MAR 20150002: PEACE RIVER

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2014 EXPLORATION AND FIELDWORK ON THE PEACE RIVER PROPERTY METALLIC AND INDUSTRIAL MINERALS PERMIT, NORTH-CENTRAL ALBERTA

PART B

Metallic and Industrial Minerals Permit
9312120366

Geographic Coordinates

56°29' N to 56°36' N
117°02' W to 117°11' W

NTS Sheets
084C/6 and 084C/11

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1. SUMMARY

During June 2014, two geologists from Dahrouge Geological Consulting Ltd. (Dahrouge) carried out a preliminary exploration program on the Peace River Property (the "Property") Metallic & Industrial Minerals Permit No. 9312120366.

Outcrops were mapped and 27 samples were collected at 9 separate locations, including two sites outside the permit area. Samples were sent to Loring Laboratories in Calgary for sieve analysis, roundness, sphericity testing, and ICP whole rock analysis.

2. INTRODUCTION

The 2014 exploration within the Peace River Property was conducted by Dahrouge, on behalf of 877384 Alberta Ltd. (877384). This assessment report describes the exploration conducted within MAIM Permit 9312120366, which is one of four permits owned by 877384 which straddle the Peace River in northwestern Alberta, ranging downstream (north) from the town of Peace River.

The objectives of the 2014 exploration were to locate and better define sandstone units exposed on the banks of Peace River that could be favorable for use as hydraulic fracturing sand. This report includes information on the geology and quality of sandstones encountered during the mapping and sampling of outcrops within the permit area.

3. GEOGRAPHIC SETTING AND ACCESS

3.1 LOCATION AND ACCESS

MAIM Permit 9312120366 encompasses both sides of the Peace River from about 30 km north of the town of Peace River to about 40 km north of town and is the northernmost of four MAIM permits owned by 877384 (Fig. 3.1).

The Property lies within the Lower Peace Land Use Framework. The Peace River here forms the boundary between the County of Northern Lights to the west, and Northern Sunrise County to the east. The Property falls within Forest Management units P01, P03 and P21.

Although Alberta secondary highway 743 parallels the Peace River on the west at a distance of 8 to 10 km, and a gravel resource road parallels the river about the same distance to the east, no roads provide direct access to the Property. Steep bluffs and cliffs supported by sandstones along both sides of the river preclude access to outcrops from above. Currently the only practical

access to exposures (used in 2014) is by boat from one of several launches north of the town of Peace River.

3.2 INFRASTRUCTURE

Accommodations, food, fuel and other necessary services are available in Peace River. The local economy is primarily based on agriculture, forestry, and energy-based industries.

Peace River, with a population of about 7,000, is 485 km (approximately 6 hours) northwest of Edmonton, following Highway 16 west for 55 km to Highway 43, then north on Highway 43 for 285 km to Valleyview, and then 145 km north along Highway 49 to Peace River.

A rail line runs north along the west side of the river to the Daishowa-Marubeni Peace River pulp mill which is situated on the west bank in MAIM permit 9314010265,about 20km south of permit 9312120366.

3.3 TOPOGRAPHY, VEGETATION AND CLIMATE

The Peace River Property permit area lies at 500 to 520 m above sea level on the Peace River plain. The river is at an elevation of about 320 m, with steep bluffs and cliffs up to 100 m high.

Most of the permit area is included in the Dry Mixedwood Natural Subregion, and lies within the Peace River Forest District. Flat to gently undulating glacial till or lacustrine plains are the dominant terrain type in this region, cut by the Peace River Canyon which exposes Lower Cretaceous (middle Albian) sandstones of the Peace River Formation. Gray luvisols are the dominant soils on uplands; gleysols and organic soils are dominant in wetlands.

Aspen forests with mixed understories of rose, low-bush cranberry, beaked hazelnut and Canada buffaloberry are typical on uplands. Jack pine stands occur on dry, well to rapidly drained glaciofluvial and aeolian parent materials. Treed, shrubby or sedge-dominated fens occupy up to 15 percent of the region.

The area has the warmest summers and highest growing degree-day accumulations of any of the boreal regions, with mean winter daytime temperatures of -17°C and mean summer maximum temperatures of 18°- 20° C with extremes of -40°C and 35°C respectively. About 70 percent of the annual precipitation falls during the April to August period, with peak precipitation in June and July that is often associated with intense convective storm events. Average rainfall is about 3 cm, and average snowfall is about 112 cm.

3.4 FIELD OPERATIONS

Field operations were conducted by a two-person geological crew from Dahrouge, based out of a hotel in Peace River, Alberta.

Transportation to and from the property was by jet boat, based out of the Peace River, Alberta. Garmin GPSmap 60CSx instruments were used to mark outcrop locations and record access information. Compasses were set at a magnetic declination of 17°07' east.

4. PROPERTY, EXPLORATION AND EXPENDITURES

4.1 PROPERTY SUMMARY

In December 2012, 877384 Alberta Ltd. acquired MAIM Permit 9312120366, about 35 km north of the town of Peace River, Alberta. This permit covers Cretaceous sandstones of the Peace River Formation along the Peace River (Fig.'s 4.1 and 4.2). MAIM Permit 9312120366 totals 7,552 hectares in size and is contiguous with 3 other 877384-owned MAIM Permits.

4.2 2014 EXPLORATION SUMMARY

From June 5-9, 2014, Dahrouge, on behalf of 877384 Alberta Ltd., conducted exploration for silica sands (with the potential for use as a proppant) within the Peace River district of Alberta. The work was undertaken to determine the location, quality and extent of sandstone units within the permit area.

Sandstone outcrops were examined along both sides of the river and a total of 21 samples from 7 sites were collected (Fig. 4.2). A further six samples from three additional sites not on the permit were also collected. Geological observations were recorded, including lithologic information, and other pertinent details (Appendix 2). Samples were reviewed by microscopic examination. A total of 19 rock samples were selected and shipped to Loring Laboratories Ltd. in Calgary, Alberta, for sieve tests, roundness, sphericity testing and whole rock analysis (Appendix 3). In some instances, sections were measured perpendicular to bedding, where sufficient exposure was present. Field maps were completed on 1:30,000 and 1:175,000 scale map sheets (Fig. 4.2).

4.3 EXPLORATION EXPENDITURES

Expenditures for 2014 totaled $38,326.88 (including 10% administration cost) (Appendix 1). The Peace River Property (MAIM Permit 9312120366) reached its renewal date on December 19,

2014, and hence these expenditures will extend the new expiry date to December 19, 2016. A reduction in the total area of the permit of 469.4 ha is proposed in areas of thick overburden (Table 4.1).

TABLE 4.1 PROPOSED CHANGES TO AREA OF MAIM PERMIT 9312120366

Township	Land to Retain	Area to Retain	Land to Release	Area to Release
5-20-088	**4-6**	777.0 ha	-	-
5-20-087	**2**: *L2-16;* **3-4**; **9:** *L1-3, L6-11, L14-16;* **10-11**; **13:** *L12-13;* **14-15; 16:** *L1-12, L14-16;* **20:** *L9,13-16;* **21:** *L1-3, L6-16;* **22-23; 24:** *L4-6, L11-14;* **25:** *L3-6, 11-14;* **26-29; 30:** *L1-3, L5-16;* **31-33; 34:** *L1-14;* **35:** *L1-8*	5746.5 ha	**2:** *L1;* **9**: *L4-5, L12-13;* **13:** *L3-6, L11, L14;* **16:** *L13;* **20:** *L1-8, L10-12;* **21:** *L4-5;* **24:** *L3;* **30:** *L4;* **34:** *L15-16*	469.4 ha
5-20-086	**32, 33, 34:** *L4-6; 11-14*	647.5 ha	-	-
	Total Area :	**7171.1 ha**		**469.4 ha**

Expenditures are allocated to the proposed reduced area of MAIM permit 9312120366 as follows:

TABLE 4.2 EXPENDITURES AND EXPIRY DATE

Agreement	Record Date	Original Size (ha)	Reduced Size (ha)	Due per (ha)	Required Spending	Expenditures	Excess Expenditures	Term Expiry
9312120366	Dec. 19, 2012	7552	7171.1	$5.00	$35,855.50	$38,326.88	$2,471.38	Jan. 1, 2026

5. REGIONAL GEOLOGY

5.1 STRATIGRAPHY

In the Peace River area, essentially flat-lying sandstones of the lower Cretaceous Peace River Formation are overlain by shales of the mid-Cretaceous Shaftsbury Formation of the Colorado Group (Fig. 5.1). The Peace River Formation is 20 m thick on average, and consists of three members: a basal marine shale (Harmon Member), a middle, marine sand (Cadotte Member), and an upper continental sand (Paddy Member).

The Harmon Member consists of dark-grey non-calcareous marine shale of middle Albian age, and ranges up to 10 m thick. It was not observed in exposure on the permit area. The Cadotte Member, also of middle Albian age, is a well-sorted, uniform, deltaic sandstone with a maximum thickness of up to 20 m. It has a lobate pattern typical of some deltas and it extends east to the middle of Lesser Slave Lake and north to Township 101. Its southern extensions are unknown.

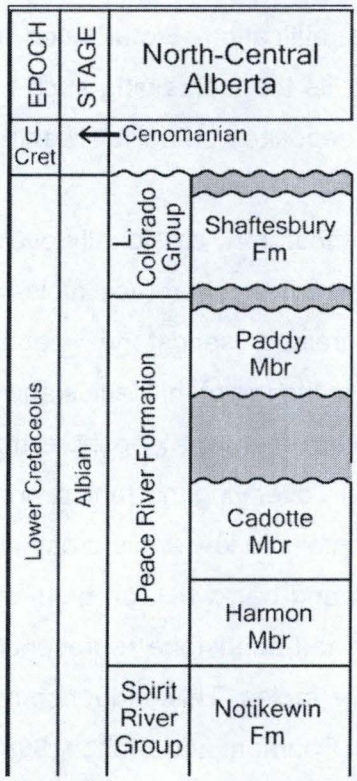
The overlying Paddy member is the continental phase of Peace River sedimentation and has a maximum thickness of over 10 m in the area. It too has the "bird's-foot" pattern of a delta formed on a shallow shelf. This member extends to the western tip of Lesser Slave Lake, north to Township 91 and south to Township 66.

Both Cadotte and Paddy members are exposed on the Property along the canyon of the Peace River. Both had a complex western source which probably consisted of igneous, metamorphic and clastic rocks lying, for the most part, west of the present day Rocky Mountain Trench.

In northwest Alberta and northeast British Columbia, the basal contact of the Colorado Group sediments is represented by a major erosion surface between the Paddy and Cadotte members of the Peace River Formation. This unconformity has beveled the underlying Cadotte and Harmon members toward the east and south. Westward, in the Rocky Mountain Foothills of northeastern British Columbia, the unconformity approximately corresponds to the position of the lowermost paleosols within the Boulder Creek Formation (Leckie et al., 1990).

Shales of the Shaftsbury Formation outcrop only at the top of the sandstone cliffs along the river and were not directly observed during field work.

TABLE 5.1 GENERALIZED CRETACEOUS STRATIGRAPHY OF THE PEACE RIVER AREA, NORTH-CENTRAL ALBERTA*



*adapted from Dafoe, Gingras, and Pemberton, (2010) *Bulletin of Canadian Petroleum Geology, June 2010, v. 58, p. 173-201,*

5.1.1 Cadotte Member

The Albian Cadotte Member in northwestern Alberta is a clastic shoreline to offshore progradational sequence. A prominent erosional scour surface subdivides the Cadotte into lower and upper units which can be easily recognized in the subsurface on gamma-ray logs.

The lower unit is finer grained and consists of a coarsening-upward offshore to middle shoreface shale, siltstone and sandstone sequence. The offshore facies consists of interbedded shale and wave-rippled to graded-bedded siltstone and very fine grained sandstone, representing deposition below storm-weather wave base. The overlying lower shoreface facies consists of interbedded graded-bedded and hummocky cross-stratified sandstone and shale with a moderate amount of bioturbation. This bioturbation occurs in the upper portion of sandy layers, giving rise to laminated-to-burrowed structure. Deposition took place below the average storm-weather wave base.

The middle shore face facies gradationally overlies the lower shoreface facies and consists of very fine to fine grained, horizontal to low-angle cross-stratified sandstone, interpreted as amalgamated hummocky cross-stratification. Bioturbation in this facies is restricted to a thin argillaceous sandstone zone near its top, containing such burrows as *Skolithos, Palaeophycus* and *Terebellina*. This facies was deposited below fair weather wave base where severe storms reworked bottom sediments.

The upper unit, which for the most part, erosionally overlies the lower unit, comprises three facies. At the base of the unit, an upper shoreface facies consists of cross- and horizontally stratified, medium to coarse grained sandstone, pebbly sandstone and conglomerate. *Macaronkhnus segregatis* occurs at the top of this facies and into the base of the overlying facies. The overlying facies represents current-swept longshore troughs and rip channels of a barred high-energy shoreline. Gradationally overlying this facies, and at times difficult to separate from it, is a foreshore consisting of horizontally to low-angle cross-stratified, medium grained sandstone deposited by the action of swash and backwash on high-energy beaches. A rooted and highly homogenized fine to medium grained sandstone representing the uppermost backshore facies gradationally overlies the foreshore facies. This sequence represents the seaward progradation of a high-energy barred coastline (Rahmani and Smith, 1988).

5.1.2 Paddy Member

The Paddy member overlies the Cadotte member on an erosional surface. Outcrop exposures of the Peace River Formation in northwestern Alberta contain evidence of significant relative sea-level fluctuations that occurred during the middle to late Albian, including Paddy Member channels that incised into the Cadotte Member shoreline deposits. The upper Cadotte Member contact is irregular and siderite-cemented; it has been scoured into and infilled by sandstone of the Paddy Member.

The lower sandstone of the Paddy Member is crossbedded, with abundant comminuted, carbonaceous debris. Channels cut into the Cadotte Member are up to 5 m deep and are locally overlain by *in situ* coal and roots. The channels are infilled with alternating couplets of moderately to intensely bioturbated sand and mud which have inclined heterolithic stratification; mud plugs are also present. Internally these sands are rippled with parallel cross-laminated. This lower part of the Paddy Member is interpreted as estuarine fill that resulted from a relative sea-level rise. The channel fill is overlain by intensely bioturbated, locally rooted, finely interbedded sandstone, siltstone and shale, with minor reworked bentonites, which are interpreted as tidal flat deposits.

These tidal flat sediments are overlain by 2 to 3 m of scoured, parallel-laminated sandstone and capped by 1.5 m of planar-tabular crossbedded sandstone interpreted to be shoreface and transgressive, estuary-mouth deposits, respectively. Evidence for tides throughout the Paddy Member includes inclined heterolithic stratification, mud couplets, reactivation surfaces, reversing paleoflows and compound crossbeds. The incised channels and related fill are correlative with a sequence of paleosols 300 km southwest in the Boulder Creek Formation. A brackish influence is indicated by the presence of a few species of peridinioid dinoflagellates, occurring in abundance at certain levels, as well as the trace fossil assemblage. The Paddy Member is overlain by marine mudstone of the Shaftesbury Formation. A 20 to 30 cm thick, wave-rippled layer of fish teeth, fish bones and pebbles, near the base of the Shaftesbury Formation, can be traced along the Peace River for at least 75 km. This layer of fish remains is interpreted as a transgressive lag (Leckie and Singh, 1991).

5.2 STRUCTURE

The dominant structural feature in this part of the Alberta Basin is the Peace River Arch, which is a large, fault-controlled cratonic uplift. It is an east-northeasterly trending structure that has a total preserved length of approximately 750 km. At its western end, near the Alberta/British Columbia boundary, the arch stands approximately 1,000 m above the regional elevation of the basement. The amplitude of the arch decreases eastward to between 400 and 500 m at the fifth meridian (175 km east of the Property) and to only several tens of metres at its eastern end, near the fourth meridian. It is an asymmetrical structure with a steeply dipping northern flank and a more gently dipping southern slope. The axis passes about 5km north of the town of Peace River, about 30 km south of the permit area.

Facies distributions within the Lower Cretaceous Peace River Formation also appear to have been controlled by subsidence of the underlying Dawson Creek Graben Complex, a series of linked grabens that formed the central core of a renewed Peace River Embayment, a zone of subsidence which developed during the Carboniferous. Within the Cadotte Member, an abrupt transition from shoreline sandstone to offshore shale overlies the southern margin of the complex. An incised fluvial-estuarine system within the overlying Paddy Member parallels this shoreline, and the southern edge of the Dawson Creek Graben Complex (Leckie et al.,1990). In the Peace River region there are many minor structural offsets within units throughout the Cretaceous, possibly caused by the reactivation of underlying Peace River Arch / Dawson Creek Graben Complex structures.

Dips for the top of the Colorado Group are estimated at 40-6 0m per 10 km to the south and southwest. Local variations due to scours, cross-bedding and other sedimentological features are generally of greater amplitude (O'Connell, 1994).

6. RESULTS

Three days were spent mapping and sampling sandstone outcrops in detail in June, 2014. The exploration concentrated on identifying stratigraphic units and contacts, and locating favorable horizons for follow-up.

Sandstones of the Peace River Formation were examined and sampled within MAIM Permit 9312120366, along both banks of the Peace River in northwestern Alberta (Fig. 4.2 and 4.3). A total of 9 locations were examined and a total of 27 samples were taken (Appendix 2). After microscope examination, 19 of these were sent for sieve analysis, roundness and sphericity testing, and whole rock analysis (Appendix 3). Not all samples yielded enough material in all size fractions for roundness and sphericity to be tested. Whole-rock chemistry, sieve analyses, and roundness and sphericity results are presented in Tables 6.1, 6.2, and 6.3 respectively.

TABLE 6.1 WHOLE-ROCK CHEMISTRY

Sample No.	Al_2O_3	Ba	CaO	Cr	Fe_2O_3	K_2O	MgO	MnO	Na_2O	Ni	P_2O_5	SO_3	SiO_2	Sr	TiO_2	V	LOI@1000	SUM
	%	ppm	%	ppm	%	%	%	%	%	ppm	%	%	%	ppm	%	ppm	%	%
82278	1.78	491	0.11	96	0.45	0.50	0.11	0.00	0.05	4	0.04	0.04	95.04	58	0.06	45	0.78	98.97
82279	1.84	515	0.19	82	1.55	0.42	0.16	0.01	0.09	12	0.09	0.06	93.67	61	0.07	53	1.27	99.41
82280	2.63	489	0.23	110	1.87	0.57	0.24	0.02	0.11	14	0.08	0.06	91.24	63	0.10	66	1.49	98.62
82281	2.69	484	0.20	98	2.23	0.62	0.24	0.02	0.09	15	0.07	0.12	91.10	61	0.09	62	1.63	99.09
82282	3.09	498	0.24	104	7.81	0.66	0.35	0.04	0.10	29	0.13	0.06	82.70	62	0.10	105	2.94	98.22
82283	2.35	715	2.55	84	14.64	0.52	0.56	0.11	0.15	23	1.31	0.17	70.42	373	0.07	100	5.41	98.24
82284	2.85	506	0.30	95	12.81	0.60	0.55	0.04	0.15	23	0.18	0.24	76.86	68	0.08	122	4.08	98.73
82285	2.48	490	0.08	71	0.42	0.82	0.14	0.00	0.07	5	0.02	0.06	92.95	54	0.06	34	0.99	98.11
82286	2.47	489	0.07	125	0.46	0.67	0.14	0.00	0.07	5	0.03	0.05	93.25	53	0.06	42	0.86	98.13
82287	2.46	504	0.10	93	0.48	0.66	0.15	0.00	0.08	5	0.04	0.11	93.02	62	0.06	48	1.05	98.21
82288	2.24	472	0.09	74	0.81	0.55	0.15	0.00	0.07	7	0.06	0.05	93.06	58	0.07	50	1.06	98.21
82289	1.99	469	0.07	77	0.56	0.54	0.12	0.00	0.09	4	0.05	0.05	93.84	62	0.06	38	0.83	98.21
82290	2.16	477	0.08	82	0.71	0.55	0.11	0.01	0.09	9	0.05	0.07	93.64	70	0.08	39	0.93	98.48
82291	3.33	476	0.27	73	4.82	0.67	0.22	0.04	0.13	41	0.08	0.54	86.16	76	0.08	56	2.60	98.95
82292	3.60	564	0.31	67	9.61	0.85	0.64	0.05	0.18	25	0.13	0.30	77.74	69	0.09	66	4.75	98.24
82293	2.63	480	0.11	79	0.44	0.71	0.18	0.01	0.08	5	0.04	0.10	92.90	63	0.07	44	0.85	98.12
82294	2.31	473	0.14	72	0.40	0.79	0.11	0.00	1.57	3	0.02	0.20	92.62	51	0.06	32	1.03	99.26
82295	2.94	516	0.13	131	0.59	0.78	0.25	0.00	0.09	7	0.04	0.16	91.92	51	0.07	47	1.23	98.20
82296	3.05	514	0.14	90	0.97	0.76	0.19	0.00	0.13	7	0.05	0.19	91.40	56	0.07	45	1.25	98.21

TABLE 6.2 SIEVE ANALYSES - PERCENT BY WEIGHT

SAMPLE ID	+ 20 Mesh	20 x 40 Mesh	40 X 70 Mesh	70 X 140 Mesh	-140 Mesh
82278	0.1%	0.4%	1.5%	92.2%	5.8
82279	1.1%	1.4%	2.6%	84.3%	10.5
82280	2.1%	1.8%	6.6%	71.6%	17.8
82281	1.1%	2.7%	5.2%	71.9%	19.1
82282	0.2%	10.0%	11.8%	57.9%	20.1
82283	28.9%	6.1%	8.9%	42.1%	14.1
82284	0.1%	12.5%	14.2%	53.5%	19.7
82285	0.0%	0.3%	21.4%	68.6%	9.7
82286	0.0%	0.2%	38.9%	50.4%	10.6
82287	0.0%	0.1%	25.4%	66.0%	8.4
82288	0.0%	0.2%	33.6%	57.7%	8.6
82289	0.0%	0.1%	14.3%	78.4%	7.2
82290	0.0%	0.1%	36.1%	55.8%	8.0
82291	13.3%	2.0%	4.6%	65.3%	14.8
82292	17.5%	0.9%	1.1%	65.1%	15.4
82293	0.0%	0.1%	5.2%	82.1%	12.6
82294	0.1%	0.5%	65.7%	28.3%	5.5
82295	0.0%	0.3%	81.0%	14.2%	4.4
82296	0.0%	0.1%	69.9%	22.9%	7.1

In summary, no samples contained over 98% silica. The best (82278) was only 95.04% and most samples were 91 to 93% SiO_2 (Table 6.1) Chert was a common component, a few samples were very rusty (< 14.6% Fe_2O_3 – 82283) and a few contained several modal percent feldspar (Appendix 2).

With the exception of five samples, most were well-sorted and skewed to the finer sieve sizes (40x70 and 70x140) with ten samples having greater than 10% and up to 20.1% in the -140 mesh fraction (Table 6.2).

Insufficient material or poor quality prevented determination of roundness and sphericity in some samples (Table 6.3). Only two samples (82278 and 82294) approached or exceeded the API standard for high-strength proppants of >0.7 roundness and >0.7 sphericity. In general, most samples tested achieved acceptable roundness, but with sphericity of only 0.4 to 0.5.

TABLE 6.3 ROUNDNESS AND SPHERICITY

Sample No.	20 x 40 Mesh		40 x 70 Mesh		40 x 70 Mesh	
	Roundness	Sphericity	Roundness	Sphericity	Roundness	Sphericity
82278	--	--	0.8	0.6	0.7	0.5
82279	--	--	--	--	0.6	0.4
82280	--	--	--	--	0.7	0.4
82281	--	--	--	--	0.6	0.4
82282	--	--	--	--	0.6	0.4
82283	--	--	--	--	0.6	0.4
82284	--	--	--	--	0.7	0.5
82285	--	--	0.7	0.5	0.8	0.5
82286	--	--	0.7	0.4	0.7	0.5
82287	--	--	0.7	0.5	0.8	0.5
82288	--	--	0.7	0.5	0.9	0.5
82289	--	--	0.7	0.5	0.7	0.5
82290	--	--	0.8	0.5	0.8	0.5
82291	--	--	--	--	--	--
82292	--	--	--	--	0.7	0.5
82293	--	--	0.7	0.5	0.7	0.5
82294	--	--	0.7	0.5	0.8	0.8
82295	--	--	0.7	0.5	0.7	0.5
82296	--	--	0.7	0.5	0.7	0.5

At each location, sampling began at the highest stratigraphic point reachable, and sample numbers increase down-section.

At location AD-14-02, on the west side of the Peace River (Fig.4.3), samples 82278 and 82279 were taken from the base of an approximately 10 m high cliff face of dominantly beige, consolidated, friable sandstone of the Paddy Member. Both are acceptably high in silica and are skewed heavily to the 70x140 mesh size fraction. Sample 82278, the upper sample, had good roundness, and nearly acceptable sphericity. Sampling higher up stratigraphically at this spot might yield good values, as only the bottom 2¼ m could be reached. The difficulty is the need to pack an extension ladder down the cliffs or up from the river.

At location AD-14-03, about 20 m north and stratigraphically below 14-02, possibly in the upper Cadotte Member, samples 82280 an 82281 were both rusty, fine-grained lithic and feldspathic sandstone. These samples were both about 91% SiO_2, but less well sorted than 14-02, and with poorer sphericity.

At location AD-14-04 about 15 m north of 14-03 and approximately at the same stratigraphic horizon, rusty weathering, hematitic or limonitic nodules were found in fine-grained sandstone. Silica was low (70-82%), and L.O.I.'s high. Sorting was poorer than the previous two locations, and roundness and sphericity lower in the 40x70 fraction. This is most likely upper Cadotte Member.

At location AD-14-05, a section of about 13 m stratigraphic thickness was measured, spanning parts of both the Cadotte and Paddy Members:

Sample	Length (m)	Azimuth	Sample Slope	Bedding Dip	Dip Direction	Strat. Thickness (m)	Cumulative Stratigraphic Thickness
82285	2.1	230	-41	0	90	1.38	13.05
82286	3	238	-32	0	90	1.59	11.67
82287	2.9	247	-30	0	90	1.45	10.08
OFFSET	3.4	262	-1	0	90	0.06	8.63
82288	3.1	262	-23	0	90	1.21	8.57
82289	3	260	-42	0	90	2.01	7.36
82290	3.1	258	-32	0	90	1.64	5.35
82291	2.9	283	-44	0	90	2.01	3.71
82292	3.2	260	-32	0	90	1.70	1.70

The Paddy Member samples were generally fine-grained, moderately well sorted, and sub-rounded. The basal two samples (82292 and 82291) are rusty, low silica, high iron; very-fine to medium grained, poorly sorted sandstone, and represent the top of the Cadotte Member. The upper 9 m (82290 to 82285) are consistent, massive, fine-grained, greyish-white, well sorted, sub-angular to sub-rounded, semi-consolidated, friable sandstone with minor feldspar and rock fragments (<5%). These samples represent most of the Paddy Member in this area. Silica is very consistent at about 93%. Nearly all of each sample falls in the 40x70 and 70x140 size fractions, with consistently good roundness, and consistent 0.5 sphericity.

Location AD-14-08 is about 800 m west of 14-05 and sample 82293 was taken at the base of the Paddy Member. It is a very fine grained, grey, well sorted, moderately friable, consolidated sandstone. Silica is similar to most of the other Paddy Member samples at 92.9%. The 70x140 fraction is 82.1% by weight, and roundness and sphericity in both fractions are 0.7 and 0.5 respectively, which is consistent with other samples from the Paddy Member.

Location AD-14-09, about 2 km west of 14-08 on the west bank of the river covers the basal 4.5 m of the Paddy Member, which is beige fine-grained well-sorted sandstone with minor lithic fragments. Again, it shows consistent silica in the low 90's, almost all in the 40x70 and 70x140 fractions, with good roundness, and fair sphericity. Sample 82294 at the top, returned 0.8 roundness and 0.8 sphericity in the 70x140 fraction.

No Shaftsbury Formation or Harmon Member outcrops were directly observed during the 2014 exploration.

7. CONCLUSIONS

Sandstone units of the Cadotte and Paddy members of the Peace River Formation were examined and sampled along Peace River north of the village of Peace River, within MAIM Permit 9312120366. A total of 12 discrete intervals were sampled and described in detail. Based on the samples collected and units mapped during the 2014 exploration, along with overall property assessment, the permit will be retained with a small reduction of area (469.4 ha) along margins of the property where overburden thickness is deemed too great which will be released(Fig.4.1b).

Currently, access to the property is limited. Jet boat and hiking/climbing are required to reach the sandstones on much of the Peace River Property. The steepness of cliffs frequently prevents systematic sampling, particularly of the upper part of the Paddy Member below the Shaftesbury.

Samples indicate that sands along this part of the Peace River in the lower part of the Paddy Member are somewhat immature, with lower than optimal silica content, and lower than desirable sphericity. An effort should be made to sample the upper part of the Paddy Member at more locations as there is some indication of improving characteristic up-section. The difficulties presented by the cliffs are mentioned earlier in this report. Future exploration should expand on previously conducted work in the area, confirming or redefining past geological interpretations and determining the potential for quality hydraulic fracturing sand within the permit area. Indications from limited sampling south of this permit suggest that quality may improve to the south on sister permits 9314010263; 64; and 65.

8. REFERENCES

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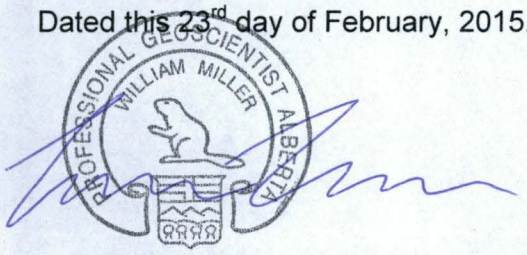
9.0 STATEMENT OF QULIFICATIONS

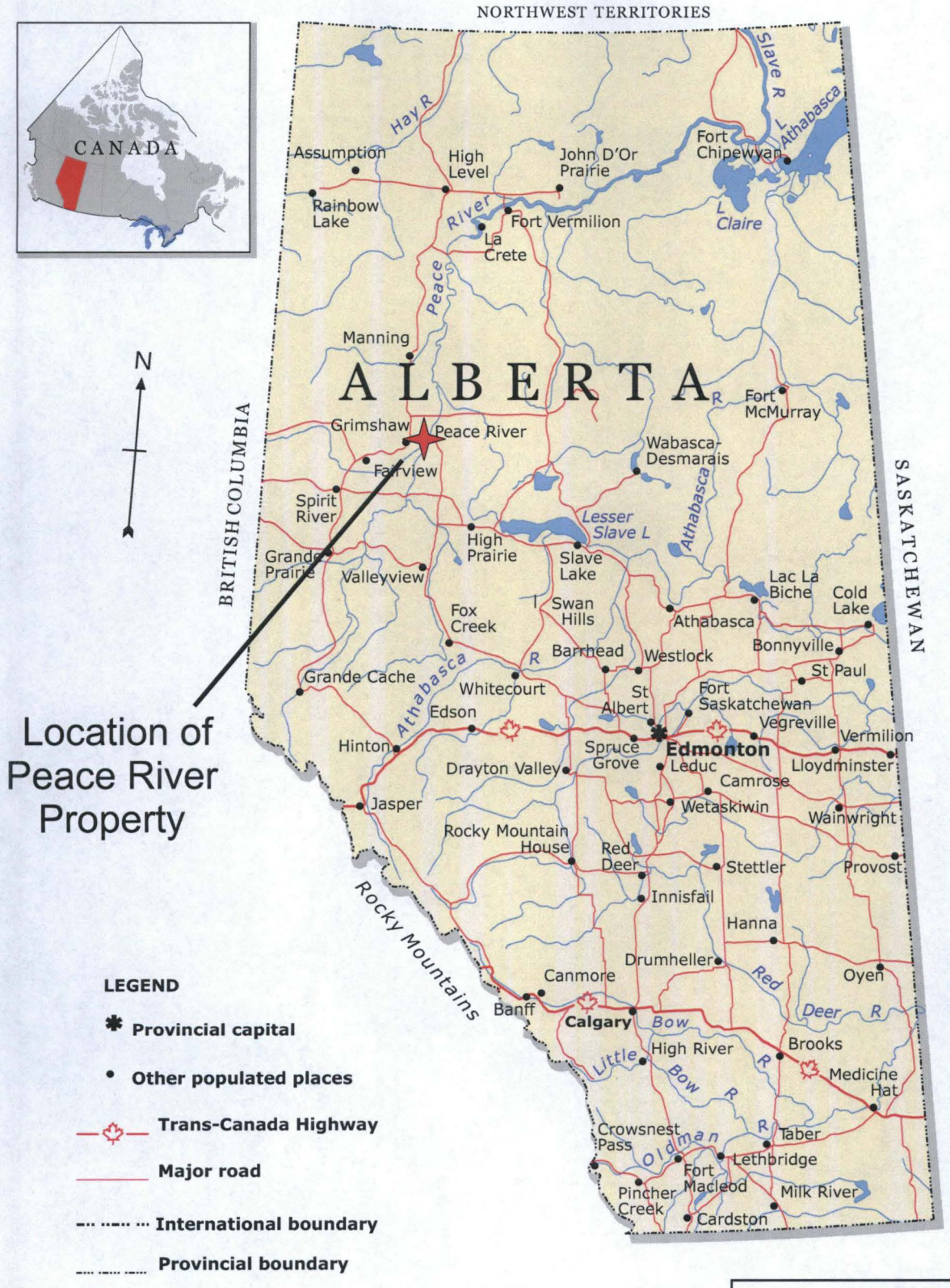
- I, William Miller, [redacted], do hereby certify that:
- I am a geologist of Dahrouge Geological Consulting Ltd., Suite 18, 10509 - 81 Ave., Edmonton, Alberta, T6E 1X7.
- I am a 2009 graduate of the University of Alberta, Edmonton, Alberta with a B.Sc. in Geology.
- I have practiced my profession as a geologist continuously since 2009.
- I am a registered Professional Geologist with the Association of Professional Engineers and Geoscientists of Alberta, member M119457.
- I hereby consent to the copying or reproduction of this Assessment Report following the one-year confidentiality period.
- I am the author of the report entitled "2014 Exploration and Fieldwork, Peace River Property Metallic and Industrial Minerals Permit, Northwestern Alberta" and accept responsibility for the veracity of technical data and results.

Dated this 23rd day of February, 2015.



William Miller, B.Sc., P.Geo.

APEGA M119457



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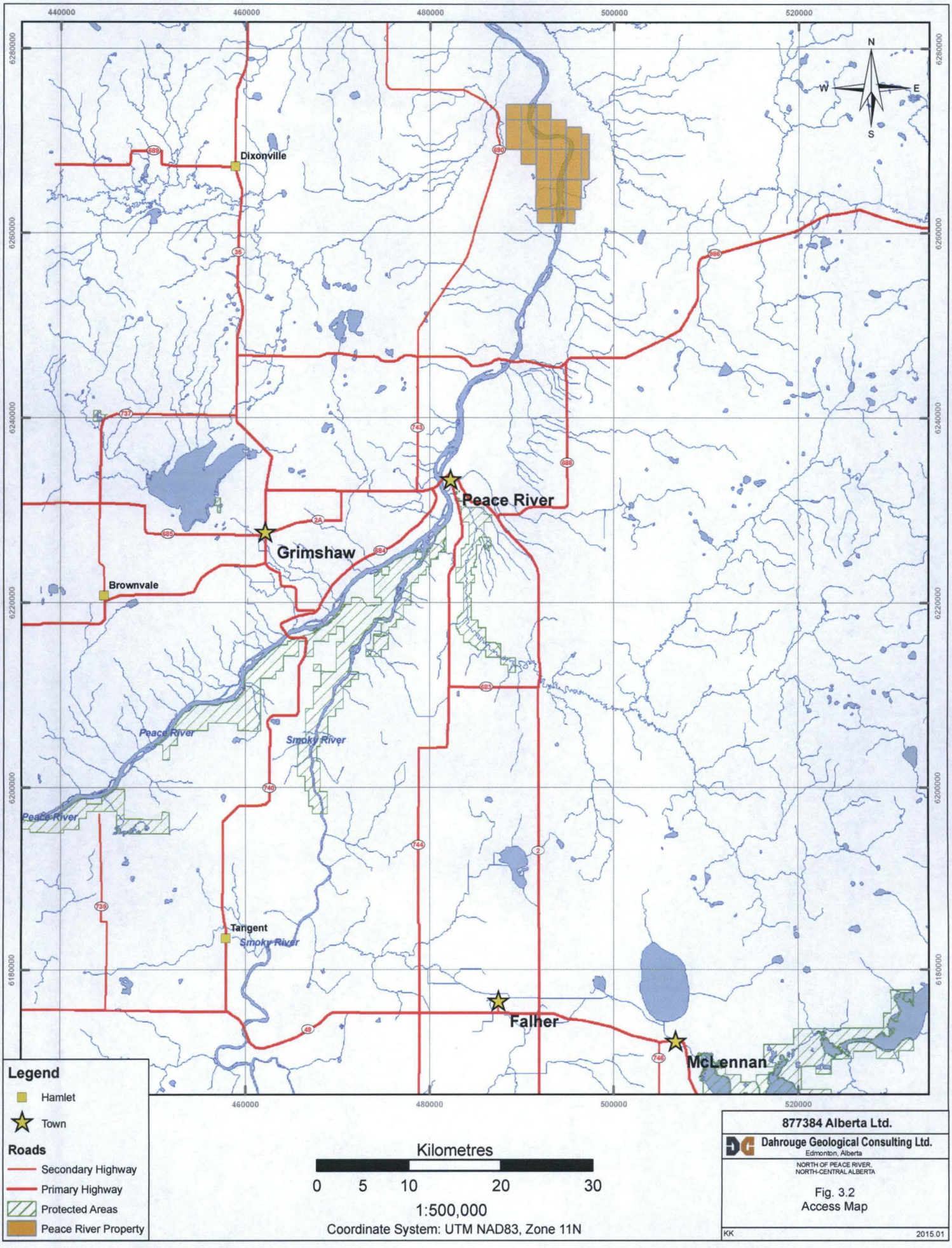
Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

PEACE RIVER,
NORTH-CENTRAL ALBERTA

Fig. 3.1
Property Location

WM 2015.01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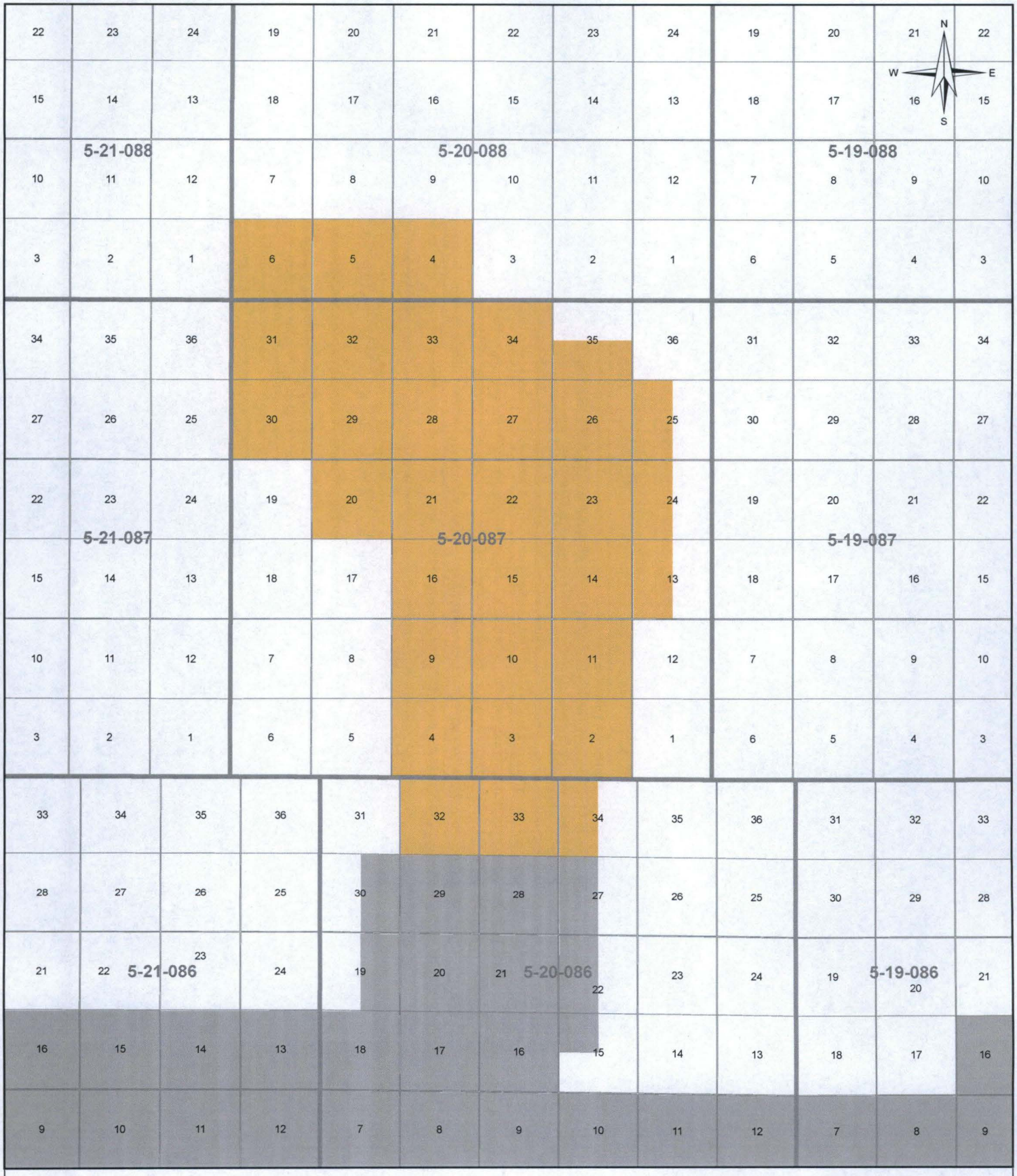
Peace River
Grimshaw
Brownvale
Tangent
Falher
McLennan
Peace River
Smoky River
Peace River
Smoky River
Legend
Hamlet
Town
Roads
Secondary Highway
Primary Highway
Protected Areas
Peace River Property
Kilometres
0 5 10 20 30
1:500,000
Coordinate System: UTM NAD83, Zone 11N
877384 Alberta Ltd.
Dahrouge Geological Consulting Ltd.
Edmonton, Alberta
NORTH OF PEACE RIVER,
NORTH-CENTRAL ALBERTA
Fig. 3.2
Access Map
KK
2015.01



Legend

Land Holdings

- Permit # 9312120366 (7617.4 ha)
- Others

Kilometres

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1:100,000

Coordinate System: UTM NAD83, Zone 11N

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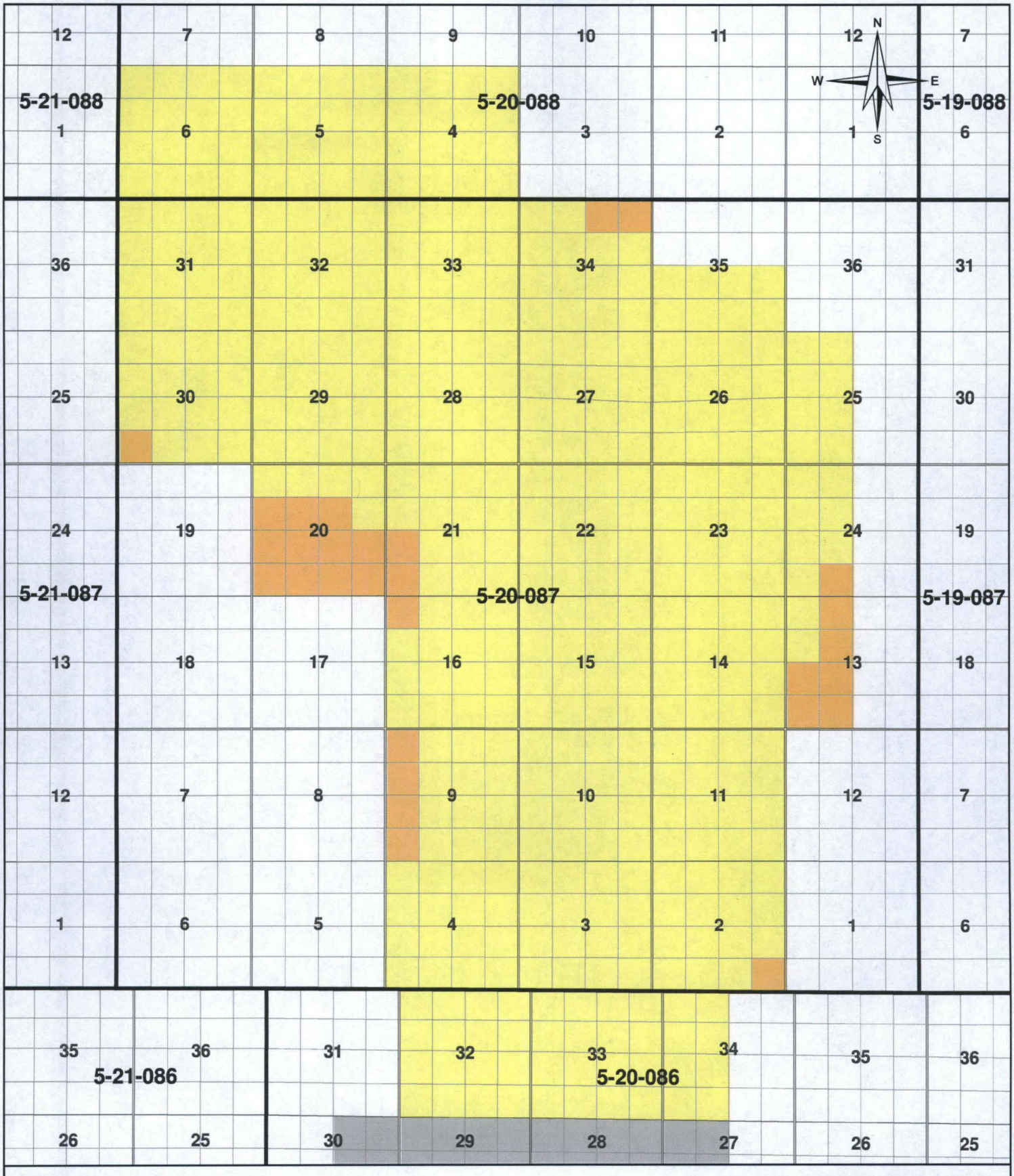
NORTH OF PEACE RIVER,
NORTH-CENTRAL ALBERTA

Fig. 4.1a
Permit Map

KK 2015.01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Legend
2014 Area to Retain (7171.1 ha)
Land Holdings
Area to Release (469.4 ha)
Other Permits
Kilometres
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1:60,000
Coordinate System: UTM NAD83, Zone 11N
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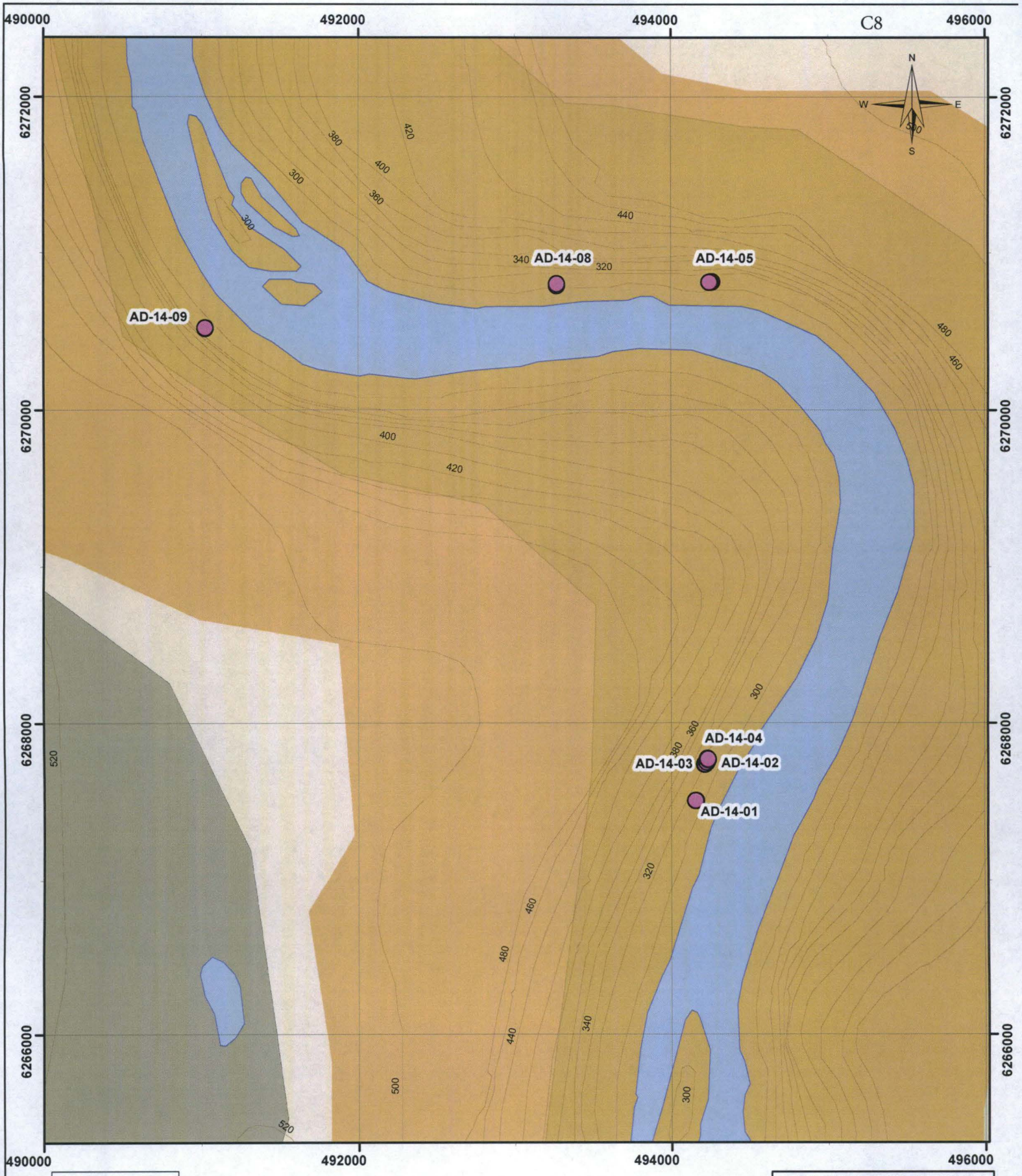
Edmonton, Alberta
NORTH OF PEACE RIVER,
NORTH-CENTRAL ALBERTA
Fig. 4.1b
Permit #9312120366
Area to Release
JA
2015.02



Legend

- Sample_Locations
- Minor Road
- 20 m Contours
- Possible Paddy Member Extent
- Dunvegan Formation
- Peace River Formation
- Shaftesbury Formation
- Smoky Group

Kilometres

0 0.2 0.4

1:30,000

Coordinate System: UTM NAD83, Zone 11N

RAINMAKER RESOURCES

Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

NORTH OF PEACE RIVER,
NORTH-CENTRAL ALBERTA

Fig. 4.3 Permit # 9312120366 Details of Sample Locations

AD 2014.06

APPENDIX 1: COST STATEMENT FOR THE 2014 EXPLORATION WITHIN THE PEACE RIVER PERMITS

a) **Personnel**		$ 17,184.30
b) **Food and Accommodation**		$ 2,255.41
c) **Transportation**		$ 5,755.78
d) **Instrument Rental**		$ 105.00
e) **Drilling**	n/a	$ -
f) **Analyses**		$ 8,662.50
h) **Other** (Software Rental, Overhead, Supplies, Courier & Shipping)		$ 879.63
Total		$ 34,842.62
Administration (10%)		$ 3,484.26
Total + Administration		**$ 38,326.88**

ITEMIZED COST STATEMENT FOR THE 2014 EXPLORATION
PEACE RIVER PROPERTY

a) Personnel

[redacted]

2.50	days		office	Site evaluation	
2.50	days	@	[redacted]		[redacted]

[redacted]

3.80	days		office	Project planning and logistics, sample selection,compilation	
3.80	days	@	[redacted]		[redacted]

[redacted]

0.10	days		office	Project planning and preparation	
0.10	days	@	[redacted]		[redacted]

[redacted]

5.00	days		field	Sampling June 5th to 9th	
5.00	days	@	[redacted]		[redacted]

[redacted]

9.70			office	Project Planning	
5.00	days		field	Sampling June 5th to 9th	
14.70	days	@	[redacted]		[redacted]

[redacted]

0.10	days		office	Preparation	
0.10	days	@	[redacted]		[redacted]

[redacted]

0.25	hours		office	Logistics	
0.25	hours	@	[redacted]		[redacted]

$ 17,184.30

b) Food and Accommodation

5	nights	@	$ 310.72	accommodations	$ 1,553.61
10	man-days	@	$ 55.00	meals	$ 701.80

$ 2,255.41

c) Transportation

Flights to/from Peace River	$ 971.56
Roadrunner Jetboat Rentals	$ 2,835.00
4x4 Truck Rental	$ 892.50
Car Rental	$ 569.03

	Fuel	$ 432.69	
	Mileage	$ 55.00	
			$ 5,755.78
d) Instrument Rental			
	Radios	$ 52.50	
	GPS	$ 52.50	
			$ 105.00
e) Drilling	n/a		
f) Analyses			
0 samples @	$1,855.00 complete anaysis	$ -	
19 samples @	$~575.00 sieve, rnd, sph,ICP	$ 8,662.50	
			$ 8,662.50
h) Other			
	Overhead and supplies	$ 879.63	
	Software Rental (GIS)	$ -	
			$ 879.63
Total			$ 34,842.62
Administration (10%)			$ 3,484.26
Total + Administration			**$ 38,326.88**

[redacted]

W. Miller, B.Sc., P.Geo.

Edmonton, Alberta
February 15, 2015

STATEMENT OF INTENT

1. **Project Name:** Peace River

Permit Numbers: 9314010266

Work Period: June 5-9, 2014 (9312120366)

2. **MINERAL ASSESSMENT APPOINTEE:**

Name: William Miller, BSc, P.Geo

Address: Dahrouge Geological Consulting Ltd.
#18, 10509 - 81 Ave
Edmonton, AB T6E 1X7

3. **PERMIT MAP(S):** (attached)

4. **ESTIMATED EXPENDITURES:**

Estimated excess prior expenditures:	$	-
Estimated Required Expenditures to retain all lands:	$	37,760.00
Estimated Expenditure (Deficency) or Excess:	$	566.88

5. **LIST OF PERMITS and GROUPING CRITERIA**

Permit(s) to be Surrendered: n/a

Land(s) to be Retained: To be determined and defined in Part A of the Assessment Report.

6. PAYMENT IN LIEU OF EXPENDITURE: n/a

ESTIMATED EXPENDITURE STATEMENT BY ACTIVITY

		AMOUNT SPENT
1.	Prospecting	$
2.	Geological mapping and petrography	$ 26,180.12
3.	Geophysical Surveys	
a.	Airborne	$
b.	Ground	$
4.	Geochemical Surveys	$
5.	Trenching and Stripping	$
6.	Drilling	$
7.	Assaying and whole rock analysis	$ 8,662.50
8.	Other Work	$
	SUBTOTAL	$ 34,842.62
9.	Administration (10% of subtotal)	$ 3,484.26
	TOTAL	$ 38,326.88

[redacted]

SIGNATURE

23-Feb-15

DATE

William Miller

PRINT NAME

APPENDIX 2: 2014 SAMPLE DESCRIPTIONS AND ASSAY RESULTS FROM THE PEACE RIVER PROPERTY

Notes: Stratigraphic thicknesses are based on measured attitudes of bedding listed below, with appropriate interpolations.
UTM coordinates are NAD83, Zone 11N. Section locations are shown in Figure 4.2.
Stratigraphy Abbreviations: Pd - Paddy Member, Cd - Cadotte Member

Sample	Strat. Unit	Strat. Thick. (m)	Description	SiO_2 (%)	Al_2O_3 (%)	CaO (%)	Fe_2O_3 (%)	P_2O_5 (%)	MnO (%)	Ba ppm)	Sr ppm)
AD-14-01 (494304 E, 6267513 N)											
82276	Cd	1.5	Fine grained-medium grained, brownish-beige, weakly bedded sandstone. Minor pebbles <0.5cm in diameter, rounded. Doesn't appear to be that pure, common mafic grains throughout. Few clay seems, moderately-strongly friable overall. Few organics at top and few limonite pockets.	-	-	-	-	-	-	-	-
82277	Cd	1.75	Fine grained-medium grained, brown-beige with common mafic rock fragments and feldspar throughout. Top 40cm has common limonite/ hematite pockets and lenses, with few greyish-brown clay seems. Below hematite, sandstone is fairly uniform, less altered, and weakly consolidated.	-	-	-	-	-	-	-	-
AD-14-02: (494153 E, 6267518 N)											
82278		1	Fine grained, soft, clean, greyish-beige, well sorted, sub angular-sub rounded strongly friable, weakly bedded (approximately horizontal) sandstone. Rare limonite pockets/ patches (weathering product), overall massive.	95.04	1.78	0.11	0.45	0.04	0.00	491	58
82279		1.25	Fine grained, sub angular- sub rounded, moderately friable sandstone. Appears more beige than 82278 with a greater percentage of feldspar, but still dominantly silica. Top 10cm of section has rare 1mm limonite laminations, pockets and patches (weathering product).	93.67	1.84	0.19	1.55	0.09	0.01	515	61
AD-14-03: (494216 E, 6267736 N)											
82280		1.5	Fine grained, friable, grey, well sorted, powdery soft sand. Dominantly quartz but common feldspar and rare rock fragments (limonite weathered). Limonite coating a between rare horizontal beds.	91.24	2.63	0.23	1.87	0.08	0.02	489	63
82281		1.5	Similar to 82280; Fine grained, grey, well sorted, sub rounded, soft, friable sandstone. Limonite coating between massive beds (1mm).	91.10	2.69	0.20	2.23	0.07	0.02	484	61
AD-14-04: (494236 E, 6267777 N)											
82282		1.5	Fine grained, grayish brown, well sorted, sub rounded, moderately friable (less than 82281) sandstone. Solid, iron-rich nodules and lenses common, not friable. Common limonite throughout.	82.70	3.09	0.24	7.81	0.13	0.04	498	62
82283		1.5	Same as 82282, except 2-3 ft. lithified fe-rich sandstone lens. Rusty-brown-orange-red, extremely hard and massive, in sharp contact with friable sandstone. Strongly hematite/ limonite staining, dense, with weak sulfur-odor coming off.	70.42	2.35	2.55	14.64	1.31	0.11	715	373
82284		1	Fine grained, brown-orange, well sorted, weakly friable, strongly weathered sandstone. Fairly iron-rich (perhaps leached from lens above?), overall blocky, further down section sand starts to appear more like 82282.	76.86	2.85	0.30	12.81	0.18	0.04	506	68

AD-14-05: (494283 E, 6270825 N)

82285		1.5	Fine grained, white-grey, moderate-well sorted, sub angular-sub rounded, strongly friable, weakly consolidated. 90-95% silica with rare feldspar grains and few-common mafic rock fragments.	92.95	2.48	0.08	0.42	0.02	0.00	490	54
82286		1.5	Same as 82285, less rock fragments, >95% silica, f.g.-m.g.	93.25	2.47	0.07	0.46	0.03	0.00	489	53
82287		1.5	Fine grained, greyish-white, well sorted, sun angular-sub rounded, semi-consolidated, friable sand. Common feldspar (5-10%), common rock fragments (5%), massive, uniform clean sand.	93.02	2.46	0.10	0.48	0.04	0.00	504	62
82288		1.5	Fine grained, brownish-beige-grey, weakly consolidated, friable, sub angular-sub rounded, mod-well sorted sand. Sand is massive and uniform, with common orange-stained feldspar giving off brown color, as well as dark black rock fragments (90% silica).	93.06	2.24	0.09	0.81	0.06	0.00	472	58
82289		1.75	Same as 82288, more grey than beige-brown, slightly more silica pure.	93.84	1.99	0.07	0.56	0.05	0.00	469	62
82290		1.5	Same as 82288, beige-grey. Orange pockets randomly throughout, seems to coincide with feldspar. Fine 1-3 mm laminations present.	93.64	2.16	0.08	0.71	0.05	0.01	477	70
82291		1.5	Fine grained-medium grained, brown-orange color, sub rounded, moderately sorted, uniform, less friable than previous. Massive with few 1-2 mm laminations. At top of section, 1-2 ft. (lateral variation) iron-rich, lithified, hard, siliceous unit. Friable sand under is more orange-brown color (product of leaching?).	86.16	3.33	0.27	4.82	0.08	0.04	476	76
82292		1.5	Very fine grained- fine grained, moderately sorted, beige sand. Pockets of orange (weathering?), moderate-strongly laminated (bedding coincides with laminations), dominantly silica (90%). Bottom 1 ft. is deep red-rusted orange shale.	77.74	3.60	0.31	9.61	0.13	0.05	564	69

AD-14-08: (493269 E, 6270810 N)

82293		1.25	Fine grained, grey, well sorted, moderately friable, consolidated sand. >90% silica	92.90	2.63	0.11	0.44	0.04	0.01	480	63

AD-14-09: (491628 E, 6270520 N)

82294	Pd	1.75	Fine grained-medium grained, beige, moderate-well sorted, sub-rounded, weakly consolidated, strongly friable, clean, fresh, uniform, massive sand. >95% quartz, rare mafic rock fragments and feldspar present.	92.62	2.31	0.14	0.40	0.02	0.00	476	51
82295	Pd	1.75	Same as 82294, fine grained-medium grained, beige sand. Subtly more rock fragments (~95% silica). Faint yellow hue in sections; glauconite?	91.92	2.94	0.13	0.59	0.04	0.00	516	51
82296	Pd	1	Sand in contact with Paddy Mbr. is subtly orange and gets significantly darker as we move down section. Fine grained, moderately sorted, sub angular-sub rounded, massive. Uniform and moderately friable. Common rock fragments and abundant feldspar (~85% silica?)	91.40	3.05	0.14	0.97	0.05	0.00	514	56

AD-14-10: (483284 E, 6243008 N)

82297	Pd	1.5	Fine grained-medium grained, deep brown-red (purplish hue?) to sand. Appears to be >95% silica, moderate-well sorted, sub angular-sub rounded. Weakly consolidated, very friable, massive overall with subparallel bedding locally.	-	-	-	-	-	-	-	-
82298	Pd	1.5	Fine grained-very coarse grained, very weakly consolidated sandstone. >95% silica with a combination of smoky and clear quartz, very poorly sorted, angular-rounded. Varies from deep brown-purple gradually into a lighter brown-orange. Color change from clay above? Massive, extremely friable, overall grain size transitions are sharp and range from <0.5cm-3cm scale.	-	-	-	-	-	-	-	-

AD-14-11: (483284 E, 6243008 N)

82299	Pd	1.5	Very fine grained-very coarse grained, crystalline sand with rare smoky quartz. Grades abruptly from fine grained to coarse grained (sequences are difficult to identify; 10cm - 1.5 ft.). Extremely friable with evident cross bedding present in OC. Sand is dark brown-red, very poorly sorted, angular-rounded, >95% silica.	-	-	-	-	-	-	-	-
82300	Pd	1.5	Similar to 82299; very radical grain size changes again; last 1ft is more consolidated and therefore less friable (coincides with light yellow stain). Sand gradually transitions into light grey color; strongly cross bedded.	-	-	-	-	-	-	-	-
82251	Pd	1.5	Fine grained, medium grey, well sorted, sub rounded, with few yellow-orange pockets. Common rock fragments (mafics), moderate-weakly consolidated but still friable, massive. 1-2mm yellow-orange laminations in top half	-	-	-	-	-	-	-	-

AD-14-12: (483284 E, 6243008 N)

82252		2.5	Same as 82251, but light grey	-	-	-	-	-	-	-	-

Loring Laboratories(Alberta) Ltd.

629 Beaverdam Road N.E.,
Calgary Alberta T2K 4W7
Tel:403- 274-2777 Fax:403- 275-0541

ISO9001:2008 Certified

TO: Dahrouge Geological
Suite 18, 10509 81 Ave.
Edmonton AB
T6E 1X7

Attn: William Miller

FILE: 58085

DATE: January 29, 2015

Sample: Sand

WHOLEROCK ICP ANALYSIS

Sample I.D.	Al_2O_3 %	Ba ppm	CaO %	Cr ppm	Fe_2O_3 %	K_2O %	MgO %	MnO %	Na_2O %	Ni ppm	P_2O_5 %	SO_3 %	SiO_2 %	Sr ppm	TiO_2 %	V ppm	LOI@1000 %	SUM %
82278	1.78	491	0.11	96	0.45	0.50	0.11	0.00	0.05	4	0.04	0.04	95.04	58	0.06	45	0.78	98.97
82279	1.84	515	0.19	82	1.55	0.42	0.16	0.01	0.09	12	0.09	0.06	93.67	61	0.07	53	1.27	99.41
82280	2.63	489	0.23	110	1.87	0.57	0.24	0.02	0.11	14	0.08	0.06	91.24	63	0.10	66	1.49	98.62
82281	2.69	484	0.20	98	2.23	0.62	0.24	0.02	0.09	15	0.07	0.12	91.10	61	0.09	62	1.63	99.09
82282	3.09	498	0.24	104	7.81	0.66	0.35	0.04	0.10	29	0.13	0.06	82.70	62	0.10	105	2.94	98.22
82283	2.35	715	2.55	84	14.64	0.52	0.56	0.11	0.15	23	1.31	0.17	70.42	373	0.07	100	5.41	98.24
82284	2.85	506	0.30	95	12.81	0.60	0.55	0.04	0.15	23	0.18	0.24	76.86	68	0.08	122	4.08	98.73
82285	2.48	490	0.08	71	0.42	0.82	0.14	0.00	0.07	5	0.02	0.06	92.95	54	0.06	34	0.99	98.11
82286	2.47	489	0.07	125	0.46	0.67	0.14	0.00	0.07	5	0.03	0.05	93.25	53	0.06	42	0.86	98.13
82287	2.46	504	0.10	93	0.48	0.66	0.15	0.00	0.08	5	0.04	0.11	93.02	62	0.06	48	1.05	98.21
82288	2.24	472	0.09	74	0.81	0.55	0.15	0.00	0.07	7	0.06	0.05	93.06	58	0.07	50	1.06	98.21
82289	1.99	469	0.07	77	0.56	0.54	0.12	0.00	0.09	4	0.05	0.05	93.84	62	0.06	38	0.83	98.21
82290	2.16	477	0.08	82	0.71	0.55	0.11	0.01	0.09	9	0.05	0.07	93.64	70	0.08	39	0.93	98.48
82291	3.33	476	0.27	73	4.82	0.67	0.22	0.04	0.13	41	0.08	0.54	86.16	76	0.08	56	2.60	98.95
82292	3.60	564	0.31	67	9.61	0.85	0.64	0.05	0.18	25	0.13	0.30	77.74	69	0.09	66	4.75	98.24
82293	2.63	480	0.11	79	0.44	0.71	0.18	0.01	0.08	5	0.04	0.10	92.90	63	0.07	44	0.85	98.12
82294	2.31	473	0.14	72	0.40	0.79	0.11	0.00	1.57	3	0.02	0.20	92.62	51	0.06	32	1.03	99.26
82295	2.94	516	0.13	131	0.59	0.78	0.25	0.00	0.09	7	0.04	0.16	91.92	51	0.07	47	1.23	98.20
82296	3.05	514	0.14	90	0.97	0.76	0.19	0.00	0.13	7	0.05	0.19	91.40	56	0.07	45	1.25	98.21

Sample received on Jan. 06, 2015
0.5 gm sample digested with multi acids and finished by ICP

Certified by: [redacted]

WR

LORING LABORATORIES (ALBERTA) LTD.
629 Beaverdam Road N.E. Calgary, Alberta T2K 4W7
Tel : (403) 274-2777 Fax : (403) 275-0541

ISO 9001:2008 Certified

TO: Dahrouge Geological
Suite 18, 10509 81 Ave.
Edmonton AB
T6E 1X7

Attn: William Miller
Sample Type: Sand

FILE # : 58085
DATE : February 17, 2015
REPORT BY : David Ko

[redacted]

SIEVE ANALYSIS % by Weight

SAMPLE ID	+ 20 M	20 x 40 M	40 X 70 M	70 X 140 M	-140 M
82278	0.1%	0.4%	1.5%	92.2%	5.8%
82279	1.1%	1.4%	2.6%	84.3%	10.5%
82280	2.1%	1.8%	6.6%	71.6%	17.8%
82281	1.1%	2.7%	5.2%	71.9%	19.1%
82282	0.2%	10.0%	11.8%	57.9%	20.1%
82283	28.9%	6.1%	8.9%	42.1%	14.1%
82284	0.1%	12.5%	14.2%	53.5%	19.7%
82285	0.0%	0.3%	21.4%	68.6%	9.7%
82286	0.0%	0.2%	38.9%	50.4%	10.6%
82287	0.0%	0.1%	25.4%	66.0%	8.4%
82288	0.0%	0.2%	33.6%	57.7%	8.6%
82289	0.0%	0.1%	14.3%	78.4%	7.2%
82290	0.0%	0.1%	36.1%	55.8%	8.0%
82291	13.3%	2.0%	4.6%	65.3%	14.8%
82292	17.5%	0.9%	1.1%	65.1%	15.4%
82293	0.0%	0.1%	5.2%	82.1%	12.6%
82294	0.1%	0.5%	65.7%	28.3%	5.5%
82295	0.0%	0.3%	81.0%	14.2%	4.4%
82296	0.0%	0.1%	69.9%	22.9%	7.1%

Sample received on Jan. 06, 2015

[redacted]

ASSAYER

Sieve

LORING LABORATORIES (ALBERTA) LTD.
629 Beaverdam Road N.E. Calgary, Alberta T2K 4W7
Tel : (403) 274-2777 Fax : (403) 275-0541

ISO 9001:2008 Certified

TO: Dahrouge Geological
Suite 18, 10509 81 Ave.
Edmonton AB
T6E 1X7

Attn: William Miller
Sample Type: Sand

FILE # : 58085
DATE : February 17, 2015
REPORT BY : David Ko

SAMPLE ID	Wet Wt (gm) As Rec'd	Dried Wt (gm) After Desliming
82278	3461	3285
82279	3374	3115
82280	2859	2680
82281	3420	3136
82282	2927	2597
82283	2897	2620
82284	3104	2709
82285	3817	3480
82286	4488	4149
82287	4013	3615
82288	4403	4080
82289	4374	4200
82290	5188	4922
82291	5082	4892
82292	4793	4219
82293	4752	4230
82294	5037	4608
82295	4644	4272
82296	4155	3843

Sample received on Jan. 06, 2015

[redacted]
ASSAYER

Deslime

LORING LABORATORIES (ALBERTA) LTD.
629 Beaverdam Road N.E. Calgary, Alberta T2K 4W7
Tel : (403) 274-2777 Fax : (403) 275-0541

ISO 9001:2008 Certified

TO: Dahrouge Geological
Suite 18, 10509 81 Ave.
Edmonton AB
T6E 1X7

FILE # : 58085
DATE : February 17, 2015
REPORT BY : David Ko

Attn: William Miller
Sample Type: Sand

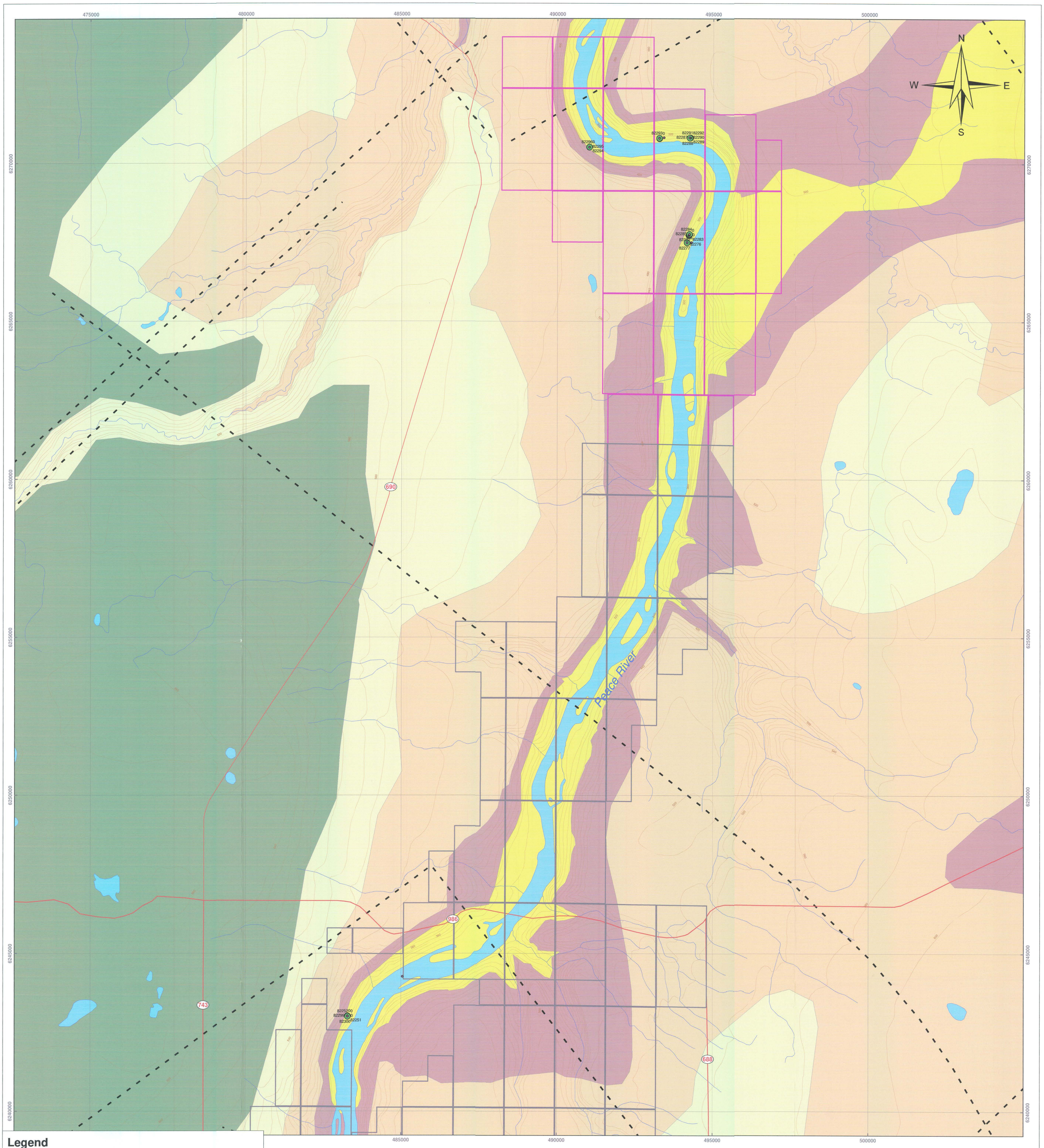
SAMPLE ID	20 x 40 Mesh		40 x 70 Mesh		70 x 140 Mesh	
	Roundness	Sphericity	Roundness	Sphericity	Roundness	Sphericity
82278	--	--	0.8	0.6	0.7	0.5
82279	--	--	--	--	0.6	0.4
82280	--	--	--	--	0.7	0.4
82281	--	--	--	--	0.6	0.4
82282	--	--	--	--	0.6	0.4
82283	--	--	--	--	0.6	0.4
82284	--	--	--	--	0.7	0.5
82285	--	--	0.7	0.5	0.8	0.5
82286	--	--	0.7	0.4	0.7	0.5
82287	--	--	0.7	0.5	0.8	0.5
82288	--	--	0.7	0.5	0.9	0.5
82289	--	--	0.7	0.5	0.7	0.5
82290	--	--	0.8	0.5	0.8	0.5
82291	--	--	--	--	--	--
82292	--	--	--	--	0.7	0.5
82293	--	--	0.7	0.5	0.7	0.5
82294	--	--	0.7	0.5	0.8	0.8
82295	--	--	0.7	0.5	0.7	0.5
82296	--	--	0.7	0.5	0.7	0.5

Note: " -- " indicated sample has small amount of good grains suitable for the test.
Note: Sand sample was deslimmed, dried, dry sieved and weighed.
Sample after drying was wet sieved at 20, 40, 70 and 140 mesh, dried and weighed.
High strength proppants should have an average sphericity of 0.7 or greater and an average roundness of 0.7 or greater.

Sample received on Jan. 06, 2015

[redacted]
ASSAYER

Roundness



Legend

- 2014 Samples

Roads

- Secondary Highway
- Primary Highway
- Topo Contours (20 m)
- Faults
- Permit 9312120366
- Other 877384 Ltd. Properties

Bedrock Geology

Formation

- Dunvegan Fm.
- Upper Shaftesbury Fm.
- Lower Shaftesbury Fm.
- Peace River Fm.
- Spirit River Fm.

Kilometres

0 2.5 5 10

1:45,000

Coordinate System: UTM NAD83, Zone 11N

877384 Alberta Ltd.

Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

NORTH OF PEACE RIVER,
NORTH-CENTRAL ALBERTA

Fig. 4.2
Geology & Sample Locations

KK 2015.01