



March 5, 2015  
Stantec File: 111440070  
Conservation File: 5577.00

**Attention: Peter Crocker, District Supervisor**  
Manitoba Conservation and Water Stewardship  
Environmental Compliance and Enforcement Branch  
Box 13, 1129 Queens Avenue  
Brandon, MB R7A 1L9

Dear Mr. Crocker,

**Reference: Daly Irrigation Project – 2014 Final Monitoring Report – Licence No. 3010**

Stantec Consulting Ltd. (Stantec) submits the following 2014 Final Monitoring Report for the Daly Irrigation Project, on behalf of the Daly Irrigation Development Group (DIDG; the Licencee). This letter provides a summary and status of monitoring data collected in 2014, as required by *Environment Act* Licence No. 3010 (the Licence), issued on July 5, 2012.

The following information is presented:

- Upstream and downstream flows, volumes and rates of water pumped, and durations of pumping as prescribed by Clause 21 of the Licence.
- Findings of the Dissolved Oxygen Monitoring Plan as prescribed by Clause 22 of the Licence.
- Photographs of the Little Saskatchewan River riffle bed exposure immediately downstream of the diversion point of the Development as prescribed by Clause 23 of the Licence.

**MEASUREMENT OF UPSTREAM AND DOWNSTREAM FLOW RATES**

In accordance with Clause 21 of the Licence flow rates are to be recorded daily on a continual basis. For monitoring purposes, daily flow rates are monitored at two sites, upstream and downstream from the Development diversion point, as described below:

- The upstream flow gauging station (ID: 05MF018), operated by Water Survey of Canada, is in operation close to the crossing of Highway 25 over the Little Saskatchewan River, just downstream of the reservoir outlet at Rivers, Manitoba.
- A stream flow monitoring station was installed downstream of the pump intake on July 20, 2012. This monitoring station consists of two data loggers: one (ID: DIVER M4391) was installed at the bottom of the river to measure total water pressure and water temperature,



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and the other (ID: DIVER L6518) was installed at the surface, adjacent to the pumping station to measure atmospheric pressure and air temperature.

It appears that ice scour and high water in the Little Saskatchewan River contributed to relocating the water pressure logger from its original location in the spring of 2014. High water conditions in the spring and early summer precluded access to confirm the level logger was operating correctly. The logger was later found on October 6 and it was determined that stream flow data was not recorded during the irrigation period from July 15 – August 23, 2014. The water pressure logger may have been damaged as a result of spring conditions in the River, and will be evaluated to confirm its operability prior to the 2015 irrigation season.

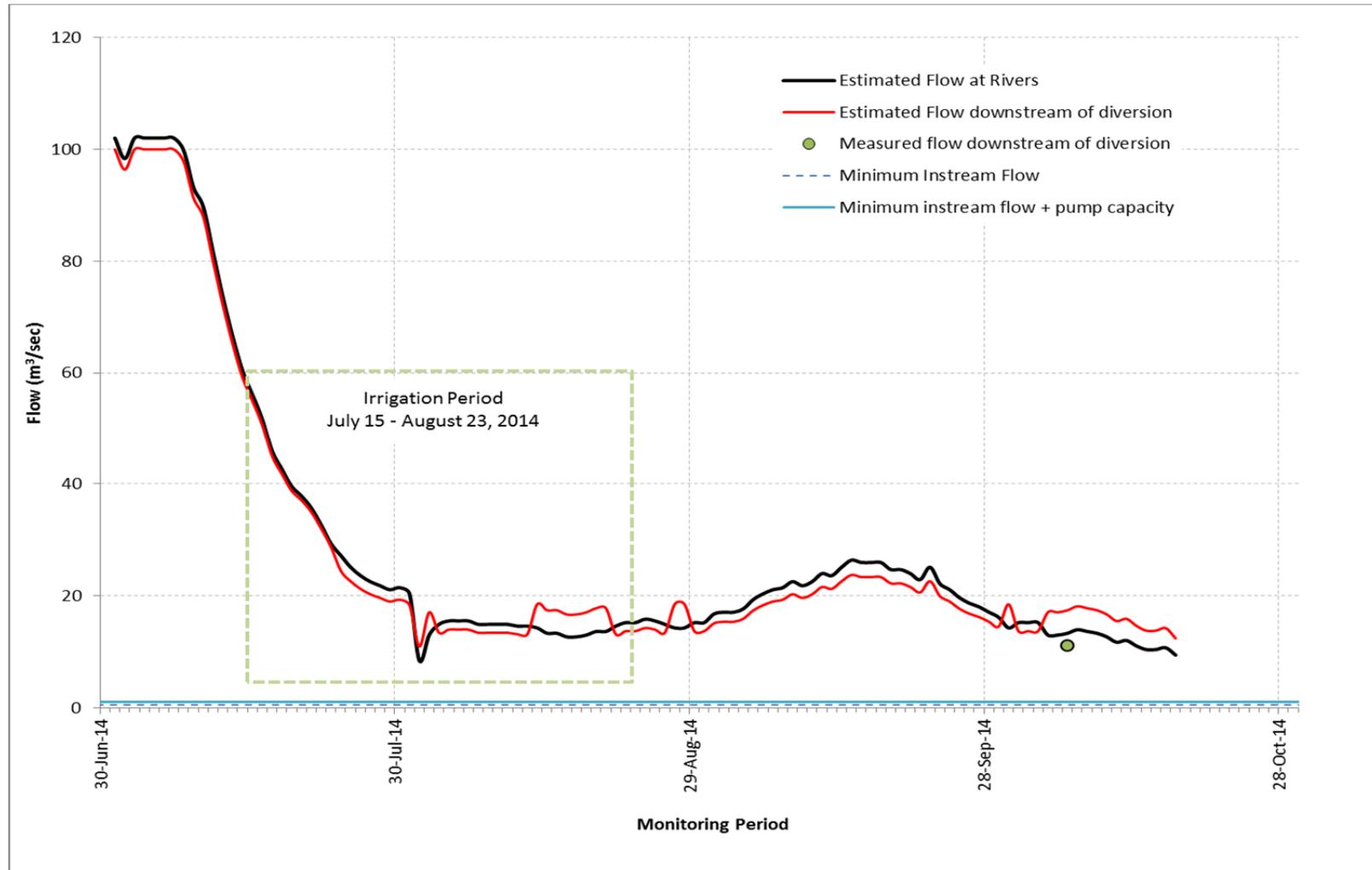
A manual stream flow measurement was attempted downstream of the diversion point on August 6, 2014, however, equipment malfunctions occurred during field data collection resulting in erroneous data and was omitted from this report.

A second manual stream flow measurement was successfully collected on October 6, 2014. The flow rate measured on this date was 11.1 m<sup>3</sup>/sec. Flow on this date was similar to that throughout most of August during the irrigation season.

Stantec used water level records available from the upstream Water Survey of Canada Station (ID 05MF018) to develop a functional relationship with 2013 and 2014 data for estimating downstream stream flow data throughout the irrigation period. The estimated stream flows at Rivers and downstream of the diversion, relative to the minimum in-stream flow prescribed in the Licence, are shown in Figure 1.

At the beginning of Spring 2014, the two estimated stream flows show similar patterns and upstream-downstream correlation. During the irrigation season, downstream flow was generally lower than upstream, indicating withdrawals at the diversion.

The estimated flow downstream of the diversion throughout the 2014 irrigation season was well-above the minimum instream flow requirement of 0.524 m<sup>3</sup>/sec as prescribed by the Licence. Similarly, the estimated flow rates are well-above the minimum instream flow requirement plus the maximum allowable pump withdrawal (0.524 m<sup>3</sup>/sec + 0.555 m<sup>3</sup>/sec = 1.075 m<sup>3</sup>/sec). This suggests that operation of the Project had a negligible effect on instream flow immediately downstream of the pumping diversion in 2014. The stream flow calibration measurement conducted on October 6 confirmed that stream flows were still well in excess of the minimum instream flow rate during a period comparable to the lowest flows experienced during the irrigation period in 2014, even if maximum allowable withdrawals were considered.



**Figure 1: Estimated Daily Average Flow Rates Upstream and Downstream of the Diversion**

## **VOLUMES AND RATES OF WATER PUMPED AND DURATION OF PUMPING**

The Development withdrew water from the Little Saskatchewan River during the period of July 15 to August 23, 2014. A total of approximately 2,560 acres of land were irrigated (1040 acres of potatoes, 160 acres of wheat, 320 acres of barley, 800 acres of canola and 240 acres of soybean).

In accordance with Clause 21 of the Licence, pump intake volumes and rates are summarized in Table 1 in Attachment A.

The total volume of water pumped during the irrigation season was 296,038,345 US gallons (1,120,627 m<sup>3</sup>). The daily average total volume of water pumped was 1,805,112 US gallons (6,833m<sup>3</sup>).

As per Clause 19 of the Licence, the maximum pumping rate at the diversion point of the Development shall be limited to 0.555 m<sup>3</sup>/sec or as determined by Manitoba Conservation and Water Stewardship and in accordance with the provisions of a Water Rights Licence issued for the Development. According to daily pump monitor records the maximum instantaneous pumping rate of 0.555 m<sup>3</sup>/sec may have been slightly exceeded on three instances (July 23 – 0.557 m<sup>3</sup>/sec [0.4% above maximum rate], July 30 – 0.560 m<sup>3</sup>/sec [1.0% above maximum rate], August 5 – 0.578 m<sup>3</sup>/sec [4.1% above maximum rate]). Exceedances would have occurred only if the variable pumping rates from individual pumps achieved maximum instantaneous pumping rates concurrently.

## **DISSOLVED OXYGEN CONCENTRATION**

In accordance with Clause 22 of the Licence, a Dissolved Oxygen (DO) Monitoring Plan was implemented in 2014 with deployment of the HOB0@ U26-001 DO Logger.

The purpose of the DO Monitoring Plan was to determine if the Development had an impact on DO concentration and fish habitat within the Little Saskatchewan River downstream from the diversion point. Impacts to fish habitat are conceivable when DO concentration drops to 2-4 mg/L. Fish kills occur at DO concentration of <2 mg/L. Optimal habitat conditions within the river are achieved at a DO concentration of 5-8 mg/L.

The DO logger was deployed on August 6, 2014 and recorded DO and temperature values on an hourly basis during the irrigation period until August 23, 2014 (DO Monitoring Period). High water conditions during the early part of the season delayed safe deployment of the monitoring equipment, which resulted in no DO data to be collected from July 15 – August 5 during the irrigation period. Daily average, minimum and maximum DO concentration and temperature were recorded for the remainder of the irrigation period (August 6 – August 23) and are summarized in Figure 2.

On October 6, 2015 the DO logger was retrieved from the River and it was observed that debris (i.e., mud and vegetation) had accumulated on the casing of the equipment. DO data was downloaded and it indicated erroneous concentrations of DO during portions of the irrigation period. For example, DO concentrations from August 8-10 appear erroneous, and from August 16-



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23 data are obviously compromised with reported DO concentrations approaching and falling below 0 mg/L. It is likely that the high water levels during the season contributed to movement of debris and sediment which blocked the equipment's sensor and inhibited accurate data capture.

Dissolved oxygen saturation was estimated based on water temperature and is presented in Figure 3 in relation to measured, hourly temperature and dissolved oxygen. Based on the high water level/flow conditions it is unlikely water withdrawals from the Project during the irrigation period during 2014 had a measurable effect on dissolved oxygen concentration. The day-to-day variability of dissolved oxygen concentrations appears to be attributable to biological activity (i.e., oxygen production by algae during daylight hours).

Based on the high-water levels throughout the irrigation period in 2014 it is reasonable to conclude that the Project did not have an effect on DO concentrations or result in any impact to fish or fish habitat.



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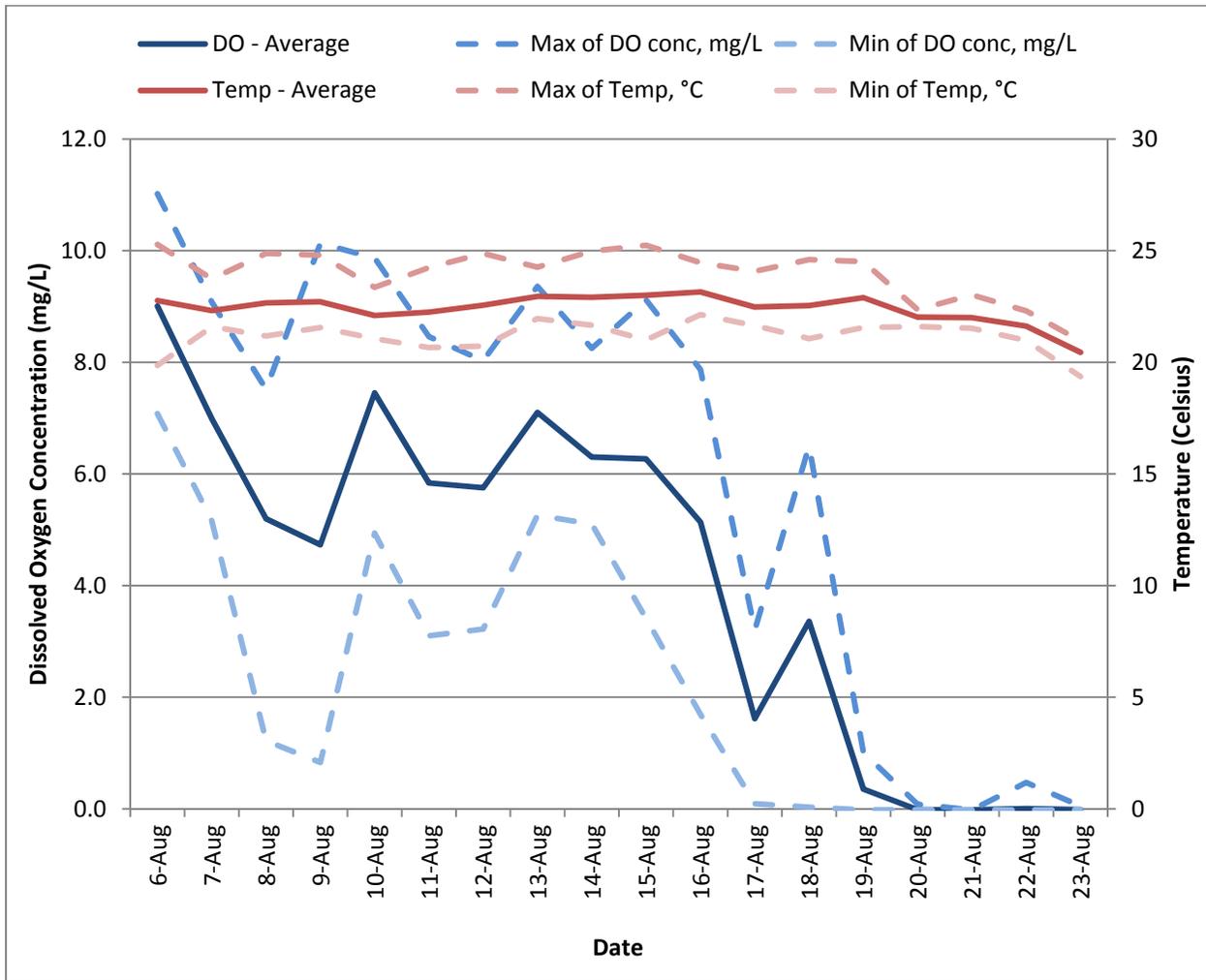
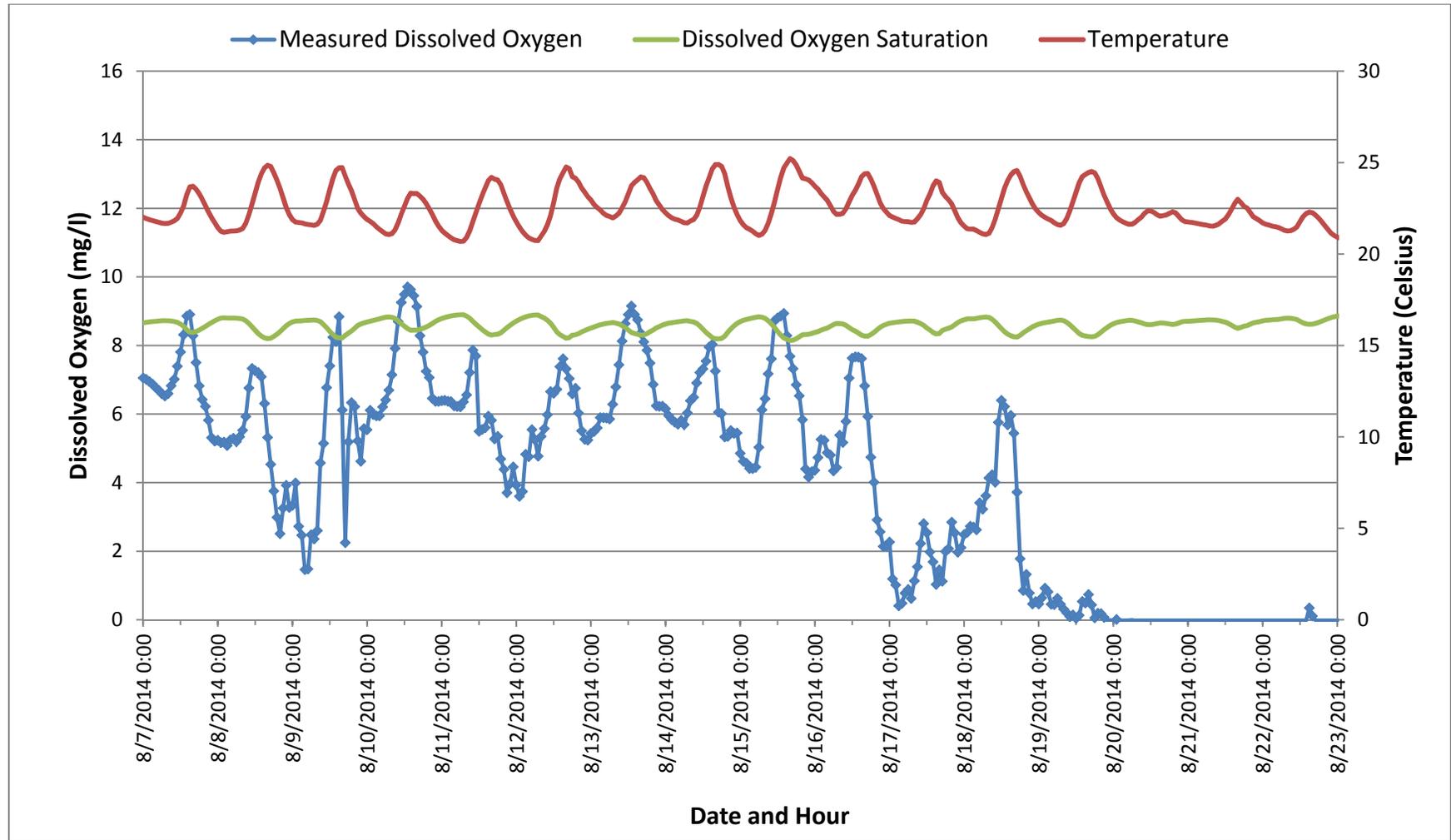


Figure 2: Measured Dissolved Oxygen Concentration and Temperature



**Figure 3: Hourly Dissolved Oxygen Concentration and Temperature**

### **RIFFLE MONITORING**

Under Clause 23 of the Licence, the Licencee is required to capture photographs of the riffle bed exposure in the Little Saskatchewan River downstream from the Development's diversion point during the irrigation season. A trail camera was used to record daily photographs of the riffle from May 1, 2014 to August 20, 2014.

Attachment B includes photographs which show the riffle during active irrigation dates on July 15, July 22, July 31, August 2, August 11, and August 20, 2014. The riffle photo from August 2 represents a relative low-flow during the irrigation period. A complete set of photographs taken by the trail camera are included on CD-ROM (submitted to Manitoba Conservation and Water Stewardship).

### **MONITORING ACTIVITIES PLANNED FOR 2015**

The following monitoring activities are planned for 2015:

- Evaluation and confirmation of the operability of the water pressure logger at the downstream monitoring location prior to commencement of irrigation in 2015.
- Evaluation of the current dissolved oxygen monitoring plan, and discussion with Manitoba Conservation on any required modifications to the plan, prior to commencement of irrigation in 2015.
- Ongoing monitoring of stream flows, dissolved oxygen, riffle and diversion withdrawals as per Licence requirements.

### **STATUS OF DALY IRRIGATION PROJECT CONSTRUCTION**

Figure 4 in Attachment C shows an updated Project Footprint based on 2014 Project activities. In 2015 Keywest is planning to add a pivot at the previously-identified N 21-12-21 and remove the potential pivot at SE 20-12-21; and Redfern is planning to develop the pivot at the previously-identified SW 01-12-22 (see Figure 5 in Attachment C).



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We trust this report meets your present requirements. Please contact the undersigned should you have any questions on this report.

Regards,

**STANTEC CONSULTING LTD.**

A handwritten signature in black ink, appearing to read 'Terry Duddridge'.

Terry Duddridge  
Environmental Planner  
Phone: 204-290-4632  
Fax: 204-942-2548  
terry.duddridge@stantec.com

A handwritten signature in black ink, appearing to read 'David Whetter'.

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Senior Associate, Project Manager  
Phone: 204-488-5706  
Fax: 204-942-2548  
david.whetter@stantec.com

Attachment: Attachment A (Water Use); Attachment B (Riffle Monitoring Photographs);  
Attachment C (Figure 4 - 2014 Project Footprint & Figure 5 - 2015 Planned Project  
Footprint)

c. Bruce Webb (MCWS); Ed Waldner (DIDG)

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Attachment A

Table 1: Daly Irrigation Development Project Licence No. 3010, Annual Water Use Report, 2014 Year

Date (2014)	Redfern (Pump 2)					Keywest (Pump 2)					Sundance (Pump 2)					Sundance (Pump 1)				
	Intake Location: NW10-12-21W					Intake Location: NW10-12-21W					Intake Location: NW10-12-21W					Intake Location: NW10-12-21W				
	Pump Capacity: 2400 US gpm (0.1514 m <sup>3</sup> /s)					Pump Capacity: 2400 US gpm (0.1514 m <sup>3</sup> /s)					Pump Capacity: 2400 US gpm (0.1514 m <sup>3</sup> /s)					Pump Capacity: 1600 US gpm (0.1001 m <sup>3</sup> /s)				
	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m <sup>3</sup> /s)	Volume Pumped (m <sup>3</sup> )	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m <sup>3</sup> /s)	Volume Pumped (m <sup>3</sup> )	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m <sup>3</sup> /s)	Volume Pumped (m <sup>3</sup> )	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m <sup>3</sup> /s)	Volume Pumped (m <sup>3</sup> )	Parcel(s) Irrigated
July 14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
July 15	-	-	-	-	-	2212.79	105380.59	0.13940577	398.908739	SW 21-12-21 SW 22-12-21	-	-	-	-	-	-	-	-	-	-
July 16	-	-	-	-	-	1538.34	268855.13	0.09691542	1017.7269	SW 21-12-21 SW 22-12-21	-	-	-	-	-	1792	374246	0.11289600	1417	NE 7-12-21 SE 7-12-21
July 17	-	-	-	-	-	1876.83	1301993.75	0.11824029	4928.58016	SW 21-12-21 SW 22-12-21	-	-	-	-	-	1634	2273654	0.10294200	8607	NE 7-12-21 SE 7-12-21
July 18	-	-	-	-	-	1596.84	53625.88	0.10060092	202.995942	SW 21-12-21 SW 22-12-21	-	-	-	-	-	1597	2109367	0.10060092	7985	NE 7-12-21 SE 7-12-21
July 19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1683	1603627	0.10602900	6070	NE 7-12-21 SE 7-12-21
July 20	-	-	-	-	-	-	-	-	-	-	2816	1022458	0.17740800	3870	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	-	-	-	-	-

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July 21	-	-	-	-	-	-	-	-	-	-	2312	1770589	0.14565600	6702	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	-	-	-	-	-
July 22	2604.33	899000	0.1640728	3403.08	SW 5-12-21 SE 6-12-21 NW 6-12-21	1516.68	414409	0.09555084	1568.70797	SW 21-12-21 SW 22-12-21	2012	2855905	0.12675600	10811	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1836	732947	0.11566800	2775	NE 7-12-21 SE 7-12-21
July 23	2889.67	1770589	0.1820492	6702.41	SW 5-12-21 SE 6-12-21 NW 6-12-21	2284.09	1780876.5	0.14389767	6741.34771	SW 21-12-21 SW 22-12-21	2034	2849996	0.12814200	10788	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1638	1903263	0.10319400	7205	NE 7-12-21 SE 7-12-21
July 24	2128.72	2485905	0.1341094	9410.17	SE 1-12-22 SW 6-12-21 SE 5-12-21	2284.09	3195170.75	0.14389767	12095.0313	SW 21-12-21 SW 22-12-21 NW 22-12-21	2325	2753573	0.14647500	10423	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	1621	2294637	0.10212300	8686	NE 7-12-21 SE 7-12-21
July 25	2170.63	2749996	0.1367497	10409.86	SE 1-12-22 SW 6-12-21 SE 5-12-21	2517.81	3120293.5	0.15862203	11811.5902	SW 21-12-21 SW 22-12-21 NW 22-12-21	2434	2753205	0.15334200	10422	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	1532	2136289	0.09651600	8087	NE 7-12-21 SE 7-12-21
July 26	2602.65	2913573	0.1639670	11029.07	SW 5-12-21 SE 6-12-21 NW 6-12-21	2410.66	3057584.25	0.15187158	11574.21	SW 21-12-21 SW 22-12-21 SE 21-12-21	-	-	-	-	-	1727	2286343	0.10880100	8655	NE 7-12-21 SE 7-12-21

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July 27	2600.54	2704305	0.1638340	10236.90	SW 5-12-21 SE 6-12-21 NW 6-12-21	2160.2	2316524.25	0.1360926	8768.99406	SW 21-12-21 SW 22-12-21	-	-	-	-	-	1735	2316524	0.10930500	8769	NE 7-12-21 SE 7-12-21
July 28	2490.98	3315688	0.1569317	12551.24	SE 1-12-22 SW 6-12-21 SE 5-12-21	1607.81	559769.31	0.10129203	2118.95634	SW 21-12-21 SW 22-12-21	2515	3008403	0.15844500	11388	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1685	2398725	0.10615500	9080	NE 7-12-21 SE 7-12-21
July 29	2427.70	3118155	0.1529451	11803.50	SE 1-12-22 SW 6-12-21 SE 5-12-21	2374.23	2853091.25	0.14957649	10800.1201	SW 21-12-21 SW 22-12-21 SE 21-12-21	2223	3094797	0.14004900	11715	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1692	2133091	0.10659600	8075	NE 7-12-21 SE 7-12-21
July 30	2213.52	3108403	0.1394518	11766.58	SW 5-12-21 SE 6-12-21 NW 6-12-21	2367.06	3335339.5	0.14912478	12625.6275	SW 21-12-21 SW 22-12-21 NW 22-12-21	2565	2925064	0.16159500	11073	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1748	2386340	0.11012400	9033	NE 7-12-21 SE 7-12-21
July 31	2231.80	3093147	0.1406034	11708.83	SW 5-12-21 SE 6-12-21 NW 6-12-21	2545.8	3236660.5	0.1603854	12252.087	SW 21-12-21 SW 22-12-21 NW 22-12-21	2411	3248722	0.15189300	12298	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	-	-	-	-	-
Aug 1	2644.41	3125064	0.1665978	11829.65	SE 1-12-22 SW 6-12-21 SE 5-12-21	2193.52	3065784.5	0.13819176	11605.2513	SW 21-12-21 SW 22-12-21 SE 21-12-21	2434	2787605	0.15334200	10552	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	-	-	-	-	-

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Aug 2	2422.22	3149722	0.1525999	11922.99	SE 1-12-22 SW 6-12-21 SE 5-12-21	2152.04	1695893.13	0.13557852	6419.65081	SW 21-12-21 SW 22-12-21	2416	2112061	0.15220800	7995	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	1821	1695893	0.11472300	6420	NE 7-12-21 SE 7-12-21
Aug 3	2799.81	2067605	0.1763880	7826.73	SW 5-12-21 SE 6-12-21 NW 6-12-21	2347.79	1340491.63	0.14791077	5074.31042	SW 21-12-21 SW 22-12-21	-	-	-	-	-	1632	2138254	0.10281600	8094	NE 7-12-21 SE 7-12-21
Aug 4	3183.03	1539061	0.2005309	5825.98	SW 5-12-21 SE 6-12-21 NW 6-12-21	2610.49	3276061.75	0.16446087	12401.2369	SW 21-12-21 SW 22-12-21 NW 22-12-21	-	-	-	-	-	1702	2237456	0.10722600	8470	NE 7-12-21 SE 7-12-21
Aug 5	2470.73	2958520	0.1556560	11199.21	SE 1-12-22 SW 6-12-21 SE 5-12-21	2328.53	3167230.25	0.14669739	11989.2651	SW 21-12-21 SW 22-12-21 SE 21-12-21	2687	3256360	0.16928478	12327	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1686	2375362	0.10621800	8992	NE 7-12-21 SE 7-12-21
Aug 6	2441.90	3054054	0.1538397	11560.85	SE 1-12-22 SW 6-12-21 SE 5-12-21	2438.78	3115623	0.15364314	11793.9105	SW 21-12-21 SW 22-12-21 SE 21-12-21	2206	3124235	0.13897800	11827	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1654	2378367	0.10420200	9003	NE 7-12-21 SE 7-12-21
Aug 7	2387.06	3190860	0.1503848	12078.71	SW 5-12-21 SE 6-12-21 NW 6-12-21	2501.78	2473665.25	0.15761214	9363.83717	SW 21-12-21 SW 22-12-21	2203	2902777	0.13878900	10988	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	1721	2373665	0.10842300	8985	NE 7-12-21 SE 7-12-21

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	Pump Capacity: 2400 US gpm (0.1514 m³/s)					Pump Capacity: 2400 US gpm (0.1514 m³/s)					Pump Capacity: 2400 US gpm (0.1514 m³/s)					Pump Capacity: 1600 US gpm (0.1001 m³/s)				
	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated
Aug 8	2406.18	3124556	0.1515893	11827.73	SW 5-12-21 SE 6-12-21 NW 6-12-21	1571.95	2210725.25	0.09903285	8368.50147	SW 21-12-21 SW 22-12-21	2278	3182541	0.14351400	12047	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	1642	2210725	0.10344600	8369	NE 7-12-21 SE 7-12-21
Aug 9	2208.04	3102777	0.1391065	11745.28	SE 1-12-22 SW 6-12-21 SE 5-12-21	2113.65	2599789.5	0.13315995	9841.26917	SW 21-12-21 SW 22-12-21	2153	3034553	0.13563900	11487	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	1621	2399790	0.10212300	9084	NE 7-12-21 SE 7-12-21
Aug 10	2277.37	3082441	0.1434743	11668.30	SE 1-12-22 SW 6-12-21 SE 5-12-21	2092.83	2928977.75	0.13184829	11087.3817	SW 21-12-21 SW 22-12-21 NW 22-12-21	2244	2987070	0.14137200	11307	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1695	2246378	0.10678500	8503	NE 7-12-21 SE 7-12-21
Aug 11	2269.07	3054353	0.1429514	11561.98	SW 5-12-21 SE 6-12-21 NW 6-12-21	2476.61	3043475.5	0.15602643	11520.8026	SW 21-12-21 SW 22-12-21 SE 21-12-21	2321	3237456	0.14622300	12255	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1639	2389476	0.10325700	9045	NE 7-12-21 SE 7-12-21
Aug 12	2380.17	3157070	0.1499507	11950.80	SW 5-12-21 SE 6-12-21 NW 6-12-21	2217.57	3137948.75	0.13970691	11878.4226	SW 21-12-21 SW 22-12-21 SE 21-12-21	-	-	-	-	-	1639	2348254	0.10325700	8889	NE 7-12-21 SE 7-12-21
Aug 13	2579.44	3181256	0.1625047	12042.36	SE 1-12-22 SW 6-12-21 SE 5-12-21	2207.45	2125193.75	0.13906935	8044.72967	SW 21-12-21 SW 22-12-21	-	-	-	-	-	1689	2125194	0.10640700	8045	NE 7-12-21 SE 7-12-21

Attachment A

Table 1: Daly Irrigation Development Project Licence No. 3010, Annual Water Use Report, 2014 Year

Date (2014)	Redfern (Pump 2)					Keywest (Pump 2)					Sundance (Pump 2)					Sundance (Pump 1)				
	Intake Location: NW10-12-21W					Intake Location: NW10-12-21W					Intake Location: NW10-12-21W					Intake Location: NW10-12-21W				
	Pump Capacity: 2400 US gpm (0.1514 m³/s)					Pump Capacity: 2400 US gpm (0.1514 m³/s)					Pump Capacity: 2400 US gpm (0.1514 m³/s)					Pump Capacity: 1600 US gpm (0.1001 m³/s)				
	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated
Aug 14	2756.07	2705441	0.1736324	10241.20	SE 1-12-22 SW 6-12-21 SE 5-12-21	0.42	4.5	0.00002646	0.01703435		-	-	-	-	-	-	-	-	-	-
Aug 15	2331.23	3115010	0.1468675	11791.59	SW 5-12-21 SE 6-12-21 NW 6-12-21	-	-	-	-	-	2889	3122734	0.18200700	11821	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	-	-	-	-	-
Aug 16	2166.69	3026342	0.1365015	11455.95	SW 5-12-21 SE 6-12-21 NW 6-12-21	-	-	-	-	-	2297	3147320	0.14471100	11914	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	-	-	-	-	-
Aug 17	2275.68	3082734	0.1433678	11669.41	SE 1-12-22 SW 6-12-21 SE 5-12-21	1497.84	927587.06	0.09436392	3511.29733	SW 21-12-21 SW 22-12-21	2167	2989706	0.13652100	11317	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	1845	1017587	0.11623500	3852	NE 7-12-21 SE 7-12-21
Aug 18	2364.98	3143970	0.1489937	11901.22	SE 1-12-22 SW 6-12-21 SE 5-12-21	1450.44	2010878.13	0.09137772	7611.99818	SW 21-12-21 SW 22-12-21	2431	2723715	0.15315300	10310	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1632	2232578	0.10281600	8451	NE 7-12-21 SE 7-12-21
Aug 19	2285.95	3229706	0.1440149	12225.76	SW 5-12-21 SE 6-12-21 NW 6-12-21	1439.76	2008642.5	0.09070488	7603.53541	SW 21-12-21 SW 22-12-21	2131	2859286	0.13425300	10824	NE 5-12-21 E 1/2 8-12-21 NW 31-11-21	1734	2323643	0.10924200	8796	NE 7-12-21 SE 7-12-21

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Table 1: Daly Irrigation Development Project Licence No. 3010, Annual Water Use Report, 2014 Year

Date (2014)	Redfern (Pump 2)					Keywest (Pump 2)					Sundance (Pump 2)					Sundance (Pump 1)				
	Intake Location: NW10-12-21W					Intake Location: NW10-12-21W					Intake Location: NW10-12-21W					Intake Location: NW10-12-21W				
	Pump Capacity: 2400 US gpm (0.1514 m³/s)					Pump Capacity: 2400 US gpm (0.1514 m³/s)					Pump Capacity: 2400 US gpm (0.1514 m³/s)					Pump Capacity: 1600 US gpm (0.1001 m³/s)				
	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated	Max Pumping Rate (gpm)	Volume Pumped (gallons)	Max Pumping Rate (m³/s)	Volume Pumped (m³)	Parcel(s) Irrigated
Aug 20	2365.26	2923915	0.1490114	11068.22	SW 5-12-21 SE 6-12-21 NW 6-12-21	2040.1	2463303.5	0.1285263	9324.6137	SW 21-12-21 SW 22-12-21	2241	3168208	0.14118300	11993	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	1769	2362304	0.11144700	8942	NE 7-12-21 SE 7-12-21
Aug 21	2120.99	2980286	0.1336224	11281.60	SE 1-12-22 SW 6-12-21 SE 5-12-21	1994.82	954452.88	0.12567366	3612.99548	SW 21-12-21 SW 22-12-21	2294	2465683	0.14452200	9334	NE 5-12-21 E 1/2 8-12-21 NW 5-12-21	1653	954453	0.10413900	3613	NE 7-12-21 SE 7-12-21
Aug 22	2291.71	3028208	0.1443777	11463.01	SE 1-12-22 SW 6-12-21 SE 5-12-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aug 23	2281.31	2568883	0.1437225	9724.28	SW 5-12-21 SE 6-12-21 NW 6-12-21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total (US gallons)</b>	<b>93,750,595</b>					<b>68,145,302</b>					<b>73,384,018</b>					<b>60,758,430</b>				
<b>Total (m³)</b>	<b>354,884</b>					<b>257,958</b>					<b>277,789</b>					<b>229,996</b>				
<b>Total (ac-ft)</b>	<b>287.71</b>					<b>209.13</b>					<b>225.21</b>					<b>186.46</b>				

**Attachment B**

**Reference: Daly Irrigation Project – 2014 Final Monitoring Report – Licence No. 3010**

**RIFFLE MONITORING PHOTOGRAPHS**



**Bushnell** ⓘ Camera Name 28.60 In→ 82°F ○

07-15-2014 02:00:45



**Bushnell** ⓘ Camera Name 28.69 In↑ 71°F ●

07-22-2014 09:00:12

**Attachment B**

**Reference: Daly Irrigation Project – 2014 Final Monitoring Report – Licence No. 3010**

**RIFFLE MONITORING PHOTOGRAPHS**



**Bushnell** 📷 Camera Name 28.11In→ 66°F ●

07-31 -2014 22:44:42



**Bushnell** 📷 Camera Name 28.40In↓ 73°F ○

08-02 -2014 00:00:17

Attachment B

Reference: Daly Irrigation Project – 2014 Final Monitoring Report – Licence No. 3010

RIFFLE MONITORING PHOTOGRAPHS



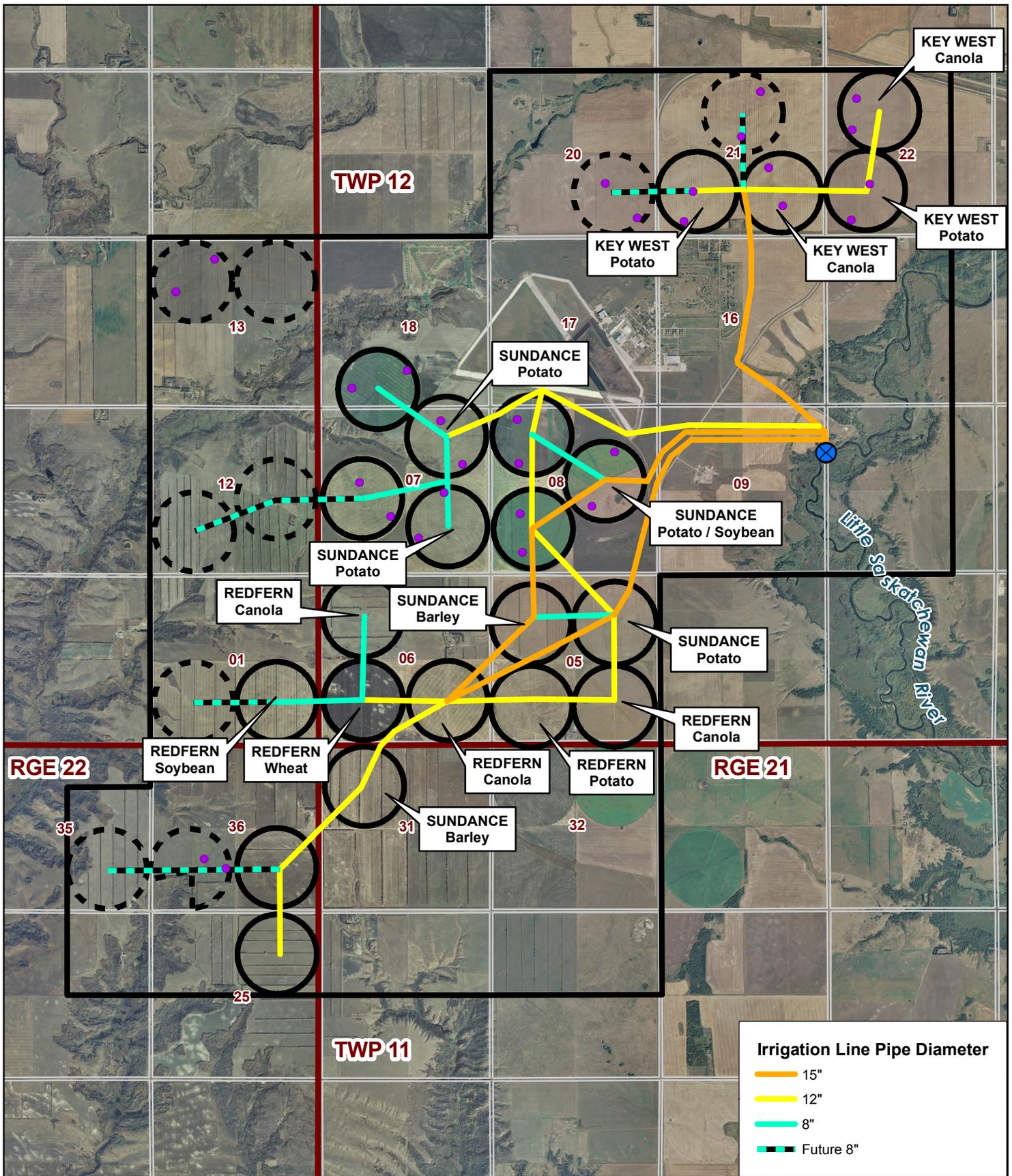
Bushnell ⓘ Camera Name 28.25 In↓ 66°F ●

08-11-2014 08:00:45

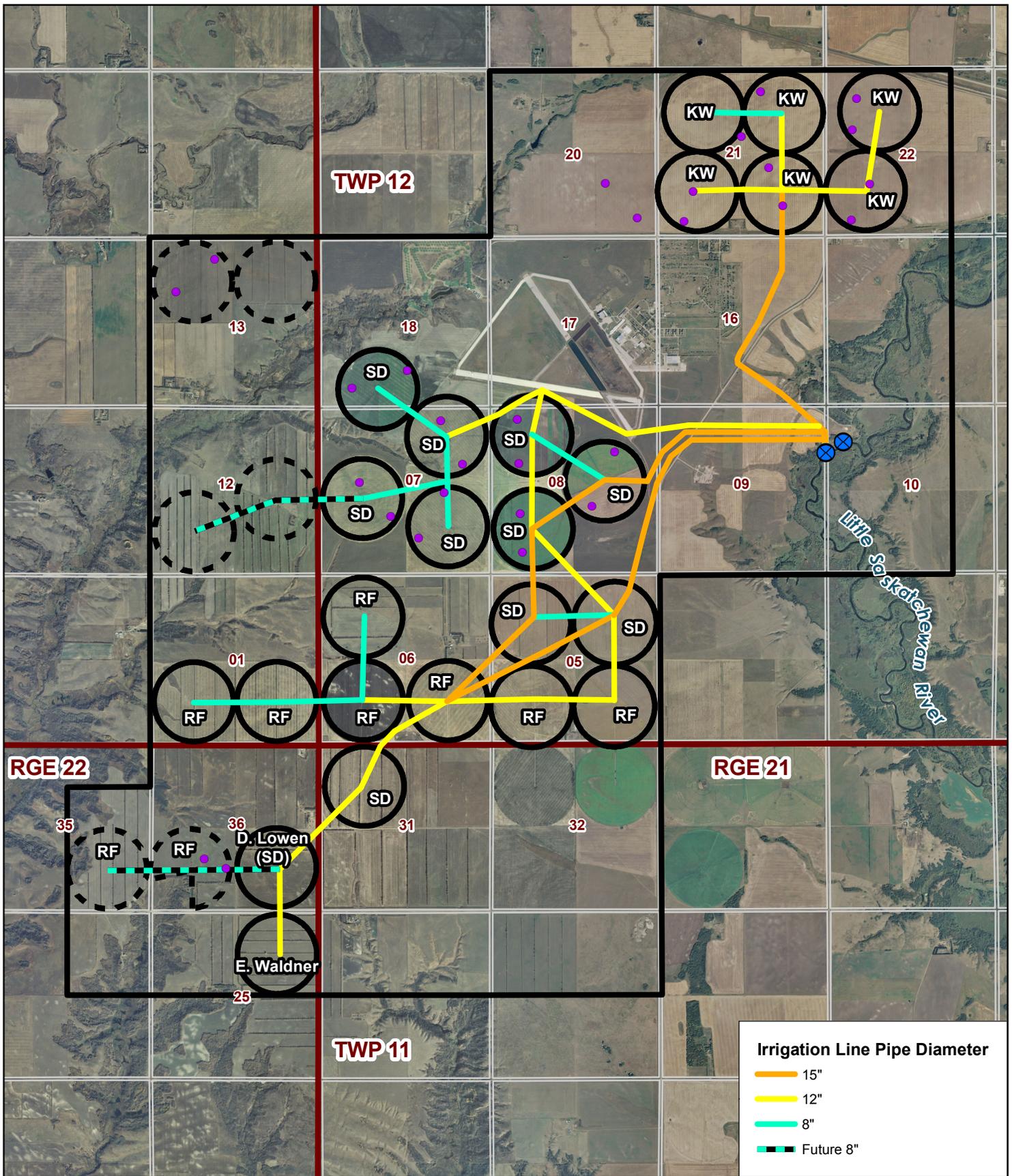


Bushnell ⓘ Camera Name 28.20 In↓ 92°F ●

08-20-2014 02:00:55



<h3>Project Footprint</h3>	<b>LEGEND</b> □ Local Study Area ○ Phase 1 Pivots/Project Footprint ⊙ Phase 2 Proposed Pivots ⊗ Pump Station ● Soil Inspection Points	DATA SOURCE: ORTHOPHOTO IMAGERY AND SOIL RESOURCE INFORMATION PROVIDED BY MANITOBA LAND INITIATIVE, PROVINCE OF MANITOBA.		
	COORDINATE SYSTEM NAD 1983 UTM Zone 14N		DATE Feb 19, 2015	PROJECT 1114 40070
	SCALE: 0 400 800 Metres / 0 1,500 3,000 Feet		DRAWN AC	QA/QC TD
			<b>FIGURE 4</b>	



**Project Footprint**

**LEGEND**

- Local Study Area
- Phase 1 Pivots/Project Footprint
- Phase 2 Proposed Pivots
- ⊗ Pump Station
- Soil Inspection Points

DATA SOURCE:  
 ORTHOPHOTO IMAGERY AND  
 SOIL RESOURCE INFORMATION  
 PROVIDED BY MANITOBA  
 LAND INITIATIVE,  
 PROVINCE OF MANITOBA.

0 395 790 Metres  
 0 1,500 3,000 Feet

**Stantec**

COORDINATE SYSTEM: NAD 1983 UTM Zone 14N

DATE: Feb 24, 2015 PROJECT: 1114 40070 FIGURE: 5

DRAWN: AC QA/QC: TD APPROVED: TD