Environmental Protection Agency
Region 7
Total Maximum Daily Load
For Atrazine

Cedar Lake (04-LDM-03085-L_0)
Madison County, Iowa

for Karen A. Flournoy

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3-19-10
Date

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Acronyms and Abbreviations

Ac-ft	Acre – Feet
BMP	Best Management Practice(s)
CFR	Code of Federal Regulations
cm^3	Cubic Centimeter(s)
CPI	Crop Protection Incorporated
CRP	Conservation Reserve Program
CWA	Clean Water Act
DEA	Desethylated Atrazine
DIA	Desisopropyl Atrazine
DACT	Diaminochlorotriazine
DSC	Division of Soil Conservation
EPA 319	United States Environmental Protection Agency Section 319 Grant Program
EPA	United States Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ft^3	Cubic feet
GWLF	Generalized Watershed Loading Functions
HH	Human Health
HUC	Hydrologic Unit Code
IA	Iowa
IAC	Iowa Administrative Code
ID	Identification
IDNR	Iowa Department of Natural Resources
IEM	Iowa Environmental Mesonet
IFIP	Iowa Financial Incentive Program
kg	Kilogram(s)
lb	Pound(s)
LA	Load Allocation
m	Meter(s)
m^2	Square Meter(s)
m^3	Cubic Meter(s)
MCL	Maximum Contaminant Level
MDL	Maximum Daily Limit
mg/L	Milligrams per Liter
MOS	Margin of Safety
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
REAP	Resource Enhancement and Protection Tax Credit Program
SWCD	Soil Water Conservation District
TMDL	Total Maximum Daily Load
TSD	Technical Support Document
µg/L	Micrograms per Liter

Acronyms and Abbreviations (continued)

USGS	United States Geological Survey
VMP	Voluntary Monitoring Program
WLA	Wasteload Allocation
WPF	Water Protection Funds
WQS	Water Quality Standards

1 SUMMARY

This Cedar Lake Total Maximum Daily Load (TMDL) for atrazine is being established in accordance with Section 303(d) of the Clean Water Act (CWA), which requires a TMDL for each water body on a state's Section 303(d) List of impaired waters, herein referred to as 303(d) List, in accordance with requirements of Section 303 of the CWA; Water Quality Planning and Management Regulations, 40 Code of Federal Regulations (CFR) Part 130; and United States Environmental Protection Agency (EPA) guidance. EPA is establishing this TMDL to fulfill the requirements of the Consent Decree established as part of the *Sailors, Inc., Mississippi River Revival and Sierra Club v. EPA* Consolidated Case No. 98-134-MJM. Cedar Lake (04-LDM-03085-L_0) is included in the Consent Decree because it was on the Iowa (IA) 1998 303(d) List due to atrazine concentrations that exceeded IA Water Quality Standards (WQS). Cedar Lake is also included on the Iowa 2006 303(d) List because of atrazine impairment.

This document includes a TMDL for Cedar Lake assessed as impaired due to atrazine levels above the numeric criteria for drinking water supply (Class C) as defined in the Iowa WQS, 567 Iowa Administrative Code (IAC) 61.3(3). Cedar Lake is located in Madison County, Iowa; the listing applies to the entire lake (Table 1).

Table 1. Cedar Lake (04-LDM-03085-L_0) 303(d) List Summary

Water Body Name	Cedar Lake
Water Body Identification (ID) Number	04-LDM-03085-L_0
Segment Description	Entire Lake
County	Madison
Use Designation Classes	Aquatic Life (Class B[LW]), Human Health (Class Human Health [HH]), and Drinking Water Supply (Class C)
Major River Basin	Des Moines (Hydrologic Unit Code [HUC] 07100008)
Pollutant	Atrazine
Pollutant Sources	Agricultural Nonpoint Sources
Impaired Use	Drinking Water Supply (Class C)
2006 303(d) Priority	Medium
Watershed Area	10,380 Acres
Lake Area	88 Acres (90 Acres on Iowa Department of Natural Resources [IDNR] ADBNet – 305(b) Water Quality Assessment Database)
Load Allocation	34.1 kg/year (75.1 lbs/year)
Wasteload Allocation (WLA) for Point Sources	No Point Sources in Watershed; WLA = 0
Wasteload Allocation for MS4	No MS4 Permits in Watershed; WLA = 0

A TMDL quantifies the pollutant loading a water body can assimilate without exceeding the WQS for that pollutant. This Cedar Lake TMDL also establishes the pollutant load allocation necessary to meet the WQS based on the relationship between pollutant sources and in-stream conditions. The TMDL consists of a wasteload allocation (WLA), a load allocation (LA), and a margin of safety (MOS). The WLA is the fraction of the total pollutant load

apportioned to point sources, while the LA is the fraction apportioned to nonpoint sources. The MOS is a percentage of the TMDL intended to account for the uncertainty in the response between the pollutant load and resulting water quality. This is often related to model assumptions, data limitations, and analytical imprecision.

The key elements supporting the development of the atrazine TMDL are summarized below:

1. **Name and geographic location of the impaired or threatened water body for which the TMDL is being established:** Cedar Lake, S19, T76N, R27W, northeast of Winterset, Madison County, Iowa.

2. **Identification of the pollutant and applicable WQS:** The pollutant causing the water quality impairment is atrazine. Designated uses for Cedar Lake are Aquatic Life (Class B[LW]), Human Health (Class HH), and Drinking Water Supply (Class C). The atrazine limit for Class C waters is listed as the EPA drinking water maximum contaminant level (MCL), which is 3 micrograms per liter (µg/L). The Iowa Department of Natural Resources (IDNR) interprets this limit as a moving annual average to assess contaminant levels in drinking water supply lakes. Excess atrazine loading has impaired the potable water source water quality criteria, 567 IAC 61.3(3), and hindered the designated use. In addition, 567 IAC 61.3(3)(2) states for Class C waters: "All substances toxic or detrimental to humans or detrimental to treatment process shall be limited to nontoxic or nondetrimental concentrations in the surface water."

3. **Quantification of the pollutant load that may be present in the water body and still allow attainment and maintenance of the WQS:** The water quality target for this TMDL is 3 µg/L atrazine. Based on this concentration, the annual loading target is 34.1 kg/year (75.1 lb/year).

4. **Quantification of the amount by which the current pollutant load in the water body, including the pollutant from upstream sources that is being accounted for as background loading, deviates from the pollutant load needed to attain and maintain WQS:** Atrazine is present in Cedar Lake at levels above the target WQS of the MCL of 3 µg/L (567 IAC 61.3[3], Table 1). Atrazine levels must be reduced from 42.3 kg/year (93.2 lb/year) to 34.1 kg/year (75.1 lb/year) to meet the WQS and restore the beneficial uses of Cedar Lake. This is equivalent to an annual reduction of 19% from conditions present during 2001 – 2009. An assessment of monthly loads to the lake demonstrated that the spring period, in particular the month of May, accounted for most of the annual delivered load. Therefore, a 27% reduction in atrazine load, from 30.1 kg/year (66.3 lb/year) to 21.9 kg/year (48.3 lb/year) delivered during the month of May will result in achieving the TMDL and attainment of the surface WQS on an annual basis.

5. **Identification of pollution source categories**: Nonpoint sources of atrazine are identified as the cause of impairment in Cedar Lake. Atrazine is a systemic herbicide that is typically applied to row crops, primarily corn, during the growing season. Potential transport mechanisms include overland runoff, discharge from tile drainage systems, and contaminated dust that is delivered to the lake through wet and dry atmospheric deposition.

6. **WLAs for pollutants from point sources:** There are no point sources of atrazine in the Cedar Lake watershed; therefore, the WLA for atrazine is zero (µg/L). In the absence of a National Pollutant Discharge Elimination System (NPDES) permit, the discharges associated with sources were applied to the LA, as opposed to the WLA, for purposes of this TMDL. The decision to allocate these sources to the LA does not reflect any determination by EPA as to whether these discharges are, in fact, unpermitted point source discharges within this watershed. In addition, by establishing this TMDL with some sources treated as LAs, EPA is not determining that these discharges are exempt from NPDES permitting requirements. If sources of the allocated pollutant in this TMDL are found to be, or become, NPDES regulated discharges, their loads must be considered as part of the calculated WLA sum in this TMDL. WLA, in addition to that allocated here, is not available.

7. **LAs for pollutants from nonpoint sources:** The LA for nonpoint sources is 34.1 kg/year (75.1 lb/year). This load represents a 19% reduction in the existing annual load. Given that most, if not all, of the reductions will occur during the spring application period, the TMDL can be met through a 27% reduction in load delivered during the month of May alone. This percent reduction is equivalent to an average reduction of 8.2 kg (18.0 lb) during the month of May. The approach used to convert these loads to maximum daily values is based upon the maximum daily permit calculations provided by EPA (EPA, 1991). Daily maximum loads for the month of May are calculated based on the assumption that all reductions will be accounted for during this month. Daily maximum loads for May are calculated to be 2.39 kg/day (5.26 lb/day), based on the 95th percentile.

8. **MOS:** A MOS is incorporated implicitly in the selection and application of models used to develop the TMDL. In applying the Cedar Lake Simple Model, emphasis was placed on matching peak measured concentrations. As a result, the model tends to slightly over predict average monthly atrazine loads. In addition, TMDL calculations were based on the monthly period with the highest measured and modeled atrazine concentrations (May). Thus, the load reductions are conservative and have been developed for the most critical period of the year.

9. **Consideration of seasonal variation:** Atrazine loading to Cedar Lake occurs during all months; however, loading is highest during the weeks and months following spring application. Seasonal variation of atrazine application rates, watershed loads, and lake flushing rates are included in the computer modeling and in developing the daily and annual TMDL limits. Thus, seasonal variations are considered.

10. **Allowance for reasonably foreseeable increases in pollutant loads:** An allowance for increased atrazine loading was not included in this TMDL. Cedar Lake is a drinking water source and atrazine is a chemical of concern; therefore, it is unlikely that changes to Cedar Lake would result in an increased assimilative capacity of the lake.

2 CEDAR LAKE, DESCRIPTION AND HISTORY

2.1 CEDAR LAKE (04-LDM-03085-L_0)

Cedar Lake, constructed in 1939 and located northeast of Winterset, Iowa, (Figure 1) has been used as a source of drinking water for the Winterset community since 1940. Today it provides water for approximately 4,786 people in Madison County (IDNR, 2004).

Public uses of Cedar Lake include fishing, picnicking, hiking, bicycling, bird watching, canoeing, sail boating, ice skating, cross country skiing, and waterfowl hunting. The Winterset Municipal Water Utility has previously enlarged two parking areas and regraded the boat ramp to better accommodate visitors. The shoreline park and the lake average 2,400 user days per year (IDNR, 2005).

The surface area of Cedar Lake has been reported at 88 acres, in the Cedar Lake TMDL for nitrate (IDNR, 2005), and 90 acres, in Iowa's 305(b) water quality assessment database, ABDNet (IDNR, 2008). However, much of this area is very shallow due to high sediment loads. For the purposes of this report, 88 acres is used because the loading analysis in this report is based on models developed in conjunction with the Cedar Lake TMDL for nitrate. A more accurate measure of the usable surface area would be approximately 65 acres. The storage volume is approximately 792 ac-ft. The original volume of Cedar Lake has decreased by approximately 310 ac-ft despite raising the spillway in 1979 to increase the lake's volume. Cedar Lake has a mean depth of 9.0 feet and a maximum depth of 18 feet.

Cedar Lake is fed by and discharges to Cedar Creek, a tributary of the North River. Total inflow to the lake was determined using the BasinSim 1.0 Watershed Simulation Program (Ting et al., 1999). BasinSim 1.0 was run from April 1995 through March 2009 and simulated an average monthly inflow of 837,691 cubic meters (m^3), with a peak monthly inflow volume of 8,121,600 m^3. During this period, the lowest simulated flows occurred in January. Simulated low flows averaged 175,242 m^3 in January and ranged from 0 – 634,500 m^3. The estimated annual average detention time for Cedar Lake is 0.097 years based on inflow and lake volume.

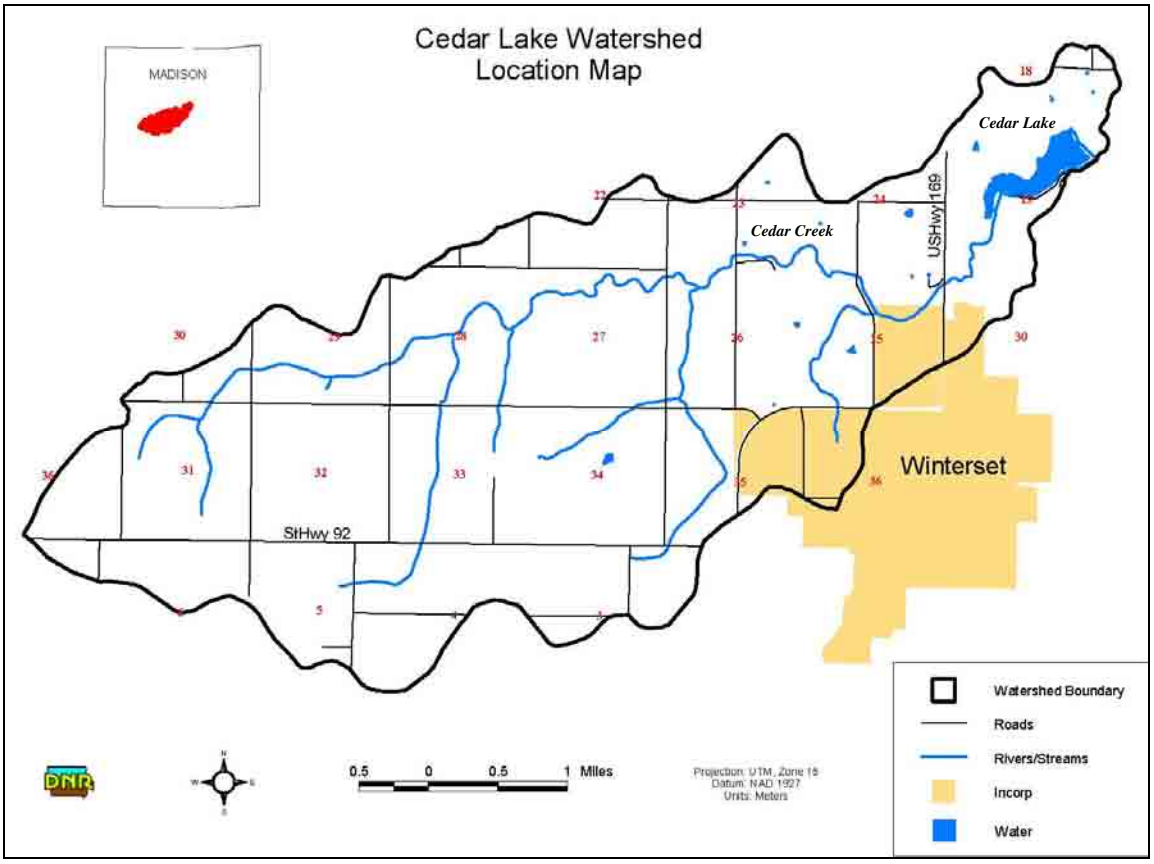


Figure 1. Location of Cedar Creek, Cedar Lake, and the Cedar Lake Watershed (IDNR, 2005)

2.2 THE WATERSHED (04-LDM-03085-L_0)

The Cedar Lake watershed has an area of approximately 10,380 acres, excluding the lake area, and has a watershed-to-lake ratio of 118:1. Land use data was collected in 2003 by the Madison County Soil Water Conservation District (SWCD) in cooperation with the Nonpoint Source Program of the IDNR. The relative area and percent of total watershed area of each land use/land cover is presented in Table 2 and Figure 2.

Table 2. Land Use/Land Cover in Cedar Lake Watershed (Madison County, Iowa)

Land Use	Area (acres)	Percent of Total Area (%)
Row Crop	8,430	81.2
Timber	590	5.7
Pasture	350	3.4
Farmstead	260	2.5
Grassland	220	2.1
Hay	160	1.5
Roads	150	1.4
Industrial/Commercial	130	1.3
Residential	50	0.5
Grazed Timber	30	0.3
Water	10	0.1
Total	**10,380**	**100**

Source: Madison County SWCD online at: http://downloads.ddti.net/MadisonIA

The watershed contains predominantly gently sloping, highly productive soils. The topography of the watershed ranges from very flat A and B soil groups to moderately sloping C and D soils. Two-thirds of the cropland is designated as non-highly erodible. These soils erode at less than, Soil Loss Tolerance, "T," the maximum amount of erosion at which the quality of a soil as a medium for plant growth can be maintained (Natural Resources Conservation Service [NRCS], 2009). The remaining acres potentially have soils that exceed "T" soil loss. Soils in the watershed are of the Macksburg-Winterset association and the Sharpsburg-Lamoni association. A small portion of the watershed in close proximity to the lake is of the steeper Clinton-Lindley-Steep rock land-Clanton association. Figure 3 shows the spatial distribution of soil types in the watershed.

Average rainfall in the area is 33 inches/year, with the greatest monthly amount falling in May. Prior to 2002, several best management practices (BMPs) were present in the Cedar Lake watershed. This included terracing on over 700 acres of cropland. While terraces are beneficial for erosion reduction, tile drainage from terraces provides a direct conduit through which atrazine can be directly transported to waterways and Cedar Lake.

Over the past several years, a watershed protection project has been implemented in the Cedar Lake watershed. The goals of the project included the implementation of soil and water conservation plans for 70% of the watershed area, the installation of six grade stabilization structures with downstream wetlands, and the establishment of 100 acres of conservation buffers. The project and its various components were funded by the EPA Section 319 Grant Program (EPA 319), the Environmental Quality Incentives Program (EQIP), the Resource Enhancement and Protection Tax Credit Program (REAP), the Iowa Financial Incentive Program (IFIP), Water Protection Funds (WPF), the Conservation Reserve Program (CRP), and the Division of Soil Conservation (DSC) with additional support from the Winterset Municipal Utilities.

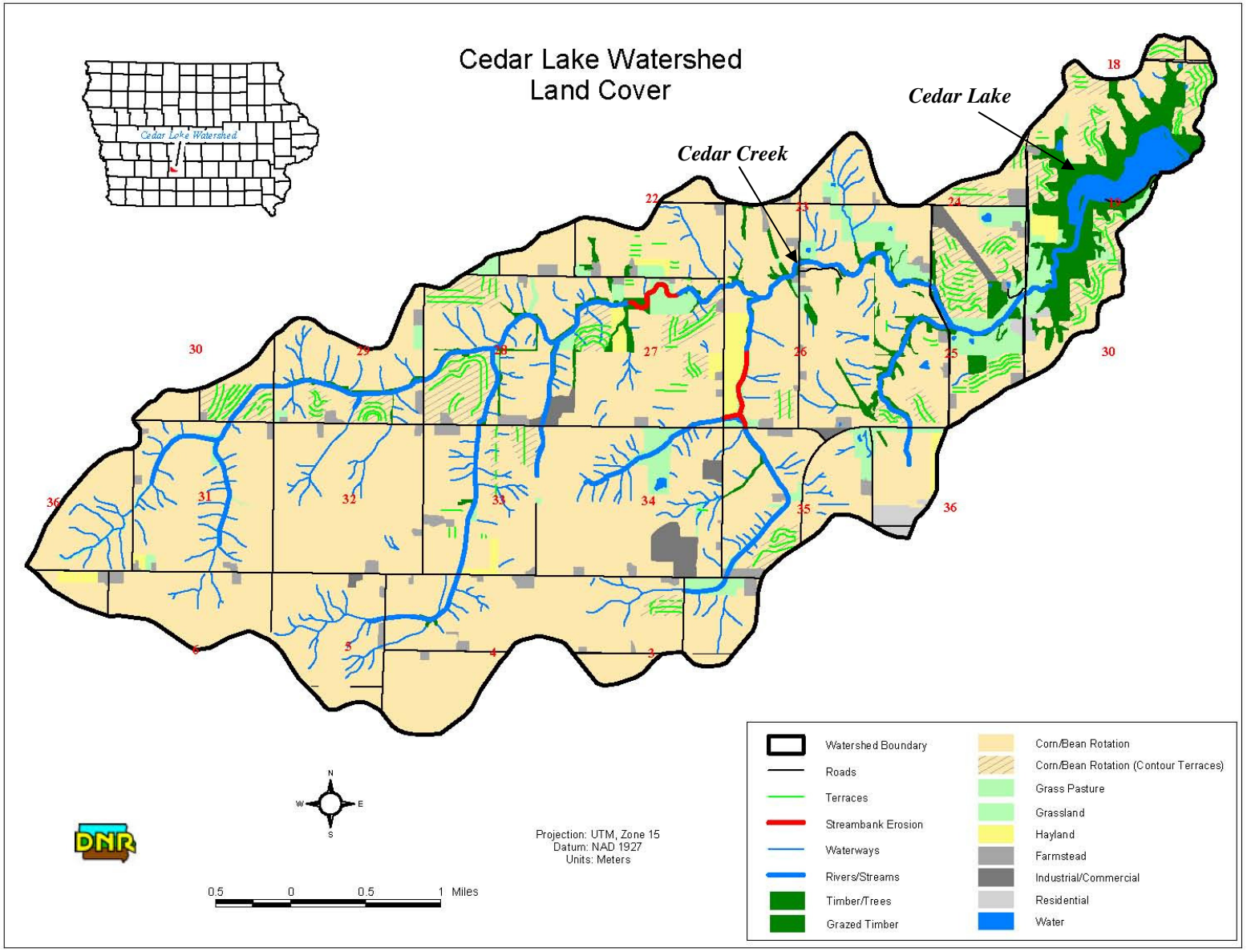


Figure 2. Land Use/Land Cover (2002) in the Cedar Lake Watershed, Madison County, Iowa (IDNR, 2005)

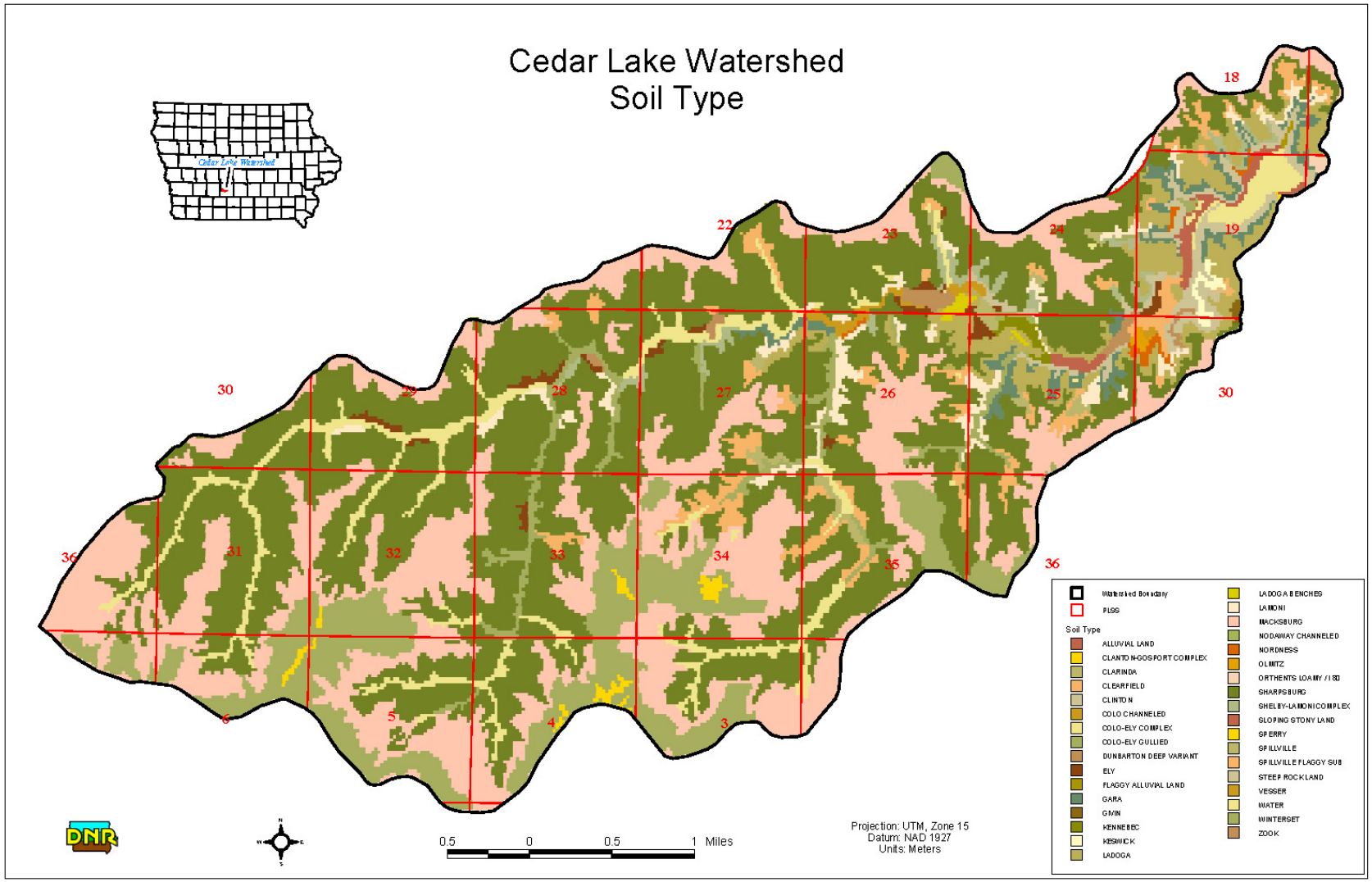


Figure 3. Soil Type in the Cedar Lake Watershed, Madison County, Iowa (IDNR, 2005)

3 TMDL FOR ATRAZINE

3.1 PROBLEM IDENTIFICATION

3.1.1 Impaired Beneficial Uses and Applicable Water Quality Standards

The IDNR 2006 Water Quality Assessment (IDNR, 2006) specifies the following uses for Cedar Lake, 04-LDM-03085-L_0:

- Aquatic Life (Class B[LW])
- Drinking Water Supply (Class C)
- Human Health (Class HH)

The impaired use is Drinking Water Supply (Class C). Iowa specific water quality criteria for Class C waters, 567 IAC 61.3(3)c(2), state that "All substances toxic or detrimental to humans or detrimental to treatment process shall be limited to nontoxic or nondetrimental concentrations in the surface water." In 1998, Cedar Lake was included on the 303(d) List due to elevated levels of atrazine. This assessment was based on the voluntary monitoring program administered by the agribusiness Syngenta Crop Protection, Inc. (Syngenta). For the 2002 assessment period, data from the sampling program indicated that atrazine levels in Cedar Lake had decreased to levels below the drinking water standard, and Cedar Lake was removed from the Iowa 303(d) List. However, water quality data collected by the Syngenta "Iowa Voluntary Atrazine Monitoring Program" from 2002 – 2004 showed average levels of atrazine above the MCL, and Cedar Lake was listed as "impaired" on the 2006 303(d) List. According to IDNR ADBNet – 305(b) Water Quality Assessment Database:

> "This monitoring [the Syngenta 'Iowa Voluntary Atrazine Monitoring Program'] showed that although the time-weighted mean levels of atrazine in samples collected from Cedar Lake in these three calendar years [2002 – 2004] were below the MCL of 3 µg/l, moving annual average concentrations did exceed the MCL. The time-weighted mean of atrazine in 2002 (N=16) was 3.39 µg/l, in 2003 (N=27) was 2.6 µg/l, and in 2004 (N=33) was 2.0 µg/l. Eleven of the 66 moving annual averages calculated for the three-year period exceeded the MCL of 3 µg/l (maximum = 3.7 µg/l). Based on IDNR's Section 305(b) assessment methodology, if the average contaminant levels in source water are greater than the MCL, the Class C (drinking water) uses of the source water should be assessed as 'not supported.' The high levels of atrazine (4 to 5.3 µg/l) that occurred in samples taken from mid-May to early November 2002 resulted in moving annual averages that exceeded the atrazine MCL." (IDNR, 2008)

3.1.1.1 Interpreting Cedar Lake Water Quality Data

Atrazine data collected from 2001 – 2009 is presented in Appendix A. Based on the moving annual average method of assessing compliance with water quality criteria, Cedar Lake was out of compliance during this period. Results from the moving annual average analysis are presented in Section 3.2.2 of this report.

3.1.2 Key Sources of Data

Atrazine measurements were collected in Cedar Lake on a bimonthly (or more frequent) basis at the Winterset Water Treatment Plant raw water intake during 2001 – 2009. During this period, approximately 226 individual atrazine samples were collected. This data is presented in Appendix A.

In 2005, IDNR developed a TMDL for nitrate in Cedar Lake. In developing this TMDL, a watershed model (BasinSim 1.0) and a lake model (Simple Lake Model) were used to estimate hydrologic inputs and in-lake volumes and concentrations. These models are also used in this TMDL to estimate existing and allowable atrazine concentrations and loads to the lake and in the lake.

The following data, models, and studies were acquired and assessed to support TMDL development for atrazine:

- *Application Technology and Best Management Practices for Minimizing Herbicide Runoff* (Baker and Mickelson, 1994)
- *Managing to Minimize Atrazine Runoff* (Devlin et al., 2000)
- Cedar Lake Watershed Project (IDNR, 2004)
- *TMDL for Nitrates, Cedar Lake, Madison County, Iowa* (IDNR, 2005)
- Generalized Watershed Loading Function (GWLF) model (Haith et al., 1992) and the BasinSim 1.0 model used to develop the Cedar Lake TMDL for nitrate (Ting, et al., 1999)
- Simple Lake Model, a well-mixed lake spreadsheet model developed by Chapra (2001)
- Atrazine data collected at the Winterset Water Treatment Plant during 2001 – 2009 by Syngenta Crop Protection, Incorporated (CPI)

3.2 TMDL TARGET

3.2.1 Criteria for Assessing Water Quality Standards Attainment

Designated uses for Cedar Lake are Aquatic Life (Class B[LW]), Human Health (Class HH), and Drinking Water Supply (Class C). The atrazine limit for Class C waters is listed as the EPA drinking water MCL, which is 3 µg/L (567 IAC 61.3[3], Table 1). Excess atrazine loading has resulted in exceedances of the water quality criteria for drinking supply sources (567 IAC 61.3[3]). These water quality conditions do not support the designated beneficial use of the water body.

3.2.2 Selection of Environmental Conditions

Atrazine loadings are flow dependent and seasonal with the highest observed concentrations typically occurring in the spring and early summer. Figure 4 presents atrazine measurements collected in raw water at the Winterset Water Treatment Plant during 2001 – 2009 and the moving annual average concentration. During the 2001 – 2009 period, single point measurements exceeded the 3 µg/L limit in February (one time), May (nine times), June (thirteen times), July (five times), and August (two times). The greatest atrazine concentrations typically

occur during May. In-lake concentrations during 2001 – 2009 were the highest during May 2004 and May 2005. The high concentrations in Cedar Lake during summer months coincide with herbicide application; however, sampling events were conducted more frequently during the spring and early summer months. A moving annual average concentration shows annual averages exceed the 3 µg/L limit between May 2004 – April 2005 and June 2005 – May 2006 (Figure 4, next page).

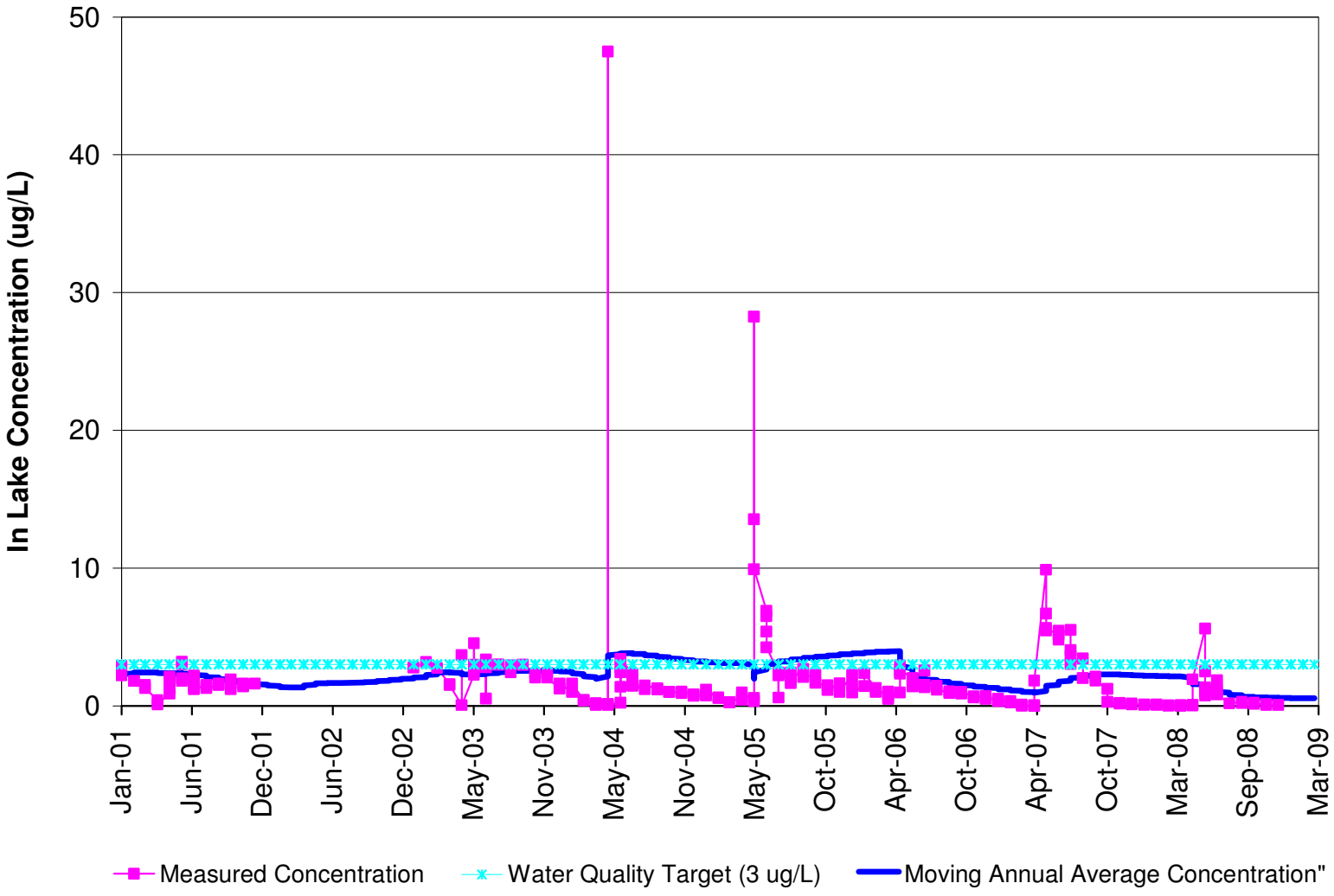


Figure 4. Atrazine Concentration and Moving Annual Average Concentration in Cedar Lake (2001 – 2009)

3.2.3 Modeling Approach

Atrazine loading to the lake was estimated using an existing Cedar Lake watershed model entitled BasinSim 1.0 (Ting, et al., 1999), a Simple Lake Model and 2001 – 2009 in-lake atrazine measurements collected at the Winterset Water Treatment Plant.

The Cedar Lake BasinSim 1.0 application was developed in conjunction with the Cedar Lake TMDL for nitrate (IDNR, 2005). This model incorporates Generalized Watershed Loading Functions (GWLF) Version 2.0 (Haith et al., 1992), a model capable of simulating watershed hydrology and developing cumulative monthly water inflows to the lake. The GWLF model was used to estimate monthly average volumes (m^3) entering the lake from the watershed during 1995 – 2009. Model inputs for temperature and precipitation were obtained from Winterset Weather Station (IA9132) through the Iowa Environmental Mesonet (IEM) website (IEM, 2009). Transport parameters (e.g., land use area, runoff curve number, groundwater recession and seepage coefficients, etc.) for this application were identical to those used in the Cedar Lake TMDL for nitrate (IDNR, 2005). The Cedar Lake TMDL for nitrate used hydrologic parameters that were calibrated from a similar watershed, Squaw Creek near Colfax, Iowa (United States Geological Survey [USGS] 05471040) (IDNR, 2005). GWLF inputs, including Cedar Lake weather data and the transport file used to simulate watershed conditions for the Cedar Lake atrazine TMDL, are included in Appendices B and C, respectively. GWLF flow outputs (summary, annual averages, and monthly averages) are included in Appendix D.

Atrazine concentrations in Cedar Lake were estimated using a well-mixed lake spreadsheet model, the Simple Lake Model (Chapra, 2001). The Simple Lake Model uses a Runge-Kutta fourth-order numerical integration method to solve the differential equations required to simulate a completely mixed lake under variable loading conditions for a user-defined time step. Within the simple model framework pollutants may undergo first order reaction rate to represent decay, hydrolysis or other losses. The first order reaction rate is used commonly to represent these types of losses. This model was modified during the development of the Cedar Lake nitrate TMDL to incorporate a temperature-dependent reaction rate.

Average monthly stream flows (cubic centimeters [cm^3]/month), developed using GWLF, were used to estimate flows, in-lake volumes, and atrazine loading in the Simple Lake Model (hereafter referred to as Cedar Lake Simple Model). To estimate inflow atrazine concentrations, inflow values were initially set equal to the corresponding observed in-lake measurements and were adjusted when necessary to fit the modeled in-lake concentrations to in-lake measurements. Model inputs selected to set initial conditions in the Cedar Lake Simple Model are provided in Table 3.

Table 3. Cedar Lake Simple Model Initial Conditions

Parameter	Value	Units
Area	3.56E+05	square meters (m^2)
Depth	2.74	meters (m)
Reaction Rate	0.0833333	/month
Settling Velocity	0	m/month
Initial Concentration	2.41	milligrams per liter (mg/L)
Calculation Step	0.2	month
Print Step	0.2	month
Initial Time	1	month
Final Time	168	month

Cedar Lake Simple Model results for existing conditions are presented in Figure 5 and 6. Figure 5 presents the entire range of predicted and observed concentrations, Figure 6 presents only the low concentration ranges (0-10 µg/L) and the observed and predicted monthly averages. In general, the model performs well; minimum and maximum values are matched in the model and monthly and seasonal trends are captured. However, for May 2004, when the highest in-lake concentrations were measured, the Cedar Lake Simple Model estimates greater concentrations prior to and after this peak. As a result, the relationship between measured and predicted concentrations during this month is poor (Figure 7). A least-squares regression fit between predicted and observed atrazine in-lake concentration (Figure 8) shows a good relationship between the two variables (coefficient of determination [R^2] = 0. 877). The blue (short-dash) regression line is based on the entire dataset. The red (long-dash) regression line is based on the entire dataset with the exception of the May 2004 monthly average. Because peak concentrations are of concern, calibration to higher concentrations was favored over matching low concentrations. This results in a model that, on average, slightly overpredicts in-lake concentrations of atrazine. This bias in the calibration results in a conservative model and an implicit MOS.

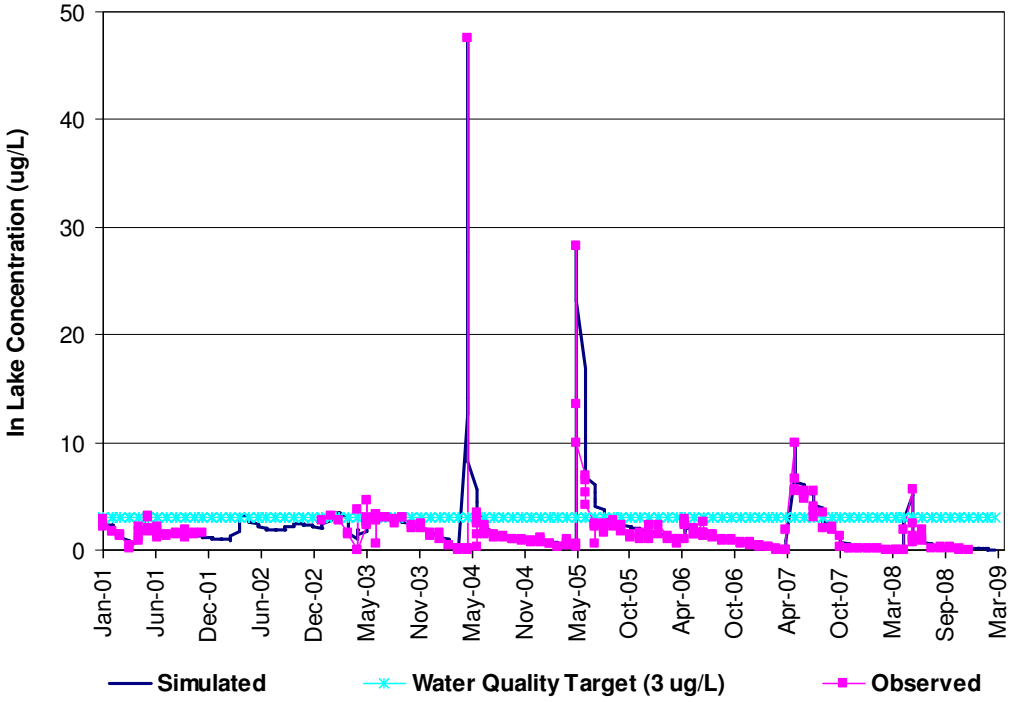


Figure 5. Cedar Lake Simple Model Results for Existing Conditions (2001 - 2009)

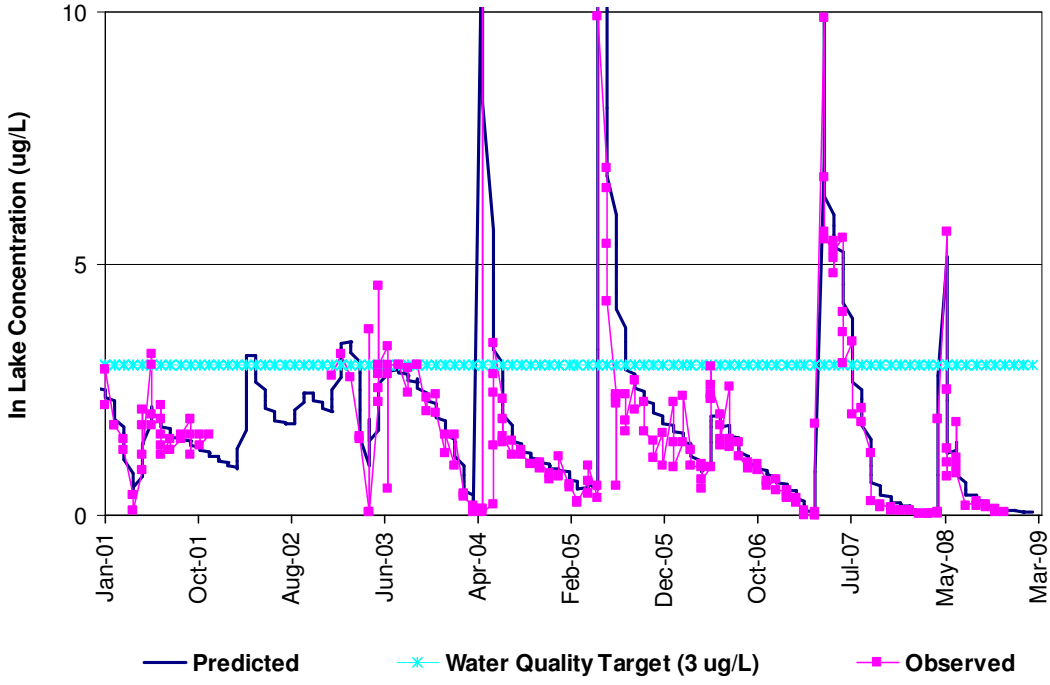


Figure 6. Cedar Lake Simple Model Results for Existing Conditions Showing Model Fit at Low Concentrations (2001 - 2009)

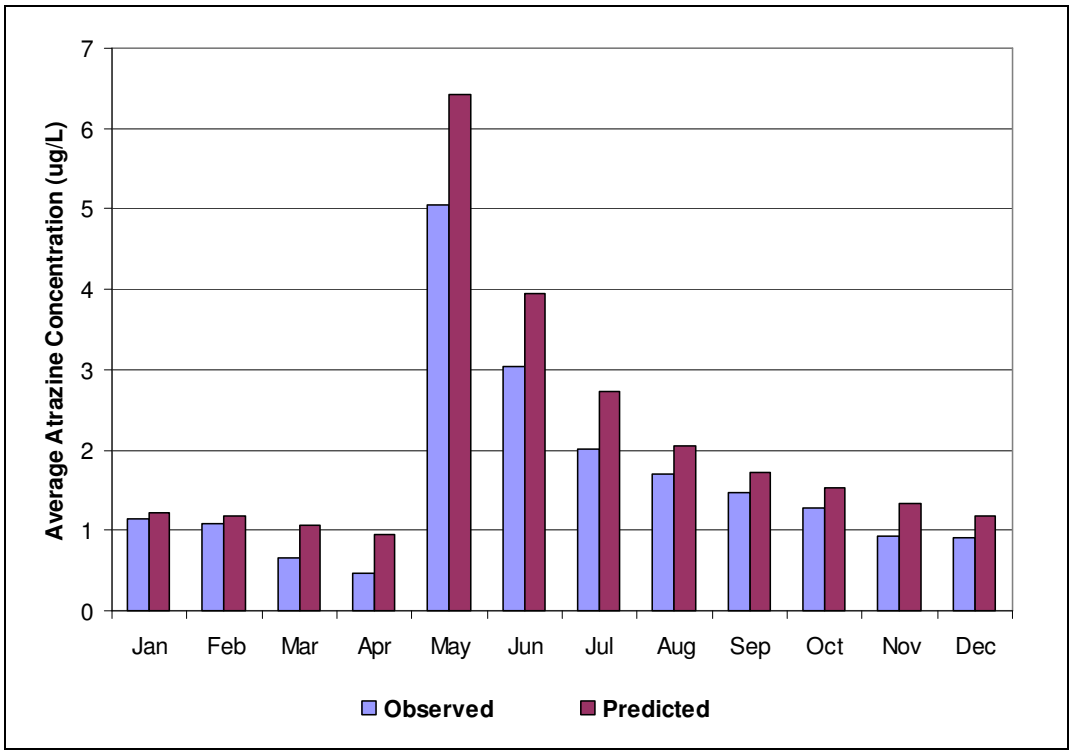
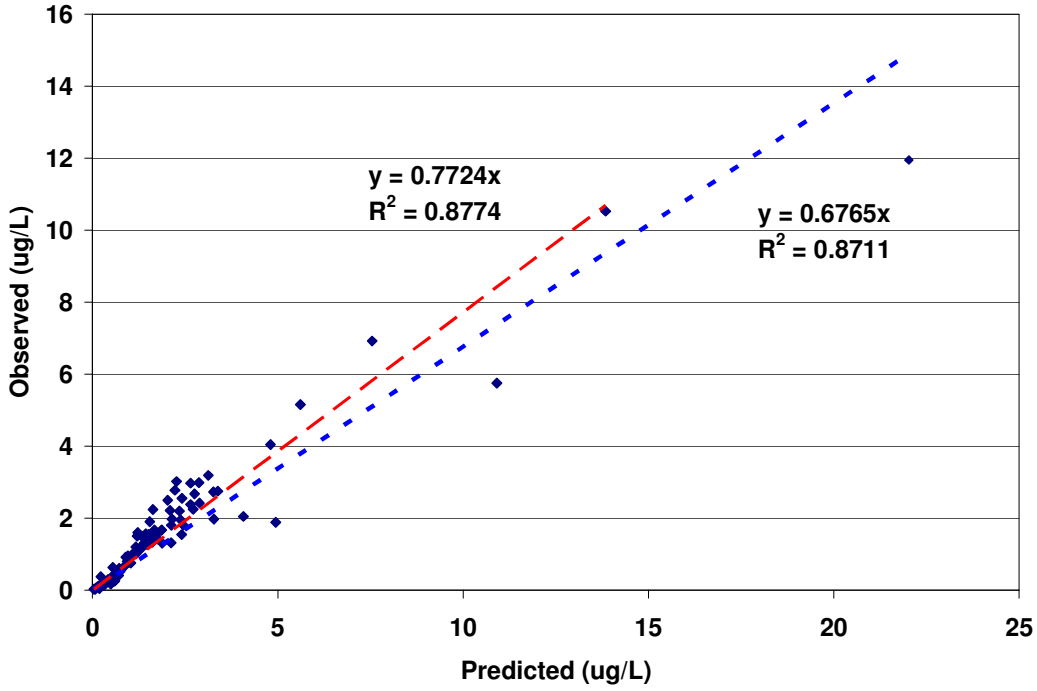


Figure 7. Observed and Predicted Average Atrazine Concentration in Cedar Lake (2001 – 2009)



Notes: P-Value = 0.00 for both regression lines. The red regression line excludes average May 2004 value.

Figure 8. Linear Regression Between Average Monthly Observed and Predicted In-Lake Concentrations

3.2.4 Water Body Pollutant Loading Capacity

Moving annual average concentrations are calculated for each month by averaging the previous year of atrazine data for each respective month. Using this approach, averages are calculated for the existing 2001 – 2009 in-lake conditions, shown on Figure 9 as "Annual Moving Average – Existing," and adjusted by reducing the input concentrations until the moving annual average concentrations meet the 3 µg/L atrazine target during the entire 2001 – 2009 period, shown on Figure 9 as "Annual Moving Average – TMDL." To reach this limit, an annual reduction in atrazine loading of 19% is required. This reduction corresponds to a maximum allowable delivered load of 34.1 kg/year (75.1 lb/year).

Given the nature and sources of atrazine in the Cedar Lake watershed, a large percentage of atrazine loading to the lake occurs during the spring months following atrazine land application. Figure 10 presents average atrazine loads (based on existing conditions in the 2001 – 2009 model) delivered to Cedar Lake on a monthly basis. Loads delivered during May are, on average, over five times higher than any other month. The average delivered load during May is approximately 70% (30.1 kg [66.3 lb]) of the total average annual load (42.3 kg [93.2 lb]) to the lake. Using the moving annual average in-lake concentration as the target for determining necessary load reductions, the TMDL can be met through a 27% reduction in delivered load during the month of May (Figure 10). This reduction is based on meeting the entire TMDL during the month of May and reducing average delivered loads in May from 30.1 kg (66.3 lb) to 21.9 kg (48.3 lb).

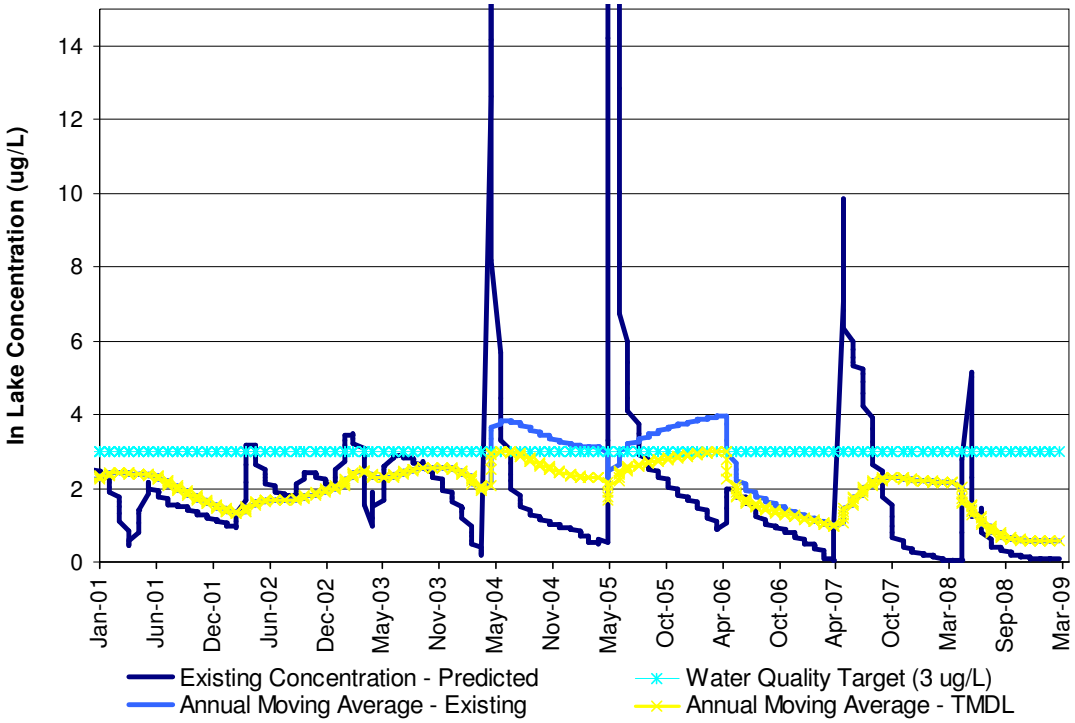


Figure 9. Predicted In-Lake Concentrations and Moving Annual Averages for Existing and Allowable Concentrations Based on the 3 µg/L Atrazine Target

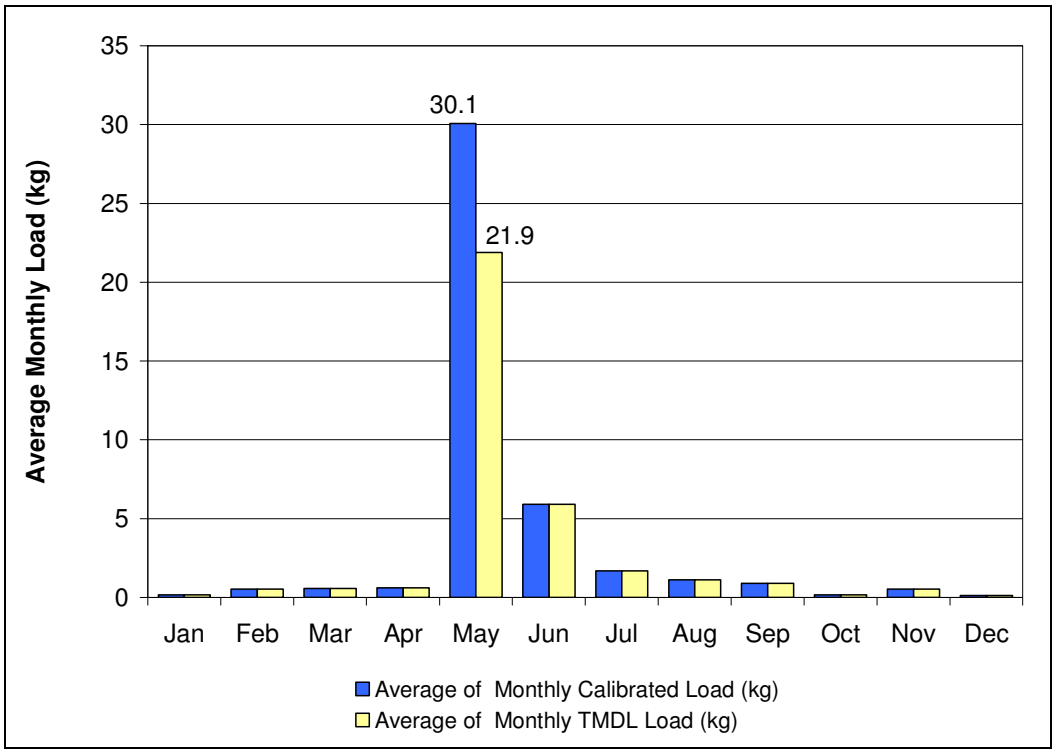


Figure 10. Monthly Average Atrazine Loads Delivered to Cedar Lake Under Existing and TMDL Conditions

3.3 POLLUTANT SOURCE ASSESSMENT

A pollutant source assessment is designed to characterize known and suspected sources of pollutant loading to the impaired water body. Pollutant sources within a watershed are characterized and quantified to the extent that information is available. Atrazine sources that contribute to impairment in Cedar Lake include overland runoff, drainage tile discharge containing atrazine from infiltration, and direct rainfall to the lake containing low levels of contaminated dust.

3.3.1 Existing Load

The existing annual average atrazine load to Cedar Lake is estimated to be 42.3 kg/year (93.1 lb/year) based on the Cedar Lake Simple Model.

3.3.2 Departure from Load Capacity

The modeled load capacity for Cedar Lake is 34.1 kg/year (75.1 lb/year). This represents a 19% reduction in the existing annual load. This load capacity is equivalent to an average monthly load of 2.84 kg/month (6.3 lb/month) and an average daily load of 0.092 kg/day (0.202 lb/day). Given that most, if not all, of the reductions will occur during the spring application period, the TMDL can be met through a 27% reduction in load delivered during the month of May alone. This percent reduction is equivalent to an average reduction of 8.2 kg (18.0 lb) during May. EPA provides guidance for calculating maximum daily limits (MDL) using long term average concentrations (EPA, 1991). For this TMDL, MDLs are calculated based on the assumption that all reductions will be accounted for during the month of May. The daily maximum load, based on average May loads during 2001 – 2009, is calculated to be 2.39 kg/day (5.26 lb/day) based on 95th percentile. The daily maximum is included to meet the decision of the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA et.al., No. 05-5015 (April 25, 2006) and is not meant to occur every day. Using the 95th percentile value, this daily load should only be seen 5 percent of the days in the averaging period.

3.3.3 Identification of Pollution Sources

3.3.3.1 Point Sources

No point sources of atrazine were identified in the Cedar Lake watershed. In the absence of an NPDES permit, the discharges associated with sources were applied to the LA, as opposed to the WLA, for purposes of this TMDL. The decision to allocate these sources to the LA does not reflect any determination by EPA as to whether these discharges are, in fact, unpermitted point source discharges within this watershed. In addition, by establishing this TMDL with some sources treated as LAs, EPA is not determining that these discharges are exempt from NPDES permitting requirements. If sources of the allocated pollutant in this TMDL are found to be, or become, NPDES regulated discharges, their loads must be considered as part of the calculated WLA sum in this TMDL. WLA, in addition to that allocated here, is not available.

One NPDES-permitted facility is located in the Cedar Lake watershed (Table 4). This facility, Rose Acre Farm, Inc. (IA00072681), is not considered to be a source of atrazine as it does not apply agricultural chemicals to crops. Previously, the Summerset Haven Sewage Treatment Plant near Winterset (IA0064777) discharged from a two-cell waste stabilization lagoon designed for a population equivalent of 50 people into a drainage ditch that flows into

Cedar Creek and on into Cedar Lake. However, the facility this treatment system served closed in the summer of 2001, and the lagoon system has since been abandoned. In addition, while the system was still in operation, no effluent discharges from the lagoons directly to Cedar Creek had occurred since 1994. Lagoon effluent was land applied for the 1994 – 2001 operational period (IDNR, 2005).

Table 4. NPDES Facility in the Cedar Lake Watershed

Name	NPDES Number	Location	SIC Code and Description
Rose Acre Farms, Inc. Winterset Egg Farm	IA 00072681	1981 Highway 92 Winterset, IA 50273	5144; Poultry and Poultry Products

3.3.3.2 Regulated Storm Water: Municipal Separate Storm Sewer System (MS4) Contributions

There are no MS4 contributions in the Cedar Lake watershed.

3.3.3.3 Nonpoint Sources

No point source loads of atrazine were identified in the Cedar Lake watershed. Therefore, only loads addressed here as nonpoint sources of atrazine contribute to the impairment. Atrazine is a systemic herbicide typically applied to row crops during the spring to provide broadleaf control and grass suppression. Atrazine is one of the lowest cost herbicides on a cost-per acre basis (Devlin et al., 2000), which adds to its widespread use in row crops. Atrazine's runoff potential is high due to its weak adsorption to soil particles, and it persists in the soil for a long time with a half life of 6 months. Approximately 90% of atrazine loss occurs in the water portion of runoff and only 10% with the eroding soil particles (Devlin et al., 2000). Potential transport mechanisms include overland runoff, drainage tile discharge containing atrazine from infiltration, groundwater flow, and direct rainfall to the lake containing low levels of contaminated dust.

3.3.4 Linkage of Sources to Target

Row crops cover approximately 81% of the Cedar Lake watershed. Atrazine can be applied in a variety of ways to decrease the amount available for runoff, and BMPs can be employed based on site specific conditions to minimize atrazine runoff. Using atrazine BMPs in the Cedar Lake watershed will help reduce the nonpoint source load from row crops and contribute to decreasing atrazine concentrations in the lake. Based on current conditions in Cedar Lake, loads delivered to the lake from nonpoint sources will need to be reduced to 34.1 kg/year (75.1 lb/year). This is equivalent to an estimated average annual reduction of 19%. Given that most, if not all, of the reductions will occur during the spring application period, the TMDL can be met through a 27% reduction in load delivered during the month of May alone. This percent reduction is equivalent to an average reduction of 8.2 kg (18.0 lb) during May. A daily maximum load for the month of May is calculated to be 2.39 kg/day (5.26 lb/day) based on a coefficient of variation of 1.6 and a 95th percentile probability (see Section 3.4.2).

3.4 POLLUTANT ALLOCATIONS

The pollutant allocations described in this Section apply throughout the entire year; however, based on typical atrazine use, most, if not all, of the reductions in land application and/

or implementation of BMPs will need to occur during the spring application period in order to meet the TMDL.

3.4.1 Wasteload Allocations

A WLA of zero atrazine is set for this TMDL. No load reductions are required to achieve this allocation, because no existing sources were identified as contributing to the impairment. In the absence of an NPDES permit, the discharges associated with sources were applied to the LA, as opposed to the WLA, for purposes of this TMDL. The decision to allocate these sources to the LA does not reflect any determination by EPA as to whether these discharges are, in fact, unpermitted point source discharges within this watershed. In addition, by establishing this TMDL with some sources treated as LAs, EPA is not determining that these discharges are exempt from NPDES permitting requirements. If sources of the allocated pollutant in this TMDL are found to be, or become, NPDES-regulated discharges, their loads must be considered as part of the calculated WLA sum in this TMDL. WLA in addition to that allocated here is not available.

3.4.2 Load Allocations

The long term average annual LA for this TMDL is 34.1 kg/year (75.1 lb/year). This is equivalent to a 19% reduction in the estimated existing annual nonpoint source loading. Given that most, if not all, of the reductions will occur during the spring application period, the TMDL can be met through a 27% reduction in load delivered during the month of May. This percent reduction is equivalent to an average reduction of 8.2 kg (18.0 lb) (from 30.1 kg [66.3 lb] to 21.9 kg [48.3 lb]) during the month of May. The approach used to convert these loads to maximum daily values is based upon the maximum daily permit calculations provided in the *Technical Support Document (TSD) for Water Quality-based Toxics Control* (EPA, 1991). The monthly average for May was converted to a MDL using guidance provided in Table 5-2 of the TSD. Using a coefficient of variation of 1.6 (calculated with 2001 - 2009 model results) and a 95th percentile probability, a multiplication factor of 7.29 was calculated. Daily maximum loads for the month of May are 2.39 kg/day (5.26 lb/day). A summary of long term and daily loads is provided in Table 5. The daily maximum is included to meet the decision of the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA et.al., No. 05-5015 (April 25, 2006) and is not meant to occur every day. Using the 95th percentile value, this daily load should only be seen 5 percent of the days in the averaging period.

3.4.3 Margin of Safety

A MOS is incorporated implicitly in the selection and application of models used to develop the TMDL. In applying the Cedar Lake Simple Model, emphasis was placed on matching peak measured concentrations. As a result, the model tends to slightly over predict average monthly atrazine loads. In addition, TMDL calculations were based on the monthly period with the highest measured and modeled atrazine concentrations (May). Thus, the load reductions are conservative and have been developed for the most critical period of the year.

3.5 ATRAZINE TMDL SUMMARY

The equation for the TMDL shows the lake atrazine load capacity:

TMDL = Load Capacity (34.1 kg/year [75.1 lb/year]) = WLA (0 kg/year [0 lb/year]) + LA (34.1 kg/year [75.1 lb/year]) + MOS (implicit)

As discussed in Section 3.4.2, EPA's TSD (EPA, 1991) provides guidance for calculating a MDL for atrazine in Cedar Lake. Per guidance presented in Table 5-2 of the TSD, the MDL was calculated to be 2.39 kg/day (5.26 lb/day) using a coefficient of variation of 1.6 and a 95th percentile probability (Table 5). The coefficient of variation was calculated using simulated in-lake concentrations during the 2001 – 2009 period.

Table 5. Lake Atrazine Annual and Daily TMDL Summary[1]

	Annual Atrazine Load		Atrazine Load Delivered During May		Daily Atrazine Load[2]	
Average Existing Condition	42.4 kg	93.2 lb	30.1 kg	66.3 lb	0.97 kg	2.14 lb
TMDL Condition	34.1 kg	75.1 lb	22.0 kg	48.3 lb	0.71 kg	1.56 lb
Required Reduction (load)	8.2 kg	18.1 lb	8.2 kg	18.0 lb	0.26 kg	0.58 lb
Required Reduction (percent)	19%		27%		27%	
Maximum Daily Limit (95th Percentile)[3]					2.39 kg	5.26 lb

Notes

[1] Average existing condition, TMDL condition, and daily limit are based on model simulations during the 2001 – 2009 period.

[2] An average of 2001 – 2009 simulated monthly loads for May were used as the basis for calculating average daily load delivered.

[3] The maximum daily limit is based on the assumption that the TMDL will be met solely through reductions in loads delivered to the lake during the month of May. The daily maximum is included to meet the decision of the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA et.al., No. 05-5015 (April 25, 2006) and is not meant to occur every day. Using the 95th percentile value, this daily load should only be seen 5 percent of the days in the averaging period.

4 SEASONAL VARIATION

Atrazine is applied in the watershed in May or June when rainfall occurs frequently. During these months, monitoring data taken soon after a rainfall event indicate that atrazine concentrations in the lake increase sharply. Atrazine concentrations in the lake increase throughout May and/or June, level out through July and August, and then slowly decrease by dilution, degradation, and outflow until the next application season. A three- or four-inch rain during any time outside the application season can produce an observable decline in the lake atrazine concentration. The high concentration water is displaced by water containing small amounts of the chemical, changing the overall concentration.

5 MONITORING

Under a program coordinated between Novartis Crop Protection, Inc. (now Syngenta CPI) and the city of Winterset, samples for atrazine have been taken bimonthly since May 1994, with weekly sampling implemented in the May through July period. That data is submitted annually to IDNR. This program is part of the Voluntary Monitoring Program (VMP)

coordinated through Syngenta CPI and EPA as part of the re-registration process for atrazine. The VMP participants will continue to monitor this lake throughout the life of this TMDL. The current monitoring frequency will be continued, but the analyses have been extended to include atrazine and three of its metabolites (Tierney, 2002).

Metabolites are the secondary products created as a compound starts to degrade, or metabolize. Atrazine is metabolized into three chlorinated atrazine compounds: desethylated atrazine (DEA), desisopropyl atrazine (DIA), and diaminochlorotriazine (DACT). The chlorinated atrazine compounds are considered to be equal in toxicity to atrazine (EPA, 2002), and have therefore been included in all of Syngenta's VMP plans for Community Water Supply monitoring.

6 IMPLEMENTATION

The following implementation plan was provided by the contractor during the preparation of this TMDL. EPA neither reviews implementation plans in state submitted TMDLs, nor establishes implementation plans in EPA established TMDLs. The following Section is included for informational purposes only and should not be considered as a part of this EPA established TMDL.

The existing TMDL rules do not require implementation plans. The following discussion can provide guidance to those interested in improving water quality in the lake. The following difficulties need to be resolved if atrazine application is to have minimal impact on the lake:

- How to protect atrazine from rainfall until it is absorbed into plants.
- How to prevent the fraction of atrazine not used by the plant from getting to the lake.
- How to remove quickly the atrazine that reaches the water column.

The goal of implementation is to meet the load allocations established in this TMDL, which are designed to bring the lake into compliance with established WQS. Application practices within the watershed should be inventoried to improve understanding and assessment of the problem. Application timing and the relationship to changes in lake concentrations need to be further evaluated. The relative contributions of major atrazine delivery mechanisms (overland runoff from rainfall events and tile terraces that are direct conduits to streams and the lake) must be assessed. These activities will help to determine what watershed management approaches will have the desired impact. Research from Iowa State University has shown that between 1% and 5% of atrazine applied to cropland is lost (Baker and Mickelson, 1994).

For example, if no atrazine is present in the lake, available information indicates that 4,830 pounds of atrazine (48.3 is 1% of 4,830) could be applied to cropland during May without the atrazine delivery to the lake exceeding the load allocation. Further, if atrazine concentrations in the lake are at 3 µg/L, no atrazine can be delivered to the lake without exceeding the load allocation. Any additional atrazine delivered to the lake with the 3 µg/L antecedent concentration would cause a water quality violation. Table 6 presents target watershed loads (amount of atrazine that can be applied to cropland in the watershed) for the range of load allocations as described in Section 3.

Table 6. Watershed Target Loads

Antecedent lake atrazine concentration	Load allocation: Allowable pounds of atrazine deliverable to the lake during May	Target watershed load: Total mass (pounds) that can be applied (assumes between 1% and 5% of total application load will be delivered to the lake)	
(µg/L)	(pounds)	(1%)	(5%)
0	48.3	4,830	966
0.5	40.3	4,025	805
1	26.8	2,683	537
1.5	13.4	1,342	268
2	4.5	447	89
2.5	0.7	75	15
3	0.0	0	0

7 PUBLIC PARTICIPATION

EPA regulations require that TMDLs be subject to public review (40 CFR 130.7). EPA provided public notice of this TMDL for Cedar Lake on the EPA, Region 7, TMDL website: http://www.epa.gov/region7/water/tmdl_public_notice.htm. The response to comments and final TMDL are available at: http://www.epa.gov/region07/water/apprtmdl.htm#Iowa.

The impaired Cedar Lake, located near Winterset, Iowa, was included on the EPA approved 1998 303(d) List of impaired waters. This TMDL is being produced by EPA to meet the requirements of the 2001 Consent Decree, *Sailors, Inc., Mississippi River Revival and Sierra Club v. EPA,* Consolidated Case No. 98-134-MJM. Iowa may submit and EPA may approve another TMDL for this water at a later time.

As part of the public notice process, IDNR may have assisted EPA by providing a link to this public notice on the Iowa TMDL Public Notice webpage at: http://www.iowadnr.gov/water/watershed/pubs.html. EPA responded to comments on the draft TMDL after the public notice comment period ended on March 10, 2010, and posted the response to comments on the EPA website: http://www.epa.gov/region07/water/apprtmdl.htm#Iowa.

8 REFERENCES

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Appendix A

Cedar Lake Atrazine Data

Includes:
Data from 2001 through 2009

Program	Year	CWS Actual Name	State	Date Sampled	Type of Water R or F	Atrazine (ppb)
AMP	2001	Winterset Water Treatment Plant	Iowa	1/8/2001	R	2.2
AMP	2001	Winterset Water Treatment Plant	Iowa	1/22/2001	R	2.9
AMP	2001	Winterset Water Treatment Plant	Iowa	2/12/2001	R	1.8
AMP	2001	Winterset Water Treatment Plant	Iowa	2/26/2001	R	1.8
AMP	2001	Winterset Water Treatment Plant	Iowa	3/12/2001	R	1.5
AMP	2001	Winterset Water Treatment Plant	Iowa	3/26/2001	R	1.3
AMP	2001	Winterset Water Treatment Plant	Iowa	4/9/2001	R	0.4
AMP	2001	Winterset Water Treatment Plant	Iowa	4/23/2001	R	0.1
AMP	2001	Winterset Water Treatment Plant	Iowa	5/7/2001	R	0.9
AMP	2001	Winterset Water Treatment Plant	Iowa	5/14/2001	R	2.1
AMP	2001	Winterset Water Treatment Plant	Iowa	5/21/2001	R	1.8
AMP	2001	Winterset Water Treatment Plant	Iowa	5/29/2001	R	1.2
AMP	2001	Winterset Water Treatment Plant	Iowa	6/4/2001	R	3.2
AMP	2001	Winterset Water Treatment Plant	Iowa	6/11/2001	R	3.0
AMP	2001	Winterset Water Treatment Plant	Iowa	6/18/2001	R	2.0
AMP	2001	Winterset Water Treatment Plant	Iowa	6/25/2001	R	1.8
AMP	2001	Winterset Water Treatment Plant	Iowa	7/2/2001	R	1.9
AMP	2001	Winterset Water Treatment Plant	Iowa	7/9/2001	R	1.6
AMP	2001	Winterset Water Treatment Plant	Iowa	7/16/2001	R	2.2
AMP	2001	Winterset Water Treatment Plant	Iowa	7/23/2001	R	1.4
AMP	2001	Winterset Water Treatment Plant	Iowa	7/30/2001	R	1.2
AMP	2001	Winterset Water Treatment Plant	Iowa	8/6/2001	R	1.5
AMP	2001	Winterset Water Treatment Plant	Iowa	8/20/2001	R	1.3
AMP	2001	Winterset Water Treatment Plant	Iowa	9/4/2001	R	1.5
AMP	2001	Winterset Water Treatment Plant	Iowa	9/17/2001	R	1.6
AMP	2001	Winterset Water Treatment Plant	Iowa	10/1/2001	R	1.9
AMP	2001	Winterset Water Treatment Plant	Iowa	10/15/2001	R	1.2
AMP	2001	Winterset Water Treatment Plant	Iowa	10/29/2001	R	1.6
AMP	2001	Winterset Water Treatment Plant	Iowa	11/12/2001	R	1.6
AMP	2001	Winterset Water Treatment Plant	Iowa	11/26/2001	R	1.4
AMP	2001	Winterset Water Treatment Plant	Iowa	12/10/2001	R	1.6
AMP	2003	Winterset Water Treatment Plant	Iowa	1/13/2003	R	2.78
AMP	2003	Winterset Water Treatment Plant	Iowa	2/10/2003	R	3.19
AMP	2003	Winterset Water Treatment Plant	Iowa	3/10/2003	R	2.75
AMP	2003	Winterset Water Treatment Plant	Iowa	4/14/2003	R	1.58
AMP	2003	Winterset Water Treatment Plant	Iowa	4/28/2003	R	1.51
AMP	2003	Winterset Water Treatment Plant	Iowa	5/12/2003	R	0.05
AMP	2003	Winterset Water Treatment Plant	Iowa	5/19/2003	R	3.69
AMP	2003	Winterset Water Treatment Plant	Iowa	5/27/2003	R	0.05
AMP	2003	Winterset Water Treatment Plant	Iowa	6/2/2003	R	2.25
AMP	2003	Winterset Water Treatment Plant	Iowa	6/9/2003	R	2.53
AMP	2003	Winterset Water Treatment Plant	Iowa	6/16/2003	R	4.54
AMP	2003	Winterset Water Treatment Plant	Iowa	6/23/2003	R	2.8
AMP	2003	Winterset Water Treatment Plant	Iowa	6/30/2003	R	2.98
AMP	2003	Winterset Water Treatment Plant	Iowa	7/7/2003	R	3.36
AMP	2003	Winterset Water Treatment Plant	Iowa	7/14/2003	R	2.8
AMP	2003	Winterset Water Treatment Plant	Iowa	7/21/2003	R	0.53
AMP	2003	Winterset Water Treatment Plant	Iowa	7/28/2003	R	2.99
AMP	2003	Winterset Water Treatment Plant	Iowa	8/4/2003	R	2.98

Program	Year	CWS Actual Name	State	Date Sampled	Type of Water R or F	Atrazine (ppb)
AMP	2003	Winterset Water Treatment Plant	Iowa	8/18/2003	R	3
AMP	2003	Winterset Water Treatment Plant	Iowa	9/8/2003	R	2.43
AMP	2003	Winterset Water Treatment Plant	Iowa	9/22/2003	R	2.93
AMP	2003	Winterset Water Treatment Plant	Iowa	10/6/2003	R	2.97
AMP	2003	Winterset Water Treatment Plant	Iowa	10/20/2003	R	2.97
AMP	2003	Winterset Water Treatment Plant	Iowa	11/3/2003	R	2.05
AMP	2003	Winterset Water Treatment Plant	Iowa	11/17/2003	R	2.35
AMP	2003	Winterset Water Treatment Plant	Iowa	12/1/2003	R	2.39
AMP	2001	Winterset Water Treatment Plant	Iowa	12/15/2003	R	2.04
AMP	2004	Winterset Water Treatment Plant	Iowa	1/12/2004	R	1.24
AMP	2004	Winterset Water Treatment Plant	Iowa	1/26/2004	R	1.61
AMP	2004	Winterset Water Treatment Plant	Iowa	2/9/2004	R	0.99
AMP	2004	Winterset Water Treatment Plant	Iowa	2/23/2004	R	1.6
AMP	2004	Winterset Water Treatment Plant	Iowa	3/8/2004	R	0.44
AMP	2004	Winterset Water Treatment Plant	Iowa	3/22/2004	R	0.38
AMP	2004	Winterset Water Treatment Plant	Iowa	4/5/2004	R	0.16
AMP	2004	Winterset Water Treatment Plant	Iowa	4/12/2004	R	0.05
AMP	2004	Winterset Water Treatment Plant	Iowa	4/19/2004	R	0.15
AMP	2004	Winterset Water Treatment Plant	Iowa	4/26/2004	R	0.18
AMP	2004	Winterset Water Treatment Plant	Iowa	5/3/2004	R	0.13
AMP	2004	Winterset Water Treatment Plant	Iowa	5/10/2004	R	47.5
AMP	2004	Winterset Water Treatment Plant	Iowa	5/17/2004	R	0.13
AMP	2004	Winterset Water Treatment Plant	Iowa	5/24/2004	R	0.05
AMP	2004	Winterset Water Treatment Plant	Iowa	6/1/2004	R	0.22
AMP	2004	Winterset Water Treatment Plant	Iowa	6/7/2004	R	2.43
AMP	2004	Winterset Water Treatment Plant	Iowa	6/14/2004	R	1.38
AMP	2004	Winterset Water Treatment Plant	Iowa	6/21/2004	R	2.79
AMP	2004	Winterset Water Treatment Plant	Iowa	6/28/2004	R	3.41
AMP	2004	Winterset Water Treatment Plant	Iowa	7/6/2004	R	2.32
AMP	2004	Winterset Water Treatment Plant	Iowa	7/12/2004	R	1.45
AMP	2004	Winterset Water Treatment Plant	Iowa	7/19/2004	R	1.9
AMP	2004	Winterset Water Treatment Plant	Iowa	7/26/2004	R	1.56
AMP	2004	Winterset Water Treatment Plant	Iowa	8/9/2004	R	1.2
AMP	2004	Winterset Water Treatment Plant	Iowa	8/23/2004	R	1.47
AMP	2004	Winterset Water Treatment Plant	Iowa	9/7/2004	R	1.28
AMP	2004	Winterset Water Treatment Plant	Iowa	9/20/2004	R	1.19
AMP	2004	Winterset Water Treatment Plant	Iowa	10/4/2004	R	1.01
AMP	2004	Winterset Water Treatment Plant	Iowa	10/18/2004	R	1.01
AMP	2004	Winterset Water Treatment Plant	Iowa	11/8/2004	R	0.93
AMP	2004	Winterset Water Treatment Plant	Iowa	11/22/2004	R	1.04
AMP	2004	Winterset Water Treatment Plant	Iowa	12/7/2004	R	0.82
AMP	2004	Winterset Water Treatment Plant	Iowa	12/20/2004	R	0.72
AMP	2005	Winterset Water Treatment Plant	Iowa	1/3/2005	R	0.76
AMP	2005	Winterset Water Treatment Plant	Iowa	1/18/2005	R	0.81
AMP	2005	Winterset Water Treatment Plant	Iowa	1/31/2005	R	1.18
AMP	2005	Winterset Water Treatment Plant	Iowa	2/15/2005	R	0.56
AMP	2005	Winterset Water Treatment Plant	Iowa	2/28/2005	R	0.61
AMP	2005	Winterset Water Treatment Plant	Iowa	3/14/2005	R	0.27
AMP	2005	Winterset Water Treatment Plant	Iowa	3/28/2005	R	0.24

Program	Year	CWS Actual Name	State	Date Sampled	Type of Water R or F	Atrazine (ppb)
AMP	2005	Winterset Water Treatment Plant	Iowa	4/4/2005	R	0.67
AMP	2005	Winterset Water Treatment Plant	Iowa	4/11/2005	R	0.44
AMP	2005	Winterset Water Treatment Plant	Iowa	4/18/2005	R	0.44
AMP	2005	Winterset Water Treatment Plant	Iowa	4/25/2005	R	0.98
AMP	2005	Winterset Water Treatment Plant	Iowa	5/2/2005	R	0.35
AMP	2005	Winterset Water Treatment Plant	Iowa	5/9/2005	R	0.58
AMP	2005	Winterset Water Treatment Plant	Iowa	5/16/2005	R	28.25
AMP	2005	Winterset Water Treatment Plant	Iowa	5/23/2005	R	13.55
AMP	2005	Winterset Water Treatment Plant	Iowa	5/31/2005	R	9.92
AMP	2005	Winterset Water Treatment Plant	Iowa	6/6/2005	R	6.88
AMP	2005	Winterset Water Treatment Plant	Iowa	6/13/2005	R	6.50
AMP	2005	Winterset Water Treatment Plant	Iowa	6/20/2005	R	5.38
AMP	2005	Winterset Water Treatment Plant	Iowa	6/27/2005	R	4.25
AMP	2005	Winterset Water Treatment Plant	Iowa	7/5/2005	R	2.41
AMP	2005	Winterset Water Treatment Plant	Iowa	7/11/2005	R	2.21
AMP	2005	Winterset Water Treatment Plant	Iowa	7/18/2005	R	0.59
AMP	2005	Winterset Water Treatment Plant	Iowa	7/26/2005	R	2.34
AMP	2005	Winterset Water Treatment Plant	Iowa	8/1/2005	R	2.41
AMP	2005	Winterset Water Treatment Plant	Iowa	8/15/2005	R	1.65
AMP	2005	Winterset Water Treatment Plant	Iowa	8/29/2005	R	1.87
AMP	2005	Winterset Water Treatment Plant	Iowa	9/12/2005	R	2.67
AMP	2005	Winterset Water Treatment Plant	Iowa	9/26/2005	R	2.09
AMP	2005	Winterset Water Treatment Plant	Iowa	10/11/2005	R	2.25
AMP	2005	Winterset Water Treatment Plant	Iowa	10/24/2005	R	1.66
AMP	2005	Winterset Water Treatment Plant	Iowa	11/7/2005	R	1.49
AMP	2005	Winterset Water Treatment Plant	Iowa	11/21/2005	R	1.15
AMP	2005	Winterset Water Treatment Plant	Iowa	12/5/2005	R	1.62
AMP	2005	Winterset Water Treatment Plant	Iowa	12/19/2005	R	1.00
AMP	2006	Winterset Water Treatment Plant	Iowa	1/3/2006	R	2.25
AMP	2006	Winterset Water Treatment Plant	Iowa	1/17/2006	R	1.46
AMP	2006	Winterset Water Treatment Plant	Iowa	1/30/2006	R	0.96
AMP	2006	Winterset Water Treatment Plant	Iowa	2/13/2006	R	1.44
AMP	2006	Winterset Water Treatment Plant	Iowa	2/27/2006	R	2.36
AMP	2006	Winterset Water Treatment Plant	Iowa	3/13/2006	R	1.29
AMP	2006	Winterset Water Treatment Plant	Iowa	3/27/2006	R	1.00
AMP	2006	Winterset Water Treatment Plant	Iowa	4/3/2006	R	0.96
AMP	2006	Winterset Water Treatment Plant	Iowa	4/10/2006	R	0.51
AMP	2006	Winterset Water Treatment Plant	Iowa	4/17/2006	R	1.03
AMP	2006	Winterset Water Treatment Plant	Iowa	4/24/2006	R	0.71
AMP	2006	Winterset Water Treatment Plant	Iowa	5/1/2006	R	0.96
AMP	2006	Winterset Water Treatment Plant	Iowa	5/8/2006	R	2.32
AMP	2006	Winterset Water Treatment Plant	Iowa	5/15/2006	R	2.94
AMP	2006	Winterset Water Treatment Plant	Iowa	5/22/2006	R	2.40
AMP	2006	Winterset Water Treatment Plant	Iowa	5/30/2006	R	2.58
AMP	2006	Winterset Water Treatment Plant	Iowa	6/5/2006	R	2.01
AMP	2006	Winterset Water Treatment Plant	Iowa	6/12/2006	R	1.78
AMP	2006	Winterset Water Treatment Plant	Iowa	6/19/2006	R	1.40
AMP	2006	Winterset Water Treatment Plant	Iowa	6/26/2006	R	1.50
AMP	2006	Winterset Water Treatment Plant	Iowa	7/5/2006	R	2.56

Program	Year	CWS Actual Name	State	Date Sampled	Type of Water R or F	Atrazine (ppb)
AMP	2006	Winterset Water Treatment Plant	Iowa	7/10/2006	R	1.35
AMP	2006	Winterset Water Treatment Plant	Iowa	7/17/2006	R	1.40
AMP	2006	Winterset Water Treatment Plant	Iowa	7/24/2006	R	1.52
AMP	2006	Winterset Water Treatment Plant	Iowa	7/31/2006	R	1.52
AMP	2006	Winterset Water Treatment Plant	Iowa	8/14/2006	R	1.45
AMP	2006	Winterset Water Treatment Plant	Iowa	8/28/2006	R	1.18
AMP	2006	Winterset Water Treatment Plant	Iowa	9/11/2006	R	0.92
AMP	2006	Winterset Water Treatment Plant	Iowa	9/25/2006	R	1.05
AMP	2006	Winterset Water Treatment Plant	Iowa	10/10/2006	R	0.88
AMP	2006	Winterset Water Treatment Plant	Iowa	10/23/2006	R	1.02
AMP	2006	Winterset Water Treatment Plant	Iowa	11/6/2006	R	0.69
AMP	2006	Winterset Water Treatment Plant	Iowa	11/20/2006	R	0.60
AMP	2006	Winterset Water Treatment Plant	Iowa	12/4/2006	R	0.72
AMP	2006	Winterset Water Treatment Plant	Iowa	12/18/2006	R	0.50
AMP	2007	Winterset Water Treatment Plant	Iowa	1/2/2007	R	0.50
AMP	2007	Winterset Water Treatment Plant	Iowa	1/16/2007	R	0.37
AMP	2007	Winterset Water Treatment Plant	Iowa	1/29/2007	R	0.35
AMP	2007	Winterset Water Treatment Plant	Iowa	2/12/2007	R	0.35
AMP	2007	Winterset Water Treatment Plant	Iowa	2/26/2007	R	0.25
AMP	2007	Winterset Water Treatment Plant	Iowa	3/12/2007	R	0.08
AMP	2007	Winterset Water Treatment Plant	Iowa	3/26/2007	R	0.00
AMP	2007	Winterset Water Treatment Plant	Iowa	4/2/2007	R	0.00
AMP	2007	Winterset Water Treatment Plant	Iowa	4/9/2007	R	0.00
AMP	2007	Winterset Water Treatment Plant	Iowa	4/16/2007	R	0.06
AMP	2007	Winterset Water Treatment Plant	Iowa	4/23/2007	R	0.00
AMP	2007	Winterset Water Treatment Plant	Iowa	4/30/2007	R	1.83
AMP	2007	Winterset Water Treatment Plant	Iowa	5/7/2007	R	9.88
AMP	2007	Winterset Water Treatment Plant	Iowa	5/14/2007	R	6.70
AMP	2007	Winterset Water Treatment Plant	Iowa	5/21/2007	R	5.47
AMP	2007	Winterset Water Treatment Plant	Iowa	5/29/2007	R	5.64
AMP	2007	Winterset Water Treatment Plant	Iowa	6/4/2007	R	5.12
AMP	2007	Winterset Water Treatment Plant	Iowa	6/11/2007	R	5.45
AMP	2007	Winterset Water Treatment Plant	Iowa	6/18/2007	R	4.81
AMP	2007	Winterset Water Treatment Plant	Iowa	6/25/2007	R	5.25
AMP	2007	Winterset Water Treatment Plant	Iowa	7/9/2007	R	5.50
AMP	2007	Winterset Water Treatment Plant	Iowa	7/16/2007	R	4.03
AMP	2007	Winterset Water Treatment Plant	Iowa	7/23/2007	R	3.62
AMP	2007	Winterset Water Treatment Plant	Iowa	7/30/2007	R	3.03
AMP	2007	Winterset Water Treatment Plant	Iowa	8/13/2007	R	3.45
AMP	2007	Winterset Water Treatment Plant	Iowa	8/27/2007	R	2.01
AMP	2007	Winterset Water Treatment Plant	Iowa	9/10/2007	R	2.11
AMP	2007	Winterset Water Treatment Plant	Iowa	9/24/2007	R	1.84
AMP	2007	Winterset Water Treatment Plant	Iowa	10/9/2007	R	1.23
AMP	2007	Winterset Water Treatment Plant	Iowa	10/22/2007	R	0.28
AMP	2007	Winterset Water Treatment Plant	Iowa	11/5/2007	R	0.15
AMP	2007	Winterset Water Treatment Plant	Iowa	11/19/2007	R	0.21
AMP	2007	Winterset Water Treatment Plant	Iowa	12/3/2007	R	0.16
AMP	2007	Winterset Water Treatment Plant	Iowa	12/17/2007	R	0.10
AMP	2008	Winterset Municipal Waterworks	Iowa	1/14/2008	R	0.09

Program	Year	CWS Actual Name	State	Date Sampled	Type of Water R or F	Atrazine (ppb)
AMP	2008	Winterset Municipal Waterworks	Iowa	1/28/2008	R	0.08
AMP	2008	Winterset Municipal Waterworks	Iowa	2/11/2008	R	0.09
AMP	2008	Winterset Municipal Waterworks	Iowa	2/25/2008	R	0.08
AMP	2008	Winterset Municipal Waterworks	Iowa	3/10/2008	R	0.03
AMP	2008	Winterset Municipal Waterworks	Iowa	3/24/2008	R	0.03
AMP	2008	Winterset Municipal Waterworks	Iowa	4/7/2008	R	0.03
AMP	2008	Winterset Municipal Waterworks	Iowa	4/14/2008	R	0.03
AMP	2008	Winterset Municipal Waterworks	Iowa	4/21/2008	R	0.03
AMP	2008	Winterset Municipal Waterworks	Iowa	4/28/2008	R	0.03
AMP	2008	Winterset Municipal Waterworks	Iowa	5/5/2008	R	0.03
AMP	2008	Winterset Municipal Waterworks	Iowa	5/12/2008	R	0.06
AMP	2008	Winterset Municipal Waterworks	Iowa	5/19/2008	R	0.07
AMP	2008	Winterset Municipal Waterworks	Iowa	5/27/2008	R	1.92
AMP	2008	Winterset Municipal Waterworks	Iowa	6/2/2008	R	5.62
AMP	2008	Winterset Municipal Waterworks	Iowa	6/10/2008	R	2.50
AMP	2008	Winterset Municipal Waterworks	Iowa	6/16/2008	R	0.76
AMP	2008	Winterset Municipal Waterworks	Iowa	6/23/2008	R	1.04
AMP	2008	Winterset Municipal Waterworks	Iowa	6/30/2008	R	1.32
AMP	2008	Winterset Municipal Waterworks	Iowa	7/9/2008	R	1.13
AMP	2008	Winterset Municipal Waterworks	Iowa	7/14/2008	R	1.85
AMP	2008	Winterset Municipal Waterworks	Iowa	7/21/2008	R	0.99
AMP	2008	Winterset Municipal Waterworks	Iowa	7/28/2008	R	0.83
AMP	2008	Winterset Municipal Waterworks	Iowa	8/25/2008	R	0.18
AMP	2008	Winterset Municipal Waterworks	Iowa	9/8/2008	R	0.29
AMP	2008	Winterset Municipal Waterworks	Iowa	9/22/2008	R	0.20
AMP	2008	Winterset Municipal Waterworks	Iowa	10/6/2008	R	0.22
AMP	2008	Winterset Municipal Waterworks	Iowa	10/20/2008	R	0.14
AMP	2008	Winterset Municipal Waterworks	Iowa	11/3/2008	R	0.13
AMP	2008	Winterset Municipal Waterworks	Iowa	11/17/2008	R	0.07
AMP	2008	Winterset Municipal Waterworks	Iowa	12/1/2008	R	0.07

Appendix B

Cedar Lake Weather Data

Data from 1995 through 2009

	January-95		February-95		March-95		April-95		May-95		June-95		July-95		August-95		September-95		October-95		November-95		December-95	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	-	-	-	-	-	-	6.1	0	9.4	0	17.8	0.5	15	0	18.3	0.6	19.4	0	16.7	0	4.2	1	5.6	0
2	-	-	-	-	-	-	11 9	0	10.3	0	17.5	0.5	16.9	0	21.7	0	21.4	0	16.7	0	1.9	2.3	8.3	0
3	-	-	-	-	-	-	13 3	0 3	9.7	0	18.1	0.9	21.1	0	23.9	0	21.7	0.3	13.1	0	-2.5	0	6.9	0
4	-	-	-	-	-	-	3 3	0	10.3	0.9	21.1	0	21.7	1.1	25.3	0	23.3	0	15	0	-3.6	0	-0.6	0
5	-	-	-	-	-	-	10	0	11.7	0	21.1	0	20	2.8	24.2	0	21.9	0	14.7	0	4.7	0.2	1.7	0
6	-	-	-	-	-	-	14 2	0	13.6	0	22.2	0.6	20	0.6	25	0	24.4	0	10.3	1.2	6.7	0	-5.3	0
7	-	-	-	-	-	-	11 9	0	14.7	0	24.2	0	19.7	0	25.8	0	18.9	0	10.3	0.1	2.2	0	-6.7	0.2
8	-	-	-	-	-	-	7 5	0 9	16.4	3.2	18.9	0.6	22.8	0.7	28.9	0	13.6	0.1	10.8	0	-5	0	-10	0.4
9	-	-	-	-	-	-	7 2	1	15	0.5	15.6	0.3	24.2	0	26.7	0	12.2	0	11.7	0.1	7.2	0	-17.5	0.2
10	-	-	-	-	-	-	1.1	0 3	12.5	0.8	15.3	0	25.6	0	25.6	1	12.8	0	16.1	0	4.7	0	-14.7	0
11	-	-	-	-	-	-	3 6	2 3	12.2	0	16.7	0	27.8	0	27.5	1.3	16.9	0	18.1	0	-7.8	0.2	-11.1	0
12	-	-	-	-	-	-	2 5	0 6	11.4	0	16.7	0	30.3	0	28.1	0	19.7	0.6	22.2	0	-2.5	0	-11.9	0
13	-	-	-	-	-	-	8 9	0	18.3	1.2	18.6	0	30.8	0	28.9	0	22.2	0	18.3	0	-2.5	0	-5	0
14	-	-	-	-	-	-	13 9	0	16.4	0	20	0	30.3	0	25.6	0	18.9	0	10.3	0	-0.3	0	1.7	0.3
15	-	-	-	-	-	-	15 3	0	14.2	0	22.8	2.3	26.7	2.7	22.5	0.8	19.2	0	8.9	0	-0.8	0	-2.8	0
16	-	-	-	-	-	-	10 3	0	18.6	0	24.4	0	23.9	1.4	24.4	0.4	21.7	0	11.4	0	2.8	0	-0.3	0
17	-	-	-	-	-	-	7 2	0	13.9	0.3	25.6	0	22.5	0	28.3	0	16.9	0	19.4	0	2.2	0	0	0
18	-	-	-	-	-	-	10	1 8	12.8	1.2	24.4	0	22.5	0	28.1	0	16.4	0	13.1	0	4.2	0	0	0
19	-	-	-	-	-	-	6.4	0	14.2	0	23.9	0	24.7	0	25.6	0	16.7	3.2	14.4	0	9.4	0	-0.8	0
20	-	-	-	-	-	-	9.4	0	16.7	0	23.9	0	23.1	1.3	19.4	0	7.5	0.2	7.8	0	5.3	0	-3.6	0
21	-	-	-	-	-	-	7 2	1 3	13.9	0	25.6	0	21.7	0	21.4	0	6.9	0.3	5.6	0	0.3	0	-4.2	0
22	-	-	-	-	-	-	8.1	0	15.3	0	23.1	0	23.3	0.8	21.7	0	4.7	0	6.9	0	1.1	0	-6.1	0
23	-	-	-	-	-	-	9.4	0	13.6	0.5	25.3	0	23.3	0	24.4	0	9.2	0	10.6	0	-1.9	0	-6.4	0
24	-	-	-	-	-	-	8 9	0	12.8	0.6	22.8	0	23.3	2	25.3	0	9.2	0	8.6	0	-3.6	0	-4.2	0
25	-	-	-	-	-	-	9.7	0	13.3	0	20.3	0.6	24.4	0	24.4	0	12.2	0.2	10.6	0	4.4	0	-2.8	0
26	-	-	-	-	-	-	7 5	2 5	14.2	0	19.7	0.4	24.2	0	25.6	0	16.4	0	8.3	0	7.5	0	-1.4	0
27	-	-	-	-	-	-	6.7	2 9	17.5	0.3	20.3	1.2	26.7	0	25.6	0	19.4	0	8.6	0	0.3	0.1	-3.3	0
28	-	-	-	-	-	-	10	0	16.9	1.7	20.3	1.3	24.4	0	28.3	0	18.9	0	6.9	0.1	-11.7	0.5	-7.2	0
29	-	-	-	-	-	-	11 9	0	15.3	0	21.1	0.8	26.7	0	27.5	0	20.8	1.6	5.3	0	-5.6	0	-3.1	0
30	-	-	-	-	-	-	10 6	0 6	17.8	0	18.3	0	27.2	0	28.6	0	20.6	1.5	2.2	0	3.9	0	-0.3	0
31	-	-	-	-	-	-			19.2	0			24.2	0	24.2	0			1.7	0.9			0.3	0.2

	January-96		February-96		March-96		April-96		May-96		June-96		July-96		August-96		September-96		October-96		November-96		December-96	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	0	0	-21.94	0	-3.89	0	3.89	0	10.28	0	18.06	5.4864	23.89	0	19.17	0	21 67	0	18 33	0	-1 94	0	-2 22	0
2	-3 9	0	-26.11	0	-5.83	0	15.83	0	10.28	0	18.33	1.27	25.28	0	20.56	0	22.78	0	15 56	0	-2.5	0	-4.44	0
3	-11.1	0	-28.61	0	-10.28	0	13.61	0	11.11	0.3556	13.89	0.127	20.56	0	22.5	0	22.5	0	6 67	0	5 83	0	-5 83	0 2286
4	-7 2	0 3	-20.83	0	0	0	0.83	0	11.11	1.0414	13.61	0	22.5	0.1778	24.17	0	23 33	0	10 83	0	7.5	0.9144	-1 94	0
5	-13 9	0	-10	0	1.11	0	0.56	0	13.06	0	18.06	0	22.5	0	25.83	1.143	23 89	0	16 39	0	7.5	1.3208	-1 39	0
6	-19.7	0	-7.22	0	-5.56	0.127	1.67	0	10.28	0	17.5	0	23.33	0	28.06	0	21.11	0	19.17	0	9.72	0.3048	2 22	0
7	-18.1	0	3.61	0	-15.56	0	5	0	11.94	0	14.72	1.5494	24.44	0	24.44	0	20	0	13 89	0	5 83	0	1 39	0
8	-11.1	0	5.83	0	-13.06	0	1.94	0	17.5	2 286	16.67	0.4572	23.06	0	21.11	0	21 94	0.4572	7.78	0	3 06	0	-2.78	0
9	-0 8	0	5.83	0	-7 5	0	3.06	0	19.17	2.413	17.5	0	18.06	0	22.22	0	18 33	0	11 67	0.4064	-1.11	0	-3 61	0
10	-0 6	0	5.83	0	1.67	0	10.56	0	15.83	8 001	18.89	0	16.39	0	22.22	0	20 28	0	8 33	0	-2.78	0	3 06	0
11	0	0	0	0	6.39	0	20.56	0	10.28	0.1778	21.94	0.0762	20.56	0	19.72	2.667	21 39	0	10 83	0	-3 89	0	1 67	0
12	2 8	0	-1.67	0	9.72	0	16.11	0	7.78	0	23.33	0	24.72	0	19.72	0	13 33	0	17.78	0	-6 39	0	3 06	0
13	7 8	0	2 5	0	13.33	0	4.72	0	8.06	0.2286	24.17	0.127	21.11	0	21.39	0	12 22	0	20 56	0	-3 33	0	2 22	0
14	2 8	0	3.33	0	10	0	5	0	10.28	0	24.72	0	22.22	0	24.17	0	10	0	20 28	0	-4.17	0	1 67	0
15	-8.1	0	-5	0	3.89	0	5.28	1.143	16.94	1.0922	23.89	0	22.22	0	20.28	0	10 83	0	18 33	0	3 61	0.3302	0 28	0 6604
16	1.1	0	-9.44	0.1524	4.17	0	5.83	0	20.56	0	23.89	2.8956	22.5	0.1778	17.22	0	15 56	0	19.72	0	10 83	0.4572	-3 33	0
17	3 9	0	-3.33	0	4.17	0 2032	17.22	0	25	0.1778	22.78	0.5588	25.83	1.0922	19.44	0.9144	13 33	0	13 89	0	3 61	1.3716	-6.39	0
18	-3 3	1.4	-4.44	0	1.67	0	20	0	24.72	0	20.83	0	28.89	3.7846	20.83	0	13 61	0	6 67	0	-2 22	0	-14.44	0
19	-19.4	0 6	5.56	0	-1.67	0	17.22	0	25.83	0	21.11	0	27.5	0	23.33	0	14.72	0	10 28	0	-0 83	0	-16.11	0
20	-12 8	0	8.61	0	0.83	0	13.06	0.8128	20.83	1.9304	23.33	0.0508	23.61	0	22.78	0.4064	15 56	0.6604	15 83	0	-1 39	0	-12.78	0
21	-3 9	0	2 5	0	-1.94	0	14.17	0	17.78	0.4572	25	1.6002	22.5	0.5588	23.89	0	15 28	0.381	11 67	0	-0 28	0.4318	-1.11	0
22	-3 9	0	1.11	0.1778	0.83	0	12.22	0	19.44	0	23.06	0 508	23.33	0	25.56	0	15	0	6 67	1.0668	1.11	0	-3 61	0
23	-11.1	0	6.11	0	3.33	0	6.67	0	18.89	4 064	21.39	2.1082	21.39	0.3048	21.11	0	16 39	3.683	8 61	3.9878	2.5	0	-11.39	0
24	-12 2	0 2	8.33	0	11.39	0	15.28	0	13.89	0 508	21.39	0.8128	21.94	0	18.61	0	12.5	0	9.44	0	-3 89	0.1524	-16.39	0.127
25	-8 9	0	10.83	0	-1.39	0.4572	17.22	0	12.5	0 508	21.67	0	18.89	0	21.39	0	13 61	0	13 06	0	-10	0	-17 22	0
26	-9.7	0 2	5.83	0	-6.94	0	9.72	0	10.28	0.1778	22.22	0	19.44	0	20.83	0.4318	10 83	3.8862	18 89	0	-10 83	0	-16.67	0 0762
27	-15 6	3 9	-3.33	0.127	0.83	0	8.06	0	10.83	2.2606	24.44	0	20.56	0	19.72	2.6924	10	0.762	13 33	0	-6.11	0	-9.44	0
28	-9 2	0	-10.28	0	5	0	9.72	0	10.83	1.3462	26.94	0	22.5	1.2192	21.39	0	13 89	0	6 39	0	0 83	0.1778	-2 22	0
29	-10 3	0	-10.28	0	5.83	0	5.83	4.1148	15.56	0	28.61	0	21.94	0	21.67	0	13 33	0	14.17	1.5494	3 61	0	-9.44	0
30	-19 2	0 2			6.94	0	7.78	0.3048	15.28	0	26.39	0 381	18.33	2.7686	20.56	0	18 89	0	6 94	0.762	0 56	0.9144	-5 56	0
31	-24.4	0			0.56	0.7874			15.28	0			18.89	0	20	0			-0 83	0			-5 28	0

	January-97		February-97		March-97		April-97		May-97		June-97		July-97		August-97		September-97		October-97		November-97		December-97	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	0	0	1.94	0	3.06	0	10.83	0	6.94	3.5052	17.22	0	25	0	18.89	0	24.44	0	16.11	0	10 28	0	2.5	0
2	9.17	0	1.39	0	0.28	0	11.67	0.1016	10	0.9906	17.78	0	25	0	23.06	0	26.11	1.6002	16 67	0	7.78	0	1 39	0
3	3.33	0	-1.39	0	1.94	0	11.94	0 635	10.56	0 508	19.17	0	18.33	0	25.83	0	18 89	0	22.78	0	1.11	0.381	1 94	0.889
4	5	0.1524	-1.94	1.7272	-0.28	0	14.17	0.2286	12.5	0	18.33	0	16.67	0	27.22	0	13 33	0	22.78	0	-1 67	0	-3 61	0 3048
5	-4.17	0	-3.61	0	-3.61	0	13.61	0 381	17.5	0.2286	19.44	0	15.28	0	21.39	0	14.44	0	19.72	0	-0 28	0	-6 39	0.508
6	-7.78	0	-5.56	0	-3.89	0	6.11	2.0066	12.78	0	20.56	0	17.5	0	16.94	0	20	0	24.44	0	2 22	0	-7.5	0
7	-8.06	0	-6.94	0	3.33	0	-0.56	0	15.56	0.5334	17.78	0	18.33	0	18.89	0	25 56	0	24.72	0	3 33	0	-5	0
8	-1.67	0	-4.72	0.1524	5	0	-1.39	0	15	2.8956	18.33	0.0762	19.72	0	20.83	0	22.5	1.1938	23 89	0	4.72	0	-5	0 2032
9	-6.94	0	-5.28	0 0254	7.78	1.651	-3.06	0	11.39	0	16.39	0	21.67	0	21.39	0	21 39	0	15 28	2.159	6 67	0	-2 22	0.7366
10	-18.61	0 3048	-5.83	0	8.61	0	0	0	12.5	0	18.06	0	20	0	18.61	0	16.11	0	11 67	0	1.11	0.3048	-2.5	0.1778
11	-20	0	-6.67	0	6.67	0	-0.83	1.2192	17.5	0	18.06	0	22.22	0	17.78	0.762	13 89	0	13 33	0	-4.72	0	-2.78	0
12	-20.28	0	-9.72	0	4.44	0	0.56	1.0414	9.17	0	19.44	0	25	0	15.56	1.1684	14.72	0	22.5	0.6858	-1 94	0	-5	0
13	-15	0	-10.83	0	4.17	0	0.83	0	6.39	0	20.28	0.4572	26.94	0	17.78	0	19.17	1.6764	13 33	3.2004	-1 94	0	-6 67	0
14	-14.72	0	-4.72	0	-2.78	0	4.17	0	10.83	0	20.83	0	26.67	0	19.17	0	18 33	0	5 83	0	-0 83	0.0762	-3 61	0
15	-6.94	0 3556	-10.83	0	-6.67	0	10.83	0	8.61	0	21.94	0	23.33	0	21.11	0.0508	19.72	0	7 22	0	-3 06	0.2794	-1 67	0
16	-13.89	0	-5	0 3556	2.22	0	5.28	0	15	0	23.89	0	25.56	0	24.17	0	20 83	0	10 83	0.0762	-5 56	0	3 33	0
17	-19.72	0	3.33	0	7.78	0	5	0	20	0	20.83	0	27.5	0	25	1.5494	21.11	0.4572	8 33	0	-5	0	-1.11	0
18	-13.89	0	11.11	0	4.17	0	13.33	0	24.72	0	21.94	0	27.22	0	17.78	0	19.72	0	7.78	0	1.11	0	0 83	0
19	0	0	4.17	0	5	0	13.33	0	17.78	0	23.33	0	27.22	0	17.22	0	24.44	0	11 39	0	2 22	0	4.17	0
20	3.06	0	4.72	0	10	0	14.44	0.8382	10.83	0	24.72	0.127	27.5	0	19.72	0	16 67	0	7.5	0	2 22	0	0 83	0
21	6.39	0	1.67	0 2286	13.33	0	8.61	1.7018	11.94	0	25.83	1.2192	26.67	0.9398	17.78	0	10	0	5	0	2.5	0	-3 06	0
22	1.39	0	-2.78	0	5.83	0	11.67	0.127	15	0	23.61	0	24.44	0.6858	18.06	0	11 39	0.381	2.78	0	-2.5	0	-2.78	0 2286
23	-8.89	0	-4.44	0	5.28	0	10.28	0.1778	17.78	0	25.83	0	24.44	0	17.78	0	12.5	3.0734	0 56	0	-2.5	0	-1.11	0.127
24	-9.17	0 3556	-4.17	0	5.56	0	7 5	0	20	0.6858	26.39	0.127	24.44	0.5842	21.67	0	12.5	0	9.72	1.397	-0 28	0	-0 83	0
25	-17.22	0	-2.22	0	4.17	0.4572	8.61	0	15.83	0	23.61	2.54	26.94	0	26.11	0	14.44	0	7 22	0.381	0 83	0	-3 06	0.1778
26	-18.33	0.4064	1.67	0	10.56	0	10.83	0	11.67	0.4572	19.72	0	30.28	0	21.94	0	18 61	0	2.78	1.5748	9.44	0	-3 61	0.1016
27	-17.22	0.1016	-3.33	0.4064	15.28	0	12.78	0	9.72	0.0762	21.11	0	29.72	0	25	0	18 06	0	-5	0.4064	5	0	-4.17	0
28	-18.33	0	1.11	0	12 5	0	12 5	0	10.28	1.4224	21.94	0	27.22	0.0762	23.89	1.0414	18 06	0	-4.72	0	8 61	0	-4.17	0
29	-8.89	0			6.39	0	16.39	0	13.33	0	24.44	1 016	21.94	0	25.56	0	17.5	0	2.78	0	6 67	0.0762	-2 22	0
30	-6.94	0			7 5	0 2286	10.56	1.1176	14.17	0	24.17	0.4572	19.72	0	25.83	0	18 33	0	5 56	0	2.5	1.8288	-3 33	0
31	5.28	0			7 5	0			17.22	0			18.06	0	25.28	0			10 56	0			-3 06	0

	January-98		February-98		March-98		April-98		May-98		June-98		July-98		August-98		September-98		October-98		November-98		December-98	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	-3.61	0	6.67	0.762	-3.06	0.127	6.39	0 254	11.94	0	16.11	0	21.67	0	20	0	20	0.762	15 28	0	8 06	0	6 67	0
2	5	0	-1.39	0.1778	-2.78	0	1.39	0	16.39	0	15.56	0.2032	21.67	0	20.28	0	20 28	0	9.17	0.9398	8 33	2.0574	11 39	0
3	9.72	0	-5.56	0	-1.39	0	2.78	0	10	0.0508	15.28	0.1778	23.33	0	20.28	1.2446	21 39	0	7 22	1.9558	4.17	0.762	11 67	0 0254
4	1.39	0	-8.61	0	-3.61	0	3.06	0	15.56	0	8.61	0.6096	25.28	0.3048	23.89	0	23 61	0	9.17	0.1778	2.5	0	13 06	0
5	-3.33	1.1938	-3.33	0	-2.22	0	6.11	0	16.39	0	10.83	0	24.17	0	23.33	0.1016	21 67	0	13 61	2.3368	1.11	0	14.17	0
6	-0.28	0 0762	-4.44	0	-4.44	0	8.06	0	17.78	0	11.39	0	20.56	3.2004	20.83	1.0414	23 61	0	11 67	0	-1 94	0	7.5	0.1016
7	-0.56	0	-2.22	0	-2 5	0	14.17	0.0508	15.28	1.143	13.33	0.0508	25.83	7.0866	18.89	0.3048	25 83	0	9.44	0	0 28	0	-4.17	0.4572
8	-1.67	0	-1.39	0	-1.11	1 9812	13.06	0.5588	15	0	15.28	0.8128	23.89	0	20	0	16 94	0	9.44	0	-0 56	1.397	-2.78	0
9	-0.83	0	1.67	0	-6.67	1.143	6.39	0.762	14.72	0	14.17	2.2098	24.44	0	23.33	0	15	0	9.17	0	1 39	0.1016	0 83	0
10	-9.17	0	3.89	0.4572	-14.72	0	6.67	0.0508	16.67	0	13.89	0.0762	24.72	0	26.11	0.1524	18 61	0	12 22	0	7.78	2.0828	2.5	0
11	-10.28	0	0.28	1 0922	-14.44	0.1016	8.61	0	18.06	0	17.5	0	23.61	0.0508	21.11	0	19.72	0	14.44	0	0 56	0.0508	0 83	0
12	-8.89	0	-2 5	0	-18.33	0	15.28	0	18.61	0 381	19.72	4.0386	23.06	0	21.39	0	20 83	0	13 89	0	4.17	0	2.78	0
13	-13.06	0	0	0	-15.56	0	16.94	0.127	15.83	0	19.44	0	23.33	0	22.22	0	24.44	0	10 28	0	0 83	0	4.17	0
14	-14.72	0	1.94	0	-3.89	0	10.83	0.0508	17.78	0	20	2.159	24.72	0	21.39	0.3048	23 89	0.4064	10 28	0	7 22	0	1 67	0
15	-8.33	0	1.67	0	-7.22	0	11.67	0.4572	22.78	0	17.22	1 524	23.89	0.5588	23.06	2.032	21 67	0.0254	12.78	0	8 33	0	5 28	0
16	-8.33	0	8.06	0	-3.89	0	8.89	0.2794	21.11	0	18.89	0.3302	23.61	0.0508	23.61	0	21 39	0	17.5	0	5	0	4.17	0
17	-4.17	0.381	5.28	1.016	-0.83	0.1778	5	0	21.39	0	19.72	0	24.17	0	24.72	0	20 83	0	20	0.1778	1 39	0	0 83	0
18	-10.28	0	3.61	0.254	0	1 0414	6.67	0	23.33	0	21.94	0.7112	24.17	0.2032	26.94	0	21 94	0	13 33	2.2098	7.5	0	-0 28	0
19	-11.11	0	2 5	0 0508	0.56	0.254	10.56	0	24.72	0	20.83	1.8796	26.94	0	26.94	0	21 94	0	11.11	0	8 06	0	0 56	0
20	-6.94	0	2.22	0	-1.11	0	11.39	0 635	24.17	0 889	22.78	0	27.5	0	27.78	0	25	1.0668	9.17	0	0 56	0	-8 06	0
21	-3.89	0.7112	2.78	0	-0.83	0	8.06	0.1778	19.44	0	23.61	0	28.89	0	26.39	1.143	18 06	0.0762	8 33	0	-0 56	0	-11.67	0
22	-3.33	0	5	0.381	0.83	0	10.56	0	17.5	3.8354	21.11	0	26.39	2.1082	24.17	0	11 67	0	7.78	0	6 39	0	-14.72	0
23	-5.56	0	7.22	0 0762	2 5	0	11.67	0	14.44	0.0508	20.56	0	21.94	0.4318	26.11	0	11 67	0	8 33	0	11 94	0	-14.17	0
24	-6.39	0 0508	6.94	0 0254	-0.83	0	13.89	0	14.44	0.4572	22.78	0.3048	21.39	0	26.39	0	13 06	0.254	11 94	0	6.11	0	-9.44	0
25	-3.33	0	7.78	0	0.28	0	16.39	0.1778	17.5	0	26.11	0	21.39	0	24.72	0	19.72	0	12 22	0	6 67	0	-7.5	0
26	-1.94	0	9.72	0.1778	11.11	0	18.89	0.127	16.67	0	26.94	0	20.56	0	20.83	0	24.72	0	15	0	8 61	0	-6.11	0
27	-2 5	0	3.61	0	19.17	0	9.44	0.0762	18.89	0	27.5	0	20.83	0	20.83	0.7874	23 61	0.254	17 22	0.1016	10	0	-6.11	0
28	-0.28	0	-1.67	0 2286	13.33	0 3556	8.61	0	21.11	0	26.11	0.2794	22.22	0	22.78	2.4638	20 83	0.1524	15	0.2794	10 83	0	-1.39	0
29	2.78	0			12.22	0	8.33	0.1016	24.17	2.2098	24.44	0	23.61	0	22.22	0	20 83	0	16 67	0.254	14.44	0	-2.78	0
30	-0.83	0			19.17	2.413	8.89	0.0508	22.78	0	23.33	0	21.94	0	22.5	0	22.78	0	14.72	0	15 56	0.2032	-12.5	0
31	1.67	0			10.83	1.7018			23.61	0			19.17	0	20.83	1.2446			8 61	0			-18.33	0 5842

	January-99		February-99		March-99		April-99		May-99		June-99		July-99		August-99		September-99		October-99		November-99		December-99	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	-17.78	0	0.56	0 0762	1.39	0	13.06	0	11.11	0	17.78	0.127	18.89	0.4318	21.39	0	22.5	0	11 67	0	10 28	0	4.44	0
2	-11.67	0.508	0.56	0	7.78	0	13.89	0	12.5	0	17.22	0.127	20.28	0	20	0	23 61	0	9.72	0	7 22	0	8 33	0
3	-13.33	0 2794	2 5	0	-0.83	0.254	10.56	0.5588	17.22	0	18.06	0	23.61	0	19.44	0	25 83	0	7 22	0.3302	1 67	0	11 94	0 0762
4	-20.28	0	3.89	0	-2.22	0	11.11	0.1778	17.5	0	19.44	0	27.78	0	21.94	0	25 83	0.5588	0 56	0.4318	6.11	0	10	0
5	-23.89	0	0	0	3.33	0	8.89	0.127	16.94	0.3302	23.33	2.1844	27.5	0	19.72	0	21 67	3.5052	5	0	8 61	0	1 94	0
6	-10	0	6.94	0	-0.83	0	10	3.1496	11.67	0.0762	26.67	0	25.83	0.2032	21.39	0	16.11	0	12 22	0	8 61	0	-2.78	0
7	-9.44	0	1.67	0	-4.44	0	10	0	10.83	0.3302	23.06	0	20.83	0	21.67	4.1402	18 06	0	12.5	0	8 89	0	-0 28	0
8	-15.28	0 0508	4.44	0	-3.33	0 5588	15.56	0	10.56	0.3556	25.28	0	22.22	0	23.61	0	21 94	0.2032	17.78	0	13 06	0	5 28	0
9	-19.17	0	7.78	0	-3.06	2.413	13.06	1 651	7.5	0	24.72	0	26.67	1.8542	20.83	0	16 94	0	14.17	0	18 61	0	4.72	0
10	-17 5	0	6.67	0	-2.78	0	6.67	0	13.61	0	25	0 254	21.11	0	21.94	0	15 28	0	14.72	0	15 28	0	0 56	0
11	-12 5	0	10	0 8128	-3.89	0	11.94	0	20.28	0.9144	22.22	4 953	17.78	0	22.78	0	15 83	0	12.78	0	7.78	0	-0 56	0
12	-3.06	0	-2 5	0.127	-5	0	6.67	0	15	1.4478	23.61	2.1336	19.17	0	21.39	0.9652	17 22	0	12 22	0	5 56	0	1 39	0
13	-11.39	0	-6.67	0	-5.56	0	9.72	0	10.28	0.2794	22.5	0	20.83	0	23.06	0	15	0	18 61	0	12 22	0	1 67	0
14	-11.94	0	-3.61	0	-2 5	0	12.22	0	11.67	0	18.06	0	21.94	0	15.56	0	11 94	0	8 61	0	15 28	0	1.11	0
15	-7 5	0	6.94	0	-1.67	0	8.06	3.1496	14.17	0.0254	16.39	0	24.17	0	16.94	0	11 39	0	12 22	0	4.72	0	-1 67	0
16	-4.17	0	7.78	0	3.33	0	4.17	1.9558	16.94	2.1336	12.78	0 254	26.94	0	21.39	0.127	11.11	0	19.17	0.0762	6 39	0	-7 22	0.1778
17	2.22	0	-4.17	0	11.39	0	1.67	0.127	20.28	1.7018	13.33	0	22.78	1.3716	23.33	0	11 67	0	10 56	0	5 28	0	-9.44	0.1524
18	0.56	0 0762	-4.17	0 0508	5.28	0	4.44	0	13.61	0.3302	15	0	24.17	0	22.22	1.4478	13 89	0	3 89	0	10 56	0	-9.44	0
19	-3.06	0	-3.33	0.7112	2 5	0	6.94	0	15.56	0	17.22	0	27.78	0	21.94	0.0762	18 06	0	6 39	0	13 33	0	-8 06	0
20	-2.78	0	-3.33	0 0762	3.33	0	11.39	0.127	17.78	0	18.89	0	27.22	1.143	18.06	0	13 89	0.2794	3 33	0	-1.11	0	-7.5	0 9652
21	-1.67	0	-7 5	0	7.22	0	13.61	0	19.72	1.5748	21.94	0	27.5	0	18.89	0	6 94	0	6 67	0	5 28	0	-18 33	0
22	0	0.127	-6.94	0	3.33	0	11.67	1.4224	16.11	1.3208	23.61	0	28.33	0	22.5	0	8 61	0	15 83	0	8 06	0	-18.06	0 2286
23	-0.56	0.1524	-4.17	1.524	0.28	0	7 5	0.6604	18.61	0 508	21.94	3.7084	28.33	0	23.61	0	14.44	0	5 83	0	6.11	2.9464	-15.83	0
24	-1.39	0	-2.78	0	3.33	0	7.22	0	14.44	0	22.78	0	25.56	0	20.83	0.1524	18 33	0	1 39	0	2 22	0.0762	-8 06	0
25	-5	0 0762	-3.61	0	1.39	0	10.56	0	13.89	0	25	0	27.22	0	19.72	0	17 22	0	3 61	0	3 06	0	-11.11	0
26	-6.39	0	-1.39	0	1.39	0	12 5	0	14.72	0	25.28	0	29.44	0.0508	20.83	0	20 83	0	9.72	0	3 61	0	-1 39	0
27	1.94	0	2.78	0	4.44	0	11.67	2.3368	15.28	0	24.72	0	25.28	0.127	22.78	0	14.44	2.3368	10 56	0	7.5	0.2286	-1 67	0
28	-1.94	0	3.33	0	8.61	0.508	12.22	0.1778	20.28	0	22.22	0.9398	27.22	0.2794	23.89	0	13 06	0.5334	17 22	0	5	0	-3 61	0
29	-3.61	0			7.78	0	10.28	0	19.72	0	18.06	0.3048	28.61	0	24.44	0	10 28	0	11 94	0	3 06	0	2.5	0
30	-3.33	0			10.28	0	11.11	0	19.72	0	16.11	0	30.83	0	22.78	0.0508	10	0	15 83	0.0508	1 39	0	5 28	0
31	-1.67	0			15	0			21.11	1.3208			28.89	0 889	20.83	0			8 33	0			2 22	0

	January-00		February-00		March-00		April-00		May-00		June-00		July-00		August-00		September-00		October-00		November-00		December-00	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	1.94	0	-7.22	0	8.06	1.1176	9.72	0.3048	18.33	0	25.28	0	21.39	0	24.72	0	28 06	0	20 83	0	17 22	0	-1 94	0 3048
2	3.61	0	-7.78	0	2.78	0	8.33	0	12.22	0	21.67	0.0003	22.5	0	23.61	0	25 28	0	19.17	0	13 06	0.8636	-2.5	0.254
3	2.22	0	-1.39	0	3.06	0	11.11	0	15.28	0	15.56	0	24.17	1.2446	21.67	0	29.44	0	15 56	0	8 61	0	-10	0
4	-5.28	0.1016	-1.39	0	5	0	3.89	0	18.33	0	16.67	1 524	21.67	0.1524	20.28	0.2794	26 39	0	14.44	0	7 22	0	-4.44	0
5	-11.39	0	-6.11	0	10	0	4.44	0	20.28	0	16.67	0	24.72	0	21.94	0	17.78	0	12 22	0.254	9.72	0	-6.11	0
6	-1.67	0	-3.33	0	12 5	0	16.39	0	20.83	0	12.5	0	21.94	3.7846	25.56	0	16 39	0	3 61	0.6604	9.17	1.4732	-12.5	0 2032
7	-2.78	0	1.67	0	15	0	11.39	0	20	0	15	0	25.56	0	23.33	0	17.78	0	2 22	0	4.72	2.7432	-4.44	0
8	-1.11	0	-2 5	0	19.72	0	2.22	0.6604	22.5	0 508	20.56	0	26.39	0	24.17	1.9558	22 22	0	-0 56	0	-3 06	0	1 67	0
9	4.44	0	0.56	0	9.17	0 0254	2 5	0	16.11	0 254	25	0	27.5	0	25	0.0762	25 56	0	1 67	0	-4.17	0	-6 67	0
10	3.89	0	5.28	0	-0.83	0	9.72	0	12.78	0 635	24.44	0	27.5	0.0254	23.33	0	25	0	4.44	0	-3 33	0	-4.17	0
11	1.11	0	-3.61	0	-1.67	0	6.11	1.8034	15.56	0	25.28	0.127	26.11	0	22.78	0	27 22	0	8 33	0	-2.78	0	-13 89	0.4064
12	-3.33	0	-6.39	0	1.39	0	2.22	0	24.17	0	22.22	4.0132	22.5	1.6764	23.61	0	22.78	0	11 94	0	-1 39	0.3048	-20.28	1 27
13	-3.89	0	-2 5	0 0762	3.89	0	5.83	0	13.06	0	23.06	0	22.78	0	25.83	0.0254	16 39	0	17.78	0	-2.78	0	-19.72	0.1778
14	-7 5	0	-3.89	0 0508	4.44	0	12.78	0	9.17	0	22.22	3.5814	24.17	0	23.61	0.1016	22.78	0.0762	18 61	0.635	-4.72	0	-15.28	0 5334
15	1.11	0	-2 5	0	8.06	0	15.28	0	13.89	0	16.39	0	25	0	25.83	0	16.11	0	16 39	0	-3 89	0	-14.44	0
16	0.83	0	3.61	0	1.94	0	8.61	0	15.83	0	20.56	0.2032	23.33	1.4732	22.22	0	13 33	0	11 67	0	0 83	0	-8 06	0.127
17	-6.11	0	-3.06	0	-0.83	0	6.39	0.762	18.61	0.0508	14.72	0	23.89	0.2032	22.5	0	17.5	0	12 22	0.0508	-5 83	0	-13.33	0
18	-2 5	0	-0.28	1.016	1.11	0 0254	5.56	0	21.11	0	13.61	0	21.11	0	19.17	0	23 89	0	13 06	0	-4.72	0	-16 94	0.1524
19	0.83	0 0508	-3.61	0 5588	2.22	0.4572	13.06	0	15.28	0 508	18.06	0	16.11	2.1082	19.44	0	23 61	0	17 22	0	-1 39	0	-15.56	1.016
20	-8.61	0 3556	-5.28	0	1.67	0 2032	19.44	0 381	10	0	19.72	0.1778	17.78	0.0254	17.5	0.0508	18 06	0.9144	19.44	0	-3 89	0	-15.83	0
21	-12.78	0	-0.83	0	4.44	0 0254	5.28	1.7272	13.33	0	20	0	18.33	0	20.56	0	10 56	0.1016	16 67	0	-10 83	0	-13.33	0.4572
22	-10	0 2032	10.56	0	8.61	0	10	0	20	0	20	0	16.94	0	22.78	0.1016	10 83	2.8702	16 39	0	-4.72	0	-21.11	0
23	-2.78	0	11.94	0 2032	12.22	0	15	0	22.22	0	22.78	0	17.22	0	22.5	0.3556	17 22	0	15 83	0.4572	-5 56	0	-18.33	0
24	-11.67	0	12.22	0 2032	13.33	0 0762	14.72	0	20.83	0	23.89	0.9652	20.56	0	25	0.0508	10	0.1524	16 94	0	0 28	0	-17.22	0
25	-3.89	0	12 5	0.4572	11.11	0	10.83	0	17.78	0	22.22	0	21.11	0 381	22.5	0	6 67	0.3556	18 61	0.127	0 28	0	-21.67	0
26	-10.56	0	10.83	0 5588	11.11	0	11.11	0	16.11	0	21.67	3.6576	22.22	0	24.17	0	11.11	0	18 61	0.8128	0 83	0	-16.39	0.1524
27	-12.22	0	5.56	0	13.33	0	11.67	0.3556	14.72	2.6162	18.89	0	22.22	0 635	25.83	0	14.17	0	16 39	0	-4.44	0	-14.72	0
28	-10.56	0	6.67	0	5.56	0	14.72	0.2032	13.61	0.0254	19.72	0	23.33	0	22.78	0	16 39	0	10 56	0	1 94	0	-14.17	0
29	-8.06	0.1524	10.28	0	4.44	0	13.33	0	14.17	0	16.94	0.4572	22.78	0	26.94	0	16.11	0	10 56	0	2 22	0.127	-10.28	0 5842
30	-6.11	0 2286			6.39	0	11.94	0	18.89	0	19.17	0	21.94	0	21.94	0	19.17	0	12 22	0.3556	-1 94	0	-13.61	0
31	-9.72	0			8.89	0			25.83	0			22.5	0	26.94	0			16.11	0			-16 39	0

	January-01		February-01		March-01		April-01		May-01		June-01		July-01		August-01		September-01		October-01		November-01		December-01	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	-15	0 0508	-6.11	0	-10.56	0	3.33	0	17.22	0.4572	7.22	1.7018	25.56	0	29.72	0	18 89	0	14.17	0	15	0	-0 56	0 0508
2	-18.61	0.1016	-15	0 0762	-3.61	0	4.17	0	21.11	0	15	0.2794	17.5	0	29.72	0.0762	16 94	0	20	0	13 33	0	2.5	0
3	-13.33	0	-15.56	0	-2.22	0	8.06	0	15.83	1.6764	13.89	0	19.44	0.127	28.06	0	23 33	0	20 56	0	11 39	0	6 39	0
4	-6.39	0	-2.22	0	-0.56	0	6.39	0.2794	13.61	2.413	13.06	0.4572	24.17	0 508	24.72	1.143	21 94	0	15 83	0	12 22	0	7 22	0 0508
5	-3.06	0	-2.22	0	-5.83	0	10.28	0	16.11	0.3302	13.33	0.6858	22.5	0	26.94	0	19.72	0	9.17	0.8636	12.5	0	15 28	0
6	-1.11	0	-1.11	0 0508	-6.11	0	15	0.2032	15.28	0.4318	16.39	0.5588	21.11	0	27.78	0	23 33	0	6.11	0	13 61	0	9.17	0
7	2.22	0	-3.89	0	-4.44	0	14.44	0.1016	15.83	0 889	18.61	0	23.89	0	26.39	0	23 33	3.3528	7.78	0	16 67	0	3 61	0
8	-5	0	-4.44	0.1524	-3.06	0	11.94	0	14.72	0	19.44	0	28.61	0	25.83	0	20	7.8994	10 56	0	15 28	0	1 39	0
9	-10	0	-5.28	2 5654	-3.89	0	15.28	0.9398	16.11	0	20	0	24.72	0	26.11	0	17 22	0	14.72	0	3 33	0	-0 83	0
10	-7 5	0	-16.11	0.4572	-1.94	0	13.33	0	20.28	0.7366	22.5	0.1778	24.44	0	24.44	0	16.11	0.2032	16 39	1.6764	6 94	0	4.17	0
11	1.94	0 2794	-16.39	0	-0.56	0	12.78	3.7338	18.89	1.2192	24.17	0	22.78	0	18.33	0	18 33	0	11 67	0.1778	6 94	0	5 56	0
12	1.11	0.254	-9.17	0	-1.67	0 9652	13.33	2.0828	13.61	0	27.22	0	22.78	0.2286	20	0	20	0	10 56	0	6.11	0	5	0.4826
13	-0.83	0	-1.39	0	0.83	0	6.94	0	11.94	0	26.39	0	20.28	0	23.06	0	21 39	0	9.44	0.127	10 83	0.1524	2 22	0 2032
14	0.28	0.762	-3.06	0 3048	1.94	0	9.44	0	14.72	1.0922	25.56	0	21.39	0	18.61	0	15 83	0.127	10 83	0	14.17	0	-1 39	0
15	-0.56	0 2032	-10.56	0 2794	6.94	0.1016	11.11	0.0762	23.61	0	18.33	1.4224	22.5	0	19.17	0.127	12.78	0.0508	8 89	0	15 83	0	0 83	0
16	-4.72	0	-8.61	0	0.83	1 5494	7.22	0	23.89	0	19.44	0	22.78	0	16.94	1.4986	13 89	0.9398	5 28	0	16 67	0	6.11	0.1778
17	-7.22	0	-14.17	0	-4.72	0 3048	2.22	0	23.33	0.0508	21.94	0	25	0	18.61	0	15 56	0.9398	3 33	0	16 67	0	1 94	0
18	-5.56	0	-13.33	0	-4.17	0	4.17	0	19.72	0	24.17	0.3556	26.67	1.3208	19.72	0.762	14.44	0	9.17	0	15	0	1 39	0
19	-6.94	0	-5	0	-2.78	0	7.78	0	18.33	0	21.94	1.6002	25.28	0.3302	18.06	0	13 06	0.1778	8 61	0	8 61	0.0508	1 39	0
20	-17.78	0	-2.22	0 2032	2.22	0	14.44	0	19.17	0.6096	14.72	0.2032	25	0 254	18.89	0	16 94	0	10 28	0	1 67	0	-0 83	0
21	-12.78	0	-10.56	0	2.78	0	20.83	0.0762	15.56	0.3048	15	0.127	26.67	0.0508	19.72	0	17.5	0.0508	12.5	0	3 61	0	1.11	0
22	-8.89	0	-12.22	0	5.56	0	14.44	0.1778	10	0	17.5	0	28.89	0	25.83	0.0508	16 39	0	12 22	0	8 61	0	0 28	0
23	-3.61	0	-6.39	0	6.11	0	16.39	0.1524	11.39	0	16.39	0	30.28	0	23.06	0.1016	18 06	1.0922	11 39	1.778	10 83	0	0 28	0.127
24	-1.39	0	-4.72	0.635	-2 5	0.381	3.61	0	8.06	0.3048	17.78	0	26.67	0 254	24.44	0	8 89	0	13 33	0.127	10 56	1.0414	-7.5	0
25	-11.94	0	0	1 3716	-4.44	0	9.72	0	10.28	0.2794	24.17	0	25.83	0	23.33	0.1778	7.78	0	6 94	0	7 22	0.1016	-10	0
26	-9.44	0 2286	-4.72	0	-7.22	0	13.61	0	13.61	0.6096	25.56	0	22.78	0	20.83	0.4064	8 61	0	2.5	0	3 33	0.1524	-10.28	0
27	-9.17	0.4826	-4.72	0	-3.89	0	20	0	13.33	0 254	25.28	0	22.5	0	23.06	0	12.5	0	-0 83	0	4.17	0.4064	-9.72	0
28	-10.28	0	-13.61	0	-0.56	0	20	0	15.28	0	23.33	0	21.94	0 508	21.11	0	13 89	0	0 83	0	-2.78	0	-6.11	0
29	-2 5	0.7366			2.22	0 0762	20	0	14.17	0	22.5	0	22.5	0.1016	20	0	13 06	0	12.78	0	-2.5	0	-9.17	0
30	-0.83	1.7526			4.17	0	21.67	0	15	0	23.61	0	25	0	25.83	0	12 22	0	10 28	0	-0 56	0	-12 22	0
31	-1.11	0			5.83	0 3048			10.56	3.9116			28.61	0	20.56	0			11.11	0.127			-11.67	0

	January-02		February-02		March-02		April-02		May-02		June-02		July-02		August-02		September-02		October-02		November-02		December-02	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	-11.67	0	-6.67	0 5588	-3.06	0	3.33	0	11.39	0 635	25.28	0	27.5	0	27.78	0	22 22	0	25	0.3048	-3 33	0	-7 22	0
2	-11.11	0	-8.33	0	-9.17	0 9144	6.67	0	9.17	0.127	24.72	0.0762	25.28	0	23.06	0	25 28	0.3302	19.72	6.1468	-1 67	0	3 33	0
3	-10.56	0 0254	-4.44	0	-13.33	0 0762	-0.56	0	7.22	0	23.33	0	25	0	20	0	21 94	0	10 83	0.508	0 56	0	-4.72	0
4	-7.22	0	-9.72	0	-16.67	0	-4.44	0	10	0	23.33	0	25.83	0	26.11	0	19.44	0	15 56	0.8382	0 83	0	-7.78	0
5	-0.28	0	-13.33	0	-5.28	0	-1.94	0	14.17	0	14.44	0.0508	25.83	0	27.5	0	22.78	0	10	0	-1 67	0.2032	-6 39	0 0003
6	1.39	0 0003	-4.44	0	6.67	0	4.44	0	17.78	0.3556	16.94	0	26.11	0.1016	25	0	24.72	0	11 67	0	1 39	0	-7.78	0 0003
7	-8.89	0	-3.61	0	-0.28	0	5.56	0.2286	18.06	0.127	19.44	0	25.83	0.1524	20.28	1.1938	26 67	0	7 22	0	5 56	0	-1 67	0
8	-7 5	0	-0.28	0	3.61	0 2032	9.44	0.2794	16.67	0.0254	21.39	0	25.56	0	20.28	0	27.5	0	7.78	0	11 39	0	0 28	0
9	7 5	0	3.61	0	1.11	1 0668	4.72	0.4826	16.67	0.7874	23.33	0	28.61	0	20.56	0	26 67	0	14.44	0	10 83	0	-8 06	0
10	6.94	0	2.22	0 8382	-7.78	0	7.78	0	8.61	0	25.83	0	26.11	0	20.83	0	25 56	0	13 06	0	12.5	0	-1 94	0
11	0	0	-5.28	0	-5	0	16.11	0	12.5	1.27	22.78	1.27	23.33	2.8702	24.17	0	15 28	0	16 67	0	3 06	0	2.78	0
12	2.78	0	0.28	0	1.94	0	13.89	2.0828	10	4 699	23.06	0 381	17.78	0.7366	26.67	0	16.11	0	16 67	0	-1 94	0	3 06	0
13	1.67	0	-0.83	0	3.89	0	8.33	0	6.39	0	20.56	2.0828	19.17	0	21.94	2.8448	16 94	0	6 67	0.1016	5	0	0 83	0
14	4.44	0 0508	0.56	0	5	0	10.28	0	12.22	0	17.78	0	19.17	0	16.94	0.254	18 61	0.3556	6 39	0	7.78	0	0 56	0
15	-2.78	0	5.28	0	10.56	0	18.89	0	13.33	0	17.78	0	20.28	0	20.28	0	15 83	0	9.44	0	-0 28	0	4.17	0
16	-3.33	0	4.72	0	0.56	0	23.61	0	18.61	0.0508	17.78	0	21.67	0	19.17	0	15	0	4.17	0	-0 83	0	6 94	0
17	-5.83	0	1.39	0	3.06	0	18.33	0	12.78	0 889	17.78	0	24.44	0	18.06	0.1778	17.78	0	1 39	0.3048	-1 94	0	0 83	0
18	-3.89	0	2 5	0	-0.56	0	17.22	0	8.89	0	20.56	0	26.67	0	15.83	0.0508	20 28	0	6 94	0	-0 28	0	5 28	0.4572
19	-8.06	0 0508	10	0.1524	2.22	0.1016	18.06	0	9.44	0	23.06	0	27.78	0	16.11	0.254	21 67	3.6576	11 39	0	5	0	3 06	0
20	-1.94	0	6.11	0 8382	1.94	0.508	10	0	10.56	0	24.44	0	26.11	0.2794	19.17	0	17.5	0	1 39	0	6 67	0	1.11	0
21	-0.28	0	0.56	0 0003	0.56	0	6.67	1.6256	9.72	0	26.11	0	29.17	0	20.56	0	17 22	0	4.17	0	6 67	0	-3 89	0
22	1.39	0	-1.11	0	-8.89	0	3.61	0.0762	10.56	0	25.56	0	27.78	0 381	23.33	0.5334	13 61	0	4.44	0.1778	0 28	0	-3 89	0
23	4.72	0	-0.83	0	-4.44	0	7.22	0.7366	16.94	0.7112	25.83	0	21.11	0.0762	23.89	3.429	11 67	0	2.78	0	-0 28	0	-4.17	0
24	-5.56	0	10	0	4.44	0	14.17	0	12.78	0	24.72	0	20.28	0	21.94	0	9.72	0	0 56	0.7112	4.17	0	-5 28	0
25	-2.78	0	5.56	0	-1.94	0.1016	8.33	0.6858	11.39	1.6002	25.28	0	21.94	0.5334	21.39	0	10	0	1 94	1.5748	-5 83	0.0003	-8.06	0
26	7.22	0	-6.67	0 0508	-4.17	0	6.94	0	14.17	0	27.22	0	25.83	0.4064	21.94	0	18 61	0	5	0	-6 94	0.127	-6.11	0
27	11.67	0	-11.67	0	-1.39	0	6.94	1.0414	18.61	0	23.33	0	25	1 016	22.22	0	16.11	0	5	0	-6 94	0	-2 22	0
28	5.56	0	-8.33	0	6.11	0	8.89	1.4732	20.28	0	23.06	0	27.5	0	21.39	0	9.44	0	1 94	0.4318	-6 94	0	0 83	0
29	-4.72	0 0003			11.67	0.1778	5.28	0	21.39	2.794	24.17	0	26.67	0	21.39	0	17.78	0.0508	3 06	0.0508	-1.11	0	6 67	0
30	-6.67	0			8.06	0	12.22	0.0762	22.5	0	26.94	0	24.72	0	21.94	0	23 89	0	4.17	0.1016	1.11	0	4.44	0
31	-5.83	0 6858			4.17	0.1778			24.72	0			27.5	0	20.83	0			0	0.0762			-0 56	0

	January-03		February-03		March-03		April-03		May-03		June-03		July-03		August-03		September-03		October-03		November-03		December-03	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	-3.33	0	0.56	0	-2 5	0.1016	13.06	0	12.5	0.8636	17.22	0	20.28	0	21.67	0	14.72	0.762	7.5	0	2.5	0	6 39	0
2	-2.78	0	5	0	-7.22	0	21.11	0	12.5	0	16.94	0.1016	22.78	0	22.22	0	17.5	0	4.72	0	0 56	1 27	2.5	0
3	-6.39	0	1.94	0	-10.83	0	20.56	0	13.61	0.127	10.56	0.9906	24.44	0	20.28	0	20	0	5	0	3 33	2.794	1 67	1 2446
4	-4.44	0	-5.83	0 5842	-1.94	0	12 5	0.6858	14.72	0.762	11.94	0	28.06	0	21.39	0	17.78	0	13 06	0	5 28	7.9248	-0 83	0
5	4.72	0 0508	-11.39	0	-13.06	0.635	-1.39	0.127	11.11	4 572	16.11	0	24.72	0.6096	22.5	0	16 39	0	15 28	0	1 39	0	-0 83	0 3048
6	-1.39	0	-6.39	0	-13.89	0	-0.83	0	12.5	0.0762	18.06	2.413	24.44	0 889	21.11	1.2192	20 83	0	16 39	0	-3 89	0	-3 06	0
7	-2.78	0	-16.39	0	-7 5	0	0	1.5748	13.61	1.4986	15.83	0	24.72	0	21.94	0	21 94	0	16 67	0	-1.11	0	-2.78	0
8	5.83	0	-14.44	0	-4.44	0	-2.22	0 254	14.17	0	16.11	1.143	26.39	0	21.67	0	21 39	0	19.44	0	-2.78	0	1 39	0
9	10	0	-8.06	0	-11.11	0	-4.17	0	12.78	1.8288	15.28	0	21.94	0.5588	21.11	0	20 28	0	19.72	0	-4.72	0	3 89	0
10	-2 5	0 0003	-8.89	0 0003	-12 5	0	0.56	0	15.56	0	18.33	2.4638	23.06	1.27	20.83	0	21.11	0	19.44	0	3 06	0	-4.17	0 5334
11	-10.56	0	-9.72	0	-8.33	0 0003	10	0	11.11	0.1778	18.33	0	19.17	0	23.06	1.3208	23 89	0	17.78	0	6 39	0.0762	-10.28	0
12	-10.56	0	-4.72	0	3.61	0	13.06	0	9.17	0	19.17	0	21.11	0	22.22	0	21 67	3.556	12 22	0.6858	9.72	0	-11.94	0
13	-3.33	0	-5.83	0	0.83	0 0003	12.22	0	12.78	0.2032	19.17	0	20.56	0	19.72	0	19.17	0	12.78	0	2 22	0	-7.78	0
14	-8.33	0	-0.28	0	2.78	0	16.39	0	16.94	1 016	21.94	0	21.39	0	21.67	0	14.72	0.6858	13 06	1.7526	-0 28	0	-4.72	0.1778
15	-10.83	0	-2.22	1 9304	7.78	0	22.22	0	15.83	0 381	22.22	0	25.28	0	22.22	0	14.72	0	9.17	0	5 83	0	-2.5	0
16	-11.94	0.381	-12 5	1 0668	15.83	0	21.39	0.1778	12.78	0	21.39	0	22.5	0	26.39	0	16 39	0	7.78	0.0762	6.11	0.0254	0 56	0 0762
17	-12.22	0	-15.28	0	16.11	0	12.78	0.0508	13.33	0	22.22	0	23.06	0	27.78	0	20 28	0	3 06	0	9.17	0	-6 39	0
18	-14.44	0 0508	-10.83	0	15.83	0	7.22	0.0003	15.56	0	23.06	0	26.94	0	29.72	0	23 06	0	6 94	0	11.11	1.0922	-3 06	0 0508
19	-11.94	0	-1.11	0	11.11	0 0762	9.44	0.7366	17.5	0	22.22	0	22.78	0	29.17	0	12.78	0.8128	18 06	0	6 94	0	-0 28	0
20	-5	0	-2.22	0	3.33	0 8382	8.61	2.54	13.33	0.3048	18.06	0	23.61	0	27.78	0	10 56	0	18 89	0	9.17	0	-3 61	0
21	-10	0	5.28	0	1.67	0	8.06	0	10	0	17.78	0	24.72	0	28.89	0	12.78	0	20 28	0	10	0	0	0
22	-12.78	0 0003	3.06	0	5	0	8.89	0	12.22	0	20	0	20.56	0	23.33	0	12.78	2.8448	15	0	2 22	0	4.44	0
23	-17.78	0 0003	-7.22	0	7 5	0	10	0	14.17	0	23.61	0	17.78	0 635	21.67	0	12.5	0	13 61	0	1 94	0.6858	1 39	0
24	-18.61	0	-12 5	0 2794	14.17	0	13.06	0.6858	15.56	0	25.56	0	18.06	0	24.17	0	14.72	0	11 39	0	-5	0.1524	-6 39	0
25	-11.67	0	-18.33	0	11.39	0	8.89	1.27	12.78	0.127	27.22	0	21.11	0	28.89	0	11 94	0	9.44	0.0762	-5 83	0	-4.44	0
26	-10	0.1778	-15.56	0	7 5	0	11.94	0	15.56	0	18.89	3.7592	25.56	0	29.44	0	10	0	6 67	0	0	0	1 39	0
27	-15.83	0	-10.56	0	6.94	0.1778	12.78	0	16.67	0	18.06	0	28.33	0	27.5	0	13 89	0	4.17	0	-0 28	0	5	0
28	-6.67	0	-6.67	0	9.17	0.1778	17.22	0	18.06	0.127	21.39	0.4318	21.11	1.0922	26.39	0.4572	10	0	6 39	0.635	-1 67	0	6 39	0 0508
29	-4.72	0 2794			1.67	0	15.56	0.2286	18.89	0	22.22	0	20.83	0	24.17	0.127	6 94	0	4.72	0	-6 39	0	1.11	0
30	-8.06	0			0	0	10.56	2.7432	18.61	0.0003	19.72	0	21.94	0	22.5	0	8 06	0	8 06	0	1.11	0	-4.44	0
31	-1.11	0.127			2.22	0			21.39	0			22.78	0.5588	18.33	0			11 67	0			2 22	0

	January-04		February-04		March-04		April-04		May-04		June-04		July-04		August-04		September-04		October-04		November-04		December-04	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	-3.06	0	-15.28	0	10	0.254	3.06	0	7.78	0.0762	17.5	0.127	20.83	0	21.67	0.5588	20 83	0	18 33	0.1778	6 67	0.7366	-3 61	0
2	4.72	0	-8.61	0.762	4.17	0 3048	5.28	0	8.61	0	16.11	0	22.5	0	23.61	0.0508	23 33	0	8 89	0.2032	7.5	2.2606	-1 67	0
3	5.83	0	-11.39	0.4826	1.67	0	7 5	0	5	0.0003	15	0	23.33	1.778	25.56	0	21 67	0	6 39	0	1 94	0	0 83	0
4	-6.39	0 3048	-15.56	0	1.94	0 0508	5.56	0	6.67	0	16.67	0	20.56	0.4318	26.11	5.4102	22 22	0	14.72	0	1 94	0.1778	1 39	0
5	-12.78	0 9906	-10.56	0.254	2.78	2 6924	5.83	0	14.17	0	19.44	0	23.33	0	19.17	0	23 33	0	6 39	0	4.72	0	4.17	0
6	-18.89	0	-7 5	0 9652	1.39	0 0003	11.39	0	15.28	0	18.61	0.0254	20.28	1.9812	16.67	0	20 83	4.2164	11 94	0	8 06	0	1 39	1.143
7	-15.83	0	-11.11	0 3302	6.11	0 0762	12 5	0	22.5	0	21.67	0	16.94	0	16.39	0	17 22	0	16 39	0	13 89	0	3 89	0 0508
8	-10	0	-16.94	0	1.94	0	12.78	0	14.44	0	25.83	0	16.67	0	19.44	0	14.44	0	16 39	0.1778	5 83	0	0 56	0
9	-5.83	0	-8.06	0	6.39	0	9.44	0	21.94	9.4742	24.44	0	18.61	0 889	22.78	0	15	0	13 61	0	6.11	0	3 33	0
10	-8.06	0	-4.44	0	4.17	0	8.89	0	21.39	0.0254	22.22	0.7112	22.78	0 508	18.89	0	17 22	0	11 67	0	10 83	0	3 33	0 0003
11	-3.89	0	-5.28	0	6.11	0	1.39	0	19.44	0	23.06	0.5588	23.61	0	15	0	21 39	0	11 39	0	7 22	0.6858	0	0.127
12	2 5	0	-6.67	0	-5	0	1.67	0	20.83	0	22.78	0	21.39	3.5306	11.67	0	21.11	0	10 56	0	-1.11	0	1 94	0
13	1.11	0	-13.61	0 0762	-0.56	0	3.33	0	16.94	2.2098	22.22	3 048	24.44	0	13.61	0	21 67	0	13 06	0	-0 83	0	1.11	0
14	-0.56	0	-7 5	0	6.39	0.381	5.28	0	6.67	0.3302	20.56	0 508	23.33	0	14.72	0	23 33	0	8 89	0.0254	0	0	-9.44	0
15	-3.61	0	-12 5	0	4.44	0 0508	11.39	0	7.22	0.0508	21.67	0.1524	20.28	0	15.83	0	25	0	6 67	0	3 06	0.0762	-7.78	0
16	-3.61	0	-13.89	0	-3.33	3 9116	16.94	0	9.72	0	21.39	0	20.83	0.0254	16.39	0	17 22	1.2192	6 94	0	7.5	0	1 39	0
17	-0.83	1.4478	-5.83	0	-2.78	0 2032	20.28	0	16.67	0	21.39	0	22.22	0	20	0.2032	15 83	0	4.72	0	12.78	0	-1 67	0
18	-7.22	0	-5.28	0	1.67	0	19.72	0	19.72	3.3528	19.72	0.0762	19.44	0	20.56	0	17.5	0.1778	9.72	0	14.44	0.127	-3 06	0
19	-14.17	0	2.22	0	1.67	0	17 5	0.0508	16.11	0.3302	14.72	0.0508	19.72	0	16.94	0.0762	21.11	0	9.44	0.3302	10 28	0.635	-7.5	0
20	-13.33	0	5.28	0 6858	9.17	0	11.67	0.3048	18.89	0.0254	15	0	23.89	0	13.89	0	22.78	0	8 06	0	8 61	0.0762	-13.61	0
21	-7 5	0 0003	0	0	3.61	0	13.61	1.8288	24.17	0	16.67	0.4572	25.56	0	16.11	0	21.11	0	8 89	0	2 22	0	-1 94	0.254
22	-3.61	0	1.94	0.127	-2.22	0	11.67	0	22.5	1 397	17.5	0.1778	25.83	0.3048	16.39	0	21.11	0	11 94	0.0254	2 22	0	-13.61	0
23	-9.44	0	5	0	1.11	0	9.72	0	20.83	2.6924	18.06	0	21.94	2.3368	22.5	0	20 83	0	15 83	0	4.44	0	-15.56	0
24	1.94	0	-0.28	0	7 5	0 0254	11.67	0	15.56	0	20.28	0	19.72	0 889	22.78	0.762	15 83	0.0508	10	0	1 67	0	-18.33	0
25	-6.94	0	0	0	17 5	0	9.17	1.0668	15.83	4.5974	10.56	0.3302	14.17	0.3302	22.22	0	17 22	0	13 61	0	-2.78	0	-13.06	0
26	-5.83	0.381	-0.56	0	15.83	0 0508	10.83	0	13.06	0.0508	13.89	0	16.94	0	21.94	4.2164	14.72	0	11 39	0	0	0	-3 06	0
27	-13.61	0 6096	1.39	0	17 5	0	8.06	0	15.83	0.0508	17.22	0.0254	17.78	0	24.44	0	15 28	0	11 39	0.762	5 83	0.6858	-6.11	0
28	-20.28	0	5.28	0	11.94	3 2258	10	0	18.33	0	17.5	0.2032	18.06	0	21.11	0.6858	18 89	0	11 94	0.0508	-2 22	0.0003	-1.39	0
29	-19.72	0	7.78	0	7 5	0.1016	21.94	0	19.44	0	17.5	0	20.56	0	16.67	0	10 56	0	16 94	0.0508	-2.78	0.254	-0 28	0
30	-20.28	0.254			7.22	0	14.72	0	20.83	2.0828	19.17	0	21.39	0.127	16.94	0.8382	10 83	0	16 67	0.3302	-3 89	0.0508	0 83	0
31	-21.11	0.381			0	0			17.5	0.2032			20	0	20.28	0			6 39	0			8 61	0

	January-05		February-05		March-05		April-05		May-05		June-05		July-05		August-05		September-05		October-05		November-05		December-05	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	0.28	0.1778	0.56	0	-7.22	0 0003	8.06	0	5.83	0	16.67	0.2286	21.67	0	23.33	0.508	19.72	0	16 67	0	6 67	0	-7.5	0.508
2	0	0 2286	0.28	0	-5	0	5	0	3.61	0	17.78	0.0003	19.72	0	25.56	0.1778	19.44	0	19.72	0.0254	8 89	0	-10.83	0
3	-3.61	0.1016	1.67	0	-0.83	0	6.11	0	4.17	0	19.72	0	21.11	0	26.67	0	20 83	0	22.78	0.254	16.11	0	-10 28	0
4	-6.11	0 2286	5.28	0	0.83	0	13.89	0	5.83	0	20	0.9652	23.61	0	26.67	0.2032	20 83	0	25 83	0	11 39	0	-12.22	0 2032
5	-7 5	1 3716	8.33	0	6.39	0	19.72	0	11.39	0	21.67	1.3208	20.56	0	20	0	25	0	25 56	0	9.17	0	-16.11	0
6	-13.33	1.1938	8.89	0	4.72	0	17.22	0	14.72	0	20.56	0	20.83	0.2286	18.06	0	25 56	0	12 22	0.3556	8 33	0.0003	-15.56	0 0762
7	-13.89	0	-0.56	1 3208	13.33	0 0003	13.33	0 635	18.33	0	23.61	0	21.94	1.0668	19.17	0	23 61	0	5	0	9.72	0	-20	0
8	-11.94	0	-10	0 0003	-3.06	0	9.72	0	21.67	0	25.28	0	22.78	0	23.61	0	21 67	0.0508	3 89	0	12.5	0	-20	0 2794
9	-10.83	0	-10	0.4318	-3.06	0	11.11	0	19.44	0	22.22	1.0922	24.44	0	25	0	23 61	0.3302	5 56	0	13 33	0	-16.94	0.1524
10	-5.56	0	-11.94	0	-2.78	0 0003	17.78	0	15.83	0	21.94	0.4064	26.39	0	26.94	0	25 83	0	7 22	0	2.5	0	-12.5	0
11	-8.61	0.1016	-9.44	0	1.67	0	19.17	1.5748	19.17	8.8392	21.67	0.0508	24.72	0	24.44	0.6858	25 83	0	10 28	0	5 56	0	-2.5	0 0003
12	-4.72	0 0762	-1.11	0	1.67	0	13.06	1.2192	13.61	0 889	20.28	0	21.94	0	25.28	0.5588	25 83	0	11.11	0.2032	13 06	0	1 39	0.127
13	-4.72	0 0254	1.94	1.4478	-5.83	0	9.44	0.0508	12.22	4 318	21.39	2.2098	21.94	0	20	0.0762	25 83	0	10 83	0.127	13 06	0.0003	-0.28	0
14	-14.17	0	5	0.4826	-2 5	0	6.94	0	10.56	0 254	20.83	0.4572	24.44	0	15.83	0.4064	17.78	1.8288	14.17	0	4.17	0	1 39	0 6096
15	-21.11	0 0003	8.61	0	-3.61	0	8.61	0	7.5	0	20	0	24.72	0	17.78	0	17 22	0	16 67	0	4.17	0	-0 28	0 0762
16	-18.89	0	-0.28	0	-0.56	0	12.78	0.0003	9.17	0	18.61	0	25.56	0	19.17	0	16 39	0	11 67	0	-3 06	1.3208	-5 28	0 0508
17	-18.33	0	-3.06	0	4.44	0	16.39	0.6858	13.06	0	18.61	0	27.5	0	20.56	0	18 06	0	13 06	0	-11 39	0	-10.28	0 0003
18	-17.78	0	-1.67	0	5.56	0	18.06	0	18.33	0	19.44	0	25.83	4.3434	21.67	0	18 33	0	16 67	0	-6 67	0	-10	0
19	-3.61	0	-2.22	0	4.44	0.1524	18.89	0.1016	16.39	0 508	20.83	0	21.94	0	24.72	0	23 89	0	17 22	0	2 22	0	-13.06	0
20	-0.83	0	1.11	0.127	-1.94	0	18.61	2.2352	20.28	0	21.94	0	23.61	0	24.72	0.254	19.72	0	10 28	0.508	3 61	0.1016	-10.56	0
21	-2.78	0 0003	2.22	0 0003	1.11	0	16.67	1.143	16.39	0	23.06	0	26.94	0 381	24.44	0	20 83	0	5 56	0.254	1 67	0	-5 83	0
22	-8.06	0 0003	-1.67	0	5.28	0	10.83	0.3556	17.78	0	25.56	0	26.67	0.0508	23.33	0.0762	25 56	0	6 94	0	3 89	0	-3 61	0
23	-13.61	0	0.56	0	2.22	0 0254	7.78	0.2286	18.89	0	25.56	0	27.5	0	18.61	0	18 06	0	4.44	0	3 89	0	4.44	0
24	-8.06	0	-1.39	0 0508	4.17	0 0003	4.44	0	20	0	26.39	0	29.72	0	18.89	0	16.11	0.0508	3 33	0.254	3 89	0	3 61	0.254
25	0.56	0	-1.67	0	1.11	2.032	6.67	0	18.06	0	26.11	0.1778	28.33	0	19.17	0	21.11	0	3 61	0	-6 94	0	0 56	0.127
26	4.44	0	0.83	0	1.94	0.1016	10.28	0.1778	15.83	0 635	24.44	0	26.94	0 889	21.94	0	19.72	0.7366	4.17	0	-1 39	0	-1 67	0 0508
27	-2.22	0	0	0	3.06	0	6.39	0	15.56	0.0508	27.5	0	15.83	1.4986	20.83	0.254	13 06	0	2.78	0	6 67	0	-0 56	0
28	-3.89	0	2.78	0 0508	6.11	0	8.06	0	14.17	0	26.11	2.2098	16.67	0	21.39	0	16 67	0	5	0	9.17	0.889	-2.5	0
29	-2.78	0			11.67	0	5	0	15.83	0.0508	23.89	0	18.33	0	21.39	0	8 33	1.3208	9.44	0	0 56	0.2032	-1 39	0 0254
30	-0.83	0			17 5	0	5.56	0	12.5	0.3048	24.44	0.4064	23.61	0	21.67	0	8 89	0	14.44	0	-8 33	0	-0 83	0
31	-0.28	0			10.83	0 5588			16.11	0			23.89	0.0508	20	0			11 39	0.0003			0 28	0

	January-06		February-06		March-06		April-06		May-06		June-06		July-06		August-06		September-06		October-06		November-06		December-06	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	0	0	4.72	0	2 5	0	6.39	0	11.39	2.54	21.11	0	23.89	0.127	30.83	0	18 06	0	16 94	0	-1 39	0	-10 83	0
2	3.61	0.762	5.28	0	9.17	0	8.06	0.9398	12.22	0	19.44	0	27.22	0	28.06	1.016	17.78	0	21 39	0	-0 56	0	-6 94	0
3	0.56	0 0508	6.39	0 0003	-0.83	0	10	1.778	15.83	0.5588	20.56	0	25.56	0.0508	23.89	0.254	17.78	0.0254	23 33	0	-2 22	0	-8 89	0
4	1.39	0	-4.17	0	0	0	4.44	0	12.78	0	23.06	0	23.89	0 254	20.83	0	16 67	1.2446	22.78	0	3 61	0	-8 61	0
5	3.06	0	-8.06	0	1.39	1.651	7 5	0	11.67	0	21.39	0	19.17	0	24.72	0	15 83	0	15 28	0	8 61	0	-3 33	0
6	-3.89	0	-7.22	0	2.78	0.1778	15.83	0 254	7.5	0	21.67	0.2032	17.5	0	23.89	1.397	17.78	0	12 22	0	9.72	0	2.78	0
7	-2.22	0	-5.28	0	1.39	0	16.67	0.2032	8.61	0	23.89	0	18.61	0	25.28	0.0508	18 89	0	13 06	0	7.5	0.0508	-5 56	0 0003
8	4.17	0	-1.39	0 0508	1.67	0 3302	8.33	0	12.78	0	24.44	0	21.67	0	22.78	0.9144	20	0	16 94	0	11 39	0	-12.22	0
9	-0.28	0	-10	0	2.78	1 9558	4.17	0	17.5	0.8128	25	0	20.83	0	20.83	2.286	20 56	0	16 67	0	16 39	0	-3 89	0
10	-5.56	0	-6.67	0 0003	4.44	0	9.72	0	16.94	0	22.22	0.127	25.83	0	24.44	0.254	16 94	2.3114	11 67	0	8 33	0.1016	3 61	0
11	-1.94	0	-3.61	0 0254	7.78	0	17.78	0	12.78	0.0254	12.78	0.3302	21.94	2.54	24.72	0.0762	16.11	3.556	7.78	0.6858	-1 94	0.6858	6.11	0
12	4.17	0	-6.11	0	7 5	0	17.22	0 508	8.06	0.0762	13.61	0	24.44	0.1778	22.22	0	13 61	0	2.5	0	-2.5	0	5 83	0.254
13	3.89	0	-6.94	0	1.94	1.143	16.39	0	11.94	0	16.67	0	23.33	0.0508	23.33	0	13 61	0	1 94	0	4.44	0.3556	-0 56	0 0003
14	-5	0	1.94	0	-2 5	0	20	0	8.61	0	19.44	0	25.28	1.778	21.94	1.7272	15	0	4.17	0	5 28	0	4.17	0
15	-0.56	0	7 5	0	1.39	0	20.56	0	10.83	0 381	22.78	0	24.17	0	19.44	0	17.78	0	4.44	0.4826	4.17	0.0762	5 56	0
16	7 5	0	-3.06	0 0508	1.39	0	19.17	0.5588	14.17	0.3302	23.61	0	26.94	0	20.83	0	19.17	0.0003	9.72	0.5588	1 67	0	1 67	0
17	-1.67	0 0003	-11.94	0 0762	1.67	0 0762	14.17	0	14.72	0.0254	26.94	0	28.06	0	23.06	1.6002	23 33	1.6764	11 39	0.0508	0 83	0	6 94	0
18	-6.11	0	-20.28	0	1.67	0	12.78	0	17.5	0	22.5	0	25.83	0	23.33	3.7846	11 94	0	10 56	0.1524	1 39	0	-0 28	0
19	-0.56	0	-18.33	0	2 5	0	12.22	1.0922	16.67	0.0762	23.61	0.1524	24.17	0	23.06	1.778	10 28	0	3 06	0.4318	-2 22	0	-2.78	0
20	5	0	-11.11	0	3.33	0	11.11	0	21.94	0	23.33	0	30	0	18.33	0	6 67	0	4.44	0	-1 94	0	0	0
21	-3.06	0.1016	-3.33	0	0.56	1.524	10.56	0	16.67	0.0508	23.33	0.1016	24.44	0.2032	19.44	0	8 06	0.1016	7.5	0.508	1 67	0	1.11	2.667
22	-2.22	0	-1.67	0	-6.39	0 0762	12.22	0	13.89	0	23.61	0.4318	19.72	1.3462	21.94	0	13 06	1.397	0 28	0.5842	8 06	0	6 39	0 0508
23	-2.78	0	1.11	0	-5	0	11.94	0	16.67	0	20.83	0	20.83	0	22.5	0	16 67	0	0 28	0	7 22	0	0 83	0 0508
24	-1.11	0	-0.56	0	-1.11	0	12.78	0	21.67	1.5748	22.78	0	24.17	0	24.17	0	13 06	0	0	0	9.17	0	-0 56	0
25	0.28	0	4.72	0	0	0	13.33	0 635	22.78	0	19.17	0.127	25.56	0	25.28	0	13 33	0	2.78	0	7 22	0	1 94	0
26	0.28	0	-5	0	1.11	0	3.06	0.7112	20	0	17.5	0 254	26.11	2 032	22.5	0.0254	14.44	0	4.72	0.9398	5 28	0	-3 33	0
27	7.22	0	-1.39	0	3.89	0 9906	9.17	0	20.28	1.8542	19.44	0.2032	25.28	0	20.28	0	15 56	0	6.11	0.0254	9.72	0	-0 56	0
28	10	0	5.56	0	3.33	0 9144	11.11	0.0762	23.89	0.4572	19.17	0.0762	25	0.3556	19.72	3.048	11 39	0.0508	7.5	0	8 06	3.5052	4.72	0
29	5.56	0.254			4.17	0	13.33	1 397	26.39	0	19.72	0	26.11	0	16.67	0.1778	9.44	0	6 67	0	7.78	0.2032	5 28	0
30	1.39	0			9.17	0	11.39	2.2352	23.06	0.2286	23.06	0	28.61	0	18.61	0.0762	14.17	0	9.72	0	-7.5	0	8 06	0 3556
31	-0.56	0			13.06	2 0066			21.94	0			30.56	0	18.61	0			8 89	0			8 33	2.032

	January-07		February-07		March-07		April-07		May-07		June-07		July-07		August-07		September-07		October-07		November-07		December-07	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	1.94	1.143	-11.39	0 0003	-1.11	0.4318	11.94	0.3048	23.61	0	18.33	0	17.5	0	22.78	0	19.44	0	19.44	0.4572	5 56	0	-6.11	0 0003
2	-3.89	0	-14.17	0 0003	-2.22	1.7272	9.72	0	16.94	0	18.89	0.6858	19.72	0	25.56	0	19.17	0	19.44	0	6.11	0	3 33	2 6924
3	-1.67	0	-16.11	0	-7 5	0.4064	10.56	0.127	15.28	0	18.33	0	21.67	0	22.5	0	20 56	0	15 28	4.6228	6 67	0	-6 67	0
4	5.28	0	-19.44	0	-11.39	0	1.67	0	12.5	0.0762	18.61	0 381	25	0.3048	23.61	0	22.78	0	15	0	5 28	0	-3 33	0
5	5.56	0	-18.33	0	-6.11	0	-1.94	0	16.94	0.4318	19.44	0	24.17	0	25.28	1.397	23 89	0	20 56	0	9.44	0	0	0 0003
6	0.83	0	-15.83	0 0003	-6.11	0	-2.22	0	18.89	5.2578	17.5	0.127	24.17	0	26.94	0	23 89	0	24.44	0.0508	3 06	0	-6 94	0
7	0.83	0	-12.78	0	-3.33	0	-4.44	0	15.83	4.7498	21.39	0.0762	25	0	25	3.175	23 61	3.937	24.44	0	-1 67	0	-6 39	0 3302
8	-1.11	0	-13.61	0	-4.44	0	-3.61	0	17.78	0 381	20.83	0	27.78	0	25.83	0.4318	17.78	0	20	1.1176	2.5	0	-7.5	0
9	2.78	0	-13.61	0 0003	1.94	0	-1.39	0	17.5	0	16.39	0	27.22	0	21.67	1.2446	18 33	0	15 83	0.0508	2 22	0	-11.39	0.1016
10	-2.78	0	-14.44	0	2 5	0 2286	1.11	0	18.89	0	20.56	0	25	0	25.28	0.0762	16 94	0.6858	14.17	0	3 89	0	-11.11	0 0003
11	3.89	0	-12.22	0	5.28	0	5	2 032	20.56	0	21.39	0	20.83	0	25.83	0	11.11	0.9398	7.5	0	8 33	0	-6 67	1.7526
12	-1.39	0 0254	-1.94	0	6.94	0	-0.56	0.7366	20.56	0	22.78	0	20	0	27.5	0	11 94	0	7.78	0	11 39	0	-5	0 8382
13	-12.22	0 0003	-4.72	0.4318	12.22	0	2 5	0	19.44	0	22.22	0	19.72	0.0762	25.28	4.2418	12 22	0	13 06	1.1176	5 56	0	-5.56	0
14	-12 5	0.1778	-15	0 3048	14.44	0	3.33	0	21.67	0	21.67	0	19.44	0	25.83	0	16.11	0	12.5	2.5146	7 22	0	-4.72	0
15	-9.44	0 6858	-17.78	0	6.67	0	5.56	0	21.94	0.4572	22.22	0	22.5	0	27.22	0	7.78	0	15 28	3.3528	3 89	0	-11.11	0.1524
16	-18.61	0 0003	-18.61	0	2.22	0	9.44	0	12.22	0 508	23.33	0	21.94	0.0508	25.83	0	7.5	1.3716	13 06	0.1524	1 94	0	-12.22	0.127
17	-18.33	0	-10.56	0 3048	1.39	0.1016	12 5	0	12.22	0	26.11	0	27.22	0	21.67	0.635	15 56	0	10 83	0.0003	7 22	0	-9.17	0
18	-9.44	0	-7.78	0	0.83	0.127	13.33	0	13.33	0	25.83	0	29.17	0	21.39	0	23 89	0	13 33	2.0828	7 22	0	-5 83	0
19	-6.67	0	-2.78	0	4.17	0	10.28	0	15.83	0	20	0.2032	26.94	1.3208	24.17	0	18 61	1.9558	12.5	0.6096	3 61	0.127	-3 61	0
20	-10	0	2.22	0	5.28	0	9.17	0	19.44	0	18.33	0	21.39	0	24.72	0.127	17.5	0	12.5	0	12 22	0	-3 89	0
21	-8.06	0 5334	4.17	0	4.72	0.254	16.39	0	20.83	0	21.67	0	20.56	0	24.17	0.3302	21 67	0	16 94	0	2.78	0.0762	0	0
22	-5.28	0.1016	4.72	0	11.94	0.1016	19.17	0	21.11	0	25.28	0.4318	21.11	0	25.83	0	18 89	1.7018	15	0	-3 33	0.4826	1.11	0
23	-7.78	0	1.11	0	9.44	0 0003	16.94	0 508	21.67	0	23.06	1.3208	23.61	0.127	23.61	3.048	15	0	5 83	0	-7.5	0	-5 83	0 3556
24	-6.39	0 0003	1.11	0 3048	14.44	0	15	0.1016	20.28	1.27	19.44	0	22.78	1.0922	22.5	6.0706	21 94	0	9.44	0	-7.5	0	-8 61	0
25	-3.61	0	-1.94	3.048	18.33	0.508	10.83	3 683	12.5	1.3208	19.72	0	23.89	0	18.06	0.4318	22 22	0.0762	5 83	0	-2.78	0	-3 61	0
26	-4.44	0	-4.72	0.1778	20.83	0	7 5	2.3368	13.61	0	23.89	0	25	0	19.72	0	10 28	0.2286	5 56	0	0 83	0	0 83	0
27	-1.39	0	-5.83	0	18.33	0	8.33	0.127	15.28	0.5842	25.28	0	26.39	2.3622	21.94	0	12.78	0	8 06	0	0	0	-4.72	0 0003
28	-12 5	0 0003	-3.89	0	15.28	0.127	13.33	0	15.56	0	21.67	0	23.61	0	26.39	0	15	0	6 67	0	-1 67	0	-6.11	0 2286
29	-13.89	0			15.83	0	16.67	0	20.83	0	19.17	0	23.06	0	25.28	1.4732	13 61	0	6 94	0	-1 94	0	-6 94	0.1524
30	-11.11	0			12.78	0 6858	20.56	0	22.78	0.3556	17.78	0	23.06	0	18.06	0	20 83	0	12 22	0	-1 39	0	-7 22	0
31	-16.39	0			16.94	1.4732			16.11	1.7272			22.22	0	17.78	0			15 28	0			-7.5	0

	January-08		February-08		March-08		April-08		May-08		June-08		July-08		August-08		September-08		October-08		November-08		December-08	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	-9.17	0	-8.33	0	0.56	0	3.89	0.5588	11.67	0	20.28	0	19.72	0	24.44	0	22 22	0	12 22	0	13 89	0	-4.44	0.1016
2	-15	0	-5.28	0	4.17	0	0.83	0	18.06	0.127	20.83	0	21.11	0	23.33	0	25	0	10	0	11 94	0	-6 94	0
3	-13.33	0	-1.11	0	4.17	1.4478	3.89	0	10	0.5334	22.22	2.9972	23.06	0	21.11	0	20	0	11 67	0	16 94	0	-0 28	0 0003
4	-6.94	0	-3.33	0 5842	-10.28	0	1.11	1.0668	7.5	0	20.28	0.1778	19.17	0	28.06	0	13 89	0.6096	13 61	0	18 61	0	-7.78	0 0762
5	-0.56	0	0	0 0003	-6.94	0	6.67	0	11.11	0	20.28	3.7338	20.28	0	27.22	0	12.5	0	13 61	0	17.5	0.1778	-10	0
6	4.17	0	-3.89	1.1938	-6.67	0	11.11	0	16.94	0	22.78	4.7752	20.83	0	19.72	0	13 33	0.0003	19.72	0	13 89	2.8956	-6.11	0
7	3.06	0 0003	-7.22	0.381	-6.11	0 0003	7 5	0	17.22	0	21.11	0	23.61	0.3048	20	0	12.5	0	19.72	2.032	5 56	0.127	-6 39	0 0003
8	0	0 0003	-7 5	0	-15	0 0762	5.28	0.0762	12.5	0	25	0.2286	26.39	4.3688	19.72	0	14.72	0.3048	10	0.762	0 28	0.1524	-7.78	0
9	-1.94	0	-6.39	0	-11.39	0	0.56	0.7112	13.33	0.1016	21.67	5 842	21.39	0	20	0	8 61	0.6858	12.5	0	-1 94	0	-2 22	0.4826
10	-0.83	0	-8.06	0	-4.44	0	2 5	0.9398	13.06	0.0003	19.17	0 635	21.94	0	22.22	0	12 22	0	11 67	0	-3 61	0	-10.28	0
11	-3.61	0.127	-17.22	0	-4.72	0	8.33	1.27	11.39	1.8542	20.56	0	25.56	0	20	0	17 22	0	16 39	0	-2.5	0.5842	-8 89	0
12	-3.61	0	-15.83	0 0508	4.72	0	1.94	0.4572	8.89	0	21.67	8 255	24.17	2 286	19.72	0	21.11	2.032	19.72	0	3 61	0.381	-2.78	0 0003
13	-6.67	0	-16.39	0 0003	8.61	0	0	0.0003	12.78	0	20.28	0	18.61	0	18.06	0.8128	18 89	4.2418	20 83	0	4.44	0	-1 67	0
14	-6.11	0	-9.17	0	7.22	0	1.67	0	11.39	0	19.72	0	20.28	0	21.11	0.1778	19.17	0.1016	11 39	0.6096	8 61	0.4318	5 83	0
15	-11.94	0	-9.17	0	3.89	0	3.61	0	10.83	0	21.94	0	22.78	0	19.72	0.9906	10 28	0	7.5	1.1684	2.78	0.5588	-4.17	0
16	-8.06	0	-13.61	0	-0.83	0	11.39	0	12.5	0	20.56	0.0762	25.56	0	18.06	0.1778	12.78	0	7 22	0.6604	-1 67	0	-17.5	0
17	-7.22	0.7366	-4.72	0 9144	1.67	0.1016	15	0	16.11	0	16.67	0	23.89	0	18.33	0	17.5	0	6 67	0	2 22	0	-15.83	0 2032
18	-14.17	0 0003	-5.83	0 3048	1.94	0 3048	6.67	2.8702	18.06	0	17.78	0	24.17	1.1684	20	0	20 28	0	4.44	0.1778	-3 61	0	-11.94	0
19	-16.39	0 0003	-15.83	0 0003	2.78	0	7 5	1.0668	15.28	0	21.11	0	20.56	0.6858	20.83	0	19.44	0	7 22	0	-4.72	0	-8.89	1 8542
20	-20.56	0	-15.56	0	5	0	7.78	0	16.11	0	20.28	0.127	23.89	0.7112	21.39	0	18 61	0	16.11	0	3 61	0	-7 22	0
21	-17.78	0	-19.72	0	6.39	0	13.89	0	11.94	0	21.67	0.0762	24.17	0.2032	20.28	0	18 89	0	8 61	0	-7 22	0	-13.61	0 0003
22	-12 5	0.1016	-12.78	0	4.44	0	13.33	0.4318	13.89	0	21.67	0.6858	22.22	0	20	0.3048	17.78	0	5	2.5146	-8 61	0	-21.67	0
23	-14.44	0	-9.44	0	2.78	0 0762	13.06	0	12.78	0.9652	19.44	0	21.67	0	24.44	0.0254	20 28	0	8 06	2.6416	-4.72	0.0762	-15.28	0.1524
24	-18.06	0 0003	-5.83	0	-2 5	0 0003	16.39	0.3048	11.39	1.4478	18.89	0	20.56	0.4318	18.89	0	21 67	1.6256	7.78	0.254	4.44	0	-7.5	0 2286
25	-18.61	0	-1.67	0	1.67	0	18.61	2.4384	14.44	0.4572	20.28	0 635	20.56	3 048	17.22	0	17.5	0	5 56	0.3048	-0 28	0	-15.83	0
26	-7 5	0 0003	-4.44	0 9144	5.28	0	8.33	0.0003	22.78	1.5494	23.89	0.5842	22.5	0	16.94	0	19.17	0	9.72	0	-1 94	0	-3 89	0
27	-4.17	0	-7 5	0	5	0	6.67	0.0762	18.89	0.9398	18.89	2.9464	21.94	0	17.78	0	21.11	0	4.44	0	0 28	0	5	0 3048
28	1.11	0	-6.94	0	-1.39	0 6096	5.83	0	9.44	1.3208	21.67	0 508	23.33	9.9822	20	0.8128	18 89	0	-0 83	0	0	0	-5 56	0.4572
29	3.33	0	-2.78	0 0003	1.67	0	3.06	0	11.67	0.0508	17.78	0.1778	23.89	0.0762	18.89	0	16.11	1.778	1 94	0	1 67	0	-3 06	0
30	-11.67	0 0003			5.28	0	5.28	0	19.72	2.6924	19.17	0	22.22	0.1524	18.61	0	13 33	0	8 89	0	0	0.6096	0	0
31	-14.44	0			7.78	1.4732			20.83	0.0762			23.61	0	20	0			13 89	0			-3 61	0

	January-09		February-09		March-09		April-09		May-09		June-09		July-09		August-09		September-09		October-09		November-09		December-09	
Day	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip	Temp	Precip
1	-9.72	0	2.22	0	-10	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-1.39	0	-1.39	0	-10.56	0	4.17	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-3.33	0	-9.44	0	-5	0	2.22	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-6.67	0 0508	-14.17	0	-1.94	0	3.89	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-10.83	0	-11.39	0	4.44	0	8.61	0.6858	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-5.28	0	1.94	0	11.67	0	-1.11	0 889	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-3.61	0	8.06	0	6.94	1.016	-0.83	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-10	0 0003	5	0	3.33	2.1082	2.78	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-7.78	0	0.83	0	1.39	1.1176	6.39	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-3.61	0 6604	9.72	0 0508	2.78	1.4986	4.44	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-10.83	0	8.33	0	-5.56	0 0003	4.72	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-4.72	0	0.28	0	-9.44	0	5.56	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	-10	0.4318	0.83	0	-7.22	0	6.94	0 381	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	-14.17	0.4826	-7 5	0.7112	0.83	0	1.94	0.7112	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-23.33	0	-8.89	0	3.61	0	7 5	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-23.61	0	-9.17	0	8.06	0	9.17	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	-12 5	0	-4.44	0	13.33	0	11.39	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	-3.61	0 0003	1.39	0	13.06	0	13.06	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	-5.83	0 0003	-7.22	0	5	0	12.78	0 381	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-8.89	0	-8.61	0	3.89	0	8.61	0.0508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	-7 5	0	-3.33	0 0762	7 5	0	5.83	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	-3.06	0	-8.89	0	12.78	0	9.17	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	1.11	0	-7.78	0	13.89	0 3556	13.61	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	-12.78	0	-6.11	0	14.72	4.1402	17.78	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	-16.11	0.381	5.56	0	5.56	0 3048	18.06	0.0508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	-13.89	0 0003	5.83	0	5.28	0	8.61	3 302	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	-15.83	0 0003	-1.94	0 0508	3.06	0	15.83	4.8768	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	-17.22	0 0003	-5.56	0.254	-1.39	0	5.28	0.127	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	-11.39	0			-2 5	0.1778	8.89	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-9.17	0			2 5	0	12.22	0.2032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	-8.89	0			9.44	0 0003			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix C

Cedar Lake GWLF Inputs

TRANSPRT Inputs

TRANSPRT DATA

LAND USE	AREA(ha)	CURVE NO	KLSCP
soy beans	1409.	75.0	0.01278
corn	1991.	75.0	0.01531
farmstead	106.	70.0	0.00047
pasture	140.	61.0	0.00792
grassland	87.	61.0	0.00130
grazed timber	13.	65.0	0.00400
timber	239.	55.0	0.00190
hay field	63.	61.0	0.00946
industrial	52.	86.0	0.00009
residential	20.	70.0	0.00000
road	61.	98.0	0.00183
water	40.	0.0	0.00017

MONTH	ET CV()	DAY HRS	GROW. SEASON	EROS. COEF
jan	0.389	9.4	0	.26
feb	0.389	10.4	0	.26
mar	0.486	11.7	0	.26
apr	0.586	13.1	1	.26
may	0.689	14.2	1	.26
jun	0.700	14.9	1	.26
jul	0.800	14.5	1	.26
aug	0.750	13.6	1	.26
sept	0.650	12.3	1	.26
oct	0.500	10.9	1	.26
nov	0.399	9.7	0	.26
dec	0.389	9.1	0	.26

ANTECEDENT RAIN+MELT FOR DAY -1 TO DAY -5

0	0	0	0	0

INITIAL UNSATURATED STORAGE (cm) = 10
INITIAL SATURATED STORAGE (cm) = 0
RECESSION COEFFICIENT (1/day) = .02
SEEPAGE COEFFICIENT (1/day) = .0283
INITIAL SNOW (cm water) = 0
SEDIMENT DELIVERY RATIO = 0.370
UNSAT AVAIL WATER CAPACITY (cm) = 10

Appendix D

Cedar Lake GWLF Outputs

- Output Summary
- Annual Outputs
- Monthly Outputs

Cedar Lake Atrazine TMDL 14 -year means

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	9.2	1.0	2.2	0.4	2.7
feb	14.2	1.7	3.8	2.0	5.8
mar	11.1	3.5	3.5	1.6	5.1
apr	9.5	6.4	2.2	0.5	2.7
may	8.2	8.4	1.3	0.2	1.5
jun	8.0	6.8	0.7	0.3	1.0
jul	6.3	5.2	0.6	0.1	0.7
aug	4.7	2.0	0.4	0.3	0.8
sept	2.7	0.6	0.3	0.1	0.5
oct	2.5	0.2	0.3	0.1	0.4
nov	3.2	0.2	0.4	0.4	0.8
dec	5.3	0.5	1.2	0.7	1.8
ANNUAL	84.7	36.4	17.1	6.7	23.8

SOURCE	AREA	RUNOFF	EROSION	DIS.NITR	TOT.NITR	DIS.PHOS	TOT.PHOS
	(ha)	(cm)	(Mg/ha)	(Mg)			
soy beans	1409.	6.63	0.00	0.00	0.00	0.00	0.00
corn	1991.	6.63	0.00	0.00	0.00	0.00	0.00
farmstead	106.	4.63	0.00	0.00	0.00	0.00	0.00
pasture	140.	2.40	0.00	0.00	0.00	0.00	0.00
grassland	87.	2.40	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	3.23	0.00	0.00	0.00	0.00	0.00
timber	239.	1.49	0.00	0.00	0.00	0.00	0.00
hay field	63.	2.40	0.00	0.00	0.00	0.00	0.00
industrial	52.	15.34	0.00	0.00	0.00	0.00	0.00
residential	20.	4.63	0.00	0.00	0.00	0.00	0.00
road	61.	56.28	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

ANNUAL.TXT

Cedar Lake Atrazine TMDL YEAR SIMULATION

YEAR	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
1	78.0	36.7	15.4	3.1	18.5
2	101.7	35.5	22.4	12.2	34.5
3	74.8	36.0	12.4	3.3	15.7
4	80.8	39.8	16.2	6.5	22.7
5	75.9	38.2	15.7	3.2	18.9
6	73.8	33.5	11.1	5.1	16.2
7	68.3	38.8	13.0	4.3	17.3
8	65.5	36.5	10.4	3.2	13.7
9	90.9	36.7	16.6	9.1	25.7
10	88.0	35.2	20.3	7.8	28.1
11	69.1	34.2	12.2	3.7	15.9
12	87.4	36.9	19.0	3.8	22.7
13	102.2	37.6	23.7	8.8	32.5
14	129.8	34.2	30.3	20.3	50.6

Cedar Lake Atrazine TMDL YEAR 1

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	14.5	0.9	2.0	1.1	3.1
feb	11.2	1.6	4.5	0.3	4.8
mar	10.0	3.6	3.1	0.1	3.2
apr	13.4	6.6	3.5	0.1	3.6
may	4.1	9.8	1.5	0.0	1.5
jun	8.0	5.9	0.3	0.1	0.4
jul	2.4	5.4	0.1	0.0	0.1
aug	4.3	1.6	0.0	0.0	0.1
sept	1.3	0.4	0.0	0.1	0.1
oct	6.8	0.2	0.0	0.0	0.0
nov	0.5	0.4	0.1	1.4	1.5
dec	1.6	0.4	0.1	0.0	0.1
YEAR	78.0	36.7	15.4	3.1	18.5

SOURCE	AREA	RUNOFF	EROSION	DIS.NITR	TOT.NITR	DIS.PHOS	TOT.PHOS
	(ha)	(cm)	(Mg/ha)	(Mg)			
soy beans	1409.	2.76	0.00	0.00	0.00	0.00	0.00
corn	1991.	2.76	0.00	0.00	0.00	0.00	0.00
farmstead	106.	1.66	0.00	0.00	0.00	0.00	0.00
pasture	140.	0.58	0.00	0.00	0.00	0.00	0.00
grassland	87.	0.58	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	0.97	0.00	0.00	0.00	0.00	0.00
timber	239.	0.22	0.00	0.00	0.00	0.00	0.00
hay field	63.	0.58	0.00	0.00	0.00	0.00	0.00
industrial	52.	8.66	0.00	0.00	0.00	0.00	0.00
residential	20.	1.66	0.00	0.00	0.00	0.00	0.00
road	61.	48.52	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 2

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	6.4	1.0	0.7	0.1	0.7
feb	27.0	1.7	5.1	7.5	12.6
mar	18.0	3.7	5.9	3.3	9.2
apr	10.1	6.0	2.7	0.1	2.9
may	8.3	8.0	1.7	0.1	1.7
jun	9.8	6.6	0.6	0.7	1.4
jul	7.8	5.8	0.8	0.1	0.9
aug	6.4	1.3	1.5	0.0	1.6
sept	1.1	0.4	1.1	0.0	1.1
oct	1.7	0.3	0.4	0.0	0.5
nov	2.9	0.2	0.8	0.2	1.0
dec	2.3	0.6	1.1	0.0	1.1
YEAR	101.7	35.5	22.4	12.2	34.5

SOURCE	AREA	RUNOFF	EROSION	DIS.NITR	TOT.NITR	DIS.PHOS	TOT.PHOS
	(ha)	(cm)	(Mg/ha)	(Mg)			
soy beans	1409.	12.22	0.00	0.00	0.00	0.00	0.00
corn	1991.	12.22	0.00	0.00	0.00	0.00	0.00

farmstead	106.	9.51	0.00	0.00	0.00	0.00	0.00
pasture	140.	6.08	0.00	0.00	0.00	0.00	0.00
grassland	87.	6.08	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	7.44	0.00	0.00	0.00	0.00	0.00
timber	239.	4.41	0.00	0.00	0.00	0.00	0.00
hay field	63.	6.08	0.00	0.00	0.00	0.00	0.00
industrial	52.	23.63	0.00	0.00	0.00	0.00	0.00
residential	20.	9.51	0.00	0.00	0.00	0.00	0.00
road	61.	72.78	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 3

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	9.6	0.8	2.1	0.2	2.3
feb	11.3	1.5	3.9	0.5	4.4
mar	6.0	3.6	1.5	0.2	1.7
apr	2.3	6.6	0.9	0.0	0.9
may	4.6	7.9	0.2	0.0	0.2
jun	8.4	7.2	0.0	0.1	0.1
jul	9.9	5.6	0.0	0.2	0.2
aug	2.9	1.6	0.0	0.0	0.0
sept	3.5	0.4	0.3	0.2	0.5
oct	2.4	0.2	0.4	0.1	0.5
nov	4.7	0.4	1.6	0.1	1.7
dec	9.3	0.3	1.3	1.8	3.1
YEAR	74.8	36.0	12.4	3.3	15.7

SOURCE	AREA	RUNOFF	EROSION	DIS.NITR	TOT.NITR	DIS.PHOS	TOT.PHOS
	(ha)	(cm)	(Mg/ha)	(Mg)			
soy beans	1409.	3.00	0.00	0.00	0.00	0.00	0.00
corn	1991.	3.00	0.00	0.00	0.00	0.00	0.00
farmstead	106.	1.65	0.00	0.00	0.00	0.00	0.00
pasture	140.	0.54	0.00	0.00	0.00	0.00	0.00
grassland	87.	0.54	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	0.88	0.00	0.00	0.00	0.00	0.00
timber	239.	0.24	0.00	0.00	0.00	0.00	0.00
hay field	63.	0.54	0.00	0.00	0.00	0.00	0.00
industrial	52.	9.57	0.00	0.00	0.00	0.00	0.00
residential	20.	1.65	0.00	0.00	0.00	0.00	0.00
road	61.	47.04	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 4

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	3.9	0.9	2.8	0.0	2.8
feb	9.0	2.0	1.9	0.3	2.1
mar	15.4	3.3	4.1	2.7	6.7
apr	14.0	6.4	3.6	2.0	5.6

may	10.8	8.7	1.0	0.1	1.1
jun	3.0	8.2	0.5	0.0	0.5
jul	8.4	5.5	0.1	0.1	0.2
aug	6.7	2.8	0.5	0.9	1.4
sept	1.2	1.1	0.2	0.0	0.2
oct	1.3	0.1	0.1	0.1	0.1
nov	3.4	0.3	0.1	0.2	0.2
dec	3.7	0.4	1.3	0.3	1.7
YEAR	80.8	39.8	16.2	6.5	22.7

SOURCE	AREA (ha)	RUNOFF (cm)	EROSION (Mg/ha)	DIS.NITR (Mg)	TOT.NITR (Mg)	DIS.PHOS (Mg)	TOT.PHOS (Mg)
soy beans	1409.	6.48	0.00	0.00	0.00	0.00	0.00
corn	1991.	6.48	0.00	0.00	0.00	0.00	0.00
farmstead	106.	4.41	0.00	0.00	0.00	0.00	0.00
pasture	140.	2.04	0.00	0.00	0.00	0.00	0.00
grassland	87.	2.04	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	2.92	0.00	0.00	0.00	0.00	0.00
timber	239.	1.08	0.00	0.00	0.00	0.00	0.00
hay field	63.	2.04	0.00	0.00	0.00	0.00	0.00
industrial	52.	14.55	0.00	0.00	0.00	0.00	0.00
residential	20.	4.41	0.00	0.00	0.00	0.00	0.00
road	61.	51.75	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 5

	PRECIP (cm)	EVAPOTRANS (cm)	GR.WAT.FLOW (cm)	RUNOFF (cm)	STREAMFLOW (cm)
jan	15.6	1.0	3.4	0.9	4.4
feb	12.6	1.7	4.3	1.0	5.3
mar	15.0	3.6	4.5	0.8	5.3
apr	6.3	7.1	2.4	0.0	2.4
may	7.0	7.8	0.8	0.1	0.9
jun	7.4	6.4	0.2	0.1	0.3
jul	0.9	5.1	0.0	0.0	0.0
aug	3.3	3.3	0.0	0.0	0.0
sept	1.6	0.9	0.0	0.1	0.1
oct	1.1	0.3	0.0	0.0	0.0
nov	3.1	0.4	0.0	0.2	0.2
dec	1.9	0.7	0.0	0.0	0.0
YEAR	75.9	38.2	15.7	3.2	18.9

SOURCE	AREA (ha)	RUNOFF (cm)	EROSION (Mg/ha)	DIS.NITR (Mg)	TOT.NITR (Mg)	DIS.PHOS (Mg)	TOT.PHOS (Mg)
soy beans	1409.	2.83	0.00	0.00	0.00	0.00	0.00
corn	1991.	2.83	0.00	0.00	0.00	0.00	0.00
farmstead	106.	1.47	0.00	0.00	0.00	0.00	0.00
pasture	140.	0.32	0.00	0.00	0.00	0.00	0.00
grassland	87.	0.32	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	0.69	0.00	0.00	0.00	0.00	0.00
timber	239.	0.05	0.00	0.00	0.00	0.00	0.00
hay field	63.	0.32	0.00	0.00	0.00	0.00	0.00
industrial	52.	10.31	0.00	0.00	0.00	0.00	0.00
residential	20.	1.47	0.00	0.00	0.00	0.00	0.00
road	61.	49.92	0.00	0.00	0.00	0.00	0.00

water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 6

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	6.2	1.0	0.7	0.0	0.7
feb	4.6	1.9	1.1	0.0	1.1
mar	14.7	3.4	2.5	1.6	4.1
apr	11.7	6.1	3.6	0.1	3.7
may	3.0	8.7	1.2	0.0	1.2
jun	4.5	5.3	0.3	0.0	0.3
jul	3.4	5.7	0.1	0.0	0.1
aug	5.5	1.1	0.0	0.1	0.1
sept	5.6	0.1	0.0	0.0	0.0
oct	4.9	0.1	0.0	0.2	0.2
nov	6.1	0.0	0.0	0.0	0.0
dec	3.7	0.2	1.7	3.0	4.7
YEAR	73.8	33.5	11.1	5.1	16.2

SOURCE	AREA	RUNOFF	EROSION	DIS.NITR	TOT.NITR	DIS.PHOS	TOT.PHOS
	(ha)	(cm)	(Mg/ha)	(Mg)			
soy beans	1409.	4.95	0.00	0.00	0.00	0.00	0.00
corn	1991.	4.95	0.00	0.00	0.00	0.00	0.00
farmstead	106.	3.35	0.00	0.00	0.00	0.00	0.00
pasture	140.	1.60	0.00	0.00	0.00	0.00	0.00
grassland	87.	1.60	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	2.25	0.00	0.00	0.00	0.00	0.00
timber	239.	0.84	0.00	0.00	0.00	0.00	0.00
hay field	63.	1.60	0.00	0.00	0.00	0.00	0.00
industrial	52.	12.44	0.00	0.00	0.00	0.00	0.00
residential	20.	3.35	0.00	0.00	0.00	0.00	0.00
road	61.	47.94	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 7

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	7.8	1.1	3.8	0.8	4.6
feb	15.6	1.7	3.7	0.6	4.3
mar	7.6	3.4	3.8	0.3	4.1
apr	3.7	6.7	1.2	0.0	1.2
may	4.3	8.7	0.3	0.0	0.3
jun	14.8	6.3	0.1	2.4	2.4
jul	4.9	4.9	0.0	0.0	0.0
aug	1.9	3.6	0.0	0.0	0.0
sept	1.1	1.2	0.0	0.0	0.0
oct	0.8	0.4	0.0	0.0	0.0
nov	2.4	0.3	0.0	0.1	0.1
dec	3.3	0.4	0.2	0.1	0.2

YEAR	68.3	38.8	13.0	4.3	17.3

SOURCE	AREA (ha)	RUNOFF (cm)	EROSION (Mg/ha)	DIS.NITR (Mg)	TOT.NITR (Mg)	DIS.PHOS (Mg)	TOT.PHOS (Mg)
soy beans	1409.	4.19	0.00	0.00	0.00	0.00	0.00
corn	1991.	4.19	0.00	0.00	0.00	0.00	0.00
farmstead	106.	2.69	0.00	0.00	0.00	0.00	0.00
pasture	140.	1.07	0.00	0.00	0.00	0.00	0.00
grassland	87.	1.07	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	1.65	0.00	0.00	0.00	0.00	0.00
timber	239.	0.52	0.00	0.00	0.00	0.00	0.00
hay field	63.	1.07	0.00	0.00	0.00	0.00	0.00
industrial	52.	10.38	0.00	0.00	0.00	0.00	0.00
residential	20.	2.69	0.00	0.00	0.00	0.00	0.00
road	61.	39.90	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 8

	PRECIP (cm)	EVAPOTRANS (cm)	GR.WAT.FLOW (cm)	RUNOFF (cm)	STREAMFLOW (cm)
jan	8.8	0.9	1.4	0.1	1.5
feb	14.1	1.6	3.7	1.7	5.4
mar	3.9	3.9	2.7	0.1	2.8
apr	6.6	6.9	0.8	0.0	0.8
may	8.7	8.0	0.2	0.1	0.2
jun	4.4	7.6	0.0	0.0	0.1
jul	11.3	4.4	0.4	0.4	0.7
aug	0.3	1.5	0.1	0.0	0.1
sept	0.5	0.9	0.0	0.0	0.0
oct	1.1	0.1	0.0	0.0	0.0
nov	3.9	0.1	0.2	0.7	0.9
dec	2.0	0.5	0.9	0.0	0.9
YEAR	65.5	36.5	10.4	3.2	13.7

SOURCE	AREA (ha)	RUNOFF (cm)	EROSION (Mg/ha)	DIS.NITR (Mg)	TOT.NITR (Mg)	DIS.PHOS (Mg)	TOT.PHOS (Mg)
soy beans	1409.	2.96	0.00	0.00	0.00	0.00	0.00
corn	1991.	2.96	0.00	0.00	0.00	0.00	0.00
farmstead	106.	1.83	0.00	0.00	0.00	0.00	0.00
pasture	140.	0.79	0.00	0.00	0.00	0.00	0.00
grassland	87.	0.79	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	1.13	0.00	0.00	0.00	0.00	0.00
timber	239.	0.42	0.00	0.00	0.00	0.00	0.00
hay field	63.	0.79	0.00	0.00	0.00	0.00	0.00
industrial	52.	8.99	0.00	0.00	0.00	0.00	0.00
residential	20.	1.83	0.00	0.00	0.00	0.00	0.00
road	61.	40.92	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 9

PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	11.1	1.0	1.6	0.6	2.2
feb	12.1	1.6	4.6	2.5	7.1
mar	11.3	3.3	2.9	0.8	3.7
apr	5.6	6.2	1.6	0.0	1.7
may	3.1	9.1	0.4	0.0	0.4
jun	8.7	6.4	0.1	0.1	0.2
jul	3.2	5.6	0.0	0.0	0.0
aug	14.0	1.8	0.2	3.1	3.3
sept	2.4	0.7	0.7	0.0	0.7
oct	4.4	0.2	0.6	0.1	0.7
nov	3.7	0.2	1.0	1.1	2.1
dec	11.3	0.6	2.9	0.8	3.7
YEAR	90.9	36.7	16.6	9.1	25.7

SOURCE	AREA	RUNOFF	EROSION	DIS.NITR	TOT.NITR	DIS.PHOS	TOT.PHOS
	(ha)	(cm)	(Mg/ha)	(Mg)			
soy beans	1409.	9.07	0.00	0.00	0.00	0.00	0.00
corn	1991.	9.07	0.00	0.00	0.00	0.00	0.00
farmstead	106.	6.61	0.00	0.00	0.00	0.00	0.00
pasture	140.	3.57	0.00	0.00	0.00	0.00	0.00
grassland	87.	3.57	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	4.75	0.00	0.00	0.00	0.00	0.00
timber	239.	2.19	0.00	0.00	0.00	0.00	0.00
hay field	63.	3.57	0.00	0.00	0.00	0.00	0.00
industrial	52.	19.58	0.00	0.00	0.00	0.00	0.00
residential	20.	6.61	0.00	0.00	0.00	0.00	0.00
road	61.	63.94	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 10

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	3.3	1.0	2.3	0.0	2.3
feb	26.9	1.8	4.8	5.9	10.7
mar	6.5	3.2	4.2	0.2	4.4
apr	13.1	5.6	3.2	0.1	3.4
may	12.8	7.0	2.5	0.4	2.9
jun	5.7	7.5	1.5	0.1	1.6
jul	2.1	5.3	0.4	0.0	0.4
aug	5.8	2.3	0.1	0.0	0.1
sept	1.6	0.7	0.0	0.0	0.0
oct	3.5	0.1	0.0	0.4	0.4
nov	3.9	0.3	0.6	0.7	1.3
dec	2.9	0.5	0.7	0.0	0.7
YEAR	88.0	35.2	20.3	7.8	28.1

SOURCE	AREA	RUNOFF	EROSION	DIS.NITR	TOT.NITR	DIS.PHOS	TOT.PHOS
	(ha)	(cm)	(Mg/ha)	(Mg)			
soy beans	1409.	7.84	0.00	0.00	0.00	0.00	0.00
corn	1991.	7.84	0.00	0.00	0.00	0.00	0.00
farmstead	106.	5.21	0.00	0.00	0.00	0.00	0.00
pasture	140.	2.29	0.00	0.00	0.00	0.00	0.00
grassland	87.	2.29	0.00	0.00	0.00	0.00	0.00

grazed timber	13.	3.35	0.00	0.00	0.00	0.00
timber	239.	1.22	0.00	0.00	0.00	0.00
hay field	63.	2.29	0.00	0.00	0.00	0.00
industrial	52.	18.74	0.00	0.00	0.00	0.00
residential	20.	5.21	0.00	0.00	0.00	0.00
road	61.	60.53	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00
TOTAL				0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 11

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	8.4	1.1	2.1	0.1	2.3
feb	15.8	1.6	4.2	2.8	7.0
mar	9.5	3.8	3.1	0.2	3.2
apr	8.5	6.5	1.6	0.1	1.7
may	3.2	8.2	0.8	0.0	0.8
jun	4.3	7.5	0.2	0.0	0.2
jul	2.0	3.1	0.0	0.0	0.0
aug	2.5	0.8	0.0	0.1	0.1
sept	2.5	0.3	0.0	0.1	0.1
oct	1.2	0.6	0.0	0.0	0.0
nov	0.2	0.2	0.0	0.0	0.0
dec	10.8	0.5	0.3	0.3	0.6
YEAR	69.1	34.2	12.2	3.7	15.9

SOURCE	AREA	RUNOFF	EROSION	DIS.NITR	TOT.NITR	DIS.PHOS	TOT.PHOS
	(ha)	(cm)	(Mg/ha)	(Mg)			
soy beans	1409.	3.45	0.00	0.00	0.00	0.00	0.00
corn	1991.	3.45	0.00	0.00	0.00	0.00	0.00
farmstead	106.	2.20	0.00	0.00	0.00	0.00	0.00
pasture	140.	1.02	0.00	0.00	0.00	0.00	0.00
grassland	87.	1.02	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	1.42	0.00	0.00	0.00	0.00	0.00
timber	239.	0.66	0.00	0.00	0.00	0.00	0.00
hay field	63.	1.02	0.00	0.00	0.00	0.00	0.00
industrial	52.	9.56	0.00	0.00	0.00	0.00	0.00
residential	20.	2.20	0.00	0.00	0.00	0.00	0.00
road	61.	41.67	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 12

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	10.4	1.1	2.5	0.8	3.3
feb	9.0	1.8	3.3	0.7	4.1
mar	2.0	3.6	1.6	0.0	1.6
apr	8.9	6.8	0.5	0.1	0.6
may	18.5	8.4	2.2	0.7	2.9
jun	10.4	6.0	2.7	0.2	2.9
jul	4.4	4.8	1.1	0.0	1.1

aug	5.0	2.3	0.3	0.1	0.3
sept	5.4	1.0	0.7	0.0	0.7
oct	2.7	0.2	1.5	0.0	1.5
nov	4.6	0.1	0.6	0.2	0.8
dec	6.2	0.7	2.1	0.9	2.9
YEAR	87.4	36.9	19.0	3.8	22.7

SOURCE	AREA (ha)	RUNOFF (cm)	EROSION (Mg/ha)	DIS.NITR (Mg)	TOT.NITR (Mg)	DIS.PHOS (Mg)	TOT.PHOS (Mg)
soy beans	1409.	3.47	0.00	0.00	0.00	0.00	0.00
corn	1991.	3.47	0.00	0.00	0.00	0.00	0.00
farmstead	106.	2.00	0.00	0.00	0.00	0.00	0.00
pasture	140.	0.59	0.00	0.00	0.00	0.00	0.00
grassland	87.	0.59	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	1.07	0.00	0.00	0.00	0.00	0.00
timber	239.	0.19	0.00	0.00	0.00	0.00	0.00
hay field	63.	0.59	0.00	0.00	0.00	0.00	0.00
industrial	52.	10.51	0.00	0.00	0.00	0.00	0.00
residential	20.	2.00	0.00	0.00	0.00	0.00	0.00
road	61.	52.46	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 13

	PRECIP (cm)	EVAPOTRANS (cm)	GR.WAT.FLOW (cm)	RUNOFF (cm)	STREAMFLOW (cm)
jan	10.0	0.8	2.8	0.7	3.4
feb	17.1	2.0	4.8	2.5	7.3
mar	3.2	3.6	2.6	0.0	2.7
apr	5.3	6.4	0.6	0.0	0.6
may	22.7	9.1	1.9	1.9	3.8
jun	10.9	6.9	2.9	0.1	3.0
jul	16.1	6.1	3.6	0.9	4.4
aug	0.7	2.0	1.5	0.0	1.5
sept	6.7	0.2	0.3	0.8	1.2
oct	1.0	0.1	0.7	0.4	1.1
nov	4.3	0.0	0.5	0.0	0.5
dec	4.1	0.4	1.5	1.5	3.0
YEAR	102.2	37.6	23.7	8.8	32.5

SOURCE	AREA (ha)	RUNOFF (cm)	EROSION (Mg/ha)	DIS.NITR (Mg)	TOT.NITR (Mg)	DIS.PHOS (Mg)	TOT.PHOS (Mg)
soy beans	1409.	8.73	0.00	0.00	0.00	0.00	0.00
corn	1991.	8.73	0.00	0.00	0.00	0.00	0.00
farmstead	106.	5.91	0.00	0.00	0.00	0.00	0.00
pasture	140.	2.76	0.00	0.00	0.00	0.00	0.00
grassland	87.	2.76	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	3.92	0.00	0.00	0.00	0.00	0.00
timber	239.	1.52	0.00	0.00	0.00	0.00	0.00
hay field	63.	2.76	0.00	0.00	0.00	0.00	0.00
industrial	52.	20.94	0.00	0.00	0.00	0.00	0.00
residential	20.	5.91	0.00	0.00	0.00	0.00	0.00
road	61.	74.24	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00

TOTAL			0.00	0.00	0.00	0.00

Cedar Lake Atrazine TMDL YEAR 14

	PRECIP	EVAPOTRANS	GR.WAT.FLOW	RUNOFF	STREAMFLOW
	(cm)				
jan	12.3	0.8	3.3	0.2	3.4
feb	12.1	1.6	3.3	1.1	4.4
mar	32.5	3.5	6.3	12.9	19.2
apr	23.4	6.0	4.9	4.1	9.0
may	3.3	7.5	3.5	0.0	3.5
jun	11.4	6.8	0.7	0.5	1.2
jul	11.1	5.1	1.2	0.1	1.3
aug	6.0	2.0	2.0	0.1	2.0
sept	3.9	0.1	1.0	0.8	1.7
oct	2.0	0.0	0.8	0.0	0.8
nov	1.1	0.3	0.9	0.1	1.0
dec	10.7	0.6	2.5	0.4	2.9
YEAR	129.8	34.2	30.3	20.3	50.6

SOURCE	AREA (ha)	RUNOFF (cm)	EROSION (Mg/ha)	DIS.NITR (Mg)	TOT.NITR (Mg)	DIS.PHOS (Mg)	TOT.PHOS (Mg)
soy beans	1409.	20.81	0.00	0.00	0.00	0.00	0.00
corn	1991.	20.81	0.00	0.00	0.00	0.00	0.00
farmstead	106.	16.32	0.00	0.00	0.00	0.00	0.00
pasture	140.	10.29	0.00	0.00	0.00	0.00	0.00
grassland	87.	10.29	0.00	0.00	0.00	0.00	0.00
grazed timber	13.	12.72	0.00	0.00	0.00	0.00	0.00
timber	239.	7.28	0.00	0.00	0.00	0.00	0.00
hay field	63.	10.29	0.00	0.00	0.00	0.00	0.00
industrial	52.	36.89	0.00	0.00	0.00	0.00	0.00
residential	20.	16.32	0.00	0.00	0.00	0.00	0.00
road	61.	96.25	0.00	0.00	0.00	0.00	0.00
water	40.	0.00	0.00	0.00	0.00	0.00	0.00
GROUNDWATER				0.00	0.00	0.00	0.00
POINT SOURCE				0.00	0.00	0.00	0.00
TOTAL				0.00	0.00	0.00	0.00