

**OFFICE OF THE STATE ENGINEER
OFFICE MEMORANDUM**

TO: Todd Sando, PE, State Engineer
Jon Patch PE, Division Director, Water Appropriations Division
William Schuh, Assistant Division Director, Water Appropriations Division

FROM: Andrew Nygren, Hydrologist

SUBJECT: Impact of In-Lieu of Irrigation Policy on Industrial Water Use

DATE: August 4, 2015

INTRODUCTION

This memorandum summarizes water use and the location of irrigation permits that have participated in the State Engineer's policy of obtaining a temporary water permit in-lieu of irrigation (ILOP). The policy has been in existence since September 2010. These water permits will be referred to as ILOP Permits. We assume industrial water use referred to in this memorandum pertains to industrial water use from water depots. The **SUMMARY POINTS** serves as a bulleted executive summary with graphs. Supporting material is included in the subsequent section.

SUMMARY POINTS

- Permits participating in ILOP that have reported use greater than zero has ranged from 1 in 2010 to 37 in 2013 and 2014 representing up to 28 users.
- There are 34 ILOP Permits in 2015 representing 24 users.
 - 14 of the 34 permits are associated with water depots that will remain open without ILOP.
 - Of the 34 permits:
 - 27 permits are located within 5 miles of a water depot that will remain open without ILOP.
 - 7 permits are located between 5 and 10 miles of a water depot that will remain open without ILOP.
 - 1 permit is located between 10 and 15 miles of a water depot that will remain open without ILOP.
- The approved irrigated acreage for ILOP Permits that reported water use greater than zero from 2010 through 2014 has respectively been 160 acres, 3,862 acres, 5,634 acres, 7,397 acres, and 7,066 acres. This represents approved irrigated acres that were taken out of production.
- The total volume of water reported under ILOP Permits from 2010 through 2014 is 12,883 acre-feet with 99% of this volume coming from groundwater sources and 1% coming from surface water sources.
- Total annual appropriations under ILOP has ranged from 424.8 acre-feet in 2010 to 5,685.3 acre-feet in 2013. The 2015 appropriation for ILOP Permits is 4,971.17 acre-feet.
- The total percent of reported water use by ILOP compared to the ILOP annual appropriation from 2010 to 2014 is respectively 36%, 81%, 80%, 53%, and 63%.

- ILOP reported water use has varied from 151.8 acre-feet in 2010 to 4,103.3 acre-feet in 2012, and has declined since 2012 (Figure 1).
- ILOP reported water use has varied from 2.7% of total industrial water use for water depots in 2010 up to 25.1% in 2012, and has declined to 11.7% in 2014 (Figure 1).
- Five counties have participated in ILOP. The policy has negligible effects on water use in Stark and Mountrail Counties (Figure 2).
- Williams County uses the most ILOP water followed respectively by McKenzie County and Divide County (Figure 2).
- The ILOP use by county as a percent of total industrial water use for water depots by county has declined since 2010 (Figure 3).
- Six geographic areas will be affected by discontinuation of ILOP (see supporting material for more details):
 - **NW McKenzie County-Charbonneau aquifer area:** Three water depots close. Alternative depot locations exist along US 85 and at Yellowstone River valley to west by way of State 200.
 - **Central Williams County-Little Muddy aquifer 13-Mile Corner area (13MC):** Five water depots will be affected, with four depots closing. There is little additional water available for appropriation from 13MC. Alternative depots exist in area based on map of developed and undeveloped water depots.
 - **North Central Williams County-Little Muddy aquifer 29-Mile Corner area (29MC):** Five water depots will close, and three water depots will see annual appropriation decline. There are several industrial water permit applications pending in this area. A numerical model is under development for area to address the large amount (4,000+ acre-feet) of pending applications that are mostly for industrial use.
 - **SE Williams County-Hofflund aquifer:** No depots will be shut down. Water depots will see decrease in annual volume of water that can be sold. Hofflund aquifer area uses highest percentage of ILOP water. Further appropriations to the aquifer will require water level triggers.
 - **SE Divide County-West Wildrose aquifer area:** No depots will be shut down. A 30% reduction in the appropriation of the affected depot would have occurred in 2015.
 - **NW Divide County-Skjeremo Lake aquifer area:** One water depot will closed. The Skjeremo Lake aquifer is heavily appropriated and further appropriations to pending industrial water permit applications will not be granted in the near future. There are alternative water depots that have not been developed to the south and to the northwest.

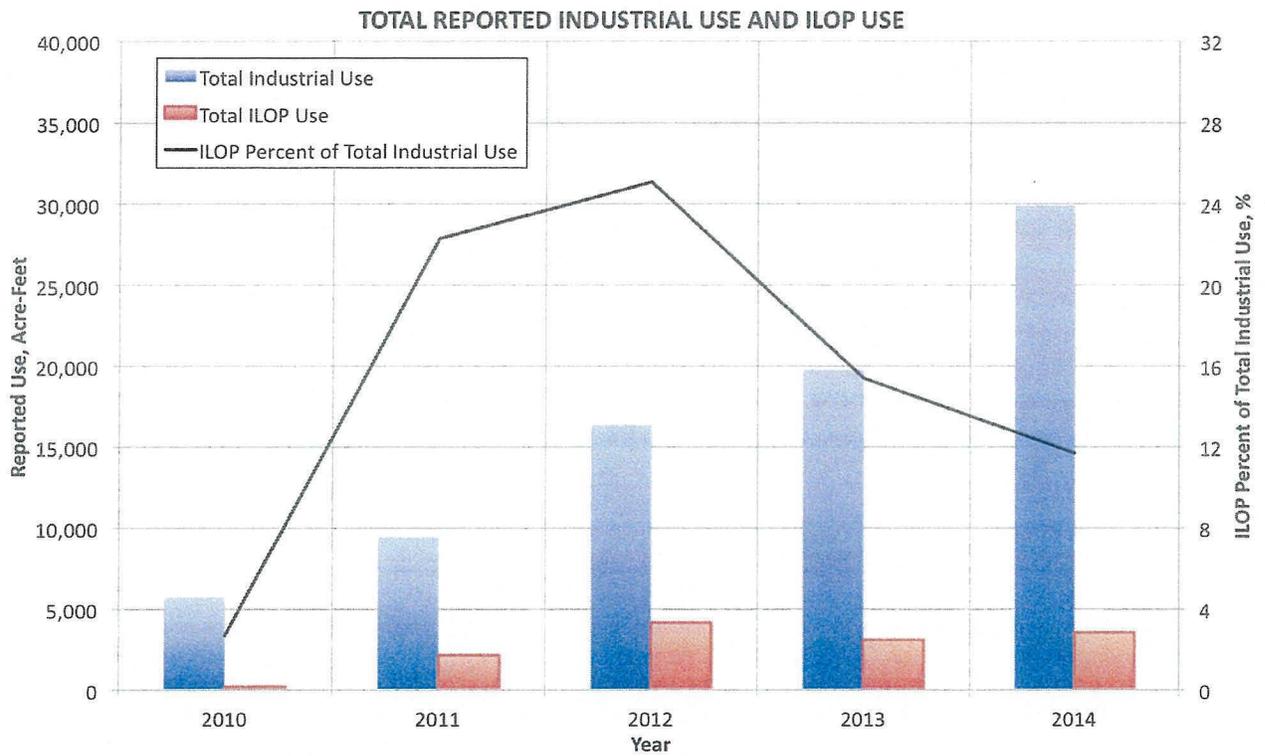


Figure 1. Total reported industrial water use from water depots and ILOP reported water use.

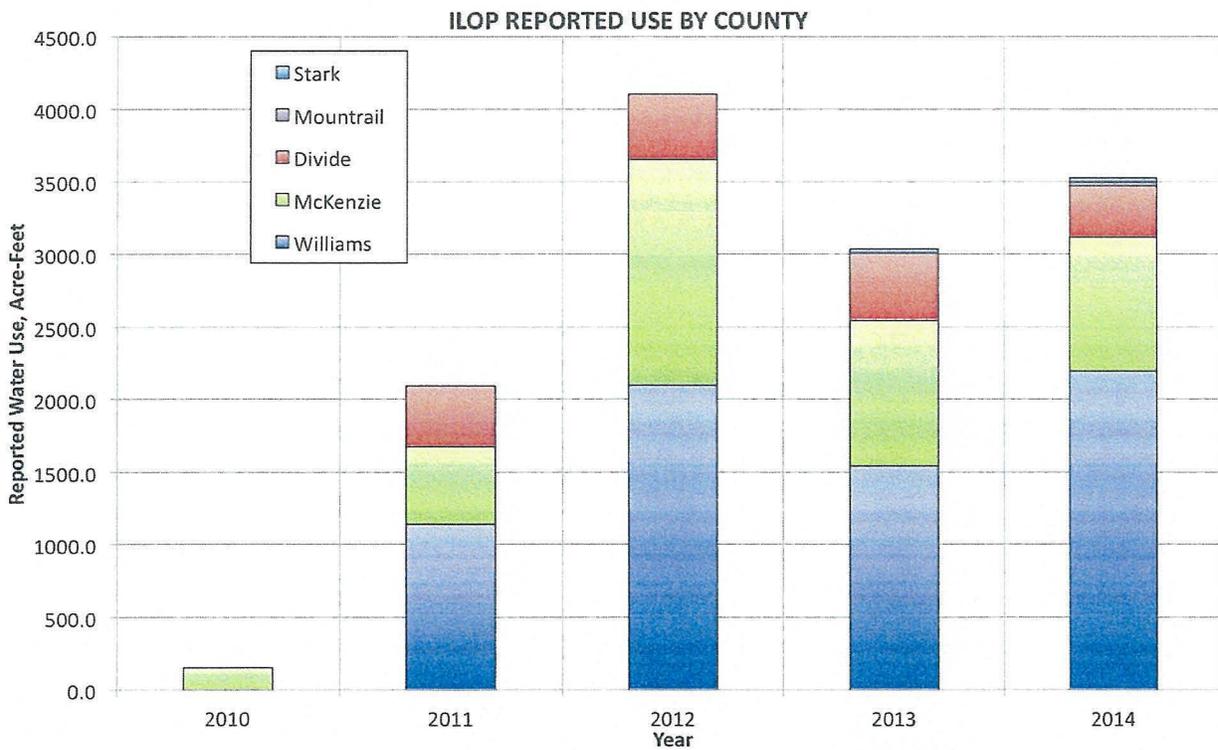


Figure 2. Total reported ILOP use by the five counties participating in ILOP.

ILOP USE BY COUNTY AS PERCENT OF TOTAL INDUSTRIAL USE BY COUNTY

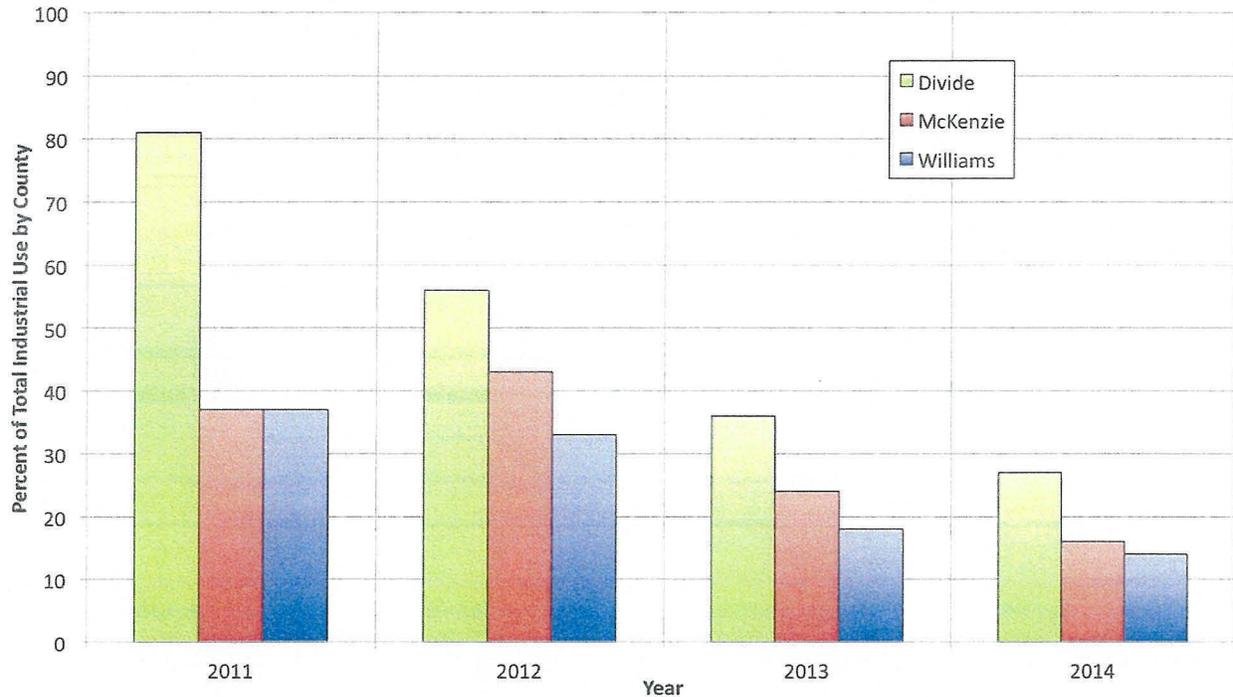


Figure 3. ILOP use by county as percent of total industrial water use by county.

SUPPORTING MATERIAL

Methods

A short SQL script was written to pull geographic, permit header, and water use data for ILOP Permits from the ND State Water Commission Postgres database. The SQL script allowed for presentation of data in tabular and GIS form. The tabular data by year is presented in Tables 3 through 7 of the Appendix. ILOP Permits with zero reported use are not included. Water use data presented beyond ILOP Permits was obtained from Michael Hove, Water Resource Senior Manager, Water Appropriations Division. Table 8 lists 2015 ILOP Permits, whether the permit holder has an existing industrial water permit for water sales, whether the permit holder has a pending industrial water permit application for water sales, and distance to nearest water depot should ILOP not continue.

Findings

ILOP Water Use

Table 1 summarizes total ILOP reported use. Note the following:

- The number of ILOP Permits has ranged from 1 to 37 permits, with 37 permits participating the past two years.
- The number of users has ranged from one-user in 2012 to 28-users in 2013 with 26-users in 2014 and 2012.
- ILOP reported water use has ranged from 151.8 acre-feet in 2010 to 4,103.3 acre-feet in 2012.
- ILOP use represented 25% of industrial water use in 2012 and subsequently decreased by 10% in 2013 and an additional 4% in 2014.

Table 1. Summary of ILOP Permits and use.

Year	Number of ILOP Permits	Number of Users	Total Industrial Water Use, Acre-Feet	ILOP Use, Acre-Feet	% of ILOP Use to Total Use	ILOP Appropriation, Acre-Feet
2010	1	1	5,700.0	151.8	2.7	424.8
2011	17	15	9,400.0	2,093.3	22.3	2,581.5
2012	33	26	16,362.0	4,103.3	25.1	5,126.5
2013	37	28	19,734.0	3,036.2	15.4	5,685.3
2014	37	26	29,883.0	3,499.2	11.7	5,591.3
2015	34	24				4971.17

Table 2 presents ILOP Permits by County. Note the following:

- Approximately 50% to 60% of ILOP use comes from Williams County.
- Approximately 25% to 35% of ILOP use comes from McKenzie County.
- Approximately 10% to 20% of ILOP use comes from Divide County.
- ILOP use from Stark and Mountrail Counties is negligible.

Table 2. Summary of ILOP Permits and use by county.

Year	Williams	% of Total ILOP Use	Divide	% of Total ILOP Use	McKenzie	% of Total ILOP Use	Mountrail	% of Total ILOP Use	Stark	% of Total ILOP Use
2010	-	-	-	-	151.80	100.00	-	-	-	-
2011	1,141.60	54.54	417.70	19.95	534.00	25.51	-	-	-	-
2012	2,098.45	51.14	447.60	10.91	1,557.19	37.95	-	-	-	-
2013	1,542.91	51.31	461.80	15.36	1,002.48	33.34	-	-	29.00	0.96
2014	2,194.97	62.76	351.00	10.04	924.53	26.44	26.83	0.77	28.70	0.82

Table 3 presents a *preliminary estimate* of reported industrial water use in acre-feet for Williams, McKenzie and Divide County along with the relative contribution of the ILOP Permits to the total industrial use. Note that WAWS industrial water use is reported from Williams County. WAWS has four depots in Williams County and four depots in McKenzie County.

County	2011 Total Use	2011 ILOP Use	ILOP % of Total Use	2012 Total Use	2012 ILOP Use	ILOP % of Total Use	2013 Total Use	2013 ILOP Use	ILOP % of Total Use	2014 Total Use	2014 ILOP Use	ILOP % of Total Use
Williams	3,062.50	1,133.13	37	6,322.50	2,086.43	33	8,421.20	1,515.82	18	15,254.20	2,135.59	14
McKenzie	1,454.70	538.24	37	3,651.10	1,569.97	43	4,169.10	1,000.58	24	5,708.90	913.42	16
Divide	512.8	415.37	81	795.4	445.42	56	1,299.80	467.93	36	1,280.50	345.74	27

McKenzie County ILOP Permits

ILOP Permits in McKenzie County are located in the Tobacco Garden Creek aquifer near Watford City and the Charbonneau aquifer. The Watford City area will not be affected by discontinuation of ILOP. A map of Charbonneau aquifer, the ILOP Permits, and area depots is presented in Figure 4. There are three water depots that use water from only ILOP Permits. Reported 2014 water use from ILOP Permits in the Charbonneau aquifer was 716.9 acre-feet. Michael Dwyer and Bratcher Farms have deferred water permit applications for industrial use. The present level of appropriation in the Charbonneau aquifer will limit immediate appropriation to the aquifer.

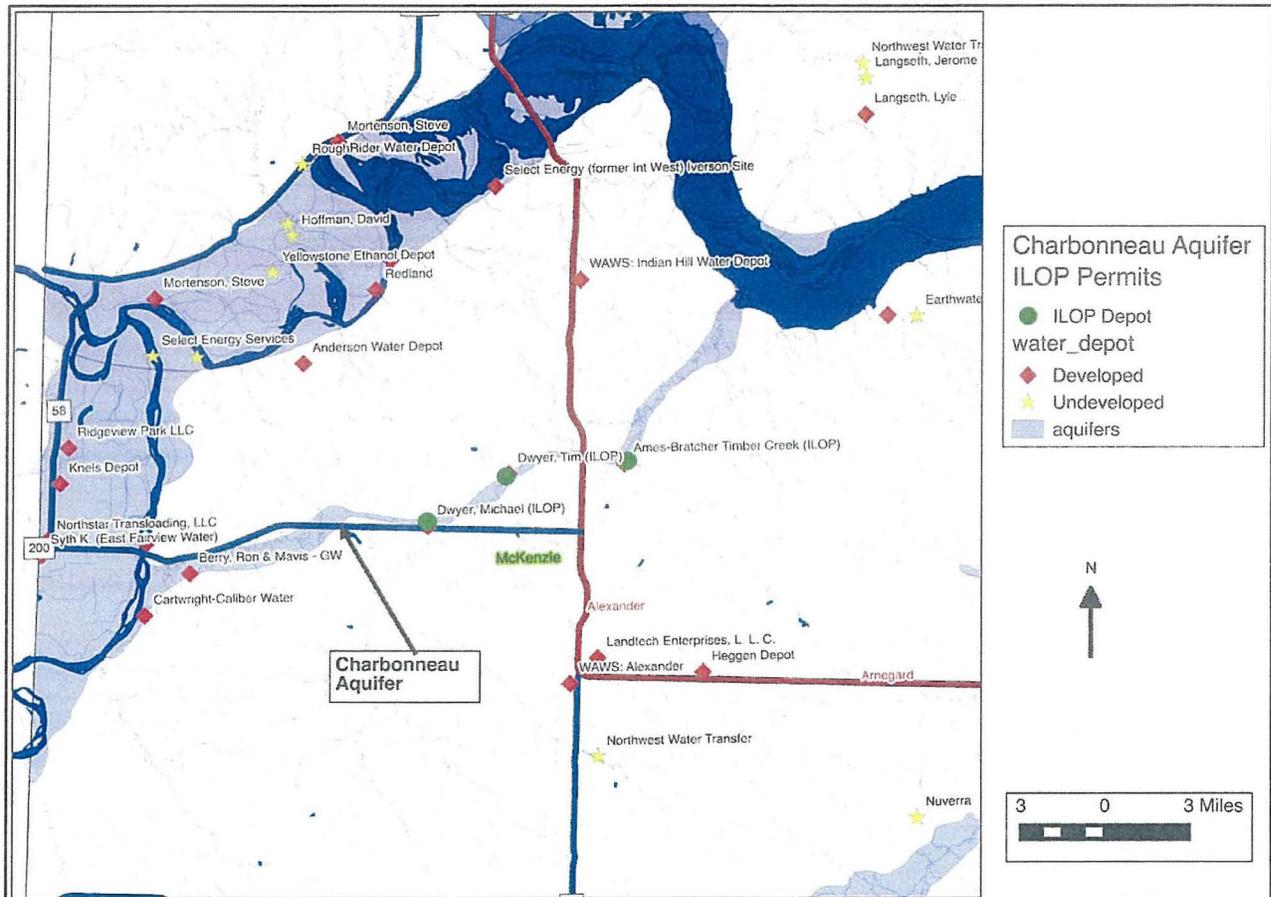


Figure 4. ILOP Permits in Charbonneau aquifer and surrounding water depots.

Williams County ILOP Permits

Three areas of interest use ILOP Permits. Each will be individually discussed.

Little Muddy Aquifer-13-Mile Corner

Most industrial groundwater being withdrawn from the 13-Mile Corner area of the Little Muddy aquifer (13MC) is by ILOP Permits. There was 454.22 acre-feet of groundwater withdrawn under ILOP Permits in 2014. The 13MC is essentially near full appropriation, and further appropriation will be limited. Two applications for industrial use (water depots) are presently under review. The Little Muddy aquifer has an upper unit that is at or near full appropriation in 13MC, and a lower unit that is being incrementally developed. Presently there is 100 acre-feet of groundwater conditionally approved from the lower unit with 200 acre-feet held in abeyance and 380 acre-feet pending review. Existing water depots and the ILOP Permits in 13MC are shown in Figure 5.

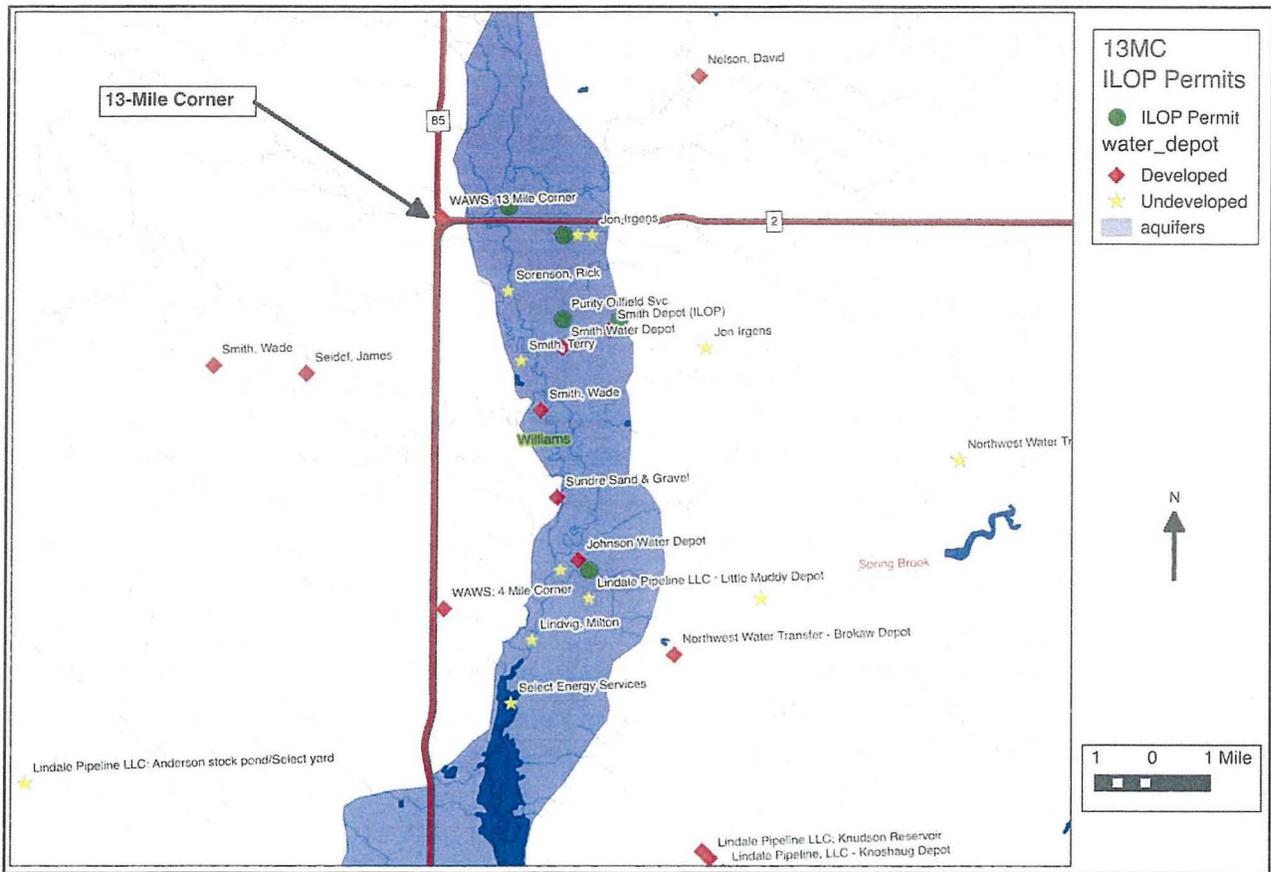


Figure 5. ILOP Permits in 13-Mile Corner area of Little Muddy aquifer (13MC) and water depots.

Little Muddy Aquifer-29-Mile Corner

Water Use from ILOP Permits in 2014 was 569.1 acre-feet. Permitted industrial use from 29MC is 400 acre-feet. There is approximately 5,500 acres of irrigated land in 29MC. Average use for irrigation at 29MC is 1.1 feet/year implying over 6,000 acre-feet of annual use for irrigation. There is approximately 4,900 acre-feet of groundwater pending review in 29MC, of which approximately 4,300 acre-feet is for industrial use (water depot). A numerical model is presently being developed to assess the pending water permit applications in this already heavily developed area. A recommendation regarding these permits will be done in late-2015 or 2016. All water depots, but 'Berg, L. Duane', 'Ames-Gafkjen (Athens)', and 'Krabseth Water Depot' use water from only ILOP Permits (Figure 6).

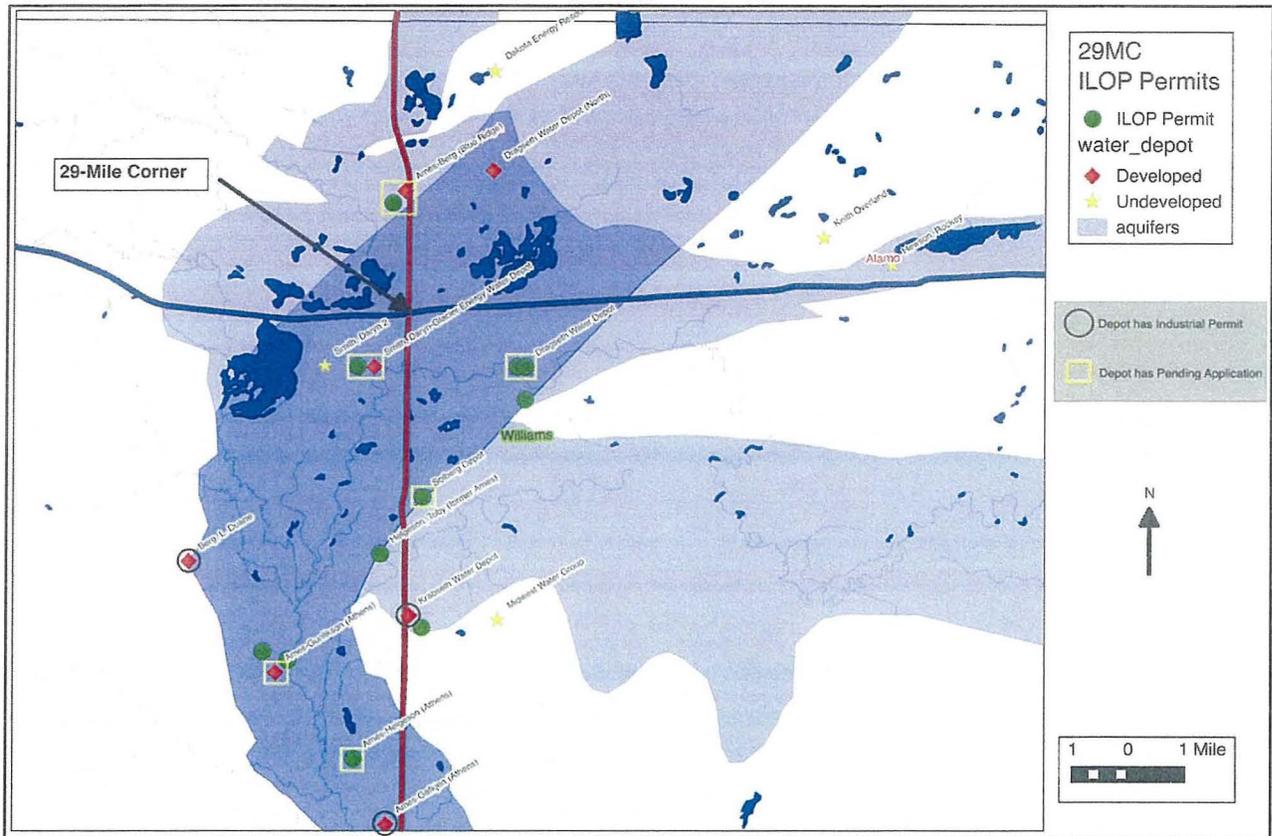


Figure 6. ILOP Permits in 29MC.

Hofflund Aquifer

Water Use from ILOP Permits in 2014 was 1,172.6 acre-feet, which represents more than half of the ILOP use from Williams County in 2014, and a third of the total ILOP use in 2014. All of the depots that received water from ILOP Permits have industrial water permits associated with the water depots (Figure 7). There will be no change in water depot numbers by discontinuing ILOP Permits. Total available water for industrial use will be reduced. Five water depots use ILOP Permits. Information regarding these depots is summarized as follows:

Water Depot	Permitted Industrial Use, Acre-Feet	2014 ILOP Use, Acre-Feet	Number of associated ILOP Permits in 2014	Number of associated ILOP Permits in 2015
Ames-Sheldon	300	393.3	1	1
Ames Red Mike	650	266.7	3	4
Lalim Water Depot	400	144.6	1	1
Hartsoch, Arley	150	182.2	4	5
Baker, Roger	195	70.64	1	0

Two additional water depots (Figure 7) are being developed in 2015 (*Imes & Key, Schmidt-701 Water*). The permits associated with these water depots will allow for 450 acre-feet of additional water. The ‘Nesson Valley’ depots are direct transfer operations and can move water to the ‘Hartsoch, Arley’ depot. The ‘Ames-Sveen’ depot moves water to the ‘Ames-Sheldon’ depot. Hofflund aquifer water levels are controlled by Lake Sakakawea. There is 1,000 acre-feet of permitted industrial water use that is subject to a water level trigger should aquifer levels decline due to low lake levels. Additional appropriation to this aquifer will be subject to water level triggers.

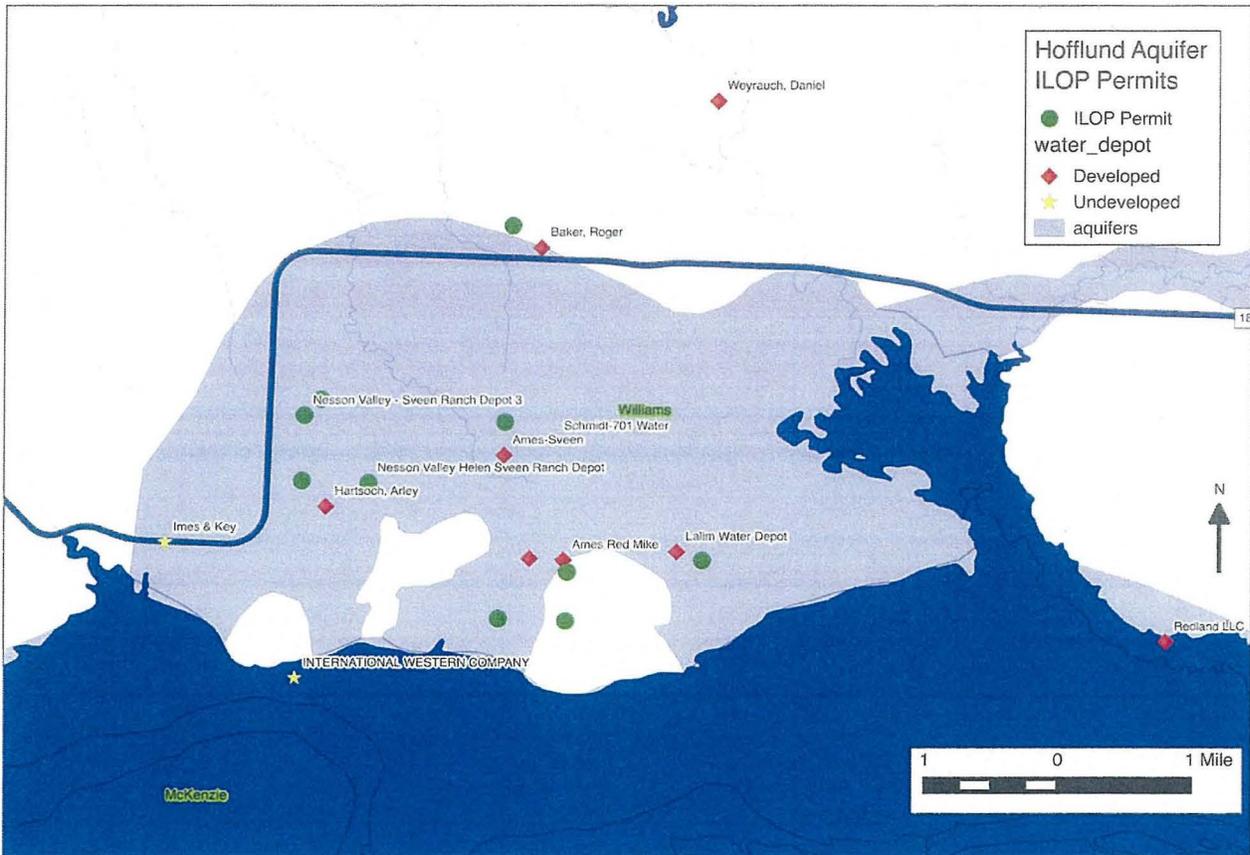


Figure 7. ILOP Permits in Hofflund aquifer area.

Divide County ILOP Permits

West Wildrose Aquifer

The 'Ames-Wildrose' depot is supplied approximately 226 acre-feet of water under ILOP Permits. The depot is also supplied by 450 acre-feet from surface water ponds given as 'West Pond', 'East Pond', and 'Far East Pond' (Figure 8). There is also 40 acre-feet of groundwater permitted under industrial permits. Permitted allocation in 2015 would be reduced by approximately 30%. There is 600 acre-feet of water applied for at the 'Ames-Wildrose' depot for industrial use. The likelihood of more appropriation from the West Wildrose aquifer is slim in the near term.

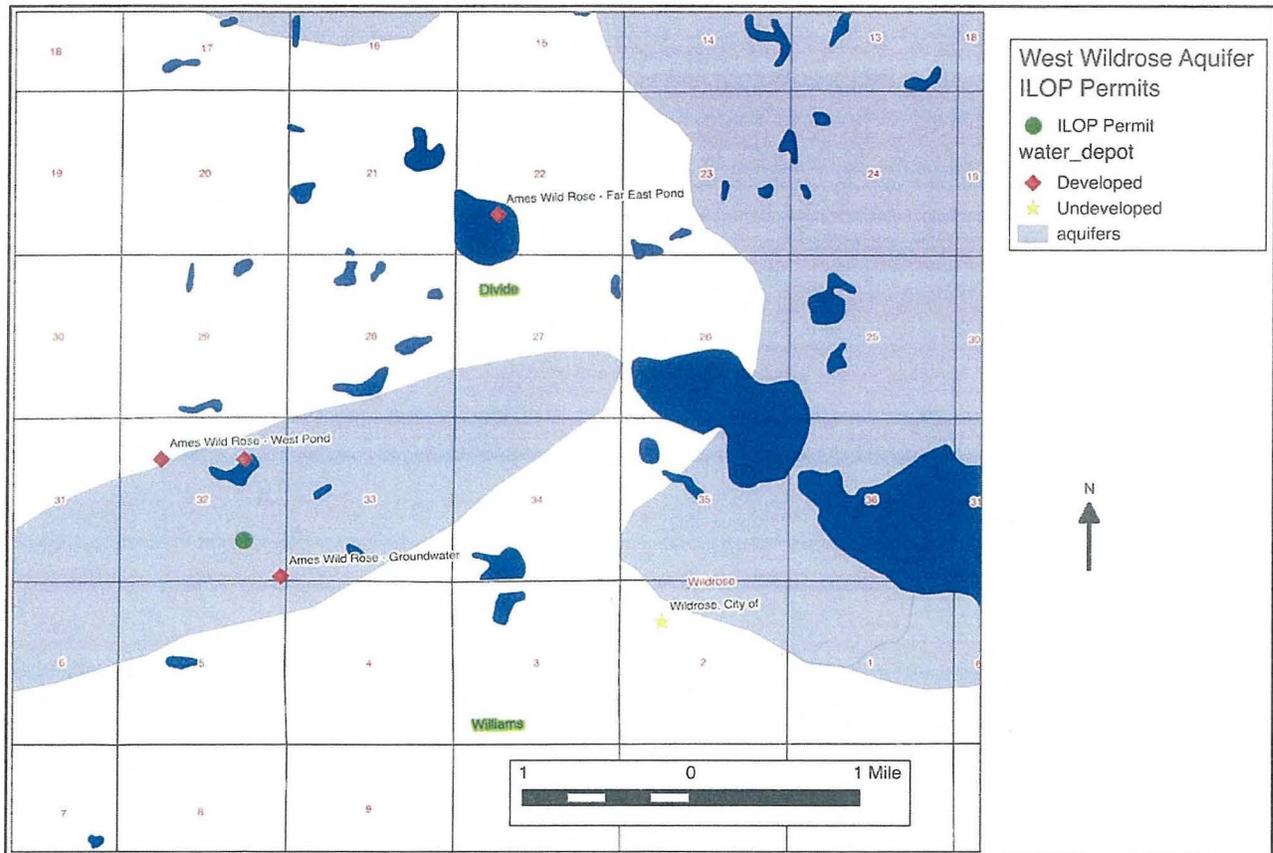


Figure 8. ILOP Permits in West Wildrose aquifer located in southeastern Divide County.

Skjermo Lake Aquifer

There is one active ILOP permit in Skjermo Lake aquifer. The 'Ames-Reistad (Westby)' depot uses water only from an ILOP Permit. The Skjermo Lake aquifer is heavily appropriated. There are pending water permit applications for industrial use from the aquifer, however appropriation from this aquifer in the near term is not likely. There are undeveloped water depots to the northwest, and to the south near the city of Grenora (Figure 9).

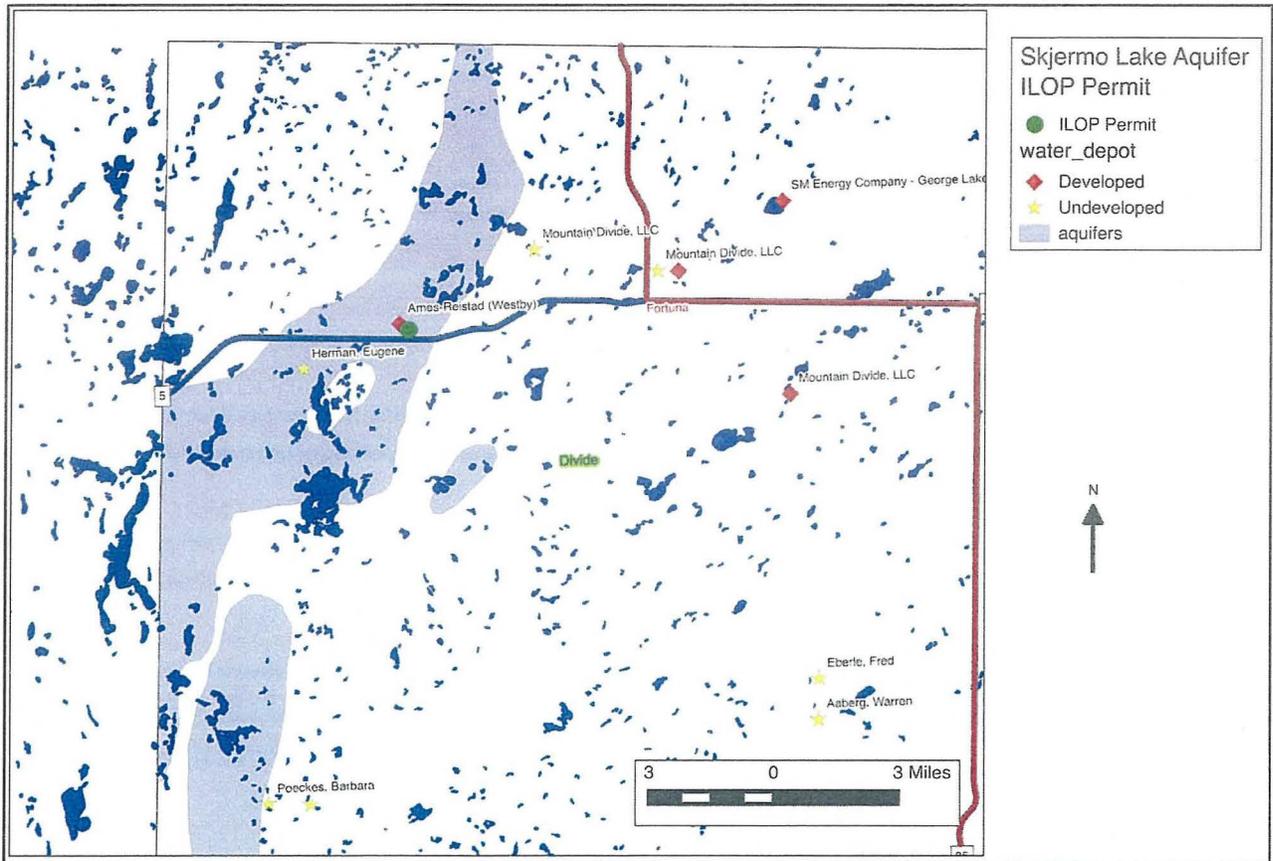


Figure 9. ILOP Permits in Skjeremo Lake aquifer.

Andrew Nygren, Hydrologist

APPENDIX: ILOP PERMITS BY YEAR

Table 3. ILOP Permits in 2010 that used water.

Permit Count	User Count	Permit No.	Permit Holder	Reported Use, Acre-Feet	Reported Year	Point of Diversion
1	1	3511	JOHNSRUD, MARK D.	151.8	2010	15109831D

Table 4. ILOP Permits in 2011 that used water.

Permit Count	User Count	Permit No.	Permit Holder	Reported Use, Acre-Feet	Reported Year	Point of Diversion
1	1	2454	AMES, JOHN M. and AMES, JANIS G.	111.8	2011	16009732D
2	1	1017	AMES, JOHN M. and AMES, JANIS G.	126.7	2011	16009732D
3	2	4669	BERG, L. DUANE	105.9	2011	15910017D
4	3	5408	BERRY, RON AND MAVIS	92	2011	15110436D
5	4	5684	BRATCHER FARMS	127.3	2011	15110104AS
6	5	5340	DWYER, MIKE	39.7	2011	15110220D
7	6	5427A	JOHNSON, BRUCE	44.3	2011	15510017A
8	7	3010	JOHNSRUD, MARK D.	148	2011	15009806A
9	7	3511	JOHNSRUD, MARK D.	127	2011	15109831D
10	8	4983	KRABSETH FARMS LIMITED LIABILITY CO	67.5	2011	15810021B
11	9	5560	LALIM, DALLAS	144.9	2011	15409616B
12	10	3947	PURITY OILFIELD SERVICES, LLC	90.9	2011	15610020C
13	11	3750	QUARNE, GREGORY OSCAR	50.5	2011	15909505C
14	12	2510	REISTAD, DONALD L.	104	2011	16310234C
15	13	5704	SHELDON, WILLIAM AND JEAN	394.6	2011	15409618D
16	14	5239	SMITH, TERRY A.	243	2011	15610021C
17	15	5677	SORENSEN, RICK AND GERALD	75.2	2011	16010028D

Table 5. ILOP Permits that used water in 2012.

Permit Count	User Count	Permit No.	Permit Holder	Reported Use, Acre-Feet	Reported Year	Point of Diversion
1	1	5319	AMES, JOHN M.	116.7	2012	15409617BS
2	1	5702	AMES, JOHN M. and AMES, JANIS G.	62.8	2012	15409617C
3	1	2454	AMES, JOHN M. and AMES, JANIS G.	105.7	2012	16009732D
4	1	1017	AMES, JOHN M. and AMES, JANIS G.	120.4	2012	16009732D
5	2	1077	BAKKEN GROUP INC.	28.7	2012	15510017BB
6	3	4669	BERG, L. DUANE	125.76	2012	15910017D
7	4	5208	BERGER, GERALD W.	80.614	2012	15610005C
7	4	5208	BERGER, GERALD W.	0.091	2012	15610005B
7	4	5208	BERGER, GERALD W.	40.676	2012	15610005D
8	4	5209	BERGER, JEFFREY W.	188.9	2012	15610007D
9	5	5408	BERRY, RON AND MAVIS	84.77	2012	15110436D
10	6	5684	BRATCHER FARMS	486.9	2012	15110109
11	7	5340	DWYER, MIKE	220.75	2012	15110220D
12	8	5386	DWYER, TIM	115.3	2012	15110214BA
13	9	1584	GUNLIKSON, DONALD AND ROGER	139.8	2012	15810124DA
14	9	5417	GUNLIKSON, DONALD AND ROGER	164.7	2012	15810019C
15	10	5757	HELGESON, TOBY	97.95	2012	15810032B
16	10	1403	HELGESON, TOBY	6	2012	15810017AB
17	11	5255A	IRGENS, THOMAS & JUDITH	91.6	2012	15610017B
18	12	5427A	JOHNSON, BRUCE	45	2012	15510017A
19	13	3511	JOHNSRUD, MARK D.	203.19	2012	15109831D
20	13	3010	JOHNSRUD, MARK D.	239.48	2012	15009806A
21	14	5275	KLOSE LANDS, LLLP	61.1	2012	15110327A
22	15	4983	KRABSETH FARMS LIMITED LIABILITY CO	67.48	2012	15810021B
23	16	5560	LALIM, DALLAS	143.58	2012	15409616B
24	17	3195	OLSON, ROGER ARVID	18.3	2012	15410328D
25	18	3947	PURITY OILFIELD SERVICES, LLC	20.35	2012	15610020C
26	19	3750	QUARNE, GREGORY OSCAR	5.4	2012	15909505C
27	20	2510	REISTAD, DONALD L.	131.6	2012	16310234C
28	21	5704	SHELDON, WILLIAM AND JEAN	398.95	2012	15409618D
29	22	5271	SKOGEN, ARDEAN	145.7	2012	15110323B
30	23	4553	SMITH, DARYN D.	0.5	2012	15910032B
31	24	5239	SMITH, TERRY A.	254.6	2012	15610021C
32	25	5677	SORENSEN, RICK AND GERALD	67.3	2012	16010028D
33	26	5747	STEWART, MICHAEL J.	22.6	2012	16010033D

Table 6. ILOP Permits that used water in 2013.

Permit Count	User Count	Permit No.	Permit Holder	Reported Use, Acre-Feet	Reported Year	Point of Diversion
1	1	5319	AMES, JOHN M.	110.3	2013	15409617BS
2	1	1017	AMES, JOHN M. and AMES, JANIS G.	113	2013	16009732D
3	1	2454	AMES, JOHN M. and AMES, JANIS G.	113	2013	16009732D
4	1	5702	AMES, JOHN M. and AMES, JANIS G.	59.4	2013	15409617C
5	2	1077	BAKKEN GROUP INC.	19.6	2013	15510017BB
6	3	4669	BERG, L. DUANE	100.5	2013	15910017D
7	4	5209	BERGER, JEFFREY W.	49.73	2013	15610007C
8	5	5408	BERRY, RON AND MAVIS	25	2013	15110436D
9	6	5684	BRATCHER FARMS	495.4	2013	15110109
10	7	5005	DRAGSETH, DONNA MAE	31.92	2013	15910034AW
11	7	6013	DRAGSETH, MICHAEL and KELVIN	3.574	2013	15910015B
12	7	6077	DRAGSETH, MICHAEL and KELVIN	13.36	2013	15910034A
13	7	5480	DRAGSETH, MICHAEL and KELVIN	39.84	2013	15910034D
14	8	5340	DWYER, MIKE	224.9	2013	15110220D
15	9	5386	DWYER, TIM	112.2	2013	15110214BA
16	10	5417	GUNLIKSON, DONALD AND ROGER	30.59	2013	15810019C
17	10	1584	GUNLIKSON, DONALD AND ROGER	12.37	2013	15810124DA
18	11	5733	HARTSOCH, ARLEY, CHERYL, ERIK & AMY	48.2	2013	15409712C
19	12	5203	HARTSOCH, DAVID	51	2013	15409604D
20	13	5757	HELGESON, TOBY	62.8	2013	15810032B
21	13	1403	HELGESON, TOBY	4.3	2013	15810017AB
22	14	5255A	IRGENS, THOMAS & JUDITH	106.6	2013	15610017B
23	15	5427A	JOHNSON, BRUCE	42.3	2013	15510017A
24	16	3010	JOHNSRUD, MARK D.	61.6	2013	15009806A
25	16	3511	JOHNSRUD, MARK D.	52.2	2013	15109831D
26	17	4983	KRABSETH FARMS LIMITED LIABILITY CO	17.1	2013	15810021B
27	18	5560	LALIM, DALLAS	77.9	2013	15409616B
28	19	12C	LETANG, NICK	29	2013	14009605S
29	20	3947	PURITY OILFIELD SERVICES, LLC	62	2013	15610020C
30	21	2510	REISTAD, DONALD L.	169.3	2013	16310234C
31	22	5704	SHELDON, WILLIAM AND JEAN	391.8	2013	15409618D
32	23	5271	SKOGEN, ARDEAN	31.18	2013	15110323B
33	24	4553	SMITH, DARYN D.	8.3	2013	15910032B
34	25	5239	SMITH, TERRY A.	65.1	2013	15610021C
35	26	5231	SOLBERG, GLENN S.	46.5	2013	15810009B
36	27	5677	SORENSEN, RICK AND GERALD	27.9	2013	16010028D
37	28	5747	STEWART, MICHAEL J.	38.6	2013	16010033D

Table 7. ILOP Permits that used water in 2014.

Permit Count	User Count	Permit No.	Permit Holder	Reported Use, Acre-Feet	Reported Year	Point of Diversion
1	1	5319	AMES, JOHN M.	114.6	2014	15409617BS
2	1	5702	AMES, JOHN M. and AMES, JANIS G.	61.8	2014	15409617C
3	1	1017	AMES, JOHN M. and AMES, JANIS G.	112.7	2014	16009732D
4	1	2454	AMES, JOHN M. and AMES, JANIS G.	112.7	2014	16009732D
5	2	6015	BAKER, ROGER AND MARILYN	70.64	2014	15509631D
6	3	4669	BERG, L. DUANE	100.5	2014	15910017D
7	4	5209	BERGER, JEFFREY W.	122.52	2014	15610007C
8	5	5684	BRATCHER FARMS	376.7	2014	15110109
9	6	5005	DRAGSETH, DONNA MAE	71.2	2014	15910034AW
10	6	6077	DRAGSETH, MICHAEL and KELVIN	29.8	2014	15910034A
11	6	6076	DRAGSETH, MICHAEL and KELVIN	18.3	2014	15910034A
12	6	5480	DRAGSETH, MICHAEL and KELVIN	88.8	2014	15910034D
13	7	5340	DWYER, MIKE	224.9	2014	15110220D
14	8	5386	DWYER, TIM	115.3	2014	15110214BA
15	9	5417	GUNLIKSON, DONALD AND ROGER	70	2014	15810019C
16	9	1584	GUNLIKSON, DONALD AND ROGER	114.8	2014	15810124DA
17	10	5733	HARTSOCH, ARLEY, CHERYL, ERIK & AMY	114.2	2014	15409712C
18	11	1403	HELGESON, TOBY	10.6	2014	15810017AB
19	11	5757	HELGESON, TOBY	46.4	2014	15810032B
20	12	5255A	IRGENS, THOMAS & JUDITH	30.3	2014	15610017B
21	13	5427A	JOHNSON, BRUCE	45.4	2014	15510017A
22	14	3010	JOHNSRUD, MARK D.	97.8	2014	15009806A
23	14	3511	JOHNSRUD, MARK D.	83	2014	15109831D
24	15	4983	KRABSETH FARMS LIMITED LIABILITY CO	14	2014	15810021B
25	16	5560	LALIM, DALLAS	144.6	2014	15409616B
26	17	12C	LETANG, NICK	28.7	2014	14009605S
27	18	5241	NESSON VALLEY HELEN SVEEN RANCH	54.2	2014	15409712D
28	18	1394	NESSON VALLEY HELEN SVEEN RANCH	58.76	2014	15409712BA
29	18	4998	NESSON VALLEY HELEN SVEEN RANCH	69.24	2014	15409712B
30	19	3947	PURITY OILFIELD SERVICES, LLC	1.3	2014	15610020C
31	20	2510	REISTAD, DONALD L.	125.6	2014	16310234C
32	21	5704	SHELDON, WILLIAM AND JEAN	393.3	2014	15409618D
33	22	4553	SMITH, DARYN D.	0.007	2014	15910032B
34	23	5239	SMITH, TERRY A.	254.7	2014	15610021C
35	24	5231	SOLBERG, GLENN S.	4.7	2014	15810009B
36	25	5316	SVEEN, WOODROW J.	90.3	2014	15409607A
37	26	5407	WURTZ, JERRY AND RICHARD	26.83	2014	15209124D

Table 8. Summary of ILOP Permits for 2015 including allocation, point of diversion, aquifer, whether there is existing industrial (non-ILOP) water permit, whether there is existing industrial (non-ILOP) water permit application, and distance to nearest water depot that will remain open without ILOP.

Permit No.	Permit Holder	Allocation, Acre-Feet	Point of Diversion	Aquifer ¹	Permit ²	Application ³	Distance ⁴
5684	BRATCHER FARMS	495.00	15110109	CA	N	Y	< 10
5340	DWYER, MIKE	225.00	15110220D	CA	N	Y	< 10
5386	DWYER, TIM	115.00	15110214BA	CA	N	N	< 10
5560	LALIM, DALLAS	144.85	15409616B	HA	Y	N	0 ⁵
5319	AMES, JOHN M.	116.62	15409617BS	HA	Y	Y	0
5702	AMES, JOHN M. and AMES, JANIS G.	62.91	15409617BS	HA	Y	Y	0
5733	HARTSOCH, ARLEY, CHERYL, ERIK AND AMY	115.00	15409712C	HA	Y	Y	0
1394	NESSON VALLEY HELEN SVEEN RANCH	58.77	15409712BA	HA	N	N	< 5
4998	NESSON VALLEY HELEN SVEEN RANCH	67.12	15409712B	HA	N	N	< 5
5241	NESSON VALLEY HELEN SVEEN RANCH	60.15	15409712A	HA	N	N	< 5
5241	NESSON VALLEY HELEN SVEEN RANCH	67.98	15409712D	HA	N	N	0
5704	SHELDON, WILLIAM AND JEAN	398.96	15409618D	HA	Y	Y	0
5316	SVEEN, WOODROW J.	90.65	15409607E	HA	N	N	0
5316	SVEEN, WOODROW J.	13.20	15409607D	HA	N	N	0
6320	SVEEN, WOODROW J.	134.29	15409607D	HA	N	N	0
5427A	JOHNSON, BRUCE	45.42	15510017A	13MC	N	Y	< 5
5209	BERGER, JEFFREY W.	206.00	15610007C	13MC	N	N	< 5
5255A	IRGENS, THOMAS & JUDITH	169.11	15610017D	13MC	N	N	< 5
3947	PURITY OILFIELD SERVICES, LLC	88.08	15610020C	13MC	N	Y	< 5
5239	SMITH, TERRY A.	254.72	15610021C	13MC	N	Y	< 5
5480	DRAGSETH, MICHAEL and KELVIN	181.60	15910034A	29MC	N	Y	< 10
6013	DRAGSETH, MICHAEL and KELVIN	115.00	15910015B	29MC	N	Y	< 10
5417	GUNLIKSON, DONALD AND ROGER	176.15	15810019C	29MC	N	Y	< 5
1403	HELGESON, TOBY	112.70	15810017AB	29MC	N	Y	< 5
5757	HELGESON, TOBY	98.20	15810032B	29MC	N	Y	0
4553	SMITH, DARYN D.	169.00	15910032B	29MC	N	Y	< 5
5231	SOLBERG, GLENN S.	96.06	15810009B	29MC	N	N	< 5
5390	BERG, L. DUANE	134.05	15810114A	29MC	Y	N	0
4669	BERG, L. DUANE	113.55	15910017D	29MC	N	Y	< 10
5677	SORENSEN, RICK AND GERALD	82.86	16010028D	29MC	N	N	< 15
5407	WURTZ, JERRY AND RICHARD	74.00	15209124D	SCA	Y	Y	0
2510	REISTAD, DONALD L.	184.00	16310234C	SLA	N	Y	< 10
3511	JOHNSRUD, MARK D.	128.00	15109831D	TGA	N	N	< 5
3010	JOHNSRUD, MARK D.	151.00	15109831D	TGA	N	N	< 5
2454	AMES, JOHN M. and AMES, JANIS G.	113.09	16009732S	WWA	Y	Y	0
1017	AMES, JOHN M. and AMES, JANIS G.	113.09	16009732S	WWA	Y	Y	0
TOTAL		4971.17					

¹ CA-Charbonneau aquifer, HA-Hofflund aquifer, 13MC- 13-Mile Corner area of Little Muddy aquifer, 29MC-29-Mile Corner area of Little Muddy aquifer, SCA-Shell Creek aquifer, SLA-Skjeremo Lake aquifer, TGA- Tobacco Garden aquifer, WWA-West Wildrose aquifer

² Notes whether there is existing industrial water permit for location (N-No, Y-Yes)

³ Notes whether there is existing industrial water permit application for location (N-No, Y-Yes)

⁴ Distance (in miles) to nearest water depot that will remain open without ILOP.

⁵ Distance of 0 miles implies the ILOP permit serves a water depot that will remain open without ILOP.