Eagle Creek Temperature Study
3rd Quarterly Report, 2008

Prepared for LMRWD
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Purpose of Study

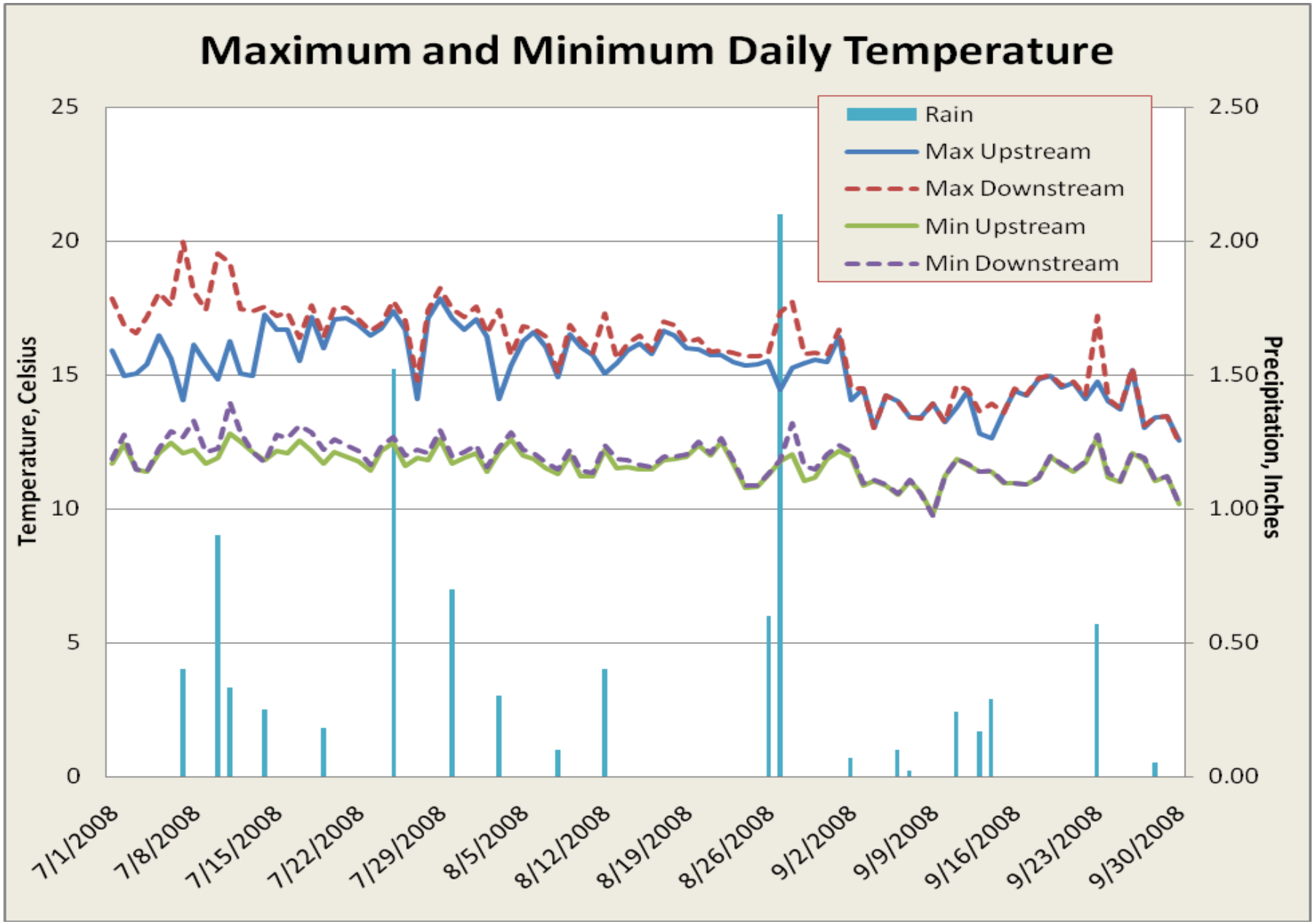
This study began in June, 2006. The purpose is to evaluate the effect Highway 101 runoff has on the temperature of DNR designated trout stream, Eagle Creek. Because Eagle Creek is a designated trout stream, temperature is a very critical variable to monitor since the optimal temperature range for trout is approximately 12 - 18º Celsius. Eagle Creek is unique because it is one of only two streams within the metro area with naturally-reproducing trout populations. The study is designed to monitor the temperature upstream of Highway 101 and compare it to the temperature downstream of Highway 101 by placing temperature loggers in the stream. Refer to the following graphs to see the difference in temperature upstream and downstream of Highway 101.

Understanding the Graphs

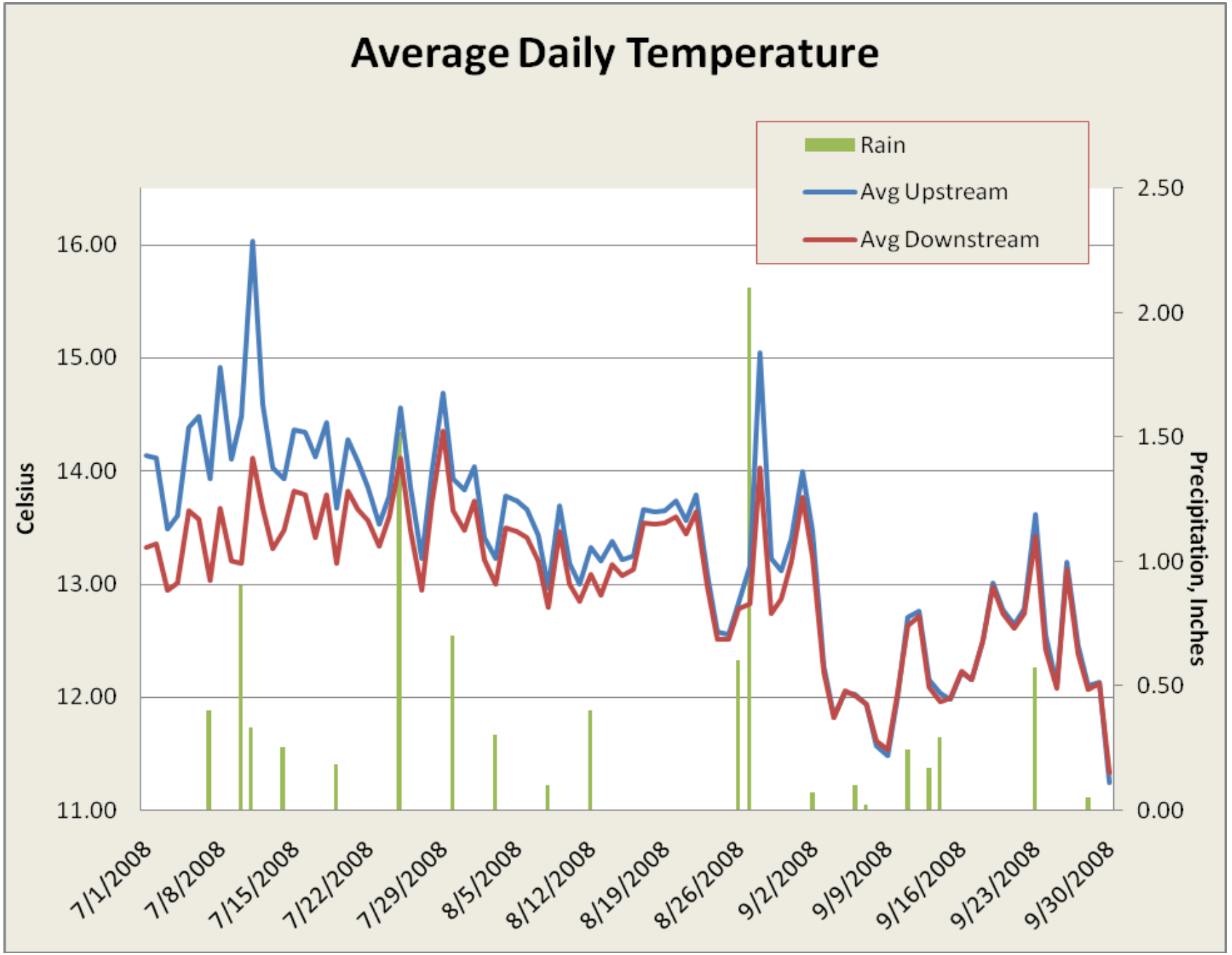
There are many ways to represent data. In the pages to follow, there are 3 graphs illustrating temperature fluctuations. Graph 1 represents maximum and minimum daily temperatures in Eagle Creek. Graph 2 represents the average daily temperature. Graph 3 represents 15 minute temperature intervals on July 7th, 2008. Temperature data is compared to precipitation in each graph to help analyze the effects of runoff from Highway 101.

Quarter 3 Results

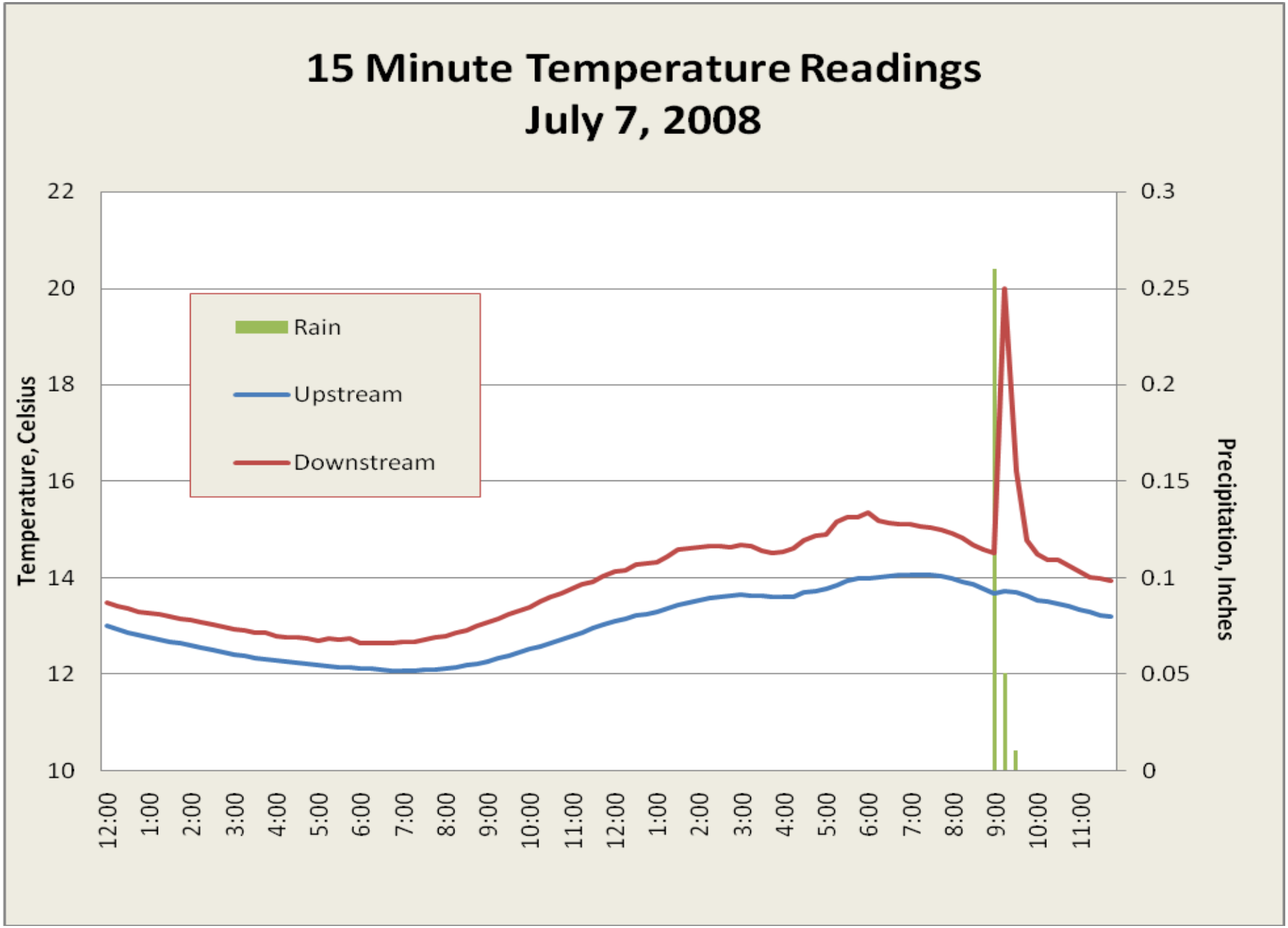
Graph 2 shows a strong correlation in daily average temperature, indicating there is not a large influence from Highway 101 runoff. However, Graph 1 shows some larger fluctuations in maximum daily temperatures. The largest fluctuation in *maximum* daily temperature occurred on July 7 with the downstream logger reading 6º Celsius higher after a rain event of .40 inches. The *average* daily temperature only fluctuated 1º Celsius on that same day. To better understand what happened on July 7th in Eagle Creek, take a look at the 15 minute intervals in Graph 3. Graph 3 shows a sharp increase in temperature downstream of Highway 101 during and shortly after the rain event. The spike was quick and only 2º Celsius above the optimal trout temperature for approximately one half hour. This was the largest spike during the 3rd quarter even though it was not the largest rainfall event. There were only two other days that the water temperature reached above 18º Celsius, but never above 20º Celsius. According to the *2007 Water Monitoring Report, June 2008,* for Brown's Creek Watershed District, "Water temperatures less than 18°C are considered preferred, between 18 and 20°C are low impact, 20 to 25°C have a moderate impact, and greater than 25°C is considered high impact to trout."


Maximum and Minimum Daily Temperature
Rain
Max Upstream
Max Downstream
Min Upstream
Min Downstream
Temperature, Celsius
Precipitation, Inches
25
20
15
10
5
0
2.50
2.00
1.50
1.00
0.50
0.00
7/1/2008
7/8/2008
7/15/2008
7/22/2008
7/29/2008
8/5/2008
8/12/2008
8/19/2008
8/26/2008
9/2/2008
9/9/2008
9/16/2008
9/23/2008
9/30/2008

Graph 1


Average Daily Temperature
Rain
Avg Upstream
Avg Downstream
Celsius
Precipitation, Inches
16.00
15.00
14.00
13.00
12.00
11.00
2.50
2.00
1.50
1.00
0.50
0.00
7/1/2008
7/8/2008
7/15/2008
7/22/2008
7/29/2008
8/5/2008
8/12/2008
8/19/2008
8/26/2008
9/2/2008
9/9/2008
9/16/2008
9/23/2008
9/30/2008

Graph 2


15 Minute Temperature Readings
July 7, 2008
Temperature, Celsius
Precipitation, Inches
Rain
Upstream
Downstream
22
20
18
16
14
12
10
0.3
0.25
0.2
0.15
0.1
0.05
0
12:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00

Graph 3