

# **PARKIN LIMESTONE PROPERTY**

**(Limestone)**

**(2014)**

**Parkin Township**

**Sudbury Mining Division**

**Ontario, Canada**



Submitted by J. M. Gaudreau

April 9, 2015

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## Location

The Parkin Limestone Property (Property) is located in the west boundary of Parkin Township, 15 kilometers north of the town of Capreol, which is amalgamated into the municipality of Greater Sudbury, Ontario, Canada within the Sudbury Mining Division.



Figure 1. Parkin Limestone Property Key Map

## Ownership

J. M. Gaudreau staked claim 4271834 on March 17, 2013 and recorded the claim on April 9, 2013. The 3 unit claim totals 48 hectares. The claim was recorded 100% in the name of Jean Marc Gaudreau. The claim was transferred to Phillip Timothy Martel on October 3, 2014.

## Ownership Status

The listed claim holder is a public owner who obtained the land by transfer. There is no other interest in the claim. The claim is not part of a public listing. The claim requires \$1,200 of work annually after April 9, 2015 to keep it in good standing.

### SUDBURY Mining Division - 408864 - MARTEL, TIMOTHY PHILLIP HARRY

Township/Area	Claim Number	Recording Date	Claim Due Date	Status	Percent Option	Work Required	Total Applied	Total Reserve
PARKIN	4271834	2013-Apr-09	2015-Apr-09	Active	100 %	\$ 1,200	\$ 0	\$ 0

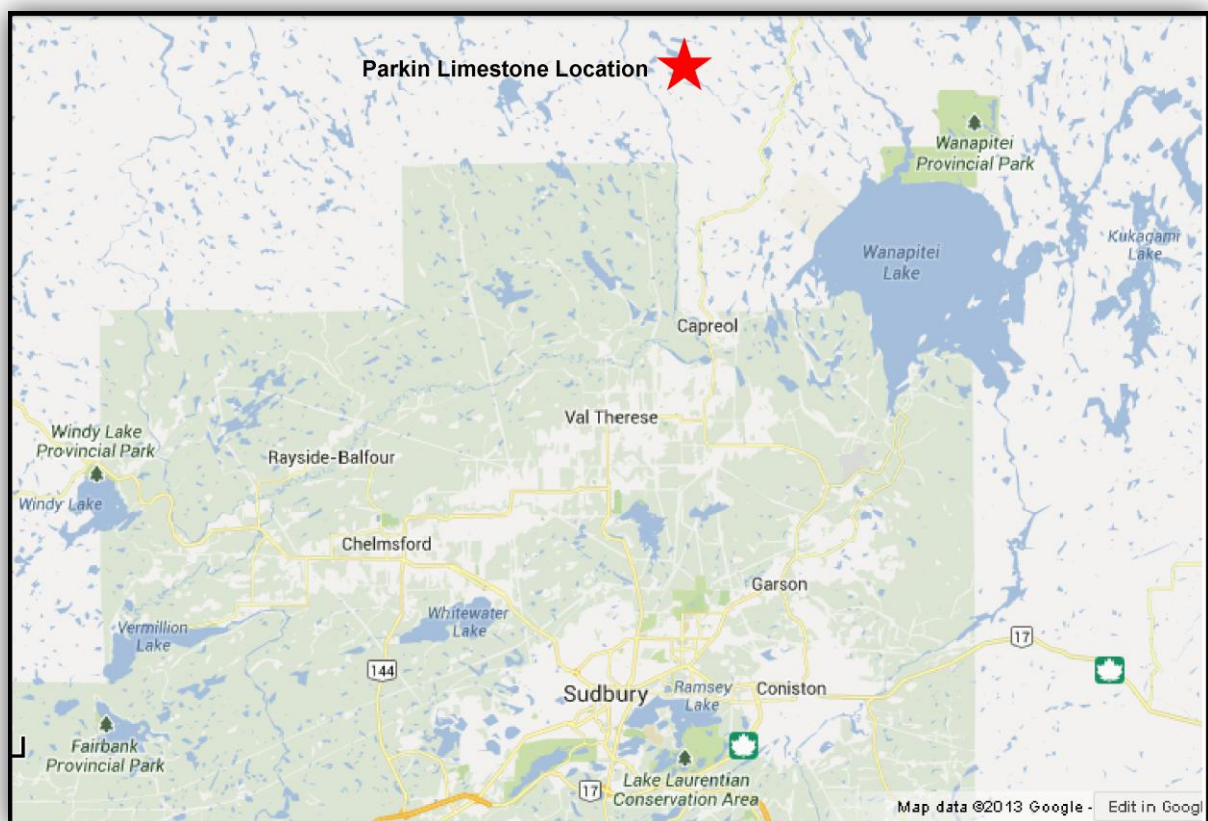


Figure 2. Location of Limestone within Greater Sudbury

## Summary

The Property was acquired after research of chromite processing smelter feed requirements after CLIFFS Natural Resources announced the location of their chromite refinery at Moose Mountain Mine site northwest of the town of Capreol in 2013.

J. M. Gaudreau researched what was deemed one of the “best qualifying” Espanola limestone formations. After staking the Property in March 2013 the J. M. Gaudreau contacted CLIFFS to request their smelter flux feed specifications for their Arc Furnace processing of chromite ore. In April of 2013 the claim holder completed multi-element

XRF-M01 analysis at the GeoLABS Geoscience Laboratories in Greater Sudbury and returned the results to CLIFFS for review. CLIFFS informed J. M. Gaudreau that the limestone did not meet CLIFFS's specifications for a smelter flux feed due to the high silica content. J. M. Gaudreau revisited the Property in October 2013 to collect additional limestone samples for ongoing testing for alternate uses. After additional testing and research it's determined that the limited testing of limestone from the Property meets specifications for:

- Building and construction - building stone, road construction aggregate, ornamental tiles and counter tops, landscaping, pavers
- Heavy industry - slag additive
- Clinker feed - lime production
- Acidity neutralizing - mine site reclamation projects and rail ballast
- Agricultural lime
- Fillers and manufactured goods

### **Accessibility and Infrastructure**

To access the Property from Sudbury, travel north to Capreol on Regional Road 84 to the junction of Moose Mountain Mine Road and Portelance road. Continue on Moose Mountain Mine Road (R.R. 84) to the crossing of the Vermillion River. Yield right onto the abandoned haul road to Mowat River. At this location the Property can be accessed by boat via the Mowat River to Irving Lake. The Property is close to and within the infrastructure of the town of Falconbridge which includes the Falconbridge Mine site.

There is no infrastructure at the Property.

### **Geology of the Property**

The Espanola Formation is part of the Huronian succession (2.1 to 2.5 b.y. old) of the north shore of Lake Huron. It is unique among Huronian formations in its high carbonate content. In the Quirke Lake region the formation may be divided into three members which, in ascending sequence, are limestone, siltstone, and dolostone. Southward thickening of the formation is due to increased thickness of the siltstone member and to the presence of an additional sandstone member at the top of the formation. Fining-upward cycles in the sandstone unit suggest a fluvial origin for that member. Paleocurrents in the same unit indicate a southerly sediment transport.

1. Limestone has endured regional metamorphism increasing its density (high specific gravity), the bedding is well healed, and the laminates of silica and impurities are thin with variable frequency throughout.
2. Field examination noted slump breccia of undetermined width on the north contact. Contact with cobalt conglomerate was not located and there is less frequent laminating in the centre of the limestone body progressing more frequent to the south contact.
3. The south contact between the limestone and cobalt conglomerate is sharp with no progressive contamination into the limestone.
4. One outcropping west face of 50+ meters appears massive with limited jointing and very few veins, tilted vertical to 73 degrees on east/west strike and a 20 meter bench.

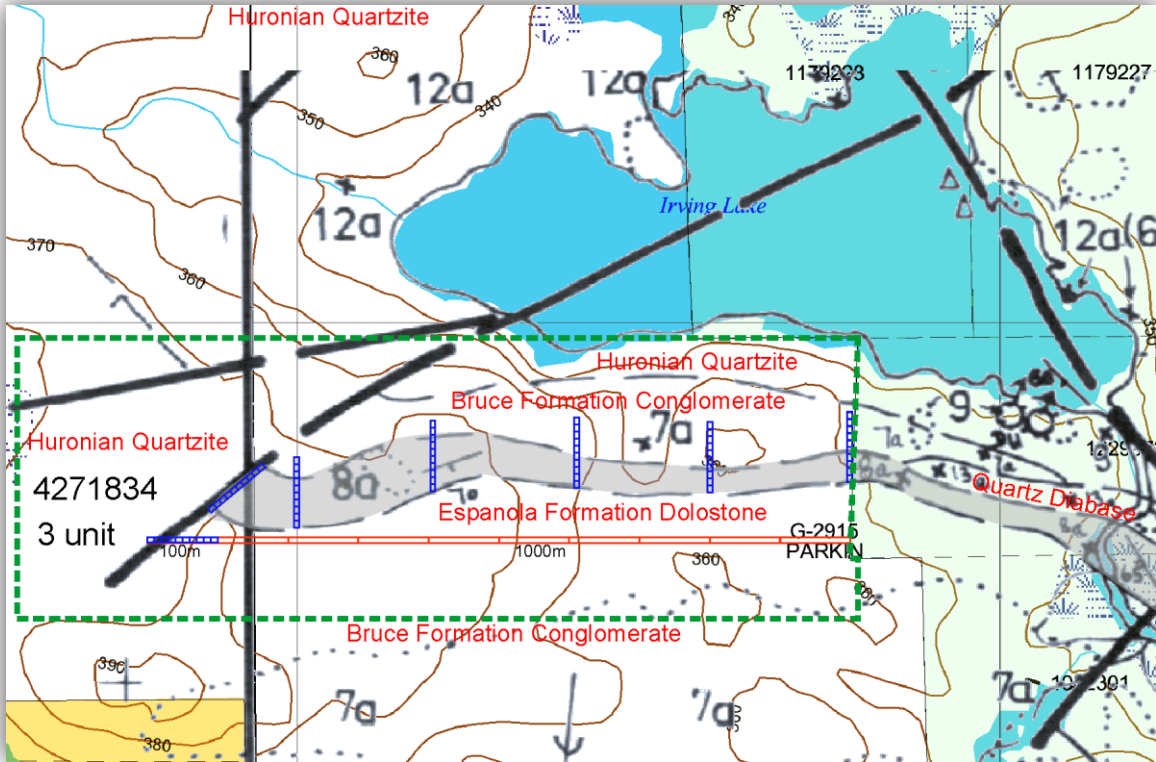


Figure 3. Property Geological Setting

**HURONIAN**

**SUPERGROUP (2.2 Ga to 2450 Ma)**

**Quirke Lake Group:**

sandstone, siltstone, conglomerate, limestone, dolostone

**Serpent Formation:**

quartz-feldspar sandstone, sandstone with minor siltstone, calcareous siltstone and conglomerate

**Espanola Formation:**

limestone, dolostone, siltstone, sandstone

**Bruce Formation:**

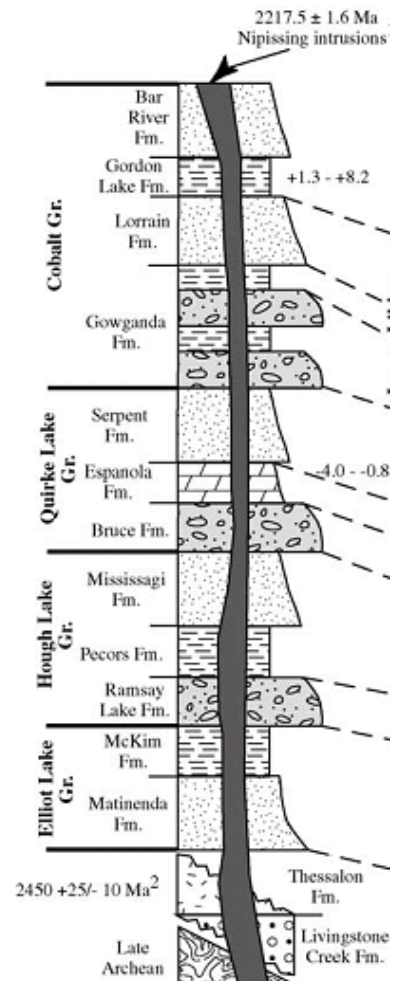
conglomerate with minor sandstone and siltstone

**ORDOVICIAN (443.7 Ma to 488.3 Ma)**

**UPPER ORDOVICIAN MIDDLE ORDOVICIAN**

Limestone, dolostone, shale, arkose, sandstone

**Espanola Limestone**



## Definition and Classification of Limestone

Prepared by Missouri Department of Natural Resources, Division of Geology and Land Survey, 2011

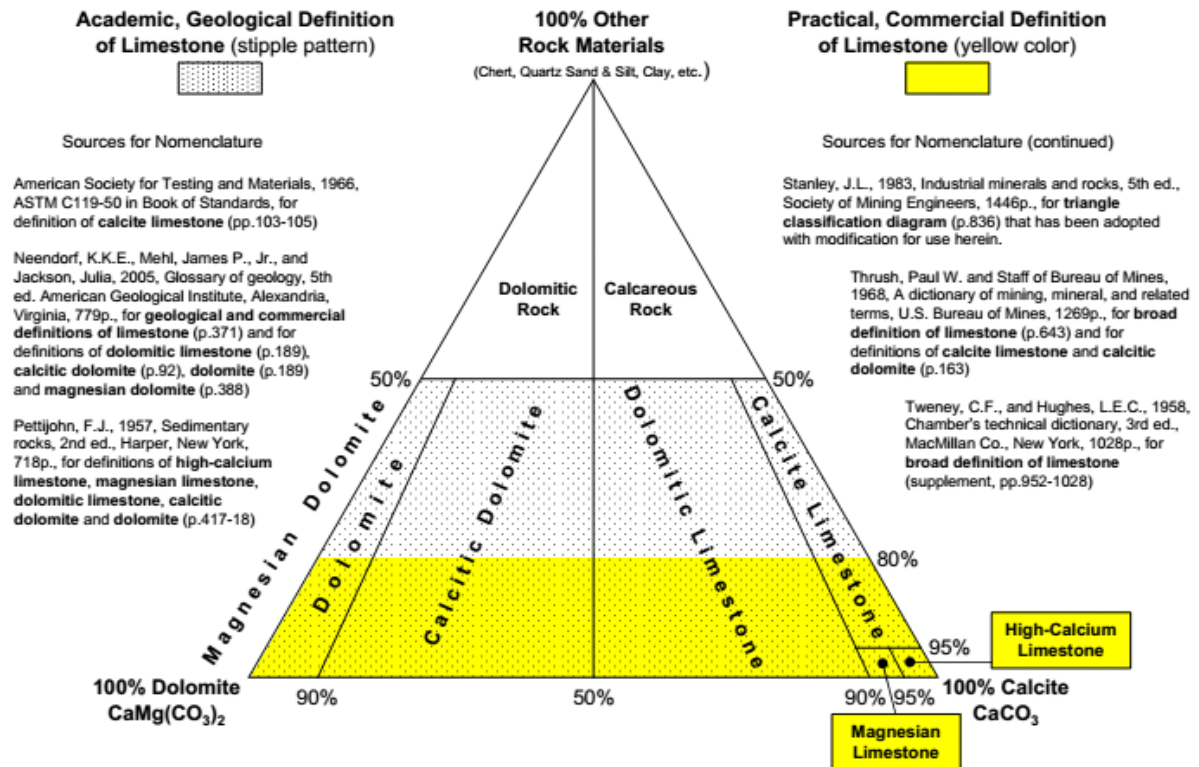


Figure 4. Definition and Classification of Limestone

*The limestone member of the Espanola Formation is in places very pure. Some work has been done to assess its usefulness for cement or smelter flux purposes. A number of analyses were made of samples taken by the author from various places in the formation. It will be noted that the content of mafic minerals in the limestone is in direct proportion to the siltstone beds that make up parts of the formation. Commercially the most interesting parts of the formation would certainly be those that contain relatively thick beds of carbonate and thin, infrequent beds of the siltstone. From the tables it appears that the most suitable limestone is found in the relatively undisturbed area in lots 4 and 5, concession IV, Hutton Township. The limestone of the Espanola Formation is pure in places, and if large amounts of the pure material could be found, it would be of commercial interest.*  
H.D. Mowen Geological Report GR80 page 68.

Origin of Carbonate-Rich Early Proterozoic Espanola Formation, Ontario, Canada  
GRANT M. YOUNG1.

Author Affiliations Department of Geology, University of Western Ontario, London, Ontario, Canada

### Abstract

*The Espanola Formation is part of the Huronian succession (2.1 to 2.5 b.y. old) of the north shore of Lake Huron. It is unique among Huronian formations in its high carbonate content. In the Quirke Lake region the formation may be divided into three members which, in ascending sequence, are limestone, siltstone, and dolostone. Southward thickening of the formation is due to increased thickness of the siltstone member and to the presence of an additional sandstone member at the top of the formation. Fining-upward cycles in the*

sandstone unit suggest a fluvial origin for that member. Paleocurrents in the same unit indicate a southerly sediment transport.

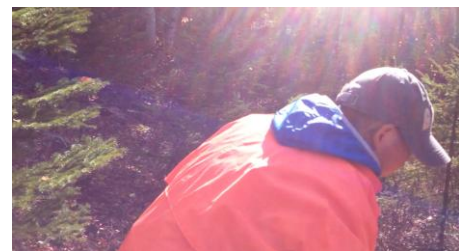
Structures in the Espanola Formation include breccias of both sedimentary and tectonic origin, cross-bedding, ripple marks, graded bedding, desiccation cracks, and a variety of injection structures. Breccias formerly described as “intraformational” occurred later than some faulting and clastic dike intrusion but before penetrative deformation. Most of the breccias were the result of downward intrusion into early formed fissures in carbonate-rich units. Development of intrusive breccia in the Espanola Formation is spatially related to areas in which there is evidence of folding before deposition of the overlying Gowganda Formation. Microprobe analyses of dolomite in rusty weathering dolostone confirm the presence of ferruginous dolomite. The limestone and dolostone members are considered to be shallow marine deposits whereas the intervening siltstone member may have been deposited in deeper waters by turbidity currents. The Espanola Formation is interpreted as the product of diachronous deposition by facies migration, involving a marine transgression (following withdrawal of the glaciers responsible for deposition of the underlying Bruce Formation). During the regression which followed, a prograding fluvial regime was established, the distal facies of which is represented by the sandstone member of the Espanola Formation. Absence of this member in more northerly areas may be attributed to contemporaneous erosion in these areas, possibly related in part to isostatic recovery following loss of the Bruce ice sheet.

## Historical Work

There are no historical exploration assessment reports on record at the Sudbury Resident Geologist Office specifically pertaining within this part of the Lorraine limestone and/or dolostone formation.

## Exploration Work

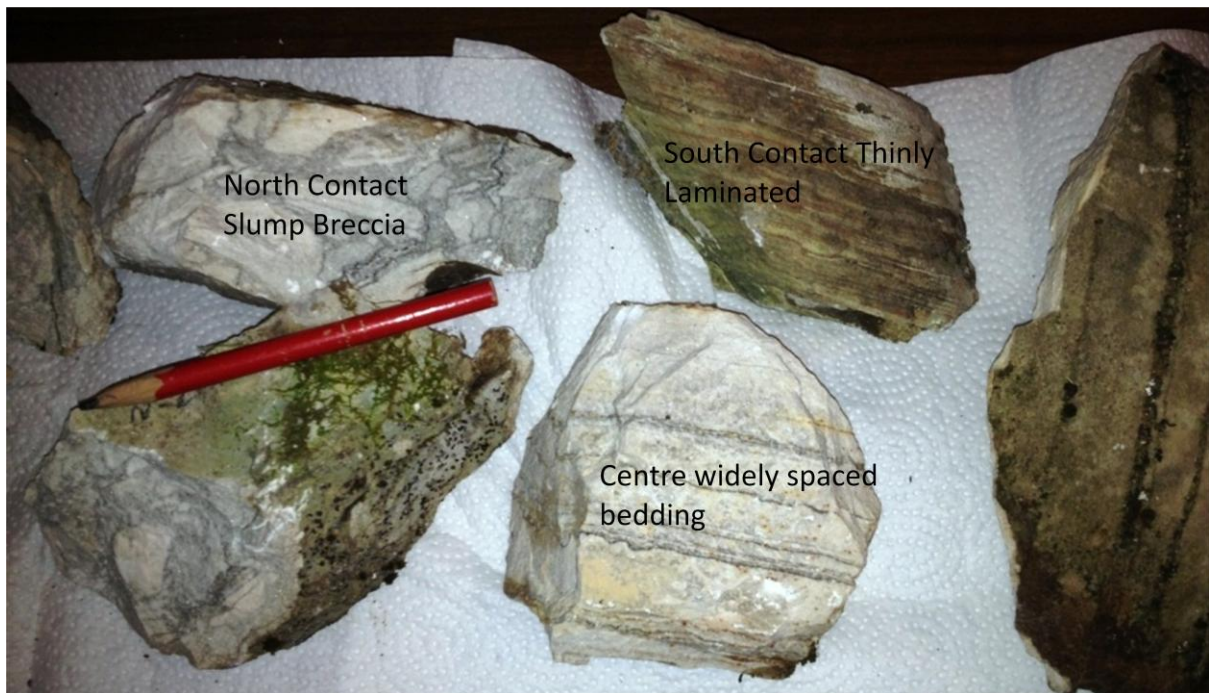
J. M. Gaudreau has completed some exploration work on the west outcrop exposure confirming to within 3 meters the north and south contacts. Minor stripping on the Property was completed by J. M. Gaudreau and two (2) assistants during the fall of 2013. Samples were taken during the site visit in late April 2013 and submitted for geochemical analysis.



Photos while on site visits, float immediately down ice direction of stripped area and two helpers taken during the fall of 2013. Minor stripping and mapping of jointing was completed as well as an east west traverse to locate outcrop and map contacts.



The sample set below shows the cross section from the north contact to the south contact.



The photos above show the consistent vertical bedding, the south contact, the areas of light stripping, the well fused competency of the limestone and the 20m bench looking west. It was extremely difficult to remove the humus layer from the limestone. The organic materials roots latched itself into the limestone and for the most part broke off when attempted to strip. For better results a power stripper will be necessary to cleanly expose the limestone for mapping additional sampling and checking the jointing.



Google Earth image of track log, not to scale. Only to be used to verify work location 140 meters south of the west end of Irving Lake.

## Dimensions

Dimensions estimated using Ontario Geologic Survey Preliminary Map P400 and Ontario Base Map 1:20,000 contour interval.

- EW strike length - 900 meters
- Maximum width - 90 meters, west side
- Minimum width - 40 meters, east side
- Average width - 50 meters
- Contour bench height - 20 meters to Irving Lake level
- Tonnage estimate - to be determined

## Analyses

Selected samples were submitted to the Ontario GeoLabs in Sudbury by D. Farrow for analysis. Samples of Lorrain Quartzite and Cobalt Conglomerate were also submitted to test for precious metals. No significant precious metals of gold or silver were returned from the assay.

Client: Farrow  
 Geo Labs JOB#: 12-0588  
 Date: 4/12/2013  
 Method Code: GFA-PBG

Client ID	Ag	Au
Units	oz/ton	oz/ton
Detection Limit	0.1	0.01
Sample #1	<0.1	<0.01
Sample #2	<0.1	<0.01

Client: Farrow  
 Geo Labs JOB#: 12-0588  
 Date: 4/4/2013  
 Method Code: SGT-R01

Client ID	SG	SG DWT	SG WWT
Units		g	g
Detection Limit			
Dolostone	2.69	1541.5	989.5

CERTIFICATE OF QUALITY CONTROL



Date: 4/12/2013  
 Geoscience Laboratories  
 933 Ramsey Lake Road, Bldg A4  
 Sudbury, ON P3E 6B5  
 Phone: (705) 670-5637  
 Toll Free: 1-866-436-5227  
 Fax: (705) 670-3047

Client: Farrow  
 Project #: RGO

Geoscience Laboratories Ref # : 12-0588  
 Method : GFA-PBG

Lab ID	Client ID	QC Name	Analyte	Units	Measured Value	Certified Value	Long Term Average
DUP-13-22720	Sample #1	DUP	Ag	oz/ton	0.0		
DUP-13-22720	Sample #1	DUP	Au	oz/ton	0.00		
IHST-13-11912		PJV-2	Ag	oz/ton	0.0		
IHST-13-11912		PJV-2	Au	oz/ton	0.27		
IHST-13-11913		PJV-2	Ag	oz/ton	0.0		
IHST-13-11913		PJV-2	Au	oz/ton	0.26		
INTL-13-16363		PM-928	Ag	oz/ton	1.3		
INTL-13-16363		PM-928	Au	oz/ton	0.11		

CLIENT:	Farrow	Al <sub>2</sub> O <sub>3</sub>	CaO	Fe <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> O	MgO	MnO	Na <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	SiO <sub>2</sub>	TiO <sub>2</sub>	LOI	Sum Of Conc.
DATE:	4/15/2013 XRF-M01 Preliminar	Al	Ca	Fe	K	Mg	Mn	Na	P	Si	Ti	--	--
Method:	y	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
12-0588-0001	Dolostone	3.17	43.529	1.21	0.52	1.29	0.035	1.20	0.036	13.35	0.12	35.69	100.15
12-0588-0001 DP	Dolostone	3.17	43.651	1.21	0.51	1.30	0.035	1.20	0.035	13.39	0.12	35.70	100.32
12-0588-0000	Inhouse ODL-1 Reference Material	2.19	25.989	2.66	0.76	17.27	0.176	0.03	0.036	8.68	0.10	41.20	99.09
12-0588-0000	International BHVO-2 Reference Material	13.70	11.488	12.45	0.51	7.38	0.169	2.21	0.275	50.16	2.71	-0.50	100.55

Specific Gravity 2.69

**Adjacent Properties**

The Property abuts mining claim 1779228 on the northeast claim line and 1229972 on the east claim line. The remainder of the claim is open onto crown land.

**Conclusions**

The geochemistry data for your analyzed Espanola Fm sample suggests it would be good for basic aggregate purposes and for concrete stone or clinker material. It has a high specific gravity - most likely due to fact that it has undergone various degrees of regional metamorphism associated with various orogenies following deposition of the Huronian Supergroup strata and leading up to present-day plate tectonic configuration.

## Typical cement clinker chemistry in Ontario

CaO - 44.4%, SiO<sub>2</sub> - 14.3%, Al<sub>2</sub>O<sub>3</sub> - 3.0%, Fe<sub>2</sub>O<sub>3</sub> - 1.1%  
LOI (loss of ignition) - 35.9%

Source: p.82 - J.A.H. Oates, 1998. *Lime and Limestone - chemistry and technology, production and uses*; John Wiley & Sons, 455p.

J. M. Gaudreau by consulting with others and considering analytical results has determined "somewhat" that the limestone formation tested at the Parkin Limestone Property meets several industrial applications as well as smelter feed stock which includes: dimension stone for building and construction, road construction aggregate, ornamental tiles, counter tops, landscaping, pavers, heavy industry - slag additive, clinker feed for lime production, acidity neutralizing at mine site reclamation projects and rail ballast, as an agricultural lime and as a filler in many manufactured goods.

## Pros and Cons

- The limestone can be extracted more efficiently under an Aggregate Permit.
- Limestone has endured regional metamorphism increasing its density (high specific gravity); the bedding is well healed and fused. The laminates of silica and impurities are thin with variable frequency throughout.
- Field examination noted slump breccia of undetermined width on the north contact. Contact with cobalt conglomerate was not located and there is less frequent laminating in the centre of the limestone body progressing more frequent to the south contact.
- The south contact between the limestone and cobalt conglomerate is sharp with no progressive contamination into the limestone.
- One outcropping west face of 50+ meters appears massive with limited jointing and very few veins, tilted vertical to 73 degrees on east/west strike and a 20 meter bench.
- The Property is within close proximity to Sudbury and an existing limestone quarry operation to the east and past producing iron mine to the west.
- There appears to be multiple product opportunities.
- The limestone is considered "clean" with only minor impurities the major being silica enriched.
- The consistency and geochemistry still needs to be tested over the limestone formation.
- There appears to be consistent bedding, strike, dip in areas stripped and mapped.
- There is a significant working bench 20 meters above Irving Lake water level.
- Extraction and preliminary assessment work can be conducted under Mining Act.
- Extraction under aggregate act is highly obtainable failing any unforeseen circumstances which might occur under the Environment Study or similar.
- There are no foreseeable problems submitting for permitting under other acts.
- Irving Lake is an ideal water source and is within 140 meters of the north contact.
- Claims will remain in good standing until April 9, 2016 if this report is accepted.
- Next phase of work if extraction of blocks or other will require an Exploration Permit and consultation with Wahnapiatae First Nations and possibly other.
- Deposit grade & tonnage (reserves) are not yet defined.
- Completion of pre-feasibility, closure/rehabilitation plan, financial assure, aggregate permit plus other related cost not completed.
- An approximate two (2) kilometer access road off existing access road to limestone at Irving Lake will need to be completed and Environment Assessment requirements by MOE still outstanding.
- Access routes might require permission from mining claims owner.

## Cost Summary

J. M. Gaudreau, agent for the claim holder is submitting this report for consideration to qualify for the work requirement, due on April 9, 2015. The following costs are cumulative after staking the claim between 2013 and work completed including promotional work to 2014 which include costs occurred during a site visit on October 25, 2013 and promotion of the limestone over a two (2) year period. The Property visit cost on October 25, 2015 includes J. M. Gaudreau and two (2) assistants, boat & motor, truck and fuel. Miscellaneous consumables include; shovels, sample bags, flagging tape and meals. Additional cost occurred during visits to MNM at the WGMC on Ramsey Lake Road for meetings with D. Farrow, F. Brunton, D. Rowell and M. Clement. Additional cost also occurred while soliciting for promotion of the limestone potential to Fisher Wavy, and other stone distributors in Sudbury. Some time was spent preparing a power point presentation for these meetings. There was time accumulated while corresponding with CLIFFS Natural Resources to meet their specifications for limestone flux feed for the pending smelting processing of chromite ore from the Ring of Fire.

## Cost Breakdown

Site visit October 25, 2013, road, boat and overland traverse from Sudbury to the Property occurred cost in fuel, boat, truck, miscellaneous consumables and food totaling approximately \$200.00.

The cost for compensation for field party on October 25, 2013,  $\$250.00 \times 3 = \$750.00$ .

Assay costs are not applicable as they were completed by D. Farrow, RGO Sudbury. However the cost of fuel from Hanmer to Sudbury should be considered for at least 10 round trips @ \$0.50/km. Round trip is approximately 50km  $\times 10 = 500 \times \$0.50$  totals \$250.00.

Cost in time to prepare maps and other promotional materials totals approximately \$100.00.

Cost to prepare assessment report for filing and submission to the Provincial Recording Office is approximately \$500.00.

Total cost of submission **\$1,800.00**

For inquiries of cost verification contact: J. M. Gaudreau