

FORM 202
12/98Ident. No. 74-15613STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR PERMIT

To appropriate the public waters of the State of Idaho

1. Name of Applicant F. JAMES WHITTAKER Phone 208-768-2491
Paula J. Whittaker
 Mailing address P.O. Box 240 Weadate, Id. 83464
2. Source of water supply Big Timber Creek which is a tributary of the Lemhi River
3. Location of point of diversion is Township 15 N Range 26 E Sec 8 in the $\frac{1}{4}$
NW $\frac{1}{4}$, SE $\frac{1}{4}$ Govt. Lot B.M. Lemhi County:

additional points of diversion if any:

4. Water will be used for the following purposes:

- 4 JAW Amount 1 cfs for irrigation purposes from 3/15 to 11/15 (both dates inclusive)
 (cfs or acre-feet per annum)
- Amount for purposes from to (both dates inclusive)
 (cfs or acre-feet per annum)
- Amount for purposes from to (both dates inclusive)
 (cfs or acre-feet per annum)
- Amount for purposes from to (both dates inclusive)
 (cfs or acre-feet per annum)
- Amount for purposes from to (both dates inclusive)
 (cfs or acre-feet per annum)
- Amount for purposes from to (both dates inclusive)
 (cfs or acre-feet per annum)

5. Total quantity to be appropriated is (a) 4.00 cfs and/or (b) 7 cfs
 cubic feet per second acre feet per annum

6. Proposed diverting works:

- a. Describe type and size of devices used to divert water from the source 30" lockable
headgate at head of ditch
- b. Height of storage dam feet; active reservoir capacity acre-feet; total
 reservoir capacity acre-feet
- c. Proposed well diameter is inches; proposed depth of well is feet
- d. Is ground water with a temperature of greater than 85°F being sought?
- e. If well is already drilled, when? ; Drilling firm ;
 Well was drilled for (well owner) ; Drilling Permit No.

7. Time required for completion of works and application of water to proposed beneficial use is 5 years (minimum 1 year)

8. Description of proposed uses (if irrigation only, go to item 9):

- a. Hydropower; show total feet of head and proposed capacity in kW.
- b. Stockwatering; list number and kind of livestock.
- c. Municipal; show name of municipality.
- d. Domestic; show number of households.
- e. Other; describe fully

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APR 22 2005

Department of Water Resources
Eastern RegionExhibit No. 1
Date: 1-5-06
Whittaker
T&T REPORTING

3. Description of place of use:

- a. If water is for irrigation, indicate acreage in each subdivision in the tabulation below.
- b. If water is used for other purposes, place a symbol of the use (example: D for Domestic) in the corresponding place of use below. See instructions for standard symbols.

TWP	RGE	SEC	NE				NW				SW				SE				TOTALS
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
16N	25E	25									40			40	40	40	40		200

Total number of acres to be irrigated 20010. Describe any other water rights used for the same purposes as described above. NONE11. a. Who owns the property at the point of diversion? Kenhi Ranches - Rodger Ballb. Who owns the land to be irrigated or place of use? JAMES & PAULA WHITTAKER

c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing:

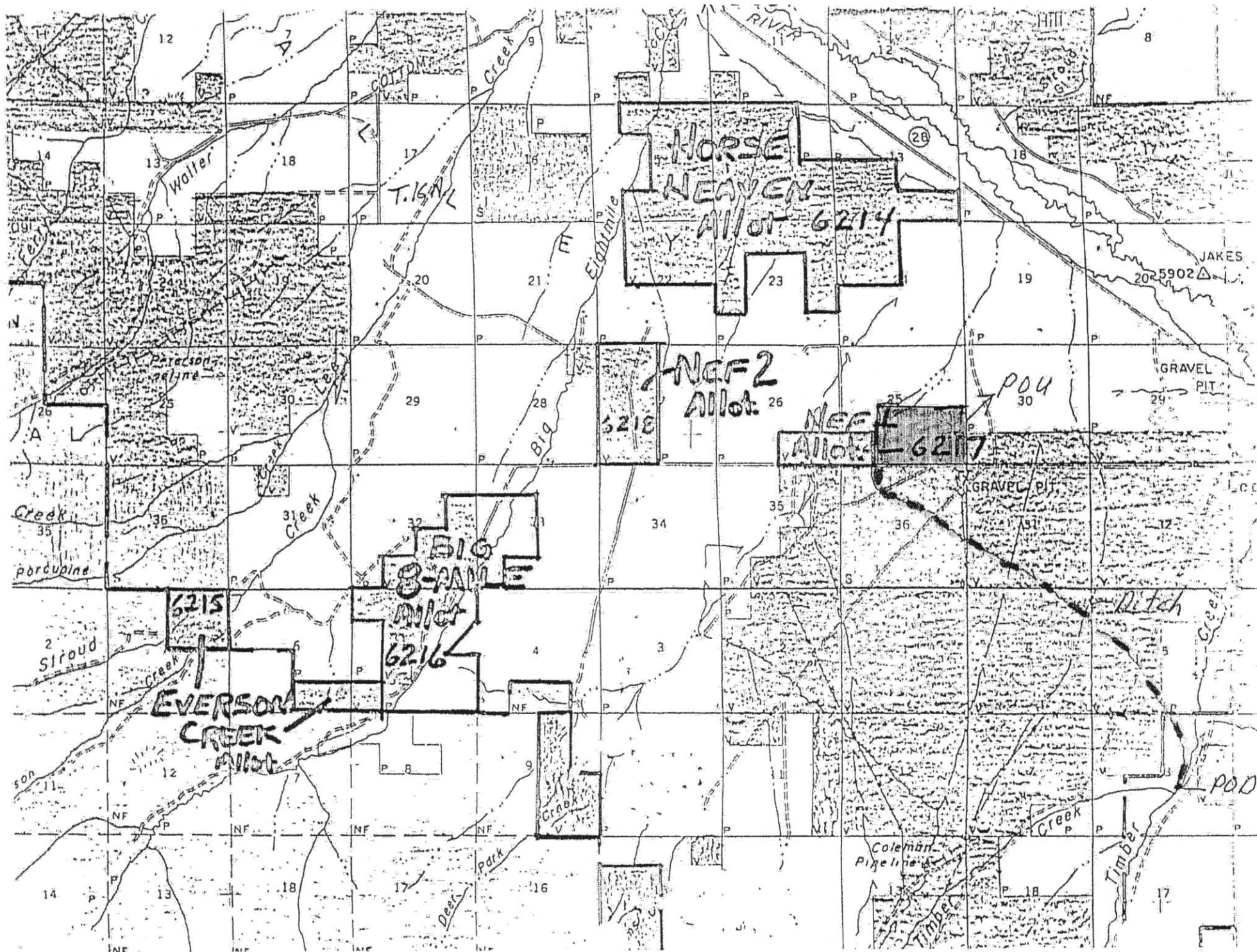
12. Remarks: The water system and right-of-way for this system are already in existence, as 74-0039 B and 74-0063 were used to irrigate this ground, prior to 1993. In 1993 they were transferred off.

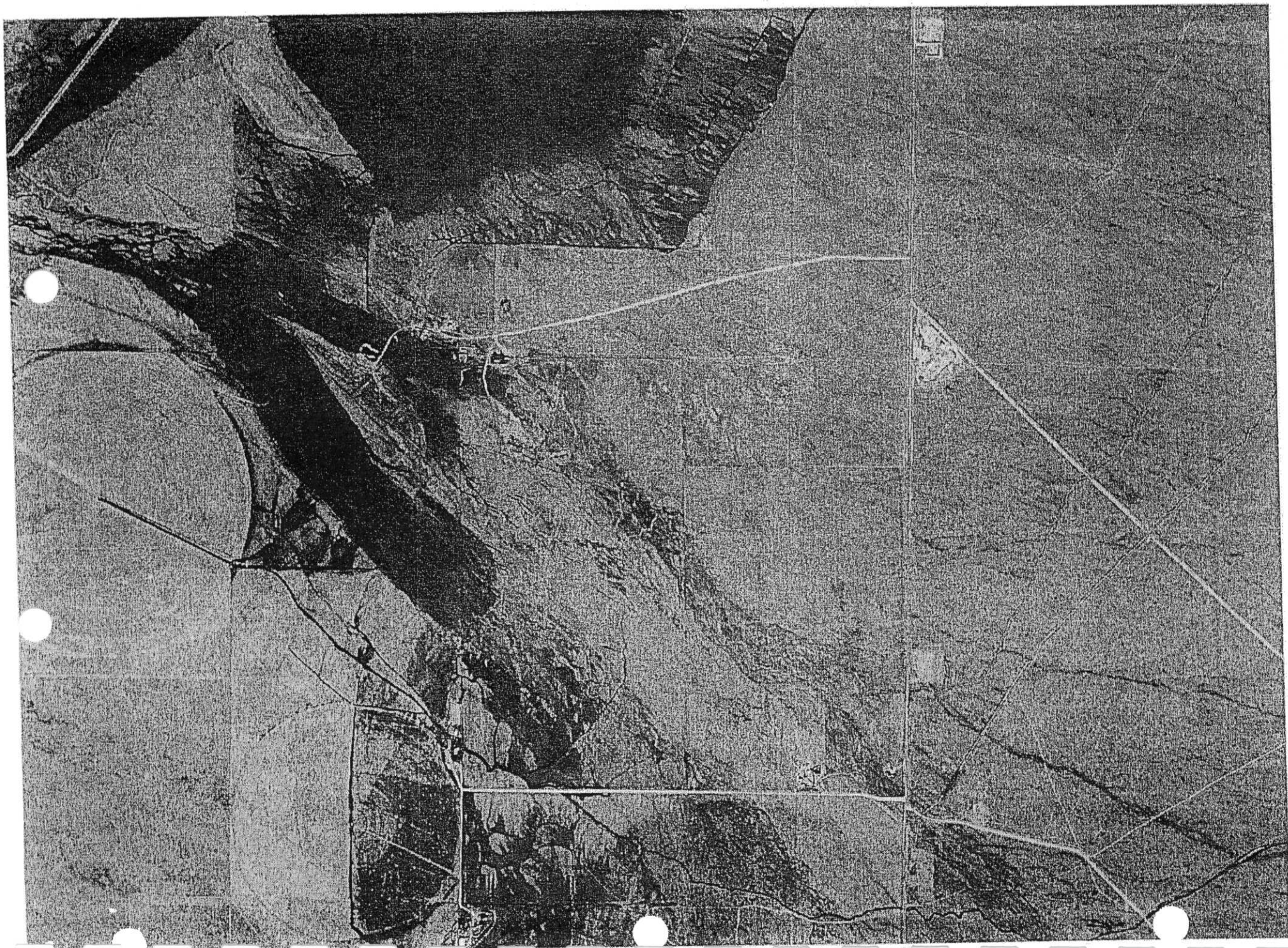
13. MAP OF PROPOSED PROJECT REQUIRED - Attach an 8 1/2"x11" map clearly identifying the proposed point of diversion, place of use, section #, township & range. (A photocopy of a USGS 7.5 minute topographic quadrangle map is preferred.)

BE IT KNOWN that the undersigned hereby makes this application for permit to appropriate the public waters of the State of Idaho as herein set forth.

James Whittaker
Signature of Applicant (and title if applicable)

Received by 370 Date 4/22/05 Time Preliminary check by ED 30849 Date 6 May 2005
 Fee \$ 370 Receipted by JAMES DUNN Date Published in Date
 Publication prepared by Date Publication approved Date





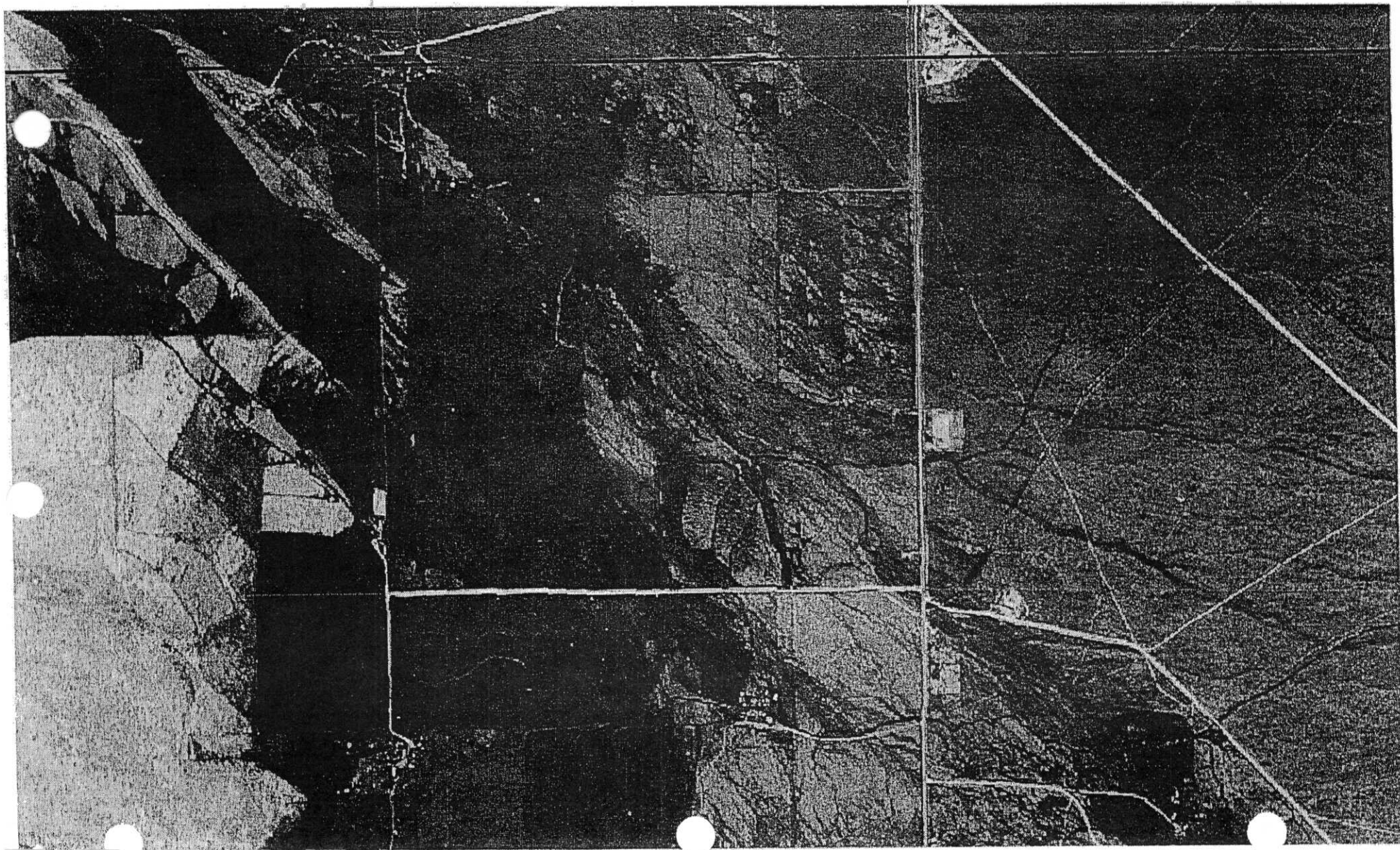
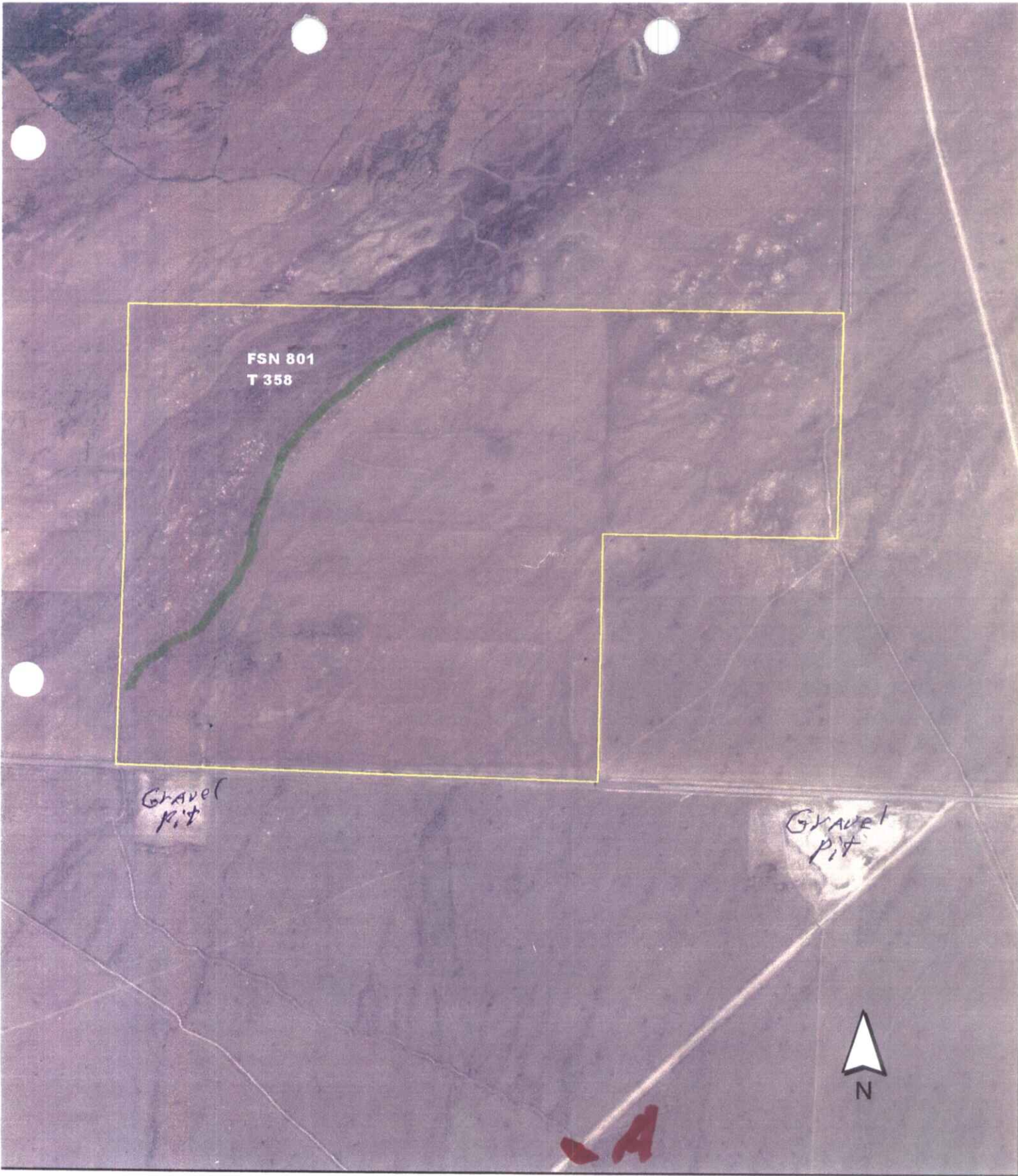


Exhibit No. 2



Tract 358
m 801

0.07 0 0.07 0.14 0.21 0.28 Miles

Map Printed: Mar 4, 2005

Exhibit No. 2
Date: 1-5-06
Whittaker
T&T REPORTING

Clark Place

Clu_a_1009.shp

NESW, SESW, NESE
NWSE, SWSE

Sec 25 16N 23E

Exhibit No. 3

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

TRANSFER OF WATER RIGHT

TRANSFER NO. 4071
WATER RIGHT NO(S). 74-00039B/74-00063

This is to certify that: **F JAMES WHITTAKER**
PAULA WHITTAKER
PO BOX 240
LEADORE ID 83464

has requested a change to the above captioned water rights. This change in water right(s) is authorized pursuant to the provisions of Section 42-222, Idaho Code, provided the conditions listed below are met.

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>
Right No. 74-00039B : IRRIGATION Priority: 06/10/1901	03/15 to 11/15	6.00 CFS

Right No. 74-00063 : IRRIGATION Priority: 07/18/1911	03/15 to 11/15	0.96 CFS
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SOURCE

BIG TIMBER CREEK

TRIBUTARY OF

LEMHI RIVER

LOCATION OF POINT(S) OF DIVERSION:

SWNW , Sec. 20, Township 15N, Range 26E
LEMHI County

PLACE OF USE: IRRIGATION

<u>TWN</u>	<u>RGE</u>	<u>SEC</u>	<u>ACRES</u>	<u>ACRES</u>	<u>ACRES</u>	<u>TOTAL</u>
15N	26E	22	NENW 40	NWNW 40	SWNW 40	195
			SEnw 40	NWSW 35		

Total number of acres irrigated: 195

CONDITIONS/REMARKS:

1. Use of water under this water right will be regulated by the watermaster of State Water District No. 74W.
2. A measuring device and lockable controlling works of a type approved by this Department shall be maintained on the diverting works in a manner that will provide the watermaster suitable control of the diversion.

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MAY 21 1993

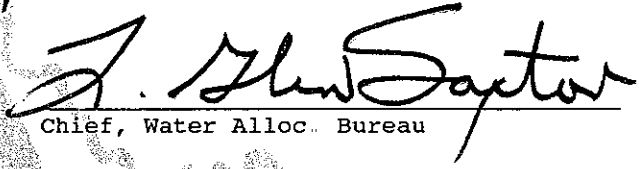
Exhibit No. 3
Date: 1-5-06
Whittaker
I&T REPORTING

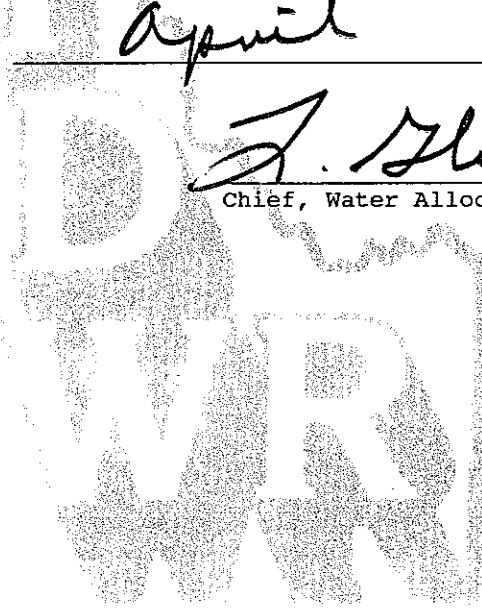
TRANSFER NO. 4071
WATER RIGHT NO(S). 74-00039B/74-00063

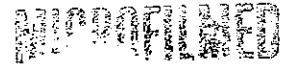
CONDITIONS/REMARKS:

3. Approval of this transfer in no way grants any right-of-way or easement for use of a delivery system owned by person(s) other than the right owner.
4. The change authorized by this transfer shall be accomplished within one (1) year of the date of this approval.
5. Approval of this transfer does not preclude the opportunity for review of the validity of the water right(s) in the ongoing Snake River Basin Adjudication.
6. The total combined rate of diversion under Right Nos. 74-00039B and 74-00063 shall not exceed 6.96 cfs.
7. The total combined rate of diversion at the field headgate under Right Nos. 74-00039B and 74-00063 shall not exceed 0.02 cfs per irrigated acre.

Dated this 26th day of April, 1993.


Chief, Water Alloc. Bureau




MAY 21 1993

Page _____ of _____

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCESTransfer No. 4071APPLICATION FOR TRANSFER OF WATER RIGHT
PART 1Name of applicant F. JAMES OR PAULA WHITTAKER Phone 768-2491Post Office address PO BOX 240, LEADORE ID 83464

A. PURPOSE OF TRANSFER

1. ☒ Change point of diversion ☐ Add diversion point(s) ☒ Change place of use
☐ Change nature of use ☐ Change period of use ☐ Other _____
2. Describe the reason for the proposed changes I feel the new place of use is better crop ground.

B. DESCRIPTION OF RIGHT(S) OR PORTION THEREOF, AFTER THE REQUESTED CHANGE

1. Right Number	Priority	Amount (cfs/ac-ft)	Nature of Use	Period of Use
<u>74-0039B</u>	<u>6-10-1901</u>	<u>6.00 cfs</u>	<u>Irrigation</u>	<u>3-15</u> to <u>11-15</u>
<u>74-00063</u>	<u>7-18-1911</u>	<u>0.96 cfs</u>	<u>Irrigation</u>	<u>3-15</u> to <u>11-15</u>
_____	_____	_____	_____	_____ to _____
_____	_____	_____	_____	_____ to _____

2. Total amount of water being transferred 6.96 cfs cubic feet per second and/or _____ acre-feet per annum.3. Source of water Big Timber Creek tributary to Lemhi River

4. Point(s) of Diversion:

Lot	¼	¼	¼	Sec.	Twp.	Rge.	County	Local name for diversion
		SW	NW	20	15N	26E	Lemhi	

5. Lands irrigated or place of use:

Twp.	Rge.	Sec.	NE ¼				NW ¼				SW ¼				SE ¼				Totals
			NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	
15N	26E	22					40	40	40	40		35							195

Total acres 195

PART 1

6. General Information:

a Description of diversion system Ditch to pipeline to gravity flow sprinklers.b. Are the lands from which you propose to transfer the water right subject to any liens, deeds of trust, mortgages, or contracts? X Yes _____ No. If yes provide a notarized statement from the holder of the lien, deed of trust, mortgage or contract agreeing to the proposed changes.

c Describe the affect on the land now irrigated if the place of use is changed pursuant to this transfer:

This land will now be used as pasture.

d. Remarks:

ACTION OF THE DIRECTOR, DEPARTMENT OF WATER RESOURCES

This is to certify that I have examined Application for Transfer of Water Rights No. _____

And said application is hereby _____, subject to the following limitations and conditions:

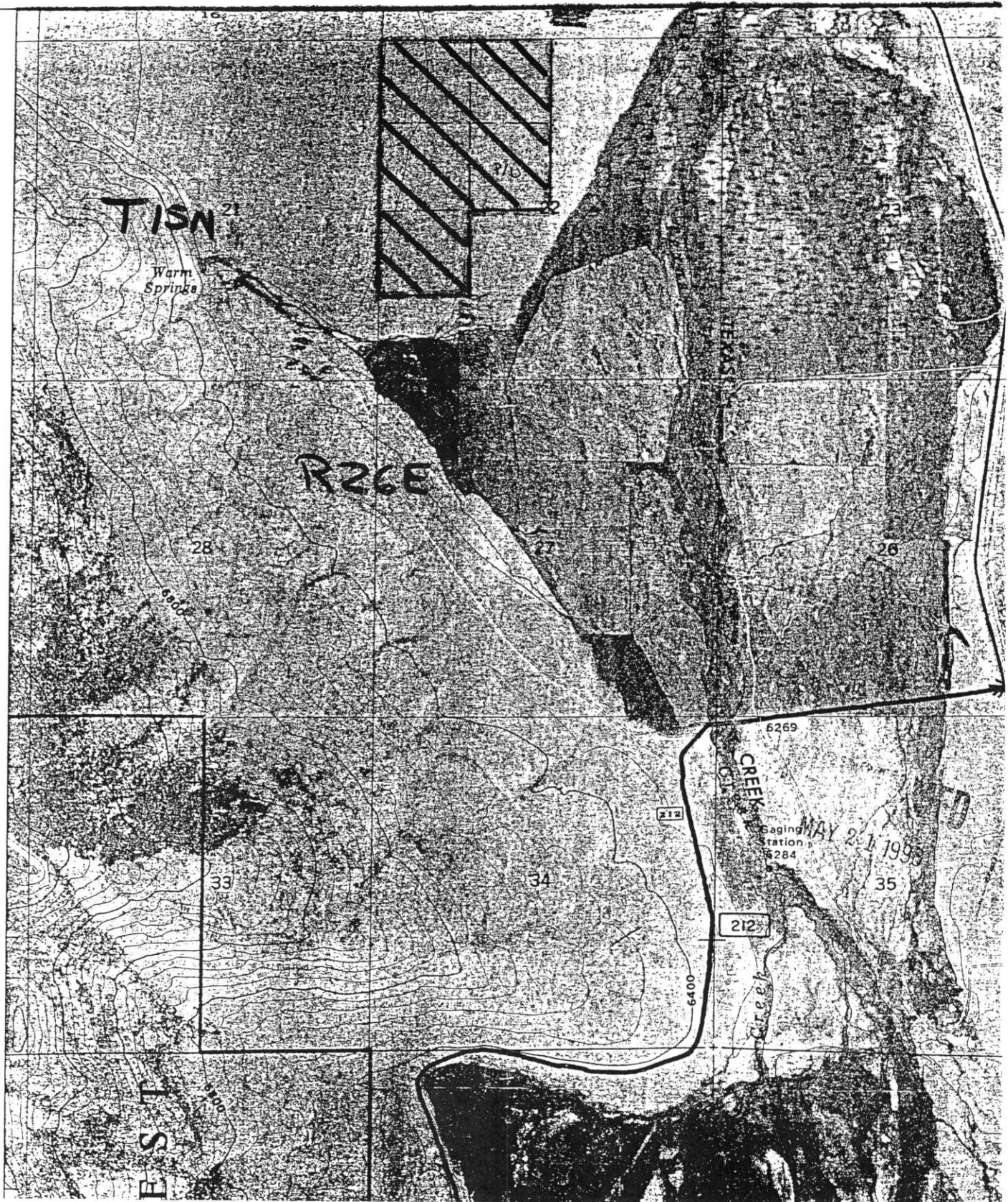
Witness my hand this _____ day of _____, 19____

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MAY 21 1993

74-000398 + 74-00063

T #4107



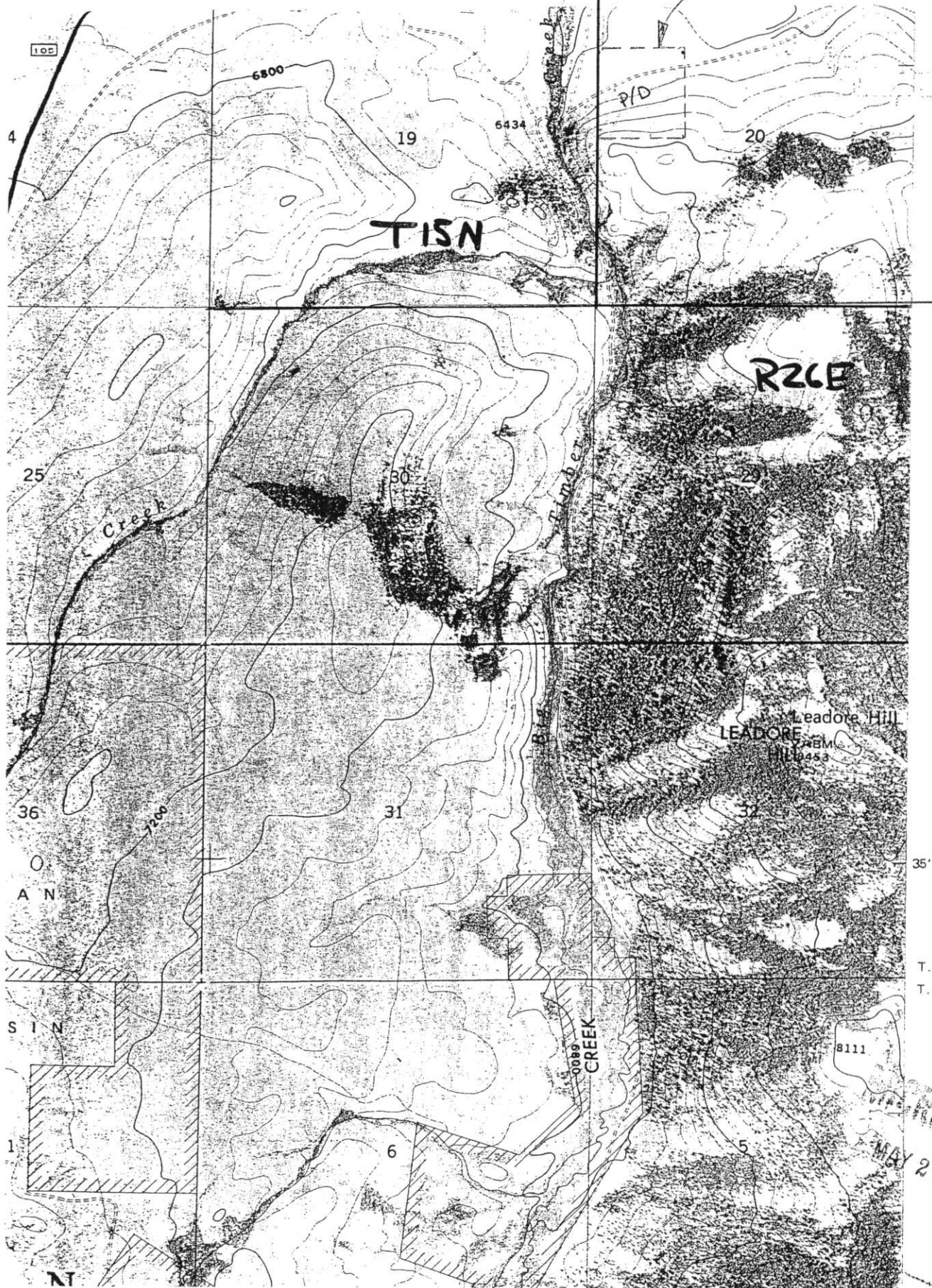
35'

T. 15 N.
T. 14 N.

74-000390 + 74-00063

NW Sec. 20

T# 4071



STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR TRANSFER OF WATER RIGHT

PART 2

(Attach one copy for each right)

A. DESCRIPTION OF RIGHT AS RECORDED

1. Right evidenced by:

- a. Decree No. 74-0039B Decreed to Wilford Shiner
in case of State of Idaho vs. Mary A. Adams
dated Dec. 30, 1982 in Dist. Court county of _____
- b. License No. _____ issued by the Idaho Department of Water Resources.
- c. Claim No. _____ on file with the Idaho Department of Water Resources.
- d. Transfer No. _____ which produced this right.

2. Attach a copy of last year's tax notice for the property to which the water right is appurtenant or other documents which show ownership. Label document as attachment A. Check appropriate box below:

☒ Tax Notice ☐ Warranty Deed ☐ Other _____

3. Source of water Big Timber Creek tributary to Lemhi River

4. Date or priority 6-10-1901

5. Water is used for the following purpose:

amount 6.00 cfs for Irrigation purposes from 3-15 to 11-15
(cfs/ac-ft)
amount _____ for _____ purposes from _____ to _____
(cfs/ac-ft)
amount _____ for _____ purposes from _____ to _____
(cfs/ac-ft)

6. Total amount of water under right 6.00 cubic feet per second and/or _____ acre-feet per annum

7. Point(s) of Diversion:

Lot	¼	¼	¼	Sec.	Twp.	Rge.	County	Local name for diversion
		NW	SE	8	15N	26E	Lemhi	

8. Lands irrigated or place of use:

Twp.	Rge.	Sec.	NE ¼				NW ¼				SW ¼				SE ¼				Totals
			NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	
16N	25E	25									35			40	40	40	40		195

Total acres 195

9. Describe any other water rights used for the same purpose as described above 74-00063

- 10 To your knowledge, has any portion of this water right undergone a period of five or more consecutive years of non-use?
 _____ If yes, describe _____

B. DESCRIPTION OF PORTION OF RIGHT BEING TRANSFERRED

(If the entire right is to be changed by the applicant, omit part B and C.)

1. amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)

2 Point(s) of Diversion:

Lot	¼	¼	¼	Sec.	Twp.	Rge.	County	Local name for diversion

3 Lands irrigated or place of use:

Twp.	Rge.	Sec.	NE ¼				NW ¼				SW ¼				SE ¼				Totals
			NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	

Total acres _____

C. DESCRIPTION OF UNCHANGED PORTION OF RIGHT (omit if there is no change)

1. amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)

2 Point(s) of Diversion:

Lot	¼	¼	¼	Sec.	Twp.	Rge.	County	Local name for diversion

3. Lands irrigated or place of use:

Twp.	Rge.	Sec.	NE ¼				NW ¼				SW ¼				SE ¼				Totals
			NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	

Total acres _____

NOT RECORDED
 MAY 21 1993

PART 3**B. CHANGES IN NATURE OF USE**

1	New Nature of Use	Amount (cfs/ac-ft)	Hours/days/year	Period of Use
				to
				to

2. Quantity and quality of return flows and location of discharge:

3. Describe effects on other water uses resulting from the proposed change:

I hereby assert that no one will be injured by such change and that the change does not constitute an enlargement in use of the original right. The information contained in this application is true to the best of my knowledge.

I understand that any willful misrepresentations made in this application may result in voiding its approval.

F. James Whitaker
(Signature of Applicant)

Subscribed and sworn to before me this 7th day of Dec., 19 92.

Clara E. Edler
(Notary Public)

My commission expires 5-1-98

FOR DEPARTMENT USE ONLY

Transfer contains _____ pages and _____ attachments

Received by HWS Date 12-8-92 Protest filed by _____

Prelim. check by _____ Fee \$50.00

Receipted by AWS #2018151 Date 12-8-92

Published in Recorder-Herald Copies of protest forwarded by _____

Pub. dates 12-17-24-92 Hearing held by _____ Date _____

Watermaster recommendation requested on 12-15-92 Recommended for ☒ approval ☐ denial

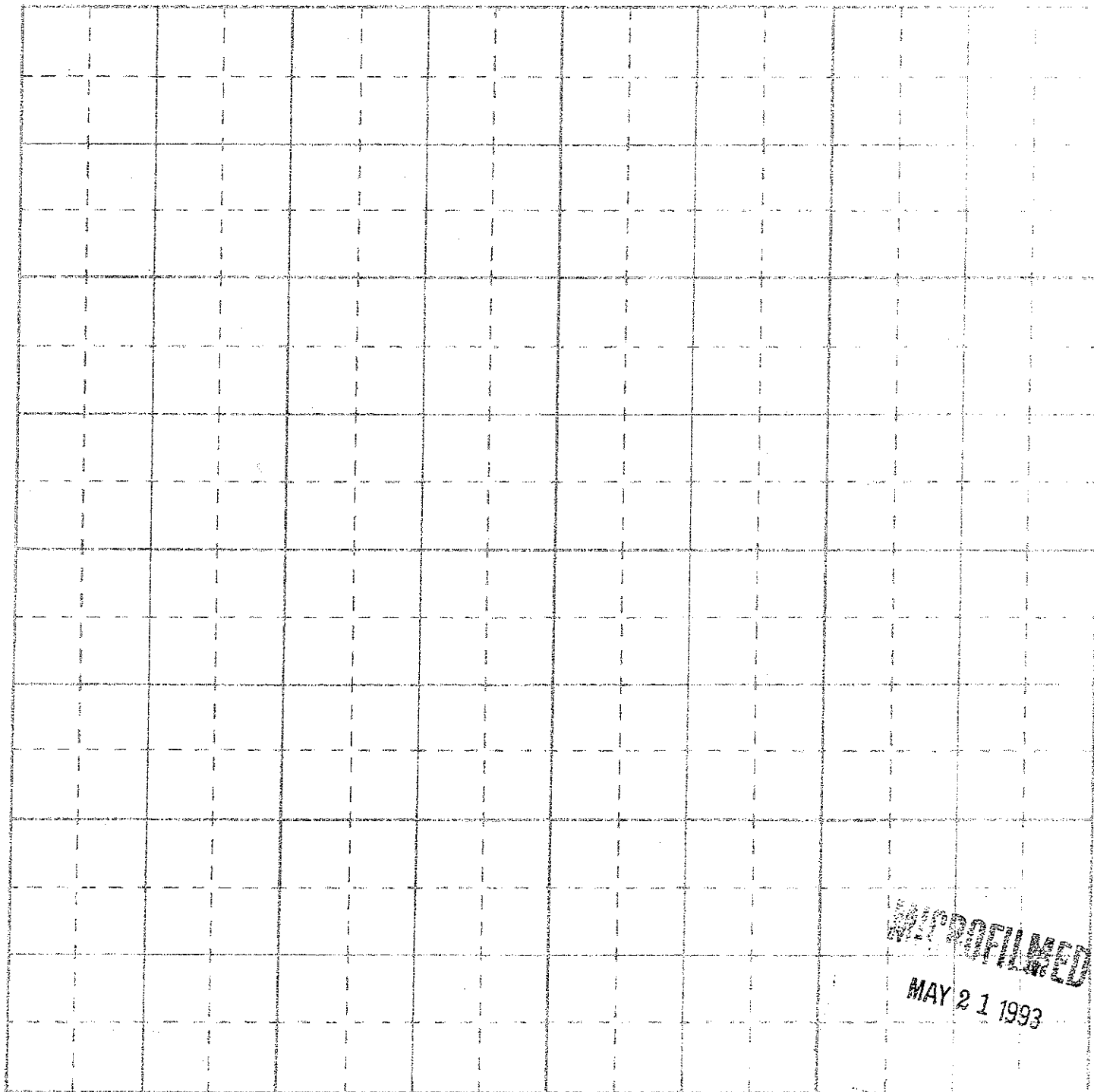
_____ rec'd _____ by RDC

Copy of transfer sent to lien holder _____

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STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR TRANSFER OF WATER RIGHT
PART 3

- A. Draw a map or attach a USGS map indicating the new point(s) of diversion and/or the new place of use for rights described in part 1. Clearly depict the land by section, township and range number.



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MAY 21 1993

SCALE: 2 inches equal 1 mile. Draw plan in ink.

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR TRANSFER OF WATER RIGHT

PART 2

(Attach one copy for each right)

A. DESCRIPTION OF RIGHT AS RECORDED

1. Right evidenced by:

- a. Decree No. 74-00063 Decreed to Wilford Shiner
in case of State of Idaho vs Mary A. Adams
dated Dec. 30, 1982 in Dist. Court county of _____
- b. License No. _____ issued by the Idaho Department of Water Resources
- c. Claim No. _____ on file with the Idaho Department of Water Resources
- d. Transfer No. _____ which produced this right.

2. Attach a copy of last year's tax notice for the property to which the water right is appurtenant or other documents which show ownership. Label document as attachment A. Check appropriate box below:

☒ Tax Notice ☐ Warranty Deed ☐ Other _____

3. Source of water Big Timber Creek tributary to Lemhi River

4. Date or priority 7-18-1911

5. Water is used for the following purpose:

amount 0.96 cfs for Irrigation purposes from 3-15 to 11-15
(cfs/ac-ft)
amount _____ for _____ purposes from _____ to _____
(cfs/ac-ft)
amount _____ for _____ purposes from _____ to _____
(cfs/ac-ft)

6. Total amount of water under right 0.96 cfs cubic feet per second and/or _____ acre-feet per annum

7. Point(s) of Diversion:

Lot	¼	¼	¼	Sec.	Twp.	Rge.	County	Local name for diversion
		NW	SE	8	15N	26E	Lemhi	

8. Lands irrigated or place of use:

Twp.	Rge.	Sec.	NE ¼				NW ¼				SW ¼				SE ¼				Totals
			NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	
16N	25E	25									35			40	40	40	40		195

Total acres 195

9. Describe any other water rights used for the same purpose as described above 74-0039B

10. To your knowledge, has any portion of this water right undergone a period of five or more consecutive years of non-use?
 _____ If yes, describe _____

B. DESCRIPTION OF PORTION OF RIGHT BEING TRANSFERRED

(If the entire right is to be changed by the applicant, omit part B and C.)

1. amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)

2. Point(s) of Diversion:

Lot	1/4	1/4	1/4	Sec.	Twp.	Rge.	County	Local name for diversion

3. Lands irrigated or place of use:

Twp	Rge	Sec.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	

Total acres _____

C. DESCRIPTION OF UNCHANGED PORTION OF RIGHT (omit if there is no change)

1. amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)
 amount _____ for _____ purposes from _____ to _____
 (cfs/ac-ft)

2. Point(s) of Diversion:

Lot	1/4	1/4	1/4	Sec.	Twp.	Rge.	County	Local name for diversion

3. Lands irrigated or place of use:

Twp	Rge	Sec.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	

Total acres _____

MAY 21 1993

Sheet No. 4

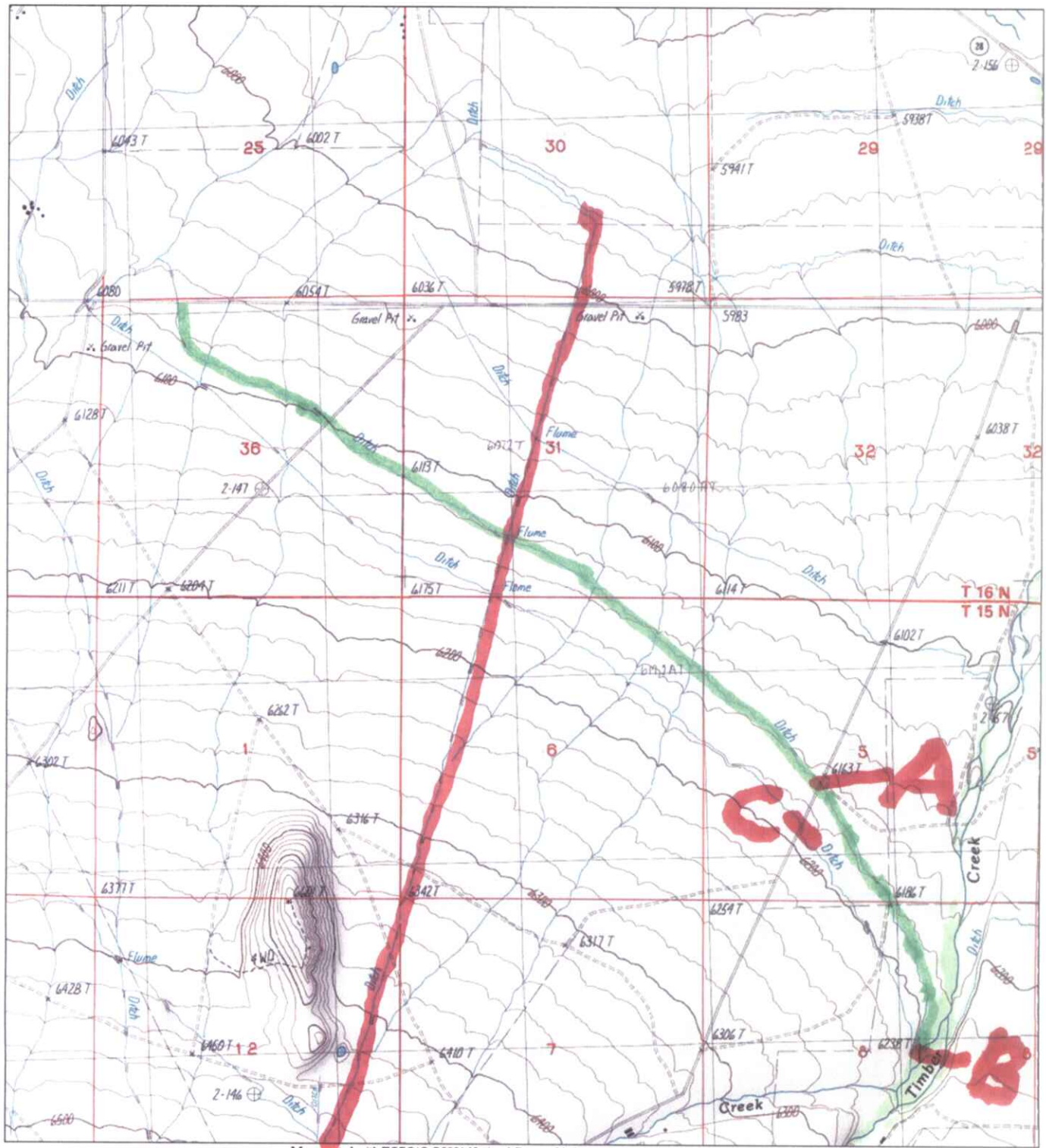
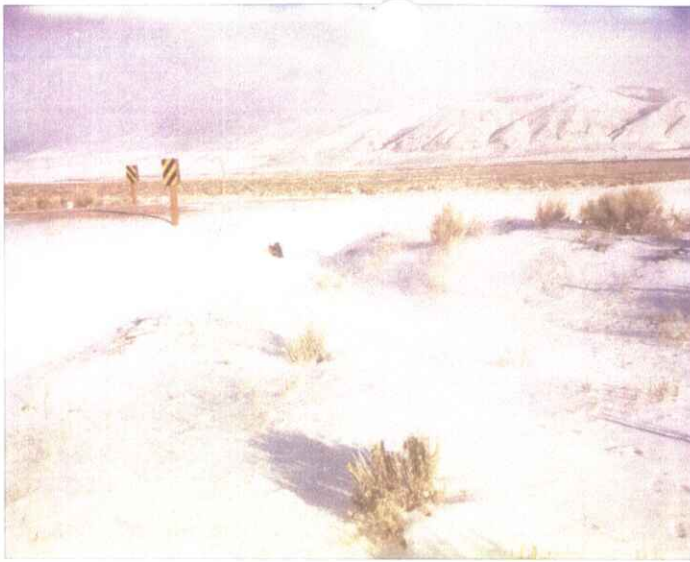


Exhibit No. 4
 Date: 1-5-01
 Whitaker
 T&T REPORTING

Exhibit 10.5



A Culvert Under Coleman Road
Where ~~the~~ ditch runs 1-5-07
our CLARK



B Our Clark Ditch headgate
1-5-07



C Alan Purcell Ditch used
EVERY year 1-5-07

Schiff No. 6

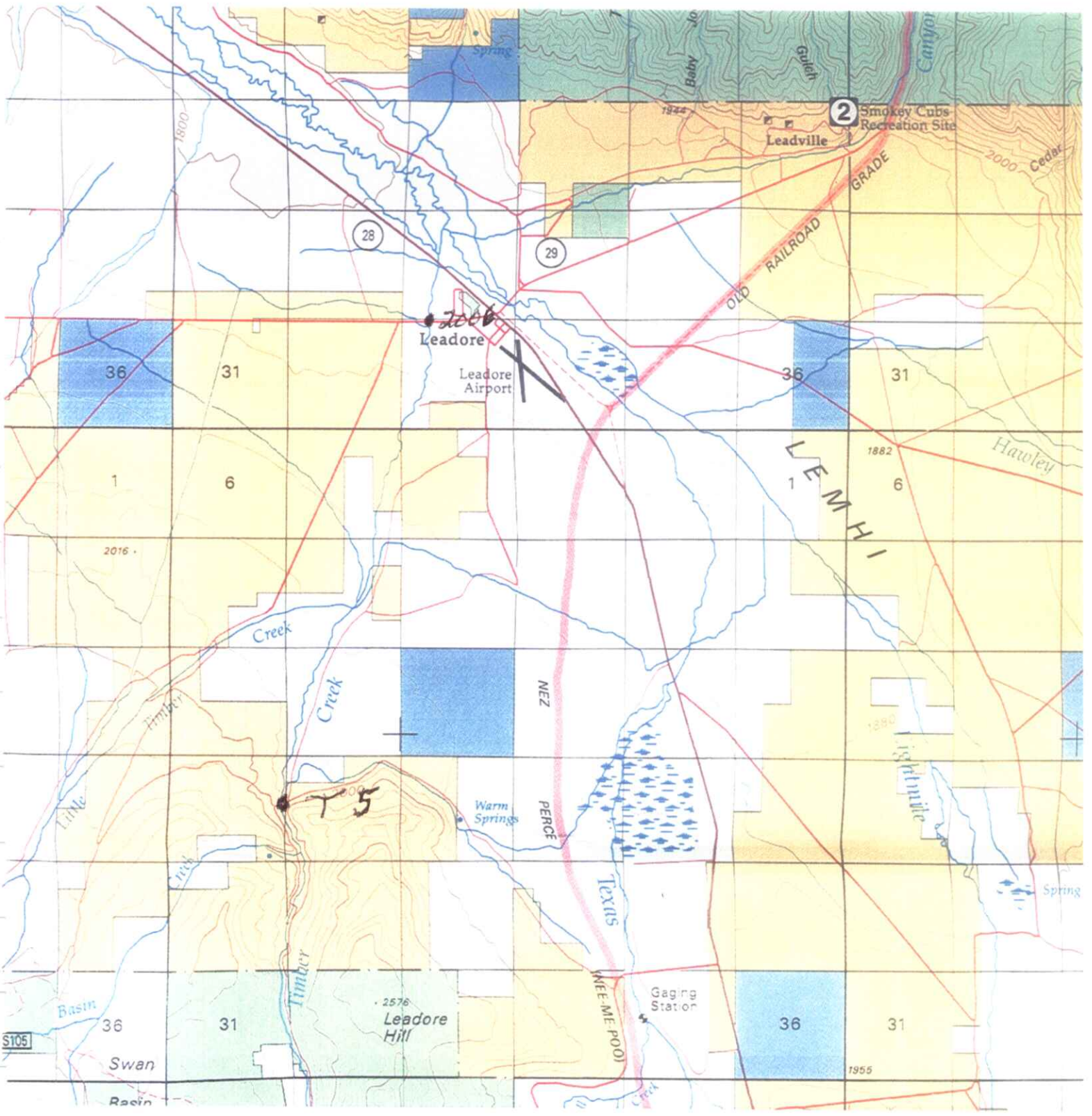


Exhibit No. 6
Date: 1-5-06
Whittaker
T&T REPORTING

Exhibit No. 7

How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps

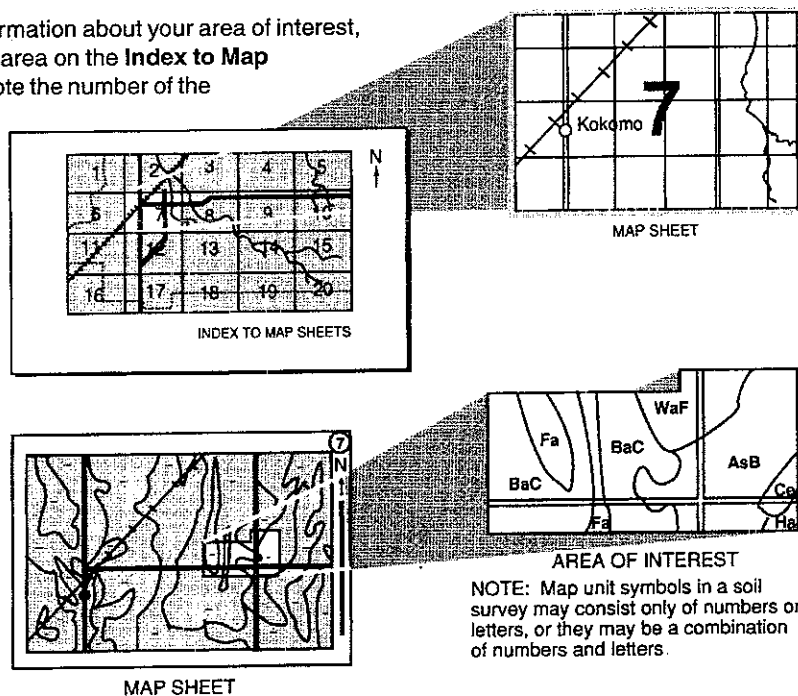
The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map

units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1993. Soil names and descriptions were approved in 1999. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1993. Tables 4 through 17 were generated in 2003 from the most recent data in the National Soil Information System (NASIS) database. This survey was made cooperatively by the Natural Resources Conservation Service and the United States Department of the Interior, Bureau of Land Management; University of Idaho, College of Agriculture; and Idaho Soil Conservation Commission. The survey is part of the technical assistance furnished to the Blaine Soil Conservation District and the Custer and Lemhi Soil and Water Conservation Districts.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Since the publication of this survey, more information on soil properties may have been collected, new interpretations may have been developed, or existing interpretive criteria may have been modified. The most current soil information and interpretations for this survey are in the Field Office Technical Guide (FOTG) at the local field office of the Natural Resources Conservation Service. The soil maps in this publication are in digital form. The digitizing of the maps was completed in accordance with the Soil Survey Geographic (SSURGO) database standards. The digital SSURGO-certified maps are considered the official maps for the survey area and are part of the FOTG at the local field office of the Natural Resources Conservation Service.

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Cover: View along Carmen Creek toward the Continental Divide in the Beaverhead Mountains.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at <http://www.nrcs.usda.gov>.

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Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Richard Sims
State Conservationist
Natural Resources Conservation Service

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

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United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with United States Department of the Interior, Bureau of Land
Management; University of Idaho, College of Agriculture; and Idaho Soil Conservation
Commission

CUSTER-LEMHI AREA is in north-central Idaho (fig. 1). It consists of areas in Custer and Lemhi Counties and a small area in the northern part of Blaine County. It includes parts of the Salmon, Challis, and Targhee National Forests. The total area is 1,959,720 acres, or about 3,062 square miles. Salmon, the county seat of Lemhi County, had a population of about 2,941 in 1990, and Challis, the county seat of Custer County, had a population of about 1,073.

The lowest point in the survey area, which is at an elevation of about 3,700 feet, is north of Salmon, along the Salmon River. The highest point, which is at an elevation of about 10,390 feet, is just south of Monument Peak, along the Idaho-Montana border.

General Nature of the Survey Area

This section gives general information about the survey area. It discusses history and development, natural resources, farming and ranching, and climate.

History and Development

Josh Jones, a Hudson's Bay Company employee, is reported to have crossed Lemhi Pass in 1804. Captain Meriwether Lewis and a handful of men entered Idaho through the same pass on August 12, 1805. From about 1810 to 1840, several parties of free trappers and fur company employees trapped in the area.

One of the first settlements in the area, which was established in 1853, was a Mormon colony at Fort Lemhi, near the present community of Tendoy, on the Lemhi River. This settlement was abandoned in 1858 because of conflicts with the Indians. Remnants of the fort can still be seen on the Mahaffey Ranch.

Around 1860 gold was discovered in Custer County, and strikes were discovered along the Salmon River until the turn of the century. Placer mining took place on Yankee Fork and Loon Creek, near Bayhorse and Clayton. Miners worked an area

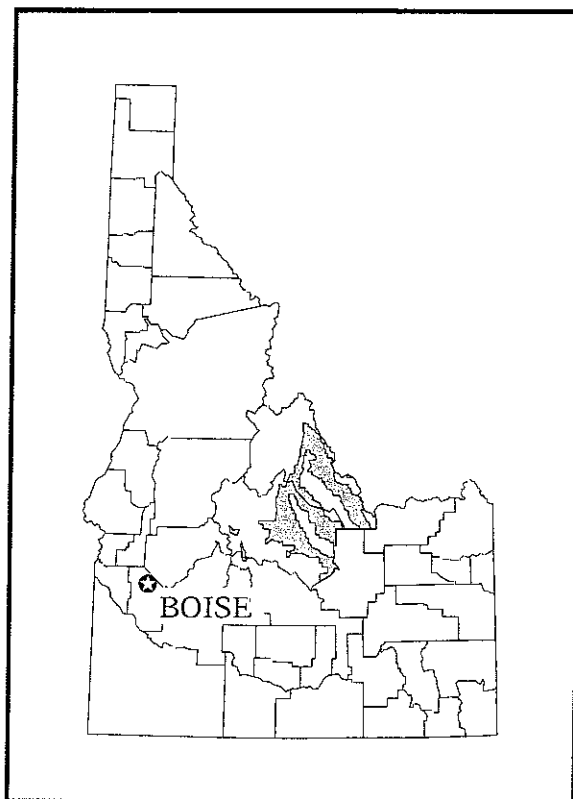


Figure 1.—Location of Custer-Lemhi Area in Idaho.

until it was mined out or until another strike was discovered. The new strike would cause a mass migration to the new area of opportunity. The Leesburg strike of 1866 established the settlement of Salmon as a trading center. About 20 families settled at Salmon and produced food for the miners. Challis was founded in 1876 by Englishman Alvah P. Challis, and it served as a gateway for supply wagons to the mining areas. Other communities soon developed, including Gibbonsville, population 6,000; Leesburg; population 4,000; and Ulysses, Nicholia, Gilmore, Shoup, Bonanza City, Custor, and Bayhorse, population 1,000 each. Prior to 1900, the dominant economic force in the area was mining. Gold, silver, copper, and lead were mined in these areas.

On January 9, 1869, Lemhi County was formed from part of Alturas County by the Territorial Legislature. It was the ninth county formed in Idaho. The first meeting of the county commission was on February 22, 1869. Custer County was formed in January 1891 from parts of Alturas, Lemhi, Boise, and Idaho Counties. Challis became the county seat in June 1891.

Although mining has had a continuing impact on the economy of the area, ranching, farming, timber production, retail trade, government activities, and tourism have largely supplanted mining as the major economic resources in the area. Stock ranching is a mainstay in the area.

The first cattle in the area were longhorn steer that came from Texas by way of Montana. These cattle were "run out," trailed to the mining camps, and butchered as needed. Range cow herds were imported from Oregon, Utah, southern Idaho, and

Range site: Millhi—FRAGILE LANDS 7 TO 9 INCH PZ, shadscale saltbush/Salmon wildrye

6—Bartonflat gravelly loam, 1 to 4 percent slopes

Composition

Bartonflat and similar soils—80 percent

Dissimilar soils—20 percent

Setting

Position on landscape: Fan terraces and stream terraces

Elevation: 6,000 to 6,400 feet

Average annual precipitation: 7 to 12 inches

Average annual air temperature: 37 to 41 degrees F

Frost-free season: 50 to 90 days

Dissimilar Soils

- A very deep, somewhat excessively drained soil that is light-colored very gravelly sandy loam over extremely gravelly loamy sand and in convex areas on fan terraces (10 percent)
- A very deep, somewhat excessively drained soil that is very gravelly sandy loam over extremely gravelly loamy sand and on upper fan terraces (10 percent)

Characteristics of Bartonflat

Typical profile:

0 to 7 inches—brown gravelly loam

7 to 11 inches—light yellowish brown and pale brown extremely gravelly sandy loam

11 to 60 inches—brown extremely gravelly loamy coarse sand

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Moderate in the upper part and very rapid in the lower part

Available water capacity: 2 to 4 inches

Effective rooting depth: 60 inches or more

Runoff: Slow

Hazard of water erosion: Slight

Major Uses

Irrigated pastureland and hayland, rangeland

Interpretive Groups

Land capability classification: 6e, nonirrigated, and 4e, irrigated

Range site: GRAVELLY LOAM 8 TO 12 INCH PZ, Wyoming big sagebrush/bluebunch wheatgrass

7—Bartonflat very gravelly sandy loam, 0 to 6 percent slopes

Composition

Bartonflat and similar soils—75 percent

Dissimilar soils—25 percent

Range site: Klug—NORTH SLOPE LOAMY 12 TO 16 INCH PZ, mountain big sagebrush/Idaho fescue

113—Langer gravelly sandy loam, 10 to 40 percent slopes

Composition

Langer and similar soils—75 percent

Dissimilar areas—25 percent

Setting

Position on landscape: Hills and mountains

Elevation: 6,400 to 6,800 feet

Average annual precipitation: 13 to 16 inches

Average annual air temperature: 34 to 37 degrees F

Frost-free season: 15 to 40 days

Characteristics of Langer

Typical profile:

0 to 9 inches—dark grayish brown and brown gravelly sandy loam

9 to 13 inches—brown very gravelly coarse sandy loam

13 to 60 inches—pale brown and very pale brown very gravelly loamy coarse sand and extremely gravelly loamy coarse sand

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Moderately rapid in the upper part and very rapid in the lower part

Available water capacity: 2.5 to 3.5 inches

Effective rooting depth: 10 to 20 inches

Runoff: Slow

Hazard of water erosion: Slight

Dissimilar Areas

- A very deep, somewhat excessively drained soil that is light-colored very gravelly sandy loam and on hills (10 percent)
- A well drained soil that is moderately deep to bedrock, very gravelly sandy loam, and on mountain slopes of more than 50 percent (5 percent)
- Rock outcrop on hills and mountains (10 percent)

Major Use

Rangeland

Interpretive Groups

Land capability classification: 6e, nonirrigated

Range site: SOUTH SLOPE LOAMY 13 TO 16 INCH PZ, mountain big sagebrush/Idaho fescue

114—Leadore gravelly loam, 2 to 6 percent slopes

Composition

Leadore and similar soils—90 percent

Dissimilar soils—10 percent

Setting

Position on landscape: Outwash fans and fan terraces

Elevation: 5,900 to 6,400 feet

Average annual precipitation: 8 to 11 inches

Average annual air temperature: 37 to 39 degrees F

Frost-free season: 50 to 75 days

Characteristics of Leadore

Typical profile:

0 to 3 inches—yellowish brown gravelly loam

3 to 16 inches—pale brown gravelly loam

16 to 60 inches—very pale brown and multicolored extremely cobbly loamy sand and extremely cobbly sand

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Moderate in the upper part and very rapid in the lower part

Available water capacity: 2 to 4 inches

Effective rooting depth: 10 to 20 inches

Runoff: Slow

Hazard of water erosion: Slight

Dissimilar Soils

- Wiggleton soils in concave areas on upper fan terraces (5 percent)
- A very deep, well drained soil that is extremely cobbly loam and in convex areas bordering abandoned drainage channels (5 percent)

Major Uses

Irrigated hayland, pastureland, and cropland, and rangeland

Interpretive Groups

Land capability classification: 6e, nonirrigated, and 4e, irrigated

Range site: GRAVELLY LOAM 8 TO 12 INCH PZ, Wyoming big sagebrush/bluebunch wheatgrass

115—Leatherman-Arbus complex, 2 to 6 percent slopes

Composition

*Leatherman and similar soils—*65 percent

*Arbus and similar soils—*35 percent

Setting

Position on landscape: Outwash fans and fan terraces

Elevation: 6,400 to 6,800 feet

Average annual precipitation: 8 to 11 inches

Average annual air temperature: 35 to 40 degrees F

Frost-free season: 30 to 60 days

Characteristics of Leatherman

Typical profile:

0 to 11 inches—pale brown and yellowish brown very gravelly loam

11 to 16 inches—light brownish gray hardpan

16 to 60 inches—light gray extremely gravelly loamy sand

Depth class: Shallow to a hardpan

Hazard of water erosion: Slight

Depth to high water table: 6 inches above the surface to a depth of 6 inches below the surface in January through December

Periods of flooding: Frequency—frequent; duration—long; months—January through June

Dissimilar Soils

- Leecreek soils in concave areas on flood plains (10 percent)
- Wiskisprings soils in concave areas on flood plains (10 percent)
- A very deep, poorly drained soil that is very gravelly loam and on low stream terraces with slopes of 2 to 6 percent (5 percent)

Major Uses

Irrigated pastureland and hayland, and rangeland

Interpretive Groups

Land capability classification: Lemhi—4w, nonirrigated and irrigated; Copperbasin—4s, nonirrigated and irrigated; Lilylake—5w, nonirrigated and irrigated

Range site: Lemhi—SEMIWET MEADOW; Copperbasin—SEMIWET MEADOW, sedges; Lilylake—RIPARIAN WET MEADOW, willow/sedges

119—Lemroi-Leecreek complex, 0 to 3 percent slopes

Composition

*Lemroi and similar soils—*45 percent

*Leecreek and similar soils—*40 percent

*Dissimilar soils—*15 percent

Setting

Position on landscape: Lemroi—linear to convex areas on flood plains and stream terraces; Leecreek—concave areas on flood plains and stream terraces

Elevation: 5,800 to 6,400 feet

Average annual precipitation: 8 to 12 inches

Average annual air temperature: 38 to 42 degrees F

Frost-free season: 50 to 70 days

Characteristics of Lemroi

Typical profile:

- 3 inches to 0—moderately decomposed roots and grass
- 0 to 8 inches—dark gray silt loam
- 8 to 15 inches—dark gray silt loam and gravelly silt loam
- 15 to 23 inches—light gray extremely gravelly loam
- 23 to 60 inches—gray extremely gravelly loamy coarse sand

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Moderate in the upper part and very rapid in the lower part

Available water capacity: 3.5 to 4.5 inches

Effective rooting depth: 20 to 30 inches

Runoff: Slow

Hazard of water erosion: Slight

Depth to high water table: 6 to 18 inches in April through October

Periods of flooding: Frequency—occasional; duration—brief; months—January through June

Characteristics of Leecreek

Typical profile:

- 2 inches to 0—moderately decomposed grass and roots
- 0 to 3 inches—grayish brown and light brownish gray silt loam
- 3 to 18 inches—light brownish gray gravelly silt loam and very gravelly silt loam
- 18 to 60 inches—multicolored extremely gravelly loamy coarse sand

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Moderate in the upper part and very rapid in the lower part

Available water capacity: 3 to 4 inches

Effective rooting depth: 13 to 22 inches

Runoff: Slow

Hazard of water erosion: Slight

Depth to high water table: 12 to 18 inches in April through October

Periods of flooding: Frequency—occasional; duration—brief; months—January through June

Dissimilar Soils

- Grandjean soils in linear areas on flood plains (5 percent)
- Sancrane soils in concave positions on flood plains (5 percent)
- Thosand soils on lower fan terraces (5 percent)

Major Uses

Irrigated pastureland and hayland

Interpretive Groups

Land capability classification: Lemroi and Leecreek—4w, nonirrigated and irrigated

Range site: Lemroi and Leecreek—not assigned

120—Lemroi-Leecreek-Grandjean complex, 0 to 3 percent slopes

Composition

Lemroi and similar soils—40 percent

Leecreek and similar soils—30 percent

Grandjean and similar soils—20 percent

Dissimilar soils—10 percent

Setting

Position on landscape: Lemroi—linear to convex areas on flood plains and stream terraces; Leecreek—flood plains and stream terraces; Grandjean—linear to concave areas on flood plains and stream terraces

Elevation: 4,900 to 6,400 feet

Average annual precipitation: 8 to 10 inches

Average annual air temperature: 36 to 40 degrees F

Frost-free season: 50 to 70 days

Characteristics of Lemroi

Typical profile:

- 3 inches to 0—moderately decomposed roots and grass
- 0 to 8 inches—dark gray silt loam
- 8 to 15 inches—dark gray silt loam and gravelly silt loam

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderate in the upper part and very rapid in the lower part
Available water capacity: 2.5 to 3.5 inches
Effective rooting depth: 10 to 20 inches
Runoff: Slow
Hazard of water erosion: Slight

Dissimilar Soils

- Zer soils on lower outwash fans and fan terraces (10 percent)

Major Uses

Rangeland and irrigated pastureland

Interpretive Groups

Land capability classification: 6s, nonirrigated, and 4s, irrigated
Range site: GRAVELLY LOAM 8 TO 12 INCH PZ, Wyoming big sagebrush/bluebunch wheatgrass

231—Whiteknob-Leadore complex, 2 to 8 percent slopes

Composition

Whiteknob and similar soils—60 percent
Leadore and similar soils—30 percent
Dissimilar soils—10 percent

Setting

Position on landscape: Whiteknob—convex areas on outwash fans and fan terraces;
 Leadore—concave areas on outwash fans and fan terraces
Elevation: 5,200 to 6,500 feet
Average annual precipitation: 8 to 11 inches
Average annual air temperature: 38 to 40 degrees F
Frost-free season: 65 to 85 days

Characteristics of Whiteknob

Typical profile:
 0 to 3 inches—pale brown gravelly loam
 3 to 9 inches—pale brown gravelly loam
 9 to 60 inches—multicolored extremely gravelly loamy coarse sand
Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Moderate in the upper part and very rapid in the lower part
Available water capacity: 2.5 to 3.5 inches
Effective rooting depth: 8 to 10 inches
Runoff: Slow
Hazard of water erosion: Slight

Characteristics of Leadore

Typical profile:
 0 to 3 inches—brown gravelly loam
 3 to 20 inches—pale brown gravelly loam and very gravelly sandy loam
 20 to 60 inches—multicolored extremely gravelly loamy sand
Depth class: Very deep

Drainage class: Somewhat excessively drained
Permeability: Moderate in the upper part and very rapid in the lower part
Available water capacity: 2 to 4 inches
Effective rooting depth: 10 to 20 inches
Runoff: Slow
Hazard of water erosion: Slight

Dissimilar Soils

- Oxhead soils on convex remnant ridges (10 percent)

Major Uses

Rangeland and irrigated pastureland

Interpretive Groups

Land capability classification: Whiteknob—6s, nonirrigated, and 4s, irrigated;
 Leadore—6e, nonirrigated, and 4e, irrigated
Range site: Whiteknob and Leadore—GRAVELLY LOAM 8 TO 12 INCH PZ, Wyoming
 big sagebrush/bluebunch wheatgrass

232—Whiteknob-Zer complex, 2 to 6 percent slopes

Composition

Whiteknob and similar soils—60 percent
Zer and similar soils—20 percent
Dissimilar soils—20 percent

Setting

Position on landscape: Whiteknob—linear to convex areas on outwash fans and fan terraces; Zer—linear to convex areas on fan terraces
Elevation: 5,700 to 6,500 feet
Average annual precipitation: 8 to 11 inches
Average annual air temperature: 40 to 44 degrees F
Frost-free season: 70 to 90 days

Characteristics of Whiteknob

Typical profile:

- 0 to 4 inches—pale brown gravelly loam
- 4 to 7 inches—brown gravelly loam
- 7 to 11 inches—pale brown very gravelly sandy loam
- 11 to 60 inches—light gray, very pale brown, and light yellowish brown extremely gravelly loamy coarse sand

Depth class: Very deep

Drainage class: Somewhat excessively drained
Permeability: Moderate in the upper part and very rapid in the lower part
Available water capacity: 2.5 to 3.5 inches
Effective rooting depth: 10 to 20 inches
Runoff: Slow
Hazard of water erosion: Slight

Characteristics of Zer

Typical profile:

- 0 to 3 inches—pale brown gravelly loam
- 3 to 9 inches—brown very gravelly loam
- 9 to 21 inches—light gray very gravelly sandy loam

appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last

Crops and Pasture

By Ralph Swift, district conservationist Natural Resources Conservation Service

General management needed for crops and pasture is given in this section. The estimated yields of the main crops and hay and pasture plants are listed for each soil, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

The survey area has about 170,000 acres of cropland, including that used for crops, hay, and pasture. All of this land is irrigated. About 59,000 acres is used for pasture.

The hayland and pastureland are cropped by removing one or more cuttings of hay or by harvesting the plants for grain. Nearly every acre of cropland is used for pasture at some time during the year. This may be early in the year before growth takes place, during the growing season, or late in the year after the cultivated crop or hay has been harvested. The majority of the land is used for livestock operations.

Field crops suited to the soils and climate of the survey area include alfalfa, grass hay, and some small grain, dominantly oats and barley. Some specialty crops suited to the area include seed potatoes and oilseed crops. Production of these crops is influenced more by the markets than by the soils.

The cropland in the survey area can be placed in three broad categories—pastureland, well drained soils suited to the production of small grain or alfalfa hay as well as specialty crops, and moderately well drained to poorly drained soils suited to grass hay or use as pastureland.

The soils suited only for use as pastureland are either too wet to grow hay or are in high elevation areas, generally above 6 300 feet. Wet soils, such as those of the Fezip and Lemroi series, are in Lemhi Valley, above the town of Lemhi, and along the Salmon and Lemhi Rivers. The majority of the soils at the high elevations are in the Stanley area and above Leadore. Supplemental irrigation is needed for pasture production on these soils. Soil compaction as a result of trampling by livestock is a concern.

The majority of the soils suited to alfalfa hay production are on the higher stream terraces of the Lemhi and Salmon Rivers and on the benches and bars above these rivers. Pattee, Perreau, and Packham soils are typical of these areas. The soils are well drained and require a full season of irrigation water for crop production.

Erosion from irrigation is a problem on flood-irrigated soils that have slopes of more than 4 percent, particularly during the establishment of crops.

Semiwet soils along the first stream terraces in the survey area are suited to grass production for use as pasture or hay. These soils commonly are wet from spring runoff and flood irrigation. They are moderately well drained to somewhat poorly drained. The surface of these soils is sufficiently dry in midsummer to late in summer to allow for harvesting of grass hay. Irrigation and fertility management are needed to improve the productivity of these soils.

Use of conservation cropping systems along with proper irrigation water management and pastureland and hayland management are key to maintaining production and reducing the risk of erosion in the areas of cropland. These practices and use of a fertility management program are important to any conservation program for the ranches in the survey area.

Fields that have slopes of 4 percent or more require intensive management for erosion control and irrigation water management. During the establishment of grain or a new seeding of alfalfa, portable sprinklers are used for irrigation to reduce the risk of runoff and erosion. Once a ground cover is established, flood irrigation can be used.

Corrugations with gated pipe limit the amount of irrigation water applied and help to minimize erosion.

Most of the irrigation water in the area is diverted from the Salmon and Lemhi Rivers and their tributaries. The supply of irrigation water is limited early in spring before the snow melts and again late in summer. Sprinkler irrigation typically is used on the benches and bars in the survey area. Sprinklers reduce the amount of irrigation water required by increasing the efficiency of the water applied to the fields.

Crop rotations commonly consist of 8 to 10 years of alfalfa and 2 years of grain. Use of minimum till or no-till farming, which eliminates the need for 2 years of grain before returning the fields to forage production, has increased in recent years. Less tillage helps to maintain soil fertility and tilth.

Surface irrigation commonly is used in areas of grass hay and pasture. Flood irrigation methods used include border dike, contour ditch, and wild flooding. Wild flooding consists of applying water by use of a main center ditch and lateral ditches and releasing water onto high areas in the meadows. This type of irrigation is very inefficient in terms of irrigation water delivery, but the excess water supports many acres of induced wildlife habitat. Some of this land has been seeded to improved meadow species.

A strong fertility program is essential for high-yield production of crops in the area. Field soil tests should be completed, and fertilizer should be applied according to the needs of the crop grown. Phosphorus is beneficial for legumes, and nitrogen is beneficial for grass and small grain. Sulfur is also beneficial on some fields.

Planners of management systems for individual fields or ranches should consider the detailed information in the description of each soil under the heading "Detailed Soil Map Units." Additional information can be obtained from the local office of the Natural Resources Conservation Service or Cooperative Extension Service.

Yields per Acre

The average yields per acre that can be expected of the principal crops and pasture plants under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the

Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 6e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c* shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

The capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in table 5.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and

long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

About 24,500 acres, or about 1 percent, of the survey area would meet the requirements for prime farmland if an adequate and dependable supply of irrigation water was available. The map units in the survey area that are considered prime farmland are listed in this section. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

The map units that meet the requirements for prime farmland if irrigated are:

- 4 Arco silt loam, 0 to 2 percent slopes
- 20 Bockston loam, 0 to 4 percent slopes
- 22 Breitenbach gravelly loam, 1 to 4 percent slopes
- 135 Mooretown-Borco complex, 0 to 2 percent slopes
- 197 Snowslide gravelly loam, dry, 1 to 10 percent slopes
- 203 Soen gravelly loam, 0 to 4 percent slopes

Rangeland

By Dan Ogle range conservationist, Natural Resources Conservation Service.

Of the 1,959,720 acres in the survey area, approximately 20 percent is privately owned land, 5 percent is endowment land (schools) under the management of the Idaho Department of Lands, and 75 percent is administered by the Bureau of Land Management.

Approximately 85 percent of the survey area is rangeland, 7 percent is irrigated hayland or pastureland, 4 percent is commercial forestland, and 3 percent is grazeable forestland. The remaining land is used as cropland and for roads, municipal uses, and other uses. Nearly all land in the survey area is used for livestock production or wildlife habitat at some time during the year.

The most common livestock enterprise is the commercial cow\calf operation. A few dairy and sheep operations are in the survey area. The ranches vary in size, but they generally consist of 600 to 800 acres of private land with grazing privileges on Federal land. Some of the rangeland in the survey area is used by operators based in other counties.

The forage produced on the rangeland is used primarily in spring and fall. Forage at an elevation of more than 6,500 feet is used in summer.

The basic soil\plant resource is best maintained or improved through management. Important range management practices include planned grazing systems (primarily rotations) and proper grazing and season of use. Facilitating practices to accomplish these goals and to attain good distribution of grazing include properly locating salt, use of watering facilities, and fencing. The suitability of range improvement practices such as brush management, range seeding, and water developments depends on specific characteristics of the soils. Information about the characteristics and suitabilities of the soils can be found in the "Detailed Soil Map Units" section.

Most ranch headquarters are located along the river and creek bottoms in the survey area. This bottomland is used primarily as feeding and foraging areas in winter, as pasture for calving in spring, and as pasture in spring and fall.

Dense stands of shrubs and deciduous trees on the bottomland provide livestock with good protection from the wind and the cold and snowy weather in winter and early in spring. Because this land is near streams (riparian zones), special management precautions should be considered. These include annual rotation of livestock to higher and drier areas to avoid overuse of forage used early in the season and to minimize soil compaction and streambank degradation.

Soils along the rivers and creeks in the survey area are moderately well drained to poorly drained. These soils support shrubs, deciduous trees, and herbaceous water-loving plants. Forage production on the valley bottoms is less influenced by yearly climatic changes than are other areas in the survey area because of the moisture in the subsoil. In the upland areas that have similar climate and topography, differences in the kind and amount of vegetation produced are closely related to the kind of soil. On stream terraces and fan terraces above the wet bottomland, the soils are fine textured or medium textured and gravelly or very gravelly and they support drought-tolerant, low-growing shrubs, grasses, and forbs. On north-facing mountain slopes above an elevation of 6,000 feet, the soils are medium textured gravelly loam that supports forest and mountain shrub plant communities. Significantly more forage is produced on the fan terraces on hills and mountains.

Table 6 shows, for each soil that supports vegetation suitable for grazing, the ecological site or forest habitat type; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the column headings in table 6 follows.

An *ecological site or forest habitat type* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology that have developed over time, particularly infiltration and runoff; and a characteristic plant community (kind and amount of vegetation). The hydrology of the site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others, and each influences the development of the others. The plant community on an ecological site or forest habitat type is typified by an association of species that differs from that of other ecological sites or habitat types in the kind and proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available at the local office of the Natural Resources Conservation Service. Descriptions of the

forest habitat types are provided in the Forest Service publication "Forest Habitat Types of Central Idaho" (USDA, 1981a)

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the historic climax plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Characteristic vegetation—the grasses, forbs, and shrubs that make up most of the historic climax plant community on each soil—is listed by common name. Under *range composition*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The composition percentages of individual species is given by dry weight. The total percent composition may not be 100 percent because species that make up less than 5 percent of the ecological site or habitat type typically are not shown in the table. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires a knowledge of the kinds of soil and of the historic climax plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the historic climax plant community on a particular rangeland ecological site. The more closely the existing community resembles the historic community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the historic climax plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the "National Range and Pasture Handbook" (<http://www.glti.nrcs.usda.gov/technical/publications/nrph.html>).

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the historic climax plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Woodland Productivity and Forest Habitat Types

About 20,000 acres in the survey area is woodland, some of which is used as grazeable woodland. Other uses include wildlife habitat, recreation, and woodcutting for firewood. For those soils in the survey area that are forested, the maximum average annual growth, expressed in cubic feet per acre per year, is given for one or more tree species in the "Detailed Soil Map Units" section. These growth figures are based on data taken from yield tables and are ascertained through the use of average site indexes. The site indexes are determined from the appropriate site index curves for each tree species, including that for lodgepole pine (Alexander, 1966), subalpine fir (Alexander, 1967), and Douglas fir (Brickell, 1968). The site indexes for Douglas fir were based on 100-year-old trees so that Meyer's yield tables could be used to determine the growth figures. If growth figures are given for more than one species on a specific soil, the figures given are the potential average annual growth that could be expected in a stand having only one of the tree species.

Value—6 or 7 dry, 5 or 6 moist
Chroma—1 or 2 dry or moist
Rock fragment content—0 to 25 percent
Texture—silt loam, silty clay loam, or gravelly loam

Bartonflat Series

Taxonomic classification: Sandy-skeletal, mixed, frigid Calcic Haploxerolls

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Moderate or moderately rapid in the upper part and very rapid in the lower part

Position on landscape: Stream terraces and fan terraces

Parent material: Kind—alluvium; source—mixed

Slope range: 0 to 6 percent

Elevation: 5,000 to 6,600 feet

Average annual precipitation: 7 to 12 inches

Average annual air temperature: 37 to 41 degrees F

Frost-free period: 50 to 90 days

Typical Pedon Location

Map unit in which located: Bartonflat very gravelly sandy loam, 0 to 6 percent slopes

Location in survey area: Custer County, Idaho; at the borrow pit approximately 1 mile southeast of Chilly Buttes; about 2,200 feet north and 1,900 feet east of the southwest corner of sec. 32, T. 9 N., R. 22 E.; lat. 44°03'59" N., long. 113°52'46" W

Typical Pedon

- A—0 to 5 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, friable, slightly sticky and nonplastic; many very fine and fine and few medium and coarse roots; common very fine and fine tubular and irregular pores; 50 percent gravel; slightly alkaline (pH 7.8); clear smooth boundary.
- AB—5 to 9 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium and coarse roots; common fine and medium irregular pores; 65 percent gravel; slightly alkaline (pH 7.6); clear smooth boundary.
- Bk—9 to 18 inches; multicolored extremely gravelly loamy sand; single grain; loose, nonsticky and nonplastic; few very fine, fine, and medium roots; common fine and medium irregular pores; 70 percent gravel and 5 percent cobbles; lime coatings 1 to 3 millimeters thick on underside and some sides of rock fragments; slightly effervescent; slightly alkaline (pH 7.5); gradual wavy boundary.
- Bkq1—18 to 45 inches; multicolored extremely gravelly loamy sand; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; common fine and medium irregular pores; 65 percent gravel and 20 percent cobbles; lime and silica coatings 1 to 3 millimeters thick on underside and sides of rock fragments; slightly effervescent; moderately alkaline (pH 7.9); gradual wavy boundary.
- Bkq2—45 to 60 inches; multicolored extremely gravelly loamy coarse sand; single grain; loose, nonsticky and nonplastic; few very fine roots; common fine and medium irregular pores; 60 percent gravel and 20 percent cobbles; lime and silica coatings 1 to 3 millimeters thick on underside and sides of rock fragments; slightly effervescent; slightly alkaline (pH 7.7).

Range in Characteristics

Profile:

Thickness of mollic epipedon—7 to 11 inches
 Average annual soil temperature—39 to 43 degrees F
 Depth to secondary carbonates—7 to 11 inches
 Depth to sand and gravel (Bk horizon)—7 to 11 inches

Particle-size control section:

Clay content—1 to 5 percent
 Rock fragment content (average)—55 to 90 percent

A horizon:

Texture—gravelly loam or very gravelly sandy loam

Bk horizon:

Hue—2 5Y or 10YR
 Value—3 or 4 moist
 Chroma—2 or 3 moist
 Rock fragment content—45 to 75 percent
 Reaction—slightly alkaline or moderately alkaline

Bkq horizon:

Texture—extremely gravelly loamy sand, extremely gravelly loamy coarse sand, or extremely cobbly sand
 Rock fragment content—65 to 85 percent
 Reaction—slightly alkaline or moderately alkaline

Bartonhill Series

Taxonomic classification: Loamy-skeletal, carbonatic, frigid Pachic Calcixerolls

Depth class: Very deep

Drainage class: Well drained

Permeability: Moderately rapid in the upper part and very rapid in the lower part

Position on landscape: Outwash fans

Parent material: Kind—alluvium; source—mixed

Slope range: 5 to 15 percent

Elevation: 6,000 to 7,000 feet

Average annual precipitation: 8 to 11 inches

Average annual air temperature: 37 to 40 degrees F

Frost-free period: 50 to 60 days

Typical Pedon Location

Map unit in which located: Bartonhill-Whitecloud complex, 5 to 15 percent slopes

Location in survey area: Custer County, Idaho; about 3 miles north of Mackay; about 800 feet south and 1,320 feet east of the northwest corner of sec. 16, T. 7 N., R. 23 E.; lat. 43°56'36" N., long. 113°44'22" W.

Typical Pedon

A1—0 to 3 inches; grayish brown (10YR 5/2) very gravelly fine sandy loam, very dark gray (10YR 3/1) moist; weak thin platy structure; slightly hard, friable, nonsticky and nonplastic; many very fine, fine, and medium and few coarse roots; common very fine irregular pores; 30 percent gravel and 10 percent cobbles; lime coatings 1 to 3 millimeters thick on underside of rock fragments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Leadore Series

Taxonomic classification: Sandy-skeletal, mixed, frigid Xeric Haplocalcids

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Moderate in the upper part and very rapid in the lower part

Position on landscape: Fan terraces and outwash fans

Parent material: Kind—alluvium; source—quartzite

Slope range: 1 to 8 percent

Elevation: 5,200 to 6,800 feet

Average annual precipitation: 8 to 11 inches

Average annual air temperature: 37 to 40 degrees F

Frost-free period: 50 to 85 days

Typical Pedon Location

Map unit in which located: Leadore gravelly loam, 2 to 6 percent slopes

Location in survey area: Lemhi County, Idaho; about 3.5 miles west of Leadore; about 1,700 feet north and 2,450 feet west of the southeast corner of sec. 36, T. 16 N., R. 25 E.

Typical Pedon

- A—0 to 3 inches; yellowish brown (10YR 5/4) gravelly loam, dark brown (10YR 3/3) moist; weak very fine subangular blocky structure parting to weak very fine and fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine irregular pores; 15 percent gravel; neutral (pH 7.2); clear wavy boundary.
- Bw—3 to 9 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak very fine, fine, and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine irregular pores; 15 percent gravel; neutral (pH 7.3); gradual wavy boundary.
- Bk—9 to 16 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak very fine, fine, and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine irregular pores; 25 percent gravel and 5 percent cobbles; lime and silica coatings less than 2 millimeters thick on underside of rock fragments; slightly effervescent; slightly alkaline (pH 7.5); abrupt wavy boundary.
- 2Bkq1—16 to 27 inches; very pale brown (10YR 7/3) extremely cobbly loamy sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; many very fine and few fine and medium irregular pores; 40 percent gravel and 40 percent cobbles; lime and silica coatings less than 2 millimeters thick on underside of rock fragments cementing gravel and sand to rock fragments; discontinuous silica cap less than 1 millimeter thick at the boundary between the Bk and 2Bkq1 horizons; violently effervescent; moderately alkaline (pH 7.9); gradual wavy boundary.
- 2Bkq2—27 to 60 inches; multicolored extremely cobbly sand; single grain; loose, nonsticky and nonplastic; common very fine roots as mats on gravel and cobbles; many very fine, common fine, and few medium irregular pores; 40 percent gravel, 35 percent cobbles, and 5 percent stones; lime and silica coatings less than 2 millimeters thick on underside of rock fragments cementing fine gravel and sand to rock fragments; dominantly slightly effervescent with areas that are strongly effervescent; moderately alkaline (pH 8.3).

Range in Characteristics

Profile:

Average annual soil temperature—39 to 41 degrees F
 Average summer soil temperature—59 to 61 degrees F
 Depth to calcic horizon—10 to 20 inches
 Depth to sand and gravel (2Bkq horizon)—10 to 20 inches

Particle-size control section:

Clay content (average)—3 to 12 percent
 Rock fragment content (average)—50 to 75 percent

A horizon:

Chroma—3 or 4 dry

Bw and Bk horizons:

Hue—7.5YR or 10YR
 Value—5 or 6 dry, 3 or 4 moist
 Chroma—3 to 6 dry or moist
 Texture—very gravelly loam, gravelly loam, or very gravelly sandy loam
 Rock fragment content—15 to 40 percent
 Calcium carbonate equivalent—0 to 5 percent

2Bkq horizon:

Texture—extremely cobbly loamy sand, extremely cobbly sand, or extremely gravelly loamy sand
 Rock fragment content—65 to 85 percent
 Calcium carbonate equivalent—10 to 25 percent

Leatherman Series

Taxonomic classification: Loamy-skeletal, carbonatic, shallow Duric Xeric Petrocryids

Depth class: Shallow to a duripan

Drainage class: Well drained

Permeability: Moderate above the hardpan and rapid below it

Position on landscape: Fan terraces and outwash fans

Parent material: Kind—alluvium; source—limestone

Slope range: 2 to 8 percent

Elevation: 6,300 to 6,800 feet

Average annual precipitation: 8 to 11 inches

Average annual air temperature: 35 to 40 degrees F

Frost-free period: 30 to 60 days

Typical Pedon Location

Map unit in which located: Leatherman-Arbus complex, 2 to 6 percent slopes (fig. 10)

Location in survey area: Custer County, Idaho; about 13 miles south of Patterson; about 2,300 feet west and 1,200 feet north of the southeast corner of sec. 30, T. 12 N., R. 23 E.; lat. 44°20'14" N., long. 113°46'52" W.

Typical Pedon

A—0 to 5 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; weak very fine and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine tubular and irregular pores; 35 percent gravel; lime and silica

WATER APPLICATION 74-15613
IDAHO CODE REFERENCE SUPPORTS
WESTERN WATER SHEDS VS. MATEJKO
OTHER REGULATION SUPPORTS LETTERS AND DOCUMENTS
1/4/07

APPLICATION

1. Idaho Department of Water Resources letter February 9, 2005.
2. Application.
3. IDWR letter May ²³~~25~~, 2005.
4. Amended application.
5. IDWR letter November 21, 2005.
6. IDWR letter December 28, 2005.

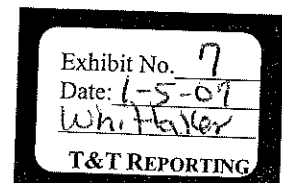
PROTESTS

1. IDWR letter January 25, 2005.
2. IDAHO FISH AND GAME letter January 20, 2006.
3. JAMES WHITTAKER letter February 14, 2006.
4. IDAHO FISH AND GAME letter February 23, 2006.

FLOW TABLES, GRAPHS AND IDWR LETTER
WATER DISTRICTS AND TRIBUTARIES SEPARATE

MINIMUM STREAM FLOWS

1. IDWR letter August 10, 2005.
2. NOTICE OF FILING OF DIRECTOR'S REPORT OF THE IDAHO WATER RESOURCE BOARD CLAIMS PURSUANT TO I. C. 42-1507. Basin 74 left out except for 42-1506.
3. 42-222 Change in point of diversion, place of use, period of use or nature of use of water rights-Forfeiture and extension-Appeals (1) Provided however, minimum stream flow water rights may not be established under the local public



interest criterion, and may only be established pursuant to chapter 15, title 42, Idaho Code.

4. 42-1502 Definitions. (b) And (f).
5. 42-1503. Application to appropriate-Process-Judicial review. (e).

RIGHTS OF WAY

1. 42-1101 Rights of landowners to water.
2. 42-1102 Owners of land-Right to right-of-way. The existence of a visible ditch, canal or conduit shall constitute notice to the owner, or any subsequent purchaser, of the underlying servient estate, that the owner of the ditch, canal or conduit has the right-of-way and incidental rights confirmed or granted by this section.
3. 42-1104 Right of way over state lands. The right of way over and upon any and all lands owned or controlled by the state of Idaho is hereby granted to any and all persons for the purpose of constructing and maintaining any ditch, canal, conduit or other works for the diversion or carrying of water for any beneficial use.
4. Western Watersheds Project v. Matejko (Supervisor, Salmon Challis National Forest). II. Most important for present purposes, however, Congress specifically chose to preserve vested rights such as those under the 1866 and 1891 Acts. Section 509 (a) of the FLPMA provides: Nothing in this subchapter shall have the effect of terminating any right-of-way heretofore issued, granted, or permitted. However, with the consent of the holder thereof, the Secretary concerned may cancel such a right-of-way or right of use pursuant to the provisions of this subchapter.
5. Letter August 10, 1950, to F. J. Whittaker
6. Land Patent No. 11-66-0100
7. Land Patent No. 11-97-0004
8. In the 1993 transfer, the BLM told us to use an old ditch, as it would take them three years to approve a right-of- way.

PRODUCTION

1. I don't really remember how many Animal Unit Months we got off the place in 1989 through 1992, when the old water rights were still intact, except it was a considerable amount. I do remember the previous owners saying they averaged around 150 ton of hay plus considerable pasture.

2. We irrigated it over in 1995 with flood water and got considerable pasture that year, as the stands of hay were still largely intact. I really don't remember what year it was that the water master told us he wouldn't be able to turn it on any more. Sometime between 1996 and 1999.
3. The stand is all gone now and it only produces 15 Animal Unit Months, which is not worth going after so we let the antelope have it and just use it for a feedlot after calving.

OPERATOR COPY

AUTH NUMBER: 1104728
DATE PRINTED: 4/29/2005

Form 4130-2a
(February 1999)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

GRAZING PERMIT

STATE ID
OFFICE 340
AUTH NUMBER 1104728
PREFERENCE CODE 03
DATE PRINTED 04/29/2005
TERM 03/01/2005 TO 02/28/2007

BUREAU OF LAND MANAGEMENT
SALMON FO
50 HWY 93 SOUTH
SALMON ID 83467

WHITTAKER, JAMES AND PAULA
PO BOX 240
LEADORE ID 83464

THIS GRAZING PERMIT IS OFFERED TO YOU UNDER 43 CFR PART 4100 BASED ON YOUR RECOGNIZED QUALIFICATIONS. YOU ARE AUTHORIZED TO MAKE GRAZING USE OF LANDS, UNDER THE JURISDICTION OF THE BUREAU OF LAND MANAGEMENT AND COVERED BY THIS PERMIT, UPON YOUR ACCEPTANCE OF THE TERMS AND CONDITIONS OF THIS PERMIT AND PAYMENT OF GRAZING FEES WHEN DUE. CONTACT YOUR LOCAL BLM OFFICE AT 208-756-5400 IF YOU HAVE QUESTIONS.

MANDATORY TERMS AND CONDITIONS

GRAZING SCHEDULE:

ALLOTMENT	PASTURE	LIVESTOCK NUMBER KIND	GRAZING BEGIN	PERIOD END	%PL USE	AUMS
06212 LEE CREEK		77 CATTLE	05/01	06/15	90 ACTIVE	105
		274 CATTLE	05/01	06/15	100 ACTIVE	414
06220 STATE SECTION		52 CATTLE	05/16	06/30	42 ACTIVE	33
06221 DEER PARK		40 CATTLE	05/20	06/19	100 ACTIVE	41
06310 SPRING CANYON		220 CATTLE	05/15	05/31	83 ACTIVE	102
		420 CATTLE	06/01	06/17	83 ACTIVE	195
		720 CATTLE	06/18	07/24	83 ACTIVE	727
		720 CATTLE	07/25	09/05	83 ACTIVE	845
		399 CATTLE	08/24	10/24	83 ACTIVE	675
		916 SHEEP	05/01	10/04	83 ACTIVE	785
06305 LEADORE HILL EAST		49 CATTLE	05/01	05/31	100 ACTIVE	50
06224 TIMBER CREEK		1200 SHEEP	05/01	06/06	82 ACTIVE	239
06309 CENTER RIDGE		1200 SHEEP	05/22	06/12	90 ACTIVE	156
		1200 SHEEP	07/13	07/13	90 ACTIVE	7

TABLE 1 (Continued)
LEMMI RHP AREA GRAZING ALLOTMENTS AND LIVESTOCK USE

ALLOTMENT NAME	ALLOT. #	NO. OF PERMITTEES	ACRES		BLM ECOLOGICAL CONDITION			APPARENT MANAGEMENT		KIND OF LIVESTOCK	SEASON OF USE	
			BLM	STATE	PRIVATE	EXCELLENT	GOOD	FAIR	POOR	UNMAINED	TREND	STATUS
Little Sawmill	6209	2	9,118	1,280	500	5,247	3,657	214	U-S	I	C	05/01 09/30
Hill Creek	6210	1	344			321			23	C	C	05/22 08/11
Walters	6211	2	1,703			1,427			276	U	I	C 05/01 06/15
Lee Creek	6212	1	2,149		160	458	1,621	70	U	I	C	05/11 06/30
Big Springs	6213	1	1,042			701	341		D	H	C	05/01 07/31
Horse Heaven	6214	2	1,484			1,484			D	I	C	05/20 06/19
Everson Creek	6215	2	279						279	C	C	05/01 10/15
Big Eightmile	6216	2	315						315	C	H	06/01 09/30
NEF #1	6217											
NEF #2	6218	1	320			320			S	C	C	05/06 10/02
Dump	6219	1	361			361			S	C	C	05/01 06/20
State Section	6220	1	434	640		434			S	C	C	05/13 06/27
Deer Park	6221	1	234			222			12	S-D	C	05/20 06/19
Adams Creek	6222	1	234			171	63		S	C	C	05/16 08/15
Milk Creek	6223	1	844			844			S	I	C	05/01 06/15
Timber Creek	6224	5	6,947	207		2,069	4,793		85	S-D	I	C 05/06 06/30
												H 05/01 06/06
												S 05/06 10/31

U = Upward
S = Static
D = Downward
I = Improve
M = Maintain
C = Custodial
C = Cattle
H = Horses
S = Sheep

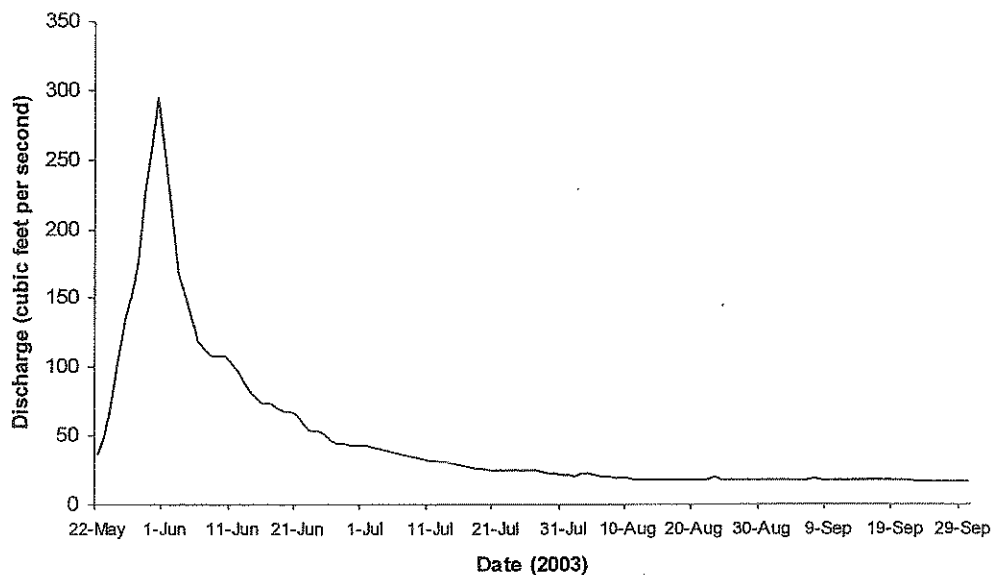


Figure 4. Graphical representation of data in Table 5 for unimpaired discharge (cfs) measured in Big Timber Creek upstream from diversions (2003).

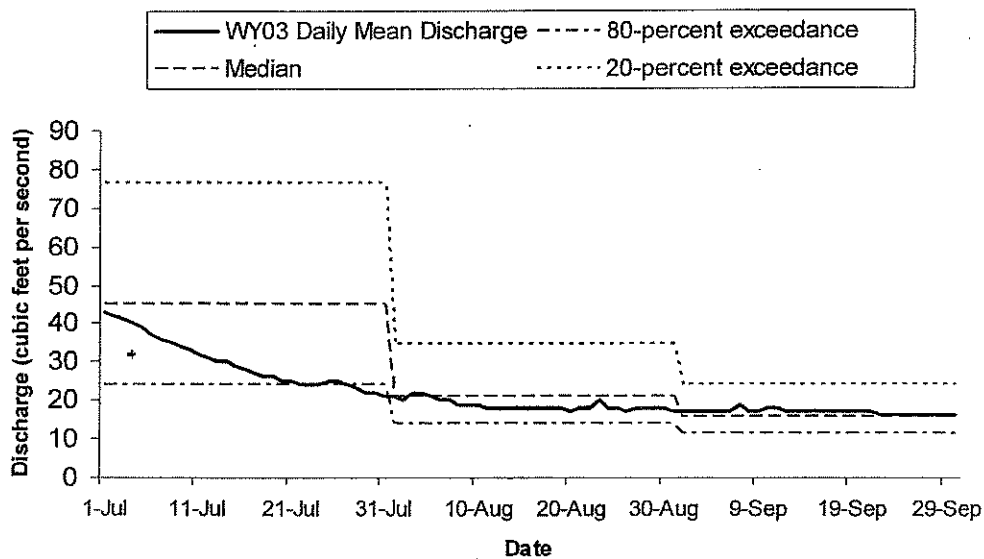


Figure 5. Graphical representation of Tables 4 and 5 for Big Timber Creek discharge (cfs) in summer, 2003 using continuous gaging data and exceedance estimates.

Table 5. Water resource records for Big Timber Creek upstream from diversion structures, 2003.

U.S. DEPARTMENT OF THE INTERIOR - U.S. GEOLOGICAL SURVEY - WATER RESOURCES
 STATION NUMBER 13303500 BIG TIMBER CREEK ABV DIVERSIONS NR LEADORE ID SOURCE AGENCY USGS STATE 16 COUNTY 059
 LATITUDE 443700 LONGITUDE 1132400 HAD27 DRAINAGE AREA 57.00 CONTRIBUTING DRAINAGE AREA 57* DATUM 6420. NGVD29
 Date Processed: 2004-01-05 09:38 By dfgreen
 Discharge, cubic feet per second
 WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	257	43	21	17
2	---	---	---	---	---	---	---	---	208	42	20	17
3	---	---	---	---	---	---	---	---	168	41	22	17
4	---	---	---	---	---	---	---	---	153	40	22	17
5	---	---	---	---	---	---	---	---	136	39	21	17
6	---	---	---	---	---	---	---	---	119	37	20	17
7	---	---	---	---	---	---	---	---	113	36	20	19
8	---	---	---	---	---	---	---	---	108	35	19	17
9	---	---	---	---	---	---	---	---	109	34	19	17
10	---	---	---	---	---	---	---	---	109	33	19	18
11	---	---	---	---	---	---	---	---	103	32	18	18
12	---	---	---	---	---	---	---	---	97	31	18	17
13	---	---	---	---	---	---	---	---	89	30	18	17
14	---	---	---	---	---	---	---	---	82	30	18	17
15	---	---	---	---	---	---	---	---	77	29	18	17
16	---	---	---	---	---	---	---	---	74	28	18	17
17	---	---	---	---	---	---	---	---	73	27	18	17
18	---	---	---	---	---	---	---	---	70	26	18	17
19	---	---	---	---	---	---	---	---	68	26	18	17
20	---	---	---	---	---	---	---	---	68	25	17	17
21	---	---	---	---	---	---	---	---	65	25	18	17
22	---	---	---	---	---	---	---	36	58	24	18	16
23	---	---	---	---	---	---	---	49	54	24	20	16
24	---	---	---	---	---	---	---	70	54	24	18	16
25	---	---	---	---	---	---	---	102	51	25	18	16
26	---	---	---	---	---	---	---	135	47	25	17	16
27	---	---	---	---	---	---	---	153	44	24	18	16
28	---	---	---	---	---	---	---	176	44	23	18	16
29	---	---	---	---	---	---	---	226	43	22	18	16
30	---	---	---	---	---	---	---	258	43	22	18	16
31	---	---	---	---	---	---	---	295	---	21	17	---
TOTAL	---	---	---	---	---	---	---	---	2784	923	580	505
MEAN	---	---	---	---	---	---	---	---	92.8	29.8	18.7	16.8
MAX	---	---	---	---	---	---	---	---	257	43	22	19
MIN	---	---	---	---	---	---	---	---	43	21	17	16
RED	---	---	---	---	---	---	---	---	76	28	18	17
AC-ET	---	---	---	---	---	---	---	---	5520	1830	1150	1000
CFSM	---	---	---	---	---	---	---	---	1.63	0.52	0.33	0.30

13303800 BIG TIMBER CREEK NEAR LEADORE, ID

LOCATION.-Lat 44°40'47", long 113°22'15", NE¼NW¼NW¼, sec. 33, T. 16N., R. 22E., Lemhi County, Hydrologic Unit 17060204, on left bank, 7 ft. above road crossing, and approximately 0.75 mile west of Leadore, ID.

PERIOD OF RECORD.-May 12, 2004 to current year.

GAGE.-Water-stage recorder.

REMARKS.-Unable to estimate daily discharges due to flow under various layers of ice during winter period. No discharge measurements made due to flow under layers of ice cover during much of the period November to March. Records are poor.

DISCHARGE (CFS), WATER YEAR 2006

MEAN DAILY VALUES

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	0.00	---
2	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	0.00	---
3	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	---	---
4	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	---	---
5	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	---	---
6	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	---	---
7	0.00	0.00	---	---	---	---	0.00	0.00	0.00	0.00	---	---
8	0.00	0.00	---	---	---	---	0.00	0.00	5.3	0.00	---	---
9	0.00	0.00	---	---	---	---	0.00	0.00	20	0.00	---	---
10	0.00	0.00	---	---	---	---	0.00	0.00	21	0.00	---	---
11	0.00	0.00	---	---	---	---	0.00	0.00	0.06	0.00	---	---
12	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	---	---
13	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	---	---
14	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	---	---
15	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	---	---
16	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	---	---
17	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	---	---
18	0.00	---	---	---	---	---	0.00	17	0.00	0.00	---	---
19	0.00	---	---	---	---	---	0.00	60	0.00	0.00	---	---
20	0.00	---	---	---	---	---	0.00	81	0.00	0.00	---	---
21	0.00	---	---	---	---	---	0.00	83	0.00	0.00	---	---
22	0.00	---	---	---	---	---	0.00	68	0.00	0.00	---	---
23	0.00	---	---	---	---	---	0.00	57	0.00	0.00	---	---
24	0.00	---	---	---	---	---	0.00	52	0.00	0.00	---	---
25	0.00	---	---	---	---	---	0.00	42	0.00	0.00	---	---
26	0.00	---	---	---	---	---	0.00	31	0.00	0.00	---	---
27	0.00	---	---	---	---	---	0.00	29	0.00	0.00	---	---
28	0.00	---	---	---	---	---	0.00	21	0.00	0.00	---	---
29	0.00	---	---	---	---	---	0.00	8.6	0.00	0.00	---	---
30	0.00	---	---	---	---	---	0.00	0.00	0.00	0.00	---	---
31	0.00	---	---	---	---	0.00	---	0.00	---	0.00	---	---
TOTAL	0	0	0	0	0	0	0	549.6	46.36	0	0	0
MEAN	0.000	0.000	---	---	---	0.000	0.000	17.8	1.5	0.000	0.000	---
MAX	0.00	0.00	---	---	---	0.00	0.00	83	21	0.00	0.00	---
MIN	0.00	0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	---
AC-FT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1090	92	0.00	0.00	0.00
CAL YEAR 2005 TOTAL	3			MEAN	0.013	MAX	3.0	MIN	0.000	AC-FT	6.0	
WTR YEAR 2006 TOTAL	596			MEAN	3.6	MAX	83.0	MIN	0.000	AC-FT	1182	

USGS Real-Time Water Data for USGS 13305310 LEMHI RIVER BELOW L5 DIVERSION N... Page 2 of 3

DATE	May 2006	Jun 2006
1	202 P	260 P
2	175 P	252 P
3	140 P	319 P
4	88 P	381 P
5	62 P	378 P
6	48 P	361 P
7	46 P	377 P
8	46 P	657 P
9	42 P	830 P
10	41 P	1,000 P
11	41 P	746 P
12	38 P	619 P
13	39 P	546 P
14	43 P	540 P
15	86 P	605 P
16	154 P	499 P
17	307 P	426 P
18	493 P	386 P
19	667 P	359 P
20	855 P	324 P
21	1,030 P	278 P
22	1,000 P	230 P
23	812 P	214 P
24	661 P	194 P
25	597 P	182 P
26	587 P	168 P
27	508 P	173 P
28	554 P	163 P
29	493 P	166 P
30	398 P	189 P
31	313 P	
COUNT	31	30
MAX	1,030	1,000
MIN	38	163

Explanation

P	Provisional data subject to revision.
---	---------------------------------------

Questions about data?
 Feedback on this web site
 USGS Surface-Water Daily Data for Idaho

[Top](#)
[Explanation of terms](#)

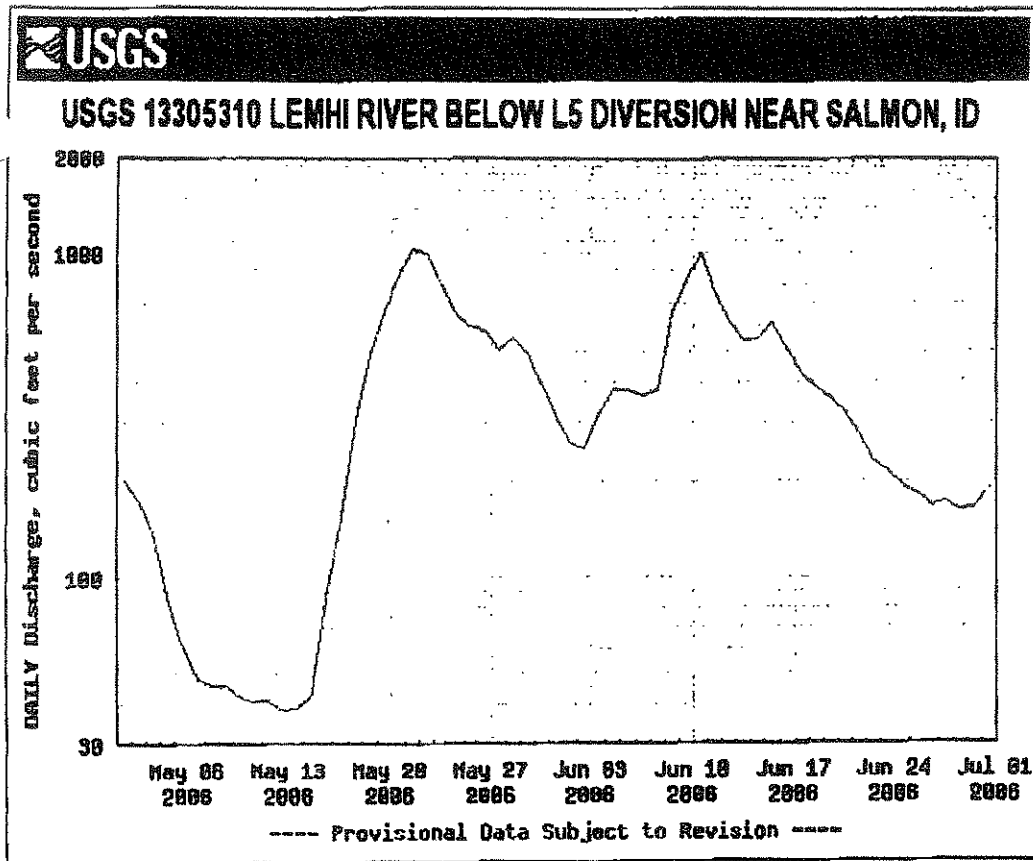


Exhibit No. 8



United States
Department of
Agriculture



NRCS

Natural
Resources
Conservation
Service

In cooperation with
United States Department
of the Interior, Bureau of
Land Management;
University of Idaho,
College of Agriculture; and
Idaho Soil Conservation
Commission

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



Exhibit No.	8
Date:	1-5-09
Whittaker	
T&T REPORTING	

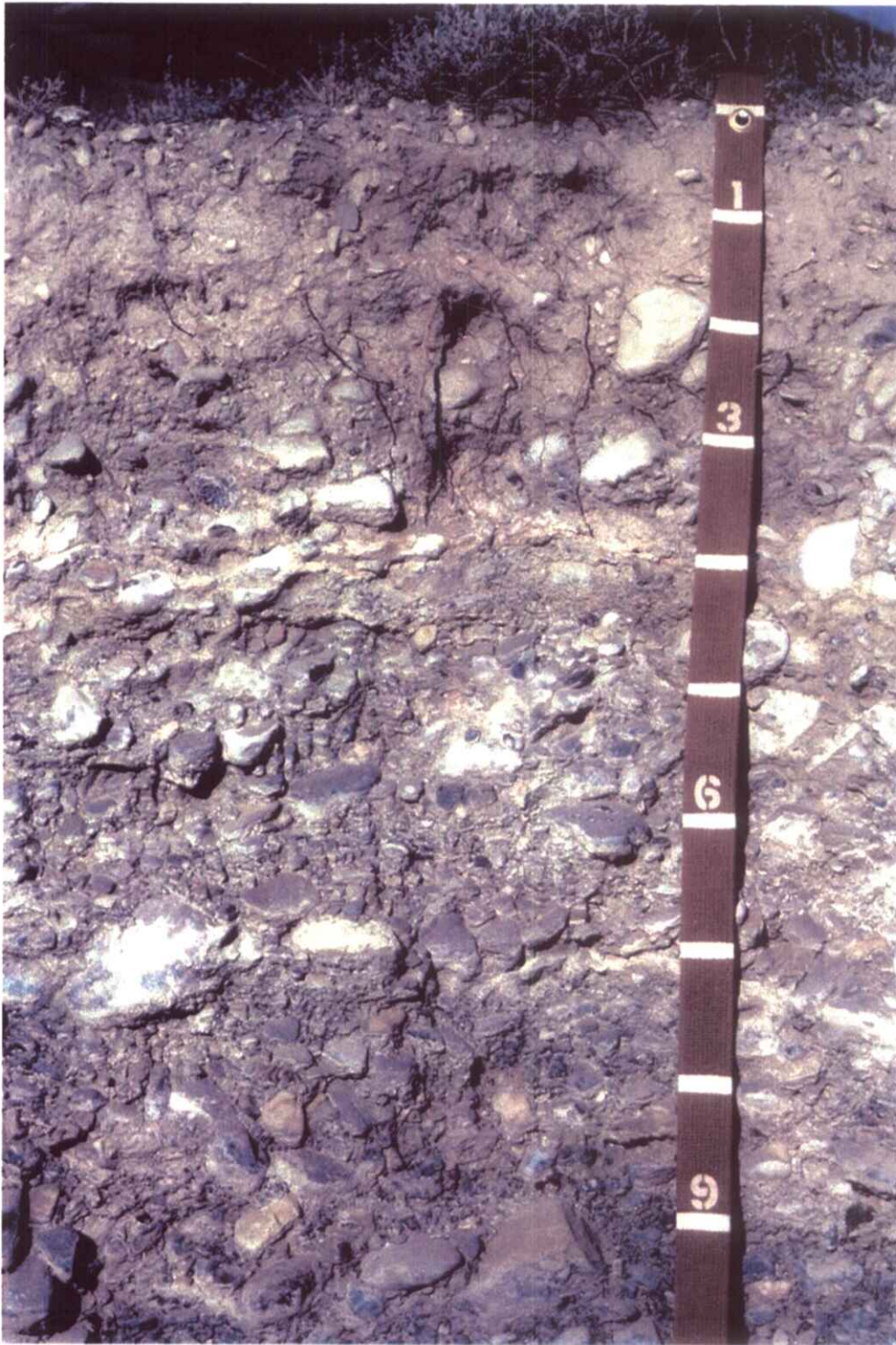


Figure 10.—Typical profile of Leatherman very gravelly loam in an area of Leatherman-Arbus complex, 2 to 6 percent slopes. This soil formed in alluvium derived from limestone. A duripan that restricts root penetration is at a depth of 30 centimeters (12 inches). The numerals on the tape are in decimeters.

coatings less than 2 millimeters thick on underside of rock fragments; strongly effervescent (50 percent calcium carbonate equivalent); slightly alkaline (pH 7.8); clear wavy boundary.

Bk—5 to 11 inches; yellowish brown (10YR 5/4) very gravelly loam, brown (10YR 4/3) moist; weak very fine and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine irregular pores and few very fine tubular pores; 55 percent gravel; lime and silica coatings less than 2 millimeters thick on underside of rock fragments; violently effervescent (more than 65 percent calcium carbonate equivalent); moderately alkaline (pH 8.0); abrupt wavy boundary.

2Bkqm—11 to 16 inches; light brownish gray (10YR 6/2) indurated duripan, dark grayish brown (10YR 4/2) moist; massive; laminar cap less than 2 millimeters thick at a depth of 11 inches; 70 percent gravel and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

2Bkq—16 to 60 inches; light gray (10YR 7/2) extremely gravelly loamy sand, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; many very fine and fine irregular pores; 65 percent gravel and 15 percent cobbles; silica and lime coatings less than 3 millimeters thick on underside of rock fragments cementing gravel and sand to rock fragments; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Profile:

Average annual soil temperature—37 to 42 degrees F

Average summer soil temperature—55 to 59 degrees F

Depth to duripan—9 to 15 inches

Reaction—slightly alkaline to strongly alkaline

Particle-size control section:

Clay content—12 to 20 percent

Rock fragment content—35 to 50 percent

Calcium carbonate equivalent—45 to 75 percent

A horizon:

Value—3 to 5 moist

Chroma—2 to 4 dry, 3 or 4 moist

Bk horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—3 or 4 dry

Rock fragment content—50 to 60 percent

2Bkqm horizon:

Value—6 or 7 dry, 3 to 5 moist

Chroma—2 to 4 dry or moist

Rock fragment content—70 to 85 percent

2Bkq horizon:

Chroma—2 or 3 dry

Texture—extremely gravelly loamy sand, extremely gravelly loamy coarse sand, or extremely gravelly sandy loam

Rock fragment content—75 to 85 percent

Leecreek Series

Taxonomic classification: Sandy-skeletal, mixed Fluvaquentic Cryaquepts

Calcium carbonate equivalent—2 to 10 percent
Reaction—slightly alkaline or moderately alkaline

Bg horizon:

Hue—10YR or 2.5Y
Value—4 or 5 dry, 3 or 4 moist
Chroma—1 or 2 dry or moist
Texture—loam or silt loam
Clay content—18 to 26 percent

2Cg1 horizon:

Hue—2.5Y or 5Y
Value—4 or 5 dry or moist
Texture—loamy sand or gravelly loamy sand
Coarse fragment content—5 to 20 percent

2Cg2 horizon:

Hue—2.5Y or 5Y
Value—4 or 5 dry or moist
Texture—extremely gravelly coarse sand or extremely gravelly loamy coarse sand
Rock fragment content—60 to 80 percent

Lemroi Series

Taxonomic classification: Loamy-skeletal, mixed, superactive Typic Cryaquolls

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Moderate in the upper part and very rapid in the lower part

Position on landscape: Flood plains and stream terraces

Parent material: Kind—alluvium; source—mixed

Slope range: 0 to 3 percent

Elevation: 4,900 to 7,400 feet

Average annual precipitation: 8 to 18 inches

Average annual air temperature: 36 to 42 degrees F

Frost-free period: 30 to 70 days

Typical Pedon Location

Map unit in which located: Fezip-Lemroi-Redfish complex, 0 to 2 percent slopes

Location in survey area: Lemhi County, Idaho; about 2 miles southwest of May; about 1,000 feet east and 1,100 feet south of the northwest corner of sec. 36, T. 15 N., R. 21 E.; lat. 44°35'30" N., long. 113°55'40" W.

Typical Pedon

Oe—3 inches to 0; moderately decomposed grass and roots.

A—0 to 8 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; common very fine and fine tubular pores; 2 percent gravel; moderately alkaline (pH 8.0); clear smooth boundary.

A2—8 to 11 inches; dark gray (10YR 4/1) silt loam, black (10YR 2/1) moist; few fine distinct dark grayish brown (10YR 4/2) masses of iron depletion; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; common very fine and fine tubular pores; 5 percent gravel; moderately alkaline (pH 7.8); clear smooth boundary.

A3—11 to 15 inches; dark gray (10YR 4/1) gravelly silt loam, black (10YR 2/1) moist;

common fine prominent light olive brown (2.5Y 5/4) masses of iron depletion; moderate medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 15 percent gravel; moderately alkaline (pH 7.8); clear wavy boundary.

Bg—15 to 23 inches; light gray (10YR 7/1) extremely gravelly loam, dark grayish brown (2.5Y 4/2) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine tubular pores; 70 percent fine gravel and 5 percent cobbles; moderately alkaline (pH 7.8); clear wavy boundary.

2Cg—23 to 60 inches; gray (10YR 6/1) extremely gravelly loamy coarse sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; common fine irregular pores; 75 percent gravel and 10 percent cobbles; moderately alkaline (pH 7.8).

Range in Characteristics

Profile:

Average annual soil temperature—34 to 36 degrees F

Depth to high water table—6 to 18 inches in April through October

Time of year flooding occurs—January through June

Depth to sand and gravel (2Cg horizon)—20 to 30 inches

Particle-size control section:

Clay content (average)—5 to 18 percent

Rock fragment content (average)—35 to 75 percent

A horizon:

Value—4 or 5 dry, 2 or 3 moist

Chroma—1 or 2 dry or moist

Bg horizon:

Texture—extremely gravelly loam or extremely gravelly sandy loam

Rock fragment content—60 to 90 percent

2Cg horizon:

Texture—extremely gravelly loamy sand or extremely gravelly loamy coarse sand

Rock fragment content—60 to 90 percent

Lesbut Series

Taxonomic classification: Sandy-skeletal, mixed, frigid Calcic Haploxerolls

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Moderate in the upper part and very rapid in the lower part

Position on landscape: Stream terraces and fan terraces

Parent material: Kind—alluvium; source—mixed

Slope range: 1 to 4 percent

Elevation: 5,200 to 6,600 feet

Average annual precipitation: 11 to 13 inches

Average annual air temperature: 38 to 40 degrees F

Frost-free period: 65 to 90 days

Typical Pedon Location

Map unit in which located: Darlington-Lesbut complex, 1 to 4 percent slopes

Location in survey area: Butte County, Idaho; about 2 miles southeast of Darlington;

Bkq horizon:

Value—4 to 8 dry, 3 to 6 moist

Chroma—2 to 4 dry or moist

Texture—very gravelly loam, very gravelly sandy loam, or extremely gravelly sandy loam

Clay content—7 to 15 percent

2Bkq and 2Bq horizons:

Texture—very gravelly sand, extremely gravelly loamy sand, or extremely gravelly loamy coarse sand

Whiteknob Series

Taxonomic classification: Sandy-skeletal, mixed, frigid Xeric Haplocalcids

Depth class: Very deep

Drainage class: Somewhat excessively drained

Permeability: Moderate in the upper part and very rapid in the lower part

Position on landscape: Outwash fans and fan terraces

Parent material: Kind—alluvium; source—quartzite

Slope range: 1 to 8 percent

Elevation: 5,000 to 6,700 feet

Average annual precipitation: 8 to 11 inches

Average annual air temperature: 38 to 44 degrees F

Frost-free period: 65 to 90 days

Typical Pedon Location

Map unit in which located: Whiteknob gravelly loam, 2 to 8 percent slopes (fig. 13)

Location in survey area: Lemhi County, Idaho; about 3 miles northwest of Leadore; about 1,900 feet west and 500 feet north of the southeast corner of sec. 24, T. 16 N., R. 26 E.

Typical Pedon

- A—0 to 4 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; moderate thin and medium platy structure parting to moderate very fine granular; soft, very friable, nonsticky and nonplastic; many very fine and fine and few medium roots; many very fine and fine tubular pores and many very fine irregular pores; 15 percent gravel; slightly effervescent; slightly alkaline (pH 7.4); clear wavy boundary.
- Bw—4 to 7 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and few medium roots; many very fine and fine tubular pores; 30 percent gravel and 1 percent cobbles; lime and silica coatings less than 1 millimeter thick on underside of rock fragments; strongly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.
- Bkq1—7 to 11 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak very fine subangular blocky structure parting to weak very fine granular; soft, very friable, nonsticky and nonplastic; common very fine and few fine and medium roots; common very fine and fine tubular pores; 50 percent gravel and 1 percent cobbles; lime and silica coatings 1 to 2 millimeters thick on sides and underside of rock fragments; violently effervescent (25 percent calcium carbonate equivalent); moderately alkaline (pH 8.0); clear wavy boundary.
- Bkq2—11 to 19 inches; light gray (10YR 7/2) extremely gravelly loamy coarse sand, pale brown (10YR 6/3) moist; massive; slightly hard, friable, nonsticky and

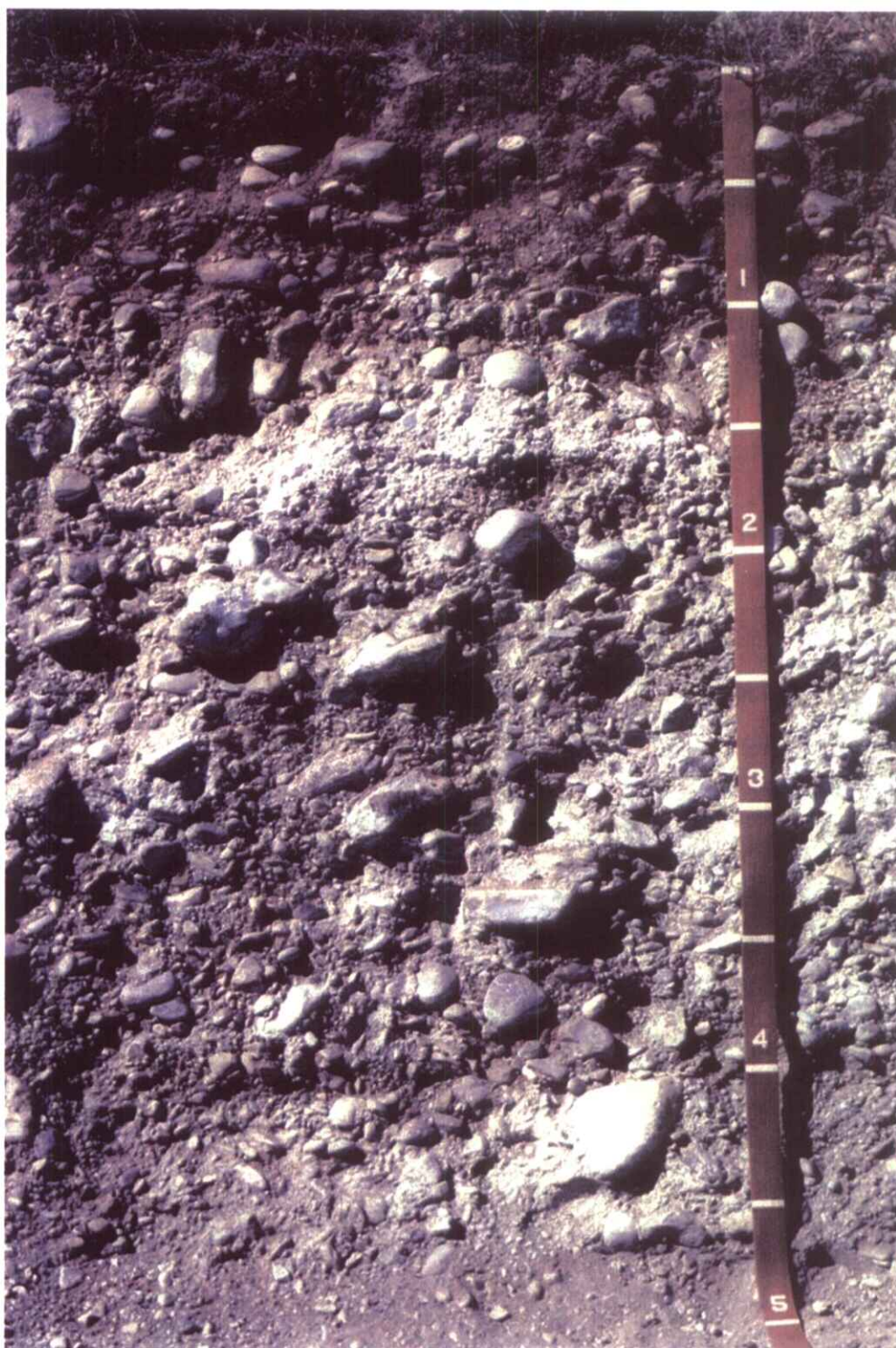


Figure 13.—Typical profile of Whiteknob gravelly loam, 2 to 8 percent slopes. This soil formed in alluvium derived from quartzite. Lime and silica coatings on underside of rock fragments between depths of 7 and 60 inches. The numerals on the tape are in feet.

nonplastic; common very fine and few fine and medium roots; common very fine and fine tubular pores; 65 percent gravel and 2 percent cobbles; lime and silica coatings 1 to 3 millimeters thick on underside and some sides of rock fragments; violently effervescent (35 percent calcium carbonate equivalent); moderately alkaline (pH 8.2); gradual wavy boundary.

Bkq3—19 to 37 inches; very pale brown (10YR 7/3) extremely gravelly loamy coarse sand, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; common very fine and fine roots; common fine irregular pores; 65 percent gravel and 5 percent cobbles; lime and silica coatings 1 to 5 millimeters thick on underside and some sides of rock fragments; violently effervescent (25 percent calcium carbonate equivalent); moderately alkaline (pH 8.4); gradual wavy boundary.

Bkq4—37 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly loamy coarse sand, dark brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine irregular pores; 65 percent gravel and 10 percent cobbles; lime and silica coatings 1 to 5 millimeters thick on underside and some sides of rock fragments; strongly effervescent (15 percent calcium carbonate equivalent); strongly alkaline (pH 8.6).

Range in Characteristics

Profile:

Average annual soil temperature—41 to 46 degrees F

Depth to calcic horizon—4 to 10 inches

Depth to sand and gravel (Bkq2 horizon)—8 to 20 inches

Particle-size control section:

Rock fragment content—50 to 80 percent

A horizon:

Value—5 or 6 dry, 3 or 4 moist

Chroma—2 or 3 dry or moist

Reaction—slightly alkaline or moderately alkaline

Bw and Bkq1 horizons:

Value—3 to 6 moist

Chroma—2 to 4 dry or moist

Texture—gravelly loam, very gravelly loam, very gravelly sandy loam, loam, or extremely gravelly sandy loam

Reaction—slightly alkaline or moderately alkaline

Bkq2, 2Bkq3, and Bkq4 horizons:

Value—4 to 6 moist

Chroma—2 to 4 dry or moist

Texture—very gravelly sand, extremely gravelly sand, or extremely gravelly loamy coarse sand

Reaction—moderately alkaline or strongly alkaline

Calcium carbonate equivalent—15 to 35 percent

Wiggleton Series

Taxonomic classification: Sandy-skeletal, mixed Xeric Haplocryolls

Depth class: Very deep

Drainage class: Somewhat excessively drained

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Challis, Grouse, and Salmon KSRA, Idaho)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
				°F	°F			In	In		
CHALLIS:											
January----	30.6	10.7	20.7	52	-19	2	0.48	0.20	0.75	1	3.9
February----	38.1	16.3	27.2	56	-11	4	0.35	0.09	0.55	1	1.9
March-----	47.1	23.7	35.4	67	4	35	0.46	0.21	0.68	1	1.7
April-----	57.3	31.0	44.2	78	16	167	0.53	0.18	0.85	1	0.9
May-----	66.9	39.0	52.9	87	24	403	1.12	0.52	1.64	4	0.1
June-----	76.5	46.4	61.4	95	32	641	1.10	0.51	1.60	3	0.0
July-----	86.0	51.5	68.7	98	38	890	0.68	0.19	1.12	1	0.0
August-----	83.8	49.6	66.7	97	36	826	0.68	0.27	1.03	2	0.0
September---	73.2	40.7	57.0	91	24	510	0.78	0.15	1.31	2	0.1
October----	60.8	31.6	46.2	80	14	224	0.41	0.13	0.71	1	0.1
November----	43.1	22.0	32.5	64	-3	24	0.54	0.16	0.85	1	2.6
December----	30.9	11.6	21.3	52	-18	1	0.58	0.18	0.94	2	4.2
Yearly:											
Average---	57.9	31.2	44.5	---	---	---	---	---	---	---	---
Extreme---	103	-34	---	99	-24	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,726	7.70	6.25	8.93	20	15.4

See footnote at end of table.

Table 1.--Temperature and Precipitation--Continued

	Temperature						Precipitation				
Month				2 years in 10 will have--		Average number of growing degree days*		2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--		Average	Less than--	More than--		
	°F	°F	°F	°F	°F	Units	In	In	In	In	
GROUSE:											
January----	28.2	-1.0	13.6	47	-34	0	1.31	0.46	2.02	3	14.8
February----	33.8	2.4	18.1	49	-28	0	1.05	0.54	1.70	3	12.7
March-----	40.9	11.6	26.3	57	-16	1	1.15	0.56	1.81	3	9.6
April-----	51.3	22.8	37.1	73	2	55	1.04	0.28	1.65	3	4.1
May-----	61.9	30.8	46.4	80	15	213	1.57	0.73	2.40	4	1.6
June-----	70.3	37.2	53.7	86	23	410	1.72	0.82	2.50	5	0.0
July-----	79.8	40.4	60.1	90	28	622	0.98	0.25	1.56	2	0.0
August-----	78.7	39.1	58.9	91	25	584	1.05	0.24	1.75	3	0.0
September---	69.5	31.0	50.2	86	13	318	0.90	0.24	1.47	2	0.6
October-----	57.7	22.3	40.0	76	2	91	0.59	0.25	1.00	2	0.7
November----	40.4	12.8	26.6	60	-15	3	1.19	0.56	1.81	4	8.4
December----	29.3	0.6	15.0	48	-31	0	1.33	0.46	2.14	4	17.1
Yearly:											
Average---	53.5	20.8	37.2	---	---	---	---	---	---	---	---
Extreme---	94	-42	---	93	-37	---	---	---	---	---	---
Total-----	---	---	---	---	---	2,297	13.89	10.47	16.49	38	69.5

See footnote at end of table.

Table 1.--Temperature and Precipitation--Continued

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
				°F	°F		In	In	In		In
SALMON KSRA:											
January----	29.9	11.2	20.6	51	-22	1	0.71	0.36	1.01	2	8.3
February----	38.6	17.2	27.9	58	-14	5	0.52	0.18	0.84	1	4.3
March-----	50.3	25.7	38.0	71	6	55	0.56	0.33	0.82	2	2.4
April-----	61.4	31.8	46.6	84	17	218	0.72	0.23	1.12	2	1.3
May-----	69.8	38.9	54.4	90	24	444	1.47	0.79	2.06	5	0.1
June-----	79.5	46.2	62.9	98	32	686	1.27	0.64	1.83	4	0.0
July-----	88.6	51.0	69.8	102	38	923	1.01	0.23	1.63	3	0.0
August-----	86.4	48.8	67.6	100	37	855	0.96	0.45	1.40	3	0.0
September---	75.1	40.1	57.6	94	24	527	0.81	0.20	1.35	2	0.0
October-----	60.9	30.8	45.8	81	13	210	0.51	0.18	0.82	1	0.1
November----	43.0	23.0	33.0	63	-3	24	0.74	0.26	1.13	2	3.7
December----	30.8	12.8	21.8	54	-17	1	0.80	0.29	1.22	2	8.2
Yearly:											
Average----	59.5	31.5	45.5	---	---	---	---	---	---	---	---
Extreme----	105	-34	---	102	-26	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,949	10.08	8.18	11.88	29	28.3

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.--Freeze Dates in Spring and Fall
 (Recorded in the period 1961-90 at Challis, Grouse, and
 Salmon KSRA, Idaho)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
CHALLIS:			
Last freezing temperature in spring:			
1 year in 10 later than--	May 5	May 27	June 18
2 years in 10 later than--	May 1	May 21	June 10
5 years in 10 later than--	April 23	May 10	May 25
First freezing temperature in fall:			
1 year in 10 earlier than--	September 23	September 15	September 7
2 years in 10 earlier than--	September 29	September 20	September 11
5 years in 10 earlier than--	October 11	September 30	September 19
GROUSE:			
Last freezing temperature in spring:			
1 year in 10 later than--	June 19	July 11	July 27
2 years in 10 later than--	June 10	July 3	July 20
5 years in 10 later than--	May 25	June 19	July 8
First freezing temperature in fall:			
1 year in 10 earlier than--	August 27	August 7	August 1
2 years in 10 earlier than--	September 1	August 14	August 7
5 years in 10 earlier than--	September 11	August 27	August 17

Table 2.--Freeze Dates in Spring and Fall--Continued

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
SALMON KSRA:			
Last freezing temperature in spring:			
1 year in 10 later than--	May 3	May 24	June 11
2 years in 10 later than--	April 28	May 18	June 5
5 years in 10 later than--	April 20	May 7	May 25
First freezing temperature in fall:			
1 year in 10 earlier than--	September 23	September 19	September 9
2 years in 10 earlier than--	September 28	September 23	September 12
5 years in 10 earlier than--	October 8	October 2	September 18

Table 3.--Growing Season

(Recorded in the period 1961-90 at Challis,
Grouse, and Salmon KSRA, Idaho)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
CHALLIS:			
9 years in 10	148	119	87
8 years in 10	155	126	97
5 years in 10	169	141	115
2 years in 10	183	156	134
1 year in 10	191	163	144
GROUSE:			
9 years in 10	78	40	13
8 years in 10	88	50	22
5 years in 10	108	69	39
2 years in 10	128	89	57
1 year in 10	138	99	66
SALMON KSRA:			
9 years in 10	147	124	98
8 years in 10	155	132	104
5 years in 10	170	147	115
2 years in 10	185	162	126
1 year in 10	193	169	132

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(The "N" column indicates nonirrigated areas; the "I" columns indicate irrigated areas.
Yields are those that can be expected under a high level of management. Absence of a
yield indicates that the soil is not suited to the crop or the crop generally is not
grown on the soil)

Map symbol and soil name	Land capability		Alfalfa hay	Barley	Grass hay	Oats	Pasture
	N	I	I	I	I	I	I
			Tons	Bu	Tons	Bu	AUM
1: Alpinepeak-----	6s	6s	---	---	---	---	2.00
2: Aguents-----	8	---	---	---	---	---	---
Riverwash-----	8	---	---	---	---	---	---
3: Arbus-----	6s	---	---	---	---	---	---
4: Arco-----	4c	3w	4.00	---	4.00	---	10.00
5: Badland-----	8	---	---	---	---	---	---
Millhi-----	7e	---	---	---	---	---	---
6: Bartonflat-----	6e	4e	3.00	---	---	---	8.00
7: Bartonflat-----	6s	6e	3.00	---	---	---	8.00
8: Bartonhill-----	6s	4e	3.00	---	---	---	8.00
Whitecloud-----	6s	4e	4.00	---	---	---	8.00
9: Bayhorse, north----	7e	---	---	---	---	---	---
Bayhorse, south----	7e	---	---	---	---	---	---
10: Bayhorse-----	6e	---	---	---	---	---	---
Dawtonia-----	6e	---	---	---	---	---	---
11: Bigflat-----	6e	3e	3.00	65.00	---	---	4.00
Dacont-----	6e	4e	---	---	---	---	---
12: Bigloast-----	6s	6s	---	---	---	---	---
Copperbasin-----	6c	6c	---	---	---	---	3.50
13: Bigrant, very poorly drained----	5w	---	---	---	---	---	---
Bigrant, poorly drained-----	4w	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay	Barley	Grass hay	Oats	Pasture
	N	I	I	I	I	I	I
			Tons	Bu	Tons	Bu	ADU
14:							
Bigrant-----	4w	4w	---	---	---	---	---
Thosand-----	5w	5w	---	---	---	---	---
Dickeypeak-----	6s	6s	---	---	2.50	---	4.00
15:							
Blackfoot-----	6c	3c	5.00	90.00	---	---	12.00
16:							
Blackfoot-----	6c	3c	5.00	90.00	---	---	12.00
Borco-----	6s	4s	---	70.00	---	---	7.00
17:							
Bluedome-----	6e	---	---	---	---	---	---
18:							
Bock-----	6e	3e	4.00	70.00	---	---	10.00
Breitenbach-----	6e	3e	4.00	100.00	---	---	---
19:							
Bock-----	6e	3c	4.00	75.00	---	---	10.00
Bromaglin-----	6s	4e	---	---	---	---	---
20:							
Bockston-----	6e	---	---	---	---	---	---
21:							
Brabas-----	7e	---	---	---	---	---	---
Heathcoat-----	6s	---	---	---	---	---	---
22:							
Breitenbach-----	6c	3c	4.00	100.00	---	---	---
23:							
Breitenbach-----	6e	3e	4.00	100.00	---	---	---
24:							
Breitenbach-----	6e	3e	4.00	100.00	---	---	---
25:							
Bunting-----	4c	---	---	---	---	---	---
26:							
Bunting-----	4c	---	---	---	---	---	---
27:							
Bunting-----	4c	---	---	---	---	---	---
Moffspring-----	4c	---	---	---	---	---	---
28:							
Bursteadt-----	3w	3w	---	---	4.00	---	7.00
Tohobit-----	4w	4w	---	---	4.00	---	7.00

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay	Barley	Grass hay	Oats	Pasture
	N	I	I	I	I	I	I
			Tons	Bu	Tons	Bu	AUM
29:							
Busterback-----	6s	6s	---	---	---	---	---
Wiggleton-----	6s	6s	---	---	---	---	---
30:							
Caloids-----	7e	---	---	---	---	---	---
Badland-----	8	---	---	---	---	---	---
Xerolls-----	6e	---	---	---	---	---	---
31:							
Caloids-----	7e	---	---	---	---	---	---
Rubble land-----	8	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---
32:							
Castlepeak-----	7s	6s	---	---	---	---	---
Yankeeefork-----	6s	6s	---	---	---	---	---
33:							
Chamberlain-----	6s	6e	---	---	---	---	---
34:							
Coalkiln-----	7e	---	---	---	---	---	---
Zeelnot-----	7e	---	---	---	---	---	---
35:							
Copperbasin-----	6c	6c	---	---	---	---	3.50
Redfish-----	5w	5w	---	---	---	---	---
36:							
Copperbasin-----	6c	6c	---	---	---	---	3.50
Redfish-----	5w	5w	---	---	---	---	---
37:							
Cowbone-----	5w	5w	---	---	3.00	---	5.00
Tohobit-----	4w	4w	---	---	4.00	---	7.00
38:							
Cronks-----	6e	---	---	---	---	---	---
Challis-----	6e	---	---	---	---	---	---
39:							
Cronks-----	7s	---	---	---	---	---	---
Venum-----	6e	---	---	---	---	---	---
40:							
Cryolls-----	7e	---	---	---	---	---	---
Rubble land-----	8	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay	Barley	Grass hay	Oats	Pasture
	N	I	I	I	I	I	I
			Tons	Bu	Tons	Bu	AUM
104:							
Klug-----	6e	---	---	---	---	---	---
105:							
Klug-----	7e	---	---	---	---	---	---
Gaciba-----	7e	---	---	---	---	---	---
Dacont-----	6e	---	---	---	---	---	---
106:							
Klug-----	7e	---	---	---	---	---	---
Povey-----	7e	---	---	---	---	---	---
107:							
Klug-----	7e	---	---	---	---	---	---
Povey-----	7e	---	---	---	---	---	---
108:							
Klug-----	7e	---	---	---	---	---	---
Zeebar-----	6e	---	---	---	---	---	---
109:							
Lacrol-----	6e	---	---	---	---	---	---
Friedman-----	4e	---	---	---	---	---	---
110:							
Lag-----	6e	---	---	---	---	---	---
111:							
Lag-----	7e	---	---	---	---	---	---
112:							
Lag-----	7e	---	---	---	---	---	---
Klug-----	7e	---	---	---	---	---	---
113:							
Langer-----	6e	---	---	---	---	---	---
114:							
Leadore-----	6e	4e	3.50	70.00	---	100.00	8.00
115:							
Leatherman-----	7s	---	---	---	---	---	---
Arbus-----	6s	---	---	---	---	---	---
116:							
Leatherman-----	7s	---	---	---	---	---	---
Bluedome-----	6e	---	---	---	---	---	---
117:							
Lemco-----	6e	---	---	---	---	---	---
Friedman-----	6e	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay	Barley	Grass hay	Oats	Pasture
	N	I	I	I	I	I	I
			Tons	Bu	Tons	Bu	AUM
118:							
Lemhi-----	4w	4w	---	---	2.50	---	4.50
Copperbasin-----	4s	4s	---	---	---	---	4.50
Lilylake-----	5w	5w	---	---	---	---	---
119:							
Lemroi-----	4w	4w	---	---	2.50	---	4.50
Leecreek-----	4w	4w	---	---	2.50	---	4.50
120:							
Lemroi-----	4w	4w	---	---	2.50	---	4.50
Leecreek-----	4w	4w	---	---	2.50	---	4.50
Grandjean-----	5w	5w	---	---	---	---	---
121:							
Lesbut-----	6s	4s	3.00	70.00	---	---	5.00
122:							
Lilylake-----	5w	5w	---	---	---	---	---
Grandjean-----	5w	5w	---	---	---	---	---
123:							
Mahaffey-----	4s	4s	---	---	---	---	4.50
Copperbasin-----	4s	4s	---	---	---	---	4.50
Wiskisprings-----	5w	5w	---	---	---	---	4.00
124:							
Meegernot-----	6e	---	---	---	---	---	---
125:							
Meegero-----	6e	---	---	---	---	---	---
Zeale-----	6e	---	---	---	---	---	---
126:							
Millhi-----	6e	---	---	---	---	---	---
127:							
Millhi-----	6e	---	---	---	---	---	---
128:							
Millhi-----	6e	---	---	---	---	---	---
Millhi, eroded-----	7e	---	---	---	---	---	---
129:							
Millhi-----	6e	---	---	---	---	---	---
Badland-----	8	---	---	---	---	---	---
130:							
Millhi-----	6e	---	---	---	---	---	---
Lacrol-----	6e	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay	Barley	Grass hay	Oats	Pasture
	N	I	I	I	I	I	I
			Tons	Bu	Tons	Bu	AUM
131:							
Misfire-----	6e	---	---	---	---	---	---
Pattee-----	6e	---	---	---	---	---	---
Dawtonia-----	7e	---	---	---	---	---	---
132:							
Mitring-----	7e	---	---	---	---	---	---
Holinrock-----	6e	---	---	---	---	---	---
133:							
Mogg-----	7e	---	---	---	---	---	---
Dawtonia-----	7e	---	---	---	---	---	---
134:							
Mooretown-----	4w	---	---	---	---	---	---
Blackfoot-----	3w	2w	4.50	75.00	---	---	10.00
Borah-----	5w	5w	---	---	4.00	---	10.00
135:							
Mooretown-----	6c	3c	---	75.00	---	---	8.00
Borco-----	6s	4s	---	70.00	---	---	7.00
136:							
Morphey-----	3e	3e	5.00	---	---	---	---
137:							
Morphey-----	3e	3e	5.00	---	---	---	---
138:							
Mountainboy-----	6s	---	---	---	---	---	---
139:							
Mountainboy-----	6s	---	---	---	---	---	---
140:							
Nicholia-----	6s	---	---	---	---	---	---
Goosebury-----	6e	---	---	---	---	---	---
141:							
Nielsen-----	7e	---	---	---	---	---	---
Gaciba-----	7e	---	---	---	---	---	---
142:							
Nitchly-----	7e	---	---	---	---	---	---
Skibo-----	6e	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---
143:							
Nurkey-----	6e	---	---	---	---	---	---
Zeebar-----	6e	---	---	---	---	---	---
Hutchley-----	6e	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay	Barley	Grass hay	Oats	Pasture
	N	I	I Tons	I Bu	I Tons	I Bu	I AUM
215:							
Thosand-----	5w	5w	---	---	---	---	---
Chillybu-----	5w	5w	---	---	---	---	---
216:							
Thosand-----	5w	5w	---	---	---	---	---
Sancrane-----	5w	5w	---	---	---	---	---
217:							
Thosand-----	5w	5w	---	---	---	---	---
Wiskisprings-----	5w	5w	---	---	---	---	4.00
218:							
Threedot-----	6e	---	---	---	---	---	---
219:							
Threedot-----	6e	---	---	---	---	---	---
220:							
Threedot, dry-----	7e	---	---	---	---	---	---
Threedot-----	7e	---	---	---	---	---	---
221:							
Typic Cryaquepts---	5w	---	---	---	---	---	---
222:							
Ureal-----	6e	---	---	---	---	---	---
Zeebar-----	6e	---	---	---	---	---	---
Dacont-----	6e	---	---	---	---	---	---
223:							
Venum-----	7e	---	---	---	---	---	---
Cronks-----	7s	---	---	---	---	---	---
224:							
Venum-----	7e	---	---	---	---	---	---
Rock outcrop-----	8	---	---	---	---	---	---
225:							
Venum-----	7e	---	---	---	---	---	---
Custco-----	6e	---	---	---	---	---	---
226:							
Whitecloud-----	6s	6s	2.50	---	---	---	7.00
227:							
Whitecloud-----	6s	---	---	---	---	---	---
228:							
Whitecloud-----	6s	---	---	---	---	---	---
Sanfelipe-----	6e	---	---	---	---	---	---
Padow-----	7s	---	---	---	---	---	---

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability		Alfalfa hay	Barley	Grass hay	Oats	Pasture
	N	I	I	I	I	I	I
			Tons	Bu	Tons	Bu	AUM
229:							
Whitecloud-----	6s	4s	4.00	---	---	---	8.00
Simeroi-----	6e	3e	4.00	---	---	---	8.00
230:							
Whiteknob-----	6s	4s	---	---	---	---	8.00
231:							
Whiteknob-----	6s	4s	---	---	---	---	8.00
Leadore-----	6e	4e	---	---	---	---	8.00
232:							
Whiteknob-----	6s	4s	---	---	---	---	8.00
Zer-----	6e	4e	---	---	---	---	---
233:							
Wiggleton-----	6s	---	---	---	---	---	---
234:							
Wiggleton-----	6s	6a	---	---	---	---	---
Copperbasin-----	6c	6c	---	---	---	---	3.50
235:							
Wimpey-----	4w	4w	---	---	2.50	---	6.25
Zeph-----	4w	4w	---	---	1.50	---	3.00
Ajax-----	5w	5w	---	---	2.50	---	6.25
236:							
Windcoat-----	6e	---	---	---	---	---	---
237:							
Windcoat-----	6e	---	---	---	---	---	---
Fandow-----	7a	---	---	---	---	---	---
238:							
Wiskisprings-----	5w	5w	---	---	2.00	---	4.00
Biglost-----	6s	6s	---	---	---	---	2.00
239:							
Wiskisprings-----	5w	5w	---	---	2.00	---	4.00
Biglost-----	6s	6s	---	---	---	---	2.00
Copperbasin-----	6c	6c	---	---	2.00	---	3.50
240:							
Xeric Torrifluvents	4e	---	---	---	---	---	---
241:							
Yearian-----	5w	5w	---	---	---	---	5.00
242:							
Yearian-----	6w	6w	---	---	---	---	5.00

Table 6.--Ecological Sites, Forest Habitat Types, and Characteristic Plant Communities

(Composition of ecological sites based on percent weight; composition of forest understory based on percent canopy cover. Absence of an entry indicates that an ecological site was not assigned)

Map symbol and soil name	Ecological site or forest habitat type	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry Weight		Forest	Range
			Lb/acre		Pct	Pct
1: Alpinepeak-----	SEMIWET MEADOW CAREX (R012XY023ID)	Favorable	1,500	Sedge		30
		Normal	1,100	Wheatgrass		25
		Unfavorable	650	Basin wildrye		10
				Other perennial forbs		10
				Willow		5
2: Aguents. Riverwash.						
3: Arbus-----	SHALLOW GRAVELLY LOAM 8-12 ARAR8/PSSP6 (R012XY028ID)	Favorable	650	Bluebunch wheatgrass		40
		Normal	350	Low sagebrush		30
		Unfavorable	200	Other shrubs		10
				Hood's phlox		5
				Sandberg bluegrass		5
				Other perennial forbs		5
				Indian ricegrass		3
				Wheatgrass		2
4: Arco-----	SEMIWET MEADOW (R012XY039ID)	Favorable	4,000	Sedge		20
		Normal	2,250	Shrubby cinquefoil		20
		Unfavorable	1,600	Mountain brome		10
				Tufted hairgrass		10
				Basin wildrye		5
				Cinquefoil		5
				Clover		5
5: Badland. Millhi-----	FRAGILE LANDS 7-9 ATCO/LESAS2 (R012XY019ID)	Favorable	300	Shadscale saltbush		20
		Normal	150	Indian ricegrass		15
		Unfavorable	75	Hood's phlox		10
				Sandberg bluegrass		10
				Bottlebrush squirreltail		10
				Bud sagebrush		10
				Wyoming big sagebrush		5
				Bluebunch wheatgrass		5
				Other perennial forbs		5
				Other shrubs		5
				Woollypod milkvetch		5
6: Bartonflat-----	GRAVELLY LOAM 8-12 ARTRWS/PSSP6 (R012XY004ID)	Favorable	500	Bluebunch wheatgrass		45
		Normal	325	Wyoming big sagebrush		20
		Unfavorable	250	Other shrubs		10
				Hood's phlox		5
				Indian ricegrass		5
				Sandberg bluegrass		5
				Bottlebrush squirreltail		5
				Other perennial forbs		5

Table 6.--Ecological Sites, Forest Habitat Types, and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site or forest habitat type	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry Weight		Forest	Range
			Lb/acre		Pct	Pct
111: Lag-----	DOUGLAS FIR/PINEGRASS (CDG113)	Favorable	---	Pinegrass	20	
		Normal	---	Other shrubs	15	
		Unfavorable	---	Bluebunch wheatgrass	10	
				Mountain big sagebrush	10	
				Myrtle pachystima	10	
				Idaho fescue	5	
				Blue wildrye	5	
				Heartleaf arnica	5	
				Longleaf hawksbeard	5	
				Other perennial forbs	5	
				Other perennial grasses	5	
				Whortleleaf snowberry	5	
112: Lag-----	DOUGLAS FIR/PINEGRASS (CDG113)	Favorable	---	Pinegrass	20	
		Normal	---	Other shrubs	15	
		Unfavorable	---	Bluebunch wheatgrass	10	
				Mountain big sagebrush	10	
				Myrtle pachystima	10	
				Idaho fescue	5	
				Blue wildrye	5	
				Heartleaf arnica	5	
				Longleaf hawksbeard	5	
				Other perennial forbs	5	
				Other perennial grasses	5	
				Whortleleaf snowberry	5	
Klug-----	NORTH SLOPE LOAMY 12-16 ARTR4/FEID (R012XY010ID)	Favorable	900	Idaho fescue		35
		Normal	600	Threetip sagebrush		20
		Unfavorable	450	Bluebunch wheatgrass		10
				Nevada bluegrass		5
				Sandberg bluegrass		5
				Lupine		5
				Mountain big sagebrush		5
				Other perennial forbs		5
				Prairie Junegrass		5
113: Langer-----	SOUTH SLOPE LOAMY 13-16 ARTRV/FEID (043AY013ID)	Favorable	1,300	Idaho fescue		35
		Normal	900	Bluebunch wheatgrass		20
		Unfavorable	400	Mountain big sagebrush		20
				Sandberg bluegrass		5
				Arrowleaf balsamroot		5
				Other perennial grasses		5
				Other shrubs		5
114: Leadore-----	GRAVELLY LOAM 8-12 ARTRWS/PSSP6 (R012XY004ID)	Favorable	650	Bluebunch wheatgrass		40
		Normal	400	Wyoming big sagebrush		20
		Unfavorable	250	Indian ricegrass		5
				Sandberg bluegrass		5
				Other perennial forbs		5
				Other perennial grasses		5
				Other shrubs		5
				Phlox		5

Table 6.--Ecological Sites, Forest Habitat Types, and Characteristic Plant Communities--Continued

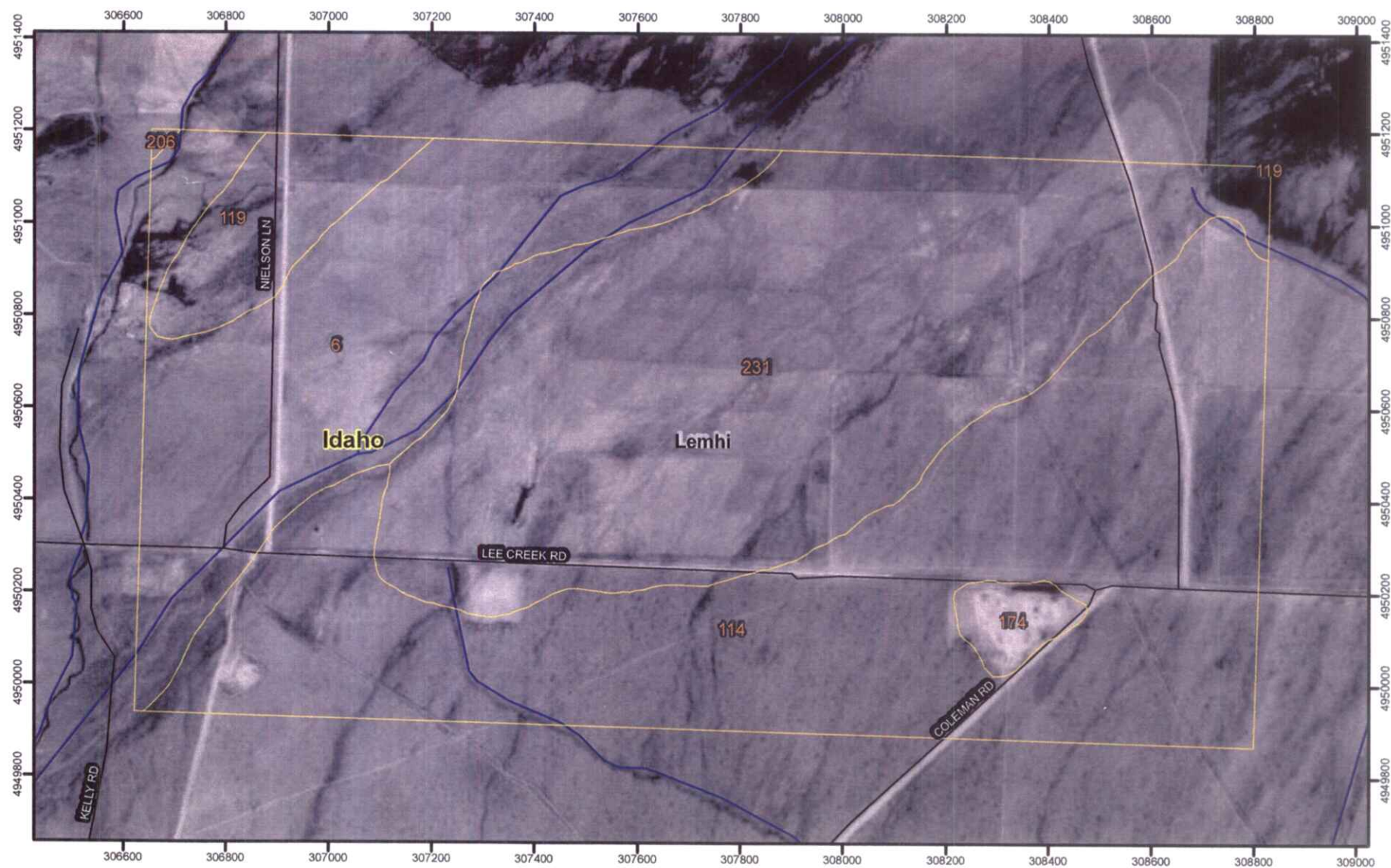
Map symbol and soil name	Ecological site or forest habitat type	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry Weight		Forest	Range
			Lb/acre		Pct	Pct
115:						
Leatherman-----	SHALLOW GRAVELLY LOAM 8-12 ARAR8/PSSP6 (R012XY028ID)	Favorable	650	Bluebunch wheatgrass		38
		Normal	350	Low sagebrush		30
		Unfavorable	200	Hood's phlox		5
				Indian ricegrass		5
				Sandberg bluegrass		5
				Other perennial forbs		5
				Other perennial grasses		5
				Other shrubs		5
				Wheatgrass		2
Arbus-----	SHALLOW GRAVELLY LOAM 8-12 ARAR8/PSSP6 (R012XY028ID)	Favorable	650	Bluebunch wheatgrass		40
		Normal	350	Low sagebrush		30
		Unfavorable	200	Other shrubs		10
				Hood's phlox		5
				Sandberg bluegrass		5
				Other perennial forbs		5
				Indian ricegrass		3
				Wheatgrass		2
116:						
Leatherman-----	SHALLOW GRAVELLY LOAM 8-12 ARAR8/PSSP6 (R012XY028ID)	Favorable	650	Bluebunch wheatgrass		38
		Normal	350	Low sagebrush		30
		Unfavorable	200	Hood's phlox		5
				Indian ricegrass		5
				Sandberg bluegrass		5
				Other perennial forbs		5
				Other perennial grasses		5
				Other shrubs		5
				Wheatgrass		2
Bluedome-----	GRAVELLY LOAM 8-12 ARTRW8/PSSP6 (R012XY004ID)	Favorable	650	Bluebunch wheatgrass		45
		Normal	400	Wyoming big sagebrush		20
		Unfavorable	250	Other perennial grasses		10
				Other shrubs		10
				Hood's phlox		5
				Sandberg bluegrass		5
				Other perennial forbs		5
117:						
Lemco-----	DOUGLAS FIR/PINEGRASS (CDG113)	Favorable	---	Pinegrass	20	
		Normal	---	Idaho fescue	10	
		Unfavorable	---	Bluebunch wheatgrass	10	
				Mountain big sagebrush	10	
				Other perennial forbs	10	
				Other shrubs	10	
				Blue wildrye	5	
				Heartleaf arnica	5	
				Longleaf hawksbeard	5	
				Mountain brome	5	
				Other perennial grasses	5	
				Whortleleaf snowberry	5	
Friedman-----	LOAMY 16-22 ARTRV/FEID (R012XY021ID)	Favorable	1,500	Idaho fescue		40
		Normal	800	Mountain big sagebrush		15
		Unfavorable	500	Bluebunch wheatgrass		10
				Arrowleaf balsamroot		5
				Longleaf hawksbeard		5
				Mountain brome		5
				Other perennial forbs		5
				Other perennial grasses		5
				Other shrubs		5
				Whortleleaf snowberry		5

Table 6.--Ecological Sites, Forest Habitat Types, and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site or forest habitat type	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry Weight		Forest	Range
			Lb/acre		Pct	Pct
229: Whitecloud-----	GRAVELLY LOAM 8-12 ARTRWS/PSSP6 (R012XY004ID)	Favorable	600	Bluebunch wheatgrass		40
		Normal	400	Wyoming big sagebrush		20
		Unfavorable	250	Other perennial grasses		10
				Hood's phlox		5
				Indian ricegrass		5
				Sandberg bluegrass		5
				Other perennial forbs		5
				Other shrubs		5
Simeroi-----	GRAVELLY LOAM 8-12 ARTRWS/PSSP6 (R012XY004ID)	Favorable	650	Bluebunch wheatgrass		40
		Normal	400	Wyoming big sagebrush		20
		Unfavorable	250	Hood's phlox		5
				Indian ricegrass		5
				Sandberg bluegrass		5
				Needleandthread		5
				Other perennial forbs		5
				Other perennial grasses		5
230: Whiteknob-----	GRAVELLY LOAM 8-12 ARTRWS/PSSP6 (R012XY004ID)	Favorable	600	Bluebunch wheatgrass		45
		Normal	400	Wyoming big sagebrush		20
		Unfavorable	250	Hood's phlox		5
				Indian ricegrass		5
				Sandberg bluegrass		5
				Needleandthread		5
				Other perennial forbs		5
				Other perennial grasses		5
231: Whiteknob-----	GRAVELLY LOAM 8-12 ARTRWS/PSSP6 (R012XY004ID)	Favorable	600	Bluebunch wheatgrass		45
		Normal	400	Wyoming big sagebrush		20
		Unfavorable	250	Hood's phlox		5
				Indian ricegrass		5
				Sandberg bluegrass		5
				Needleandthread		5
				Other perennial forbs		5
				Other perennial grasses		5
Leadore-----	GRAVELLY LOAM 8-12 ARTRWS/PSSP6 (R012XY004ID)	Favorable	650	Bluebunch wheatgrass		40
		Normal	400	Wyoming big sagebrush		20
		Unfavorable	250	Indian ricegrass		5
				Sandberg bluegrass		5
				Other perennial forbs		5
				Other perennial grasses		5
				Other shrubs		5
				Phlox		5
232: Whiteknob-----	GRAVELLY LOAM 8-12 ARTRWS/PSSP6 (R012XY004ID)	Favorable	600	Bluebunch wheatgrass		45
		Normal	400	Wyoming big sagebrush		20
		Unfavorable	250	Hood's phlox		5
				Indian ricegrass		5
				Sandberg bluegrass		5
				Needleandthread		5
				Other perennial forbs		5
				Other perennial grasses		5
Zer-----	GRAVELLY LOAM 8-12 ARTRWS/PSSP6 (R012XY004ID)	Favorable	650	Bluebunch wheatgrass		40
		Normal	450	Wyoming big sagebrush		25
		Unfavorable	250	Hood's phlox		5
				Sandberg bluegrass		5
				Salmon wildrye		5

Exhibit 1109

SOIL SURVEY OF CUSTER-LEMHI AREA, IDAHO, PARTS OF BLAINE, CUSTER, AND LEMHI COUNTIES



0 100 200 400 Meters

0 350 700 1,400 2,100 2,800 Feet

Exhibit No. 9
Date: 1-5-07
Whittaker



Web Soil Survey 1.1
National Cooperative Soil Survey

1/4/2007
Page 1 of 3

SOIL SURVEY OF CUSTER-LEMHI AREA, IDAHO, PARTS OF BLAINE, CUSTER, AND LEMHI COUNTIES

MAP LEGEND

-  Soil Map Units
-  Cities
-  Detailed Counties
-  Detailed States
-  Interstate Highways
-  Roads
-  Rails
-  Water
-  Hydrography
-  Oceans
-  Escarpment, bedrock
-  Escarpment, non-bedrock
-  Gulley
-  Levee
-  Slope
-  Blowout
-  Borrow Pit
-  Clay Spot
-  Depression, closed
-  Eroded Spot
-  Gravel Pit
-  Gravelly Spot
-  Gulley
-  Lava Flow
-  Landfill
-  Marsh or Swamp
-  Miscellaneous Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Slide or Slip
-  Sinkhole
-  Sodic Spot
-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Perennial Water
-  Wet Spot

MAP INFORMATION

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>

Coordinate System: UTM Zone 12

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

Spatial Version of Data: 2

Soil Map Compilation Scale: 1:24000

Map comprised of aerial images photographed on these dates:
8/27/1992

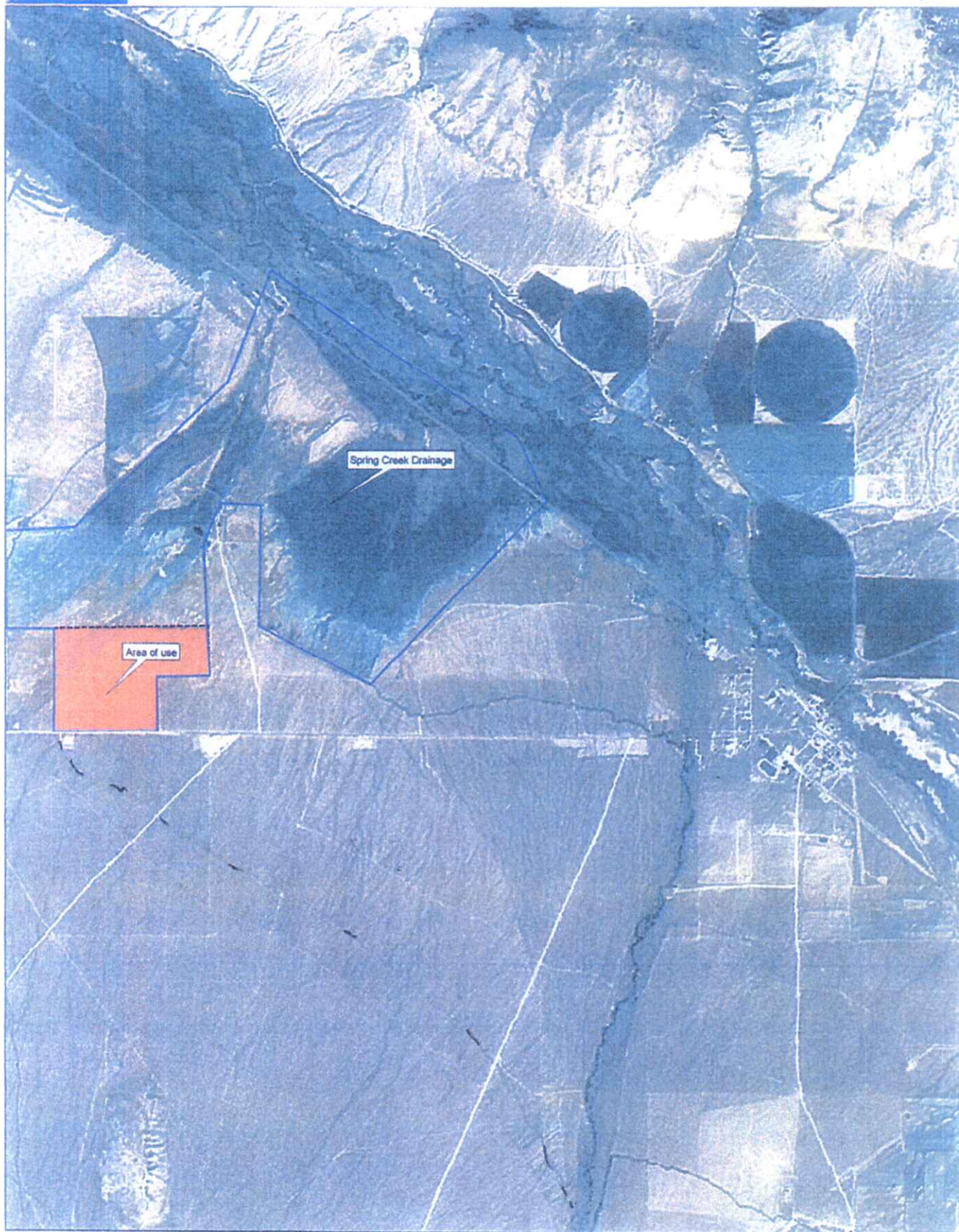
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend Summary

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6	Bartonflat gravelly loam, 1 to 4 percent slopes	148.5	19.5
114	Leadore gravelly loam, 2 to 6 percent slopes	290.6	38.2
119	Lemroi-Leecreek complex, 0 to 3 percent slopes	30.8	4.0
174	Pits, gravel	9.8	1.3
206	Sparmo-Zer complex, 1 to 5 percent slopes	0.6	0.1
231	Whiteknob-Leadore complex, 2 to 8 percent slopes	280.1	36.8

Schmitt NO. 10



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 www.delorme.com

Exhibit No. 10
 Date: 1-5-06
Whittaker
 T&T DEPT.

TM
 1" = 14.2" (1:142)

P.O.D.

Scale 1 : 40,625
 1" = 3,385.4 ft Data Zoom 12-3

EXHIBIT
Applicants
Exhibit
11

****Totals Do Not Include Minimum Instream Flows****

Total cfs Basin 74 2712.78 cfs
Total Acres Basin 74 98964.87 acres

COPY

Basin 74		
SOURCE	MaxDiv (cfs)	Total Acres
AGENCY CREEK	20.13	1482.0
ALDER CREEK	5.40	183.0
ALKALI GULCH CREEK	2.00	120.0
BALDY CREEK	0.94	77.6
BASIN CREEK	18.06	881.1
BASIN CREEK, MC NUTT CREEK	0.92	100.0
BASIN LAKE	4.36	219.0
BEAR CREEK	3.94	161.0
BEAR VALLEY CREEK	0.00	
BERG-GREEN GULCH CREEK	1.30	54.0
BIG BEAR CREEK	0.00	
BIG BEAR CREEK, HAWLEY CREEK	2.00	40.4
BIG EIGHTMILE CREEK	92.05	4698.0
BIG EIGHTMILE CREEK, DAIRY CREEK	0.00	118.0
BIG TIMBER CREEK	96.11	5113.2
BIG TIMBER CREEK, LITTLE TIMBER CREEK	4.20	429.0
BIG TIMBER CREEK, UNNAMED STREAM	2.00	74.0
BOHANNON CREEK	46.36	3140.0
BOHANNON CREEK, WIMPEY CREEK	11.83	524.0
BOOMER CREEK	0.30	11.0
BULL CREEK	4.20	470.0
CANYON CREEK	16.14	757.3
CHIPPIE CREEK	0.62	30.8
CLEAR CREEK	11.74	742.0
COLD SPRING CREEK	3.34	380.0
COW CREEK	0.35	17.6
CRUIKSHANK CREEK	3.96	169.0
CRUIKSHANK CREEK, WILDCAT CREEK	1.20	59.0
DEER CREEK	4.59	324.0
DEVILS CANYON CREEK	1.80	73.0
DIVIDE CREEK	0.70	22.0
DRY GULCH CREEK	2.80	143.0
EIGHTEENMILE CREEK	43.33	2509.0
EIGHTEENMILE CREEK, TEXAS CREEK	2.30	115.0
EVERSON CREEK	12.40	593.0
FERRY CREEK	1.82	161.0
FERRY CREEK, MILL CREEK	3.22	89.9
FORD CREEK	0.37	12.1
GARY CREEK	2.80	89.0
GEERTSON CREEK	29.20	3652.1
GROUND WATER	61.79	4757.3
GROUSE CREEK, TRAIL CREEK	1.33	65.0
HAWLEY CREEK	29.06	1772.1
HAYDEN CREEK	104.73	2512.2
HAYNES CREEK	16.94	1385.3
HOOD GULCH CREEK, UNNAMED STREAM	1.80	91.0

JAKES CANYON CREEK	6.00	485.0
JAMES STEEL GULCH CREEK	1.00	85.3
KENNEY CREEK	9.52	408.9
KIRTLLEY CREEK	16.92	1232.0
LAKE CREEK	0.34	39.4
LEE CREEK	26.55	1752.0
LEMHI BIG SPRING CREEK	31.66	1008.0
LEMHI LITTLE SPRING CREEK	0.28	14.0
LEMHI LITTLE SPRING CREEK, SPRINGS	6.25	208.0
LEMHI RIVER	1381.74	22710.5
LEMHI RIVER, LITTLE SPRING CREEK	4.06	123.0
LEMHI RIVER, SPRINGS	2.60	87.0
LITTLE EIGHTMILE CREEK	4.58	190.0
LITTLE SAWMILL CREEK	1.20	125.1
LITTLE TIMBER CREEK	46.30	2312.0
MC DEVITT CREEK	11.98	468.0
MC NUTT CREEK	10.79	623.0
MEADOW CREEK	7.10	232.2
MEADOW LAKE CREEK	2.00	67.0
MILK CREEK	1.38	357.0
MILL CREEK	73.70	3794.6
MOLLIE GULCH CREEK	1.66	83.0
MUDDY CREEK	1.32	67.0
MULKEY CREEK	0.94	47.0
MULKEY SLOUGH	0.90	30.0
NEGRO GREEN CREEK	4.51	346.0
PATTEE CREEK	10.10	874.7
PATTERSON CREEK	0.73	36.0
PETERSON CREEK	5.91	428.0
POISON CREEK	2.10	112.0
PRATT CREEK	27.07	1940.8
PRICE CREEK	0.40	20.0
PURCELL CREEK	8.39	722.0
REESE CREEK	2.16	201.0
RESERVOIR CREEK	0.00	
RYE GRASS CREEK	0.46	16.0
SANDY CREEK	60.64	3918.7
SHARKEY CREEK	0.54	21.0
SHARKEY HOT SPRING	0.03	
SOURDOUGH GULCH CREEK	1.42	91.0
SPRING	1.60	40.5
SPRINGS	96.55	4857.8
STROUD CREEK	4.00	288.0
STRUGGLE GULCH CREEK	0.64	31.0
SWANSON GULCH CREEK	1.00	42.0
SWARTZ CREEK	4.66	58.0
TENMILE CREEK	4.80	584.0
TEXAS CREEK	59.73	4249.6
TRAIL CREEK	0.10	2.0
UNNAMED SLOUGH	1.20	58.0
UNNAMED STREAM	22.75	1538.2

COPY

WALTER CREEK	0.67	29.0
WARM SPRING CREEK	0.24	23.0
WARM SPRINGS CREEK	2.28	84.0
WASTE WATER	15.60	733.4
WHITE CREEK	0.20	10.0
WIMPEY CREEK	11.42	763.1
WITHINGTON CREEK	10.76	550.5
YEARIAN CREEK	19.18	1289.0
ZEPH CREEK	5.74	40.6

COPY