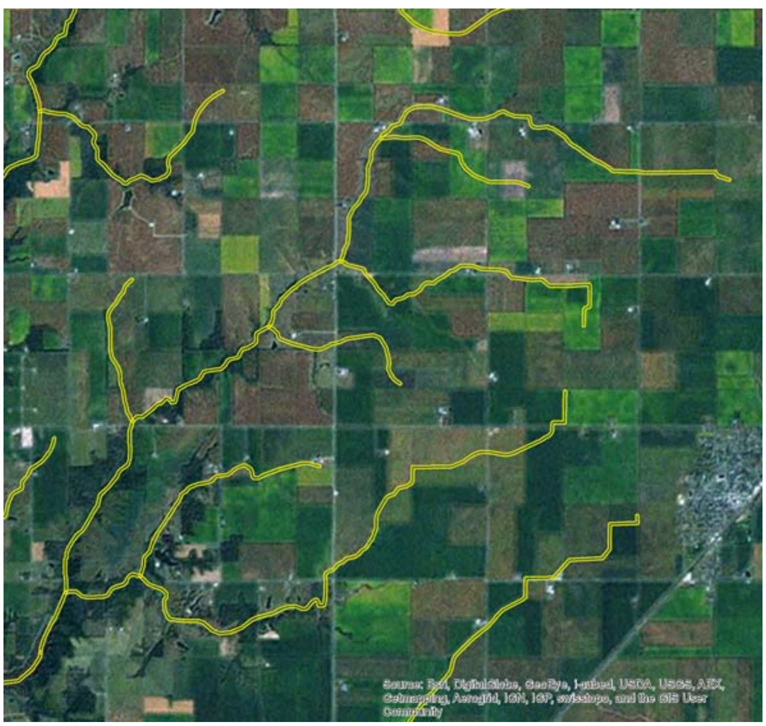


Figure 5. Buffer Strips in Glenn Shoals Watershed



Buffers also provide streambank protection along with their filtering capacity. This is relevant to this waterbody since it is impaired for phosphorus and total suspended solids, for which a TMDL was developed (IEPA 2007). The rooting systems of the vegetation serve as reinforcements in streambank soils, which help to hold streambank material in place and minimize erosion. Due to the increase in stormwater runoff volume and peak rates of runoff associated with agriculture and development, stream channels are subject to greater erosional forces during stormflow events. Thus, preserving natural vegetation along stream channels minimizes the potential for water quality and habitat degradation due to streambank erosion and enhances the pollutant removal of sheet flow runoff from developed areas that passes through the buffer. The increased organic matter in these corridors should increase degradation of atrazine.

Converting land adjacent to waterbodies for the creation of riparian buffers will provide stream bank stabilization, stream shading, and nutrient uptake and trapping from adjacent areas. Minimum buffer widths of 25 feet are required for water quality benefits. Higher removal rates are provided with greater buffer widths. Riparian corridors typically treat a maximum of 300 feet of adjacent land before runoff forms small channels that short circuit treatment. In addition to the treated area, any land converted from agricultural land has the potential to reduce the amount of atrazine needed.

The following information is taken from a the website- *The Value of Buffers for Pesticide Stewardship and Much More* (http://pesticidestewardship.org/Documents/Value%20of%20Buffers.pdf).

Permanent within-field buffers include grassed waterways, contour buffer strips and wind buffers. Grassed waterways are strategically placed where they intercept the water and slow it down, thus preventing gully and rill erosion. Contour buffer strips are planted to perennial vegetation alternated with cultivated strips and placed along the contour. These reduce the risk of concentrated flow, gully erosion and pesticide runoff. Wind buffers are a single or multiple rows of trees to protect crops from winds. They can also reduce pesticide drift and reduce runoff if they are planted dense enough. Wind buffers can also consists of tall grasses planted in thin rows perpendicular to prevailing winds.

Permanent edge-of-field buffers include field borders, filter strips and riparian forest buffers. Field borders are permanent perennial vegetation established on the edge of a crop field. It reduces the movement of pesticides and nutrients, traps eroding soils and reduces pesticide drift. Filter strips are areas of grass or other permanent vegetation located between crop field and a body of water and intended to reduce runoff. Riparian forest buffers are areas planted in trees and shrubs and located adjacent to waters.

Constructed wetlands provide additional benefits when implemented in combination with buffers. In fields that are tile drained, runoff bypasses buffers and may deliver subsurface drainage directly to streams. Wetlands can effectively degrade pesticides and denitrify nitrates when strategically located at tile outlets.

Figure 6. Example of Erosion Prone Agricultural Field

Figure 7. Example of Grassed Waterway/Filter Strip

Treatment Plant Upgrade

Removal of atrazine at the water treatment plant requires expensive chemical absorption procedures. Filters with activated carbon are used to absorb the atrazine. At most water plants, sand filters are used because they are cheaper and last longer, but they do not remove organics such as PCBs, pharmaceuticals and pesticides. The Hillsboro water treatment plant has a capacity of 2.5 million gallons per day. Water is treated with coagulants; for sedimentation removal, chlorine for disinfection, fluoride for healthy teeth and ammonia to control disinfection by products (http://www.hillsboroillinois.net/departments/?water). The treatment plant has a powdered activated carbon (PAC) system for removal of atrazine.

Atrazine Reduction Success Stories

Following high atrazine levels in 1994, the local watershed committee for Lake Springfield encouraged practices such as buffer zones of plants and vegetation along stream banks, taking farmland out of production, rotating corn and soybeans and improved chemical-application practices. The treatment plant spent more than $600,000 on powdered activated carbon from 1994 to 2003 to reduce atrazine. The yearly amount for treatment has decreased since atrazine levels in the watershed have decreased. The Lake Springfield Watershed Resources Planning Committee is made up of water treatment plant staff, farmers, conservation and environmental advocates, business people and lake residents.

Atrazine Settlement Fund

On May 30, 2012, District Judge J. Phil Gilbert of the United States District Court for the Southern District of Illinois approved a $105 million class-action settlement the City of Greenville brought against Syngenta Crop Protection, Inc., and Syngenta AG (collectively, Syngenta) for the alleged contamination of community water supplies with atrazine. Information from the settlement is available in the court order- http://www.ilsd.uscourts.gov/opinions/ilsd_live.3.10.cv.188.2065985.0.pdf. Through the agreement between the parties, a Settlement Fund was created to allocate a fixed payment to the 2,000 U.S. Community Water Systems and then allocates the remainder of the Settlement Fund on a *pro-rata* basis based on evidence of the significance of the history of atrazine detection, size, and the age of each claim. The settlement ensures that each class member receives a portion of the settlement, while providing a proportionally larger share to those who are most affected by the presence of atrazine. The Settlement Fund is intended to be used to cover the costs associated with the purchase and operation of appropriate filtration systems to properly treat atrazine. Illinois' 143 water supplies that were part of the class-action settlement received a total of $15 million (http://www.huffingtonpost.com/huff-wires/20130125/us-herbicide-settlement-money/). The $15 million was not allocated to all Illinois water supplies to share, but that the total of each Illinois public water supply claim added up to $15 million, per the settlement agreement. The settlement does not interfere with the jurisdiction of any regulatory agency, and it preserves any claims from future point-source contamination and off-label use. Syngenta acknowledges no liability and continues to stand by the safety of atrazine. Settlement funds have been used for water treatment plant upgrades to reduce atrazine. In one small community, the funds were used to install a water pipe to a nearby non-impaired source, which was more cost effective than a plant upgrade.

9.2 Reasonable Assurance

Reasonable assurance means that a demonstration is given that nonpoint source reductions in this watershed will be implemented. It should be noted that all programs discussed in this section are voluntary and some may currently be in practice to some degree within the watershed. The discussion in Section 9.1 provided information on suggested BMPs for nonpoint sources. The remainder of this section discusses an estimate of costs to the watershed for implementing these practices and programs available to assist with funding.

Available Cost-Share Programs

There are several voluntary conservation programs established through the 2008 U.S. Farm, which encourage landowners to implement resource-conserving practices for water quality and erosion control purposes. These programs would apply to agricultural land and rural grasslands in the watershed. In addition, Illinois EPA has grant programs that can assist in implementation of nonpoint source controls. Each program is discussed separately in the following paragraphs.

Conservation Reserve Program (CRP)

http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=crp
The CRP is a voluntary program for agricultural landowners. Through CRP, landowners can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland.

The Commodity Credit Corporation (CCC) makes annual rental payments based on the agriculture rental value of the land, and it provides cost-share assistance for up to 50 percent of the participant's costs in establishing approved conservation practices. Participants enroll in CRP contracts for 10 to 15 years.

CRP protects millions of acres of American topsoil from erosion and is designed to safeguard natural resources. By reducing water runoff and sedimentation, CRP protects groundwater and helps improve the condition of lakes, rivers, ponds, and streams. Acreage enrolled in the CRP is planted to resource-conserving vegetative covers, making the program a major contributor to increased wildlife populations in many parts of the country.

The Farm Service Agency (FSA) administers CRP, while technical support functions are provided by NRCS, USDA's Cooperative State Research, Education, and Extension Service, State forestry agencies, local soil and water conservation districts, and private sector providers of technical assistance. Producers can offer land for CRP general sign-up enrollment only during designated sign-up periods. Environmentally desirable land devoted to certain conservation practices may be enrolled at any time under CRP continuous sign-up. Certain eligibility requirements still apply, but offers are not subject to competitive bidding. Further information on CRP continuous sign-up is available in the FSA fact sheet "Conservation Reserve Program Continuous Sign-up."

To be eligible for placement in CRP, land must be either:

- Cropland (including field margins) that is planted or considered planted to an agricultural commodity 4 of the previous 6 crop years, and which is physically and legally capable of being planted in a normal manner to an agricultural commodity; or

- Certain marginal pastureland that is suitable for use as a riparian buffer or for similar water quality purposes.

In addition to the eligible land requirements, cropland must meet one of the following criteria:

- Have a weighted average erosion index of 8 or higher;
- Be expiring CRP acreage; or
- Be located in a national or state CRP conservation priority area.

FSA provides CRP participants with annual rental payments, including certain incentive payments, and cost-share assistance:

- Rental Payments – In return for establishing long-term, resource-conserving covers, FSA provides annual rental payments to participants. FSA bases rental rates on the relative productivity of the soils within each county and the average dry land cash rent or cash-rent equivalent. The maximum CRP rental rate for each offer is calculated in advance of enrollment. Producers may offer land at that rate or offer a lower rental rate to increase the likelihood that their offer will be accepted.

- Maintenance Incentive Payments – CRP annual rental payments may include an additional amount up to $4 per acre per year as an incentive to perform certain maintenance obligations.

- Cost-share Assistance – FSA provides cost-share assistance to participants who establish approved cover on eligible cropland. The cost-share assistance can be an amount not more than 50 percent of the participants' costs in establishing approved practices.

- Other Incentives – FSA may offer additional financial incentives of up to 20 percent of the annual payment for certain continuous sign-up practices.

Conservation practices eligible for CRP funding which are recommended BMPs for this watershed TMDL include but are not limited to filter strips, grass waterways, riparian buffers, wetland restoration, and tree plantings.

Clean Water Act Section 319 Grants

Section 319 was added to the CWA to establish a national program to address nonpoint sources of water pollution. Through this program, each state is allocated Section 319 funds on an annual basis according to a national allocation formula based on the total annual appropriation for the section 319 grant program. The total award consists of two categories of funding: incremental funds and base funds. A state is eligible to receive EPA 319(b) grants upon USEPA's approval of the state's Nonpoint Source Assessment Report and Nonpoint Source Management Program. States may reallocate funds through subawards (e.g., contracts, subgrants) to both public and private entities, including local governments, tribal authorities, cities, counties, regional development centers, local school systems, colleges and universities, local nonprofit organizations, state agencies, federal agencies, watershed groups, for-profit groups, and individuals.

USEPA designates incremental funds for the restoration of impaired water through the development and implementation of watershed-based plans and TMDLs for impaired waters. Base funds, funds other than incremental funds, are used to provide staffing and support to manage and implement the state Nonpoint Source Management Program. Section 319 funding can be used to implement activities which improve water quality, such as filter strips, streambank stabilization, etc.

Illinois EPA receives federal funds through Section 319(h) of the CWA to help implement Illinois' Nonpoint Source (NPS) Pollution Management Program. The purpose of the program is to work cooperatively with local units of government and other organizations toward the mutual goal of protecting the quality of water in Illinois by controlling NPS pollution. The program emphasizes funding for implementing cost-effective corrective and preventative BMPs on a watershed scale; funding is also available for BMPs on a non-watershed scale and the development of information/education NPS pollution control programs.

The Maximum Federal funding available is 60 percent, with the remaining 40 percent coming from local match. The program period is two years unless otherwise approved. This is a reimbursement program. For more information on the program, refer to the IEPA website at http://www.epa.state.il.us/water/watershed/nonpoint-source.html.

Section 319(h) funds are awarded for the purpose of implementing approved NPS management projects. The funding will be directed toward activities that result in the implementation of appropriate BMPs for the control of NPS pollution or to enhance the public's awareness of NPS pollution. Applications are accepted June 1 through August 1. Proposed 319 projects in TMDL watersheds receive high prioritization as long as they contain the required elements.

Environmental Quality Incentive Program (EQIP)

http://www.il.nrcs.usda.gov/programs/eqip/index.html

EQIP is a voluntary conservation program that provides financial and technical assistance to farmers and ranchers who face threats to soil, water, air, and related natural resources on their land. Through EQIP, the NRCS develops contracts with agricultural producers to implement conservation practices to address environmental natural resource problems. Payments are made to producers once conservation practices are completed according to NRCS requirements.

Persons engaged in livestock or agricultural production and owners of non-industrial private forestland are eligible for the program. Eligible land includes cropland, rangeland, pastureland, private non-industrial forestland, and other farm or ranch lands. Persons interested in entering into a cost-share agreement with the USDA for EQIP assistance may file an application at any time.

NRCS works with the participant to develop the EQIP plan of operations. This plan becomes the basis of the EQIP contract between NRCS and the participant. NRCS provides conservation practice payments to landowners under these contracts that can be up to 10 years in duration.

The EQIP objective to optimize environmental benefits is achieved through a process that begins with National priorities that address: impaired water quality, conservation of ground and surface water resources improvement of air quality reduction of soil erosion and sedimentation, and improvement or creation of wildlife habitat for at-risk species. National priorities include: reductions of nonpoint source pollution, such as nutrients, sediment, pesticides, or excess salinity in impaired watersheds consistent with TMDLs where available as well as the reduction of groundwater contamination and reduction of point sources such as contamination from confined animal feeding operations; conservation of ground and surface water resources; reduction of emissions, such as particulate matter, nitrogen oxides (NOx), volatile organic compounds, and ozone precursors and depleters that contribute to air quality impairment violations of National Ambient Air Quality Standards reduction in soil erosion and sedimentation from unacceptable levels on agricultural land; and promotion of at-risk species habitat conservation.

EQIP provides payments up to 75 percent of the incurred costs and income foregone of certain conservation practices and activities. The overall payment limitation is $300,000 per person or legal entity over a 6-year period. The Secretary of Agriculture may raise the limitation to $450,000 for projects of special environmental significance. Payment limitations for organic production may not exceed an aggregate $20,000 per year or $80,000 during any 6-year period for installing conservation practices.

Conservation practices eligible for EQIP funding which are recommended BMPs for this watershed TMDL include field borders, filter strips, cover crops, grade stabilization structures, grass waterways, riparian buffers, streambank shoreline protection, terraces, and wetland restoration.

The selection of eligible conservation practices and the development of a ranking process to evaluate applications are the final steps in the optimization process. Applications will be ranked based on a number of factors, including the environmental benefits and cost effectiveness of the proposal. More information regarding State and local EQIP implementation can be found at www.nrcs.usda.gov/programs/eqip.

Wildlife Habitat Incentives Program (WHIP)

http://www.il.nrcs.usda.gov/programs/whip/index.html

WHIP is a voluntary program for people who want to develop and improve wildlife habitat primarily on private lands and nonindustrial private forest land. It provides both technical assistance and cost share payments to help:

- Promote the restoration of declining or important native fish and wildlife species.
- Protect, restore, develop, or enhance fish and wildlife habitat to benefit at-risk species.
- Reduce the impacts of invasive species in fish and wildlife habitat.
- Protect, restore, develop, or enhance declining or impaired aquatic wildlife species habitat.

Participants who own or control land agree to prepare and implement a wildlife habitat development plan. The NRCS provides technical and financial assistance for the establishment of wildlife habitat development practices. In addition, if the landowner agrees, cooperating State wildlife agencies and nonprofit or private organizations may provide expertise or additional funding to help complete a project.

Participants work with the NRCS to prepare a wildlife habitat development plan in consultation with the local conservation district. The plan describes the participant's goals for improving wildlife habitat, includes a list of practices and a schedule for installing them, and details the steps necessary to maintain the habitat for the life of the agreement. This plan may or may not be part of a larger conservation plan that addresses other resource needs such as water quality and soil erosion.

The NRCS and the participant enter into a cost-share agreement for wildlife habitat development. This agreement generally lasts from 5 to 10 years from the date the agreement is signed for general applications and up to 15 years for essential habitat applications. Cost-share payments may be used to establish new practices or replace practices that fail for reasons beyond the participant's control.

WHIP has a continuous sign-up process. Applicants can sign up anytime of the year at their local NRCS field office. Conservation practices eligible for WHIP funding which are recommended BMPs for this watershed TMDL include but are not limited to filter strips, field borders, riparian buffers, streambank and shoreline protection, and wetland restoration.

Local Program Information

Local contact information for Montgomery County is listed in the Table 12 below. The USDA Service Center is located at 1621 Vandalia Road in Hillsboro.

Table 12. Montgomery County USDA Service Center Contact Information

Contact	Address	Phone
Local SWCD Office		
Kris Reynolds	kris.reynolds@il.usda.gov	217-532-3361
Local FSA Office		

Dan Puccetti Brian Lewey	Dan.puccetti@il.usda.gov brian.lewey@il.usda.gov	217-532-3361 x 2 217-532-3361
Local NRCS Office		
Joseph Liddell	joseph.liddell@il.usda.gov	217-532-3361 x 3

9.3 Monitoring Plan

The purpose of the monitoring plan for Lake Glenn Shoals and Hillsboro Old Lake is to assess the overall implementation of management actions outlined in this section. This can be accomplished by conducting the following monitoring programs:

- Track implementation of management measures in the watershed
- Estimate effectiveness of management measures
- Continued monitoring of the lakes
- Storm-based monitoring of high flow events
- Tributary monitoring

Tracking the implementation of management measures can be used to address the following goals:

- Determine the extent to which management measures and practices have been implemented compared to action needed to meet TMDL endpoints
- Establish a baseline from which decisions can be made regarding the need for additional incentives for implementation efforts
- Measure the extent of voluntary implementation efforts
- Support work-load and costing analysis for assistance or regulatory programs
- Determine the extent to which management measures are properly maintained and operated

Estimating the effectiveness of the BMPs implemented in the watershed could be completed by monitoring before and after the BMP is incorporated into the watershed. Additional monitoring could be conducted on specific structural systems such as a constructed wetland. Inflow and outflow measurements could be conducted to determine site-specific removal efficiency.

Illinois EPA monitors lakes every three years and conducts Intensive Basin Surveys every five years. Continuation of this state monitoring program will assess lake water quality as improvements in the watersheds are completed. Any available future sampling data can be used to assess whether water quality standards in the lakes are being attained.

10 ACRONYMS AND ABBREVIATIONS

BMP Best Management Practices
CCC Commodity Credit Corporation
CRP Conservation Reserve Program
CWA Clean Water Act
CWS Community Water Supply
DMR Discharge Monitoring Report
EPA Environmental Protection Agency
EQIP Environmental Quality Incentive Program
FSA Farm Service Agency
GIS Geographic Information Systems
IPCB Illinois Pollution Control Board
ISGS Illinois State Geological Survey
LC Loading Capacity
MCL Maximum Contaminant Level
MGD Million Gallons per Day
MOS Margin of Safety
MRDL Maximum Residual Disinfectant Level
NHD National Hydrography Dataset
NPDES National Pollution Discharge Elimination System
NPS Nonpoint Source
NRCS Natural Resources Conservation Service
PCB Polychlorinated Biphenyls
SWCD Soil and Water Conservation District
TMDL Total Maximum Daily Load
USDA United States Department of Agriculture
USEPA United States Environmental Protection Agency
WASCOB Water and Sediment Control Basins
WHIP Wildlife Habitat Incentives Program
WLA Wasteload Allocation

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ATTACHMENT 1

Syngenta Water Quality Data

Simazine Monitoring Program (SMP): Simazine, Atrazine, Metolochlor and 3 Chloroatrazine Degradate Monitoring Results in Raw and Finished Water. Community Water Supply (CWS): Hillsboro (Glenn Shoals Lake and Finished), Illinois, PWSID IL1350300.

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2006	01/06/06	F	0.13	0.27	0.25	0.65	0.55	0.41	0.05	LCMS-1
2006	01/30/06	F	0.11	0.18	0.25	0.54	0.45	0.27	0.05	LCMS-1
2006	02/13/06	F	0.05	0.05	0.25	0.35	0.33	0.30	0.05	LCMS-1
2006	03/02/06	F	0.11	0.30	0.25	0.66	0.38	0.32	0.05	LCMS-1
2006	03/13/06	F	0.12	0.16	0.25	0.53	0.28	0.29	0.05	LCMS-1
2006	03/27/06	F	0.14	0.14	0.25	0.53	0.16	0.15	0.05	LCMS-1
2006	04/03/06	F	0.18	0.14	0.25	0.57	0.17	0.13	0.05	LCMS-1
2006	04/18/06	F	0.20	0.12	0.25	0.57	0.10	0.10	0.05	LCMS-1
2006	04/24/06	F	0.22	0.14	0.25	0.61	0.05	0.05	0.05	LCMS-1
2006	05/02/06	F	0.11	0.05	0.25	0.41	0.05	0.05	0.05	LCMS-1
2006	05/08/06	F	0.14	0.05	0.25	0.44	0.16	0.05	0.05	LCMS-1
2006	05/18/06	F	0.20	0.18	0.25	0.63	0.66	0.18	0.27	LCMS-1
2006	05/22/06	F	0.15	0.05	0.25	0.45	0.87	0.15	0.22	LCMS-1
2006	06/06/06	F	0.32	0.38	0.25	0.95	2.34	0.66	0.43	LCMS-1
2006	06/12/06	F	0.36	0.32	0.25	0.93	2.80	0.41	0.36	LCMS-1
2006	06/19/06	F	0.05	0.13	0.25	0.43	0.33	0.20	0.19	LCMS-1
2006	07/10/06	F	0.05	0.20	0.25	0.50	0.20	0.26	0.20	LCMS-1
2006	07/27/06	F	0.05	0.26	0.25	0.56	0.23	0.36	0.15	LCMS-1
2006	08/07/06	F	0.05	0.23	0.25	0.53	0.33	0.57	0.14	LCMS-1
2006	08/22/06	F	0.05	0.34	0.25	0.64	0.29	0.48	0.13	LCMS-1
2006	08/28/06	F	0.13	0.36	0.25	0.74	0.27	0.50	0.13	LCMS-1
2006	09/15/06	F	0.05	0.27	0.25	0.57	0.22	0.45	0.12	LCMS-1
2006	11/02/06	F	0.05	0.29	0.25	0.59	0.21	0.40	0.05	LCMS-1
2006	11/20/06	F	0.05	0.26	0.25	0.56	0.16	0.35	0.05	LCMS-1

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2006	11/27/06	F	0.05	0.27	0.25	0.57	0.23	0.48	0.05	LCMS-1
2006	12/05/06	F	0.05	0.05	0.25	0.35	0.12	0.19	0.05	LCMS-1
2006	12/11/06	F	0.13	0.30	0.25	0.68	0.22	0.46	0.05	LCMS-1
2006	12/18/06	F	0.14	0.19	0.25	0.58	0.13	0.28	0.05	LCMS-1
2007	01/11/07	F	0.57	0.15	0.25	0.97	0.16	0.28	0.05	LCMS-1
2007	01/16/07	F	0.52	0.12	0.25	0.89	0.05	0.20	0.05	LCMS-1
2007	02/12/07	F	1.16	0.25	0.25	1.66	0.07	0.10	0.10	LCMS-2
2007	02/26/07	F	0.87	0.24	0.25	1.36	0.05	0.11	0.03	LCMS-2
2007	03/12/07	F	1.01	0.31	0.25	1.57	0.03	0.08	0.03	LCMS-2
2007	03/26/07	F	1.00	0.20	0.25	1.45	0.03	0.05	0.07	LCMS-2
2007	04/02/07	F	0.83	0.25	0.25	1.33	0.03	0.03	0.03	LCMS-2
2007	04/09/07	F	0.66	0.18	0.25	1.09	0.03	0.03	0.03	LCMS-2
2007	04/18/07	F	0.65	0.18	0.25	1.08	0.03	0.06	0.03	LCMS-2
2007	04/23/07	F	0.61	0.19	0.25	1.05	0.07	0.03	0.03	LCMS-2
2007	04/30/07	F	0.85	0.33	0.25	1.43	0.22	0.09	0.09	LCMS-2
2007	05/07/07	F	0.56	0.16	0.25	0.97	0.31	0.03	0.11	LCMS-2
2007	05/14/07	F	0.49	0.20	0.25	0.94	0.31	0.07	0.10	LCMS-2
2007	05/21/07	F	0.55	0.18	0.25	0.98	0.38	0.07	0.13	LCMS-2
2007	05/29/07	F	0.46	0.16	0.25	0.87	0.40	0.09	0.07	LCMS-2
2007	06/04/07	F	0.54	0.18	0.25	0.97	0.41	0.10	0.08	LCMS-2
2007	06/11/07	F	0.32	0.12	0.25	0.69	0.33	0.10	0.03	LCMS-2
2007	06/18/07	F	0.57	0.22	0.25	1.04	0.55	0.11	0.07	LCMS-2
2007	06/25/07	F	0.38	0.18	0.25	0.81	0.60	0.10	0.08	LCMS-2
2007	07/02/07	F	0.42	0.20	0.25	0.87	0.69	0.14	0.09	LCMS-2
2007	07/09/07	F	0.31	0.22	0.25	0.78	0.47	0.11	0.07	LCMS-2
2007	07/16/07	F	0.41	0.27	0.25	0.93	0.69	0.19	0.10	LCMS-2
2007	07/23/07	F	0.25	0.18	0.25	0.68	0.46	0.12	0.05	LCMS-2
2007	07/30/07	F	0.29	0.18	0.25	0.72	0.56	0.12	0.03	LCMS-2
2007	08/13/07	F	0.49	0.21	0.25	0.95	0.50	0.14	0.03	LCMS-2
2007	08/27/07	F	0.33	0.15	0.25	0.73	0.68	0.11	0.03	LCMS-2
2007	09/10/07	F	0.42	0.20	0.25	0.87	0.73	0.15	0.03	LCMS-2

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2007	09/24/07	F	0.42	0.17	0.25	0.84	0.57	0.17	0.03	LCMS-2
2007	10/01/07	F	0.45	0.25	0.25	0.95	0.58	0.19	0.03	LCMS-2
2007	10/09/07	F	0.39	0.21	0.25	0.85	0.57	0.16	0.03	LCMS-2
2007	10/15/07	F	0.42	0.24	0.25	0.91	0.87	0.23	0.03	LCMS-2
2007	10/22/07	F	0.34	0.09	0.25	0.68	0.63	0.18	0.03	LCMS-2
2007	10/29/07	F	0.31	0.24	0.25	0.80	0.57	0.14	0.03	LCMS-2
2007	11/05/07	F	0.31	0.21	0.25	0.77	0.49	0.18	0.03	LCMS-2
2007	11/13/07	F	0.33	0.17	0.25	0.75	0.74	0.15	0.03	LCMS-2
2007	11/19/07	F	0.29	0.19	0.25	0.73	0.70	0.15	0.03	LCMS-2
2007	11/26/07	F	0.32	0.23	0.25	0.80	0.58	0.18	0.03	LCMS-2
2007	12/03/07	F	0.24	0.12	0.25	0.61	0.42	0.16	0.03	LCMS-2
2007	12/10/07	F	0.35	0.14	0.25	0.74	0.58	0.15	0.03	LCMS-2
2007	12/17/07	F	0.25	0.06	0.25	0.56	0.35	0.13	0.03	LCMS-2
2007	12/26/07	F	0.30	0.32	0.25	0.87	0.53	0.24	0.03	LCMS-2
2008	01/14/08	F	0.39	0.32	0.25	0.96	0.69	0.18	0.03	LCMS-2
2008	01/28/08	F	0.37	0.25	0.25	0.87	0.42	0.18	0.03	LCMS-2
2008	02/11/08	F	0.42	0.19	0.25	0.86	0.55	0.20	0.07	LCMS-2
2008	02/25/08	F	0.72	0.14	0.25	1.11	0.31	0.09	0.07	LCMS-2
2008	03/10/08	F	0.91	0.42	0.25	1.58	0.31	0.10	0.14	LCMS-2
2008	03/24/08	F	0.80	0.46	0.25	1.51	0.17	0.03	0.14	LCMS-2
2008	04/14/08	F	0.66	0.05	0.25	0.96	0.07	0.03	0.16	LCMS-2
2008	04/21/08	F	0.60	0.13	0.25	0.98	0.07	0.03	0.15	LCMS-2
2008	04/28/08	F	0.46	0.16	0.25	0.87	0.03	0.03	0.17	LCMS-2
2008	05/05/08	F	0.38	0.12	0.25	0.75	0.03	0.03	0.08	LCMS-2
2008	05/12/08	F	0.38	0.03	0.25	0.66	0.12	0.03	0.12	LCMS-2
2008	05/19/08	F	0.34	0.18	0.25	0.77	0.62	0.09	0.33	LCMS-2
2008	05/27/08	F	0.36	0.13	0.25	0.74	0.89	0.13	0.61	LCMS-2
2008	06/02/08	F	0.35	0.12	0.25	0.72	2.28	0.19	0.84	LCMS-2
2008	06/09/08	F	0.32	0.24	0.25	0.81	2.98	0.27	1.29	LCMS-2
2008	06/16/08	F	0.03	0.16	0.25	0.44	0.30	0.32	1.22	LCMS-2
2008	06/23/08	F	0.03	0.21	0.25	0.49	0.13	0.37	2.15	LCMS-2

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2008	06/30/08	F	0.03	0.37	0.25	0.65	0.59	0.59	2.08	LCMS-2
2008	07/07/08	F	0.03	0.37	0.25	0.65	0.49	0.58	2.33	LCMS-2
2008	07/14/08	F	0.07	0.33	0.25	0.65	0.86	0.63	2.53	LCMS-2
2008	07/21/08	F	0.03	0.28	0.25	0.56	1.11	0.62	2.11	LCMS-2
2008	07/28/08	F	0.03	0.56	0.51	1.10	1.06	0.88	1.35	LCMS-2
2008	08/11/08	F	0.26	0.31	0.25	0.82	1.12	0.58	1.96	LCMS-2
2008	08/25/08	F	0.22	0.22	0.25	0.69	0.77	0.58	0.77	LCMS-2
2008	09/08/08	F	0.25	0.37	0.25	0.87	0.74	0.61	0.51	LCMS-2
2008	09/22/08	F	0.09	0.15	0.25	0.49	0.24	0.18	0.36	LCMS-2
2008	10/06/08	F	0.03	0.09	0.25	0.37	0.20	0.21	0.10	LCMS-2
2008	10/14/08	F	0.03	0.03	0.25	0.31	0.17	0.10	0.09	LCMS-2
2008	10/20/08	F	0.03	0.13	0.25	0.41	0.24	0.17	0.03	LCMS-2
2008	10/27/08	F	0.09	0.13	0.25	0.47	0.35	0.19	0.27	LCMS-2
2008	11/03/08	F	0.03	0.07	0.25	0.35	0.25	0.21	0.13	LCMS-2
2008	11/10/08	F	0.10	0.14	0.25	0.49	0.29	0.23	0.25	LCMS-2
2008	11/17/08	F	0.09	0.14	0.25	0.48	0.23	0.17	0.09	LCMS-2
2008	11/24/08	F	0.10	0.11	0.90	1.11	0.26	0.25	0.28	LCMS-2
2008	12/01/08	F	0.11	0.20	0.25	0.56	0.24	0.13	0.25	LCMS-2
2008	12/08/08	F	0.13	0.06	0.25	0.44	0.24	0.18	0.14	LCMS-2
2008	12/15/08	F	0.07	0.11	0.25	0.43	0.26	0.19	0.07	LCMS-2
2008	12/22/08	F	0.03	0.08	0.25	0.36	0.15	0.15	0.08	LCMS-2
2008	12/29/08	F	0.50	0.10	0.25	0.85	0.19	0.12	0.09	LCMS-2
2009	01/12/09	F	1.39	0.15	0.25	1.79	0.08	0.08	0.03	LCMS-2
2009	01/26/09	F	1.24	0.21	0.25	1.70	0.09	0.06	0.08	LCMS-2
2009	02/09/09	F	2.52	0.19	0.25	2.96	0.12	0.07		LCMS-2
2009	02/23/09	F	1.99	0.26	0.25	2.50	0.10	0.03		LCMS-2
2009	03/09/09	F	1.87	0.38	0.25	2.50	0.03	0.03		LCMS-2
2009	03/23/09	F	2.00	0.31	0.25	2.56	0.08	0.07		LCMS-2
2009	04/06/09	F	1.58	0.58	0.25	2.41	0.03	0.03		LCMS-2
2009	04/13/09	F	1.29	0.46	0.25	2.00	0.03	0.03		LCMS-2
2009	04/20/09	F	1.44	0.67	0.25	2.36	0.05	0.03		LCMS-2

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2009	04/27/09	F	1.05	0.55	0.25	1.85	0.08	0.03		LCMS-2
2009	05/04/09	F	0.03	0.03	0.25	0.31	0.07	0.03		LCMS-2
2009	05/11/09	F	0.10	0.03	0.25	0.38	0.24	0.03		LCMS-2
2009	05/18/09	F	0.08	0.06	0.25	0.39	0.24	0.03		LCMS-2
2009	05/26/09	F	0.46	0.12	0.25	0.83	1.78	0.11		LCMS-2
2009	06/01/09	F	1.14	0.35	0.25	1.74	2.82	0.23		LCMS-2
2009	06/08/09	F	0.94	0.29	0.25	1.48	2.45	0.22		LCMS-2
2009	06/15/09	F	0.08	0.12	0.25	0.45	0.14	0.13		LCMS-2
2009	06/22/09	F	0.08	0.19	0.25	0.52	0.29	0.24		LCMS-2
2009	06/29/09	F	0.07	0.16	0.25	0.48	0.54	0.19		LCMS-2
2009	07/06/09	F	0.06	0.13	0.25	0.44	0.63	0.22		LCMS-2
2009	07/13/09	F	0.09	0.27	0.25	0.61	0.97	0.35		LCMS-2
2009	07/20/09	F	0.03	0.03	0.25	0.31	0.50	0.11		LCMS-2
2009	07/27/09	F	0.09	0.21	0.25	0.55	1.17	0.31		LCMS-2
2009	08/10/09	F	0.03	0.18	0.25	0.46	0.56	0.29		LCMS-2
2009	08/24/09	F	0.03	0.09	0.25	0.37	0.61	0.19		LCMS-2
2009	09/08/09	F	0.05	0.16	0.25	0.46	0.73	0.28		LCMS-2
2009	09/21/09	F	0.03	0.07	0.25	0.35	0.58	0.23		LCMS-2
2009	10/05/09	F	0.03	0.14	0.25	0.42	0.58	0.31		LCMS-2
2009	10/12/09	F	0.03	0.18	0.25	0.46	0.81	0.30		LCMS-2
2009	10/19/09	F	0.03	0.09	0.25	0.37	0.61	0.29		LCMS-2
2009	10/26/09	F	0.03	0.10	0.25	0.38	0.61	0.27		LCMS-2
2009	11/02/09	F	0.19	0.08	0.25	0.52	0.45	0.18		LCMS-2
2009	11/09/09	F	0.30	0.03	0.25	0.58	0.18	0.07		LCMS-2
2009	11/16/09	F	0.18	0.03	0.25	0.46	0.10	0.03		LCMS-2
2009	11/23/09	F	0.42	0.13	0.25	0.80	0.11	0.06		LCMS-2
2009	11/30/09	F	0.67	0.03	0.25	0.95	0.12	0.06		LCMS-2
2009	12/07/09	F	0.53	0.06	0.25	0.84	0.11	0.03		LCMS-2
2009	12/14/09	F	0.58	0.08	0.25	0.91	0.11	0.07		LCMS-2
2009	12/21/09	F	0.35	0.03	0.25	0.63	0.07	0.03		LCMS-2
2009	12/28/09	F	0.25	0.03	0.25	0.53	0.03	0.03		LCMS-2

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2010	01/11/10	F	0.40	0.12	0.25	0.77	0.06	0.03		LCMS-2
2010	01/25/10	F	0.11	0.03	0.25	0.39	0.03	0.03		LCMS-2
2010	02/22/10	F	0.15	0.06	0.25	0.46	0.05	0.03		LCMS-2
2010	03/08/10	F	0.16	0.03	0.25	0.44	0.03	0.03		LCMS-2
2010	03/22/10	F	0.07	0.03	0.25	0.35	0.03	0.03		LCMS-2
2010	04/05/10	F	0.07	0.03	0.25	0.35	0.06	0.03		LCMS-3
2010	04/12/10	F	0.03	0.03	0.25	0.31	0.03	0.03		LCMS-3
2010	04/19/10	F	0.12	0.03	0.25	0.40	0.08	0.03		LCMS-3
2010	04/26/10	F	0.10	0.03	0.25	0.38	0.06	0.06		LCMS-3
2010	05/03/10	F	0.06	0.14	0.25	0.45	4.51	0.23		LCMS-3
2010	05/10/10	F	0.07	0.14	0.25	0.46	7.04	0.40		LCMS-3
2010	05/17/10	F	0.06	0.09	0.25	0.40	7.04	0.43		LCMS-3
2010	05/24/10	F	0.07	0.19	0.25	0.51	6.48	0.64		LCMS-3
2010	06/01/10	F	0.06	0.27	0.25	0.58	4.15	0.59		LCMS-3
2010	06/07/10	F	0.03	0.15	0.25	0.43	0.37	0.64		LCMS-3
2010	06/14/10	F	0.03	0.15	0.25	0.43	0.45	0.52		LCMS-3
2010	06/21/10	F	0.03	0.16	0.25	0.44	0.79	0.45		LCMS-3
2010	06/28/10	F	0.03	0.03	0.25	0.31	0.67	0.35		LCMS-3
2010	07/06/10	F	0.03	0.07	0.25	0.35	1.07	0.44		LCMS-3
2010	07/12/10	F	0.03	0.13	0.25	0.41	0.95	0.44		LCMS-3
2010	07/19/10	F	0.03	0.13	0.25	0.41	0.81	0.35		LCMS-3
2010	07/26/10	F	0.03	0.11	0.25	0.39	0.81	0.43		LCMS-3
2010	08/02/10	F	0.03	0.03	0.25	0.31	0.65	0.30		LCMS-3
2010	08/16/10	F	0.03	0.06	0.25	0.34	0.43	0.17		LCMS-3
2010	08/30/10	F	0.03	0.03	0.25	0.31	0.35	0.16		LCMS-3
2010	09/13/10	F	0.03	0.03	0.25	0.31	0.28	0.12		LCMS-3
2010	09/27/10	F	0.03	0.03	0.25	0.31	0.27	0.11		LCMS-3
2010	10/04/10	F	0.03	0.03	0.25	0.31	0.24	0.13		LCMS-3
2010	10/12/10	F	0.03	0.03	0.25	0.31	0.25	0.11		LCMS-3
2010	10/18/10	F	0.03	0.05	0.25	0.33	0.34	0.18		LCMS-3
2010	10/25/10	F	0.03	0.03	0.25	0.31	0.21	0.11		LCMS-3

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2010	11/01/10	F	0.03	0.03	0.25	0.31	0.20	0.10		LCMS-3
2010	11/08/10	F	0.03	0.03	0.25	0.31	0.21	0.10		LCMS-3
2010	11/15/10	F	0.03	0.03	0.25	0.31	0.24	0.13		LCMS-3
2010	11/22/10	F	0.03	0.03	0.25	0.31	0.21	0.11		LCMS-3
2010	11/29/10	F	0.08	0.03	0.25	0.36	0.20	0.09		LCMS-3
2010	12/06/10	F	0.64	0.03	0.25	0.92	0.16	0.09		LCMS-3
2010	12/13/10	F	0.96	0.08	0.25	1.29	0.18	0.09		LCMS-3
2010	12/20/10	F	0.94	0.07	0.25	1.26	0.15	0.07		LCMS-3
2010	12/27/10	F	1.07	0.08	0.25	1.40	0.13	0.07		LCMS-3
2011	01/10/11	F	0.93	0.07	0.25	1.25	0.13	0.06		LCMS-3
2011	01/24/11	F	0.81	0.07	0.25	1.13	0.12	0.06		LCMS-3
2011	02/07/11	F	0.89	0.05	0.25	1.19	0.11	0.03		LCMS-3
2011	02/22/11	F	0.74	0.03	0.25	1.02	0.10	0.06		LCMS-3
2011	03/07/11	F	0.87	0.11	0.25	1.23	0.03	0.03		LCMS-3
2011	03/21/11	F	0.55	0.06	0.25	0.86	0.03	0.03		LCMS-3
2011	04/04/11	F	0.46	0.07	0.25	0.78	0.03	0.03		LCMS-3
2011	04/11/11	F	0.34	0.07	0.25	0.66	0.03	0.03		LCMS-3
2011	04/18/11	F	0.40	0.03	0.25	0.68	0.03	0.03		LCMS-3
2011	04/25/11	F	0.32	0.06	0.25	0.63	0.22	0.03		LCMS-3
2011	05/02/11	F	0.15	0.07	0.25	0.47	0.38	0.03		LCMS-3
2011	05/09/11	F	0.25	0.08	0.25	0.58	0.15	0.03		LCMS-3
2011	05/16/11	F	0.08	0.03	0.25	0.36	0.22	0.03		LCMS-3
2011	05/23/11	F	0.07	0.03	0.25	0.35	0.24	0.03		LCMS-3
2011	05/31/11	F	0.21	0.28	0.25	0.74	2.84	0.17		LCMS-3
2011	06/06/11	F	0.21	0.27	0.25	0.73	3.61	0.33		LCMS-3
2011	06/13/11	F	0.16	0.35	0.25	0.76	4.15	0.42		LCMS-3
2011	06/20/11	F	0.11	0.48	0.25	0.84	4.95	0.72		LCMS-3
2011	06/27/11	F	0.03	0.39	0.25	0.67	0.96	0.70		LCMS-3
2011	07/05/11	F	0.03	0.43	0.25	0.71	0.49	0.62		LCMS-3
2011	07/11/11	F	0.03	0.16	0.25	0.44	0.19	0.27		LCMS-3
2011	07/18/11	F	0.03	0.22	0.25	0.50	0.40	0.43		LCMS-3

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2011	07/25/11	F	0.03	0.27	0.25	0.55	0.58	0.52		LCMS-3
2011	08/08/11	F	0.03	0.21	0.25	0.49	0.38	0.41		LCMS-3
2011	08/22/11	F	0.03	0.21	0.25	0.49	0.44	0.38		LCMS-3
2011	09/06/11	F	0.03	0.11	0.25	0.39	0.19	0.24		LCMS-3
2011	09/19/11	F	0.03	0.11	0.25	0.39	0.25	0.28		LCMS-3
2011	10/03/11	F	0.03	0.08	0.25	0.36	0.15	0.20		LCMS-3
2011	10/11/11	F	0.03	0.05	0.25	0.33	0.17	0.19		LCMS-3
2011	10/17/11	F	0.03	0.08	0.25	0.36	0.14	0.21		LCMS-3
2011	10/24/11	F	0.03	0.06	0.25	0.34	0.16	0.21		LCMS-3
2011	10/31/11	F	0.03	0.07	0.25	0.35	0.17	0.20		LCMS-3
2011	11/07/11	F	0.03	0.07	0.25	0.35	0.15	0.18		LCMS-3
2011	11/14/11	F	0.03	0.09	0.25	0.37	0.25	0.22		LCMS-3
2011	11/21/11	F	0.03	0.11	0.25	0.39	0.29	0.27		LCMS-3
2011	11/28/11	F	0.03	0.09	0.25	0.37	0.20	0.23		LCMS-3
2011	12/05/11	F	0.03	0.20	0.25	0.48	0.49	0.46		LCMS-3
2011	12/12/11	F	0.03	0.37	0.25	0.65	0.64	0.63		LCMS-3
2011	12/19/11	F	0.03	0.18	0.25	0.46	0.51	0.44		LCMS-3
2011	12/27/11	F	0.20	0.33	0.25	0.78	0.60	0.46		LCMS-3
2012	01/09/12	F	0.33	0.30	0.25	0.88	0.51	0.48		LCMS-3
2012	01/23/12	F	0.46	0.34	0.25	1.05	0.47	0.50		LCMS-3
2012	02/06/12	F	0.36	0.24	0.25	0.85	0.38	0.40		LCMS-3
2012	02/21/12	F	0.47	0.18	0.25	0.90	0.32	0.31		LCMS-3
2012	03/05/12	F	0.58	0.29	0.25	1.12	0.32	0.31		LCMS-3
2012	03/19/12	F	0.48	0.27	0.25	1.00	0.22	0.29		LCMS-3
2012	03/26/12	F	0.71	0.31	0.25	1.27	0.27	0.28		LCMS-3
2012	04/02/12	F	0.68	0.28	0.25	1.21	0.27	0.25		LCMS-3
2012	04/09/12	F	0.59	0.25	0.25	1.09	0.24	0.24		LCMS-3
2012	05/09/12	F	0.51	0.79	0.25	1.55	8.38	0.81		LCMS-3
2012	05/14/12	F	0.47	0.73	0.25	1.45	11.21	1.30		LCMS-3
2012	05/21/12	F	0.34	0.60	0.25	1.19	7.20	1.06		LCMS-3
2012	05/29/12	F	0.06	0.56	0.25	0.87	0.47	0.89		LCMS-3

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2012	06/04/12	F	0.03	0.61	0.25	0.89	0.21	1.17		LCMS-3
2012	06/11/12	F	0.03	0.71	0.25	0.99	0.21	1.16		LCMS-3
2012	06/18/12	F	0.03	0.68	0.25	0.96	0.20	1.23		LCMS-3
2012	06/25/12	F	0.03	0.72	0.25	1.00	0.28	1.52		LCMS-3
2012	07/02/12	F	0.03	0.59	0.25	0.87	0.23	1.25		LCMS-3
2012	07/09/12	F	0.03	0.54	0.25	0.82	0.20	1.08		LCMS-3
2012	07/16/12	F	0.03	0.37	0.25	0.65	0.14	0.83		LCMS-3
2012	07/23/12	F	0.03	0.56	0.25	0.84	0.30	1.14		LCMS-3
2012	07/30/12	F	0.03	0.74	0.25	1.02	0.31	1.27		LCMS-3
2012	08/13/12	F	0.03	0.62	0.25	0.90	0.28	1.16		LCMS-3
2012	08/27/12	F	0.03	0.57	0.25	0.85	0.28	1.18		LCMS-3
2012	09/10/12	F	0.03	0.39	0.25	0.67	0.21	0.73		LCMS-3
2012	09/24/12	F	0.03	0.34	0.25	0.62	0.16	0.73		LCMS-3
2012	10/01/12	F	0.03	0.35	0.25	0.63	0.18	0.74		LCMS-3
2012	10/08/12	F	0.03	0.40	0.25	0.68	0.20	0.77		LCMS-3
2012	10/15/12	F	0.03	0.30	0.25	0.58	0.15	0.70		LCMS-3
2012	10/22/12	F	0.03	0.32	0.25	0.60	0.14	0.72		LCMS-3
2012	10/29/12	F	0.03	0.32	0.25	0.60	0.13	0.67		LCMS-3
2012	11/05/12	F	0.03	0.31	0.25	0.59	0.16	0.60		LCMS-3
2012	11/12/12	F	0.03	0.27	0.25	0.55	0.15	0.55		LCMS-3
2012	11/19/12	F	0.03	0.26	0.25	0.54	0.11	0.62		LCMS-3
2012	11/26/12	F	0.06	0.18	0.25	0.49	0.16	0.58		LCMS-3
2012	12/03/12	F	0.03	0.22	0.25	0.50	0.15	0.62		LCMS-3
2012	12/10/12	F	0.03	0.21	0.25	0.49	0.13	0.55		LCMS-3
2012	12/17/12	F	0.05	0.26	0.25	0.56	0.12	0.64		LCMS-3
2012	12/27/12	F	0.08	0.22	0.25	0.55	0.12	0.55		LCMS-3
2006	01/06/06	R	0.14	0.26	0.25	0.65	0.52	0.30	0.05	LCMS-1
2006	01/30/06	R	0.11	0.24	0.25	0.60	0.49	0.45	0.05	LCMS-1
2006	02/13/06	R	0.14	0.11	0.25	0.50	0.38	0.35	0.05	LCMS-1
2006	03/02/06	R	0.12	0.33	0.25	0.70	0.42	0.32	0.05	LCMS-1
2006	03/13/06	R	0.13	0.15	0.25	0.53	0.30	0.31	0.05	LCMS-1

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2006	03/27/06	R	0.26	0.24	0.25	0.75	0.25	0.24	0.05	LCMS-1
2006	04/03/06	R	0.38	0.29	0.25	0.92	0.27	0.26	0.05	LCMS-1
2006	04/18/06	R	0.41	0.23	0.25	0.89	0.16	0.14	0.05	LCMS-1
2006	04/24/06	R	0.39	0.24	0.25	0.88	0.17	0.15	0.05	LCMS-1
2006	05/02/06	R	0.20	0.05	0.25	0.50	0.05	0.05	0.05	LCMS-1
2006	05/08/06	R	0.33	0.15	0.25	0.73	0.31	0.05	0.05	LCMS-1
2006	05/18/06	R	0.46	0.39	0.25	1.10	1.95	0.38	0.80	LCMS-1
2006	05/22/06	R	0.28	0.18	0.25	0.71	1.39	0.18	0.23	LCMS-1
2006	06/06/06	R	0.79	0.83	0.25	1.87	4.60	1.01	0.83	LCMS-1
2006	06/12/06	R	0.47	0.48	0.25	1.20	4.02	0.52	0.60	LCMS-1
2006	06/19/06	R	0.05	0.33	0.25	0.63	0.30	0.39	0.34	LCMS-1
2006	07/10/06	R	0.05	0.43	0.62	1.10	0.29	0.50	0.35	LCMS-1
2006	07/27/06	R	0.12	0.67	0.25	1.04	0.48	0.86	0.29	LCMS-1
2006	08/07/06	R	0.05	0.77	0.55	1.37	0.52	0.70	0.28	LCMS-1
2006	08/22/06	R	0.05	0.59	0.25	0.89	0.35	0.70	0.20	LCMS-1
2006	08/28/06	R	0.05	0.57	0.25	0.87	0.30	0.68	0.12	LCMS-1
2006	09/15/06	R	0.05	0.53	0.25	0.83	0.30	0.62	0.16	LCMS-1
2006	11/02/06	R	0.05	0.32	0.25	0.62	0.22	0.43	0.05	LCMS-1
2006	11/20/06	R	0.05	0.31	0.25	0.61	0.18	0.41	0.05	LCMS-1
2006	11/27/06	R	0.05	0.34	0.25	0.64	0.28	0.53	0.05	LCMS-1
2006	12/05/06	R	0.05	0.12	0.25	0.42	0.12	0.17	0.05	LCMS-1
2006	12/11/06	R	0.14	0.33	0.25	0.72	0.25	0.51	0.05	LCMS-1
2006	12/18/06	R	0.28	0.29	0.25	0.82	0.20	0.38	0.05	LCMS-1
2007	01/11/07	R	0.67	0.15	0.25	1.07	0.20	0.26	0.05	LCMS-1
2007	01/16/07	R	0.84	0.15	0.25	1.24	0.12	0.22	0.05	LCMS-1
2007	02/12/07	R	1.24	0.22	0.25	1.71	0.07	0.11	0.11	LCMS-2
2007	02/26/07	R	0.97	0.24	0.25	1.46	0.07	0.11	0.07	LCMS-2
2007	03/12/07	R	0.85	0.23	0.25	1.33	0.03	0.03	0.03	LCMS-2
2007	03/26/07	R	0.93	0.17	0.25	1.35	0.03	0.03	0.11	LCMS-2
2007	04/02/07	R	0.73	0.19	0.25	1.17	0.03	0.03	0.06	LCMS-2
2007	04/09/07	R	0.68	0.20	0.25	1.13	0.03	0.05	0.03	LCMS-2

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2007	04/18/07	R	0.70	0.18	0.25	1.13	0.03	0.06	0.03	LCMS-2
2007	04/23/07	R	0.79	0.27	0.25	1.31	0.09	0.06	0.09	LCMS-2
2007	04/30/07	R	0.81	0.23	0.25	1.29	0.28	0.08	0.14	LCMS-2
2007	05/07/07	R	0.63	0.15	0.25	1.03	0.26	0.03	0.13	LCMS-2
2007	05/14/07	R	0.49	0.17	0.25	0.91	0.32	0.07	0.11	LCMS-2
2007	05/21/07	R	0.54	0.19	0.25	0.98	0.43	0.07	0.12	LCMS-2
2007	05/29/07	R	0.51	0.17	0.25	0.93	0.47	0.09	0.08	LCMS-2
2007	06/04/07	R	0.76	0.22	0.25	1.23	0.62	0.12	0.11	LCMS-2
2007	06/11/07	R	0.57	0.16	0.25	0.98	0.56	0.09	0.10	LCMS-2
2007	06/18/07	R	0.63	0.21	0.25	1.09	0.70	0.11	0.09	LCMS-2
2007	06/25/07	R	0.45	0.23	0.25	0.93	0.72	0.12	0.11	LCMS-2
2007	07/02/07	R	0.48	0.22	0.25	0.95	0.81	0.12	0.13	LCMS-2
2007	07/09/07	R	0.43	0.22	0.25	0.90	0.64	0.12	0.08	LCMS-2
2007	07/16/07	R	0.39	0.28	0.25	0.92	0.91	0.21	0.11	LCMS-2
2007	07/23/07	R	0.39	0.23	0.25	0.87	0.63	0.13	0.03	LCMS-2
2007	07/30/07	R	0.44	0.19	0.25	0.88	0.81	0.17	0.07	LCMS-2
2007	08/13/07	R	0.58	0.24	0.25	1.07	1.33	0.17	0.34	LCMS-2
2007	08/27/07	R	0.32	0.27	0.25	0.84	0.69	0.14	0.03	LCMS-2
2007	09/10/07	R	0.35	0.21	0.25	0.81	0.71	0.16	0.03	LCMS-2
2007	09/24/07	R	0.42	0.20	0.25	0.87	0.76	0.20	0.03	LCMS-2
2007	10/01/07	R	0.38	0.20	0.25	0.83	0.68	0.20	0.03	LCMS-2
2007	10/09/07	R	0.30	0.21	0.25	0.76	0.73	0.19	0.03	LCMS-2
2007	10/15/07	R	0.33	0.18	0.25	0.76	0.96	0.24	0.03	LCMS-2
2007	10/22/07	R	0.33	0.12	0.25	0.70	0.81	0.18	0.03	LCMS-2
2007	10/29/07	R	0.33	0.23	0.25	0.81	0.66	0.15	0.03	LCMS-2
2007	11/05/07	R	0.30	0.17	0.25	0.72	0.59	0.18	0.03	LCMS-2
2007	11/13/07	R	0.35	0.21	0.25	0.81	0.84	0.18	0.03	LCMS-2
2007	11/19/07	R	0.31	0.03	0.25	0.59	0.77	0.17	0.03	LCMS-2
2007	11/26/07	R	0.34	0.21	0.25	0.80	0.69	0.18	0.03	LCMS-2
2007	12/03/07	R	0.30	0.14	0.25	0.69	0.81	0.23	0.03	LCMS-2
2007	12/10/07	R	0.57	0.22	0.25	1.04	0.51	0.14	0.03	LCMS-2

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2007	12/17/07	R	0.30	0.22	0.25	0.77	0.57	0.16	0.03	LCMS-2
2007	12/26/07	R	0.37	0.24	0.25	0.86	0.73	0.28	0.03	LCMS-2
2008	01/14/08	R	0.34	0.24	0.25	0.83	0.92	0.18	0.03	LCMS-2
2008	01/28/08	R	0.30	0.22	0.25	0.77	0.61	0.19	0.03	LCMS-2
2008	02/11/08	R	0.48	0.21	0.25	0.94	0.57	0.20	0.09	LCMS-2
2008	02/25/08	R	0.77	0.12	0.25	1.14	0.45	0.07	0.15	LCMS-2
2008	03/10/08	R	0.78	0.40	0.25	1.43	0.27	0.09	0.08	LCMS-2
2008	03/24/08	R	0.75	0.34	0.25	1.34	0.20	0.08	0.17	LCMS-2
2008	04/14/08	R	0.65	0.06	0.25	0.96	0.08	0.03	0.25	LCMS-2
2008	04/21/08	R	0.54	0.15	0.25	0.94	0.07	0.03	0.20	LCMS-2
2008	04/28/08	R	0.67	0.20	0.25	1.12	0.09	0.03	0.30	LCMS-2
2008	05/05/08	R	0.53	0.21	0.25	0.99	0.06	0.03	0.11	LCMS-2
2008	05/12/08	R	0.58	0.08	0.25	0.91	0.18	0.03	0.25	LCMS-2
2008	05/19/08	R	0.43	0.18	0.25	0.86	0.82	0.12	0.41	LCMS-2
2008	05/27/08	R	0.45	0.19	0.25	0.89	1.48	0.14	1.14	LCMS-2
2008	06/02/08	R	0.35	0.26	0.25	0.86	1.85	0.17	0.50	LCMS-2
2008	06/09/08	R	0.44	0.24	0.25	0.93	3.98	0.27	1.81	LCMS-2
2008	06/16/08	R	0.03	0.24	0.25	0.52	0.21	0.48	1.64	LCMS-2
2008	06/23/08	R	0.03	0.33	0.25	0.61	0.18	0.55	4.32	LCMS-2
2008	06/30/08	R	0.03	0.38	0.25	0.66	0.26	0.74	3.08	LCMS-2
2008	07/07/08	R	0.07	0.57	0.25	0.89	0.80	0.86	8.60	LCMS-2
2008	07/14/08	R	0.06	0.62	0.25	0.93	1.29	1.00	3.51	LCMS-2
2008	07/21/08	R	0.03	0.66	0.25	0.94	1.45	0.96	2.56	LCMS-2
2008	07/28/08	R	0.03	0.56	0.25	0.84	1.36	1.04	1.64	LCMS-2
2008	08/11/08	R	0.39	0.52	0.25	1.16	1.66	0.98	3.24	LCMS-2
2008	08/25/08	R	0.47	0.48	0.25	1.20	1.60	0.68	1.51	LCMS-2
2008	09/08/08	R	0.39	0.46	0.25	1.10	1.15	0.77	0.71	LCMS-2
2008	09/22/08	R	0.21	0.20	0.25	0.66	0.70	0.36	0.58	LCMS-2
2008	10/06/08	R	0.10	0.59	0.25	0.94	0.31	0.15	0.13	LCMS-2
2008	10/14/08	R	0.03	0.12	0.25	0.40	0.19	0.16	0.07	LCMS-2
2008	10/20/08	R	0.13	0.17	0.25	0.55	0.23	0.20	0.10	LCMS-2

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2008	10/27/08	R	0.10	0.15	0.25	0.50	0.42	0.20	0.24	LCMS-2
2008	11/03/08	R	0.11	0.07	0.25	0.43	0.20	0.20	0.08	LCMS-2
2008	11/10/08	R	0.11	0.18	0.25	0.54	0.30	0.21	0.21	LCMS-2
2008	11/17/08	R	0.09	0.15	0.25	0.49	0.26	0.17	0.13	LCMS-2
2008	11/24/08	R	0.11	0.15	1.21	1.47	0.25	0.24	0.10	LCMS-2
2008	12/01/08	R	0.13	0.19	0.25	0.57	0.24	0.21	0.22	LCMS-2
2008	12/08/08	R	0.11	0.24	0.25	0.60	0.25	0.26	0.16	LCMS-2
2008	12/15/08	R	0.07	0.19	0.25	0.51	0.23	0.17	0.03	LCMS-2
2008	12/22/08	R	0.07	0.08	0.25	0.40	0.19	0.14	0.07	LCMS-2
2008	12/29/08	R	0.30	0.11	0.25	0.66	0.22	0.18	0.11	LCMS-2
2009	01/12/09	R	1.29	0.13	0.25	1.67	0.07	0.07	0.03	LCMS-2
2009	01/26/09	R	1.84	0.16	0.25	2.25	0.12	0.07	0.10	LCMS-2
2009	02/09/09	R	2.33	0.22	0.25	2.80	0.08	0.11		LCMS-2
2009	02/23/09	R	2.52	0.22	0.25	2.99	0.10	0.03		LCMS-2
2009	03/09/09	R	2.27	0.20	0.25	2.72	0.08	0.03		LCMS-2
2009	03/23/09	R	2.25	0.29	0.25	2.79	0.08	0.03		LCMS-2
2009	04/06/09	R	2.26	0.51	0.25	3.02	0.03	0.03		LCMS-2
2009	04/13/09	R	1.73	0.48	0.25	2.46	0.06	0.03		LCMS-2
2009	04/20/09	R	1.36	0.44	0.25	2.05	0.08	0.03		LCMS-2
2009	04/27/09	R	1.33	0.45	0.25	2.03	0.14	0.03		LCMS-2
2009	05/04/09	R	0.96	0.34	0.25	1.55	1.12	0.08		LCMS-2
2009	05/11/09	R	0.87	0.29	0.25	1.41	1.62	0.11		LCMS-2
2009	05/18/09	R	0.85	0.35	0.25	1.45	1.38	0.14		LCMS-2
2009	05/26/09	R	1.16	0.32	0.25	1.73	3.01	0.19		LCMS-2
2009	06/01/09	R	1.36	0.40	0.25	2.01	3.37	0.27		LCMS-2
2009	06/08/09	R	1.44	0.54	0.25	2.23	3.40	0.31		LCMS-2
2009	06/15/09	R	0.21	0.66	0.25	1.12	0.32	0.43		LCMS-2
2009	06/22/09	R	0.17	0.61	0.25	1.03	0.48	0.47		LCMS-2
2009	06/29/09	R	0.15	0.56	0.25	0.96	0.85	0.48		LCMS-2
2009	07/06/09	R	0.14	0.62	0.25	1.01	1.19	0.53		LCMS-2
2009	07/13/09	R	0.14	0.66	0.25	1.05	1.47	0.62		LCMS-2

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2009	07/20/09	R	0.15	0.62	0.25	1.02	1.64	0.65		LCMS-2
2009	07/27/09	R	0.12	0.44	0.25	0.81	1.54	0.51		LCMS-2
2009	08/10/09	R	0.08	0.49	0.25	0.82	0.71	0.55		LCMS-2
2009	08/24/09	R	0.13	0.55	0.25	0.93	1.48	0.68		LCMS-2
2009	09/08/09	R	0.10	0.50	0.25	0.85	1.32	0.63		LCMS-2
2009	09/21/09	R	0.12	0.62	0.25	0.99	1.66	0.72		LCMS-2
2009	10/05/09	R	0.09	0.52	0.25	0.86	1.40	0.72		LCMS-2
2009	10/12/09	R	0.08	0.48	0.25	0.81	1.48	0.52		LCMS-2
2009	10/19/09	R	0.12	0.53	0.25	0.90	1.27	0.69		LCMS-2
2009	10/26/09	R	0.09	0.44	0.25	0.78	1.20	0.63		LCMS-2
2009	11/02/09	R	0.97	0.28	0.25	1.50	0.83	0.39		LCMS-2
2009	11/09/09	R	0.92	0.21	0.25	1.38	0.42	0.19		LCMS-2
2009	11/16/09	R	0.92	0.17	0.25	1.34	0.36	0.20		LCMS-2
2009	11/23/09	R	1.02	0.15	0.25	1.42	0.23	0.13		LCMS-2
2009	11/30/09	R	1.07	0.14	0.25	1.46	0.20	0.11		LCMS-2
2009	12/07/09	R	1.16	0.14	0.25	1.55	0.20	0.12		LCMS-2
2009	12/14/09	R	0.97	0.12	0.25	1.34	0.15	0.10		LCMS-2
2009	12/21/09	R	0.96	0.13	0.25	1.34	0.14	0.09		LCMS-2
2009	12/28/09	R	0.65	0.12	0.25	1.02	0.09	0.06		LCMS-2
2010	01/11/10	R	0.49	0.10	0.25	0.84	0.06	0.03		LCMS-2
2010	01/25/10	R	0.41	0.09	0.25	0.75	0.05	0.05		LCMS-2
2010	02/22/10	R	0.30	0.08	0.25	0.63	0.06	0.03		LCMS-2
2010	03/08/10	R	0.28	0.06	0.25	0.59	0.03	0.03		LCMS-2
2010	03/22/10	R	0.19	0.06	0.25	0.50	0.03	0.05		LCMS-2
2010	04/05/10	R	0.21	0.11	0.25	0.57	0.07	0.05		LCMS-3
2010	04/12/10	R	0.10	0.06	0.25	0.41	0.03	0.03		LCMS-3
2010	04/19/10	R	0.22	0.10	0.25	0.57	0.12	0.03		LCMS-3
2010	04/26/10	R	0.20	0.03	0.25	0.48	0.09	0.17		LCMS-3
2010	05/03/10	R	0.16	0.10	0.25	0.51	6.31	0.35		LCMS-3
2010	05/10/10	R	0.15	0.34	0.25	0.74	7.46	0.45		LCMS-3
2010	05/17/10	R	0.13	0.28	0.25	0.66	18.28	0.61		LCMS-3

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2010	05/24/10	R	0.15	0.32	0.25	0.72	8.11	0.95		LCMS-3
2010	06/01/10	R	0.03	0.41	0.25	0.69	1.73	0.88		LCMS-3
2010	06/07/10	R	0.03	0.42	0.25	0.70	0.61	1.04		LCMS-3
2010	06/14/10	R	0.03	0.38	0.25	0.66	1.03	0.99		LCMS-3
2010	06/21/10	R	0.03	0.42	0.25	0.70	1.52	0.99		LCMS-3
2010	06/28/10	R	0.03	0.26	0.25	0.54	1.27	0.83		LCMS-3
2010	07/06/10	R	0.03	0.21	0.25	0.49	1.95	0.66		LCMS-3
2010	07/12/10	R	0.03	0.25	0.25	0.53	1.61	0.80		LCMS-3
2010	07/19/10	R	0.03	0.40	0.25	0.68	1.32	0.61		LCMS-3
2010	07/26/10	R	0.03	0.15	0.25	0.43	1.05	0.42		LCMS-3
2010	08/02/10	R	0.03	0.11	0.25	0.39	0.69	0.33		LCMS-3
2010	08/16/10	R	0.03	0.14	0.25	0.42	0.50	0.29		LCMS-3
2010	08/30/10	R	0.03	0.09	0.25	0.37	0.49	0.24		LCMS-3
2010	09/13/10	R	0.03	0.10	0.25	0.38	0.44	0.20		LCMS-3
2010	09/27/10	R	0.03	0.08	0.25	0.36	0.39	0.16		LCMS-3
2010	10/04/10	R	0.03	0.07	0.25	0.35	0.36	0.21		LCMS-3
2010	10/12/10	R	0.03	0.07	0.25	0.35	0.35	0.14		LCMS-3
2010	10/18/10	R	0.03	0.08	0.25	0.36	0.35	0.20		LCMS-3
2010	10/25/10	R	0.03	0.09	0.25	0.37	0.34	0.21		LCMS-3
2010	11/01/10	R	0.03	0.06	0.25	0.34	0.31	0.17		LCMS-3
2010	11/08/10	R	0.03	0.06	0.25	0.34	0.27	0.18		LCMS-3
2010	11/15/10	R	0.03	0.08	0.25	0.36	0.34	0.18		LCMS-3
2010	11/22/10	R	0.03	0.03	0.25	0.31	0.29	0.18		LCMS-3
2010	11/29/10	R	0.26	0.06	0.25	0.57	0.29	0.17		LCMS-3
2010	12/06/10	R	1.17	0.09	0.25	1.51	0.20	0.11		LCMS-3
2010	12/13/10	R	1.21	0.10	0.25	1.56	0.22	0.13		LCMS-3
2010	12/20/10	R	1.33	0.09	0.25	1.67	0.18	0.11		LCMS-3
2010	12/27/10	R	1.28	0.11	0.25	1.64	0.14	0.08		LCMS-3
2011	01/10/11	R	1.26	0.10	0.25	1.61	0.16	0.07		LCMS-3
2011	01/24/11	R	1.19	0.06	0.25	1.50	0.13	0.08		LCMS-3
2011	02/07/11	R	1.07	0.08	0.25	1.40	0.14	0.07		LCMS-3

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2011	02/22/11	R	1.26	0.07	0.25	1.58	0.13	0.10		LCMS-3
2011	03/07/11	R	1.11	0.17	0.25	1.53	0.03	0.03		LCMS-3
2011	03/21/11	R	0.86	0.08	0.25	1.19	0.03	0.03		LCMS-3
2011	04/04/11	R	0.64	0.13	0.25	1.02	0.03	0.03		LCMS-3
2011	04/11/11	R	0.73	0.11	0.25	1.09	0.03	0.03		LCMS-3
2011	04/18/11	R	0.60	0.08	0.25	0.93	0.03	0.03		LCMS-3
2011	04/25/11	R	0.47	0.15	0.25	0.87	0.44	0.03		LCMS-3
2011	05/02/11	R	0.35	0.17	0.25	0.77	0.60	0.09		LCMS-3
2011	05/09/11	R	0.85	0.39	0.25	1.49	0.41	0.15		LCMS-3
2011	05/16/11	R	0.24	0.18	0.25	0.67	0.47	0.07		LCMS-3
2011	05/23/11	R	0.18	0.15	0.25	0.58	0.62	0.08		LCMS-3
2011	05/31/11	R	0.27	0.27	0.25	0.79	3.56	0.19		LCMS-3
2011	06/06/11	R	0.21	0.33	0.25	0.79	3.43	0.31		LCMS-3
2011	06/13/11	R	0.16	0.37	0.25	0.78	4.70	0.42		LCMS-3
2011	06/20/11	R	0.07	0.53	0.25	0.85	4.33	0.62		LCMS-3
2011	06/27/11	R	0.03	0.38	0.25	0.66	0.68	0.81		LCMS-3
2011	07/05/11	R	0.03	0.51	0.25	0.79	0.44	0.63		LCMS-3
2011	07/11/11	R	0.03	0.38	0.25	0.66	0.64	0.58		LCMS-3
2011	07/18/11	R	0.03	0.45	0.25	0.73	0.86	0.61		LCMS-3
2011	07/25/11	R	0.03	0.37	0.25	0.65	0.77	0.59		LCMS-3
2011	08/08/11	R	0.03	0.30	0.25	0.58	0.71	0.63		LCMS-3
2011	08/22/11	R	0.03	0.40	0.25	0.68	0.73	0.62		LCMS-3
2011	09/06/11	R	0.03	0.36	0.25	0.64	0.75	0.59		LCMS-3
2011	09/19/11	R	0.03	0.26	0.25	0.54	0.68	0.59		LCMS-3
2011	10/03/11	R	0.03	0.33	0.25	0.61	0.70	0.62		LCMS-3
2011	10/11/11	R	0.03	0.34	0.25	0.62	0.66	0.62		LCMS-3
2011	10/17/11	R	0.03	0.35	0.25	0.63	0.70	0.58		LCMS-3
2011	10/24/11	R	0.03	0.28	0.25	0.56	0.61	0.54		LCMS-3
2011	10/31/11	R	0.03	0.30	0.25	0.58	0.63	0.52		LCMS-3
2011	11/07/11	R	0.03	0.29	0.25	0.57	0.65	0.52		LCMS-3
2011	11/14/11	R	0.03	0.32	0.25	0.60	0.54	0.51		LCMS-3

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2011	11/21/11	R	0.03	0.31	0.25	0.59	0.56	0.51		LCMS-3
2011	11/28/11	R	0.03	0.29	0.25	0.57	0.60	0.52		LCMS-3
2011	12/05/11	R	0.03	0.35	0.25	0.63	0.58	0.54		LCMS-3
2011	12/12/11	R	0.03	0.20	0.25	0.48	0.62	0.68		LCMS-3
2011	12/19/11	R	0.13	0.23	0.25	0.61	0.54	0.52		LCMS-3
2011	12/27/11	R	0.19	0.30	0.25	0.74	0.56	0.50		LCMS-3
2012	01/09/12	R	0.32	0.33	0.25	0.90	0.48	0.49		LCMS-3
2012	01/23/12	R	0.46	0.33	0.25	1.04	0.53	0.48		LCMS-3
2012	02/06/12	R	0.56	0.33	0.25	1.14	0.48	0.49		LCMS-3
2012	02/21/12	R	0.75	0.36	0.25	1.36	0.42	0.43		LCMS-3
2012	03/05/12	R	0.77	0.37	0.25	1.39	0.39	0.34		LCMS-3
2012	03/19/12	R	0.80	0.48	0.25	1.53	0.34	0.39		LCMS-3
2012	03/26/12	R	0.86	0.39	0.25	1.50	0.35	0.32		LCMS-3
2012	04/02/12	R	0.87	0.44	0.25	1.56	0.33	0.33		LCMS-3
2012	04/09/12	R	0.78	0.31	0.25	1.34	0.33	0.31		LCMS-3
2012	05/09/12	R	0.28	0.76	0.25	1.29	5.07	0.58		LCMS-3
2012	05/14/12	R	0.18	0.44	0.96	1.58	4.00	0.70		LCMS-3
2012	05/21/12	R	0.16	0.51	0.25	0.92	2.60	0.57		LCMS-3
2012	05/29/12	R	0.03	0.63	0.25	0.91	0.03	0.75		LCMS-3
2012	06/04/12	R	0.03	0.73	0.25	1.01	0.09	0.98		LCMS-3
2012	06/11/12	R	0.03	0.85	0.57	1.45	0.16	1.07		LCMS-3
2012	06/18/12	R	0.06	0.94	0.25	1.25	0.31	1.77		LCMS-3
2012	06/25/12	R	0.05	1.05	0.25	1.35	0.26	1.65		LCMS-3
2012	07/02/12	R	0.07	1.06	0.55	1.68	0.39	1.87		LCMS-3
2012	07/09/12	R	0.06	1.04	0.63	1.73	0.31	1.59		LCMS-3
2012	07/16/12	R	0.07	0.82	0.57	1.46	0.36	1.46		LCMS-3
2012	07/23/12	R	0.06	1.10	0.59	1.75	0.41	1.61		LCMS-3
2012	07/30/12	R	0.07	0.97	0.56	1.60	0.38	1.71		LCMS-3
2012	08/13/12	R	0.06	1.05	0.56	1.67	0.39	1.60		LCMS-3
2012	08/27/12	R	0.06	0.94	0.59	1.59	0.35	1.40		LCMS-3
2012	09/10/12	R	0.03	0.62	0.54	1.19	0.29	1.07		LCMS-3

Year	Sample Date	Raw or Finished Water	Simazine ppb	G28279 ppb	G28273 ppb	Simazine-based TCT ppb	Atrazine ppb	G30033 ppb	Metolachlor ppb	Method of Analysis
2012	09/24/12	R	0.03	0.60	0.25	0.88	0.25	0.90		LCMS-3
2012	10/01/12	R	0.03	0.55	0.25	0.83	0.27	1.03		LCMS-3
2012	10/08/12	R	0.03	0.30	0.25	0.58	0.15	0.66		LCMS-3
2012	10/15/12	R	0.03	0.35	0.25	0.63	0.16	0.75		LCMS-3
2012	10/22/12	R	0.03	0.31	0.25	0.59	0.13	0.73		LCMS-3
2012	10/29/12	R	0.03	0.48	0.25	0.76	0.23	0.85		LCMS-3
2012	11/05/12	R	0.06	0.47	0.25	0.78	0.23	0.80		LCMS-3
2012	11/12/12	R	0.03	0.26	0.25	0.54	0.14	0.57		LCMS-3
2012	11/19/12	R	0.03	0.25	0.25	0.53	0.08	0.60		LCMS-3
2012	11/26/12	R	0.03	0.25	0.25	0.53	0.16	0.53		LCMS-3
2012	12/03/12	R	0.03	0.31	0.25	0.59	0.16	0.56		LCMS-3
2012	12/10/12	R	0.03	0.22	0.25	0.50	0.13	0.53		LCMS-3
2012	12/17/12	R	0.07	0.29	0.25	0.61	0.13	0.61		LCMS-3
2012	12/27/12	R	0.09	0.26	0.25	0.60	0.12	0.47		LCMS-3

Attachment 2

Watershed Pictures

Attachment 3

Responsiveness Summary

This responsiveness summary responds to substantive questions and comments on the Lake Glenn Shoals and Old Hillsboro Lake Atrazine Total Maximum Daily Load (TMDL) Report received during the public comment period through September 19, 2013(determined by postmark). The summary includes questions and comments from the August 20, 2013 public meeting as discussed below.

What is a TMDL?

A Total Maximum Daily Load (TMDL) is the sum of the allowable amount of a pollutant that a water body can receive from all contributing sources and still meet water quality standards or designated uses. Each contributing source of the pollutant will be assigned an amount of pollutant which it cannot exceed if the TMDL is to be met. This amount is called an "allocation." A TMDL is developed for each waterbody segment that is impaired by pollutants that have numeric water quality standards.

This TMDL is for atrazine in Lake Glenn Shoals and Old Hillsboro Lake. The report details the watershed characteristics, impairments, pollutant sources, load allocations, and reductions for the impaired lake in the watershed. The Illinois EPA implements the TMDL program in accordance with Section 303(d) of the Federal Clean Water Act and regulations there under.

Background

Lake Glenn Shoals and Hillsboro Old Lake are located in the Middle Fork Shoal Creek Watershed in Montgomery County. The watersheds cover approximately 53,039 acres (83 square miles). The lakes are impaired for public water supply designated use due to atrazine. The Clean Water Act and USEPA regulations require that states develop TMDLs for waters that do not meet water quality standards and have been placed on the Section 303(d) List. TMDL load allocations and reductions for atrazine in Lake Glenn Shoals are presented in the report. At the TMDL meeting, IEPA was informed that water from Hillsboro Old Lake has not been used for 10-12 years at the water plant. A previous TMDL was completed and approved on 2005 for the Lake Glenn Shoals and Hillsboro Old Lake http://www.epa.state.il.us/water/tmdl/report/glen-shoals/approved-report.pdf). The approved TMDL parameters for Lake Glenn Shoals include phosphorus and total suspended solids and for Hillsboro Old Lake include phosphorus, manganese and total suspended solids.

Public Meeting

A public meeting was held at the University of Illinois Extension office at 6 p.m. on August 20, 2013. The purpose of the meeting was to provide the public with an opportunity to comment on the Atrazine TMDL and to provide additional data that may be included in the TMDL development process. The Illinois EPA announced the public notice by placing a display ad in the local newspaper in the watershed; The Journal-

News. The public notice gave the date, time, location, and purpose of the meeting. It also provided references to obtain additional information about this specific site, the TMDL Program, and other related issues. The public notice was also mailed to citizens and organizations in the watershed by first class mail. The draft TMDL Report was available for review at the University of Illinois Extension Office and on the Agency's web page at http://www.epa.state.il.us/public-notices/general-notices.html. Approximately 12 people attended the meeting.

Questions/Comments

1. Why is a TMDL Being Proposed? In 2006, TMDLs were developed for phosphorus for Glenn Shoals Lake, and phosphorus and manganese for Hillsboro Old Lake. Illinois EPA's 2012 Draft Section 303(d) List listed Glenn Shoals Lake as impaired for mercury and manganese, and Hillsboro Old Lake was not listed at all. Illinois EPA's 2014 Draft Section 303(d) List listed Glenn Shoals Lake as impaired for mercury, manganese and atrazine, and Hillsboro Old Lake was listed as impaired for atrazine. Therefore, atrazine was not listed as an impairment in the watershed until the 2014 draft Section 303(d) List, which was just released for public comment this summer and is still in draft form. Representatives of Illinois EPA stated at the public meeting that a decision was made internally at Illinois EPA to develop a TMDL for the watershed despite it being omitted from the 2012 Section 303(d) List. We believe that the TMDL development for the watershed is premature, if not altogether unnecessary. Further, if Illinois EPA can choose to use available updated data in some situations, then available updated information should be considered by Illinois EPA in all possible situations.

   Response: The Draft Illinois Water Quality Report includes all data available through 2011. Both Lake Glenn Shoals and Hillsboro Old were listed on the Draft 2014 Integrated Report since IEPA believed both lakes were being used as sources of drinking water for the lake. It was at the public meeting that IEPA was informed Hillsboro Old has not been used for 10 to 12 years for a water supply, but remains an emergency back-up supply. Both lakes are still considered public water supplies but data from the intake will only be used for Lake Glenn Shoals. Data used for TMDL development was provided by Syngenta who was required to monitor for atrazine.

2. The proposed TMDL is based on data that is not current and does not accurately reflect the current water quality of Glenn Shoals Lake/Hillsboro Old Lake. Specifically, the most recent Illinois EPA data relied upon for the draft TMDL is from 2008 for Glenn Shoals Lake and 2007 for Hillsboro Old Lake.

   Response: The last historical data that IEPA used for past assessments was 2007 and 2008. More up to date data from Syngenta (2009- 2011) was used for the latest IEPA assessment of public water supply. Data is included in the TMDL Report.

3. We are also concerned that the BMPs currently in place in the Glenn Shoals Lake/Hillsboro Old Lake watershed are not being considered by Illinois EPA in its determination regarding whether a TMDL is necessary, nor are they considered in the draft TMDL implementation plan. The draft TMDL report discusses projects done in the watershed from 2003 to 2008, but does not identify additional BMPs implemented in the watershed after that time. It is very likely that actions taken from 2003 to 2008, and then after, resulted in load reductions of atrazine. As such, BMPs currently in practice in the Glenn Shoals Lake/Hillsboro Old Lake watershed should be considered as Illinois EPA determines whether a TMDL is necessary in this watershed.

   Response: Additional information was added to Section 4.4. Projects from the Resource Management Mapping Service (RMMS) were identified and listed in the report.

3. Numerous data management issues and mathematical errors render the load and load reduction calculations in these TMDLs inaccurate. As a result, the TMDLs need to be recalculated. We suggest that the current TMDL should be withdrawn, a complete and accurate data set assembled, the impaired status of both water bodies should be re-assessed, and load and load reductions recalculated (if necessary). A second public comment period should follow.

   Response: We have corrected the error and the load calculations are based on the newer data. We are only using the Syngenta intake data for Lake Glenn Shoals since the City has only been withdrawing from that lake only. The TMDL allocations will not include Hillsboro Old Lake.

4. Glen Shoals Lake atrazine monitoring data are available from Syngenta for 13 of the past 14 years. These monitoring data show that the running 4-quarter average atrazine concentration in Lake Glen Shoals has not exceeded the MCL of 3 ppb over this 14-year period of time. Monitoring data show that the concentration in Old Hillsboro Lake has not exceeded the MCL of 3 ppb over the period of time monitored.

   Response: Data from 2009 through 2011 was used for the 2014 assessment. This was the latest data available. The quarterly average from April through June of 2010 was 3.59 mg/L and exceeded the MCL. Also, one sample was 18.28 mg/L atrazine which is over fourfold the MCL. Data available from the Syngenta data provided to us at the time of the report, was 2006 through 2012 and was provided in the appendix to the TMDL report.

5. Current atrazine water quality criteria utilized by IEPA are outdated based upon current science for protection of human health in drinking water. Discussion in the TMDL related to atrazine and human health do not reflect the most recent science and reviews by multiple authorities including USEPA and the World

Health Organization. The TMDL should be updated to reflect current research and reviews. An update of IEPA atrazine criteria is requested.

Response: The Federal MCL for atrazine is 0.003 mg/L or 3 ug/L. The Illinois Pollution Control Board (IPCB) has adapted the Federal MCL as the state standard. The Illinois EPA uses this as the standard for listing waters impaired for public water supply designated use. This determination is the level of atrazine in drinking water at which no adverse health effects are likely to occur.

6. The TMDL specifies that monitoring data from the most recent three years of data be used to evaluate impairment and develop the TMDL. In the draft TMDL, data for seven years (Syngenta 2009 and 2011; IEPA 2008, 2006, 2003, 2001 and 2000) were used to characterize the water body and develop atrazine load and load reductions. The reason for this selective use of data was not provided, however this selective use of data has led to an inaccurate characterization of atrazine in these water bodies. The most recent three years of data should be used.

   Response: The average of the exceedences from 2009 through 2011 was used in the updated report. Please refer to sections 6 and 7 for complete information.

7. The MCL used in the draft TMDL uses outdated and inaccurate science. The US EPA established a single day atrazine criteria of 298 ppb which includes a 300 fold margin of safety from the No Observed Effects Level (NOEL). The Illinois EPA used a single day atrazine criteria of 3 ppb for modeling atrazine reductions (i.e. no single sample should exceed 3 ppb). This is 100 times more restrictive. The US EPA established a 90-day average atrazine + degredates criteria of 37.5 ppb which includes a 300 fold margin of safety from the NOEL. The Illinois EPA uses a quarterly average (~ 90 days) of 3 ppb. This is approximately 10 times more restrictive. The US EPA established a lifetime average atrazine MCL of 3 ppb based upon an average of a running 4-quarter average, which includes a 1000 fold margin of safety from the NOEL and other conservative factors as discussed below. The MCL published in 1991 (USEPA, 1991) does not include the research and assessments conducted since that time. The MCL was based on a reference dose of 0.0048 mg/kg/day (rounded to 0.005 mg/kg/day) which was set from a mode of action that has since been proven to be not relevant to humans. In 2006, USEPA/OW published an updated reference dose of 0.018 mg/kg/day, rounded to 0.02 mg/kg/day (USEPA, 2006a), a value 4 fold greater than the value used to set the 1991 MCL. USEPA/OW has yet to revise the MCL, stating in the federal register in 2010 that it would consider revision after USEPA completed its re-evaluation of the risk assessment begun by the Office of Pesticide Programs in 2009 (USEPA, 2010).

   A few other aspects related to the extreme conservatism of the current 3 ppb lifetime MCL are; In calculating the 3 ppb MCL, EPA/OW included the assumption that 80% of the exposure would be from food items. However, atrazine residues do not occur in food items. EPA/OPP stated in 2006 that

"Monitoring data from USDA's Pesticide Data Program and Food Safety Inspection Service, and registrant supplied laboratory and field data confirm that exposures to triazine residues in or on foods are negligible." (USEPA 2006b). EPA/OW has in essence included a 5 fold safety margin by assigning 80% exposure as coming from the diet when in reality residues from food items are negligible. The current 3 ppb MCL included a 1000 fold safety factor, which included a standard 100x safety factor generally applied to all pesticides, plus an extra 10x safety factor. In discussing the extra 10X safety factor, the FIFRA Scientific Advisory Panel of 2011 stated, "An extensive hazard database, spanning all life stages from conception to adulthood for atrazine, indicates no unique susceptibility in the developing organism. Additionally, the proposed point of departure, based upon attenuation of the LH surge, appears to be protective against adverse reproductive/developmental outcomes such as delays in onset of puberty, disruption of ovarian cyclicity and inhibition of suckling- induced prolactin release." (USEPA, 2011) The SAP further stated that the FQPA safety factor that addresses hazard potential should be removed (i.e. reduced to 1X), and also gave the option that "…that the FQPA Safety Factor component addressing the hazard potential could be reduced not just to 1X, but further by at least five-fold (i.e., to 0.2X or less)." At the same FIFRA Scientific Advisory Panel meeting, EPA/OPP proposed that the 1.8 mg/kg/day No Observable Effect Level (NOEL) should be revised to 2.56 mg/kg/day (a 40% higher value). Additionally, the SAP stated that adverse impacts are not expected even at higher levels, stating that "the spontaneous LH surge is highly resistant to atrazine given that 10 mg/kg for 4 days was without effect. Furthermore, it is reasonable to conclude that a 4-day exposure to 100 mg/kg is unlikely to have adverse effects on ovarian cyclicity or puberty" (USEPA, 2011). In summary, the IEPA criterion not only carries an unusually large implicit margin of safety, the MCL used in the draft TMDL uses outdated and inaccurate science. Atrazine has been widely studied and there are many studies out there. We respectfully request Illinois EPA to immediately update CWA atrazine assessment and TMDL criteria to reflect 2013 atrazine science for the protection of human health in drinking water as adopted by the US EPA.

Response: Illinois EPA currently uses the MCL of 3 ug/L. There have been no changes to the IPCB rules and regulations and in the Federal MCL as of today. Please visit our website (http://www.epa.state.il.us/water/tmdl/atrazine-simazine.html) that includes links to information on atrazine in drinking water (USEPA), atrazine reregistration (USEPA), atrazine information from the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and Scientific Advisory Panel (SAP), atrazine toxicity from the Agency for Toxic Substances and Disease Registry (ATSDR) and atrazine studies by the USGS.

8. Do we test for Atrazine in lakes for aquatic life use? Why is this lake not impaired for aquatic life designated use?

Response: Aquatic life designated use in lakes is determined by looking at phosphorus, chlorophyll a, Secchi disk transparency, macrophyte coverage and nonvolatile suspended solids. Refer to page 30-35 in the Integrated Water Quality Report for more information- http://www.epa.state.il.us/water/tmdl/303-appendix/2014/iwq-report-surface-water.pdf. There are specific guidelines to meet the aquatic life use and if they are not met, causes are identified (atrazine is included). It was determined that Lake Glenn Shoals and Old Hillsboro Lake are meeting the aquatic life use and no causes need to be identified.