

[illegible]

Method of Determination: Arc Map (Aerial Photo)

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.

<u>Well or Diversion ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge Size</u>
D0029717	N/A	7.5	N/A	Grundfos	(6" & 3")
		2		Nelson SR100	6"

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

D. FLOW MEASUREMENTS

1.

<u>Measurement Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
N/A						

2. Measurements: No field measurement. Irrigation system not in operation until 7/1.

E. FLOW CALCULATIONSAdditional Computation Sheets Attached

Measured Method (Theoretical):

Hp = 7.5 (Well Pump)

Hp = 2.0 (Pivot Booster Pump)

Z = 84' (Pump Depth)

P = 50 psi (Assumed – No pressure gauge)

$$Q = 8.8 \times 0.7 \times 9.5/84 + (2.31 \times 50) = 58.5/199.5 = 0.30 \text{ cfs}$$

$$Q(\text{Permit}) = 0.84 \text{ cfs} > Q(\text{theoretical}) = 0.30 \text{ cfs}$$

Manufacturer's Pump Specifications:

Q(7.5 hp pump) = 150 gpm (0.33 cfs)

Q(2.0 hp booster pump – end gun on pivot) = 60 gpm (0.13 cfs) – Assumed based on manufacturer's specifications.

$Q(\text{Permit}) = 0.84 \text{ cfs} > 0.47 \text{ cfs}$ *0.47 RC*
~~0.46~~ cfs Q(pump specs.) – Appears pumping system is not adequate to irrigate the 42.1 acres as designated on the permit.

F. VOLUME CALCULATIONS**1. Volume Calculations for Irrigation:**

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 42.1 \times 4.0 = 168.4 \text{ afa}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.46 \times 246 \times 1.9835 = 224.5 \text{ afa}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 168.4 \text{ afa}$$

2. Volume Calculations for Other Uses: Stockwater

$$\text{Cattle} - 20 \text{ head} \quad V_r = 20 \times 12 \times 365/325,850 = 0.27 \text{ afa}$$

$$V_d = 0.02 \times 365 \times 1.9835 = 14.5 \text{ afa}$$

$$V(\text{cattle}) = 0.27 \text{ afa}$$

$$\text{Sheep} - 80 \text{ head} \quad V_r = 80 \times 2 \times 365/325,850 = 0.18 \text{ afa}$$

$$V_d = 0.02 \times 365 \times 1.9835 = 14.5 \text{ afa}$$

$$V(\text{sheep}) = 0.18 \text{ afa}$$

$$\text{Total Volume} = 0.45 \text{ afa}$$

G. NARRATIVE/REMARKS/COMMENTS**IRRIGATION DISTRIBUTION SYSTEM:**

A ground water well with an 8" casing contains two pumps, provides water for irrigation and domestic use. A 7.5 hp pump is used for irrigation of pasture land for cattle and sheep grazing. The second pump, unknown size, is used for domestic use for one home. The well system is comprised of two steel discharge lines. The irrigation delivery system is comprised of a 6" main line to a pivot system and 3" main line to irrigation risers for connection to hand lines. The hand lines irrigate small areas that the pivot system cannot irrigate. The pivot system generally operates from July 1 to October 31. The pivot irrigation system is a Nelson 8000 Series pivot system with a Nelson A3000 Accelerator Plate Sprinkler package. The pivot system also contains a Nelson SR100 Endgun, which is operated by a 2 hp pump. The hand lines are used when the pivot system is not operating. The pivot system completes one irrigation cycle in approximately 1 ½ days. The pivot then reverses direction and completes another cycle. Except for the time when the hand lines are needed, the pivot operates non-stop throughout the irrigation season.

STOCK WATER:

Stock water is provided from the well for the cattle and sheep in three (3) troughs located near the barn and corrals. Hose attachments with gate valves are located on the 3" well main line piping. Hoses are used to fill the troughs. The water troughs provide water to a maximum of 45 head of cattle and 150 head of sheep.

PUMPING SYSTEM CAPACITY:

As indicated in Section E, Flow Calculations, it appears that the irrigation pumping system is inadequate to irrigate the 42.1 acres of pasture land as indicated on the permit. However, since the pivot irrigation system was not in operation during the field exam, I returned to the site to witness the pivot irrigation system in operation on three different occasions. Each observation confirmed that the existing irrigation pumping system provides adequate flows to irrigate the 42.1 acres.

RATE &/OR STORAGE RECOMMENDED FOR LICENSING

Description	Rate of Flow (cfs)		Storage (af)
Permit Amount	0.88	&/or	N/A
Beneficial Use Limit	0.88	&/or	N/A
System Measurement	0.46 (theoretical)	&/or	N/A
Proof Fee Amount	1.00	&/or	N/A
Recommended Amount	~~0.46~~ 0.47 ac	&/or	N/A

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

BENEFICIAL USE	PERIOD OF USE	DIVERSION RATE	ANNUAL VOLUME
IRRIGATION	03/15 to 10/31	~~0.300~~ 0.47 CFS	168.4 AF
STOCKWATER	01/01 to 12/31	0.040 CFS	0.5 AF
Totals:		0.500 CFS	168.9 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 ☐ Other

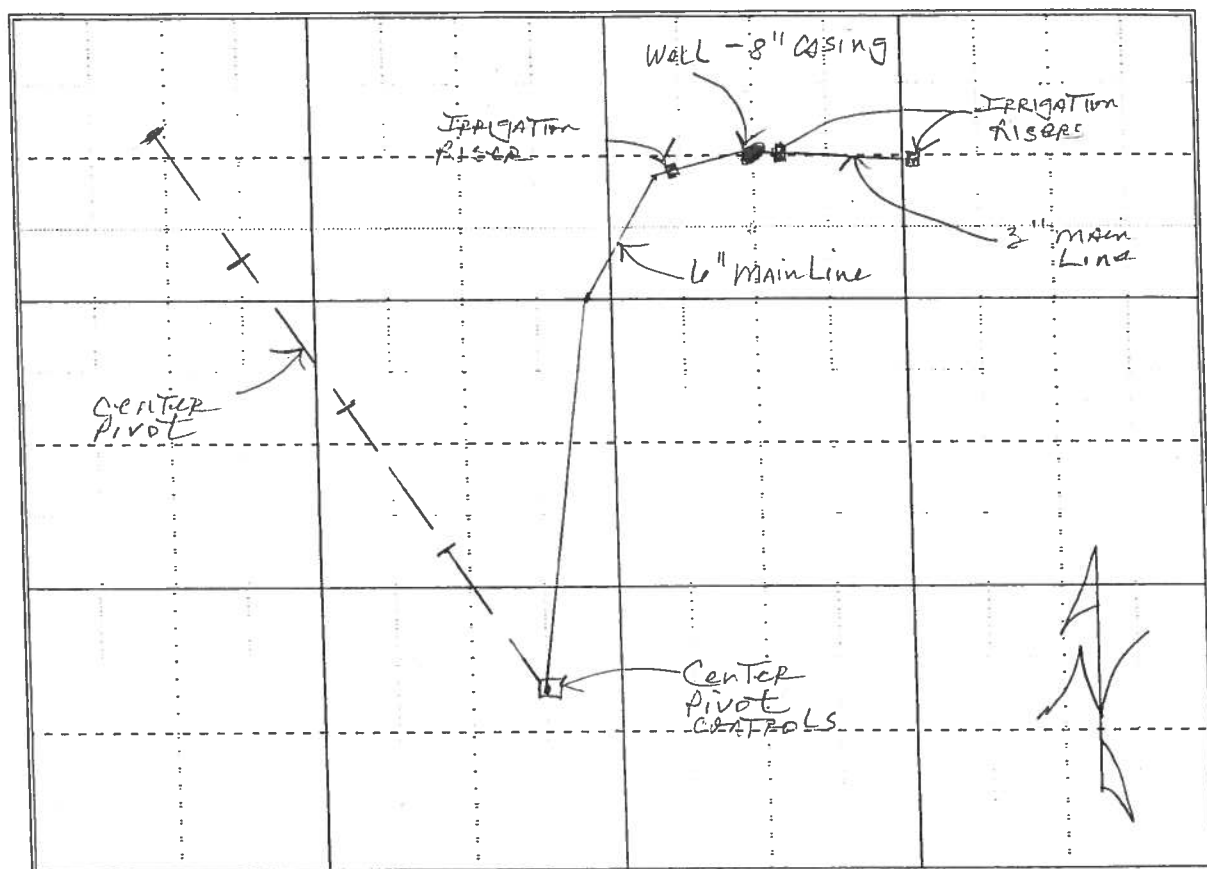
I. AUTHENTICATION

Field Examiner's Name Rick Collingwood Date 9-7-12

Reviewer _____ Date _____

* system capacity per discussion
with examiner - 9/10/12

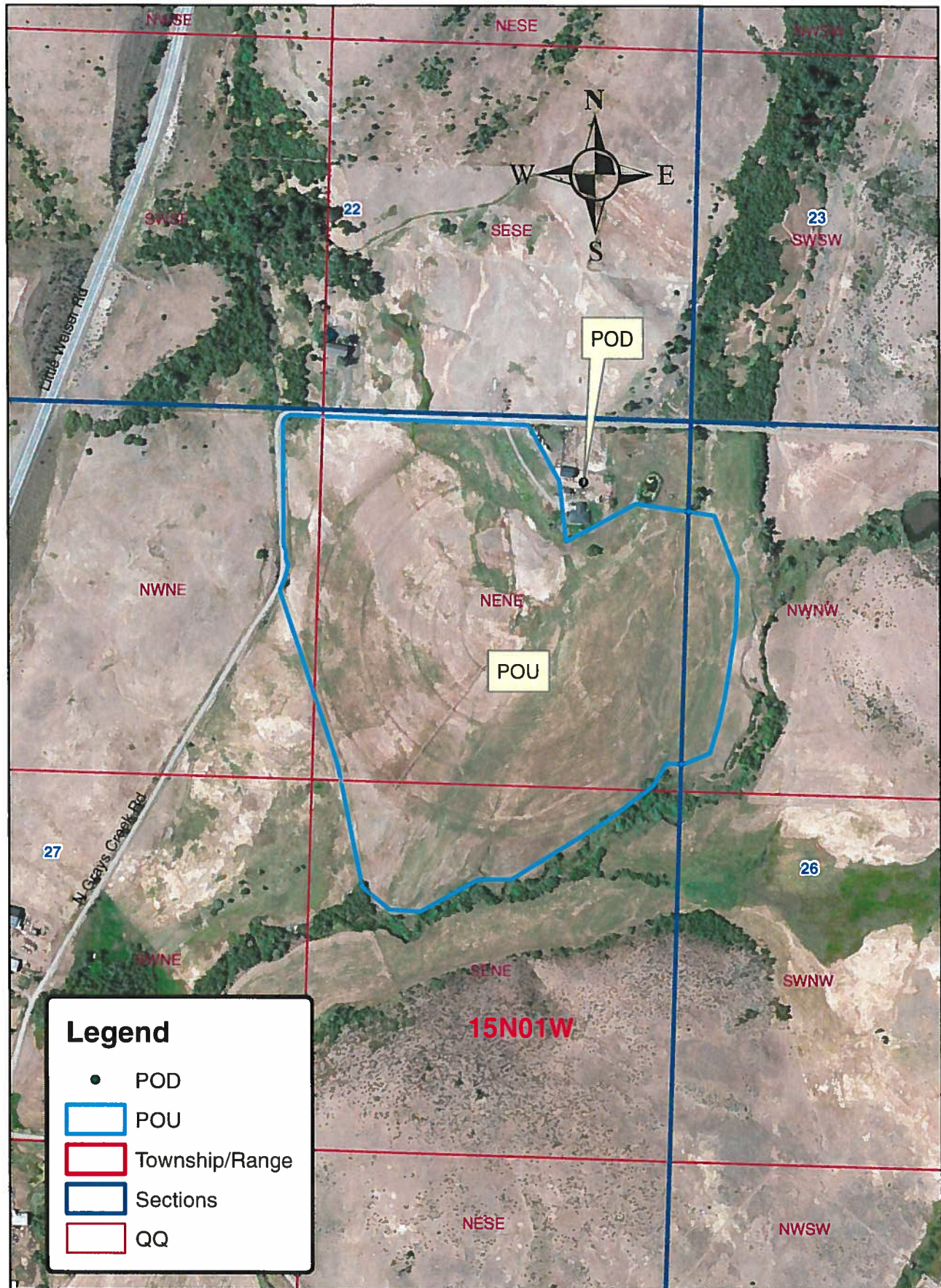
3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☐ see attached.



Scale: 1" = 200'

- ☐ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (required)
- ☒ Aerial photo attached (required for irrigation of 10+ acres)
- ☒ Photo of diversion and system attached

67-14424



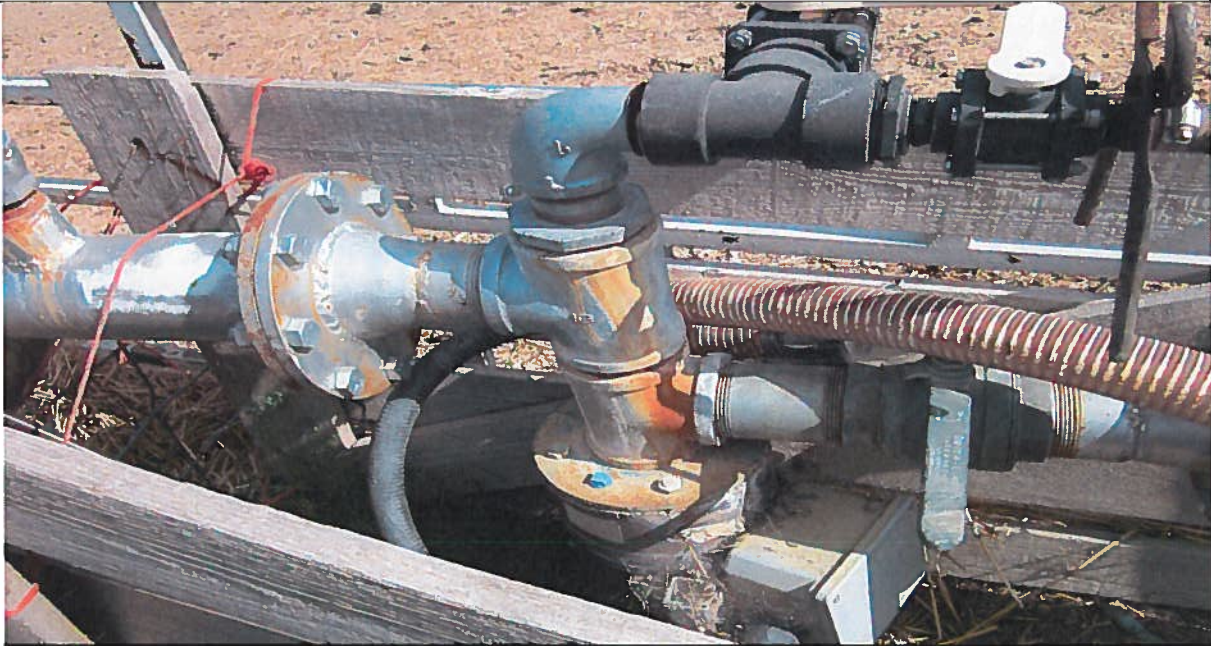
FIELD EXAM PHOTOS

Water Right Permit: 67-14424

Field Exam Date: 6-4-12

PLS: NE1/4, NE1/4 Section 27, T.15N, R.01W.

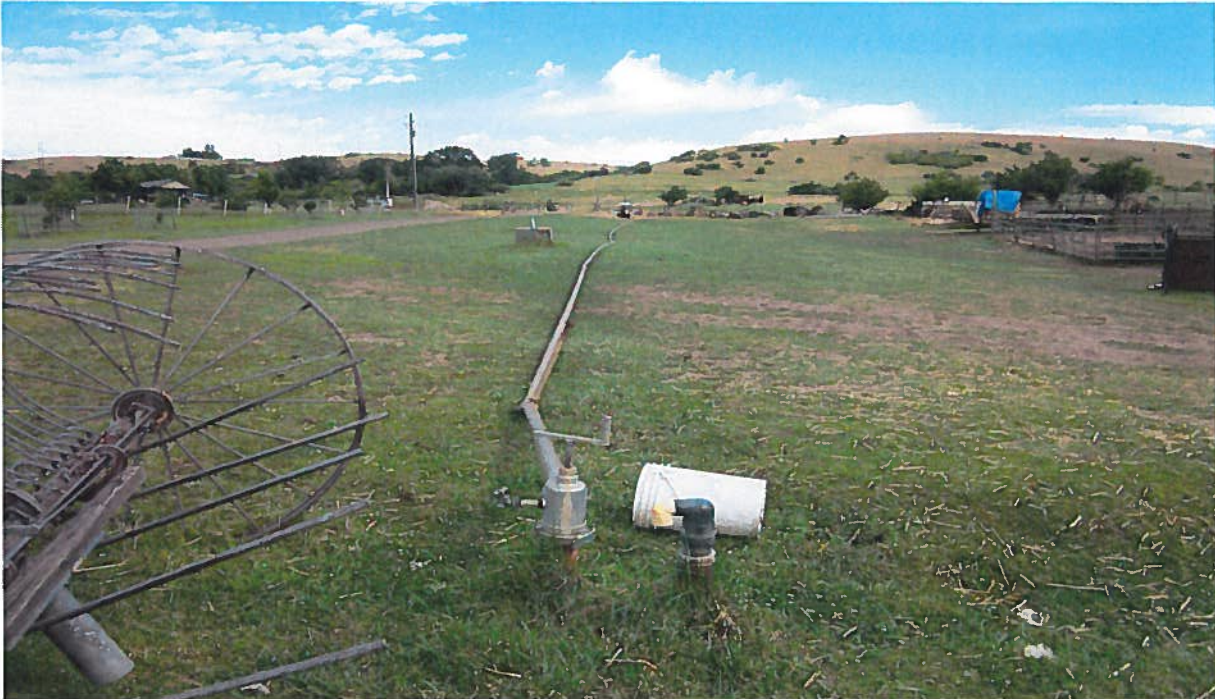
Field Examiner: RC



Point of Diversion: View northwesterly of irrigation and stock water well. Discharge line to the left of photo is the 6" steel main line for the pivot irrigation system. The discharge line below the 6" irrigation main line and extending to the right side of photo is the 3" steel main line to several risers for hand line irrigation. The upper discharge line contains two valves and hose connections for filling of livestock troughs near the barn and corrals.



Place of Use: View southwesterly of pivot irrigation system.



Place of Use: View northwesterly of 3" irrigation riser and 3" hand line.



Place of Use: View southerly of pasture land irrigated by the pivot irrigation system.