

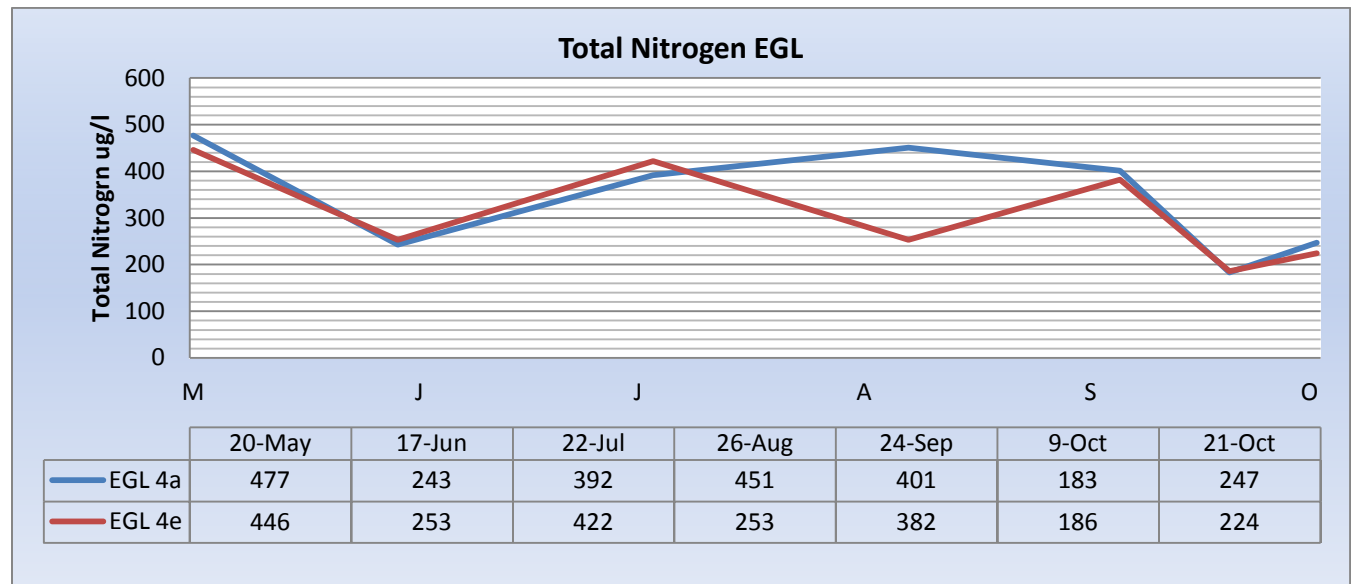
# MEMORANDUM

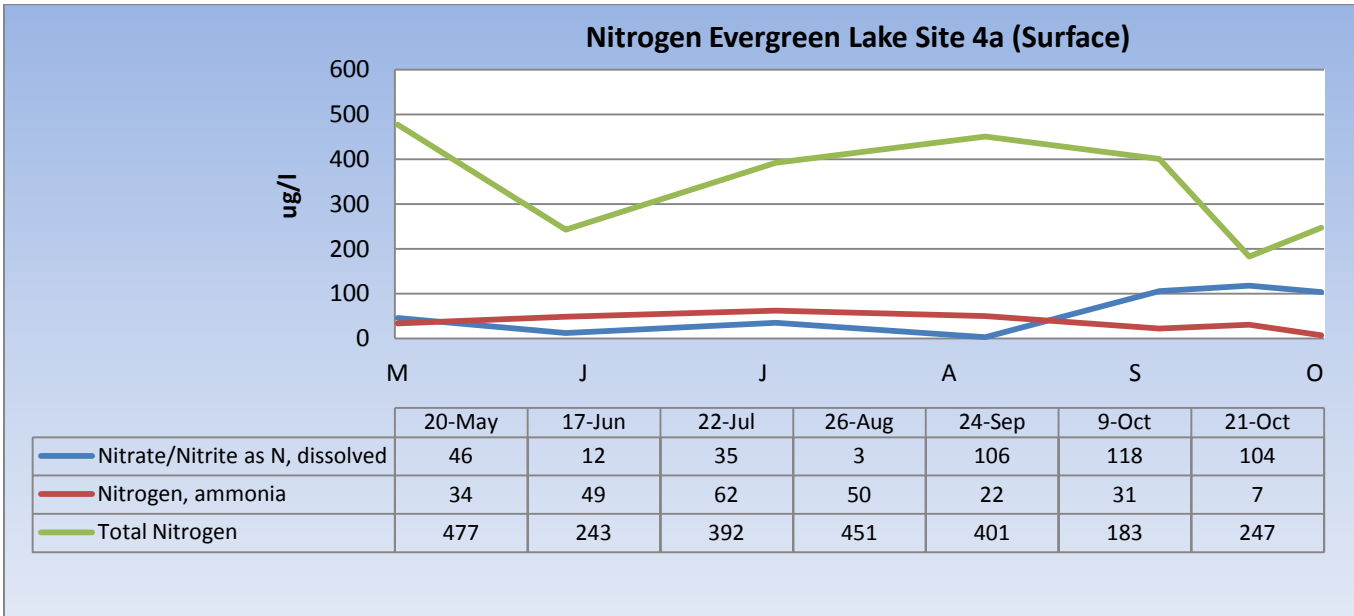
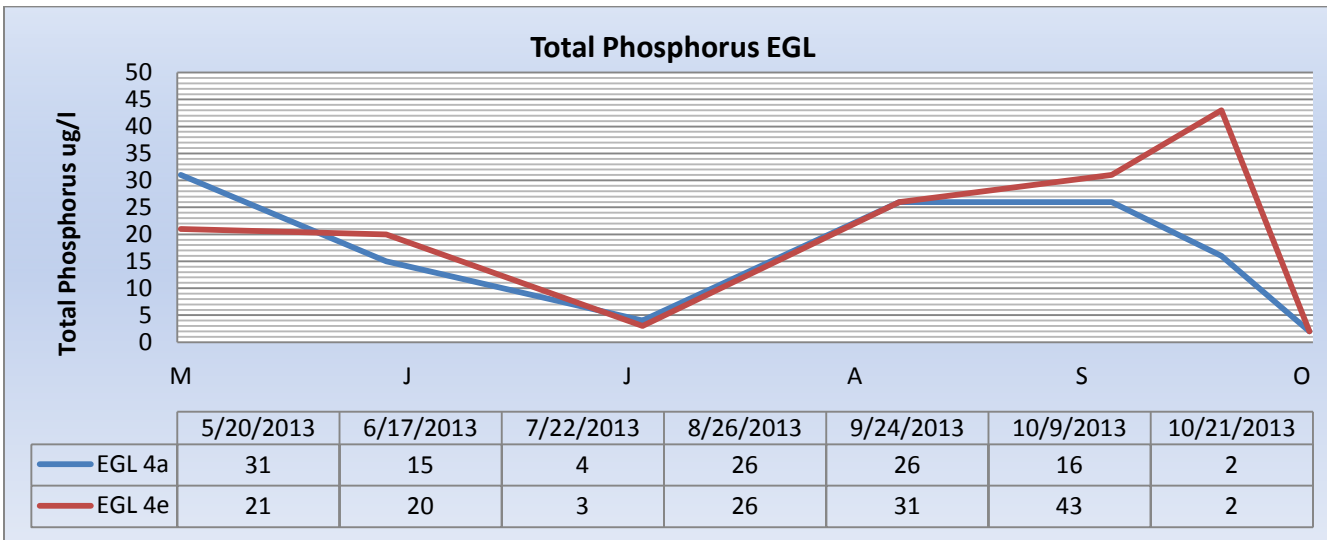
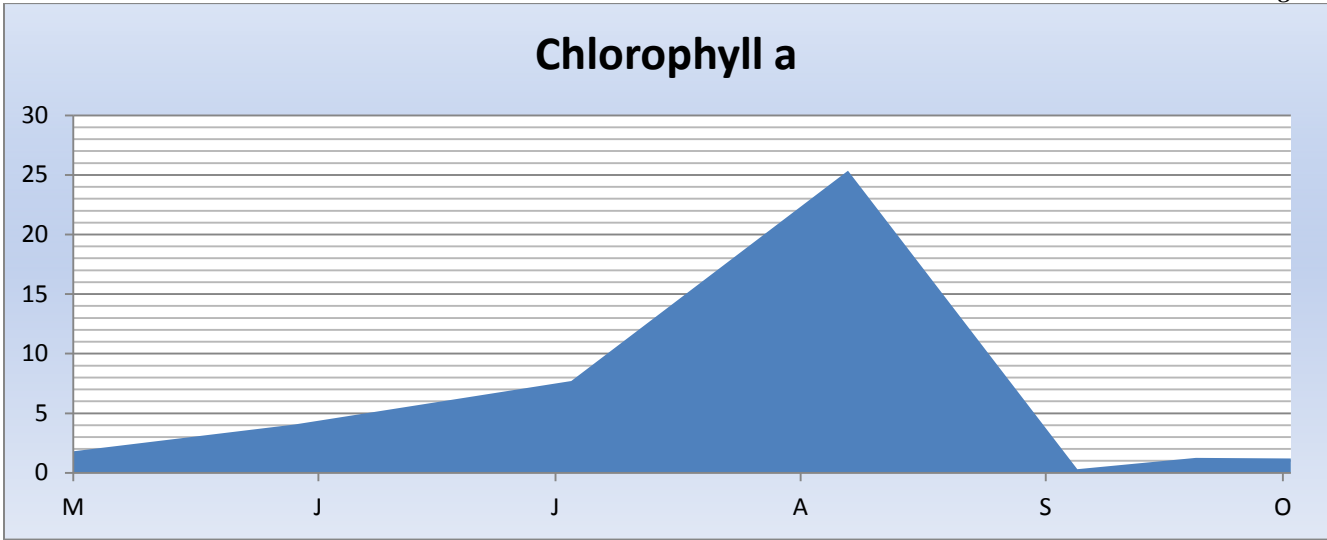
**To:** *Bear Creek Watershed Association*  
**From:** Russell N. Clayshulte, Manager  
**Re:** 2013.09 Evergreen Lake Summary

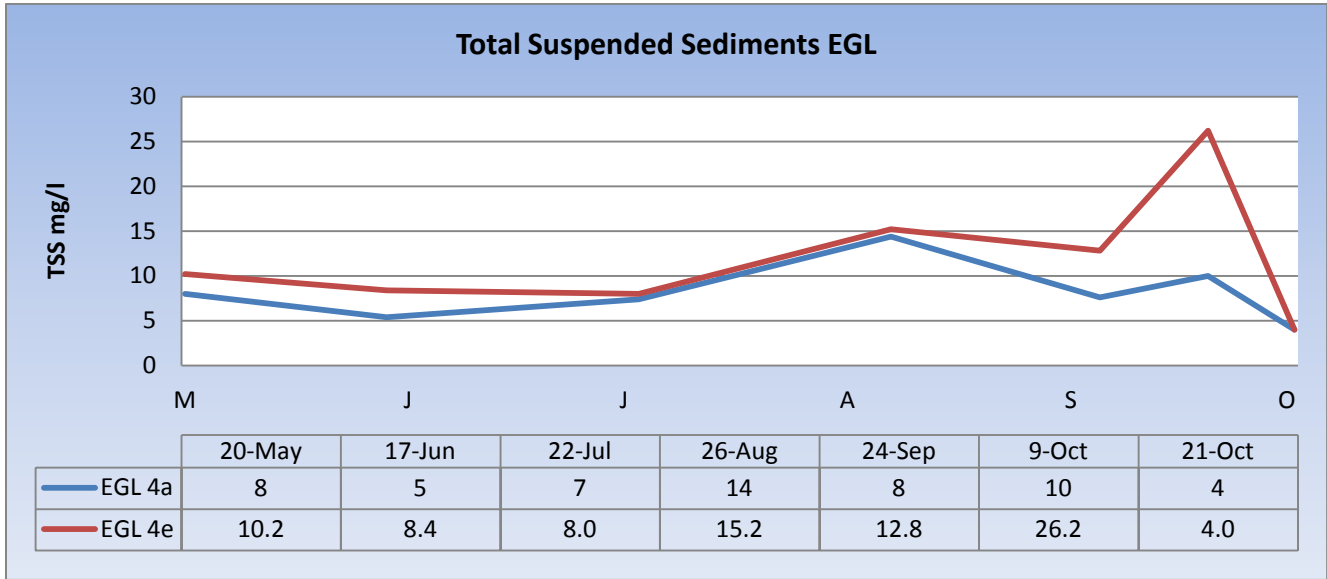


2013 Sampling Evergreen Lake, Segment 1d

| Site         | Parameter (ug/l)                | 20-May  | 17-Jun  | 22-Jul  | 26-Aug  | 24-Sep  | 9-Oct   | 21-Oct   | Average |
|--------------|---------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|
| EGL 4a       | Total Nitrogen                  | 477     | 243     | 392     | 451     | 401     | 183     | 247      | 342     |
|              | Nitrate/Nitrite as N, dissolved | 46      | 12      | 35      | 3       | 106     | 118     | 104      | 61      |
|              | Nitrogen, ammonia               | 34      | 49      | 62      | 50      | 22      | 31      | 7        | 36      |
|              | Phosphorus, total               | 31      | 15      | 4       | 26      | 26      | 16      | 2        | 17      |
|              | Total Dissolved Phosphorus      | 6       | 4       | 2       | 4       | 8       | 2       | 2        | 4       |
|              | Residue, Non-Filterable (TSS)   | 8       | 5       | 7       | 14      | 8       | 10      | 4        | 8       |
|              | Chlorophyll a, Average          | 2       | 4       | 8       | 25      | 0       | 1       | 1        | 6       |
|              | Chlorophyll a                   | 2       | 3       | 8       | 24      | 0       | 2       | 2        | 6       |
|              | Chlorophyll a                   | 2       | 5       | 7       | 27      | 0       | 1       | 1        | 6       |
| EGL 4e       | Total Nitrogen                  | 446     | 253     | 422     | 253     | 382     | 186     | 224      | 309     |
|              | Nitrate/Nitrite as N, dissolved | 44      | 10      | 29      | 4       | 106     | 114     | 104      | 59      |
|              | Nitrogen, ammonia               | 47      | 56      | 64      | 45      | 21      | 28      | 9        | 39      |
|              | Phosphorus, total               | 21      | 20      | 3       | 26      | 31      | 43      | 2        | 21      |
|              | Total Dissolved Phosphorus      | 10      | 3       | 2       | 5       | 8       | 2       | 6        | 5       |
|              | Residue, Non-Filterable (TSS)   | 10.2    | 8.4     | 8.0     | 15.2    | 12.8    | 26.2    | 4.0      | 12      |
|              | Parameter Summary               | 5/20/13 | 6/17/13 | 7/22/13 | 8/26/13 | 9/24/13 | 10/9/13 | 10/21/13 |         |
| Water Column | Dissolved Oxygen 1/2-2m         | 9.95    | 9.03    | 6.39    | 7.80    | 10.17   | 8.69    | 12.11    |         |
|              | Temperature (C) 1/2-2m          | 9.05    | 15.76   | 19.98   | 16.42   | 8.18    | 6.53    | 3.15     |         |
|              | pH water column                 | 7.44    | 8.03    | 8.06    | 7.74    | 8.08    | 8.11    | 7.97     |         |
|              | Specific Conductance (us/m)     | 0.068   | 0.056   | 0.063   | 0.064   | 0.082   | 0.083   | 0.085    |         |
|              | Bear Creek In-Flow (cfs)        | 74.0    | 30.0    | 26.0    | 37.0    | 264.0   | 93.0    | 62.0     |         |







**Table 1 Sediment Loading into EGL during September 2013 Flood Event**

| EGL  | Turbidity Based |                   | TSS Based (SSL Load) |                   | Estimated Bedload |                   |
|------|-----------------|-------------------|----------------------|-------------------|-------------------|-------------------|
|      | Tons/month      | Cubic Yards/Month | Tons/month           | Cubic Yards/Month | Tons/month        | Cubic Yards/Month |
| Aug  | 34.1            | 28.1              | 37.0                 | 30.5              | 185.1             | 152.4             |
| Sept | 794.5           | 653.9             | 905.5                | 745.3             | 13582.3           | 11178.9           |
| Oct  | 28.2            | 23.2              | 28.5                 | 23.5              | 142.5             | 117.3             |

**Table 2 Estimated Nutrient Loading from Flood Event**

|   |
|---|
| Evergreen Lake September > 20,650 ac-ft |
| TP(res) pounds >1,650                   |
| TN(res) pounds >22,550                  |



**Figure 1 Bear Creek Washout into EGL**





**Figure 2 Sediment Delta in EGL**



**Figure 3 Additional Sediment Delta Formation in EGL**





**Figure 4** September 23, 2013 Turbidity after Flooding Event



**Figure 5** June 16, 2013 Normal Lake