As requested, options to expand the proposed park pond (BC-P107S) into the adjacent parking lot were explored. Following preliminary modeling, we found that three options were feasible for the expansion of the proposed pond. Descriptions of the three options follow below and corresponding maps are attached. Details on the modeling results and cost estimates have been summarized exactly as the April 2003 Feasibility Report for ease of reference.

5.2.1 Evaluation of Options

Option 5

Description
This option is shown in Map C-3, attached. Flow generated during a 1.0" rainfall event or smaller will be diverted from the existing 54" equivalent arch pipe approximately 300' upstream from the outlet to Medicine Lake. Similar to Option 1, the diverted flows would be routed to a proposed detention pond located southwest of the existing East Medicine Lake Park parking lot, BC-P107S. This option includes the expansion of the pond proposed in Option 1 to extend into the parking lot to the northeast edge of the central parking lot island. BC-P107S then discharges to Medicine Lake.

Advantages:
- Location of low flow diversion near the bottom of the system means that low flows from virtually the entire drainage could be captured and diverted for treatment.
- Involves little construction of storm sewer and no ponding on industrial parcel, so the necessities for potentially expensive easements on adjacent industrial property are minimized.
• This option provides the highest level of treatment of all the single-pond options.

Disadvantages:

• Greatly reduces the available parking area for the park.

Estimated Cost and Effectiveness

Table 5.2.1e presents information on the load of TSS that would be removed from stormwater entering Medicine Lake with this option, the percent removal, the cost, and the cost-effectiveness expressed as the estimated construction cost of the project per pound of TSS removed annually.

<table>
<thead>
<tr>
<th>Option 5</th>
<th>TSS Load Removed (lbs)</th>
<th>Percent of Total</th>
<th>Cost</th>
<th>$/lb TSS Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>20400</td>
<td>43%</td>
<td>$324,000</td>
<td>$15.88</td>
<td></td>
</tr>
</tbody>
</table>

Option 6

Description

The plan for this option is shown in Map C-9, attached. In this option, the low flow diversion point in the existing 54" pipe would be moved up-gradient to approximately 850" from the outlet to Medicine Lake. This would make possible diversion of runoff from a larger rainfall event in this case a 1.25" 24-hour event. Similar to Option 3, the diverted flows would be routed to a proposed detention pond located southwest of the existing East Medicine Lake Park parking lot, BC-P107S. This option includes the expansion of the pond proposed in Option 3 to extend into the parking lot to the northeast edge of the southwestern parking lot island. BC-P107S would then discharge to Medicine Lake.

Advantages:

• Allows diversion of runoff from up to the 1.25" rainfall event.
Disadvantages:

- Location of low flow diversion higher in the storm drainage system to allow diversion of runoff from larger events means that all runoff from the northern lateral (sub-watershed area of 13 acres) reaching intersection of 17th Avenue and Kilmer Lane will be discharged to the beach area untreated.
- Construction of storm sewer through the industrial parking lot means that some new easements may be required.
- Reduces the available parking area for the park.

Estimated Cost and Effectiveness

Table 5.2. If presents information on the load of TSS that would be removed from stormwater entering Medicine Lake with this option, the percent removal, the cost, and the cost-effectiveness expressed as the estimated construction cost of the project per pound of TSS removed annually.

<table>
<thead>
<tr>
<th>Area BC-107</th>
<th>TSS Load Removed (lbs)</th>
<th>Percent of Total</th>
<th>Cost</th>
<th>$/lb TSS Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 6</td>
<td>17000</td>
<td>36%</td>
<td>$328,000</td>
<td>$18.43</td>
</tr>
</tbody>
</table>

Option 7

Description

The plan for this option is shown in Map C-10, attached. In this option, the low flow diversion point in the existing 54" pipe would be moved up-gradient to approximately 850' from the outlet to Medicine Lake. This would make possible diversion of runoff from a larger rainfall event in this case a 1.25" 24-hour event. Similar to Option 3, the diverted flows would be routed to a proposed detention pond located southwest of the existing East Medicine Lake Park parking lot,
BC-P107S. This option includes the expansion of the pond proposed in Option 3 to extend into the parking lot to the northeast edge of the central parking lot island. BC-P107S would then discharge to Medicine Lake.

Advantages:
- Allows diversion of runoff from up to the 1.25" rainfall event.
- This option provides the second highest level of treatment of all the single-pond options.

Disadvantages:
- Location of low flow diversion higher in the storm drainage system to allow diversion of runoff from larger events means that all runoff from the northern lateral (sub-watershed area of 13 acres) reaching intersection of 17th Avenue and Kilmer Lane will be discharged to the beach area untreated.
- Construction of storm sewer through the industrial parking lot means that some new easements may be required.
- Greatly reduces the available parking area for the park.

Estimated Cost and Effectiveness

Table 5.2.1g presents information on the load of TSS that would be removed from stormwater entering Medicine Lake with this option, the percent removal, the cost, and the cost-effectiveness expressed as the estimated construction cost of the project per pound of TSS removed annually.

<table>
<thead>
<tr>
<th>Area BC-107</th>
<th>TSS Load Removed (lbs)</th>
<th>Percent of Total</th>
<th>Cost ($)</th>
<th>$/lb TSS Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 7</td>
<td>19500</td>
<td>41%</td>
<td>$406,000</td>
<td>$20.82</td>
</tr>
</tbody>
</table>

Bonestroo, Rosene, Anderlik and Associates, Inc. www.bonestroo.com
Option 8

Description
This option is shown in Map C-11, attached. Flows generated during a 1.0" rainfall event or smaller will be diverted from the existing 54" equivalent arch pipe approximately 300' upstream from the outlet to Medicine Lake. The diverted flows would be routed to a proposed detention pond (BC-P107S) located entirely within the southwest portion of the existing East Medicine Lake Park parking lot. This option essentially involves relocating the exact pond proposed in Option 1 to the northeast into the existing parking lot. BC-P107S then discharges to Medicine Lake.

Advantages:
- Location of low flow diversion near the bottom of the system means that low flows from virtually the entire drainage could be captured and diverted for treatment.
- Involves little construction of storm sewer and no ponding on industrial parcel, so the necessities for potentially expensive easements on adjacent industrial property are minimized.
- This option is the least costly and provides the highest cost/benefit ratio.

Disadvantages:
- Greatly reduces the available parking area for the park.

Estimated Cost and Effectiveness
Table 5.2.1h presents information on the load of TSS that would be removed from stormwater entering Medicine Lake with this option, the percent removal, the cost, and the cost-effectiveness expressed as the estimated construction cost of the project per pound of TSS removed annually.

Bonestroo, Rosane, Anderlik and Associates, Inc.
www.bonestroo.com
Table 5.2.1: Estimated Effectiveness and Cost

<table>
<thead>
<tr>
<th>Area BC-107</th>
<th>TSS Load Removed (lbs)</th>
<th>Percent of Total</th>
<th>Cost ($/lb TSS Removed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 8</td>
<td>16300</td>
<td>35%</td>
<td>$196,000</td>
</tr>
</tbody>
</table>

5.2.2 Summary of Cost-Effectiveness

Table 5.2.2 summarizes the cost-effectiveness of the four options outlined in the April 2003 Feasibility Report and each of the options described above. The estimated load of TSS removed is based on an average runoff year. The costs presented in the table are described in greater detail in Appendix B of the April 2003 Feasibility Report, and attached detailed cost estimates for Options 5, 6, 7, and 8.

Table 5.2.2: Estimated Effectiveness and Cost

<table>
<thead>
<tr>
<th>Area BC-107</th>
<th>TSS Load Removed (lbs)</th>
<th>Percent of Total</th>
<th>Cost ($/lb TSS Removed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>74600</td>
<td>31%</td>
<td>$214,000</td>
</tr>
<tr>
<td>Option 2</td>
<td>13400</td>
<td>39%</td>
<td>$356,000</td>
</tr>
<tr>
<td>Option 3</td>
<td>15960</td>
<td>34%</td>
<td>$275,000</td>
</tr>
<tr>
<td>Option 4</td>
<td>25500</td>
<td>53%</td>
<td>$463,000</td>
</tr>
<tr>
<td>Option 5</td>
<td>20400</td>
<td>43%</td>
<td>$324,000</td>
</tr>
<tr>
<td>Option 6</td>
<td>17800</td>
<td>38%</td>
<td>$328,000</td>
</tr>
<tr>
<td>Option 7</td>
<td>19500</td>
<td>41%</td>
<td>$406,000</td>
</tr>
<tr>
<td>Option 8</td>
<td>16300</td>
<td>35%</td>
<td>$196,000</td>
</tr>
</tbody>
</table>
Updated Appendix A
Pond Data
Updated Appendix B
Costs
Updated Appendix C
Additional Option Maps