

Subject: **Powder/Tongue River Basin Plan  
Future Water Use Opportunities  
Task 5**

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## **INTRODUCTION**

The purpose of this task is to identify future water use opportunities that can be implemented to satisfy present and projected water demands in the Little Bighorn River, Tongue River, and Powder River Basins in Wyoming. The list of opportunities compiled under this task is intended to be used by individuals and organizations that need to develop a water supply to satisfy their specific needs.

To further assist the users of this list to identify potential opportunities to satisfy their demands, a methodology is presented that can be employed to evaluate a specific opportunity on the list relative to similar and related opportunities. The suggested methodology evaluates opportunities according to the likelihood they are desirable, functional, and capable of receiving the support required for development. By using the list of future water use opportunities and employing the evaluation methodology, individuals and organizations will have “a place to start” in their investigation to develop a water supply to satisfy their specific needs.

The procedure used to complete this task consists of the following four steps:

1. Develop screening criteria to evaluate future water use opportunities;
2. Develop a long-list of future water use opportunities;
3. Develop a short-list of opportunities; and,
4. Evaluate the opportunities on the short-list.

These steps and the results of this task are described in the remainder of this technical memorandum.

## **SCREENING CRITERIA**

A significant task of the river basin planning process is the development of screening criteria and methods for evaluating future water use opportunities identified and listed for the study basins. For the Powder/Tongue River Basins, the screening criteria and evaluation method developed for the Green River Basin Plan were presented to the Basin Advisory Group (BAG) for consideration, modification, and adoption at a BAG meeting held October 10, 2001. The criteria adopted by the BAG, and a description of each criterion, is presented below:

### **Criterion 1: Water Availability**

This criterion reflects the general ability of a project to function, given likely bypasses for environmental uses and prior rights. It is not a reflection of the relative size of the project.

### **Criterion 2: Financial Feasibility**

This criterion reflects the effects of the combination of technical feasibility (high or low construction cost) and economic use to which the water would be put (e.g. irrigation of native meadow vs. cultivation of alfalfa or row crops). The intent of this criterion is to

indicate the likely ability to afford the project or meet Wyoming Water Development Commission (or other) funding source criteria. A low number represents a project with suspect ability to be repaid, whereas a high number represents a project that should more easily meet funding and repayment requirements.

### **Criterion 3: Public Acceptance**

This criterion reflects the extent to which a project will encounter or create public controversy (low number) versus a project that would likely engender broad public support (high number). For example, on-stream storage in environmentally sensitive areas would be very controversial, while off-channel storage in less sensitive areas would more likely be supported.

### **Criterion 4: Number of sponsors/beneficiaries/participants**

This criterion reflects the desirability, all other things being equal, that a project serving a larger segment of the population should be evaluated higher (higher number) than one serving only a few (lower number).

### **Criterion 5: Legal/Institutional concerns**

This criterion reflects the perceived relative ease (high number) or difficulty (low number) with which a project could be authorized and permitted under existing state and federal law.

### **Criterion 6: Environmental/Recreation benefits**

This criterion reflects the net effect of positive environmental and recreational aspects of a project as offset, to the extent it can be determined, by potential negative impacts on these attributes.

## **LONG-LIST OF FUTURE WATER USE OPPORTUNITIES**

Compiling the long-list of future water use opportunities began with a review of published reports available for the study basins. The level of information and data available for the projects identified through the literature review varied from very sketchy to completed conceptual designs.

Specific groundwater development projects were not identified and included on the long-list. However, groundwater development is included as a generic future water use opportunity for each of the sub-basins and was considered along with the surface water opportunities. Similarly, groundwater produced in the development of coalbed methane was not included on the long-list. Although this resource has the potential to supply small, localized demands over the short-term, the feasibility of developing a significant water supply from this activity is considered to be limited because of the wide geographic dispersion of the wells and the projected short time of operation.

Water right permit applications have been submitted to the State Engineer for many of the projects included on the long-list. Some of the applications have been approved and the State Engineer has granted permits authorizing project development. The majority of the projects, however, have not been elevated to permit status and the applications remain in the pending status.

Water right information was not compiled for the projects nor was water right status considered in the subsequent evaluations of the projects. Each of the projects on the long-list were evaluated under the assumption a water right for the project could be perfected and conflicts with competing water rights could be resolved. Consideration was given to simply compiling the water right status for information only and not for the purpose of evaluation. However, this task proved to be beyond the scope of this river

basin planning study and, more important, the information derived from this effort promised to be more confusing than useful.

Another future water use opportunity in the Powder/Tongue River Basins is the establishment of instream flow water rights. These water rights are developed through a specified procedure that begins when the Wyoming Game and Fish Department proposes a stream segment for an instream flow water right. The segment is then studied by the Water Development Commission, and the water right is granted or rejected by the State Engineer. This opportunity is not, however, included on the long-list since the segments that have been proposed are either under investigation, have been granted, or have been rejected. As new segments are nominated they will be advanced through the process.

The initial long-list was presented to the BAG at a meeting held October 10, 2001, and distributed to BAG members with a memorandum dated October 19, 2001. BAG members were asked to review the list and identify potential opportunities not included on the initial draft of the long-list.

Comments and suggestions received from BAG members and additional research led to the development of the final long-list. This list is presented in Appendix A, and the future water use opportunities included on the long-list are shown on Figure 1.

### **SHORT-LIST OF FUTURE WATER USE OPPORTUNITIES**

Projects and opportunities on the long-list were reviewed to determine if they should be included on the short-list or if they should be eliminated from consideration during the 30-year planning period. Reasons considered to eliminate projects include: 1) the project has already been constructed; 2) the location of project facilities, i.e. within a National Forest or wilderness area, presents major legal, institutional, and permitting constraints; and, 3) the original demand for the project no longer exists and is not expected to appear within the planning period.

The initial long-list presented to the BAG on October 10<sup>th</sup> and distributed to the BAG on October 19<sup>th</sup> identified opportunities proposed to not be included on the short-list. Reasons for eliminating projects from short-list consideration were provided. Again, BAG members were asked to review the proposed eliminations and provide comments.

Comments and suggestions received from BAG members and additional research led to the development of the final short-list.

### **SHORT-LIST EVALUATION METHODOLOGY**

The methodology described in this section is intended to assist the user of the short-list of future water use opportunities. The process described can be employed to establish “a place to start” in the quest to match specific water demands to future water use opportunities.

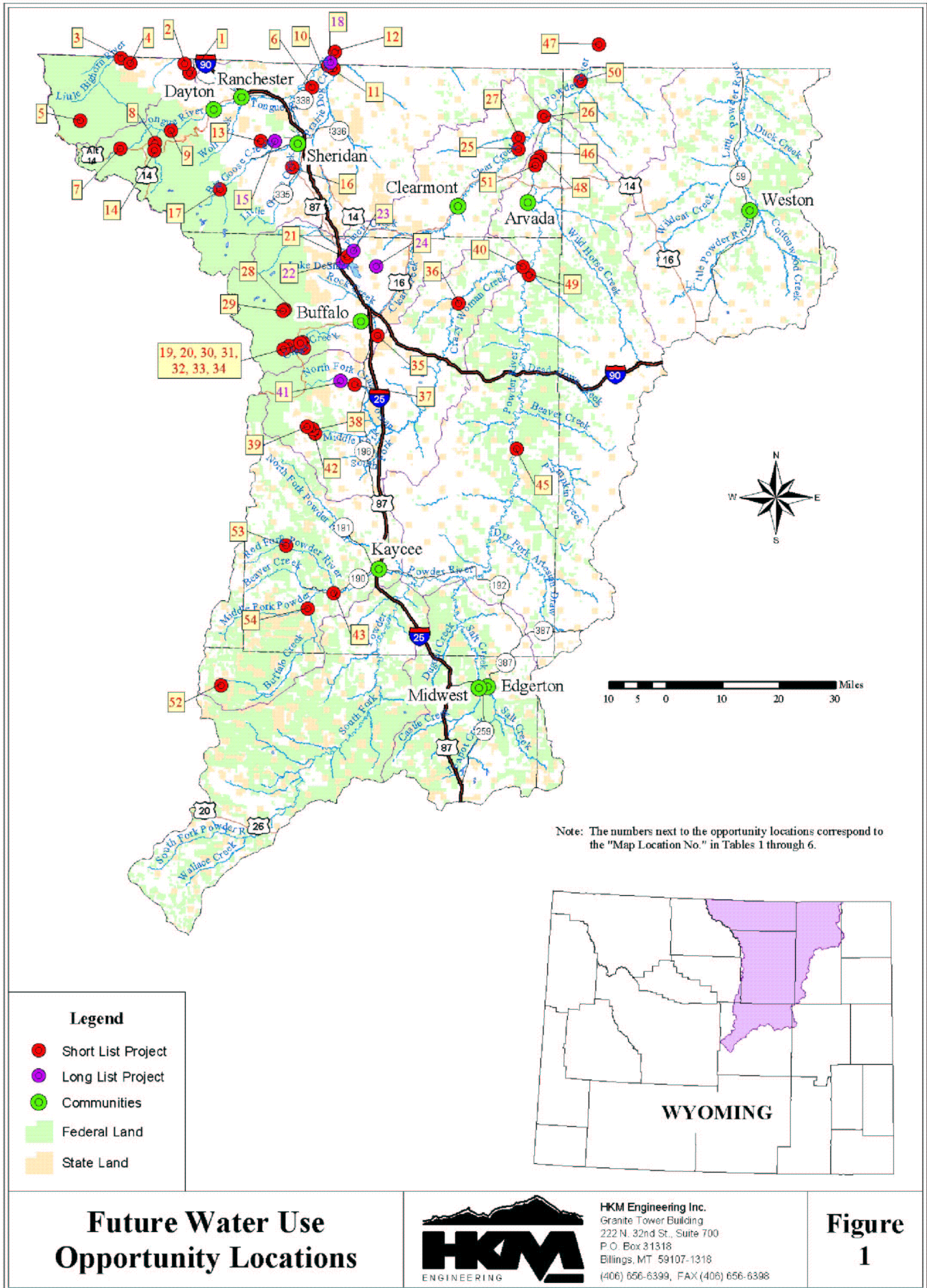
The process begins after the short-list of future water use opportunities has been prepared. The result of the process is an evaluation of opportunities according to their relative likelihood they are desirable, functional, and capable of receiving enough public support to be implemented. In general, the results present an overall picture of the favorability of a future water use opportunity or project.

The first step in the process is to categorize the future water use opportunities into one of the four types described below:

**Type 1:** Rehabilitation projects that preserve existing uses.

**Type 2:** Projects that rectify existing shortages.

**Type 3:** Projects that meet projected future demands.



**Type 4:** Projects that enhance uses in other Wyoming basins.

By categorizing the short-list projects into one of these four types, projects are evaluated only relative to similar type projects. Furthermore, the projects are grouped by sub-basin to allow planning evaluations by geographic locale.

After the short-list projects have been assigned to a type category, the six evaluation criteria were used to evaluate the projects under each of the types.

The evaluation process entails assigning a weight value to each of the criteria. These values range from a weight of 10 for criteria judged to be very important, to a weight of 1 if the criterion is not considered significant. Different criterion weight values are assigned for each of the four type categories. For example, Criterion 1: Water Availability is not significant for Type 1 projects, since these projects already have an established water supply, and will be assigned a low weight value. Conversely, this criterion is very important for projects categorized under Types 2, 3, and 4, and will be assigned higher weight values.

Each project is then assigned an evaluation score for each of the six criteria. These scores range from a high of 10 if the project is very favorable for that criterion, to a low score of 0 if the project is very unfavorable. Scoring a project under each criterion is accomplished relative to the other projects in the same type category. For example, consider Project X and Project Y that are categorized as Type 2 projects and the evaluation of these two projects concludes Project X will result in more environmental and recreational benefits (Criterion 6). Therefore, Project X will receive a higher score than Project Y under Criterion 6 with the difference in scores reflecting the degree to which Project X provides more environmental and recreational benefits than Project Y.

The total evaluation score for a project is then computed as the sum of the products of the weight value and the evaluation score. Projects achieving a higher total score are considered to be more desirable, more functional, and have a higher capability of receiving enough public support to be implemented, relative to the other projects in the same type category.

As previously stated, the level of information and data available for the projects on the list of future water use opportunities varies significantly from very sketchy to completed conceptual designs. Therefore, the exercise of assigning weights to criterion and evaluation scores to projects is totally subjective and the results of the evaluation process can only be interpreted to reflect the knowledge and judgement of the individual assigning the weights and scores. In order to make the process more objective and less subjective, detailed engineering, legal, and environmental investigations would need to be completed to advance all projects to the same level of information and data.

The suggested evaluation process described above was applied to the short-lists of future water use opportunities to provide an example of the thought process followed in its application. The results of the application of the process are presented in Tables 1, 2, 3, 4, 5, and 6 for each of the six basins of the planning area.

It must be emphasized the six evaluated short-list tables reflect the knowledge and judgement of the individual that performed the exercise. When another individual having different opinions and a different level of knowledge of the projects being evaluated completes the exercise, different total scores will likely result. Variable results will be achieved because different weights will be assigned to the evaluation criteria and different scores will be assigned to the projects.

Given this intrinsic characteristic of the evaluation methodology, it is difficult if not impossible to use the resulting evaluated short-lists for anything other than to establish “a place to start” the required investigations leading to the selection of a future water use opportunity compatible with the specific water demands of the reviewer. The evaluated short-lists simply aren’t appropriate to be used by the Wyoming Water Development Commission or any other funding entity to prioritize funding awards.

**Table 1**  
**Evaluated Short-List: Little Bighorn River Basin**

Project Type (see below) Project Title	Map Loc. No.	Est. Yield(y), Cap(c) or Depl(d) (AF)	Project Evaluation Criteria					Total Score	
			Water Availability	Financial Feasibility	Public Acceptance	No. of Sponsors/ Beneficiaries	Legal/ Institutional Constraints		Environmental/ Recreation Benefits
<b>Type 1 (None)</b>									
<b>Type 2 (None)</b>									
<b>Type 3</b>			<b>6</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>8</b>	<b>6</b>	
BEPC Sunrise Project	2	82,110 c	6	7	7	5	5	6	214
Little Bighorn River Export System	1,6	29,600 y	8	7	6	7	3	5	208
Groundwater Development		unk	5	6	8	4	7	4	208
Half Ounce Reservoir	5	10,000 y	8	6	4	5	5	3	185
Twin Creek Reservoir	2	38,588 c	8	6	4	4	4	4	178
Fuller No. 1 Reservoir	3	22,829 c	4	3	5	4	5	5	159
Fuller No. 2 Reservoir	4	1,549 c	4	3	5	4	5	4	153
<b>Type 4 (None)</b>									

Notes:

1. Each criteria has a different weighting for each type of project; 10 is most important, 1 is least important
2. Under each project, the criteria are individually scored; 10 means largely favorable, 0 is unfavorable
3. Total scores are the additive result of multiplying each project criteria weighting by the associated project type criteria score

- Type 1:** Rehabilitation projects that preserve existing uses  
**Type 2:** Projects that rectify existing shortages  
**Type 3:** Projects that meet projected future demands  
**Type 4:** Projects that enhance uses in other Wyoming basins

**Table 2**  
**Evaluated Short-List: Tongue River Basin**

Project Type (see below) Project Title	Map Loc. No.	Est. Yield(y), Cap(c) or Depl(d) (AF)	Project Evaluation Criteria					Total Score	
			Water Availability	Financial Feasibility	Public Acceptance	No. of Sponsors/ Beneficiaries	Legal/ Institutional Constraints		Environmental/ Recreation Benefits
<b>Type 1</b>									
Misc. Canal Rehab (Conservation)		unk	Not ranked, only one project of this type						
<b>Type 2</b>									
Sheridan Canal System	13	68,500 y	Not ranked, only one project of this type						
<b>Type 3</b>									
Upper State Line Reservoir	10	75,000 y	6	8	6	7	6	6	265
Lower State Line Reservoir	12	88,000 y	8	6	7	7	6	7	265
Jones Draw Reservoir	16	2,500 y	5	5	8	8	7	4	240
West Fork Reservoir	17	2,500 y	5	5	8	8	7	4	240
Prairie Dog Reservoir	11	20,000 y	6	4	7	4	6	6	210
Rockwood Reservoir	9	93,000 y	7	7	4	5	3	5	205
Groundwater Development		unk	4	4	9	4	6	4	198
North Fork Reservoir	7	21,600 y	7	5	5	4	3	5	188
South Fork Reservoir	8	13,200 y	7	5	5	4	3	5	188
Shutts Flats Reservoir	14	7,600 y	7	4	5	4	3	5	180
<b>Type 4 (None)</b>									

Notes:

1. Each criteria has a different weighting for each type of project; 10 is most important, 1 is least important
2. Under each project, the criteria are individually scored; 10 means largely favorable, 0 is unfavorable
3. Total scores are the additive result of multiplying each project criteria weighting by the associated project type criteria score

- Type 1:** Rehabilitation projects that preserve existing uses  
**Type 2:** Projects that rectify existing shortages  
**Type 3:** Projects that meet projected future demands  
**Type 4:** Projects that enhance uses in other Wyoming basins

**Table 3**  
**Ranked Short-List: Clear Creek Basin**

Project Type (see below) Project Title	Map Loc. No.	Est. Yield(y), Cap(c) or Depl(d) (AF)	Project Evaluation Criteria						Total Score
			Water Availability	Financial Feasibility	Public Acceptance	No. of Sponsors/ Beneficiaries	Legal/ Institutional Constraints	Environmental/ Recreation Benefits	
<b>Type 1 (None)</b>									
<b>Type 2 (None)</b>									
<b>Type 3</b>			<b>6</b>	<b>8</b>	<b>6</b>	<b>7</b>	<b>6</b>	<b>6</b>	
Lake DeSmet Enlargements	21	239,243 c	8	9	7	5	7	4	263
Lower Clear Creek Reservoir	26	30,300 y	8	5	6	6	6	7	244
B.C.L. Company Reservoir	25	29,300 c	7	5	6	6	6	7	238
Tex Ellis Reservoir	27	17,100 y	7	4	7	6	7	6	236
Tie Hack Reservoir Enlargement	34	7,500 c	4	5	7	8	4	7	228
Groundwater Development		unk	4	3	7	3	6	5	177
Little Sour Dough Reservoir	19	1,642 c	4	3	4	3	3	4	135
Camp Comfort Reservoir	20	11,640 c	4	3	4	3	3	4	135
South Rock Creek Reservoir	28	13,300 c	4	3	4	3	3	4	135
Triangle Park Reservoir	29	3,000 c	4	3	4	3	3	4	135
Canyon Reservoir	30	5,000 c	4	3	4	3	3	4	135
South Clear Creek Reservoir	31	5,000 c	4	3	4	3	3	4	135
Lynx Park Reservoir	32	10,700 c	4	3	4	3	3	4	135
Sour Dough Creek Reservoir	33	4,500 c	4	3	4	3	3	4	135
<b>Type 4 (None)</b>									

Notes:

1. Each criteria has a different weighting for each type of project; 10 is most important, 1 is least important
2. Under each project, the criteria are individually scored; 10 means largely favorable, 0 is unfavorable
3. Total scores are the additive result of multiplying each project criteria weighting by the associated project type criteria score

- Type 1:** Rehabilitation projects that preserve existing uses  
**Type 2:** Projects that rectify existing shortages  
**Type 3:** Projects that meet projected future demands  
**Type 4:** Projects that enhance uses in other Wyoming basins



**Table 4**  
**Ranked Short-List: Crazy Woman Creek Basin**

Project Type (see below) Project Title	Map Loc. No.	Est. Yield(y), Cap(c) or Depl(d) (AF)	Project Evaluation Criteria						Total Score
			Water Availability	Financial Feasibility	Public Acceptance	No. of Sponsors/ Beneficiaries	Legal/ Institutional Constraints	Environmental/ Recreation Benefits	
<b>Type 1 (None)</b>									
<b>Type 2</b>			<b>6</b>	<b>7</b>	<b>5</b>	<b>6</b>	<b>4</b>	<b>3</b>	
Hazelton Watershed Site "B"	39	3,000 acres	5	7	5	7	4	4	174
Doyle Creek Reservoir	42	3,000 acres	5	7	5	7	4	4	174
Hazelton Watershed Site "A"	38	1,580 acres	7	5	6	5	3	3	158
<b>Type 3</b>			<b>6</b>	<b>8</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>6</b>	
Crazy Woman Reservoir	36	10,500 y	7	6	6	6	5	5	211
Lower Crazy Woman Reservoir	40	67,200 y	7	4	6	7	4	6	202
North Fork Crazy Woman Reservoir	37	2,759 c	6	5	5	4	6	4	179
Enl. Negro Creek Reservoir	35	13,900 c	7	5	5	5	3	4	176
Groundwater Development		unk	4	3	7	3	6	5	161
<b>Type 4 (None)</b>									

Notes:

1. Each criteria has a different weighting for each type of project; 10 is most important, 1 is least important
2. Under each project, the criteria are individually scored; 10 means largely favorable, 0 is unfavorable
3. Total scores are the additive result of multiplying each project criteria weighting by the associated project type criteria score

- Type 1:** Rehabilitation projects that preserve existing uses  
**Type 2:** Projects that rectify existing shortages  
**Type 3:** Projects that meet projected future demands  
**Type 4:** Projects that enhance uses in other Wyoming basins

**Table 5**  
**Ranked Short-List: Powder River Basin**

Project Type (see below) Project Title	Map Loc. No.	Est. Yield(y), Cap(c) or Depl(d) (AF)	Project Evaluation Criteria						Total Score
			Water Availability	Financial Feasibility	Public Acceptance	No. of Sponsors/ Beneficiaries	Legal/ Institutional Constraints	Environmental/ Recreation Benefits	
<b>Type 1 (None)</b>									
<b>Type 2</b>			<b>6</b>	<b>7</b>	<b>5</b>	<b>6</b>	<b>4</b>	<b>3</b>	
Morgareidge No. 7 Reservoir	52	4,600 acres	5	6	5	7	4	4	167
Red Fork Powder River Reservoir	53	unk	4	4	5	6	4	4	141
<b>Type 3</b>			<b>6</b>	<b>8</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>6</b>	
Moorhead Reservoir	47	35,000 y	8	7	7	6	5	6	236
Buffalo Creek Reservoir	54	unk	8	3	7	6	7	6	214
Pumpkin Reservoir	45	60,000 y	6	6	6	6	6	5	210
Clarks Fork Exchange		99,700 c	8	6	6	5	3	6	207
Bass Industrial Reservoir	46	123,380 c	6	6	6	5	5	5	199
Arvada Reservoir	48	35,000 y	6	6	6	5	5	5	199
Middle Fork Powder River Reservoir	43	27,000 y	5	5	5	6	7	5	196
Fence Creek Reservoir	50	106,700 c	7	4	7	5	6	4	193
Fortification Creek Reservoir	49	63,300 y	5	4	7	6	6	4	187
Gibbs Reservoir	51	10,800 y	6	5	6	4	5	5	185
Groundwater Development		unk	3	3	7	3	6	5	155
<b>Type 4 (None)</b>									

Notes:

1. Each criteria has a different weighting for each type of project; 10 is most important, 1 is least important
2. Under each project, the criteria are individually scored; 10 means largely favorable, 0 is unfavorable
3. Total scores are the additive result of multiplying each project criteria weighting by the associated project type criteria score

- Type 1:** Rehabilitation projects that preserve existing uses  
**Type 2:** Projects that rectify existing shortages  
**Type 3:** Projects that meet projected future demands  
**Type 4:** Projects that enhance uses in other Wyoming basins

**Table 6**  
**Ranked Short-List: Little Powder River Basin**

Project Type (see below) Project Title	Map Loc. No.	Est. Yield(y), Cap(c) or Depl(d) (AF)	Project Evaluation Criteria						Total Score
			Water Availability	Financial Feasibility	Public Acceptance	No. of Sponsors/ Beneficiaries	Legal/ Institutional Constraints	Environmental/ Recreation Benefits	
<b>Type 1 (None)</b>									
<b>Type 2 (None)</b>									
<b>Type 3</b>			<b>6</b>	<b>8</b>	<b>4</b>	<b>5</b>	<b>4</b>	<b>6</b>	
Coal Mine Reclamation Reservoirs		unk	5	7	8	6	6	8	220
Groundwater Development		unk	6	5	7	4	7	5	182
<b>Type 4 (None)</b>									

Notes:

1. Each criteria has a different weighting for each type of project; 10 is most important, 1 is least important
2. Under each project, the criteria are individually scored; 10 means largely favorable, 0 is unfavorable
3. Total scores are the additive result of multiplying each project criteria weighting by the associated project type criteria score

- Type 1:** Rehabilitation projects that preserve existing uses
- Type 2:** Projects that rectify existing shortages
- Type 3:** Projects that meet projected future demands
- Type 4:** Projects that enhance uses in other Wyoming basins

## REFERENCES

- CH2M HILL, Prefeasibility Study Tongue & Little Bighorn River Project, March 1977, State of Wyoming, Governor's Interdepartmental Water Conference
- Wyoming Water Development Commission, Little Bighorn River Preliminary Feasibility Study of Development Alternatives and Delivery Options, September 1981, Report to the Honorable Ed Herschler, Governor of Wyoming
- Wyoming State Engineer's Office, Wyoming Water Planning Program, Report 10, Water & Related Land Resources of Northeast Wyoming, April 1972.
- Banner Associates, Inc., Tongue River Level I, January 1985, Wyoming Water Development Commission
- Centennial Engineering & Research, Inc., Alliance Lateral Ditch Level II Rehabilitation Feasibility Study, Final Report, October 1986, Wyoming Water Development Commission
- Harza Engineering Company, Storage Development For Water Supply, Powder River Basin in Wyoming, Level I Reconnaissance Study, September 1983, Wyoming Water Development Commission
- Harza Engineering Company, Powder River Storage Development, August, 1974, Wyoming State Engineer's Office, Wyoming Water Planning Program
- HKM Associates, Crazy Woman Watershed Project Level II, Phase I Rehabilitation Plan and Phase II Conceptual Design and Cost Estimates, November 1991, Wyoming Water Development Commission
- Harza Engineering Company, Middle Fork Powder River Dam and Reservoir Project Conceptual Report, January, 1986, Wyoming Water Development Commission
- Wright Water Engineers, Wyoming Yellowstone River Basin Exchange and Water Supply Project – A Plan to Increase Wyoming's Use of Water From the Powder River by an Exchange to Montana of Clarks Fork Water, May, 1981, Cadiz Corporation

# **APPENDIX A**

## Appendix A – Long-list and Short-list of Future Water Use Opportunities

The following is a long-list of future water use opportunities for the Powder, Tongue, and Little Bighorn River Basins of Wyoming. The long-list was compiled from a review of published reports and input from the Basin Advisory Group. A brief description of each project is provided. Numbers in parentheses following the project title, i.e. (MLN 6), are map location numbers indicating the location of the projects on Figure 1. Projects without map location numbers either have no specific location, i.e. groundwater development, or the project features are outside of the study area. Projects marked with an “ \* ” were eliminated from the short-list. Reasons for elimination are provided.

### Little Bighorn River Basin

1. Little Bighorn River Export System (MLNs 1,6): Pipelines and reservoirs to collect and divert water to the Tongue River drainage. Proposals include Parkman Reservoir (42,580 acre-feet) and Dry Fork Reservoir (30,671 acre-feet); annual yield 29,600 acre-feet
2. BEPC Sunrise Project (MLN 2): Industrial water supply developed in Sunrise No. 1 Reservoir (82,110 acre-feet) on Twin Creek with supply pipelines from East Pass, West Pass, and Gay Creeks
3. Twin Creek Reservoir (MLN 2): Diverts Tongue River water to Twin Creek Reservoir (38,588 acre-feet)
4. Fuller No. 1 Reservoir (MLN 3): Water pumped from Little Bighorn River and stored in Fuller No. 1 Reservoir on Red Gulch Creek (22,829 acre-feet)
5. Fuller No. 2 Reservoir (MLN 4): Water pumped from Little Bighorn River and stored in Fuller No. 2 Reservoir on Muir Creek (1,549 acre-feet)
6. Half Ounce Reservoir (MLN 5): Water stored in Half Ounce Reservoir (34,187 acre-feet) and diverted to Dry Fork; annual yield 10,000 acre-feet
7. Groundwater Development

### Tongue River Basin

1. North Fork Reservoir (MLN 7): 40,200 acre-foot reservoir; annual yield between 13,800 and 21,600 acre-feet depending on minimum pool and fish flow requirements
2. South Fork Reservoir (MLN 8): 26,500 acre-foot reservoir; annual yield between 9,900 and 13,200 acre-feet depending on minimum pool and fish flow requirement
3. Rockwood Reservoir (MLN 9): 125,000 acre-foot reservoir; annual yield between 65,500 and 93,000 acre-feet depending on minimum pool and fish flow requirements, and Montana cooperation
4. Upper State Line Reservoir (MLN 10): 250,000 acre-foot reservoir; annual yield between 68,000 and 75,000 acre-feet depending on minimum pool and fish flow requirements
5. Prairie Dog Reservoir (MLN 11): 128,000 acre-foot reservoir; 150 cfs pumped diversion from Tongue River; annual yield between 18,000 and 20,000 acre-feet depending on minimum pool requirement
6. Lower State Line Reservoir (MLN 12): 870,000 acre-foot reservoir; annual yield 88,000 acre-feet for Wyoming
7. Sheridan Canal System (MLN 13): diversion from the Tongue River into the Goose Creek drainage for irrigation; storage in Rockwood Reservoir (125,000 acre-feet); annual yield 68,500 acre-feet
8. Shutts Flats Reservoir (MLN 14): 11,250 acre-foot reservoir; annual yield between 5,800 and 7,600 acre-feet depending on fish-flow and minimum pool requirement
9. Alliance Lateral Ditch Rehabilitation\* (MLN 15): rehabilitation of ditch to reduce O&M costs; serves 1,395 acres  
Reasons for elimination: rehabilitation is currently being addressed by WWDC
10. Jones Draw Reservoir (MLN 16): Rural water supply developed in a 4,000 to 5,000 acre-foot reservoir on Jones Draw that is filled through the enlarged and reconstructed Peralta Ditch diverting from Little Goose Creek; annual yield 1,000 to 2,500 acre-feet
11. West Fork Reservoir (MLN 17): Rural water supply developed in a 4,000 to 5,000 acre-foot reservoir; annual yield 1,000 to 2,500 acre-feet
12. WTM Reservoir\* (MLN 18): 140,345 acre-foot reservoir on Tongue River; annual yield 50,000 acre-feet

Reasons for elimination: similar to Upper State Line Reservoir which is larger  
13. Groundwater Development

#### Clear Creek Basin

1. Little Sour Dough Reservoir (MLN 19): 1,642 acre-foot irrigation reservoir
2. Camp Comfort Reservoir (MLN 20): 11,640 acre-foot irrigation reservoir
3. Lake DeSmet and Enlargements (MLN 21): Enlargements include Healy Reservoir Enlargement (13,725 acre-feet) on Clear Creek, Reynolds High Dam (44,442 acre-feet) on Piney Creek, and 4<sup>th</sup> Enlargement Lake DeSmet (23,513 acre-feet); bring total capacity to 239,243 acre-feet
4. Reynolds Shell Creek Reservoir\* (MLN 22): 1,369 acre-foot reservoir  
Reasons for elimination: proximity to and conflict with Lake DeSmet
5. Reynolds Piney Creek Reservoir\* (MLN 23): 12,660 acre-foot reservoir  
Reasons for elimination: proximity to and conflict with Lake DeSmet
6. Boxelder Reservoir\* (MLN 24): 20,000 acre-foot reservoir  
Reasons for elimination: proximity to and conflict with Lake DeSmet
7. B.C.L. Company Reservoir (MLN 25): 29,300 acre-foot reservoir; annual yield 9,600 acre-feet
8. Lower Clear Creek Reservoir (MLN 26): 302,400 acre-foot reservoir, annual yield 30,300 acre-feet
9. Tex Ellis Reservoir (MLN 27): 61,500 acre-foot reservoir on Buffalo Creek with pumped supply diversion from Clear Creek; annual yield 17,100 acre-feet
10. South Rock Creek Reservoir (MLN 28): 13,300 acre-foot reservoir
11. Triangle Park Reservoir (MLN 29): 3,000 acre-foot reservoir
12. Canyon Reservoir (MLN 30): 5,000 acre-foot reservoir
13. South Clear Creek Reservoir (MLN 31): 5,000 acre-foot reservoir
14. Lynx Park Reservoir (MLN 32): 10,700 acre-foot reservoir
15. Sour Dough Creek Reservoir (MLN 33): 4,500 acre-foot reservoir
16. Tie Hack Reservoir Enlargement (MLN 34): 7,500 acre-foot enlargement of the capacity of the City of Buffalo's Tie Hack Reservoir
17. Groundwater Development

#### Crazy Woman Creek Basin

1. Enl. Negro Creek Reservoir (MLN 35): 13,900 acre-foot reservoir in Clear Creek drainage; diversion to Crazy Woman Creek
2. Crazy Woman Reservoir (MLN 36): 64,300 acre-foot reservoir; annual yield 3,700 to 10,500 acre-feet
3. North Fork Crazy Woman Reservoir (MLN 37): 2,759 acre-foot reservoir
4. Hazelton Watershed Site "A" SCS (MLN 38): 2,700 acre-foot reservoir, serves 1,580 acres
5. Hazelton Watershed Site "B" SCS (MLN 39): 9,000 acre-foot reservoir, serves 3,000 acres
6. Lower Crazy Woman Creek Reservoir (MLN 40): 496,300 acre-foot reservoir on Crazy Woman Creek with pumped diversion from the Powder River; annual yield 67,200 acre-feet
7. Crazy Woman Watershed Project\* (MLN 41): rehabilitation or replacement of various facilities of the Crazy Woman Watershed Improvement District  
Reasons for elimination: rehabilitation is currently being addressed by WWDC and DEQ
8. Doyle Creek Reservoir (MLN 42): Middle Fork Crazy Woman Creek Project, 9,000 acre-foot reservoir, serves 3,000 acres
9. Groundwater Development

#### Powder River Basin

1. Middle Fork Powder River Reservoir (MLN 43): 59,600 acre-foot reservoir; annual yield 27,000 acre-feet
2. Pumpkin Reservoir (MLN 45): 643,900 acre-foot reservoir; annual yield 60,000 acre-feet
3. Bass Industrial Reservoir (MLN 46): 123,380 acre-foot reservoir
4. Moorhead Reservoir (MLN 47): 211,600 acre-foot reservoir; annual yield 35,000 acre-feet for Wyoming

5. Arvada Reservoir (MLN 48): 1,309,000 acre-foot reservoir; annual yield 35,000 acre-feet
6. Fortification Creek Reservoir (MLN 49): 427,000 acre-foot reservoir; annual yield 63,300 acre-feet; 610 cfs diversion from the Powder River
7. Fence Creek Reservoir (MLN 50): 106,700 acre-foot reservoir on Fence Creek; diversion from the Powder River
8. Gibbs Reservoir (MLN 51): 195,600 acre-foot reservoir; annual yield 10,800 acre-feet
9. Morgareidge No. 7 Reservoir (MLN 52): 1,200 acre-foot reservoir providing 1,100 acre-feet per year to serve 4,600 acres.
10. Red Fork Powder River Reservoir (MLN 53): proposed reservoir of unspecified capacity to provide supplemental irrigation supply
11. Buffalo Creek Reservoir (MLN 54): proposed reservoir of unspecified capacity to improve downstream water quality by removing significant chemical and silt problems and possibly create additional agricultural water
12. Clarks Fork Exchange: two reservoirs with a combined capacity of 99,700 acre-feet in the Clarks Fork drainage, Badger Basin Reservoir and supply ditch, and Clarks Reservoir; releases to Montana in exchange for increases in Powder River depletions by Wyoming
13. Groundwater Development

#### Little Powder River Basin

1. Coal Mine Reclamation Reservoirs: small reservoirs developed as part of reclamation of surface coal mines.
2. Groundwater Development