

# PRIOR LAKE - SPRING LAKE

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## WATERSHED DISTRICT

February 19, 2013

Mr. Jeff Berg, South Metro Area Hydrologist  
Metro Region of Waters  
Department of Natural Resources  
1200 Warner Road  
St. Paul, Minnesota 55106

2012 Prior Lake Outlet System Annual Operations Report

Dear Mr. Berg:

Enclosed is the Annual Operations Report for the Prior Lake Outlet Channel for the year 2012. If you have any questions or need additional information please contact me at (952) 447-4166 or [mkinney@plslwd.org](mailto:mkinney@plslwd.org).

Sincerely



Michael Kinney  
District Administrator

CC:

PLSLWD Board Members  
Carl Almer, EOR  
Bruce Loney, City of Shakopee  
Joe Swentek, City of Shakopee  
Terry Schwalbe, LMRWD  
Paul Nelson, Scott County

Scott County Commissioners  
Katy Gehler, City of Prior Lake  
Pete Young, City of Prior Lake  
Stan Ellison, SMSC  
Scott Walz, SMSC  
Troy Kuphal, Scott SWCD

# **2012 Prior Lake Outlet System Annual Operations Report**

## **Introduction**

The Prior Lake Outlet Structure and Outlet Channel were constructed in 1983 under DNR permit 79-6016 to address high lake level issues on Prior Lake, which does not have a natural outlet. The Prior Lake Outlet Channel (PLOC) is utilized by the Prior Lake-Spring Lake Watershed District (District, or PLSLWD) in managing lake levels on Prior Lake, as well as a trunk storm water system for the Cities of Prior Lake and Shakopee, and the Shakopee Mdewakanton Sioux Community. The 7 mile long PLOC has been divided into 8 management Segments. Segment 1 is on the southern end beginning at the Prior Lake Outlet Structure, while Segment 8 is on the northern end and flows into the Minnesota River in Shakopee.

To address current needs and plan for future development in the watershed, in 2007 the District finalized a Joint Powers Agreement/Memorandum of Agreement (JPA/MOA) with the Cities of Prior Lake and Shakopee, and the Shakopee Mdewakanton Sioux Community for the operation, maintenance and use of the Prior Lake Outlet Channel. This group of cooperators oversees the operation of the PLOC, while the District administers the day to day operations. In the early 2000's, it was determined by these JPA/MOA Cooperators that while the channel and outlet had worked well since their inception, if modified in several places, they could operate more efficiently, reduce long term maintenance and enhance the environment. With this in mind, the cooperators formed the JPA/MOA and undertook a 5-7 year project to restore and enhance the PLOC. Acknowledging that the PLOC is used as a stormwater conveyance system and is not just a natural conveyance, the JPA/MOA cooperators focus is to manage the easements of the channel and the channel itself to maintain hydrologic capacity, reduce maintenance needs, provide long-term stability and improve water quality. Secondary benefits include increased aesthetics, providing improved habitat and providing consistency with city and county plans for parks and greenways.

Operation of the Prior Lake Outlet Structure is governed by the DNR-approved Prior Lake Outlet Control Structure Management Policy and Operating Procedures dated October 2004, approved February 2005. This plan specifies a review procedure that is to be repeated every 3 years. A review and revision of this document is anticipated to occur when a calibrated rating curve has been established for the new design of the Prior Lake Outlet Structure. Additionally, an Operation, Inspection and Maintenance Manual was drafted and adopted in September 2011 for the Prior Lake Outlet Structure. The purpose of this secondary manual is to establish guidelines and practices to provide existing and future District Staff with the knowledge of how to properly operate, inspect and maintain the structural and operational components of the outlet to maximize the

life and effectiveness of the structure. The manual includes a table of recommended inspections items along with the recommend frequency of inspection. These recommendations will be reviewed periodically by District Staff to determine if the frequency is appropriate based on findings in the field and the manual will be updated accordingly.

According to the National Oceanic and Atmospheric Administration records, the 30-year county wide average annual precipitation for Scott County is 30.95 inches. Following the wet year of 2010, where the District received an average of 37.23 inches of precipitation, and the contrasting 26.07 inches of precipitation during 2011, precipitation in 2012 was 30.57 inches. Attachment G summarizes the precipitation recorded within the District. The drought conditions toward the end of 2011 and the minimal snow pack through the winter of 2011-2012 contributed to low water flows through the District during the early spring months. The abundant rainfall during May and June led to a rapid increase in the outflow from Spring Lake into Prior Lake, which is the largest source of water into Prior Lake. Flow at the Spring Lake outlet channel which flows into Upper Prior Lake near CR12 peaked at 104 cfs on June 19 and slowly tapered down until it was dry toward the end of August.

## **Outlet Structure**

The Prior Lake Outlet structure was originally constructed in and has been operated since 1983. The design of the structure was such that it required manual operation to open and close gates to regulate the flow. This design posed safety concerns for operation during high water levels. Additionally, there were inefficiencies in the structure's design in that the 36 inch pipe connected to the structure did not reach its maximum flow of 65 cfs until lake levels well surpassed the outlet elevation. Over the years the structure had also developed wear and required minor maintenance.

Given these conditions, a replacement outlet structure was pursued by the District and installed in 2010. The new outlet structure design has increased the efficiency of discharging water by allowing the outlet pipe to reach capacity sooner. It has also proven to provide safer conditions for staff during inspections and maintenance, and is self-operating, which will reduce overall operations and maintenance costs. A schematic of the new structure is provided in Attachment A and a graph showing the modeled stage-discharge relationship (rating curve) can be seen in Attachment C. A field verified rating curve for the new structure is being developed as flow data collected is sufficient to do so.

Excluding 2009, the Prior Lake Outlet Structure had flow, at least partially, every year since 1999. The year 2011 held the greatest volume of water flowing through the system since the structure's establishment in 1983. This was partially due to the more efficient design of the new Outlet Structure; however, the primary factor was the

duration of continuous discharge being significantly greater than in previous years. As for 2012 operations, the Prior Lake Outlet Structure was fully operational prior to the lake rising to the outlet elevation of 902.50 feet on May 24, 2012 and performed well throughout the duration water discharged from the lake. The Prior Lake elevation receded below the outlet elevation on August 3, 2012 and remained so for the remainder of the year. In its 71 days of discharge during 2012, an estimated three feet of vertical volume was eliminated from the lake through the Prior Lake Outlet Structure.

While Attachments E and F show Prior Lake elevations throughout 2012, more information on the yearly and cumulative discharges from the Prior Lake Outlet can be seen in Attachment D. The table shown in Attachment D is provided for comparison between years on the overall usage of the Prior Lake Outlet Structure. The numbers shown are calculated based on the most accurate information available. They are not exact and are intended for yearly comparisons only.

In addition to site inspections throughout the year for general operation, the height of the weir crest was surveyed on February 15, 2012. The design elevation is 902.5 ft. A survey completed in April 2011 showed the elevation slightly higher than planned, ranging from 902.64 to 902.65. To determine if there had been any unplanned settling, the 2012 survey showed little change from 2011, with values ranging from 902.62 to 902.64 ft. In December 2012, the contractor used a laser to cut the weir down to 902.5 ft. above sea level.

## **Outlet Channel**

As stated above, the Prior Lake Outlet Structure was in operation and discharging water from late May through early August. The “Notice of Operation/Likely Discharge of Water” was issued on May 21, 2012 as required by the Prior Lake Outlet Control Structure Management Policy and Operating Procedures. An additional notice was not issued on May 25, 2012 to confirm flow.

Before and during operations, the District is required to perform regular inspections of the Outlet Structure and the PLOC in accordance with the Outlet Operations Manual. On the basis of these inspections, the District was able to determine that the Outlet Structure and PLOC were structurally sound and able to handle the lake discharges and surface flows downstream of the Outlet Structure. As noted below, several crossing culverts were observed as in disrepair due to age and other factors. However, the condition of these culverts did not reduce the hydraulic capacity of the conveyance system unacceptably or jeopardize the basic integrity of the channel. As indicated, the District has been working with property owners to address those culvert issues.

Given the vast amount of water flowing through the system, several culverts throughout the system were fully inundated and flowing at full capacity throughout portions of the year. Additionally, for several days water overtopped and flowed out of the channel and

into the adjacent floodplain areas in Segment 5b, though due to the flat topography, no erosion was observed. While not occurring in 2012, a similar situation occurred in Segment 7a in 2011 that created a gully washout into the adjacent water body known as Quarry Lake. This was repaired by the District in December 2011 and a berm was installed to prevent future erosion in that area. In addition, accumulated sediment was removed from the channel in this area as a maintenance item and to provide additional capacity in the channel. The work completed in Segment 7a held up well throughout 2012.

Additionally, several culvert and erosion problems were noted in 2011 and carried forward into 2012. Erosion into the channel was noted at the driveway of the Squires residence in Segment 2 throughout the year as the erosion control fencing has failed since the culvert was replaced in May 2011. A culvert at the end of Jackson Trail in Segment 4 failed and was removed in late November 2011 and the District has been working with the property owner and the City of Prior Lake to address the replacement of this culvert. Also in Segment 4, a culvert at a field crossing just downstream of Jackson Trail was observed to be failing in 2011, and has not yet been repaired, removed or replaced by the property owner. Lastly, the primary and secondary culverts on the US Fish and Wildlife Service driveway in Segment 8 were partially washed out in 2011 and were repaired by the property owner in early 2012. Removal of small organic debris from several culverts throughout the year to ensure free flows was the primary extent of the additional maintenance that occurred.

Monitoring within the PLOC in 2012 consisted of both water quantity and vegetation monitoring. Water quantity monitoring was limited to obtaining stage and flow measurements at the immediate daylight of the Outlet Structure. The primary goal was to provide an accurate field verified rating curve for the new Outlet Structure. Additional quantity monitoring occurred at several locations throughout the PLOC as a part of a project specific data gathering for an XP-SWMM calibration and update. Vegetation surveys were also completed along the easements of the PLOC in the spring and fall. These assessments, which will continue again in the spring and fall of 2013 and end in the spring of 2014, collected data on species composition and distribution of noxious plants, noted erosion sites along the PLOC, and identified land cover and plant community types. An annual Comprehensive Maintenance Plan for Vegetation is also a product of these vegetation surveys.

No permits were issued by the District for PLOC crossings during 2012. However, work continued on several outstanding items from a previous permit issued for the Riverside Bluffs development in Segment 5a. The District worked with the property developer and the City of Shakopee to address the issues and subsequently closed out the permit in February 2012.

## **Outlet Channel Restoration and Enhancement Project**

Over the last few years the PLSLWD and the other JPA/MOA cooperators have undertaken a project to restore and enhance the PLOC. The purpose of the project has been to maintain hydrologic capacity, reduce maintenance needs, provide long-term stability, improve water quality, increase aesthetics, provide improved habitat and provide consistency with city and county plans for parks and greenways. Several portions of this project have been completed. Work completed on Segment 1 in 2006 consisted of bank stabilizations, increased native plantings and a creation of a spillway between Upper and Lower Jeffers Ponds. A basin was excavated and sinuosity was added to the channel in Segment 5c prior to entering Dean Lake during the early portion of 2007. Work in 2009 included the replacement of an undersized culvert on the northern end of Segment 8. The year 2010 held the finalization of work in several Segments including: banks being reshaped, in addition to toe stabilization and weir reinforcements put in place on Segment 7a; toe stabilization, bank protections and flow realignment in Segment 3; and work to build up the channel bed and reconnect it to the floodplain in Segment 2. Additional site checks were made throughout 2012 to ensure stability against erosion and vegetation survival within the areas of previous work in Segments 2, 3, and 7a.

No major reconstruction work as a part of the restoration and enhancement project was completed in 2012. Additional areas with planned future reconstruction include Segments 4a, 4b and 7b. Segment 4a will consist of reshaping the channel. Segment 4b will include bank stabilizations, grade controls, cattle exclusion fencing and vegetation plantings within the bank and riparian area. Segment 7b is planned to have toe stabilizations and bank protection installed. These additional reconstruction items will be addressed with the JPA/MOA cooperators as they progress.

### **Attachments:**

- A. Prior Lake Outlet Structure Diagram**
- B. 2012 Outlet Operations Summary**
- C. Stage-Discharge Relationship (New Structure)**
- D. Volumes Discharged from Prior Lake**
- E. Prior Lake Elevations and Precipitation**
- F. Prior Lake Elevations Graph**
- G. Summary of Precipitation within PLSLWD**





Attachment B:  
2012 Outlet Operations

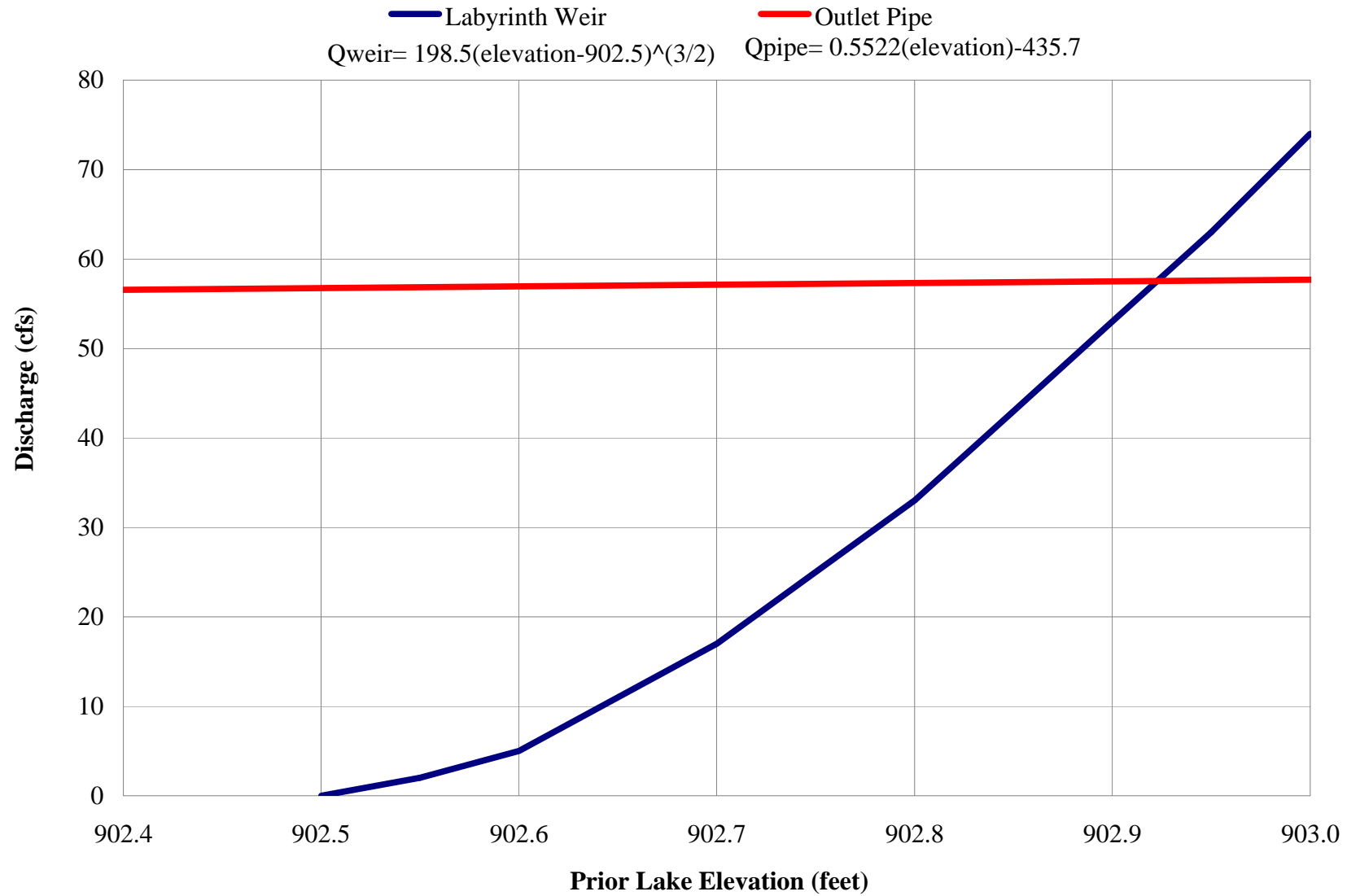
Date	Elevation	Outlet Activity	Inseptions/Channel Activity
4/20/2012	900.79	Not flowing	Continued failing of Field Crossing downstream of Jackson Trail, moderate beaver dam at Dean Lake outlet.
5/2/2012	900.85	Not flowing	Lake level check.
5/7/2012	901.52	Not flowing	Significant rainfall over past few days. No new channel issues noted.
5/9/2012	901.76	Not flowing	Lake level check.
5/14/2012	902.14	Not flowing	Lake level check.
5/17/2012	902.24	Not flowing	Lake level check.
5/21/2012	902.30	Not flowing	Lake level check.
5/24/2012	902.54	Freely flowing	Noted organic debris partially blocking several culverts, need for erosion control fencing repair along Squires driveway.
5/25/2012	902.62	Freely flowing	Lake level check.
5/29/2012	902.92	Freely flowing	Noted some flow obstruction at Jackson Trail, seepage along pond berm at Riverside Bluffs.
5/30/2012	902.94	Freely flowing	Lake level check.
6/1/2012	902.97	Freely flowing	Continued erosion of failed culvert at Field Crossing downstream of Jackson Trail, organic debris buildup in various culverts.
6/4/2012	903.00	Freely flowing	Removed organic debris from Prior Lake Outlet Structure, full capacity flow from structure resumed.
6/5/2012	903.00	Freely flowing	No new channel issues noted.
6/6/2012	902.00	Freely flowing	Organic debris buildup in various culverts noted.
6/7/2012	902.99	Freely flowing	Lake level check.
6/8/2012	902.95	Freely flowing	Noted partially plugged culvert on Segment 5b, organic debris buildup in various culverts.
6/11/2012	902.90	Freely flowing	Noted continued erosion at Field Crossing downstream of Jackson trail, seepage of berms near Riverside Bluffs.
6/14/2012	902.75	Freely flowing	Noted continued partial blockage of culvert on Segment 5b.
6/15/2012	902.94	Freely flowing	Continued erosion of failed culvert at Field Crossing downstream of Jackson Trail and partial blockage on Segment 5b.
6/18/2012	903.19	Freely flowing	Significant rain over past few days. Water outside of channel banks in Segment 5b, several culverts underwater throughout channel.
6/19/2012	903.36	Freely flowing	Water remains out of banks in Segment 5b, several culverts still underwater.
6/20/2012	903.41	Freely flowing	Jeffers Pass, Lower Jeffers, CR 42, Strauss, Kinney, Kici Yapi, CR 16, field crossings in Segment 5b and FWS culverts all underwater.
6/20/2012	903.43	Freely flowing	Lake level check.
6/21/2012	903.49	Freely flowing	Water remains out of banks in Segment 5b, several culverts still underwater.
6/22/2012	903.52	Freely flowing	Lake level check.
6/25/2012	903.59	Freely flowing	Water remains out of banks in Segment 5b, several culverts still underwater.
6/27/2012	903.55	Freely flowing	Lake level check.
6/29/2012	903.50	Freely flowing	Lake level check.
6/29/2012	903.48	Freely flowing	Organic debris buildup in various culverts noted, some culverts remain underwater.
7/2/2012	903.38	Freely flowing	Organic debris buildup in various culverts, continued erosion noted at field crossing downstream of Jackson Trail
7/3/2012	903.31	Freely flowing	Lake level check.
7/5/2012	903.21	Freely flowing	Squires driveway regraded but erosion control fence not repaired, organic debris buildup in various culverts.
7/9/2012	902.93	Freely flowing	Water levels receding in channel, no culverts noted underwater.
7/11/2012	902.85	Freely flowing	No new channel issues noted.
7/13/2012	902.73	Freely flowing	Organic debris buildup in various culverts noted.
7/16/2012	902.64	Freely flowing	Lake level check.
7/19/2012	902.60	Freely flowing	No new channel issues noted, culverts at Jackson trail and downstream Field Crossing still need repair.
7/24/2012	902.63	Freely flowing	Lake level check.
7/26/2012	902.61	Freely flowing	Lake level check.
7/30/2012	902.55	Freely flowing	Erosion around Squires driveway still needs repair, no new channel issues noted.
7/30/2012	902.57	Freely flowing	Lake level check.
8/3/2012	902.47	Not flowing	Lake level check.

\*Various spot checks as needed through remainder of the year. No flow from Outlet Structure and minimal to no flows in channel. Listed inspections do not include vegetation monitoring.



Attachment C:  
Stage-Discharge Relationship

**Prior Lake Outlet Stage-Discharge Relationship**



**Attachment D:**  
**Volumes Discharged from Prior Lake**

**Volumes Discharged from the Prior Lake Outlet and Associated Elevations**

<b>Averages</b> <b>Year</b>	<b>Volume</b> <b>Discharged (ac*ft)</b>	<b>Depth Eliminated</b> <b>from Lake (ft)</b>	<b>Min Elevation</b> <b>for the Year</b>	<b>Date of Min</b> <b>Elevation</b>	<b>Max Elevation</b> <b>for the Year</b>	<b>Date of Max</b> <b>Elevation</b>	<b>Max Elevation</b> <b>without the Outlet</b>	<b>Average</b> <b>Rainfall</b>
2012	5751	3.00	900.48	12/6/2012	903.59	6/25/2012	906.59	30.57
2011	20314	9.93	900.87	12/28/2011	903.95	4/5/2011	913.88	26.07
2010	1110	0.59	899.38	1/14/2010	902.78	12/23/2010	903.37	37.23
2009	0	0.00	898.98	9/30/2009	900.44	4/29/2009	900.44	27.41
2008	4993	2.61	900.28	12/29/2008	902.90	5/8/2008	905.51	23.88
2007	1395	0.74	900.55	8/10/2007	902.78	4/23/2007	903.52	28.59
2006	4331	2.27	900.50	12/14/2006	903.27	4/7/2006	905.54	27.77
2005	2299	1.21	900.71	1/18/2005	903.10	10/18/2005	904.31	38.02
2004	13	0.01	900.50	4/15/2004	902.79	7/12/2004	902.80	32.96
2003	5921	3.08	900.62	12/30/2003	903.17	5/23/2003	906.25	23.00
2002	9520	4.88	900.70	3/4/2002	903.60	9/10/2002	908.48	41.96
2001	8692	4.47	901.04	12/28/2001	904.28	5/7/2001	908.75	28.52
2000	80	0.04	901.52	2/20/2000	903.00	7/11/2000	903.04	26.09
1999	6240	3.24	902.00	11/25/1999	904.78	5/27/1999	908.02	33.29
1998			902.05	1/1/1998	903.90	4/13/1998		35.00*
1997	4150	2.18	901.20	2/28/1997	902.90	4/21/1997	905.08	32.36*
1996		0.00	900.77	11/4/1996	902.98	4/10/1996		26.52*
1995			902.26	9/26/1995	903.25	3/30/1995		30.62*
1994	1760+	0.93	901.90	9/7/1994	903.05	10/24/1994	903.98	35.28*
1993	10,000+	5.12	902.00	3/9/1993	904.49	7/14/1993	909.61	36.40*
1992	8,331	4.29	899.95	2/19/1992	903.16	10/12/1992	907.45	35.86
1991			898.11	4/1/1991	900.92	6/13/1991		
1990			895.46	4/24/1990	899.38	8/10/1990		
1989			895.49	11/27/1989	897.15	4/3/1989		
1988			896.90	11/11/1988	899.63	1/1/1988		
1987			899.63	12/31/1987	901.54	3/6/1987		
1986			901.22	2/14/1986	903.96	5/15/1986		
1985			902.23	9/12/1985	903.93	4/25/1985		
1984			901.75	10/9/1984	903.60	6/24/1984		
1983	Outlet Installed		901.76	1/17/1983	905.68	7/20/1983		
1982			900.06	3/24/1982	902.56	5/21/1982		
1981			898.91	7/31/1981	899.88	9/17/1981		
1980			899.92	12/29/1980	902.60	4/18/1980		
<b>Averages</b>	<b>5582 (when operated)</b>	<b>2.86 (when operated)</b>	<b>900.29</b>		<b>902.70</b>		<b>905.92</b>	<b>30.75</b>

Unless otherwise noted, data is taken from annual Prior Lake Outlet operations reports

\* Rainfall data is from MN Climatology office for 115N, 22W, 15 Prior Lake; all other rainfall as recorded at PLSLWD Office

*Italics data from PLSLWD Historic Volunteer Collected Lake Level Data*

# Attachment E:

## Prior Lake Elevations and Precipitation

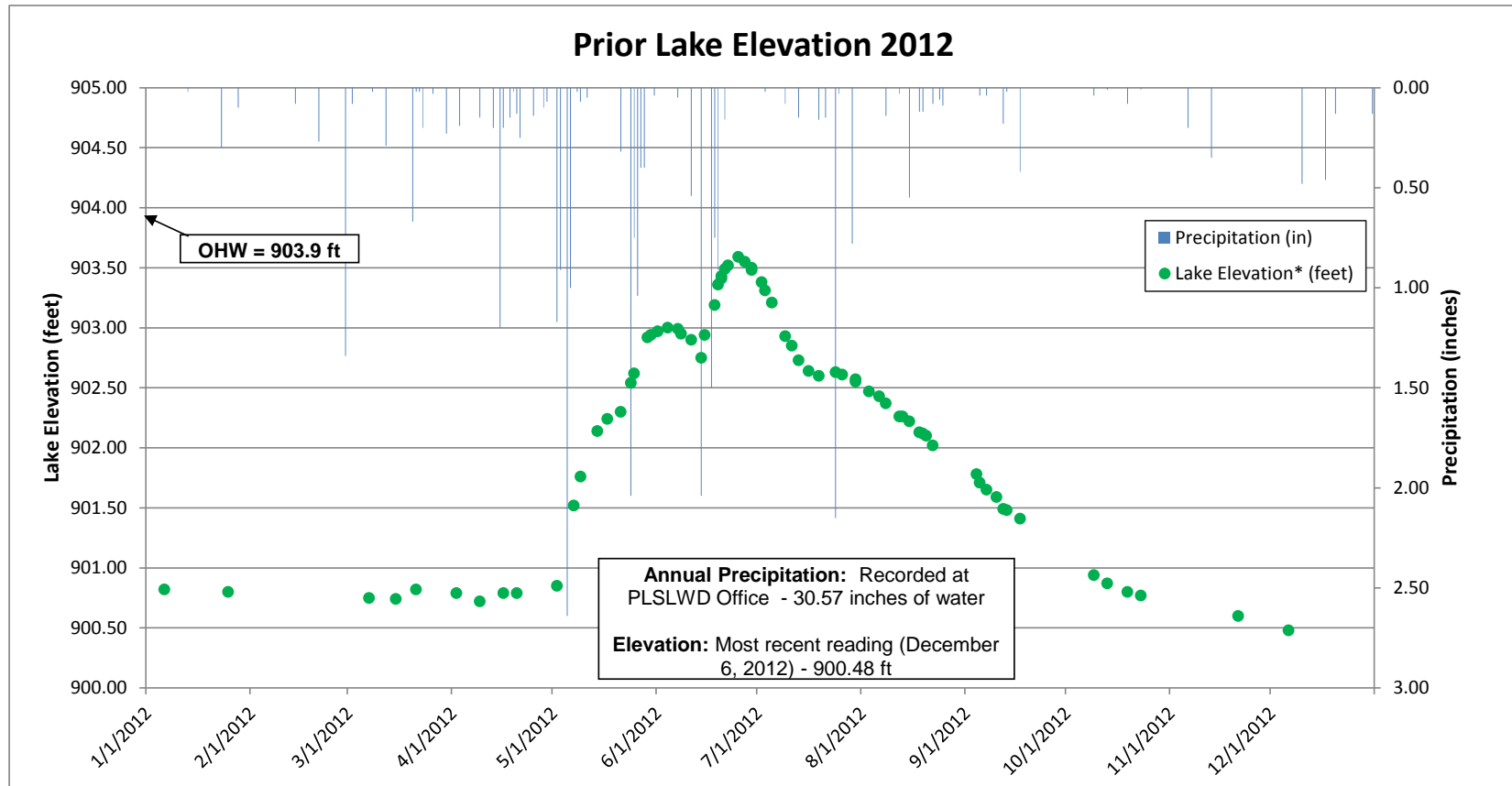
\*Lake elevations in black are from Wagon Bridge staff gauge. Elevations in red are daily averages from Ott level logger at Prior Lake Outlet Structure. Elevations are tied together.

Date	Lake Elevation* (feet)	Precipitation (in)	Monthly Precipitation Total
1/6/2012	900.82		
1/13/2012		0.02	
1/23/2012		0.30	
1/25/2012	900.80		
1/28/2012		0.10	0.42
2/14/2012		0.08	
2/21/2012		0.27	
2/29/2012		1.34	1.69
3/2/2012		0.08	
3/7/2012	900.75		
3/8/2012		0.02	
3/12/2012		0.29	
3/15/2012	900.74		
3/20/2012		0.67	
3/21/2012	900.82	0.02	
3/22/2012		0.02	
3/23/2012		0.20	
3/26/2012		0.03	
3/30/2012		0.23	1.56
4/2/2012	900.79		
4/3/2012		0.19	
4/9/2012	900.72	0.15	
4/13/2012		0.20	
4/15/2012		1.20	
4/16/2012	900.79	0.20	
4/18/2012		0.15	
4/19/2012		0.02	
4/20/2012	900.79	0.13	
4/21/2012		0.25	
4/25/2012		0.14	
4/28/2012		0.10	
4/29/2012		0.07	2.80
5/2/2012	900.85	1.17	
5/3/2012		0.91	
5/5/2012		2.64	
5/6/2012		1.00	
5/7/2012	901.52		
5/8/2012		0.02	
5/9/2012	901.76	0.07	
5/11/2012		0.05	
5/14/2012	902.14		
5/17/2012	902.24		
5/21/2012	902.30	0.32	
5/24/2012	902.54	2.04	
5/25/2012	902.62	0.75	
5/26/2012		1.04	
5/27/2012		0.40	
5/28/2012		0.40	
5/29/2012	902.92		
5/30/2012	902.94		
5/31/2012		0.04	10.85
6/1/2012	902.97		
6/4/2012	903.00		
6/7/2012	902.99	0.05	
6/8/2012	902.95		
6/11/2012	902.90	0.54	
6/14/2012	902.75	2.04	
6/15/2012	902.94		
6/17/2012		1.50	
6/18/2012	903.19	0.75	
6/19/2012	903.36	0.91	
6/20/2012	903.41		
6/20/2012	903.43		
6/21/2012	903.49	0.16	
6/22/2012	903.52		
6/25/2012	903.59		
6/27/2012	903.55		
6/29/2012	903.50		
6/29/2012	903.48		5.95

Date	Lake Elevation* (feet)	Precipitation (in)	Monthly Precipitation Total
7/2/2012	903.38		
7/3/2012	903.31	0.02	
7/5/2012	903.21		
7/9/2012	902.93	0.08	
7/11/2012	902.85		
7/13/2012	902.73	0.15	
7/16/2012	902.64		
7/19/2012	902.60	0.16	
7/21/2012		0.15	
7/24/2012	902.63	2.15	
7/25/2012		0.03	
7/26/2012	902.61		
7/29/2012		0.78	
7/30/2012	902.55		
7/30/2012	902.57		3.52
8/3/2012	902.47		
8/6/2012	902.43		
8/8/2012	902.37	0.14	
8/12/2012	902.26	0.03	
8/13/2012	902.26		
8/15/2012	902.22	0.55	
8/18/2012	902.13	0.12	
8/19/2012	902.12	0.12	
8/20/2012	902.10		
8/22/2012	902.02	0.08	
8/24/2012		0.06	
8/25/2012		0.09	1.19
9/4/2012	901.78		
9/5/2012	901.71	0.04	
9/7/2012	901.65	0.04	
9/10/2012	901.59		
9/12/2012	901.49	0.18	
9/13/2012	901.48	0.02	
9/17/2012	901.41	0.42	0.70
10/9/2012	900.94	0.04	
10/13/2012	900.87	0.01	
10/19/2012	900.80	0.08	
10/23/2012	900.77	0.01	0.14
11/6/2012		0.20	
11/13/2012		0.35	
11/21/2012	900.60		0.55
12/6/2012	900.48		
12/10/2012		0.48	
12/17/2012		0.46	
12/20/2012		0.13	
12/31/2012		0.13	1.20

Elevation		Precipitation	
Average	902.19	Yearly Total	30.57
Minimum	900.48	Max 1 Day	2.64
Maximum	903.59		

Attachment F:  
Prior Lake Elevations Graph



**Attachment G:**  
**Summary of precipitation within PLSLWD**

Month	PLSLWD 2012 Office Readings	PLSLWD 2012 YTD
Jan	0.42	0.42
Feb	1.69	2.11
Mar	1.56	3.67
Apr	2.80	6.47
May	10.85	17.32
Jun	5.95	23.27
Jul	3.52	26.79
Aug	1.19	27.98
Sep	0.70	28.68
Oct	0.14	28.82
Nov	0.55	29.37
Dec	1.20	30.57
<b>Year Total</b>	30.57	

\* Readings taken  
at PLSLWD  
Office manual  
rain gauge

NOAA Scott Co 30yr mo ave	NOAA Scott Co 30yr YTD ave
0.73	0.73
0.62	1.35
1.73	3.08
2.53	5.61
3.69	9.30
4.64	13.94
3.49	17.43
5.05	22.48
3.41	25.89
2.47	28.36
1.64	30.00
0.95	30.95
30.95	

\* NOAA 30 year average is  
per the NWS site in Jordan  
for the years 1981-2010

Monthly % Deviation	Monthly Numeric Deviation	YTD % Deviation	YTD Numeric Deviation
-42.5%	-0.31	-42.5%	-0.31
172.6%	1.07	56.3%	0.76
-9.8%	-0.17	19.2%	0.59
10.7%	0.27	15.3%	0.86
194.0%	7.16	86.2%	8.02
28.2%	1.31	66.9%	9.33
0.9%	0.03	53.7%	9.36
-76.4%	-3.86	24.5%	5.50
-79.5%	-2.71	10.8%	2.79
-94.3%	-2.33	1.6%	0.46
-66.5%	-1.09	-2.1%	-0.63
26.3%	0.25	-1.2%	-0.38
		-1.2%	-0.38

\*Deviation is calculated by the difference  
between the current year PLSLWD average  
and the 30 year Scott County average