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</tbody>
</table>
1.0 Investigation of Alternatives:

The purpose of Task A is to identify structural measures or changes in operation that would correct water quality standards violations associated with the operation of the Wheatland Irrigation Districts' Laramie River Diversion into Bluegrass Creek.

The operation of the Wheatland Tunnel Diversion from the Laramie River into Bluegrass Creek has resulted in fish kills in the Laramie River at least twice in the last 10 years. The fish kills occur when diversions from the Laramie River into Bluegrass Creek are stopped at the end of the irrigation season and the tunnel is shut down for the winter. Water and sediment impounded behind the diversion dam is sluiced into the Laramie River resulting in draining of the impoundment and water quality standards violations. Structural and management alternatives to prevent these events from occurring in the future were investigated.

On Jan. 24, 1996, the draft rehabilitation plan with alternatives was presented to the Wyoming D.E.Q., W.W.D.C. and Wheatland Irrigation District Board. After this meeting, the W.W.D.C. and the Wheatland Irrigation District opted for alternate 'A' for further study.
2.0 Water Quality and Fish Kill Mitigation:

The driving force behind this study was the mitigation of fish kills below the Laramie River Diversion Dam. To study the water quality and to identify the possible causes for fish mortality, Kennedy Engineering enlisted the help of Western EcoSystems Technologies, Inc. (WEST) and fish biologist, Rick Huber. WEST has performed water quality studies and an "Investigation Into the Cause of Fish Kills in the Laramie River Downstream of the Wheatland Tunnel Diversion Dam." This report is appended as APPENDIX I in the Final Report for Task 'A'.

The report by WEST, Inc. authored by fish biologist, Rick Huber, explains that the 1995 irrigation season was not at all "typical" due to the very unusual extended period of precipitation through April, May and June, 1995. In fact the flow in the Laramie River between the W.I.D. Reservoir No. 2 and the Laramie River Diversion Dam was approximately three to six times the "typical" 4 to 10 c.f.s. passing through the dam. The diversion pond at normal operating water level has a capacity of approximately 160 Acre-Feet. The Laramie River below the diversion dam ran in the neighborhood of 25 to 30 c.f.s. during the study period. This results in only 3 days retention time in the pond. As stated in the WEST, Inc. report, the diversion pond in 1995 did not set up a thermocline with any significant low temperature zone at the bottom compared with the temperature in the Laramie River below the dam. No fish kill occurred when the diversion dam sluice gate was opened to pass 50-60 c.f.s. on September 21, 1995.

The West, Inc. report concludes that high silt/sediment concentrations during the sudden release of water from the diversion pond after the irrigation season probably does not directly kill fish in the Laramie River. Furthermore, the report indicated that low dissolved oxygen (DO) and/or hydrogen sulfide (H₂S) or other water quality contaminates such as phosphorus and organic carbon do not likely cause the fish kills observed in past years in the Laramie River. The general conclusion of the report is that the observed fish kills are most likely the result of temperature shock. This may be rectified very simply by changing the operating procedure to eliminate the sudden increase in release of water from the diversion pond at the end of the irrigation season.

The diversion pond area was surveyed on November 15, 1995, by Kennedy Engineering. On the same date, four test probes were made by Inberg-Miller Engineers to determine the depth of silt/sediment in the diversion pond. Based on this survey, the amount of silt/sediment stored in the diversion pond is estimated at 35,000 c.y. as shown on the map included with the Alternate 'A'-Conceptual Plan in this report. Most of this silt is not flushed out into the Laramie River below the diversion dam at the end of the irrigation season. Silt being flushed out is basically along the thread of the Laramie River through the diversion pond. the volume of this silt load is estimated at 4,000 c.y. which is equivalent to 1900 ppm average silt load for 5 months winter flow at 7 c.f.s. in the Laramie River.

2.1 Description of Standard Operating Procedure for Laramie River Diversion Dam:

The standard operating procedure for the Laramie River Diversion Dam is to pass the flow through the sluice gate at the bottom of the concrete ogee weir emergency spillway part of the dam. This flow generally ranges between 4 and 10 c.f.s. which is the 'average' flow originating in approximately 19 Laramie River miles from the W.I.D. Reservoir No. 2 headgate to the Laramie River Diversion Dam. (See Exhibit 'A')

In the past, fish kills have been observed when the water impounded behind the Laramie River Diversion Dam was released at the end of the irrigation season. This release typically occurs in late September. At this time of year, it is not uncommon to have dramatic temperature fluctuations with freezing temperatures during the night and daytime temperatures in the 70°-80°F range. Due to the
depth and mass of water behind the Diversion Dam and the 'normal' low flow with minor mixing effect, the water at the bottom of the dam should be considerably colder than the surface water or the water in the Laramie River about mid-morning when the gates are open. The theory is that temperature shock stuns and kills the fish. This happens when a thermocline exists in the water behind the dam. The fish are in the comparatively warm water in the Laramie River below the dam. The headgate is cranked open increasing the flow from 4 to 10 c.f.s. to 25-30 c.f.s. in a very short time which flushes the colder water behind the dam into the Laramie River.

It is important to note that on September 21, 1995, the conditions described above did not exist, and no fish kill was observed.

2.2 Recommended Procedure for Mitigating Fish Kills:

It is important to control the flushing of colder water into the Laramie River. This can quite simply be done by gradually opening the sluice gate in the Laramie River Diversion Dam and slowly draining the water impounded behind the Dam. The sluice gate should be opened to increase the flow by no more than 25% per day, with a maximum increase of 5 c.f.s. per day. In the worst case, during dry years when the 'average' flow is only 4 c.f.s., the following table shows the daily volume of water loss in the Laramie River Diversion Pond:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>4</td>
<td>2</td>
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<tr>
<td>2</td>
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<td>29</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>10</td>
<td>34</td>
<td>4</td>
<td>60</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>244</td>
</tr>
</tbody>
</table>

The diversion pond has been calculated to hold between 160 to 235 acre-feet. As shown in the table, the Diversion Pond may be drained in 9 to 10 days.

NOTE: A SCADA system which would monitor flow and control the diversion dam sluice gate from the W.I.D. headquarters in Wheatland would greatly simplify this operation.

Exhibit 'B' herein is a copy of a letter dated March 22, 1996, from the Wheatland Irrigation District to John Wagner of the WY. D.E.Q. This letter does not really address a procedure for draining the impounded water behind the diversion dam at the end of the irrigation season. It is our recommendation that the Wheatland Irrigation District adopt the procedure outlined above to mitigate fish kills which occur when the diversion pond is drained at the end of the irrigation season.
March 22, 1996

Mr. John F. Wagner
Technical Supervisor
Department of Environmental Quality
Water Quality Division
Herschler Building
122 West 25th Street
Cheyenne, WY 82002

Dear Mr. Wagner,

Thank you for attending our most recent Scoping Meeting with Kennedy Engineering. As we discussed at the conclusion of that meeting, it seems the proper operation of the Tunnel Diversion Dam in the future will be for a 5 to 10 c.f.s flow to be maintained through the downstream headgate at times when we shut down the outflow of Reservoir No. 2.

I spoke to Bill Jones, Division No. One Superintendent, of the State Board of Control. He has assured me that he would allow the headgate to be operated in this manner to help alleviate silting problems downstream of the tunnel diversion.

Thank you for your cooperation in this matter. Please feel free to let us know if problems arise that we are not aware of.

Sincerely,

Bart Trautwein
President
3.0 Condition of Diversion Dam and Tunnel Diversions:

Inberg-Miller Engineers, subconsultants for this task, have performed a Geotechnical and structural investigation and assessment of the tunnel and the diversion dam. Their report is appended in the Final Report as APPENDIX II.

3.1 Condition of Tunnel Diversion:

The Hydrogeologist, Eric Graney, and Engineer, Steve Moldt, generally found the tunnel to be in good condition. There are a few short stretches where interior erosion from the loss of ceiling rock has resulted in enlarged sections from 12 to 15 feet high other than the enlarged sections originally constructed near the inlet and outlet of the tunnel. The tunnel walls are unlined cut through highly fractured though apparently stable rock and are comparatively rough. No immediate rehabilitation of the tunnel was recommended. However, due to the significant interior erosion evident, especially around water bearing quartz seams, periodic walk-through inspections of the tunnel were recommended by Inberg-Miller.

Inberg-Miller's report also indicated that the existing tunnel headgate structure "appears to be performing satisfactorily from a stability standpoint." However, if the existing tunnel headgates remain in use, regular inspections of the gate works and connection to the tunnel entrance, and the structural condition of the operating platform are recommended. (See Exhibit 'C')

3.2 Condition of Diversion Dam:

Inberg-Miller's opinion after inspection of the diversion dam is that the "overall condition of the diversion dam is good." There is some surface deterioration of the concrete spillway and concrete wingwalls, and steel reinforcing bar is exposed. It is recommended that "those areas of surface spalling and especially reinforcing steel exposure should be repaired." These areas should be sandblasted clean of all loose material and rust and repaired with a cement based non-shrink epoxy grout.

3.3 Condition of Water Measurement Devices:

The existing method of measuring the flow diverting through the Bluegrass Tunnel is a flow recording station below the tunnel outlet. (See Exhibit 'C') This measuring system has numerous problems some of which are summarized below:

(a) The rock lined open channel at the tunnel outlet is rough, steep, irregular in cross-section, and has significant and frequent bottom slope changes and vertical drops.

(b) The attempt to estimate flow by measuring the water level in this turbulent, irregular channel results only in an order-of-magnitude flow measurement requiring good judgement of an experienced operator to even obtain reading estimates within ± 10% accuracy. (Note: The manager of the W.I.D. indicated that the flow measurement was typically no better than ± 50 c.f.s. when correlated with measurements into the W.I.D. canal system downstream.)

(c) Operation of the headgates and measurement of diverted flow is extremely unwieldy and inefficient. First the headgates are opened, then the operator drives over the top of the mountain approx. 3/4 mile on a jeep trail to get to the flow recording station where he estimates the flow and then drives back to adjust the headgate. We are told that typically this takes three round trips.

(d) Any attempt to still the flow at the tunnel outlet should not create backwater effect in the tunnel which may reduce the hydraulic capacity of
EXHIBIT 'C'

View Downstream At Tunnel Outlet Past Flow Level Recording Station

View Downstream Past Washed-out 1983 SCS Headgate Structure to Headgates at Tunnel Entrance
the tunnel below the 550 c.f.s. peak flow currently being diverted through
the tunnel. Stilling the flow and constructing an accurate measuring
device would require considerable rock excavation, stabilization, concrete
work and expense. However, being able to accurately measure the flow does
not change the inherent problem with operation and measurement as
described in paragraph (c) above.

(e) The time lag between the operation of the headgate and the change of
flow at the measuring device at the tunnel outlet complicates automatic
control of the headgate as an option in the future. This time lag will
vary with flowrate and it would be very difficult to dampen oscillations
between headgate control and measurement.

(f) Considerable additional expense for extension of power and
communication to the measuring site at the tunnel outlet will be required
for automatic data acquisition and control of the diversion in the future.
Also, security for sensitive equipment at the tunnel outlet is more
difficult and adds another location to the capital and operation and
maintenance expense.

(g) The Tunnel outlet channel to the Bluegrass Creek is used by Kayakers
and for other "wilderness type" recreation activities. From an
environmental standpoint disturbance of this area should be kept to a
minimum.

It is the recommendation of Kennedy Engineering that the flow measuring station
at the tunnel outlet be abandoned. The flow may be much more accurately and
conveniently measured at or near the tunnel headgate as shown on the conceptual
plan for Alternate A.

The flow in the Laramie River allowed to pass through the diversion dam sluice
gate is measured by an 8 foot Parshall Flume installed in the river approximately
1600 feet below the diversion dam. This flume is equipped with a continuous gage
level recorder.

The flow out of Wheatland Irrigation District No. 2 Reservoir is accurately
measured into the Laramie River approximately 19 river miles upstream from the
Tunnel Diversion Dam.

4.0 Preferred Alternate 'A':

The preferred Alternate 'A' Conceptual plan for improvements to the Diversion Dam
and the Tunnel Diversion Headgate is graphically shown on the plan sheet herein.
The Conceptual Plan is divided into Basic Elements and Optional Elements.

The Basic Elements of the plan assume that manual control of the headgates will
continue. These basic elements simply involve some minor maintenance on the
concrete emergency spillway portion of the diversion dam and a Parshall Flume
with new Tunnel Diversion headgates to provide convenient and accurate
measurement of the flow directed into the Tunnel.

The Optional Elements of the plan involve this construction of Supervisory
Control and Automatic Data Acquisition (SCADA) systems for automated control of
the Tunnel Diversion headgate and the Laramie River Diversion Dam sluice gate
from the W.I.D. Headwaters in Wheatland, Wyoming. In the following table the
item numbers and descriptions correlate with the numbers on the Conceptual Plan
sheet attached.
### 4.1 Alternate 'A' - Conceptual Plan w/Engineers' Opinion of Probable Cost:

#### Basic Elements of Conceptual Plan:

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Est. Quant</th>
<th>Unit</th>
<th>Probable Cost Unit</th>
<th>Probable Item Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clean Blast &amp; Epoxy Patch Spalled Areas on Div. Dam Concrete Emergency Spillway.</td>
<td>500</td>
<td>S.F.</td>
<td>$10.00</td>
<td>$5,000.00</td>
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<tr>
<td>2</td>
<td>Construct New Re-inf. Conc. Headwall Across Entrance Channel to Tunnel.</td>
<td>60</td>
<td>c.y.</td>
<td>$550.00</td>
<td>$33,000.00</td>
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<tr>
<td>3</td>
<td>Salvage 72&quot;x72&quot; Sluice Gate for Use on New Headwall - Provide new operator comparative w/conversion to power operation.</td>
<td>1</td>
<td>Ea.</td>
<td>$15,000.00</td>
<td>$15,000.00</td>
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<tr>
<td>4</td>
<td>Remove 60&quot;x60&quot; Sluice Gate to W.I.D. Maint. Yard.</td>
<td>1</td>
<td>Ea.</td>
<td>$0.00</td>
<td>$0.00</td>
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<tr>
<td>5</td>
<td>Install New 72&quot;x72&quot; Sluice Gate on New Headwall.</td>
<td>1</td>
<td>Ea.</td>
<td>$30,000.00</td>
<td>$30,000.00</td>
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<tr>
<td>6</td>
<td>Backfill Behind New Headwall under P.F. Structure.</td>
<td>270</td>
<td>c.y.</td>
<td>$10.00</td>
<td>$2,700.00</td>
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<td>6.a</td>
<td>Rock Rip-Rap at flume outlet</td>
<td>25</td>
<td>c.y.</td>
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<td>$1,250.00</td>
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<tr>
<td>7</td>
<td>Construct New 16' Throat P.F. w/Stilling Basin.</td>
<td>50</td>
<td>c.y.</td>
<td>$550.00</td>
<td>$27,500.00</td>
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**SUBTOTAL** $114,450.00

* W.I.D. Forces:

#### Optional Elements of Conceptual Plan:

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<th>No</th>
<th>Item</th>
<th>Est. Quant</th>
<th>Unit</th>
<th>Probable Cost Unit</th>
<th>Probable Item Cost</th>
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</thead>
<tbody>
<tr>
<td>8</td>
<td>Extend R.E.A. Power to Tunnel Headgate Site.</td>
<td>2½</td>
<td>miles</td>
<td>NOT RECOMMENDED</td>
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<tr>
<td>9</td>
<td>Install Electric Operators on Tunnel Gates.</td>
<td>2</td>
<td>Ea.</td>
<td>$11,000.00</td>
<td>$22,000.00</td>
</tr>
<tr>
<td>10</td>
<td>Install R.T.U. with Radio Link to W.I.D. Hq. In Wheatland with Automatic Control of Tunnel Div. Gates incl. battery power w/generator; Programming &amp; Training. And Engineering, Documentation &amp; Drawings.</td>
<td>1</td>
<td>L.S.</td>
<td>L.S.</td>
<td>$60,000.00</td>
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<tr>
<td>11</td>
<td>Construct Safety Cable/float Trash Deflector.</td>
<td>730</td>
<td>L.F.</td>
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<td>12</td>
<td>Remove remains of SCS Re-inf. Conc. Headgate Structure.</td>
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<td>L.S.</td>
<td>L.S.</td>
<td>$5,000.00</td>
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<tr>
<td>Item</td>
<td>Description</td>
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<td>Unit</td>
<td>Cost</td>
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<td>-------------</td>
<td>----------</td>
<td>------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Remove silt from Reservoir.</td>
<td>35,000</td>
<td>c.y.</td>
<td>NOT RECOMMENDED</td>
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<tr>
<td>14.</td>
<td>Extend R.E.A. Power to Diversion Dam Headgate.</td>
<td>3/4</td>
<td>mile</td>
<td></td>
<td></td>
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<tr>
<td>15.</td>
<td>Replace Existing Operator with Electric Operator on Diversion Dam Gate.</td>
<td>1</td>
<td>Ea.</td>
<td>$11,000.00</td>
<td></td>
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<tr>
<td>16.</td>
<td>Install R.T.U. With Radio Link to W.I.D. Hq. In Wheatland with Automatic Control of Div. Dam Gate incl. battery power w/generator.</td>
<td>1</td>
<td>Ea.</td>
<td>L.S.</td>
<td>$7,000.00</td>
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**SUBTOTAL** $105,000.00

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<tr>
<td>Estimated Construction Cost - 1997 Dollars (1996 Dollars X 1.03)</td>
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<tr>
<td>Engineering Cost @ 10%</td>
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<td>Subtotal</td>
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<tr>
<td>Contingency @ 15%</td>
<td>$37,295.53</td>
</tr>
<tr>
<td>Construction Cost Total - 1997 Dollars</td>
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<tr>
<td>Preparation of Final Designs and Specifications</td>
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<tr>
<td>Permitting and Mitigation</td>
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<td>Legal Fees</td>
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<tr>
<td>Acquisition of Access and Rights-of-Way</td>
<td>$1,000.00</td>
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<tr>
<td>Project Cost Total</td>
<td>$312,932.38</td>
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</table>

* Per Acre per year cost - 30 year loan at 7.25% for 40% of $0.19

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>The total assessed acreage in the Wheatland Irrigation District is 54120 acres.</td>
<td></td>
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</tbody>
</table>

**ENGINEERING COST** @ 10% $22,603.35

**SUBTOTAL** $248,636.85

**CONTINGENCY** @ 15% $37,295.53

**CONSTRUCTION COST TOTAL** - 1997 DOLLARS $285,932.38

**PREPARATION OF FINAL DESIGNS AND SPECIFICATIONS** $20,000.00

**PERMITTING AND MITIGATION** $1,000.00

**LEGAL FEES** $5,000.00

**ACQUISITION OF ACCESS AND RIGHTS-OF-WAY** $1,000.00

**PROJECT COST TOTAL** $312,932.38

* The total assessed acreage in the Wheatland Irrigation District is 54120 acres.
PROFILE
PROPOSED NEW HEADGATE AND PARSHALL FLUME
ALTERNATE 'A'

PLAN
PROPOSED NEW HEADGATE AND PARSHALL FLUME
ALTERNATE 'A'

STA 11+98
S.ECT. OF HEADGATE
ALTERNATE 'A'

RESERVOIR CAPACITY TABLE

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<th>CONTOUR ELEV</th>
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<td>6413</td>
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<td>29</td>
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<tr>
<td>TOTAL</td>
<td>132</td>
<td>420</td>
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LEGEND

WHEATLAND DIVERSION DAM REHABILITATION PROJECT-LEVEL II
IMPOUNDMENT BEHIND LARAMIE RIVER DIVERSION DAM
AND
CONCEPTUAL PLAN FOR REHABILITATION OF TUNNEL
DIVERSION HEADGATES AND WATER MEASUREMENT

ALTERNATE 'A'
5.0 Economic Analysis/Ability to Pay

5.1 This project will not increase any acreage under irrigation. The existing crops within the Wheatland Irrigation District generally consist of:

1. Alfalfa/Native Grass Hay
2. Beans (Pinto) (White)
3. Corn
4. Sugar Beets
5. Small Grains
6. Sorghum
7. Irrigated Pasture

5.2 This project will not increase crop yields within the Wheatland Irrigation District due to any predictable increase in water delivery to the fields.

5.3 This project will greatly enhance the measurement accuracy of water being diverted into the tunnel form the Laramie River. The State Board of Control has indicated that accurate measurement of the flow into and out of the Laramie River is important to the State of Wyoming for the water accounting of flows in the North Platte River into Nebraska. The Laramie River is tributary to the North Platte River at old Fort Laramie in Wyoming.

To estimate a monetary benefit for the Wheatland Irrigation District due to this increased accuracy of flow measurement is not feasible. It is uncertain whether accurate measurement would increase or decrease the calculation of losses or gains in the Laramie River between the No. 2 Reservoir and the Diversion Dam. Therefore, accurate measurement may increase or decrease the flow of water diverted into the tunnel.

5.4 The basic elements of this project have a measurable benefit for the Wheatland Irrigation District in operation cost savings. The need to drive back & forth over the mountain to estimate the flow after adjusting the headgate will be eliminated.

From time estimated provided by the W.I.D. manager, eliminating the need to drive over the mountain and back will save approximately 2 hrs. per gate adjustment event on an average of 4 days per week through 17 weeks of irrigation season at a cost of $18.46 per hour (14.20x1.3 for S.S. & Benefits).

Labor Cost Savings per Irr. Season = 2 x 4 x 17 x $18.46 = $2,510/yr.
Vehicle Cost Savings = 1½mi.= 3 x 4 x 17 x $0.50/mi. = $153/yr.
Total Labor & Equipment=$2663/year

NOTE: The labor cost "savings" does not mean that the W.I.D. pays their employee(s) any less money. However, this time can be spent on other work within the district that has been left undone or wanting attention. It may be more appropriate to consider this labor cost "savings" more as a labor trade-off benefit.

Using a modest inflation rate estimate of 3% per year for the 30 year loan term to pay off the capital debt; the total "future savings" in 30 years from the current saving of $2663/yr. operation cost savings is: $126,693

5.5 An intangible but significant benefit from this project is the safety of the headgate operator. The jeep trail over the mountains between the Tunnel headgates and the gaging station at the Tunnel outlet has its obvious hazards.

5.6 The optional elements of this project will have a measurable benefit for the Wheatland Irrigation District in additional operation cost savings. Currently,
the manager of the District estimates an average of 4 days per week with a minimum of 4 hours per day through 17 weeks of irrigation season for operation of the Tunnel Diversion headgates. This requires that he drive approximately 33 miles in a 4WD vehicle to the Tunnel Diversion Dam and back. We have already estimated that the basic element part of this project would cut the 4 hours per day by 2 hours per day. It is estimated that the automation of the headgates would eliminate at least 90% of the remainder of the current operation costs:

Labor Cost Savings per Season = 0.90 x 2 x 4 x 17 x $18.46 = $2259/yr. 
Vehicle Cost Savings per Season = 0.90 x 33 x 2 x 4 x 17 x 0.26 = $1050/yr. 
Total Labor & Equipment = $3309/year

Using the modest inflation rate estimate of 3% per year for the 30 year loan term to pay off the capital debt; the total "future savings" in 30 years from the current saving of the $3309/yr. Operation cost savings is: $157,427

5.7 The intangible benefits of the optional SCADA element of this project are numerous:
   a) Significant enhancement for the personal safety of employees in minimizing required travel during all types of weather and all times of day.
   b) Reports can automatically be produced for any time frame wanted for flow records, etc.
   c) The District may be able to divert more of the direct flow right in the Laramie River due to accurate measurements coupled with the capability to respond quickly to changing conditions.
   d) The manipulation of the diversion dam headgate to comply with the recommended operation plan for the mitigation of fish kills will be much easier and take a fraction of the time and effort for manual operation.

Conclusion:

Along with significant intangible benefits, there are tangible direct benefits resulting from this project. These direct benefits equate to $284,120 in potential savings during the 30 year loan term.

The total cost of this project including the basic and optional elements is $312,932. Assuming a 60% grant for new construction and a 7.25% loan for 30 years on the remaining 40%, the yearly payment on the loan would be $10,341.73. The total cost to the W.I.D. for the 30 year loan is: $310,251.87.

NOTE that this number compares favorably with the potential savings in operating costs.

The W.I.D. office manager computes the total assessed average under the W.I.D. at 54,120 acres. Therefore the cost to pay off the loan would be $10,341.73/54,120 = $0.19 per acre per year.

This assumes no credit for the potential operation cost savings since this time will probably be spent doing work that needs attention elsewhere for the benefit of the Irrigation District.

The current assessment to farmers within the W.I.D. includes $9.50/acre/year to the W.I.D. Some of the farmers then pay an additional assessment to the individual smaller ditch companies. This assessment generally ranges around $1.00/acre/year and varies from ditch to ditch.

It appears that this project's potential benefits match the cost if the W.W.D.C. authorizes the 60% grant with a 7.25% loan for 30 years on the remaining 40%.