

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 87-10045
Exam Date: 07/22/2015

1. Current Owner:
FRANK L HILL 1189 EID RD MOSCOW ID 83843 (208) 596.6006
2. Accompanied by: SUNDANCE ALLEN (7/222015)
Phone No: (208) 669.0644
Address: 1189 EID RD, MOSCOW ID 83843
Relationship to Permit Holder: FARM OPERATOR / CARETAKER

Accompanied by: FRANK. L HILL (208) 596.6006 & TOM KIMSEY (208) 310.3262
Phone No: (208) 596.6006
Address: 1189 EID RD, MOSCOW ID 83843
Relationship to Permit Holder: (PERMIT OWNER)

3. SOURCE:
GROUNDWATER

TRIBUTARY:

B. OVERLAP REVIEW

1. Other water rights with the same place of use: NONE
2. Other water rights with the same point-of-diversion: NONE

C. DIVERSION AND DELIVERY SYSTEM

Drilled well connected to controls in manifold building with water lines to barns, frost free spigots, and water troughs (four located on hill tops above farmstead). Separate water lines supply one home on property, a barn with interior sinks/ washbasins, and frost free spigots that use hoses and drip lines for irrigation. Domestic use inside the home is not a part of this water right.

1. LOCATION OF POINT(S) OF DIVERSION:

WELL	NE¼NW¼ Sec. 9, Twp 38N, Rge 05W, B.M	LATAH County	116	58.05	3	W
Method of Determination			46	39	18.5	N

Method of Determination:

Method of Determination: Map-Moscow East" U.S. Geological Survey 7.5' Quadrangle (Topographic) 1960, Photo Revised 1975 ArcMap™ Geographic Information System (GIS) software, Garmin GPS Receiver

2

PLACE OF USE: COMMERCIAL

[illegible]

2.

PLACE OF USE: IRRIGATION

[illegible]

2.

PLACE OF USE: STOCKWATER

[illegible]

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.

☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.

☐ Aerial Photo Attached (required for irrigation of 10+ acres).

☒ Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
	Unknown	Unknown	Unknown	Unknown	Unknown

*Code to correspond with No. on map and aerial photo

D. **FLOW MEASUREMENTS** : (Theoretical) Submersible 2.0 HP pump assumed to be 45' feet below surface with 5' lift to stock water trough near Manifold building (2011 Google Earth Image).

1.

		PUMP	EQUATIONS	WATER RIGHT	87-10045	
		HP	H in feet	Efficiency as a Decimal	Pumping lift in feet	System pressure in PSI
Q = t	HP*8.8*Eff/H	2.0	107.8231	0.7	50	25
Q =	0.114 CFS	49.37	GPM			

2. Measurements: (See **NARRATIVE/REMARKS/COMMENTS** below)

E. FLOW

Additional Computation Sheets Attached

CALCULATIONS

Measured Method:

TROUGH #	TIME FOR FILL OF 555.39 GAL TROUGH	GAL PER MIN	CFS
SW of well	28.5 minutes	19.48	.04
NE of well	33.0 minutes	16.83	.04

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = (1.0 \text{ AC}) \times (3.0 \text{ AF}) = 3.0 \text{ AF}$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = (0.03 \text{ CFS}) \times (246) \times 1.9835 = 14.638$$

$$V = \text{Smaller of } V_{IR} \text{ and } V_{DR} = 3.0 \text{ AF}$$

2. Volume Calculations for Other Uses:

CFS AF

Commercial: 0.02 CFS per Applicant (see narrative/Remarks/Comments)

0.02 was applied to the IDWR Dairies Water Use Worksheet

(See attachment) to determine Acre feet (AF) for a total of 2.2 AF

02 **2.2**

Stockwater IDWR Application Processing Memo. No 3 Shows appropriate CFS / Af for 50 head dairy cattle is .02 CFS 2.0 AF .

04 **2.0**

G. NARRATIVE/REMARKS/COMMENTS

Field Exams were conducted on 7/22/2015 and 7/5/2019. Water from a drilled well with metal, above ground, casing is used for Stockwater, Irrigation, and Commercial use on Latah County tax parcel (RP38N05W090718. Water from this well is controlled from a manifold building and pumped to stock water troughs on high ground overlooking the well and farmstead buildings. The circular, concrete, cistern or well located between the home and the barn on the property is not part of the water system for this Water Right (87-10045).

The troughs seen during the 7/22/2015 Exam are located to the Northeast, Northwest, Southeast, and Southwest of the drilled well. The location of each of the four water troughs overlooking this well was verified during the Exam while accompanied by Sundance Allen. Each of the troughs was empty at the start of the Exam and measured 162" x 44' x 18' with a filled capacity of 555.39 Gallons. Mr. Allen indicated during the 2015 Exam that all the stock watering troughs have identical dimensions.

Two of the four hill top watering troughs were filled independently from empty to full capacity during the 2015 Exam. Sundance Allen operated the equipment in the manifold building to fill the Southwest trough in 28.5 minutes (19.48 Gallons Per Minute (GPM) /.04 Cubic Feet per Second (CFS) and the Northeast trough in 33 minutes (16.83 GPM /.04 CFS).

No livestock were present during the 2015 Exam, however, the presence of livestock on the property during the development period specified in the Permit is verified by a 2011 Google Earth image. The 2011 image shows a combined total of 50 head of cattle sized livestock near the well and manifold building (40 head) and additional group (8-10 head) at the Southwest watering trough. The 2011 image shows the livestock present during the development period specified in the Permit and before IDWR receipt of the proof of beneficial use. No poultry were present during the 2015 Exam. An estimated 15 chickens and quail were present when the property was visited on 7/5/2019 with Frank Hill. IDWR Application Processing Memo. No. 3 indicates that the appropriate CFS and AF for the number of cattle present in 2011 is .04 CFS and 2.0 AF.

Irrigation of one acre, as reported in the Proof of Beneficial Use dated August 22, 2012 by Mr. Hill, was confirmed during the 2015 and 2019 Exams. A hose and sprinkler head were seen operating from a frost free spigot in the irrigated area during the 2019 Exam. Sufficient drip line tubing, hoses, and other irrigation equipment, to serve the Irrigation Place of Use (POU) were seen on the property during the 2019 Exam. IDWR Application Processing Memo. No. 17 indicates that the appropriate CFS and AF for the one acre irrigated is .03 CFS and 3.0 AF.

Sundance Allen was unfamiliar with the status of Commercial water use and location of commercial dairy equipment during the 2015 Exam. The Commercial equipment (cheese separator, cream separator, cheese molds) and stored milking equipment, milk cans, head-stalls, piping, filter screens, etc. was seen in storage inside two barns during the 2019 Exam. A product processing room with large wash basins was also seen in the red barn during the

2019 Exam. The layout of the commercial equipment when assembled and in working order, in the barns, could not be determined during the 2019 Exam.

Mr. Hill stated during the 2019 Exam that the '...02 barn...' written in on the Proof of Beneficial Use was for the water use inside the barn that corresponds to Commercial use. This figure (.02 CFS) when used with the IDWR Dairies: Water Use Worksheet indicates an Acre Feet (AF) annually of 2.2 AF.

Simultaneous measurement of the flow rates required for Stockwater (.04 CFS), Irrigation (.03 CFS), and Commercial uses (.02 CFS) was not done during the 2015 or 2019 Exams. The ability of the drilled well and manifold system to lift and deliver .04 CFS to two separate hill tops using water lines of at least 1000 foot length to an elevation approximately 100 feet above the well indicates that simultaneous use is feasible.

<u>TROUGH #</u>	<u>TIME FOR FILL OF 555.39 GAL TROUGH</u>	<u>GAL PER MIN</u>	<u>CFS</u>
SW of well	28.5 minutes	19.48	0.04
NE of well	33.0 minutes	16.83	0.04

The correct Well Driller's report, and date of well completion, for this system has not been determined after a search of IDWR records. Depth shown in the theoretical calculations (see above) were based on the existence of the concrete well / cistern near the existing drilled well and a well record in Sec. 10, Twp 38N, Rge 05W, that indicate shallow wells exist in the area. The theoretical calculation indicates that a 2 HP pump can deliver .114 CFS from the drilled well.

Water Right 86-12018 was permitted at 0.20 CFS. The Permit Holder's Proof of Beneficial use limits the License to .12 CFS. The Right should be licensed at .09 CFS and 7.2 AF for 1.0 acre of Irrigation, Commercial use for a small dairy / cheese making operation, and stockwater use for 50 head Mixed Stock.

Have conditions of permit approval been met?

☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
COMMERCIAL	01/01 to 12/31	0.02 CFS	2.2 AF
IRRIGATION	03/15 to 10/31	0.03 CFS	3.0 AF
STOCKWATER	01/01 to 12/31	0.04 CFS	2.0 AF

Totals: 0.090 CFS 7.2 AF

2. Recommended Amendments

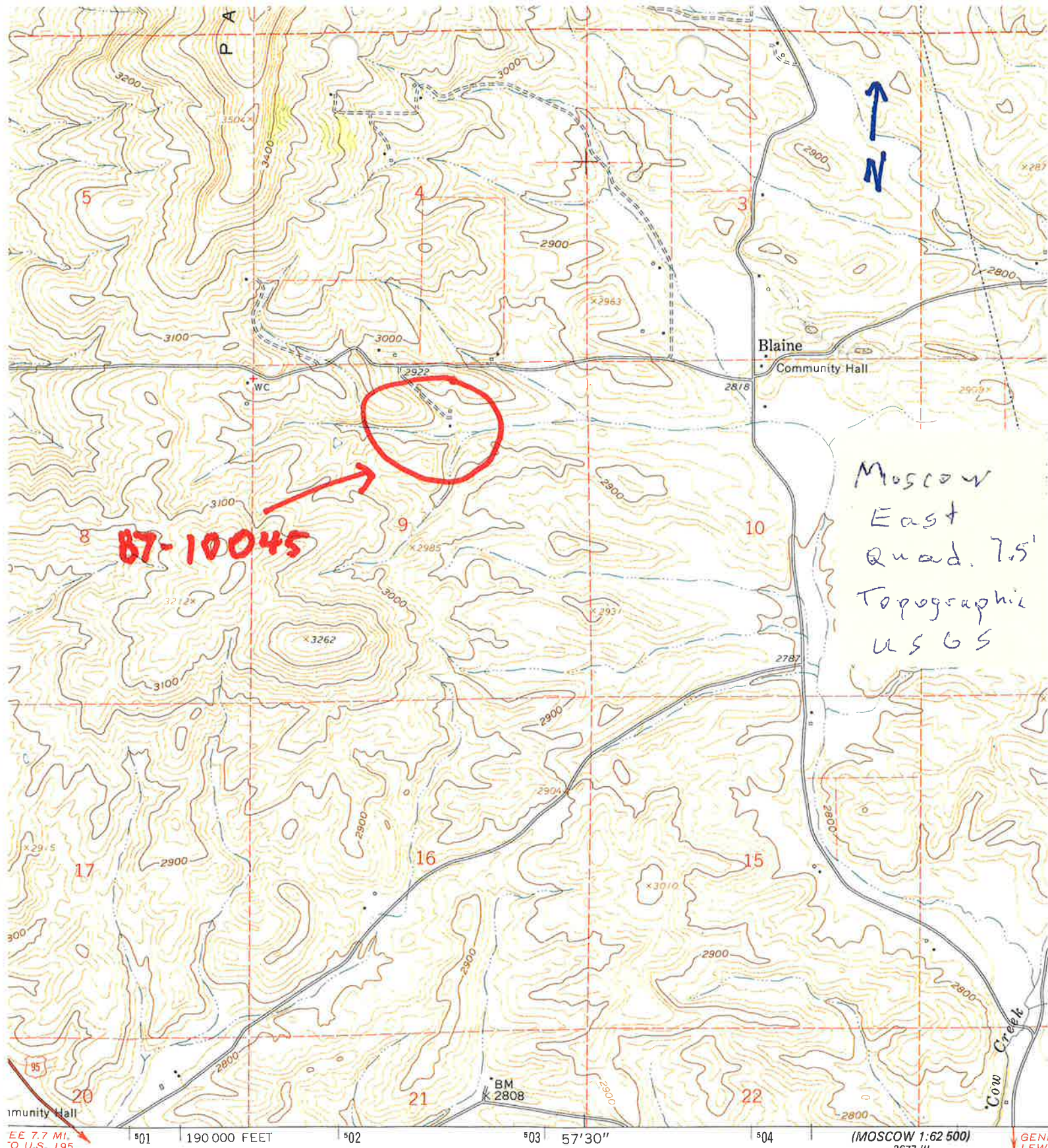
☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ None

I. AUTHENTICATION

Field Examiner's Name Stephen M. Mader Date 07/11/2019

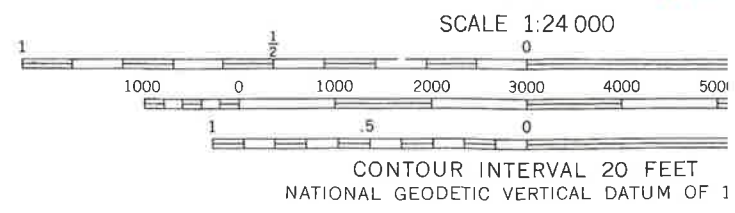
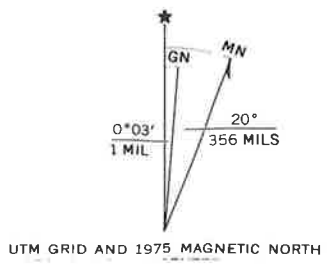
Reviewer Douglas Jones P.E. Date 7/12/2019



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 SGS and NOS/NOAA

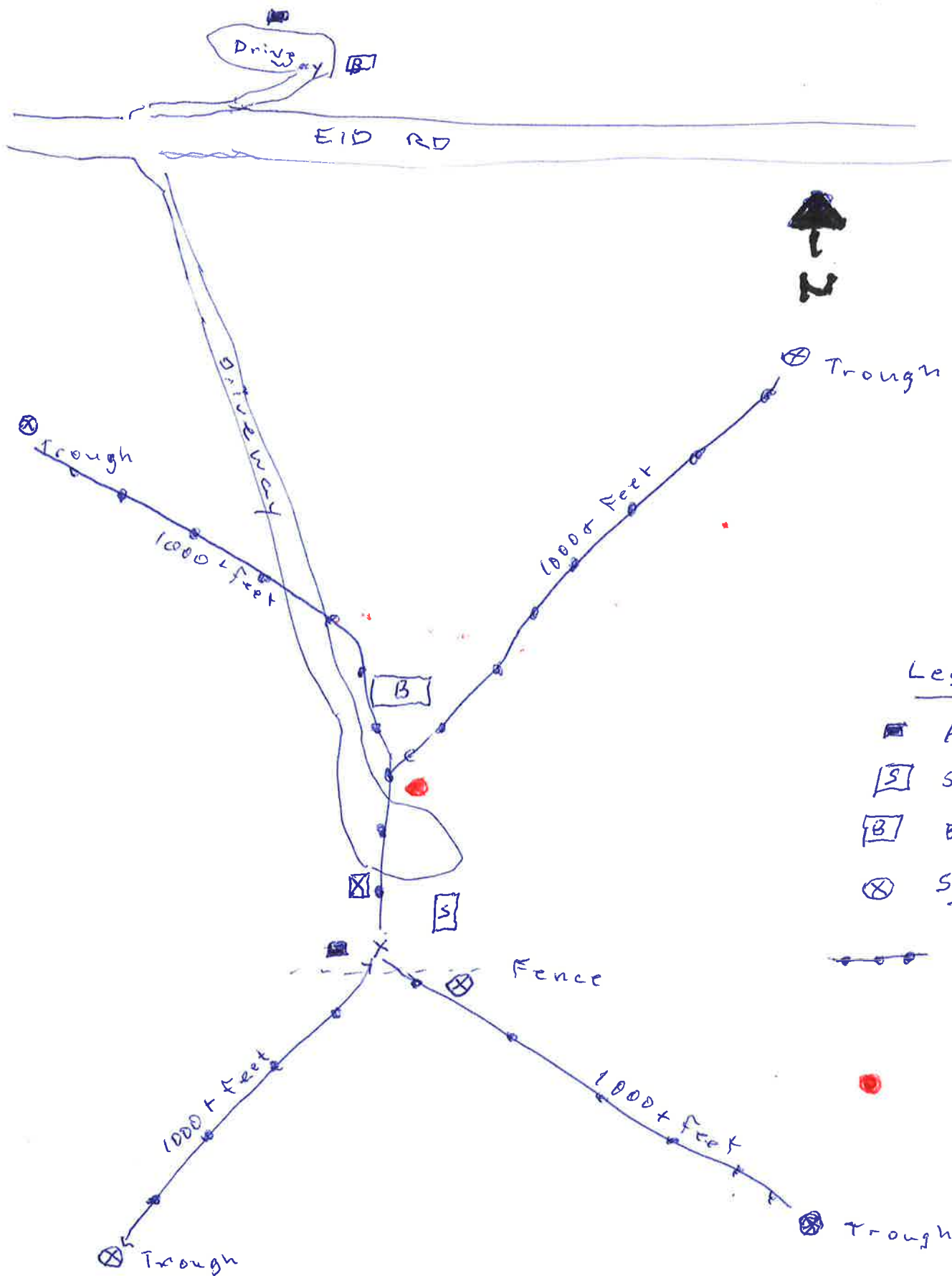
om aerial photographs by photogrammetric methods
 raphs taken 1957. Field check 1960
 ection. 1927 North American datum
 grid based on Idaho coordinate system, west zone
 Universal Transverse Mercator grid ticks,
 wn in blue

ates area in which only
 Idings are shown
 lines indicate approximate locations



THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY

No to Scale Delivery System Diagram



Legend

-  House
-  Shop
-  Barn
-  Stockwater Trough
-  Water Line Approx Route
-  Cistern Shallow well (Not part of system)

FILE NUMBER 87-10045
REVIEWER DJ
DATE July 18, 2019

DAIRIES: WATER USE WORKSHEET

THEORETICAL FLOW ESTIMATION WORKSHEET

REQUIRED DAIRY DATA

NUMBER OF MILKING CATTLE 20
NUMBER OF DRY CATTLE 30
NUMBER OF REPLACEMENT CATTLE: 0-2 MONTHS 0
3-4 MONTHS 0
5-8 MONTHS 0
9-12 MONTHS 0
13-15 MONTHS 0
16-24 MONTHS 0
ENTER 1 FOR MANUAL COW WASHING, 2 FOR AUTOMATIC COW WASHING,
OR 3 IF SPRINKLERS ARE USED TO FLUSH HOLDING PEN AND WASH COWS 1
IF SPRINKLERS ARE USED: NUMBER OF SPRINKLERS IN HOLDING PEN 0
NOZZLE DISCHARGE (USE 5.0 GPM IF UNKNOWN) 0.00
TOTAL OPERATION TIME OF SPRINKLERS (MIN/DAY) 0
NUMBER OF MILKINGS PER DAY 2
AVG. LBS. OF MILK PRODUCED PER DAY PER ANIMAL (IDAHO AVG IS 70 LBS.) 50
ARE THERE SEPARATE PUMPS FOR COMMERCIAL AND STOCKWATER USES? N
IF SO: HOW MANY HOURS PER DAY DOES THE STOCKWATER PUMP RUN?
HOW MANY HOURS PER DAY DOES THE COMMERCIAL PUMP RUN?
IF ONLY ONE PUMP, HOW MANY TOTAL HOURS PER DAY DOES IT RUN? 3.0
IS A PLATE COOLER USED? N
IS PLATE COOLER WATER LATER RECYCLED FOR OTHER USES? (IF NO PLATE
COOLER, LEAVE BLANK) N
ARE CORRAL MISTERS USED IN HOLDING PEN? N
IF USING CORRAL MISTERS: NUMBER OF MISTERS (IF UNKNOWN,
ASSUME 1 MISTER FOR EVERY 5 COWS) 0
NOZZLE DISCHARGE (USE 5 GPH IF UNKNOWN) 0
SPRAY INTERVAL (EX - 2 MIN ON EVERY 5 MIN = 2/5) 0
OPERATION TIME OF MISTERS (HRS/DAY) 0
DAYS PER YEAR MISTERS ARE USED 45
ENTER A TOTAL VOLUME IN GPD FOR MISCELLANEOUS WATER USES NOT
INDIVIDUALLY CALCULATED BELOW (EX - RESTROOMS, WASHING MACHINES) 1

CALCULATIONS

DIVERSION RATE (CFS):

STOCKWATER
MILKING CATTLE (BASED ON MILK PRODUCTION) ****
DRY CATTLE @ 17.0 GPD/HD ****
REPLACEMENT CATTLE ****
TOTAL 0.04

COMMERCIAL
TOTAL 0.04

TOTAL DIVERSION RATE 0.04

DIVERSION VOLUME (AFA):

STOCKWATER
MILKING CATTLE 0.5
DRY CATTLE 0.5
REPLACEMENT CATTLE 0.0
TOTAL 1.0

COMMERCIAL
WASHING OF BULK TANK AND RELATED EQUIPMENT 0.4
BACKFLUSH 0.0
PARLOR/MILKHOUSE/HOLDING PEN CLEANUP 1.7
CATTLE WASHING BASED UPON METHOD OF WASHING 0.0
PLATE COOLER 0.0
CORRAL MISTERS 0.0
MISCELLANEOUS USES 0.0
TOTAL 2.2

TOTAL DIVERSION VOLUME 3.2

CONSUMPTIVE USE VOLUME (AFA)(assuming 100% consumptive):

STOCKWATER 1.0
COMMERCIAL 2.2
TOTAL CONSUMPTIVE USE 3.2

REQUIRED PUMP INFORMATION

Est. PUMP HORSEPOWER (HP) 3.00
PUMP EFFICIENCY (%) 70
LIFT (FT) 130
DISCHARGE PRESSURE (PSI) 40
Est. FRICTION LOSSES (FT) 3.0
HOURS PER DAY PUMP OPERATES 4.0

	PUMP 1	PUMP 2	PUMP 3	PUMP 4	PUMP 5
PUMP HORSEPOWER (HP)	3.00		0.00	0.00	0.00
PUMP EFFICIENCY (%)	70		70	70	70
LIFT (FT)	130		0	0	0
DISCHARGE PRESSURE (PSI)	40		0	0	0
FRICTION LOSSES (FT)	3.0		0.0	0.0	0.0
HOURS PER DAY PUMP OPERATES	4.0		0.0	0.0	0.0

CALCULATIONS

THEORETICAL FLOW RATE (CFS) *	0.08	0.00	0.00	0.00	0.00
DIVERSION VOLUME (AFA) **	9.9	0.0	0.0	0.0	0.0

* IF PUMP EFFICIENCY IS UNKNOWN, 70% MAY BE ASSUMED
** DIVERSION VOLUME IS THE ABSOLUTE MAXIMUM VOLUME BASED ON THE
THEORETICAL FLOW RATE ASSUMING PUMP RUNS EVERY DAY OF THE YEAR

EVALUATION OF EQUIVALENT IRRIGATED ACREAGE

IRRIGATION RIGHT (BEFORE CHANGE)

DIVERSION RATE	4.80 CFS
ACRES OF IRRIGATION	240.0 ACRES
DIVERSION VOLUME	4.0 AC-FT/AC
CONSUMPTIVE USE VOLUME	3.0 AC-FT/AC
IRRIGATION IS BEING CONVERTED FOR WHICH PORTION OF THE DAIRY OPERATION - STOCKWATER (S), COMMERCIAL (C), OR BOTH (B)?	B

CALCULATIONS

IRRIGATION DIVERSION RATE PER ACRE	0.020 CFS/AC
REDUCTION OF IRRIGATION BASED ON DIVERSION RATE	2.0 ACRES
REDUCTION OF IRRIGATION BASED ON DIVERSION VOLUME	0.8 ACRES
REDUCTION OF IRRIGATION BASED ON CONSUMPTIVE USE	1.1 ACRES



View SW Trough, Barns, well



well



Well and Manifold BLDG

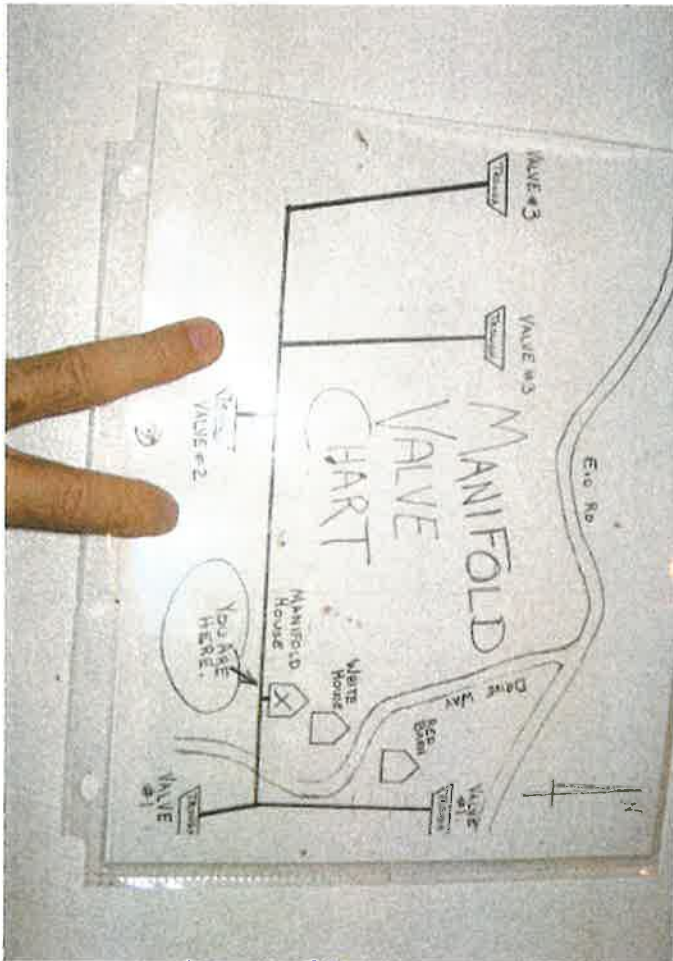


metal Shop BLDG flowing spigot

View from Southwest Trough to Farwasted



Interior Manifold BLDG



Manifold Diagram



Gauge Interior Manifold BLDG



View N to Paradise Ridge



Filled Stock Trough #1



Filled Stock Trough #1 2nd View



Filled Stock Trough #2



↑
Cheese Press
plumbing and
Cheese Molds

← Cream Separator

Untitled Map

Write a description for your map.

Legend

Livestock

Southeast
Water Trough

2011
Image

Google Earth

300 ft



Untitled Map

Write a description for your map.

Legend



North east
Water Trough

2011 Image

Google Earth



200 ft

Untitled Map

Write a description for your map.

Legend

2011
Image

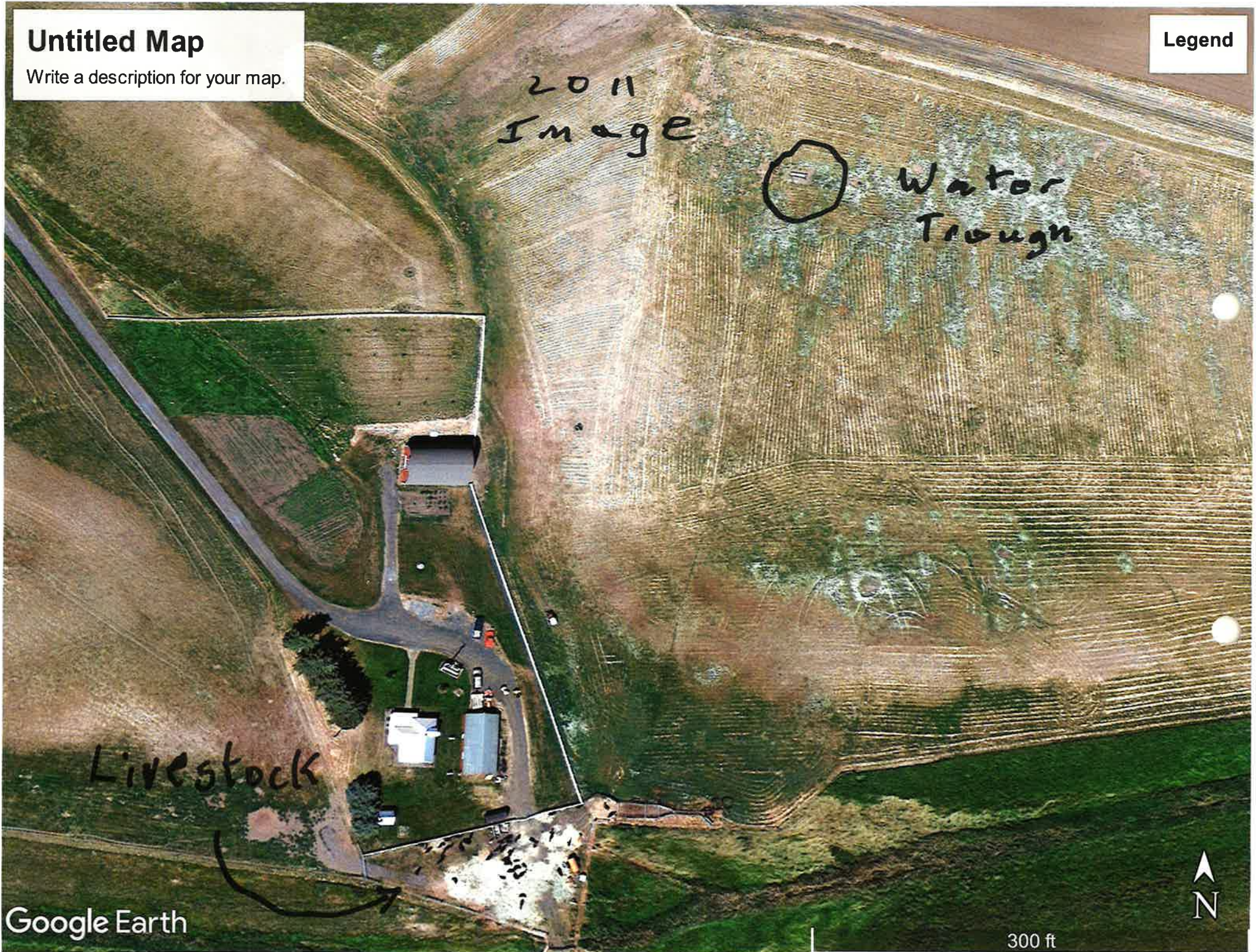
Water
Trough

Livestock

Google Earth

300 ft

N



Untitled Map

Write a description for your map.

Legend



Untitled Map

Write a description for your map.

Legend

2011 Image

→
livestock

South West Trough