

July 30, 2009

Don Shaff
Idaho Department of Water Resources
Via email

Re: Richard Bergeman Subcases

Dear Don,

This letter will summarize our meeting on July 28, 2009 and provide additional information for your consideration. We previously discussed Mr. Bergeman's objections and possible resolution prior to the upcoming initial hearing.

The objections concerned three elements of the water rights:

1. The locations of the individual points of diversion.
2. The location of the individual place of use for each water right.
3. The diversion rate, including conveyance loss for each ditch.

You also had concerns about the ownership of water right 73-12082 (a portion of water right 73-213 previously owned by Bradley Mine). After checking water master records for delivery of the water right, we understand that ownership is no longer an issue.

I agreed to provide you with GIS shapefiles outlining the Bergeman rights as we believe they should be described. That information is included with this email correspondence. That information will settle items 1 and 2.

To settle item 3, I am also providing a calculation of conveyance losses from Mr. Bergeman's ditches, based on the Worstall equation. Included with this email is a calculation sheet for each ditch (Upper and Lower). The length of each ditch reach was calculated using GIS technology and NAIP photography. The width was provided by Mr. Bergeman and is consistent with ditches of this type in the Pahsimeroi Valley.

Seepage rate was determined by first calculating the ft/day rate of "the most limiting layer to transmit water" (see NRCS information for each soil, under "Properties and qualities"). This rate ranges from approximately 1 to 4 feet per day. Assuming this range to be the least amount lost in the reach due to seepage, we then looked at the likely soil composition at the base of the ditch. The "Typical profile" for each soil indicates extremely cobbly and sandy conditions at likely ditch depths. For that reason, we chose a seepage factor of 5.0 from Hart's work "Estimating Seepage Losses from Canal Systems". The resultant conveyance losses are 0.66 cfs from the Upper ditch and 0.85 cfs from the Lower ditch.

Thank you for your time and consideration of this information. Please contact me if you have additional questions. We are hopeful a settlement can be reached shortly.

Sincerely,

Roxanne Brown
Sr. Water Rights Specialist

Cc: Richard Bergeman

SPF Job No. 631.0010

CONVEYANCE LOSS - WORSTELL

NAME OF DITCH: Bergeman (Upper)

BY: Roxanne Brown

DATE: July 23, 2009

REACH	LENGTH (FT)	AVE WIDTH (FT)	SEEPAGE (FT/DAY)	WORSTELL LOSS (CFS)
1	2200	3.0	5.00	0.42
2	1275	3.0	5.00	0.24
3				0.00
4				0.00
5				0.00
6				0.00
7				0.00
8				0.00
9				0.00
TOTALS	3475			0.66

REACH = SECTION OF CHANNEL

LENGTH = LENGTH OF REACH, THE CHANNEL CAN BE DIVIDED INTO EQUAL LENGTH REACHES
OR ACTUAL LENGTHS BETWEEN DELIVERY POINTS

AVE WIDTH = AVERAGE TOP WIDTH OF WATER SURFACE IN REACH

SEEPAGE = SOIL SEEPAGE RATE OF REACH

WORSTELL LOSS = CONVEYANCE LOSS IN REACH BASED ON WORSTELL METHOD

Notes:

- 1 Length of ditch determination based on GIS imagery.
- 2 Width of ditch based on claimant's statement
- 3 Seepage factor based on Hart, "Estimating Seepage Losses from Canal Systems" (Worstell) and soil data from NRCS online database.

NRCS Data

Reach No.	Soil No. and Description
1	No. 154 Pahsimeroi extremely gravelly loam
2	No. 152 Pahsimeroi gravelly loam

CONVEYANCE LOSS - WORSTELL

NAME OF DITCH: Bergeman (Lower)

BY: Roxanne Brown

DATE: July 23, 2009

REACH	LENGTH (FT)	AVE WIDTH (FT)	SEEPAGE (FT/DAY)	WORSTELL LOSS (CFS)
1	1470	3.0	5.00	0.28
2	3030	3.0	5.00	0.57
3				0.00
4				0.00
5				0.00
6				0.00
7				0.00
8				0.00
9				0.00
TOTALS	4500			0.85

REACH = SECTION OF CHANNEL

LENGTH = LENGTH OF REACH, THE CHANNEL CAN BE DIVIDED INTO EQUAL LENGTH REACHES
OR ACTUAL LENGTHS BETWEEN DELIVERY POINTS

AVE WIDTH = AVERAGE TOP WIDTH OF WATER SURFACE IN REACH

SEEPAGE = SOIL SEEPAGE RATE OF REACH

WORSTELL LOSS = CONVEYANCE LOSS IN REACH BASED ON WORSTELL METHOD

Notes:

- 1 Length of ditch determination based on GIS imagery.
- 2 Width of ditch based on claimant's statement
- 3 Seepage factor based on Hart, "Estimating Seepage Losses from Canal Systems" (Worstell) and soil data from NRCS online database.

NRCS Data

Reach No.	Soil No. and Description
1	No. 154 Pahsimeroi extremely gravelly loam
2	No. 152 Pahsimeroi gravelly loam

Custer-Lemhi Area, Idaho, Parts of Blaine, Custer, and Lemhi Counties

152—Pahsimeroi gravelly loam, 2 to 6 percent slopes

Map Unit Setting

Elevation: 4,500 to 6,200 feet
Mean annual precipitation: 7 to 11 inches
Mean annual air temperature: 39 to 41 degrees F
Frost-free period: 60 to 90 days

Map Unit Composition

Pahsimeroi and similar soils: 90 percent

Description of Pahsimeroi

Setting

Landform: Fan remnants, outwash fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from quartzite

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 10 to 20 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 1.4 inches)

Interpretive groups

Land capability (nonirrigated): 6s
Ecological site: LOAMY 7-10 ARTRW8/POSE (R012XY030ID)

Typical profile

0 to 7 inches: Gravelly loam
7 to 17 inches: Extremely gravelly coarse sandy loam
17 to 32 inches: Extremely cobbly loamy sand
32 to 60 inches: Extremely gravelly sand

Data Source Information

Soil Survey Area: Custer-Lemhi Area, Idaho, Parts of Blaine, Custer, and Lemhi Counties

Survey Area Data: Version 9, Jan 29, 2008

Custer-Lemhi Area, Idaho, Parts of Blaine, Custer, and Lemhi Counties

154—Pahsimeroi extremely gravelly loam, 2 to 10 percent slopes

Map Unit Setting

Elevation: 4,500 to 6,200 feet
Mean annual precipitation: 7 to 11 inches
Mean annual air temperature: 39 to 41 degrees F
Frost-free period: 60 to 90 days

Map Unit Composition

Pahsimeroi and similar soils: 85 percent

Description of Pahsimeroi

Setting

Landform: Fan remnants, outwash fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from quartzite

Properties and qualities

Slope: 2 to 10 percent
Depth to restrictive feature: 10 to 20 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 0.7 inches)

Interpretive groups

Land capability (nonirrigated): 6s
Ecological site: GRAVELLY LOAM 8-12 ARTRW8/PSSPS (R012XY004ID)

Typical profile

0 to 5 inches: Extremely gravelly loam
5 to 12 inches: Very gravelly coarse sandy loam
12 to 25 inches: Extremely cobbly loamy coarse sand

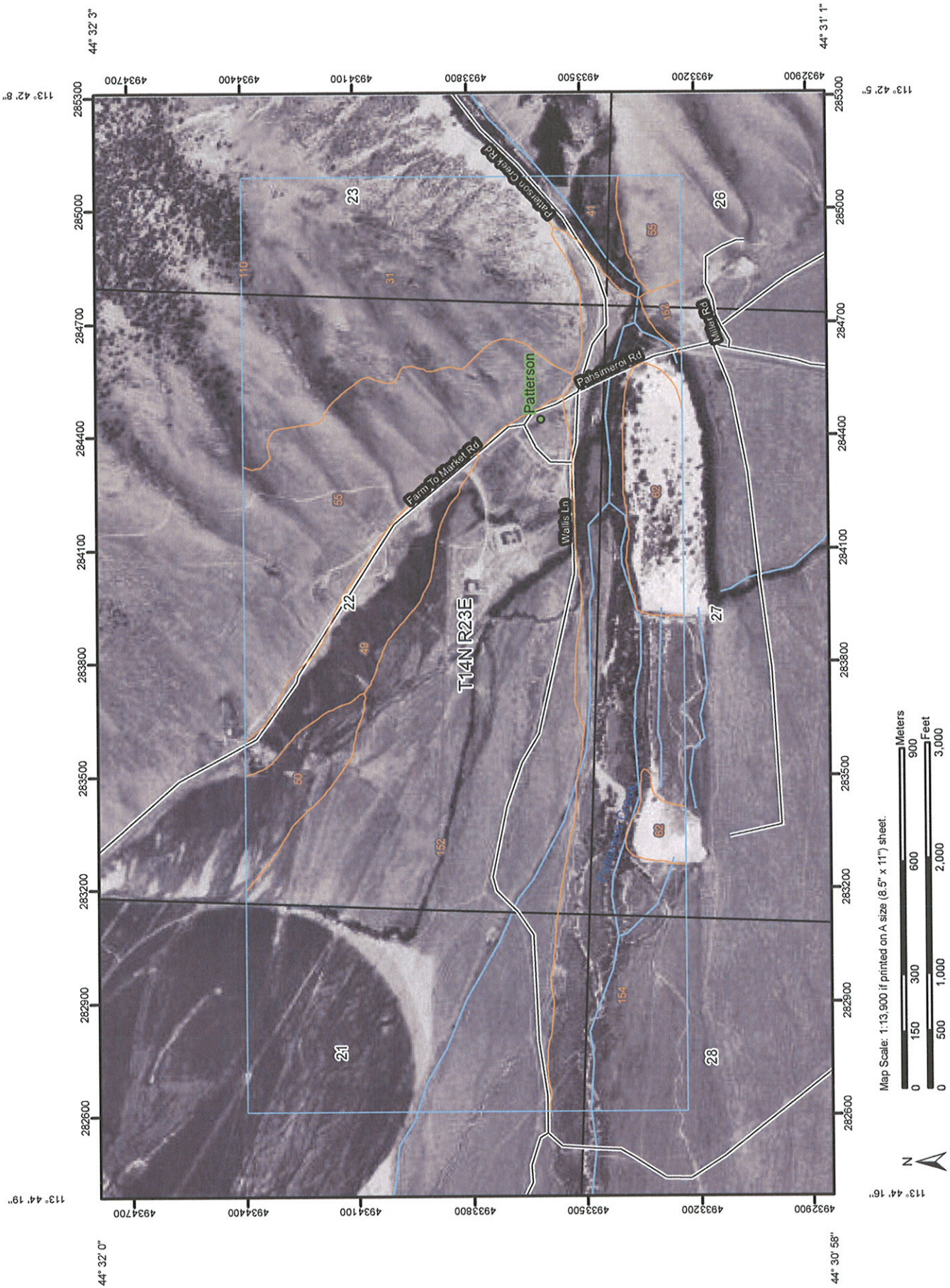
25 to 60 inches: Extremely cobbly coarse sand

Data Source Information

Soil Survey Area: Custer-Lemhi Area, Idaho, Parts of Blaine, Custer, and Lemhi
Counties

Survey Area Data: Version 9, Jan 29, 2008

Soil Map—Custer-Lemhi Area, Idaho, Parts of Blaine, Custer, and Lemhi Counties



MAP LEGEND

	Area of Interest (AOI)		Very Stony Spot
	Area of Interest (AOI)		Wet Spot
	Soils		Other
	Soil Map Units		Special Line Features
	Special Point Features		Gully
	Blowout		Short Steep Slope
	Borrow Pit		Other
	Clay Spot		Political Features
	Closed Depression		Cities
	Gravel Pit		PLSS Township and Range
	Gravelly Spot		PLSS Section
	Landfill		Water Features
	Lava Flow		Oceans
	Marsh or swamp		Streams and Canals
	Mine or Quarry		Transportation
	Miscellaneous Water		Rails
	Perennial Water		Interstate Highways
	Rock Outcrop		US Routes
	Saline Spot		Major Roads
	Sandy Spot		Local Roads
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		
	Spoil Area		
	Stony Spot		

MAP INFORMATION

Map Scale: 1:13,900 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000. Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Custer-Lemhi Area, Idaho, Parts of Blaine, Custer, and Lemhi Counties
 Survey Area Data: Version 9, Jan 29, 2008

Date(s) aerial images were photographed: 7/13/1999; 7/25/1999

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Custer-Lemhi Area, Idaho, Parts of Blaine, Custer, and Lemhi Counties (ID752)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
31	Calclids-Rubble land-Rock outcrop complex, 50 to 80 percent slopes	116.4	16.4%
41	Cryolls-Rubble land-Rock outcrop complex, 50 to 80 percent slopes	11.6	1.6%
49	Dawtonia-Dawtonia, cold complex, 5 to 25 percent slopes	30.8	4.3%
50	Dawtonia, cold-Dawtonia complex, 2 to 5 percent slopes	16.8	2.4%
55	Dawtonia-Dacont association, 20 to 50 percent slopes	96.1	13.5%
62	Dumps, mine	29.5	4.2%
110	Lag very cobbly loam, 20 to 40 percent slopes	0.0	0.0%
152	Pahsimeroi gravelly loam, 2 to 6 percent slopes	276.7	38.9%
154	Pahsimeroi extremely gravelly loam, 2 to 10 percent slopes	133.6	18.8%
Totals for Area of Interest		711.6	100.0%