

Wood River Electrical Plan

Community Advisory Committee

Meeting #7
October 25, 2007

Meeting Purpose

- To review the draft plan document, gather comments for edits, etc.
- To discuss the implementation steps, roles and responsibilities
- To discuss and reach agreement on the next steps for plan introduction

Meeting Agenda

- 10:00 a.m. Welcome and introductions
 - »Review CAC meeting #6
- 10:15 a.m. Present Draft Plan Document
- 12:00 a.m. Lunch
- 12:30 p.m. Plan Implementation Strategy
- 1:50 p.m. Next Steps, Process Evaluation and Wrap up

Purpose of the Project

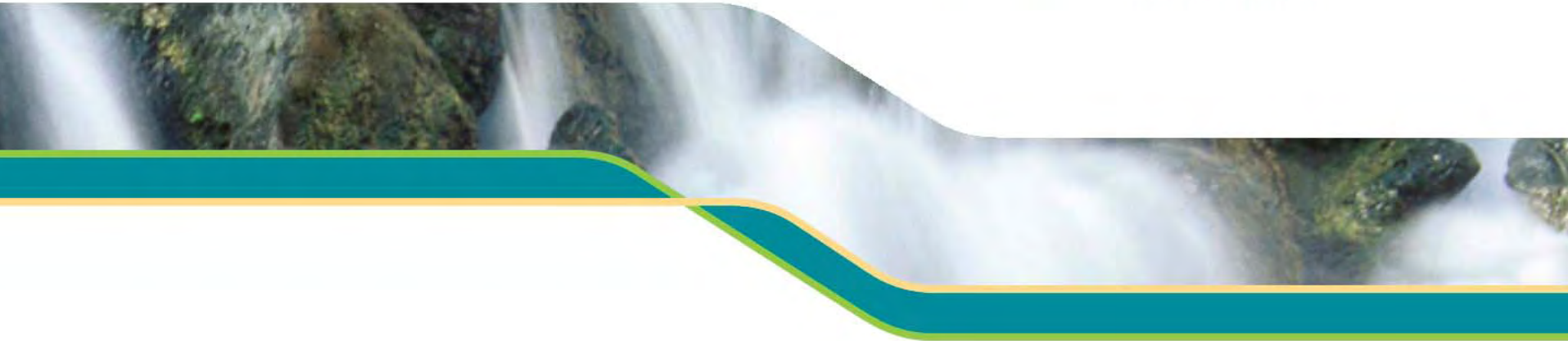
- To create a clear and documented electrical energy supply plan to serve the load needs of the Wood River Valley from now through buildout
 - *“The public process is the starting point of all electrical supply plans and any resulting transmission rights-of-way and substation siting requirements”*

General AC Meetings Outline

1. January ► Orientation and Education
2. February ► Education (continued):
 - *Rates & Regulatory*
 - *Demand Side Management*
 - *Transmission & Substations*
 - *Identify committee issues to develop preliminary system goals*
3. March ► Education (continued):
 - *Confirm system goals*
 - *How Idaho Power plans for the Wood River Valley*
 - *Parameters for various transmission lines*
 - *Wood River existing conditions*
 - *Substation and Transmission Facility Siting Criteria*

General AC Meetings Outline

4. April ► Alternatives screening: identify feasible alternatives
 - *Discuss preliminary possible alternatives*
 - *Committee to develop feasible alternatives*
5. May ► Alternatives evaluation: determine most feasible alternative(s)
 - *Present attributes of each feasible alternative (results of Idaho Power's technical review)*
6. June ► Recommendations: develop consensus for a recommended electrical plan to meet Idaho Power Company and Wood River resident needs
 - *Screen alternatives to determine the list of most feasible alternatives*
 - *Begin prioritization of most feasible alternatives*



Draft Report

**When someone asks you,
“A penny for your thoughts,”
and you put your two cents in, what
happens to the other penny?**



Introduction

- Area description
- 1995 Community Advisory Committee
- Description of current Advisory Committee
- Anything else?

Technical Background

- Existing Population and Electrical Load
- Wood River Valley Growth

<i>Blaine County</i>		<i>Population annual Growth</i>	<i>Households Annual Growth</i>
By Decade	1970-1979	5.49%	7.02%
	1980-1989	2.66%	2.85%
	1990-1990	2.99%	3.37%
	2000-2009	2.08%	2.09%
	2010-2019	1.41%	1.28%
	2020-2029	1.90%	1.93%
Previous 25 Years	1980-2004	3.05%	3.10%
Previous 5 Years	2001-2005	1.70%	1.67%
Next 5 Years	2006-2010	1.84%	1.85%
Next 25 Years	2006-2030	1.82%	1.78%

Table 1. Blaine County Population Growth

- Existing Wood River Valley Electrical Supply System

<i>Line</i>	<i>Rating (MW)</i>	<i>Year Built</i>	<i>Historic Winter Peak Line Loading (MW)</i>	<i>Historic Winter Peak Line Loading (%)</i>	<i>Historic Summer Peak Line Loading (MW)</i>	<i>Historic Summer Peak Line Loading (%)</i>
MPSN-WDRI	120	1989	77	64	45	38
KING-WDRI	105	1962	58	55	36	34
WDRI-EKHN	120	1962	62	52	26	22

Table 2. Wood River Transmission System Technical Details

- Existing Wood River Valley Electrical Supply System

<i>Substation</i>	<i>Historic Winter Peak Load (MW)</i>	<i>Historic Summer Peak Load (MW)</i>
Ketchum (KCHM)	48	18
Elkhorn (EKHN)	12	6
Hailey (HALY)	31	18
Moonstone (MOON)	8	12
Silver (SLVR)	4.5	6.5

Table 3. Existing Substation Peak Loads

- Existing Reliability

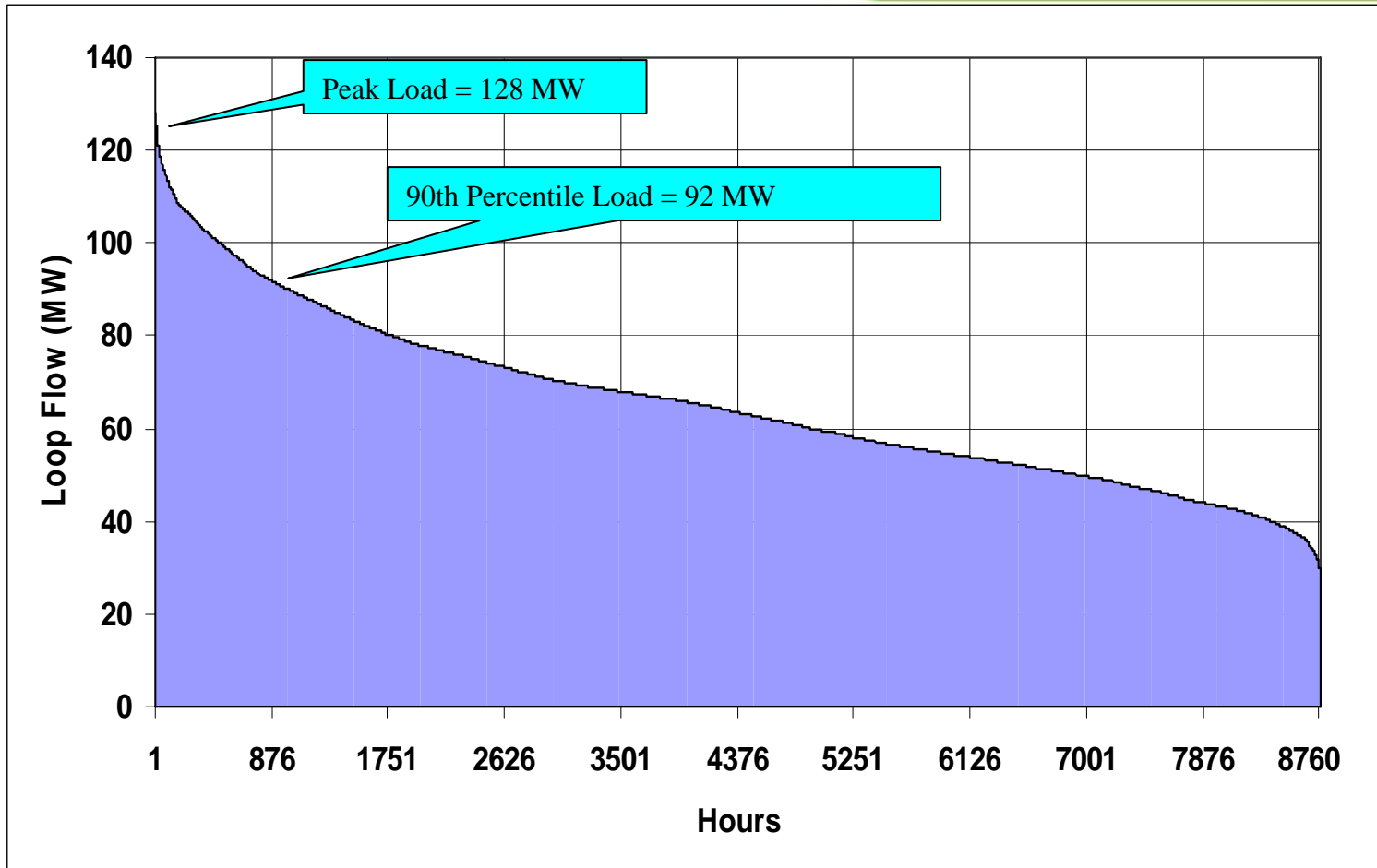


Figure 3. Load Duration Curve for Wood River Loop Transmission

- Existing Reliability

<i>Type and Cause of Outage</i>	<i>MPSN-WDRI</i>	<i>KING-WDRI</i>	<i>WDRI-KCHM</i>
Total Sustained Outages	13	24	4
Caused by Weather	8 (62%)	5 (21%)	1 (25%)
Caused by Range Fires	3 (23%)	1 (4%)	0
Caused by Maintenance	2 (15%)	18 (75%)	2 (50%)
Caused by Equipment Failure	0	0	1 (25%)
Total Momentary Outages	26	46	4
Caused by Weather	8 (31%)	12 (26%)	4 (100%)
Caused by Range Fires	0	2 (4%)	0
Caused by Maintenance	1 (4%)	20 (43%)	0
Unknown Cause	17 (65%)	12 (26%)	0

Table 4. 10-Year Outage History for Transmission Lines in the Wood River Valley

Committee Process and Input

- Alternative Energy Generating Technologies
 - Wind Turbines
 - Photovoltaic
 - Fuel Cells
 - Combustion Turbines
- Energy Efficiency

<i>Residential</i>	<i>Commercial/Industrial/Irrigation</i>
A/C Cool Credit	Irrigation Peak Rewards
Weatherization Assistance	Irrigation Efficiency
Rebate Advantage	Building Efficiency
Energy Star® Homes	Easy Upgrades
Energy Star® Lighting	Customer Efficiency
Energy House Calls	

Table 5. Idaho Power Demand Side Management Programs

- Transmission Characteristics

<i>Voltage</i>	<i>Type</i>	<i>\$/mi *</i>	<i>ROW (ft)</i>
230,000 V	Overhead, H-Frame	\$350,000	120
230,000 V	Overhead, Single Pole	\$400,000	70
138,000 V	Overhead Single Pole (low profile)	\$200,000	50
138,000 V	Underground	\$3,000,000	12
69,000 V	Overhead, Single Pole	\$175,000	40
69,000 V	Underground	\$2,700,000	12
35,000 V	Overhead, Single Pole	\$150,000	30
35,000 V	Underground	\$1,500,000	12

Table 6. Estimated Transmission Costs for Various Voltage Levels

* Does not include ROW costs

- Goals Document
- Load Blocks

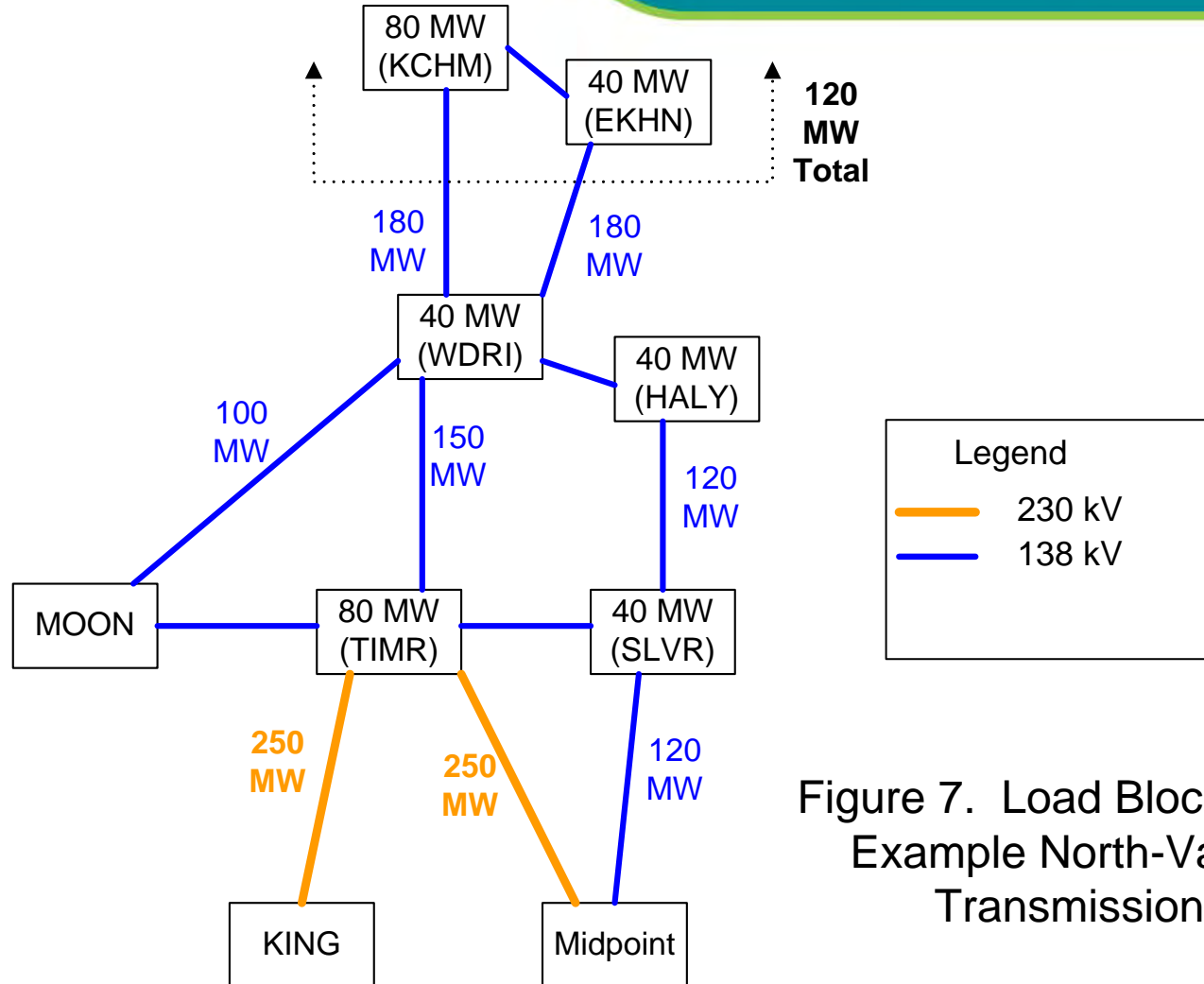
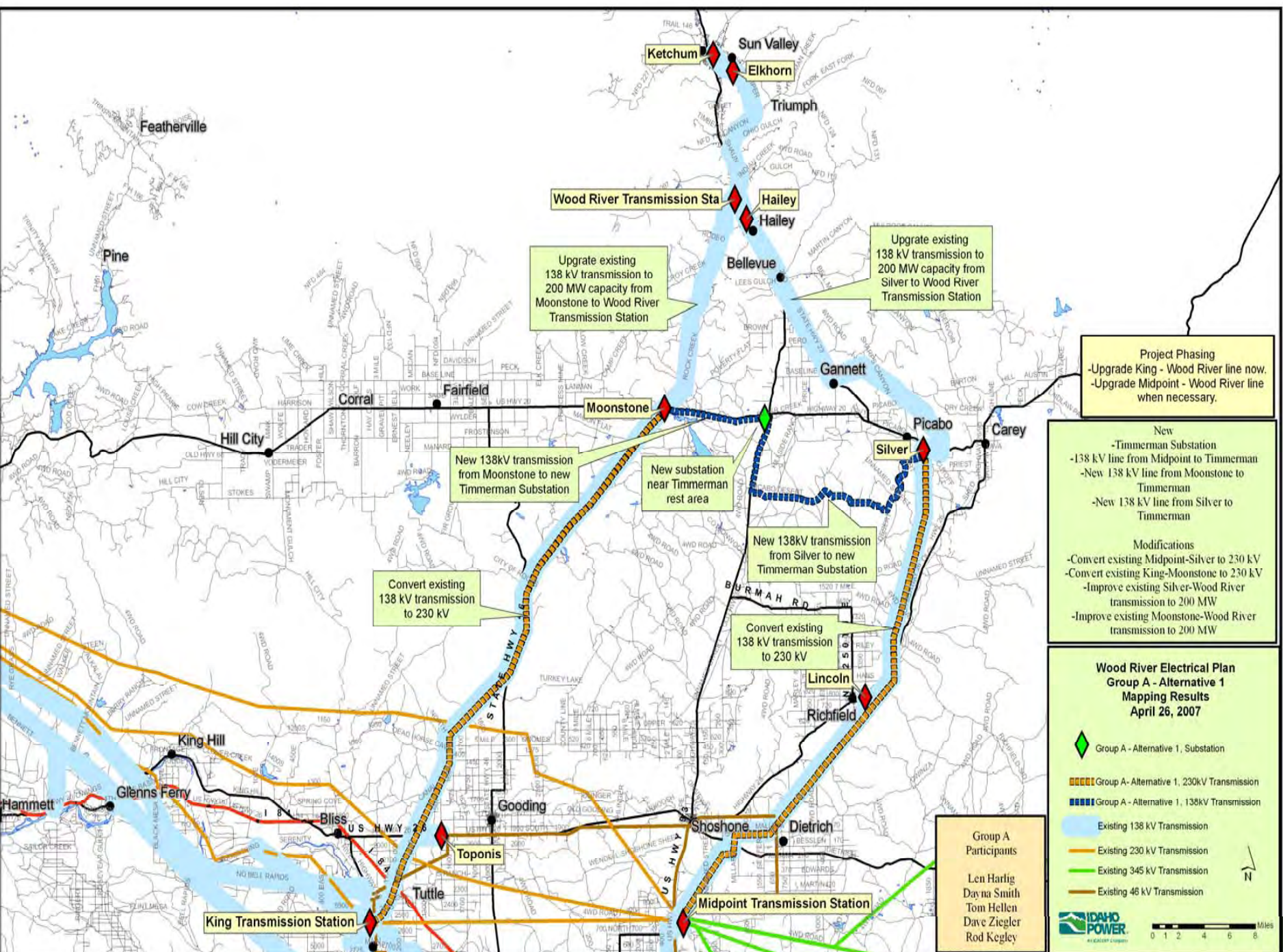


Figure 7. Load Blocks with Example North-Valley Transmission



Upgrade existing 138 kV transmission to 200 MW capacity from Moonstone to Wood River Transmission Station

Upgrade existing 138 kV transmission to 200 MW capacity from Silver to Wood River Transmission Station

Project Phasing
 -Upgrade King - Wood River line now.
 -Upgrade Midpoint - Wood River line when necessary.

New 138kV transmission from Moonstone to new Timmerman Substation

New substation near Timmerman rest area

New 138kV transmission from Silver to new Timmerman Substation

Convert existing 138 kV transmission to 230 kV

Convert existing 138 kV transmission to 230 kV

New
 -Timmerman Substation
 -138 kV line from Midpoint to Timmerman
 -New 138 kV line from Moonstone to Timmerman
 -New 138 kV line from Silver to Timmerman

Modifications
 -Convert existing Midpoint-Silver to 230 kV
 -Convert existing King-Moonstone to 230 kV
 -Improve existing Silver-Wood River transmission to 200 MW
 -Improve existing Moonstone-Wood River transmission to 200 MW

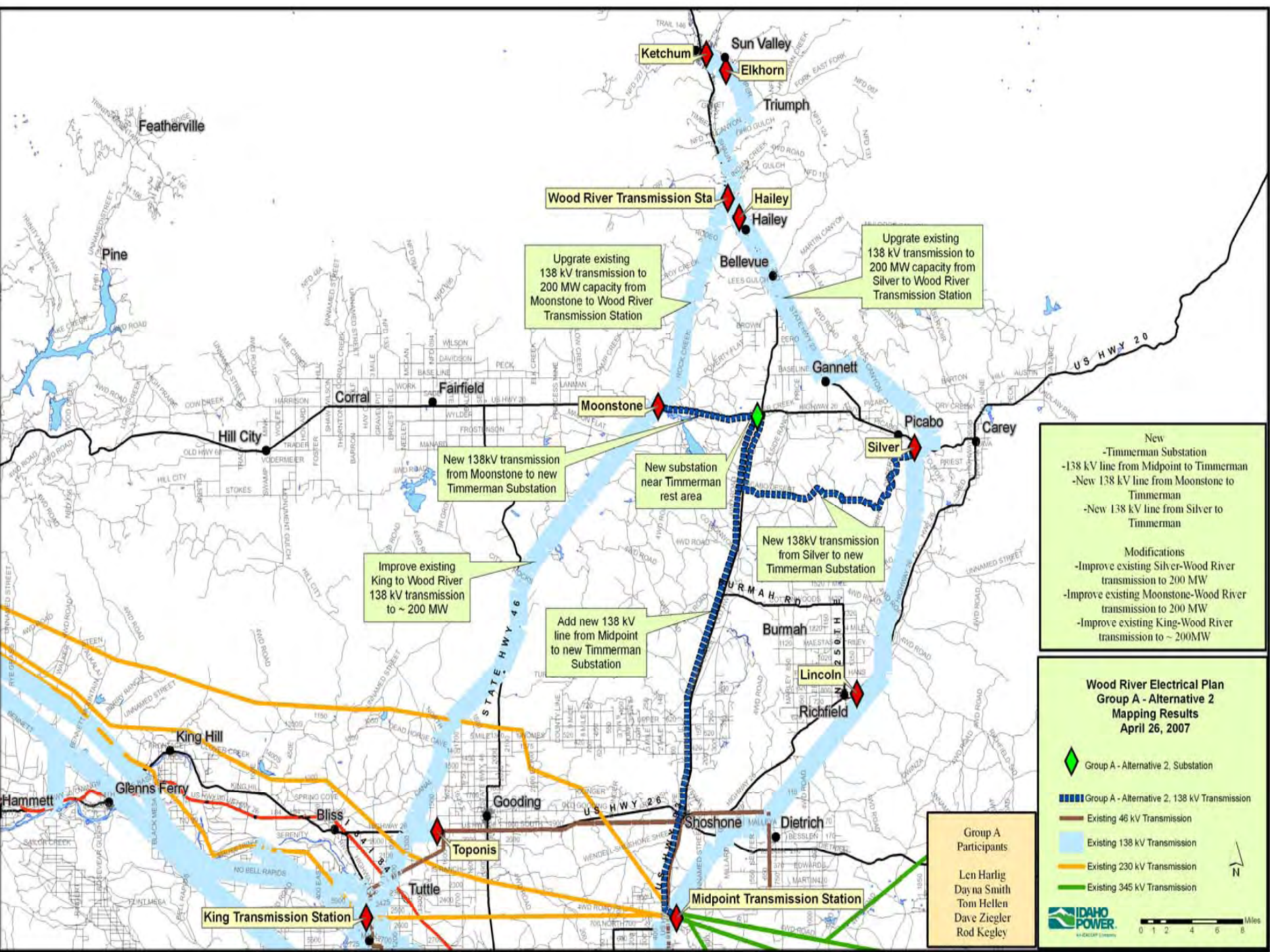
**Wood River Electrical Plan
 Group A - Alternative 1
 Mapping Results
 April 26, 2007**

Group A Participants
 Len Harlig
 Dayna Smith
 Tom Hellen
 Dave Ziegler
 Rod Kegley

Group A - Alternative 1, Substation
 Group A - Alternative 1, 230kV Transmission
 Group A - Alternative 1, 138kV Transmission
 Existing 138 kV Transmission
 Existing 230 kV Transmission
 Existing 345 kV Transmission
 Existing 46 kV Transmission

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 AN EXCELLOP COMPANY

0 1 2 4 6 8 Miles
 N



Upgrade existing 138 kV transmission to 200 MW capacity from Moonstone to Wood River Transmission Station

Upgrade existing 138 kV transmission to 200 MW capacity from Silver to Wood River Transmission Station

New 138kV transmission from Moonstone to new Timmerman Substation

New substation near Timmerman rest area

New 138kV transmission from Silver to new Timmerman Substation

Improve existing King to Wood River 138 kV transmission to ~ 200 MW

Add new 138 kV line from Midpoint to new Timmerman Substation

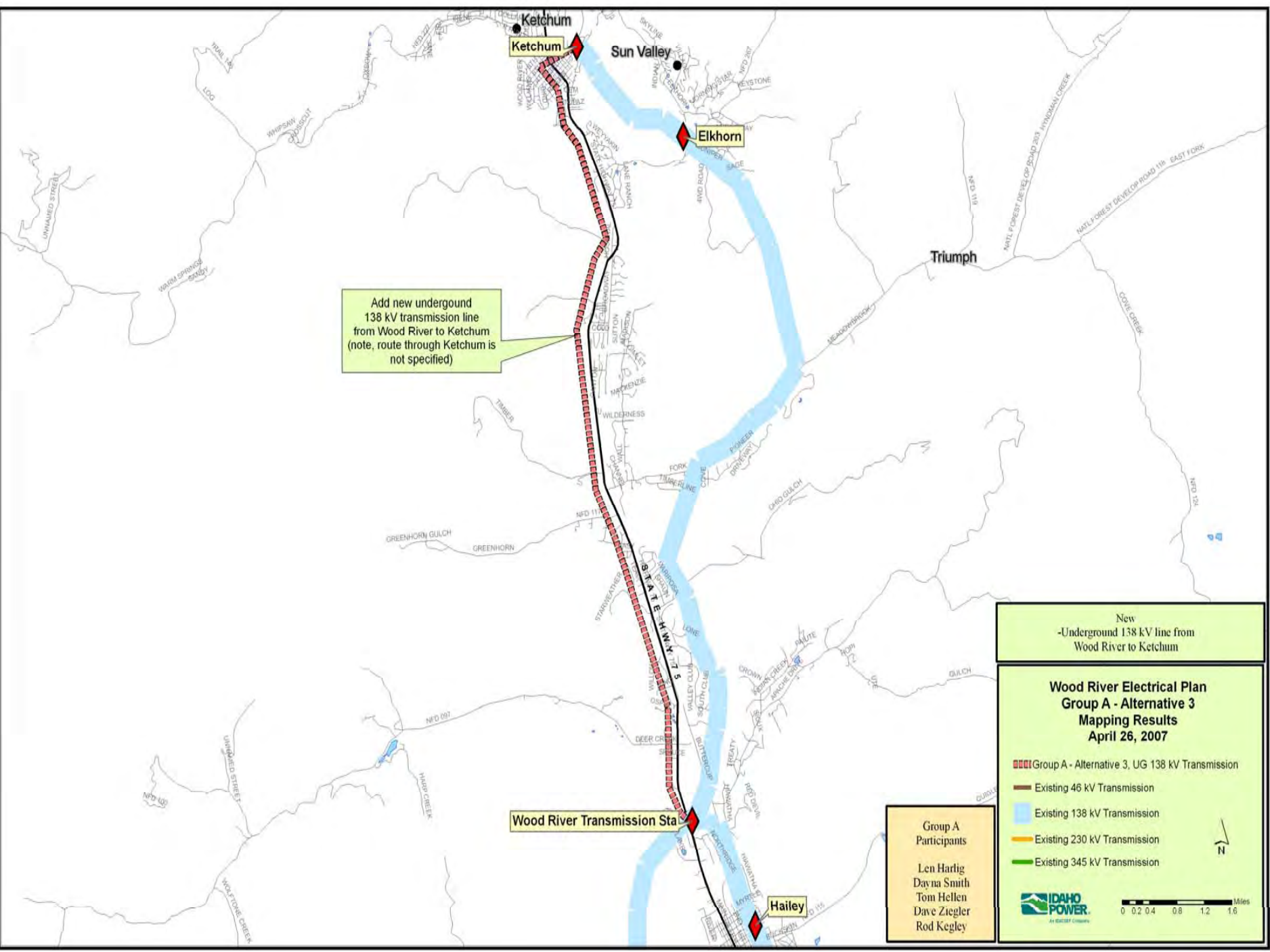
- New**
- New Timmerman Substation
 - 138 kV line from Midpoint to Timmerman
 - New 138 kV line from Moonstone to Timmerman
 - New 138 kV line from Silver to Timmerman
- Modifications**
- Improve existing Silver-Wood River transmission to 200 MW
 - Improve existing Moonstone-Wood River transmission to 200 MW
 - Improve existing King-Wood River transmission to ~ 200MW

**Wood River Electrical Plan
Group A - Alternative 2
Mapping Results
April 26, 2007**

- Group A - Alternative 2, Substation
- Group A - Alternative 2, 138 kV Transmission
- Existing 46 kV Transmission
- Existing 138 kV Transmission
- Existing 230 kV Transmission
- Existing 345 kV Transmission

Group A Participants

- Len Harlig
- Day na Smith
- Tom Hellen
- Dave Ziegler
- Rod Kegley



Add new underground 138 kV transmission line from Wood River to Ketchum (note, route through Ketchum is not specified)

New
-Underground 138 kV line from
Wood River to Ketchum

Group A - Alternative 3, UG 138 kV Transmission

Existing 46 kV Transmission

Existing 138 kV Transmission

Existing 230 kV Transmission

Existing 345 kV Transmission

Group A Participants

Len Hardig

Dayna Smith

Tom Hellen

Dave Ziegler

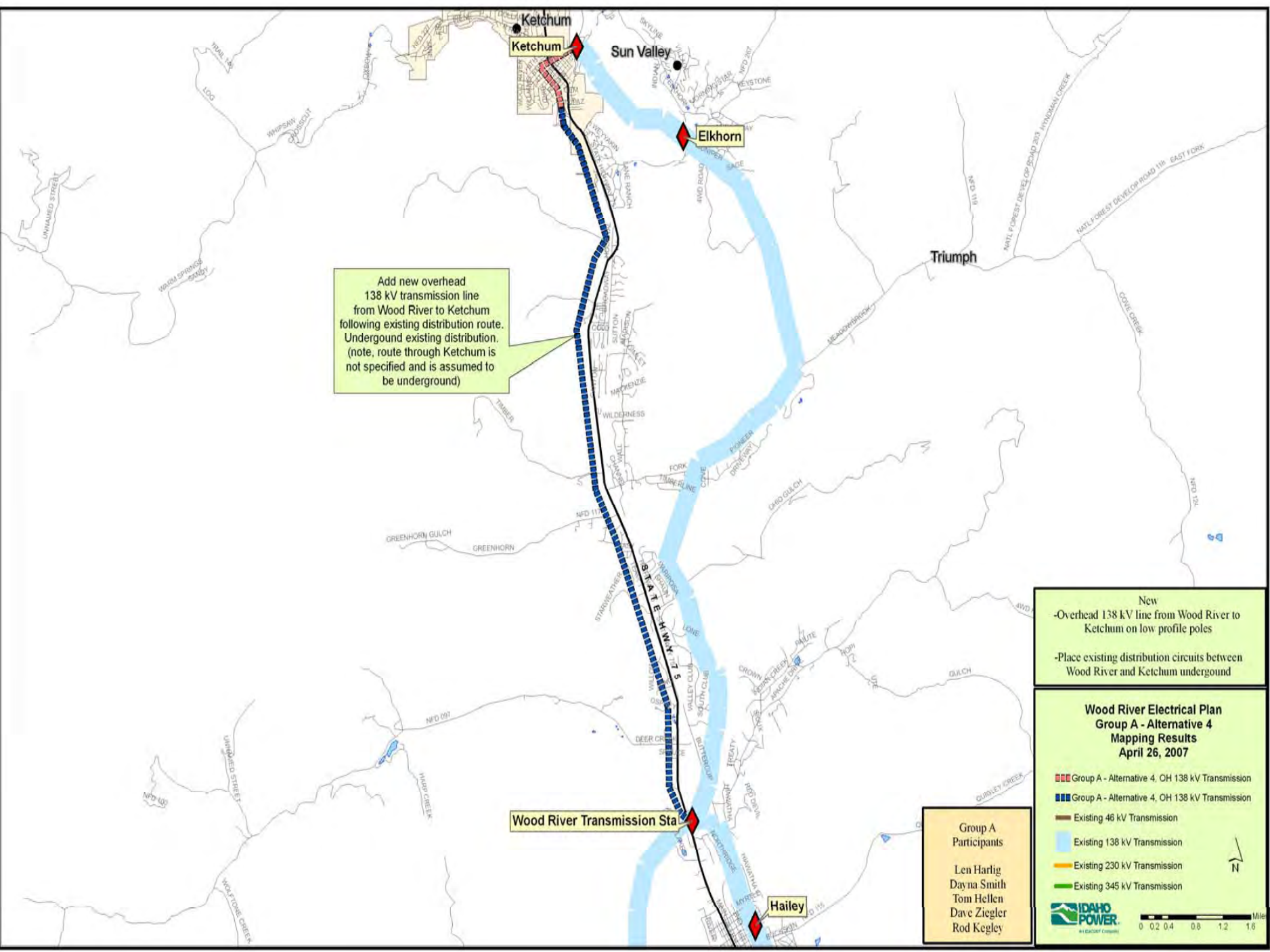
Rod Kegley

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AN EXCELP ENERGY COMPANY

0 0.2 0.4 0.8 1.2 1.6 Miles

N



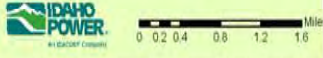
Add new overhead 138 kV transmission line from Wood River to Ketchum following existing distribution route. Underground existing distribution. (note, route through Ketchum is not specified and is assumed to be underground)

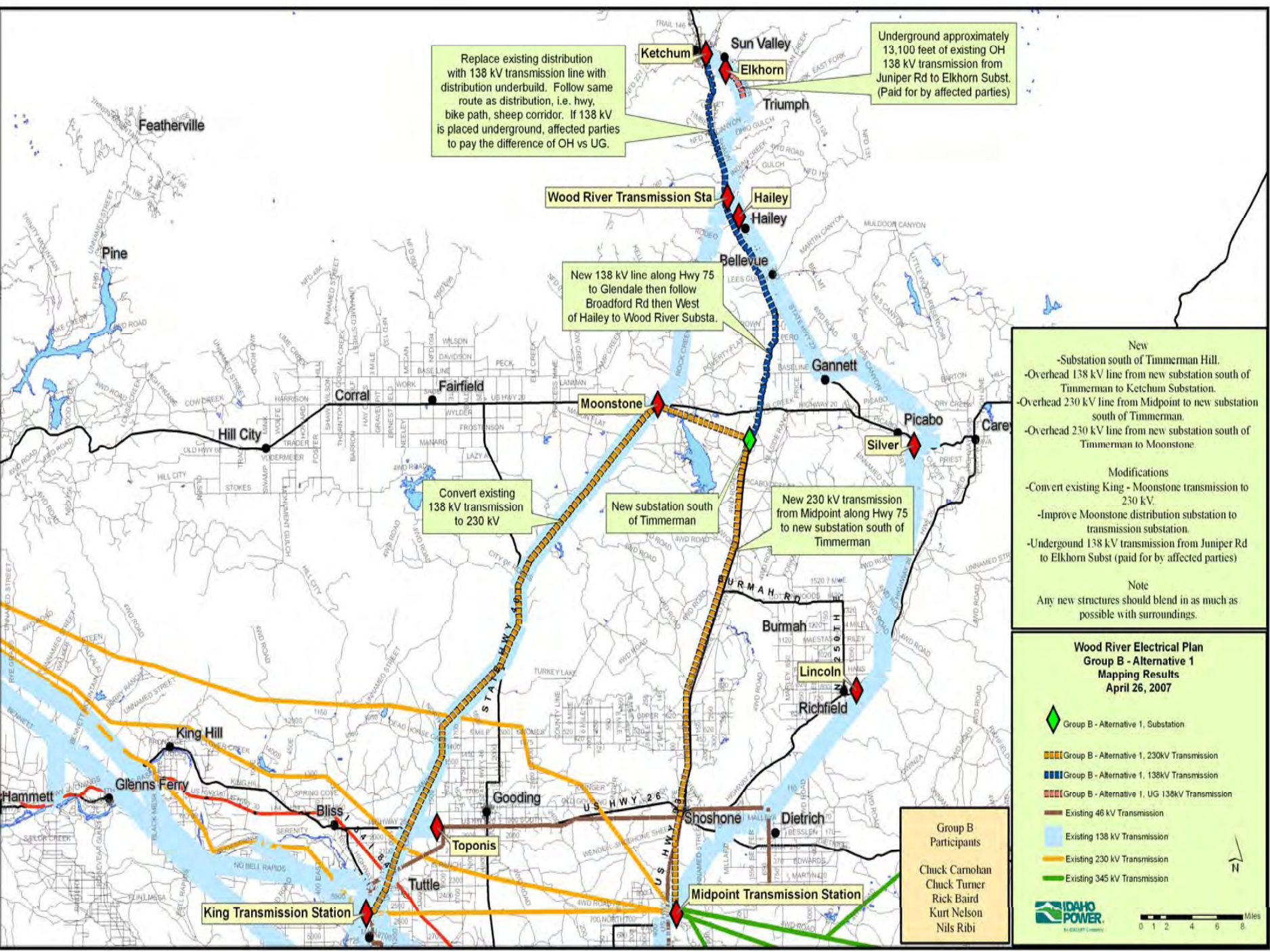
New
 -Overhead 138 kV line from Wood River to Ketchum on low profile poles
 -Place existing distribution circuits between Wood River and Ketchum underground

**Wood River Electrical Plan
 Group A - Alternative 4
 Mapping Results
 April 26, 2007**

- Group A - Alternative 4, OH 138 kV Transmission
- Group A - Alternative 4, OH 138 kV Transmission
- Existing 46 kV Transmission
- Existing 138 kV Transmission
- Existing 230 kV Transmission
- Existing 345 kV Transmission

**Group A
 Participants**
 Len Harlig
 Dayna Smith
 Tom Hellen
 Dave Ziegler
 Rod Kegley





Replace existing distribution with 138 kV transmission line with distribution underbuild. Follow same route as distribution, i.e. hwy, bike path, sheep corridor. If 138 kV is placed underground, affected parties to pay the difference of OH vs UG.

Underground approximately 13,100 feet of existing OH 138 kV transmission from Juniper Rd to Elkhorn Subst. (Paid for by affected parties)

Wood River Transmission Sta

New 138 kV line along Hwy 75 to Glendale then follow Broadford Rd then West of Hailey to Wood River Substa.

Convert existing 138 kV transmission to 230 kV

New substation south of Timmerman

New 230 kV transmission from Midpoint along Hwy 75 to new substation south of Timmerman

New

- Substation south of Timmerman Hill.
- Overhead 138 kV line from new substation south of Timmerman to Ketchum Substation.
- Overhead 230 kV line from Midpoint to new substation south of Timmerman.
- Overhead 230 kV line from new substation south of Timmerman to Moonstone

Modifications

- Convert existing King - Moonstone transmission to 230 kV.
- Improve Moonstone distribution substation to transmission substation.
- Underground 138 kV transmission from Juniper Rd to Elkhorn Subst (paid for by affected parties)

Note

Any new structures should blend in as much as possible with surroundings.

**Wood River Electrical Plan
Group B - Alternative 1
Mapping Results
April 26, 2007**

- Group B - Alternative 1, Substation
- Group B - Alternative 1, 230kV Transmission
- Group B - Alternative 1, 138kV Transmission
- Group B - Alternative 1, UG 138kV Transmission
- Existing 48 kV Transmission
- Existing 138 kV Transmission
- Existing 230 kV Transmission
- Existing 345 kV Transmission

Group B Participants

Chuck Carnohan
Chuck Turner
Rick Baird
Kurt Nelson
Nils Ribi

- Screening Alternatives

<i>Alternatives</i>	<i>Grand Total Scoring</i>							<i>Total Score</i>
	<i>Reliable Power</i>	<i>New Infrastructure Design</i>	<i>Energy Conservation</i>	<i>Environ-ment</i>	<i>Political Support</i>	<i>Cost Effectiveness</i>	<i>Siting</i>	
<i>Zone 1: South of Timmerman</i>								
A-1	52	42	39	42	47	31	44	297
A-2	56	35	39	30	34	42	32	268
B-1	62	39	39	39	33	53	40	305
C-1	56	39	39	34	36	51	38	293
<i>Zone 2: Mid Valley</i>								
A-1	56	49	39	49	49	41	44	327
A-2/C-1	53	41	39	36	39	44	38	290
B-1	59	34	39	35	23	53	32	275
<i>Zone 3: North Valley</i>								
A-3	58	50	39	55	46	16	50	314
A-4	55	44	39	52	39	42	42	313
B-1	58	42	39	39	35	57	38	308
C-1	53	37	39	33	34	44	35	275

Table 7. Alternatives Scoring Matrix

- Committee Alternative Consensuses
 - Zone 1: South of Timmerman
 - Preferred Choice: Alternative C-1
 - Second Choice: Alternative A-1
 - Third Choice: Alternative B-1
 - Alternative A-2 will be dropped due to the undesirable location of new substation.

Committee Comments

- Substation placement cannot be north of Timmerman Hill crest
- **Do not locate substation in the area of the potential new town (west side)**
- Probably ought to avoid potential airport locations – south of Timmerman and north of Highway 20 and west of Highway 75
- Might consider putting the new substation at the “square hole” on the north side of Picabo Desert Road (believed to be a gravel borrow hole site)
- Might consider old ITD material site
- Structures: Stay away from two-pole design (H-frame). Stay with single pole design. Steel poles would be preferable; less fire hazard
- South of Burmah Road, the BLM has some Wilderness Study Areas and Environments of Critical Concern. The further south of Burmah Road one goes, the more difficulty BLM has with the route
- Stay within existing corridors, distribution areas and highways, etc.

- Zone 2: Mid Valley
 - Preferred Choice: Combination/modified Alternatives C-1/A-1 (moving new substation south side of Timmerman Hill). Named C-2
 - Dropped Alternative A-2 – This is a duplicate to A-1 in Zone 2 when the location of the new substation to the south of Timmerman Hill is moved
 - Dropped Alternative B-1 – Due to undesirable route along Broadford Road

Zone 2: Mid Valley

Committee Comments

- Do not go up the highway (SH20?)
- Don't skyline the structures in any phase of the project; especially as you top Timmerman Hill looking north
- Just have one set of taller poles for distribution and transmission instead of multiple shorter poles, generally speaking

- Zone 3: North Valley
 - Preferred Choice – New alternative: new overhead 138 kV transmission along SH 75 from Wood River Transmission Station to Ketchum. Underbuild distribution circuit on same towers with transmission.
 - Funding Contingent Alternative – New underground 138 kV transmission line and underground distribution along SH 75 from Wood River Transmission Station to Ketchum. Install underground where funding is available to pay cost difference between overhead and underground transmission.
 - Dropped Alternative A-4 – Due to uncertainty of funding for Ketchum underground transmission.
 - Dropped Alternative A-3 – Due to uncertainty of funding for full length underground transmission.
 - Dropped Alternative B-1 – Due to lack of support for distribution underbuild and resulting structure height.
 - Dropped Alternative C-1 – Due to undesirable route off SH 75 to Cold Springs.

Zone 3: North Valley

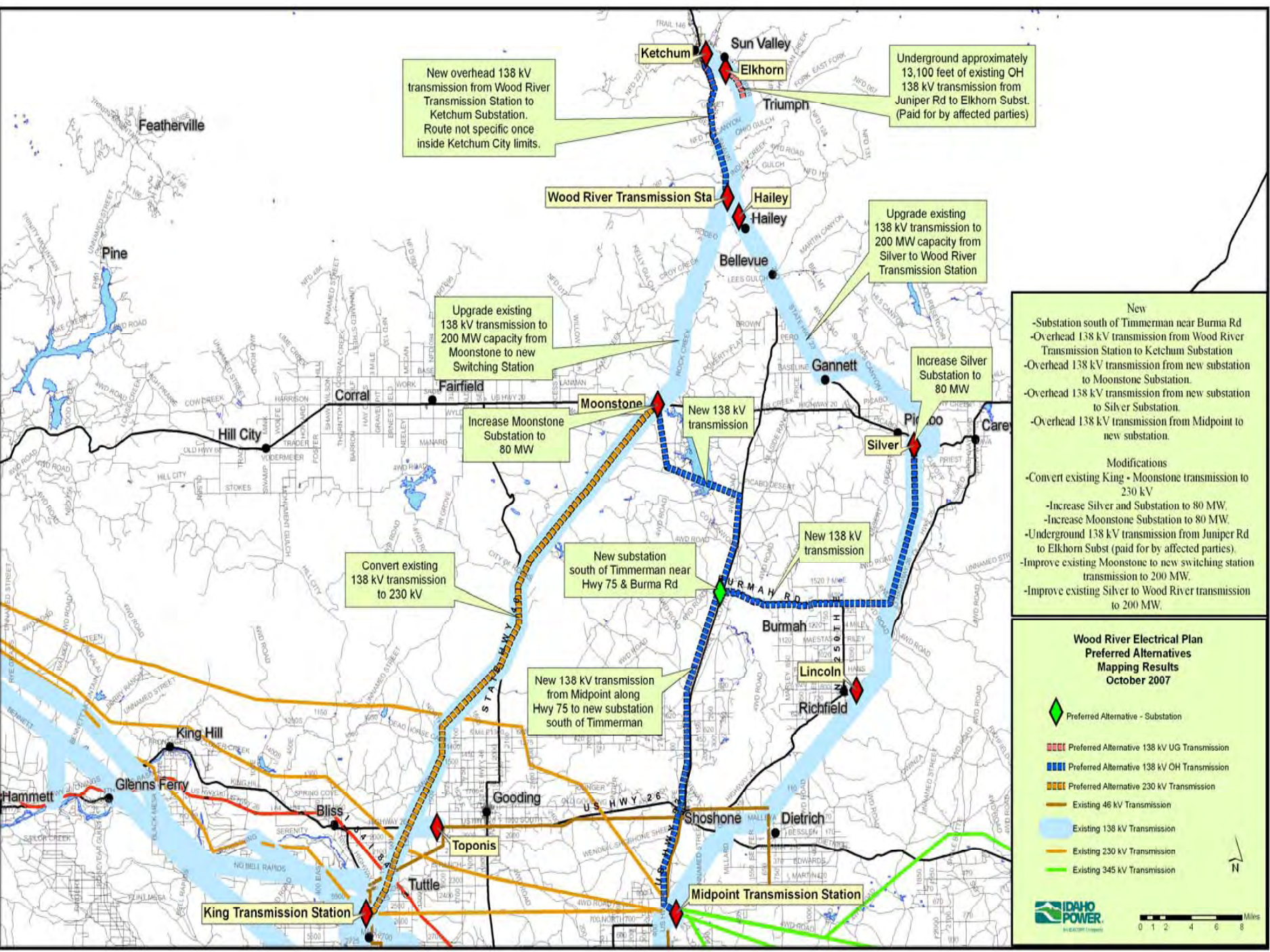
Committee Comments

- Committee consensus support for providing physical redundancy in North Valley and throughout the other portions of the Wood River Valley's electrical system
- Committee consensus support for a new 138,000-Volt line along SH 75 between Wood River Transmission Station and Ketchum
- Support for overhead transmission line installation (Idaho Power's industry standard with costs shared by everyone in the electrical system (rate payers), with no additional cost to individuals along the route – details within this choice are how and why?
 - Include with this recommended alternative a photo illustration for the public, depicting what this option will look like in-place.

Zone 3: North Valley

Committee Comments (cont.)

- Support for underground line installation – “Here’s the optimal, if you can find the money”
 - Include cost estimate description, what Idaho Power will pay for and what must be paid for by others
- The plan should describe “who pays” for each part of each alternative
- When introducing this and other parts of the Committee’s recommendation, public education is critical. Education to the public about the need for redundancy, need for additional power to meet future “build out” needs and general education about the system and how it works, photo illustrations of alternatives, etc. is critical to successful public support of the Committee’s recommendations.



New overhead 138 kV transmission from Wood River Transmission Station to Ketchum Substation. Route not specific once inside Ketchum City limits.

Underground approximately 13,100 feet of existing OH 138 kV transmission from Juniper Rd to Elkhorn Subst. (Paid for by affected parties)

Upgrade existing 138 kV transmission to 200 MW capacity from Silver to Wood River Transmission Station

Upgrade existing 138 kV transmission to 200 MW capacity from Moonstone to new Switching Station

Increase Silver Substation to 80 MW

Increase Moonstone Substation to 80 MW

New 138 kV transmission

Convert existing 138 kV transmission to 230 kV

New substation south of Timmerman near Hwy 75 & Burma Rd

New 138 kV transmission

New 138 kV transmission from Midpoint along Hwy 75 to new substation south of Timmerman

- New**
- Substation south of Timmerman near Burma Rd
 - Overhead 138 kV transmission from Wood River Transmission Station to Ketchum Substation
 - Overhead 138 kV transmission from new substation to Moonstone Substation.
 - Overhead 138 kV transmission from new substation to Silver Substation.
 - Overhead 138 kV transmission from Midpoint to new substation.
- Modifications**
- Convert existing King - Moonstone transmission to 230 kV
 - Increase Silver and Substation to 80 MW.
 - Increase Moonstone Substation to 80 MW.
 - Underground 138 kV transmission from Juniper Rd to Elkhorn Subst (paid for by affected parties).
 - Improve existing Moonstone to new switching station transmission to 200 MW.
 - Improve existing Silver to Wood River transmission to 200 MW.

Wood River Electrical Plan Preferred Alternatives Mapping Results October 2007

- Preferred Alternative - Substation
- Preferred Alternative 138 kV UG Transmission
- Preferred Alternative 138 kV OH Transmission
- Preferred Alternative 230 kV Transmission
- Existing 46 kV Transmission
- Existing 138 kV Transmission
- Existing 230 kV Transmission
- Existing 345 kV Transmission

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WEATHER READY

0 1 2 4 6 8 Miles

Technical Analysis

- n-1 Reliability Criteria
- Line-Loading Criteria
- Modeling Results

ROW Analysis

- Methods of obtaining ROW
- Private vs public easements
- Overhead vs underground ROW costs

Cost Estimates

<i>Alt.</i>	<i>South Valley</i>	<i>Mid Valley</i>	<i>North Valley Total</i>	<i>North Valley Private</i>	<i>Total (excluding Private)</i>	<i>Total</i>
B1 ⁽¹⁾	\$29,605,000	\$31,687,500	\$12,400,000	\$8,800,000	\$64,892,500	\$73,692,500
C1 ⁽²⁾	\$32,542,500	\$36,525,000	\$15,350,000	\$9,000,000	\$75,417,500	\$84,417,500
C2 ⁽³⁾	\$30,405,000	\$42,925,000	\$15,350,000	\$9,000,000	\$79,680,000	\$88,680,000
A1/A4 ⁽⁴⁾	\$36,258,000	\$42,525,000	\$20,800,000	\$17,800,000	\$81,783,000	\$99,583,000
A1/A3 ⁽⁵⁾	\$36,258,000	\$42,525,000	\$43,050,000	\$39,600,000	\$82,233,000	\$121,833,000
A2/A4 ⁽⁶⁾	\$48,531,250	\$30,875,000	\$20,800,000	\$17,800,000	\$82,406,250	\$100,206,250
A2/A3 ⁽⁷⁾	\$48,531,250	\$30,875,000	\$43,050,000	\$39,600,000	\$82,856,250	\$122,456,250
Preferred ⁽⁸⁾	\$30,405,000	\$42,925,000	\$4,600,000	\$0	\$77,930,000	\$77,980,000

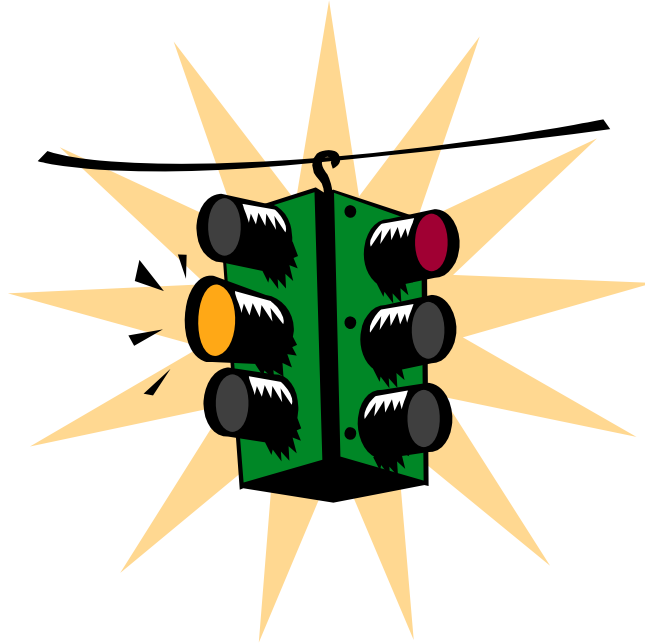
Table 8. Estimated Alternative Buildout Costs

Conclusion/Results

- Description of electrical load growth in Wood River Valley
- Demand-side management
- Committee Consensus

Appendices

- Appendix A – List of Community Advisory Committee Members
- Appendix B – Comments & Suggestions Recorded During Mapping Exercises
- Appendix C – Group Mapping Results
- Appendix D – Load Density Based on Zoning
- Appendix E – Example Transmission Tower Photographs
- Appendix F – n-1 Reliability Criteria Example



Implementation Plan

Idaho Power recommends the following implementation plan:

- 5 Year;
 - Build second 138 kV transmission line between Wood River Transmission Station (Hailey) and Ketchum Substation (Top Priority)
 - Site and build Timmerman (Burmah) Substation
 - Build new 138 kV transmission line from Midpoint Substation to new Timmerman (Burmah) Substation
 - Build new 138 kV transmission line from Timmerman (Burmah) Substation to Silver Substation
- 10 Year;
 - Upgrade Moonstone to Wood River Transmission Station line to 200 MW
 - Add new 230 kV to 138 kV transformer at Midpoint
 - The existing transformer capacity will be inadequate to serve the Wood River Valley load at this point

- 15 Year;
 - Add 12 megaVAR shunt capacitor at Ketchum Substation
 - This is an electrical device that helps keep the voltage up to acceptable levels as the load grows
 - Won't require new lines into Ketchum Substation
 - Won't require that Ketchum Substation be enlarged
- 20 Year;
 - Add distribution fed from Wood River Transmission Station
 - Currently, this station only serves to switch the transmission, it doesn't directly feed any of the load around Hailey.
 - This would relieve some of the load from Hailey Substation

- 30 Year;
 - Upgrade Silver Substation to Wood River Transmission Station 138 kV line to 200 MW
 - This will provide more capacity to the growing valley load
 - Will also help support the voltage at Ketchum and Elkhorn
 - Add 3rd 230kV to 138 kV transformer at Midpoint
 - The existing transformers will be inadequate to serve the Wood River Valley load at this point
- When load levels require, convert existing King to Moonstone 138 kV transmission to 230 kV. Moonstone Substation will require improvements.

Public Communication

- Present to Blaine County Leadership Committee
- Present to
 - County Commission
 - City Councils
 - Planning & Zoning Commissions
- Present to public

Next Steps, Process Evaluation & Wrap Up

- Open discussion