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***Funding for WRDS and the creation of this electronic document was provided by the Wyoming Water Development Commission***  
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BITTER CREEK CHANNEL IMPROVEMENT STUDY

EXECUTIVE SUMMARY

I. AUTHORIZATION AND FUNDING

The Study and Report were completed pursuant to a Contract between Johnson-Fermelia Co., Inc. (JFCo) and the City of Rock Springs. Funding for the project was provided by the City of Rock Springs and the Wyoming Water Development Commission. JFCo was assisted on the project by Western Water Consultants of Laramie, Wyoming, who provided expertise for stream channel geomorphology and evaluation of erosion, channel stability and sedimentation.

II. FLOOD CONTROL MEASURES

The flood control measure and channel improvements considered in the project outlined in this Report consist of:

- A. Excavating to construct an enlarged trapezoidal earth channel and purchasing developed property to construct the enlarged channel in

some cases. The procurement of developed property will only involve taking property at limited cost.

- B. Driving steel sheet piling to serve as a channel sidewall and excavating to the inside face of the sheet piling after it is driven to enlarge the channel. This method of construction will be used where purchasing additional property to construct a larger trapezoidal earth channel would be costly.
- C. Maintaining and improving existing earth levees.
- D. Constructing channel transitions entering and exiting bridge undercrossings.
- E. Relocating, revising or modifying pipeline crossings.
- F. Modifying, relocating, or extending some utilities.

G. Constructing storm water inlets.

The course of Bitter Creek Channel is divided into the following reaches for purposed of this Report.

**Reach 1** - From West Corporate City Limits to  
West Beltway Bridge

**Reach 2** - From West Beltway Bridge to Dewar  
Drive Bridge.

**Reach 3** - From Dewar Drive Bridge to Elk Street Bridge.

**Reach 4** - From Elk Street Bridge to Confluence with Dead  
Horse Canyon Creek.

**Reach 5** - From Confluence with Dead Horse Canyon Creek to  
East Corporate City Limits.

Channel improvements are planned for all reaches, differing only in their response to the local conditions, and the improvements will contain the 100-year flood event within the stream channel. In Reaches 1,2, 3, and 5, a trapezoidal earth channel is proposed. In Reach 1 an extensive levee system would be built on both sides of

the stream to augment the partial existing levee system, while in Reach 5, the existing levee system on the right (north) bank would be improved. In Reaches 2 and 3, little or no levee construction is necessary and flood levels would be maintained largely below existing surrounding ground levels. Channel widening in these reaches will provide the additional capacity needed to handle the flows. In Reach 4, channel widening is not possible due to development and topography, so channel improvements provide the additional capacity by using vertical walls in the lower part of the channel area rather than the sloping walls of the earth channel. Sheetpile or other means would be necessary to create the vertical walls.

Two alternates were studied initially in Reach 3; one considered improving the channel in its existing location, the second involved completing the channel realignment project that was started in the 1960's. The project proposed in the Report encompasses completing the realignment of the channel that began in the 1960's.

An appurtenant trail system and green belt contiguous to the improved channel are described briefly in the Report; however, their design and cost are not presented herein.

III. PROJECT COSTS

TOTAL PROJECT COSTS ARE

ESTIMATED TO BE.....\$11,284,333.00

A breakdown of construction and capital costs are presented in the tables on the following pages:

ANNUAL MAINTENANCE COSTS ARE ESTIMATED TO BE:

Reach 1.....	\$ 2,000.00
Reach 2.....	\$ 10,000.00
Reach 3.....	\$ 10,000.00
Reach 4.....	\$ 10,000.00
Reach 5.....	<u>\$ 3,000.00</u>
<b>TOTAL ANNUAL MAINTENANCE COST.....</b>	<b>\$ 35,000.00</b>

IV PROJECT BENEFITS

Construction of the project will provide protection to all properties within the boundaries of a flood that would result from a 100-year storm event. These lands will also be removed from the zone of flooding outlined on the September 15, 1989 Flood Insurance Rate Map, published by the Federal Emergency Management Agency. Removing these lands from the flood zone will result in lower flood insurance premiums.

## CONSTRUCTION AND PROPERTY ACQUISITION COSTS

### Reach 1: Treatment Plant Road Bridge to West

#### Beltway Bridge

RM 17.125 to RM 19.500

Item	Description	Quantity	Units	Unit price	Amount
1	Channel excavation	378.4	CY	8	\$3,027
2	Earth levee	232.9	CY	12	\$2,795
3	Sheetpile channel wall	0	LF	900	\$0
4	Sheetpile check dam	800	LF	150	\$120,000
5	Chainlink fence	0	LF	7	\$0
6	Bank protection – general	19500	SY	2	\$39,000
7	Bank protection – riprap	2800	CY	75	\$210,000
8	Bridge transition	1	EA	65000	\$65,000
9	Pipeline crossing	200	LF	50	\$10,000
10	Utility pole relocation	0	EA	2500	\$0
11	Storm inlet	9	EA	2500	\$22,500
12	Large storm connection	0	LF	200	\$0
13	Raise Treatment Plant Road	850	LF	105	\$89,250
14	Raise sewage lift station top	1	LS	5000	\$5,000

\$566,572

Land acquisition – vacant                      52.6    AC

### Reach 2: West Beltway Bridge to Dewar Drive Bridge

RM 19.500 to RM 20.322

Item	Description	Quantity	Units	Unit price	Amount
1	Channel excavation	105.4	CY	8	\$843
2	Earth levee	52.2	CY	12	\$626
3	Sheetpile channel wall	0	LF	900	\$0
4	Sheetpile check dam	70	LF	150	\$10,500
5	Chainlink fence	0	LF	7	\$0
6	Bank protection – general	17600	SY	2	\$35,200
7	Bank protection – riprap	0	CY	75	\$0
8	Bridge transition	1	EA	65000	\$65,000
9	Pipeline crossing	1020	LF	50	\$51,000
10	Utility pole relocation	13	EA	2500	\$32,500
11	Storm inlet	11	EA	2500	\$27,500
12	Large storm connection	0	LF	200	\$0

\$223,170

Land acquisition – residential                      1.8    AC

Land acquisition – lots                                      0.5    AC

Land acquisition – commercial                      1.5    AC

Land acquisition – vacant                              12.1    AC

*RM = River mile, measured from mouth at the Green River*

**CONSTRUCTION AND PROPERTY ACQUISITION COSTS**

**Reach 3: Dewar Drive Bridge to Elk Street Bridge**

*RM 20.322 to RM 20.966*

Item	Description	Quantity	Units	Unit price	Amount
1	Channel excavation	302.8	CY	8	\$2,422
2	Earth levee	10.8	CY	12	\$130
3	Sheetpile channel wall	0	LF	900	\$0
4	Sheetpile check dam	340	LF	150	\$51,000
5	Chainlink fence	0	LF	7	\$0
6	Bank protection – general	2800	SY	2	\$5,600
7	Bank protection – riprap	6200	CY	75	\$465,000
8	Bridge transition	2	EA	65000	\$130,000
9	Pipeline crossing	740	LF	50	\$37,000
10	Utility pole relocation	11	EA	2500	\$27,500
11	Storm inlet	4	EA	2500	\$10,000
12	Large storm connection	500	LF	200	<u>\$100,000</u>

\$828,652

Land acquisition – lots                    0.5    AC  
 Land acquisition – vacant                13.7    AC

**Reach 4: Elk Street Bridge to Dead Horse Canyon  
Creek**

*RM 20.966 to RM 21.606*

Item	Description	Quantity	Units	Unit price	Amount
1	Channel excavation	51.9	CY	8	\$415
2	Earth levee	0.0	CY	12	\$0
3	Sheetpile channel wall	5790	LF	900	\$5,211,000
4	Sheetpile check dam	395	LF	150	\$59,250
5	Chainlink fence	5790	LF	7	\$40,530
6	Bank protection – general	0	SY	2	\$0
7	Bank protection – riprap	0	CY	75	\$0
8	Bridge transition	3	EA	65000	\$195,000
9	Pipeline crossing	200	LF	50	\$10,000
10	Utility pole relocation	14	EA	2500	\$35,000
11	Storm inlet	0	EA	2500	\$0
12	Large storm connection	0	LF	200	\$0
13	Soulsby St footbridge repl	1200	SF	50	<u>\$60,000</u>

\$5,611,195

Land acquisition – vacant                0.3    AC

*RM = River mile, measured from mouth at the Green River*



## CONSTRUCTION AND PROPERTY ACQUISITION COSTS

Reach 5: Dead Horse Canyon Creek to UPRR Bridge  
(East City Limits)

RM 21.606 to RM 22.754

Item	Description	Quantity	Units	Unit price	Amount
1	Channel excavation	175.4	CY	8	\$1,403
2	Earth levee	11.6	CY	12	\$139
3	Sheetpile channel wall	100	LF	900	\$90,000
4	Sheetpile check dam	540	LF	150	\$81,000
5	Chainlink fence	100	LF	7	\$700
6	Bank protection – general	0	SY	2	\$0
7	Bank protection – riprap	0	CY	75	\$0
8	Bridge transition	0	EA	65000	\$0
9	Pipeline crossing	0	LF	50	\$0
10	Utility pole relocation	0	EA	2500	\$0
11	Storm inlet	2	EA	2500	\$5,000
12	Large storm connection	0	LF	200	\$0

\$178,242

Land acquisition – vacant                      16.4    AC

*RM = River mile, measured from mouth at the Green River*

Grand Total Project Components

\$7,407,831

### LAND ACQUISITION SUMMARY

Residential – portion of lots	1.8	AC	\$53,000	\$95,400
Residential – whole property	1.0	AC	\$122,000	\$122,000
Commercial – portion of lots	1.5	AC	\$65,000	\$97,500
Vacant	95.1	AC	\$9,000	\$855,900

Capital Costs

Capital Costs are presented in the following tabulation:

LAND ACQUISITION SUMMARY

Residential – portion of lots	1.8	AC	\$53,000	\$95,400
Residential – whole property	1.0	AC	\$122,000	\$122,000
Commercial – portion of lots	1.5	AC	\$65,000	\$97,500
Vacant	95.1	AC	\$9,000	\$855,900

CAPITAL COSTS

Preparation of Final Designs and Specifications				\$592,626
Permitting and Mitigation				\$50,000
Legal Fees				\$100,000
Acquisition of Access and Rights of Way				\$1,170,800
Cost of Project Components			\$7,407,831	
Engineering Costs @ 10%			<u>\$740,783</u>	
Subtotal			<u>\$8,148,614</u>	
Contingency @ 15%			<u>\$1,222,292</u>	
Construction Cost Total				<u>\$9,370,906</u>
Project Cost Total				\$11,284,333

**V PROJECT PHASING AND SCHEDULING**

The following phasing of project construction is proposed considering the findings presented in this Study and the Level II Feasibility Phase IA Report referenced in SECTION II - HISTORIC FLOODING AND PRIOR STUDIES - Previous Studies and Reports.

<u>Priority</u>	<u>Project Description</u>	<u>Capital Cost</u>
1.	White Mountain Mall Tributaries. *	\$1,540,000.00
2.	Bitter Creek - Elk Street Downstream to Belt Loop Bridge.	\$1,610,000.00
3.	Bitter Creek - Confluence with Dead Horse Canyon Creek to Elk Street Bridge.	\$8,550,000.00
4.	Bitter Creek - Confluence with Dead Horse Canyon Creek to East City Limits.	\$ 280,000.00
5.	Bitter Creek - West Belt Loop Bridge to West City Limits.	\$ 870,000.00
6.	Flood Control Improvements on Dead Horse Canyon Creek. *	\$ 724,000.00

\* As identified in Level II Feasibility Study Phase IA Report, "Flood Control Project, Bitter Creek Tributaries".