# GROUNDWATER INDEX

County: Musselshell  
Twp: 11N  
Rge: 22E

<table>
<thead>
<tr>
<th>Sec.</th>
<th>Name of Appropriator</th>
<th>Type of Form</th>
<th>County File No.</th>
<th>Remarks</th>
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<td>4</td>
<td>Lincoln, A.W. Jr.</td>
<td>GWY</td>
<td>169543</td>
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<tr>
<td>36</td>
<td>Elliott, Robert A.</td>
<td>57108</td>
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</tbody>
</table>

- "GWY" likely refers to the type of form used for groundwater index.
STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER
(Under Chapter 237, Montana Session Laws, 1961)

Declaration of Vested Groundwater Rights

1. A. W. Fischer, Jr., of Roundup, Montana
   (Name of Appropriator) (Address) (Town)
   County of Musselshell State of Montana
   have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:

   2. The beneficial use on which the claim is based:
      Stock water and small-scale irrigation

   3. Date or approximate date of earliest beneficial use; and how continuous the use has been: December 30, 1961, since then use has been intermittent

   4. The amount of groundwater claimed (in miner's inches or gallons per minute) Five (5) gallons per minute with 80 feet of drawdown

   5. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof:
      Planning to use it on approximately 40 acres immediately south of well, owned by appropriator

   6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal:
      Well has constant natural flow at times; otherwise well will be pumped

   7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater: Drilling commenced Nov. 23, 1961, completed Dec. 30, 1961

   8. The depth of water table: 60 feet from top of ground

   9. So far as it may be available, the type, size and depth of each well or the general specifications of any other works for the withdrawal of groundwater: 6 3/4 inch hole, total dept 505 feet

   10. The estimated amount of groundwater withdrawn each year: Not determined to date

   11. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record

   Signature of Owner:
   Date: December 27, 1963

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; Duplicate to the State Engineer; Triplicate to the Montana Bureau of Mines and Geology, and Quadruplicate for the Appropriator.
STATE OF MONTANA,
MUSSEL SHELL COUNTY

FILED THIS 30 DAY OF

A.D. 1963

AT 11:00 O'CLOCK A.M.

B. H. MATZKE
COUNTY RECORDER

FRANCES L. HAMMON
DEPUTY
# WATER WELL LOG

**Owner:** Ronald E. Elliott  
**Address:** Rancher Drift  
**Driller:** Ronald Elliott  
**Address:** Melvin City

**Date Started:** 6-1-57  
**Date Completed:** 6-2-57

**Location:** Sec. 76 T. 11N. R. 23E 1/4 sec.  
**Type of well:** DUG  
**Equipment used:** ROTARY

**Water use:**  
- [ ] Domestic  
- [ ] Municipal  
- [ ] Stock  
- [ ] Irrigation  
- [ ] Industrial  
- [ ] Drainage  
- [ ] Other:  

**Casing:**  
- [ ] ft. to [ ] ft.  
- [ ] Type [ ] Size [ ]

**Perforated or Screened:**  
- [ ] ft. to [ ] ft.  
- [ ] Ft. to [ ] ft.  

**Type of screen or perforations:**

**Static Water level, for non-flowing well:**  
- [ ] feet.

**Shut-in pressure, for flowing well:**  
- [ ] in./sq. in. on: [ ] (date)

**Pumping water level:**  
- [ ] feet at [ ] gal. per min.

**How tested:**  
- [ ]

**Length of test:**  
- [ ]

**Remarks:** (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

---

(over)
WATER WELL LOG

Owner: Robert G. Elliott  Address: Roundup, Mont.
Driller: Buck Elliott  Address: Miles City

Date Started: 6-1-57  Date Completed: 6-5-57

Location: Sec. 36 T. 11 N. 22 E, 4th Sec. SW 1/4.

Type of well: Drilled  Equipment used: Rotary

Water use: Domestic [ ]  Municipal [ ]  Stock [X]  Irrigation [ ]

Industrial [ ]  Drainage [ ]  Other: [ ]

Casing: from ft. to 104 ft. Type [ ]  Size [ ]

Casing: from ft. to ft. Type [ ]  Size [ ]

Casing: from ft. to ft. Type [ ]  Size [ ]

Perforated or Screened: Ft. 201 to ft. Ft. to ft.

Type of screen or perforations: [ ]

Static Water level, for non-flowing well: [ ]

Shut-in pressure, for flowing well: [ ]  lb./sq. in. on: [ ]  (date)

Pumping water level: 60 feet at 10 gal. per min

How tested: [ ]

Length of test: [ ]

Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

(over)
<table>
<thead>
<tr>
<th>Depth, feet</th>
<th>Description of Material Drilled</th>
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</thead>
<tbody>
<tr>
<td>0 - 20'</td>
<td>Sand</td>
</tr>
<tr>
<td>20 - 55</td>
<td>Brown Clay</td>
</tr>
<tr>
<td>55 - 75</td>
<td>Blue Slate</td>
</tr>
<tr>
<td>75 - 115</td>
<td>Sand</td>
</tr>
<tr>
<td>115 -</td>
<td>Blue Slate</td>
</tr>
<tr>
<td>Sec.</td>
<td>Name of Appropriator</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Grant Ranch Company</td>
</tr>
<tr>
<td>7</td>
<td>Pearlco Oil &amp; Gas Co.</td>
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<td>Kombol, Mary</td>
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<td>Pearlco Oil &amp; Gas Co.</td>
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<td>23</td>
<td>Kombol, Mary</td>
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<td>Kombol, Joe</td>
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<td>Kombol Ranch</td>
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<td>Kombol Brothers</td>
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<td>32</td>
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</tr>
<tr>
<td>33</td>
<td>Nebraska Feeding Co.</td>
</tr>
</tbody>
</table>
Form No. 18
8-60

MONTANA BUREAU OF MINES AND GEOLOGY
Butte, Montana

Water Well Log

Owner: Graves Ranch Company  Address: Roundup, Mont.
Driller: Watt Jasbock  Address: Roundup, Mont.
Date Started: Sept. 1954  Date Completed: Sept. 1954
Location: Sec. 11 T. 11 R. 23 1/2 sec., Butte

<table>
<thead>
<tr>
<th>Type of Well Drilled</th>
<th>Equipment Used Churn</th>
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</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>Churn</td>
</tr>
<tr>
<td>Municipal</td>
<td>Drill</td>
</tr>
<tr>
<td>Stock</td>
<td>Rotary</td>
</tr>
<tr>
<td>Irrigation</td>
<td>Other</td>
</tr>
</tbody>
</table>

Casing: 0 ft. to 64 ft. Type 20G, Galv. Size 6
Casing: _____ ft. to _____ ft. Type _____ Size _____
Casing: _____ ft. to _____ ft. Type _____ Size _____
Perforated or Screened: Ft. 38 to Ft. 64. Ft. _____ to Ft. _____
Type of Screen or Perforations: perforated 20 Ga.
Static water level, for non-flowing well: 35 feet.
Shut-in pressure, for flowing well: ______ lb./sq. in. on: ______
Pumping water level: 50 feet at 12 gal. per min.

How tested: Pump
Length of test
Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

(over)
<table>
<thead>
<tr>
<th>Depth, feet</th>
<th>Description of Material Drilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 37</td>
<td>gravel</td>
</tr>
<tr>
<td>37 to 57</td>
<td>yellow shale</td>
</tr>
<tr>
<td>57 to 64</td>
<td>grey sandstone</td>
</tr>
</tbody>
</table>
Declaration of Vested Groundwater Rights
(Under Chapter 237, Montana Session Laws, 1961)

1. CRAYES RANCH COMPANY of ROUNDUP
   (Name of Appropriator) (Address) (Town)
   County of MUSSELHELL State of MONTANA
   have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:

2. The beneficial use on which the claim is based
   STOCK WATER

3. Date or approximate date of earliest beneficial use; and how continuous the use has been
   SEPT 1954

4. The amount of groundwater claimed (in miner's inches or gallons per minute) 12 gal per min pump test

5. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof

6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal
   PUMP

7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater SEPT 1954

8. The depth of water table 35 ft.

9. So far as it may be available, the type, size and depth of each well or the general specifics, as of any other works for the withdrawal of groundwater Depth 64 ft.

10. The estimated amount of groundwater withdrawn each year as needed for stock 3,110,800 gal.

11. The log of formations encountered in the drilling of each well if available
   0 to 37+ gravel; 37 to 37+ yellow shale; 37 to 54+ gray sands

12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record none

Signature of Owner: Chas. B. Grant
Date: 9/30/63

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; triplicate to the Montana Bureau of Mines and Geology and quadruplicate for the Appropriator.
MONTANA BUREAU OF MINES AND GEOLOGY
Butte, Montana

WATER WELL LOG

<table>
<thead>
<tr>
<th>Fearless Oil &amp; Gas Company</th>
<th>Fearless Incorporated</th>
</tr>
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<tbody>
<tr>
<td>Owner: Wyzana Ranch Division</td>
<td>1670 Denver Club Bldg.</td>
</tr>
<tr>
<td>Address: Denver 2, Colorado</td>
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</tbody>
</table>

Driller: ________________________________  Address: ________________________________

Date Started: __________________________  Date Completed: __________________________

Location: Sec. ______ T.____ R.____ Sec. ______ NW.____

Type of well: Drilled  Equipment used: Churn Drill

(Wag, driven, bored, or drilled)

Water use: Domestic ______ Municipal ______ Stock ______ Irrigation ______

Industrial ______ Drainage ______ Other: ______

Casing: ______ ft. to ______ ft.  Type: ______  Size: ______

Casing: ______ ft. to ______ ft.  Type: ______  Size: ______

Casing: ______ ft. to ______ ft.  Type: ______  Size: ______

Perforated or Screened: ______ ft. to ______ ft.  ______ ft. to ______ ft.  ______ ft. to ______ ft.

Type of screen or perforations: ________________________________

Static Water level, for non-flowing well: ______ feet

Shut-in pressure, for flowing well: ______ lb./sq. in. on: ______ (date)

Pumping water level: ______ feet at ______ gal. per min.

How tested: ________________________________

Length of test: ________________________________

Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

________________________________________

(over)
All depths relative to rotary bushing which is 6.2 feet above ground elevation.

**Korena**

0 - 105
Drilled with cable tool and no samples taken. Top of 3rd Cat Creek Sand at 30 feet is not accurately established as compared with rotary sampling.

105 - 194
Typical 3rd Cat Creek Sand. Medium to coarse grained, angular to subangular, with quartz grains, cherty, mostly salt and pepper grey color. Drills up as sand with large fragments in it. Some pyrite and occasionally iron staining.

**Morrison**

190 - 210
Siltstone, grey, with pyrite and cartonaceous material. Has black shale break at about 200-205 and grades to fine grained quartzite and sandstone downward.

210 - 250
Sandstone, quartzite, light grey to grey, with an occasional quartzite layer but mostly zones of silty and silt character. Some pyrite and coal locally. Mostly fine grained to almost medium but most always tightly cemented.

280 - 300
Claystone, grey and iron red or reddish, with some siltstone and quartzitic layers, both of grey or brownish-grey color.

300 - 310
Sandstone, fine grained, quartzite, grey color, with quartzitic layers.

310 - 327
Claystone, calcareous, grey, dark red, or brown, and siltstone, grey, calcareous, with sandy zones.

327 - 348
Limestone, brown to grey and brownish-yellow, mottled, dense to sugary or fine crystalline. Break down into soft clayey material under acid, never very hard. Grades downward into grey, non-calcareous, claystone.

348 - 350
Sandstone, yellowish-orange, calcareous.

350 - 360
Siltstone, mottled grey, brown, and reddish-brown, calcareous.

360 - 370
Siltstone, grey, brown, red, non-calcareous, some zones are sandy and calcareous.
370 - 375 Sandstone, fine grained, grey, non-calcareous, quartzose.
375 - 425 Silstone and claystone, calcareous, grey, mottled greenish-grey and dark red, with some quartzite layers and sandy zones.
425 - 425 Lime stone, dense, dark buff, grading downwards into grey limestone and then into grey calcareous, silty claystone.
425 - 455 Claystone, grey, sandy, calcareous; and siltstone, grey to dark buff, calcareous; grading down into almost a fine grained sandstone or sandy limestone.

455 - 525 Sandstone, fine to coarse grained, quartzose, subrounded to subhedral quartz grains, cherty glauconitic, poor to fairly well sorted, mostly tight, non-calcareous. Some zones which are siltly and darker grey in color and often quartzitic in hardness. Occasional coal and pyrite fragment at 520 to 525.
525 - 530 Sandstone, very fine grained, dark grey, quartzose, calcareous, highly fossiliferous, some fossils replaced by pyrite.
530 - 555 Claystone and shale, grey, slightly mottled with pale brown or red-brown, non-calcareous, scattered quartz grains, micaceous, some gypsum layers.
555 - 577 Sandstone, fine grained quartzose, calcareous, glauconitic, dirty dark grey color.
577 - 630 Limestone, soft, white, buff to dirty grey, dense, irregularly dark spotted, some grains of glauconite scattered throughout, some pyrite, zones of siltly non-glauconitic character as well as sandy zones.
630 - 638 Siltstone and sandstone, dark red, hard, reddish quartz grains, calcareous, medium grained.

638 - 642 Claystone, marly, highly fossiliferous, red to dark grey.
642 - 660 Limestone, white to buff and yellowish-orange, dense but with zones of fine porous nature, minute stylolitic fractures lined with black material, zones of calcite crystallization and fossil fragments.
660 - 667 Claystone, limy, pink-grey to lavender, purple and iron red, non-calcareous, and some siltly.
667 - 712 Limestone, white, shades of pink, and buff, dolomitic, fragmental, dense to sugary, occasional clear calcite crystals.

712 - 715 Claystone, non-calcareous, bluish to greenish-grey with minute brown specks. Grades into a silty variety.

715 - 730 Shale, bluish hard, calcareous.

730 - 845 Limestone, dark grey to black, brownish-black, and some brownish-buff, fossiliferous (oat/soda), irregular splintery fracturing. Has zones of grey pyritic calcareous claystone. Also some large veins of calcite and some pyrite. Dense to sugary and finely crystalline.

845 - 860 Shale, black, calcareous, pyritic. Also a few pieces of red siltstone which may be chert.

860 - 885 Sandstone, quartzose, medium grained, well sorted, pure white to grey and with much pyrite, tight. Also black carbonaceous material in the sandstone.

885 - 888 Siltstone and claystone, dark grey, pyritic, carbonaceous, and non-calcareous.

885 - 900 Sandstone, white to dirty grey, quartzose, friable, well sorted, medium grained, dark impurities and some pyrite. With interbedded layers of claystone, iron red and greenish-grey, non-calcareous.

900 - 915 Limestone, buff to dirty grey-buff, dense, some streaked and colored by dark purplish-red iron staining. Sandy zones and base is overall pink color.

915 - 935 Claystone, red, soft, slightly calcareous, some grey and silty.

935 - 990 Sandstone, fine to medium grained, well sorted, quartzose grey, redish-grey, and greenish-grey, some with red hematite spots, occasional yellow limonite staining. Carbonaceous and has gypsum and selenite fragments showing near the base.

990 - 1000 Siltstone, dark grey and grey, with black carbonaceous spots, quartzose, non-calcareous. Also has layers of red claystone and soft blue clay.

1000 - 1005 Sandstone, white, to pale green quartz, well sorted, calcareous, medium grained, poorly porous.

1005 - 1018 Siltstone, grey and grey pyritic, non-calcareous; also varicolored claystone. Fossiliferous (crinoids).
Limestone, dark grey to black, medium course surgery, highly fossiliferous with crinoid stems.

Claystone, black, dark grey, and dark greenish-grey, pyritic, non-calcareous.

Limestone, brownish-black, sugary, calcite and pyrite veinlets, thin continuous bands of black carbonaceous material. Also gypsum fragments and inclusions in limestone.

Shale, black, calcareous, sulphur odor.

Limestone, brownish-black, sugary, calcite veinlets. Selenite fragment and zones of grey, non-calcareous siltstone.

Respectfully submitted,

Herbert O. Hadley

September 27, 1949
WATER ANALYSIS REPORT

Field: Pronghorn Ranch  
Operator: Herb Hadley  
Location: 7-11-6-23E  
Well No.: Haolon #1  
Location: 7-11-6-23E  
Date: 9-30-19  
Operator: Herb Hadley  
Location: 7-11-6-23E  
Date: 9-30-19  
Other pertinent data:  

Analyzed by: KA  
Lab. No: 3399  

### PARTS PER MILLION

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<th>Na</th>
<th>K</th>
<th>Ca</th>
<th>Mg</th>
<th>Fe</th>
<th>SO4</th>
<th>Cl</th>
<th>CO3</th>
<th>HCO3</th>
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### MILLIGRAM EQUIVALENTS

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### MILLIGRAM EQUIVALENTS IN PERCENT

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Total Solids in Parts per Million

- By evaporation: 1368
- After ignition: 1308
- Calculated: 1373

Properties of Reaction in Percent

- Primary salinity: 75.28
- Secondary salinity: 4.44
- Primary alkalinity: 0.00
- Secondary alkalinity: 24.38
- Chloride salinity: 1.05
- Sulfate salinity: 95.95

Remarks and conclusions: Appears to be formation water. Correlates with  
Lab. No: 3400
WATER ANALYSIS REPORT

Field: Frangano Ranch                        Well No.: Hanlon #1
Operator: Herb Hadley                        Location: 7.11N, 23E
Sampled by:                                  Date: 9-30-49
Sand: 300                                    How sampled: Open Flow Tank

Other pertinent data

Analyzed by: SA                              Lab. No.: 3499

PARTS PER MILLION

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<tr>
<th>Na &amp; K</th>
<th>Ca</th>
<th>Mg</th>
<th>Fe</th>
<th>SO2</th>
<th>Cl</th>
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MILLIGRAM EQUIVALENTS

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<th>Ca/20</th>
<th>Mg/50</th>
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<th>Cl/2</th>
<th>CO/25</th>
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MILLIGRAM EQUIVALENTS IN PERCENT

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<tr>
<th>Fe/2</th>
<th>Ca/20</th>
<th>Mg/50</th>
<th>SO/3</th>
<th>Cl/2</th>
<th>CO/25</th>
<th>HCO/50</th>
<th>OH/10</th>
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<tr>
<td>12.13</td>
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<td>15.02</td>
<td>36.52</td>
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<td>12.68</td>
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Total Solids in Parts per Million

By evaporation: 1279
After ignition: 1279
Calculated: 1299

Properties of Reaction in Percent

Primary salinity: 21.26
Secondary salinity: 56.16
Primary alkalinity: 0.00
Secondary alkalinity: 25.28
Chloride salinity: 4.93
Sulfate salinity: 96.92

Observed pH: 7.5

Remarks and conclusions: Appears to be formation water. Correlates with

Lat. No. 3999.
## WATER WELL LOG

**Owner:** Wyman Ranch Division  
**Address:** Denver, Colorado

**Owner:** Fearless Incorporated  
**Address:** Denver, Colorado

**Driller:** Gordon Scaman  
**Address:** Roundup, Montana

<table>
<thead>
<tr>
<th>Date Started</th>
<th>Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Location:** Sec. 9 T. 11 R. 23 1/4 sec. W4 Mtk

### Type of well

- Drilled:
  - (Dug, driven, bored, or drilled)
  - (Churn drill, rotary, other)

### Water use:

- Domestic
- Municipal
- Stock
- Irrigation
- Industrial
- Drainage
- Other:

### Casing:

- ft. to ft.
- Type
- Size

### Perforated or Screened:

- Ft. to Ft.
- Ft. to Ft.

### Type of screen or perforations:

-...

### Static Water level, for non-flowing well:

- feet

### Shut-in pressure, for flowing well:

- lb./sq. in.
- (date)

### Pumping water level:

- 106 feet at 10 gal. per min.

### How tested:

- Bailier

### Length of test:

- ...

### Remarks:

- (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

- ...

- (over)
WYTANA CATTLE COMPANY ** PRONGHORN WATER WELL NO. 26
NEHHEE Sec. 9-11-63

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 9</td>
<td>Shale brown</td>
</tr>
<tr>
<td>9 - 49</td>
<td>Shale black</td>
</tr>
<tr>
<td>49 - 51</td>
<td>Sandstone grey hard (small amount water)</td>
</tr>
<tr>
<td>51 - 78</td>
<td>Shale, black hard</td>
</tr>
<tr>
<td>78 - 84</td>
<td>Sandstone, dark grey hard (water bearing)</td>
</tr>
<tr>
<td>84 - 99</td>
<td>Shale, black hard</td>
</tr>
<tr>
<td>99 - 105</td>
<td>Sandstone, dark grey (water bearing)</td>
</tr>
<tr>
<td>105 - 106</td>
<td>Shale, black - total depth.</td>
</tr>
</tbody>
</table>

Casing perforated opposite water sand
Casing set on bottom - 2½ inch
Tested with bailer 10 gallons per minute.
YAPUNCICH-SANDERSON LABORATORIES  
S NORTH 26TH ST. 
BILLINGS, MONTANA  

WATER ANALYSIS REPORT  
Lab. No. 1341  

To: Mr. Gordon Scammon  
Address: P.O. Box 451, Roundup, Montana  
Sample from Wytana Cattle Co. Water Well No. 26 Pronghorn, Woury Sand 108'  
Intended use: Stock  

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Parts per Million</th>
<th>Total Solids in Parts per Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>499</td>
<td>By evaporation: 1328</td>
</tr>
<tr>
<td>Calcium</td>
<td>10</td>
<td>After ignition: 1558</td>
</tr>
<tr>
<td>Magnesium</td>
<td>16</td>
<td>Calculated: 1448</td>
</tr>
<tr>
<td>Sulfate</td>
<td>561</td>
<td>pH: 8.3</td>
</tr>
<tr>
<td>Chloride</td>
<td>29</td>
<td>Specific gravity: 1.002 @ 60°F</td>
</tr>
<tr>
<td>Carbonate</td>
<td>32</td>
<td>Resistivity @ 60°F</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>608</td>
<td>ohms per meter cubed: 5.50</td>
</tr>
<tr>
<td>Total Silica</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soluble Silica</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total hardness as calcium carbonate: 5.3 grains/U.S. gallon  
Remarks:  
Soft water. Suitable for stock and domestic use.
**Water Well Log**

**Owner:** Mary Komboi  
**Address:** Roundup, Montana

**Driller:** Mrs. & Joe Komboi  
**Address:** Roundup, Montana

**Date Started:** April 1, 1958  
**Date Completed:** April 11, 1958

**Location:** Sec. 11 T 22 R 23 NW of NE 4

**Type of well:** Drilled  
**Equipment used:** Churn (Drill, driven, bored, or drilled)

**Water use:** Stock

**Casing:**
- 0 ft. to 21 ft. Type: Iron  
- Size: 6 inch

**Perforated or screened:**
- 9 ft. to 21 ft. Ft. to Ft.

**Type of screen or perforations:**

**Static water level, for non-flowing well:** 15 ft.

**Shut-in pressure, for flowing well:** 14 lb./sq. in. on: (date)

**Pumping water level:** 15 feet at over 15 gal. per min.

**How tested:** Baler

**Length of test:** 1 hour

**Remarks:** (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

---

(over)
<table>
<thead>
<tr>
<th>Depth, feet</th>
<th>From</th>
<th>To</th>
<th>Description of Material Drilled</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>16</td>
<td>Surface soil</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>21</td>
<td>Gravel</td>
</tr>
</tbody>
</table>
STATE OF MONTANA

ADMINISTRATOR OF GROUNDWATER CODE

OFFICE OF STATE ENGINEER

Declaration of Vested Groundwater Rights
(Under Chapter 237, Montana Session Laws, 1961)

Marly Kombol, of BOX 898, Roundup

County of Musselshell, State of Montana

have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:

1. Name of Appropriator

2. The beneficial use on which the claim is based

3. Date or approximate date of earliest beneficial use; and how continuous the use has been
   June 1956
   3 months
   8 ft. of each year

4. The amount of groundwater claimed (in miner's inches or gallons per minute)
   8 gal. p. m.

5. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof
   20 acres

6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal
   Cylindrical & Pump Jack

7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater
   June 1956
   June 1956

8. The depth of water table
   6 ft. static water level

9. So far as it may be available, the type, size and depth of each well or the general specifications of any other works for the withdrawal of groundwater
   10 ft. hole 20 ft. deep

10. The estimated amount of groundwater withdrawn each year
    200,000 gal.

11. The log of formations encountered in the drilling of each well if available
    5 to 32 gravel 22 to 24 sand 8 to 10 sand

12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record
    None

Signature of Owner

Date

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the Montana Bureau of Mines and Geology and Quadruplicate for the Appropriator.
STATE OF MONTANA,  
MUSSELHELL COUNTY.  

FILED THIS 10 DAY OF 
Dec., A.D. 1943  
AT 2:23 O'CLOCK P.M.  
R. H. MATZKE  
COUNTY RECORDER,  

[Signature]
[Signature]  

169101  

[Filed Information]
MONTANA BUREAU OF MINES AND GEOLOGY
Butte, Montana

WATER WELL LOG

Owner: Peerless Oil & Gas Company
Kytza Ranch Division
Address: Denver Club Bldg.
1670 Denver, Colorado

Driller: Gordon Bozeman
Address: Roundup, Montana

Date Started: __________ Date Completed: __________

Location: Sec. _______ T. _______ R. _______ sec. _______

Type of well: Drilled
(Churn, driven, bored, or drilled)

Equipment used: Churn Drill
(Churn drill, rotary, other)

Water use: Domestic [ ] Municipal [ ] Stock [ ] Irrigation [ ]
Industrial [ ] Drainage [ ] Other: [ ]

Casing: ft. to ft. Type Size

Casing: ft. to ft. Type Size

Casing: ft. to ft. Type Size

Perforated or Screened: Ft. to Ft. to Ft. to Ft.

Type of screen or perforations:

Static Water level, for non-flowing well: __________ feet.

Shut-in pressure, for flowing well: __________ lb./sq. in. on: __________ (date)

Pumping water level: ________ feet at ________ gal. per min.

How tested: __________

Length of test: __________

Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

(over)
WYTANA CATTLE COMPANY

FRONCHORM RANCH WATER WELL NO. 25 — NW1/4 SE1/4 Sec. 15 — 11 — 23

0 - 18 ft. Gravel
18 - 40 Shale tan
40 - 49 Sand fine grained, no water
49 - 61 Shale yellow
61 - 70 Shale dark grey
70 - 78 Shale yellow
78 - 130 Sandstone grey, water 6 gallons per minute
130 - 140 Shale dark grey total depth 140 feet.

4 1/2 J.D. casing perforated 80' to 130'
Baker cage catcher set on pipe at 78'

APR 28 1953
WATER ANALYSIS REPORT

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Parts per Million</th>
<th>Total Solids in Parts per Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>81</td>
<td>By evaporation 464</td>
</tr>
<tr>
<td>Calcium</td>
<td>54</td>
<td>After ignition 354</td>
</tr>
<tr>
<td>Magnesium</td>
<td>46</td>
<td>Calculated 455</td>
</tr>
<tr>
<td>Sulfate</td>
<td>102</td>
<td>pH 7.3</td>
</tr>
<tr>
<td>Chloride</td>
<td>21</td>
<td>Specific gravity</td>
</tr>
<tr>
<td>Carbonate</td>
<td>0</td>
<td>Resistivity @ 60° F</td>
</tr>
<tr>
<td>Bicarbonate</td>
<td>364</td>
<td>1000 ohms per meter cubed 14.7</td>
</tr>
<tr>
<td>Total Silica</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soluble Silica</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total hardness as calcium carbonate 18.9 grains/U. S. gallon

Remarks:

Hard water. Suitable for domestic and stock use.

SPECIALIZING IN CORE, WATER, GAS AND CRUDE OIL ANALYSES
## WATER WELL LOG

**Owner:** Fearless Oil & Gas Company  
**Address:** Butte, Montana  
**Driller:** [Name]  
**Date Started:** [Date]  
**Date Completed:** [Date]  
**Location:** Sec. 17 T. 11N. R. 23E.  

<table>
<thead>
<tr>
<th>Type of well</th>
<th>Drilled</th>
<th>Equipment used</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Dug, driven, bored, or drilled)</td>
<td>Churn drill (Churn drill, rotary, other)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water use:</th>
<th>Domestic</th>
<th>Municipal</th>
<th>Stock</th>
<th>Irrigation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[ ]</td>
<td>[ ]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Casing:</th>
<th>ft. to.</th>
<th>ft.</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perforated or Screened:</th>
<th>Ft. to. ft.</th>
<th>Ft. to. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of screen or perforations:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Static Water level, for non-flowing well:</th>
<th>feet.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shut-in pressure, for flowing well:</th>
<th>lb./sq. in. on: (date)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pumping water level: feet at:</th>
<th>gal. per min.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How tested:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of test:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Cemented**
LITHOLOGIC LOG

All depths relative to rotary bushing which was five (5) feet above ground.

Colorado Shale
0 - 120 No samples taken, but drillers report dark grey shale.
120 - 215 Shale, dark grey to black, with silty zones.

First Cat Creek
215 - 310 Sandstone, fine grained, white to silty grey, quartzose, well sorted, sub-rounded, slightly micaceous and some carbonaceous, some zones of variable porosity, water bearing.
270-80 Patches of coaly carbonaceous material
280-90 Tight silty and carbonaceous
300-10 White matrix

Kootenai Fm.
310 - 350 Siltstone, greenish-grey to grey, hard quartzose, with some zones of black claystone, some silty.
350 - 380 Sandstone, soft, medium to coarse grained, soft green and black mineral grains, sub-angular to rounded, and poorly sorted with white clayey matrix, not porous.
380 - 520 Siltstone and claystone, iron red, grey, brownish to greenish-grey, to white and quartzose, often mottled, biotitic, glauconitic, and carbonaceous, also pyritic.
420-30 Sandy zone, poorly sorted, reddish grey with green glauconite grains, biotitic, and tight.
500-10 Siltstone, white, with greenish-black pyrite specks and also large pyrite inclusions.
510-20 Same becoming quartitic with coarse angular, clear, quartz grains scattered and in zones, tight.

Second Cat Creek Sand
520 - 570 Sandstone, fine to coarse grained, quartzose, cherty, pyritic, friable to tight, sub-rounded to subhedral, grey and grey-white, water bearing.
570 - 582 Claystone, greenish-grey, with scattered quartz grains and zones of quartz sandstone, pyritic.

Third Cat Creek Sand
582 - 640 Sandstone, very fine to medium grained, irregularly to well sorted, rounded to sub-angular, clean, white, quartz, with slight reddish stain at top and grey-brown, soft, silty at bottom. Tight from 580 to 600 ft. Primarily porous and coarse grained from 600 to 730 feet and water bearing.

HERBERT D. HAELEY
CONSULTING EDOLOGIST
MONTANA
640 - 730 Sandstone, medium to coarse grained, quartzose, sub-rounded to angular, much black chert, fairly well sorted, pyritic, some quartz grains euhedral, dirty "salt and pepper" color, and carbonaceous flakes at 720-30, water bearing.

Morrison fm.

730 - 750 Shale, black, pyritic with fine quartz sandy zones and grading into claystone, grey, pyritic with silty zones.

750 - 765 Sandstone, medium to coarse grained, white to grey, quartz with black and brown accessory mineral in varying amounts, carbonaceous streaks and patches, maybe some coal fragments included; where matrix shows it is white; also pyritic zones, porous to tight, some quartz grains euhedral, others sub-angular to rounded, poor to fairly well sorted.

765 - 780 Siltstone and claystone, grey and brownish-grey, micaceous, limy.

770 - 75 Also dark brownish-grey quartzitic, coarse, poorly sorted and quartzitic siltstone.

780 - Total Depth
CHEMICAL & GEOLOGICAL LABORATORIES
521 South Center St.  P. O. Box 279
Casper, Wyoming

WATER ANALYSIS REPORT

Field: Pronghorn Ranch, Montana  Well No.: 2
Operator: H. Hadley  Location: Section 17, T11N, R23E
Sampled by:  Date: 
Formation Sampling: Data: Crack Depths: 580  How sampled: Free Flow
Other pertinent data: Between hard and soft, and only very slightly alkaline and good for stock or irrigation -- probably somewhat contaminated by lat. Cat Creek water. Test indicated would flow 3000 bbls/day.

Analysed by: KA  Date: 10-28-49  Lab No. 3485

<table>
<thead>
<tr>
<th>Parts per Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Na  K  Ca  Mg  Fe</td>
</tr>
<tr>
<td>357  36  46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Milligram Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.52  1.80  3.78  14.34  1.02  1.97  3.77</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Milligram Equivalents in Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.78  4.26  8.96  33.98  2.42  4.67  8.93</td>
</tr>
</tbody>
</table>

- Total Solids in Parts per Million: 1366
- Properties of Reaction in Percent:
  - Primary salinity: 72.80
  - Secondary salinity: 0.00
  - Primary alkalinity: 9.76
  - Secondary alkalinity: 6.44
  - Chloride salinity: 6.65
  - Sulfate salinity: 93.35

Remarks and conclusions: Satisfactory for stock and irrigation.
CHEMICAL & GEOLOGICAL LABORATORIES  
321 South Center St.  
P. O. Box 279  
Casper, Wyoming  

WATER ANALYSIS REPORT  

Field: Pronghorn Ranch, Montana  
Well No.: 2  
Operator: H. Hadley  
Location: Section 17, Township 623E.  

Sampled by:  
Formation: First Cat. Speed. Depth: 370 feet.  
How sampled: Open flow test.  

Other pertinent data: Sulfur water—should be used for stock but not too good for prolonged irrigation as water is fairly alkaline.  
Test indicated flow of 750 bbls/day.  

Analyzed by: CED  
Date: 10-15-49  
Lab. No: 3437

<table>
<thead>
<tr>
<th>Parts Per Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Na &amp; K</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>391</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Milligram Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.99</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Milligram Equivalents in Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.00</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Solids in Parts per Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>By evaporation: 1238</td>
</tr>
<tr>
<td>After ignition: 1052</td>
</tr>
<tr>
<td>Calculated: 1050</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Properties of Reaction in Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary salinity: 72.68</td>
</tr>
<tr>
<td>Secondary salinity: 0.00</td>
</tr>
<tr>
<td>Primary alkalinity: 27.32</td>
</tr>
<tr>
<td>Secondary alkalinity: 0.00</td>
</tr>
<tr>
<td>Chloride salinity: 35.31</td>
</tr>
<tr>
<td>Sulfate salinity: 64.69</td>
</tr>
</tbody>
</table>

Remarks and conclusions: Okay for stock and irrigation.
WATER ANALYSIS REPORT

Field: Fergus County, Montana  Well No.: 2
Operator: J. M. Hadley
Location: Section 17, T11N, R21E
Sampled by:  Date:
Sand, Third Cat Creek  Depth: 722 ft  How sampled: Upon flow test
Other pertinent data: Fairly hard, but can be made soft by preheating
Food water for stock or irrigation

Analyzed by: KA  Date: 12-11-49  Lab. No.: 3438

<table>
<thead>
<tr>
<th>Parts per Million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Na &amp; K</td>
</tr>
<tr>
<td>175</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Milligram Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Milligram Equivalents in Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.63</td>
</tr>
</tbody>
</table>

Total solids in parts per million:
- By evaporation: 779
- After ignition: 680
- Calculated: 758

Properties of reaction in percent:
- Primary salinity: 42.36%
- Secondary salinity: 9.00%
- Primary alkalinity: 19.99%
- Secondary alkalinity: 49.74%
- Chloride salinity: 8.19%
- Sulfate salinity: 91.81%

Observed pH: 7.5

Remarks and conclusions: OKAY for domestic use, irrigation, and stock; different water than 34.77 and better.
CHEMICAL & GEOLOGICAL LABORATORIES
521 South Center St. P. O. Box 279
Casper, Wyoming

WATER ANALYSIS REPORT

Field: Pronghorn Ranch, Montana
Well No.: #2
Operator: H. Hadley
Location: Section 17, T11N, R23W.
Sampled by: Date:
Formation: Third Cat Creek
Depth: 280 T.D.
How sampled: Open flow test
Other pertinent data: Sample somewhat contaminated with drilling mud and water from 1st and 2nd Cat Creek sands.

Analysed by: K.A.
Date: 10-13-49
Lab. No.: 3439

<table>
<thead>
<tr>
<th>Na &amp; K</th>
<th>Ca</th>
<th>Mg</th>
<th>Fe</th>
<th>SO₄</th>
<th>Cl</th>
<th>CO₃</th>
<th>HCO₃</th>
<th>OH</th>
<th>H₂S</th>
</tr>
</thead>
<tbody>
<tr>
<td>158</td>
<td>59</td>
<td>31</td>
<td></td>
<td>259</td>
<td>21</td>
<td>24</td>
<td>340</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MILLIGRAM EQUIVALENTS

<table>
<thead>
<tr>
<th></th>
<th>Parts Per Million</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>Na &amp; K</td>
<td>6.85</td>
</tr>
<tr>
<td>Ca</td>
<td>2.95</td>
</tr>
<tr>
<td>Mg</td>
<td>2.55</td>
</tr>
<tr>
<td>Fe</td>
<td>5.39</td>
</tr>
<tr>
<td>SO₄</td>
<td>0.59</td>
</tr>
<tr>
<td>Cl</td>
<td>0.80</td>
</tr>
<tr>
<td>CO₃</td>
<td>5.57</td>
</tr>
</tbody>
</table>

MILLIGRAM EQUIVALENTS IN PERCENT

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Na &amp; K</td>
<td>27.73</td>
</tr>
<tr>
<td>Ca</td>
<td>11.94</td>
</tr>
<tr>
<td>Mg</td>
<td>10.33</td>
</tr>
<tr>
<td>Fe</td>
<td>21.82</td>
</tr>
<tr>
<td>SO₄</td>
<td>2.39</td>
</tr>
<tr>
<td>Cl</td>
<td>3.24</td>
</tr>
<tr>
<td>CO₃</td>
<td>22.55</td>
</tr>
</tbody>
</table>

Total Solids in Parts per Million

By evaporation: 870
After ignition: 783
Calculated: 719
Observed pH: 7.2

Properties of Reaction in Percent

Primary salinity: 48.42%
Secondary salinity: 0.00%
Primary alkalinity: 7.04%
Secondary alkalinity: 4.54%
Chloride salinity: 9.87%
Sulfate salinity: 90.13%

Remarks and conclusions: Same water as # 3438; okay for stock, irrigation, and domestic use.
CHEMICAL & GEOLOGICAL LABORATORIES
521 South Center St. P. O. Box 279
Casper, Wyoming

WATER ANALYSIS REPORT

Field: Pronghorn Ranch, Montana. Well No.: 2
Operator: H. Hadley. Location: Section 17, T11N, R28W.
Sampled by: Date: 
Other pertinent data: Clean sample after well cased and cleaned. Good water for shock or injection. 

Analyzed by: KA. Date: 10-18-49. Lab. No. 3461.

PARTS PER MILLION

<table>
<thead>
<tr>
<th>Na &amp; K</th>
<th>Ca</th>
<th>Mg</th>
<th>Fe</th>
<th>SO4</th>
<th>Cl</th>
<th>CO3</th>
<th>HCO3</th>
<th>OH</th>
<th>H2S</th>
</tr>
</thead>
<tbody>
<tr>
<td>217</td>
<td>44</td>
<td>192</td>
<td>19</td>
<td>50</td>
<td>330</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MILLIGRAM EQUIVALENTS

9.42  2.20  4.00  0.54  1.67  5.41

MILLIGRAM EQUIVALENTS IN PERCENT

40.53 9.47 17.21 2.32 7.19 23.28

Total Solids in Parts per Million

By evaporation: .677
After ignition: .641
Calculated: .684

Observed pH: 7.8

Properties of Reaction in Percent

Primary salinity: 39.06
Secondary salinity: 0.00
Primary alkalinity: 42.00
Secondary alkalinity: 18.94
Chloride salinity: 11.88
Sulfate salinity: 88.12

Remarks and conclusions: Minera!ly suitable for all purposes including human consumption.
# Montana Bureau of Mines and Geology

**Butte, Montana**

## Water Well Log

**Owner**: Peerless Oil & Gas Company

**Address**: Butte, Montana

**Driller**: W. L. Livingston

**Address**: Missoula, Montana

**Owner**: Montana Ranch Division

**Address**: Denver, Colorado

**Type of Well**: Drilled

**Equipment Used**: Churn Drill

### Well Details

- **Location**: Sec. 20, T. 11, R. 23, ¼ sec. NE ¼ NE ¼

### Water Use

- **Domestic**
- **Municipal**
- **Stock**
- **Irrigation**
- **Industrial**
- **Drainage**
- **Other**

### Casing

- **Casing**: ft. to ft. Type Size
- **Perforated or Screened**: Ft. to Ft. to Ft.

### Static Water Level

- For non-flowing well: feet

### Shut-in Pressure

- For flowing well: lb./sq. in.

### Pumping Water Level

- feet at gal. per min.

### Remarks

- Gravel packing, cementing, packers, type of shut-off, depth of shut-off

---

(over)
Log of Pronghorn Water Well No. 12  NE4 NE1, Sec 20 T13N25

0-10  Gravel
10-.57  Sand (set 80' of 8" surface pipe and Halliburton cemented
       with 32 sacks of cement)
97-160  Colorado shale and some bentonite
160-170  Shale with hard streaks of sand
170-190  Hard sand and grey shale
190-200  Medium hard sand and bentonite
200-210  Shale, bentonite, and hard sand streaks
210-235  Black shale with sand streaks
235-340  Dark hard sand with shale
340-370  Shale with hard sand streaks
370-380  Hard white sand with some shale
380-410  Med. to hard sand with streaks of shale
410-470  Grey sand
470-490  Grey sand and various colored shale
490-500  Red shale
500-510  Grey sand and var. shale
510-550  Var. shale
550-590  Hard sand with shale
590-650  Sand with grey clay
650-618  Var. shale and grey clay
618-622  Hard grey sand
622-643  Sand and shale
643-646  Hard lime sand (Run 63'ilee 6" galv. pipe, cemented
       with 32 sacks)
646-647  Hard lime sand
647-680  Grey salt & pepper sand
680-690  Grey clay and soft sand
690-715  Soft sand
715-733  Reddish sand (Col. Bottomed at 734')  Well flowing, measures
        5,950 bbls. per day.)
### WATER WELL LOG

**Owner:** Beie Liversmore  
**Address:**  
**Drilled By:** L. Ferguson  
**Address:**  
**Date Started:** May 2, 1959  
**Date Completed:** May 9, 1959  
**Location:** Sec. 31 T. 8 R. 26 3/4 sec. (Center)

<table>
<thead>
<tr>
<th>Type of well:</th>
<th>Drilled</th>
<th>Equipment used: Churn Drill</th>
</tr>
</thead>
</table>

- **Water use:**  
  - Domestic  
  - Municipal  
  - Stock  
  - Irrigation  
  - Industrial  
  - Drainage  
  - Other:  

<table>
<thead>
<tr>
<th>Casing:</th>
<th>ft. to</th>
<th>195 ft.</th>
<th>Type:</th>
<th>Galvanized</th>
<th>Size:</th>
<th>6&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Perforated or Screened:** Ft. 16.5 to Ft. 17.5  
- **Type of screen or perforations:**  

- **Static Water level, for non-flowing well:** feet  
- **Shut-in pressure, for flowing well:**  
  - lb./sq. in. on:  
  - (date)  
- **Pumping water level:** 55 feet at  
  - 5 gal. per min.  
- **How tested:** Drilling  
- **Length of test:** 1 ft.  

**Remarks:** (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)  

---

(over)
<table>
<thead>
<tr>
<th>Depth, feet</th>
<th>Description of Material Drilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 3</td>
<td>Argillite, silt.</td>
</tr>
<tr>
<td>3 - 5</td>
<td>Hard sandstone.</td>
</tr>
<tr>
<td>5 - 8</td>
<td>Light blue shale.</td>
</tr>
<tr>
<td>8 - 20</td>
<td>Sandstone, light grey shale.</td>
</tr>
<tr>
<td>20 - 36</td>
<td>Coal</td>
</tr>
<tr>
<td>36 - 60</td>
<td>Sandy shale, little lignite.</td>
</tr>
<tr>
<td>60 - 175</td>
<td>Brown sand, 20,000,000 phi, 98%</td>
</tr>
<tr>
<td>175 - 180</td>
<td>Lignite 2 shale.</td>
</tr>
<tr>
<td>180 - 190</td>
<td>Brown sand 1:20, 90% phi, 99%</td>
</tr>
<tr>
<td>190 - 195</td>
<td>Shale</td>
</tr>
<tr>
<td>Type of well</td>
<td>Drilled</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water use</th>
<th>Domestic</th>
<th>Municipal</th>
<th>Stock</th>
<th>Irrigation</th>
<th>Industrial</th>
<th>Drainage</th>
<th>Other</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Casing:</th>
<th>ft. to ft.</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Casing:</th>
<th>ft. to ft.</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Perforated or Screened:</th>
<th>Ft. to Ft.</th>
<th>Ft. to Ft.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Type of screen or perforations:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Static Water level, for non-flowing well:</th>
<th>feet</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Shut-in pressure, for flowing well:</th>
<th>lb./sq. in. on:</th>
<th>(date)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Pumping water level:</th>
<th>feet at</th>
<th>gal. per min.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>How tested:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Length of test:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)</th>
</tr>
</thead>
</table>
July 10, 1951

Wynona Cattle Co.
# Robinson & Colesman
218 Bank Electric Bldg.
Lewistown, Mont.

Dear Sir:

The drillers log of the S. O Miller et al #1 Anderson Sec. 20, T. 11 N, R. 23 E is enclosed herewith for your information. All data from that log has been plotted exactly as originally recorded.

Formation tops interpreted from this log are as follows:

<table>
<thead>
<tr>
<th>Formation</th>
<th>Interval</th>
<th>Top</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontier</td>
<td>156'</td>
<td></td>
</tr>
<tr>
<td>First Cat Creek</td>
<td>350'</td>
<td>475'</td>
</tr>
<tr>
<td>Kootenai</td>
<td>475'</td>
<td>649'</td>
</tr>
<tr>
<td>Second Cat Creek</td>
<td>649'</td>
<td>738'</td>
</tr>
<tr>
<td>Total Depth</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Water horizons encountered in the #1 Anderson were as follows:

<table>
<thead>
<tr>
<th>Aquifer</th>
<th>Interval</th>
<th>Water Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontier</td>
<td>150' - 173'</td>
<td>Water rose 160' in hole</td>
</tr>
<tr>
<td>First Cat Creek</td>
<td>350' - 440'</td>
<td>Water which flowed over top of casing</td>
</tr>
<tr>
<td>(upper portion)</td>
<td></td>
<td>Sulphur water which flowed 4' over top of 8' casing, estimated at 24,000 barrels per day</td>
</tr>
<tr>
<td>Second Cat Creek</td>
<td>649' - 733'</td>
<td></td>
</tr>
</tbody>
</table>

The formation tops and water zones noted above have good correlation with the other water wells on the Pronghorn Ranch. At total depth the #1 Anderson was very close to the top of the Third Cat Creek sand. If drilling had continued, the top of the Third Cat Creek sand should have been penetrated within another five feet. Conceivably, water from the Third Cat Creek sand could have broken through the shale overlying it and contributed to the strong artesian flow observed by the drillers. However, the log shows no actual penetration of Third Cat Creek sand.

George Dessow
Consulting Geologist
Billings, Montana
In view of the reported artesian flow of the #1 Anderson and the known artesian flow of the #10 Pronghorn, the area in the immediate vicinity of these wells must be considered especially favorable for development of artesian flows from the Second Cat Creek sand.

Geological studies are recommended for any future wells drilled in the Second Cat Creek area.

Sincerely,

George Darrow

[Signature]

GEORGE DARROW
CONTRIBUTING GEOLOGIST
DILLINGER PETROLEUM
# WATER WELL LOG

<table>
<thead>
<tr>
<th>Owner</th>
<th>Mary Kosbol</th>
<th>Address</th>
<th>Roundup, Montana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driller</td>
<td>Kosbol Frank</td>
<td>Address</td>
<td>Roundup, Montana</td>
</tr>
<tr>
<td>Date Started</td>
<td>October, 1953</td>
<td>Date Completed</td>
<td>October, 1953</td>
</tr>
<tr>
<td>Location: Sec.</td>
<td>23 T. 11 R. 23 34 sec. 3.0 of SE 22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Type of well**: Drilled  
**Equipment used**: Churn (Drill, driven, bored, or drilled)  
**Churn**: (Churn drill, rotary, other)

**Water use**: Domestic [ ]  Municipal [ ]  Stock [X]  Irrigation [ ]  Industrial [ ]  Drainage [ ]  Other: [ ]

**Casing**: 0 ft. to 40 ft. Type: Galvanized  Size: 6 inch

**Casing**: 40 ft. to [ ] ft. Type: [ ] Size: [ ]

**Casing**: [ ] ft. to [ ] ft. Type: [ ] Size: [ ]

**Perforated or Screened**: Ft. 20 to Ft. 40  Ft. [ ] to Ft. [ ]

**Type of screen or perforations**: Drilled 3 inch holes

**Static Water level, for non-flowing well**: 20 ft. of water

**Shut-in pressure, for flowing well**:  lb./sq. in. on: [ ]

**Pumping water level**: 6 ft. feet at 3 gal. per min.

**How tested**: [ ]

**Length of test**: 2 hours

**Remarks**: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

---

(over)
## Log of Well

<table>
<thead>
<tr>
<th>Depth, feet</th>
<th>Description of Material Drilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
</tr>
<tr>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>10</td>
</tr>
</tbody>
</table>
WATER WELL LOG

Owner: Mary Kembol  
Address: Roundup, Montana

Driller: Kembol Bros.  
Address: Roundup, Montana

Date Started: October 1, 1954  
Date Completed: October 15, 1954

Location: Sec. 23, T. 11 N., R. 23 W., 1/4 sec. 32 of NE

Type of well: Drilled  
Equipment used: Churn

Water use: Domestic □  
Municipal □  
Stock □  
Irrigation □

Industrial □  
Drainage □  
Other □

Casing: 0 ft. to 39 ft.  
Type: Galvanized  
Size: 1 inch

Casing: 39 ft. to ft.  
Type:  
Size:

Casing: ft. to ft.  
Type:  
Size:

Perforated or Screened: Ft. 20 to 39 ft.

Type of screen or perforations: Drilled holes

Static Water level, for non-flowing well: 11 ft. from top  
28 ft. of water feet

Shut-in pressure, for flowing well: lb./sq. in. on: (date)

Pumping water level: 28 ft. deep feet at 20 gal. gal. per min.

How tested: Beater

Length of test: 1 hour

Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

Sand rock

(over)
<table>
<thead>
<tr>
<th>Depth, feet</th>
<th>Description of Material Drilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 9</td>
<td>Sandy loam</td>
</tr>
<tr>
<td>9 to 38</td>
<td>Sandrock</td>
</tr>
<tr>
<td>38 to 39</td>
<td>Shale (dark)</td>
</tr>
</tbody>
</table>
Declaration of Vested Groundwater Rights
(Under Chapter 237, Montana Session Laws, 1961)

Mary Kembol
(Without Appropriator)  of BOX 878  ROUNDUP
County: RUSSELLE STATE OF MONTANA
(Address) (Town) State of MONTANA
have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:

2. The beneficial use on which the claim is based
   STOCK WATER

3. Date or approximate date of earliest beneficial use and how continuous the use has been
   July 1-5-63

4. The amount of groundwater claimed (in miner's inches or gallons per minute) 25 G.P.M.

5. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof
   30 acres  GARDEN
   Mary Kembol

6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal
   3½ Cylinder & Gas Driven
   Pump Jack

7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater
   July 1952  Completed July 1952

8. The depth of water table
   12 FEET  STATIC WATER LEVEL

9. So far as it may be available, the type, size and depth of each well, or the general specifications of any other works for the withdrawal of groundwater
   7½ IN HOLE 39 DEEP

10. The estimated amount of groundwater withdrawn each year
    300,000 GALLONS

11. The log of formations encountered in the drilling of each well if available
    O to 39 SAND

12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record
    NONE

Signature of Owner
Mary Kembol
Date 12-9-63

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; triplicate to the Montana Bureau of Mines and Geology and quadruplicate for the Appropria tor.
STATE OF MONTANA
MUSSEL SHELL COUNTY

FILED THIS 10 DAY OF

December 1963

AT 2:25 O'CLOCK P.M.

R. H. MATZKE
COUNTY RECORDER

FRANCES L. MILLER
DEPUTY
## Declaration of Vested Groundwater Rights

**STATE OF MONTANA**

**ADMINISTRATOR OF GROUNDWATER CODE**

**OFFICE OF STATE ENGINEER**

### Declaration of Vested Groundwater Rights

(Under Chapter 237, Montana Session Laws, 1961)

**Mary Kombol**
(Name of Approprietor)

<table>
<thead>
<tr>
<th>Address</th>
<th>Town</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box 888</td>
<td>Roundup</td>
</tr>
</tbody>
</table>

**County of Musselshell**

State of Montana have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:

1. The beneficial use on which the claim is based: **Stock Water**

2. **Date or approximate date of earliest beneficial use:** July 1952; **How continuous the use has been:** Year around

3. The amount of groundwater claimed (in miner's inches or gallons per minute): **32 GPM**

4. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof: **NONE**

5. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater: **July 1952**

6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal: **2¼ Cylinder, Interleap Pumping**

7. The depth of water table: **10 ft water level**

8. The estimated amount of groundwater withdrawn each year: **250,000 Gals**

9. The log of formations encountered in the drilling of each well if available: **Red Clay to 10 sandy**

10. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record: **NONE**

**Signature of Owner:** Mary Kombol
**Date:** 12-7-63

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; triplicate to the Montana Bureau of Mines and Geology and quadruplicate for the Appropriator.
Notice of Completion of Groundwater Appropriation by Means of Well
DEVELOPED AFTER JANUARY 1, 1962
(Under Chapter 237, Montana Session Laws, 1961)

Owner: Joe Honold  Address: Ronan, Mont.
Driller: Joe Honold  Address: Ronan, Mont.

Date of Notice of appropriation of groundwater: __________
Date well started: __________  Date completed: __________

Type of well: Drilled  Equipment used:Shown
(Dug, Driven, bored or drilled) (Churn drill, rotary or other)

Water use:  Domestic ☐  Municipal ☐  Stock ☐  Irrigation ☐
Industrial ☐  Draining ☐  Other ☐

Indicate on the diagram the character and thickness of the different strata met
with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show
depth at which water is encountered, thickness and character of water-bearing
strata and height to which the water rises in the well.

<table>
<thead>
<tr>
<th>Size of Drilled Hole</th>
<th>Size and Weight of Casing</th>
<th>From (Feet)</th>
<th>To (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 1/2</td>
<td>8 1/4 x 22 1/2</td>
<td>0</td>
<td>45</td>
</tr>
</tbody>
</table>

Static Water Level for non-flowing well: 41 ft.

Shut-in Pressure for Flowing Well: __________
Pumping Water Level: __________

Discharge: __________ gal. per minute.

How Tested: __________
Length of Test: __________
Remarks: (Gravel packing, cementing, pack-


Indicate location of well and
place of use, if possible. Each
small square represents 40
acres.

SHOW—If used for irrigation, industrial, drainage, explain, state
number of acres and location or other data ( Ade, Block and Addi-
tion).

This form to be prepared by driller, and three copies to be filed by the owner with the
County Clerk and Recorder in the county in which the well is located, tissue copy to be
re-oliced by driller.

Please answer all questions. If not applicable, so state, otherwise the form will be
returned.

Driller's License Number: __________
Driller's Signature: __________

41, 589
STATE OF MONTANA
ADMINISTRATOR OF GROUNDWATER CODE
OFFICE OF STATE ENGINEER

Declaration of Vested Groundwater Rights
(Under Chapter 237, Montana Session Laws, 1961)

STATE OF MONTANA

COUNTY OF MUSSEL SHELL

STATE ENGINEER

Declaration of Vested Groundwater Rights
(Under Chapter 237, Montana Session Laws, 1961)

JOE MARY

KOMBOL RANCH

Box 898

ROUNDEL

(Name of Appropriator)

(Address)

(Town)

County of MUSSEL SHELL

State of MONTANA

have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:

1. Stock Water

2. The beneficial use on which the claim is based

3. Date or approximate date of earliest beneficial use; and how continuous the use has been

4. The amount of groundwater claimed (in miner's inches or gallons per minute)

5. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof

6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal

7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater

8. The depth of water table

9. So far as it may be available, the type, size and depth of each well or the general specifications of any other works for the withdrawal of groundwater

10. The estimated amount of groundwater withdrawn each year

11. The log of formations encountered in the drilling of each well if available

12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record

Signature of Owner

Date: 12-9-63

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; triplicate to the School of Mines and quadruplicate for the appropriator.
<table>
<thead>
<tr>
<th>Field</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td>Kombol Bros.</td>
</tr>
<tr>
<td>Address</td>
<td>Roundup, Montana</td>
</tr>
<tr>
<td>Driller</td>
<td>Joe Kombol</td>
</tr>
<tr>
<td>Address</td>
<td>Roundup, Montana</td>
</tr>
<tr>
<td>Date Started</td>
<td>November 16, 1960</td>
</tr>
<tr>
<td>Date Completed</td>
<td>11-22-60</td>
</tr>
<tr>
<td>Location</td>
<td>Sec. 26, T. 11, R. 23 ¾ sec. Center of Sec. 32 ½</td>
</tr>
<tr>
<td>Type of well</td>
<td>Drilled</td>
</tr>
<tr>
<td>Equipment used</td>
<td>Churn</td>
</tr>
<tr>
<td>Water use</td>
<td>Domestic, Stock, Irrigation</td>
</tr>
<tr>
<td>Casing</td>
<td>0 ft. to 132 ft. Galvanized, Size 6 in.</td>
</tr>
<tr>
<td>Casing</td>
<td>ft. to ft. Type Size</td>
</tr>
<tr>
<td>Casing</td>
<td>ft. to ft. Type Size</td>
</tr>
<tr>
<td>Perforated or Screened</td>
<td>55 ft. to 70 ft., 105 ft. to 130 ft.</td>
</tr>
<tr>
<td>Type of screen or perforations</td>
<td>½ inch holes - 6 holes per foot.</td>
</tr>
<tr>
<td>Static Water level, for non-flowing well</td>
<td></td>
</tr>
<tr>
<td>Shut-in pressure, for flowing well</td>
<td></td>
</tr>
<tr>
<td>Pumping water level</td>
<td>35 feet at 15 gal. per min.</td>
</tr>
<tr>
<td>How tested</td>
<td>Faller</td>
</tr>
<tr>
<td>Length of test</td>
<td>1 hour</td>
</tr>
<tr>
<td>Remarks</td>
<td>(Gravel packing, cementing, packers, type of shut-off, depth of shut-off)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Log of Well

<table>
<thead>
<tr>
<th>Depth, feet</th>
<th>Description of Material Drilled</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 70</td>
<td>Sandstone</td>
</tr>
<tr>
<td>70 - 111</td>
<td>Light Shale</td>
</tr>
<tr>
<td>112 - 115</td>
<td>Coal</td>
</tr>
<tr>
<td>115 - 132</td>
<td>Sandrock - Water</td>
</tr>
</tbody>
</table>
MONTANA BUREAU OF MINES AND GEOLOGY
Butte, Montana

WATER WELL LOG

<table>
<thead>
<tr>
<th>Owner</th>
<th>Peetless Oil &amp; Gas Company</th>
<th>Address</th>
<th>Montana Ranch Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driller</td>
<td>Montana Pioneer Oil Company</td>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>Date Started</td>
<td>Dec. 26, 1922</td>
<td>Date Completed</td>
<td>Dec. 1924</td>
</tr>
<tr>
<td>Location</td>
<td>Sec. 29 T 11N R 23S 1/4 sec</td>
<td>NE NE</td>
<td></td>
</tr>
</tbody>
</table>

Type of well: Drilled
(Dug, driven, bored, or drilled)

Equipment used: Churn Drill
(Churn drill, rotary, other)

Water use: Domestic □ Municipal □ Stock □ Irrigation □
Industrial □ Drainage □ Other:

Casing:
- ft. to ft. Type Size
- ft. to ft. Type Size
- ft. to ft. Type Size

Perforated or Screened: Ft. to ft. Ft. to ft.

Type of screen or perforations:

Static Water level, for non-flowing well: □ feet.
Shut-in pressure, for flowing well: □ lb./sq. in. on: (date)
Pumping water level: □ feet at □ gal. per min.
How tested:

Length of test:

Remarks: (Gravel packing, cementing, packers, type of shut-off, depth of shut-off)

(over)
South Willow Creek

Montana Pioneer Oil Company  #1 Miller Ranch
NE NE Sec. 29 T. 11 N, R. 25 E
150' S & 250' W of the NE cor. of Sec. 29
Musselshell Company, Montana

Commenced: Dec. 26, 1922
Completed: Dec. 1924
Total Depth: 2210

Drillers Log

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>50</td>
<td>Terrace gravel</td>
</tr>
<tr>
<td>55</td>
<td></td>
<td>Shale, black</td>
</tr>
<tr>
<td>945</td>
<td>960</td>
<td>Sand - water</td>
</tr>
<tr>
<td>1150</td>
<td></td>
<td>Shale, black</td>
</tr>
<tr>
<td>1227</td>
<td></td>
<td>First Cat Creek</td>
</tr>
<tr>
<td>1240</td>
<td></td>
<td>Sand - water - oil showing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in part</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shale, black</td>
</tr>
<tr>
<td>1590</td>
<td>1465</td>
<td>Kootenai</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shale, red</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand with occasional lime</td>
</tr>
<tr>
<td></td>
<td></td>
<td>shells, good oil showing about 1410', water above</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and below</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sand</td>
</tr>
<tr>
<td>1510</td>
<td></td>
<td>Shale, black</td>
</tr>
<tr>
<td>1515</td>
<td></td>
<td>Shale - caving</td>
</tr>
<tr>
<td>1626</td>
<td>1618</td>
<td>Sand - water, heavy artesian</td>
</tr>
<tr>
<td></td>
<td></td>
<td>flow 1550' to 1540'</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shale, black</td>
</tr>
<tr>
<td>1620</td>
<td></td>
<td>Sand</td>
</tr>
<tr>
<td>1629</td>
<td></td>
<td>Shale, dark</td>
</tr>
<tr>
<td>1635</td>
<td></td>
<td>Shale, gray</td>
</tr>
<tr>
<td>1653</td>
<td></td>
<td>Shale, brown</td>
</tr>
<tr>
<td>1655</td>
<td></td>
<td>Shale, gray</td>
</tr>
<tr>
<td>1855</td>
<td></td>
<td>Ellis</td>
</tr>
<tr>
<td>1948</td>
<td></td>
<td>Sand, shale with water</td>
</tr>
</tbody>
</table>

George Lassen
CONSULTING GEOLOGIST
BILLINGS, MONTANA