

LAKE REDSTONE PROTECTION DISTRICT

**Lake Monitoring Project
East and West Branches of Big Creek
2006 and 2007 Water Depth and Streamflow Data**

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2006 and 2007 Water Depth and
Streamflow Data**

**Prepared for:
Lake Redstone Protection District
S1473 Navaho Ct.
LaValle, WI 53941**

**Prepared by:
Vierbicher Associates, Inc.
400 Viking Drive, P.O. Box 379
Reedsburg, WI 53959**

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LAKE MONITORING PROJECT
EAST AND WEST BRANCHES OF BIG CREEK
2006 AND 2007 WATER DEPTH AND STREAMFLOW DATA**

INTRODUCTION

The Lake Redstone Protection District (LRPD) contracted with Vierbicher Associates, Inc. to collect water depth and streamflow data on two branches of Big Creek that are substantial tributaries to Lake Redstone (the East and West Branches of Big Creek). The purpose of the data collection was to repeat the water quality study that was completed about ten years ago in 1996 by Vierbicher Associates, Inc. and Jim Leverance and John Panuska of the Wisconsin Department of Natural Resources (WDNR). The LRPD invested in farm yard improvements at farms along Big Creek during the past decade. As a result the LRPD is interested in knowing how those farm improvements have affected the water quality of Lake Redstone. In short, what was the benefit per the dollars they spent? Lake Planning Grants were awarded to the LRPD for this project, LPL-1064-06 supported the Lake Redstone Nutrient Loading Study – Part 1 was for the stream monitoring and water sampling and Part 2 would be for future computer analysis of the data collected. Part 1 of the grant was performed by Vierbicher Associates Inc. and data were collected from May 1, 2006 until November 30, 2006 and from April 1, 2007 until November 1, 2007.

SITE DESCRIPTIONS

The two stream sites where data were collected included, Clark Road on the West Branch of Big Creek and LaValle Road on the East Branch of Big Creek (see the attached Lake Redstone Monitoring Sites Location Map). The Clark Road site on the West Branch is in the Town of Summit, Juneau County and the LaValle Road site is in the Town of LaValle, Sauk County. According to previous study results, the Clark Road site measures flow that represents about 48 percent of the inflow to Lake Redstone and LaValle Road represents about 18 percent.

DATA COLLECTION

Monitoring equipment was installed and began operating at both sites on May 1, 2006. At the request of the LRPD the same equipment that was used in the 1996 study was installed at each site. The equipment at Clark Road included an ISCO 4150 Flow Logger and an ISCO 3700 Sampler. At LaValle Road an ISCO 3230 Air Bubble Meter (later changed out to a new 4150 Flow Logger) and an ISCO 2910 Sampler were installed. The flow monitoring equipment recorded water depth at 15 minute interval at each site. The samplers were also set up to take water samples at 15 minute intervals during specific storm events. The flow loggers would trigger the water samplers to collect water when the water level rose above a certain depth. The sampling of water would continue until the water depth went back down below the specific storm water level threshold or the samplers were full. As the seasonal flow conditions in each stream changed, the sampler trigger water depth level was also changed to facilitate water sampling only during specific rain events.

The water level monitoring for this project documents storm events and base flow at the two sites from May 1, 2006 through November 30, 2006 and from April 1, 2007 until November 1, 2007. At the Clark Road site there is a nearly continuous record of water level showing numerous storm events which occur primarily between July 18, 2006 and November 15, 2006 and from May 15, 2007 through September 30, 2007. At the LaValle Road site the 2006 water level records are interrupted during several periods where equipment failures, in-stream interference (beavers), or vandalism disrupted the data. However, there are several storm events recorded at the site between July 10, 2006 and September 1, 2006. During 2007 the water depth records at LaValle Road indicate substantial rain events throughout the measurement period.

Included in this report is a graph showing the water depth measurements at each site during the period of data collection. Also included with the report is a disk containing a spreadsheet with the raw data (depth readings), adjusted data (depth reading) based on field corrections, and the estimated streamflow based on the adjusted depth readings, for each site.

CONCLUSIONS AND RECOMMENDATIONS

Providing continuous records of water level at any site is challenging given the numerous environmental factors such as animals, floods, vandals, and equipment that must be dealt with. The records resulting from this investigation represent a significant series of storm events documenting substantial inflow to Lake Redstone during open-water periods in 2006 and 2007.

Should the LRPD want to supplement this data collection effort we recommend that an alternate site be investigated to avoid the beavers and vandals at LaValle Road. In addition, we recommend that each sampling site be visited more frequently, perhaps weekly, to help avoid longer periods of missing data. We also recommend that the LRPD buy equipment of their own and be trained to monitor stream level so that there is better coordination between the water sampling and water level data collection. This strategy would help avoid missing water sampling data during important storm events.

Finally, as an analysis of the data is completed to determine the amount of nutrients reaching the lake, the previous 1996 study results and the analytical methods used in that study must be considered. Furthermore the land use changes and best management practices deployed in the basin since the previous study should also be considered.