TECHNICAL MEMORANDUM

DATE October 24, 2016 **PROJECT No.** 1529718

TO Mr. Louis Prevost
United Counties of Prescott and Russell

CC Marc Bataille, James Parkin

FROM Rachel Lee Gould **EMAIL** RLGould@golder.com

INFORMATION RESPONSE TO SOUTH NATION CONSERVATION

On behalf of Colacem Canada Inc. (Colacem), applications to amend the United Counties of Prescott and Russell Official Plan and the Township of Champlain Zoning By-law 2000-75 were submitted on June 10, 2016 to facilitate the development of a cement plant in L'Orignal, Ontario. The United Counties of Prescott and Russell (UCPR) contracted South Nation Conservation to complete a peer review of the following two supporting documents:

- Environmental Impact Study, prepared by Golder Associates Ltd. February 2016; and
- Technical Memorandum – Groundwater Supply Review, prepared by Golder Associates Ltd. August 28, 2015.

South Nation Conservation provided comments/questions on the two supporting documents to the UCPR on August 4, 2016; a copy of their letter is provided in Attachment A.

Colacem and Golder Associates Ltd. (Golder) have prepared the following responses to address South Nation Conservation's comments.

Environmental Impact Study

1) *It would be beneficial to clarify if the Terms of Reference received from the Township (appendix A) in 2011 are still valid.*

   Response

   Mr. Louis Prevost, the UCPR Director of Planning and Forestry, confirmed via telephone call on July 21, 2015 that the terms of reference provided in a letter dated July 21, 2011, are still valid.

2) *What will be done with the Pet coke ashes? Will they be stored on site or trucked out?*

Response

Petroleum coke (pet coke) ashes are transformed into clinker crystal and ultimately incorporated into the final cement product.

Pet coke is a solid carbon product that is produced in the oil refining process and commonly used world-wide as an efficient fuel for industrial applications. The percentage of ash content in pet coke is between 0.2 - 1% (i.e., more than ten times less than the ash content of natural coal). The quantity of pet coke necessary to produce clinker is approximately 10% of the clinker production. The chemical composition of pet coke ash is compatible with the clinker's chemistry. After combustion on the main kiln burner, pet coke ash is mixed together with the hot clinker in the burning zone; here reactions take place that lead to the formation of a stable compound.

3) *In Table 3 (pages 14/15), the air temperature should be noted along with the water temperature.*

Response

Air temperatures have been incorporated into the updated table below.

Table 1: Aquatic Habitat on the Site

Station(s)	Waterbody	Habitat Description
1	Municipal Drain (Charlebois Drain)	An open-channel municipal drain that flows west to east across the northernmost extent of the site through crop fields. Flow was observed to be a run, with few riffles or pools, and a water depth of 0.25 to 1.0 m. The drain was approximately 4 m in wetted width, with very steep banks and fine substrates. Water quality measurements conducted in the drain indicate a conductivity of 580 µS/cm, dissolved oxygen (DO) level of 6.75 mg/L, a pH of 7.74, very turbid water and a water temperature of 18.5°C. Air temperature was 19°C. In-stream vegetation consisted primarily of cattail and emergent vegetation. The occasional tree was observed on the banks of the drain. Riparian vegetation consisted of a thin band of meadow on both the north and south sides of the drain.
2	Drainage Ditch / Intermittent side stream	A ditch that flows east to west across the central portion of the site through a crop field and flows into the main drainage ditch. Water flow was intermittent, but was observed to be moderate to slow at the time of the survey at a depth of 0.05 to 0.25 m. Water quality measurements conducted in the ditch indicate a conductivity of 760 µS/cm, DO level of 8.40 mg/L, a pH of 7.92, moderate turbidity and a water temperature of 20°C. Air temperature was 19°C. The ditch was approximately 1.2 m in wetted width with fine substrates of clay and silt. The ditch had dense in-stream vegetation of emergent and submerged vegetation. Riparian vegetation consisted of a thin band of meadow on both sides of the drain.

Table 1: Aquatic Habitat on the Site

Station(s)	Waterbody	Habitat Description
3	Main Drainage Ditch	A surface drain that enters the site on the west side from the adjacent quarry property. The drain initially flows west to east to the center of the site where it is realigned to flow north and connect with Charlebois Drain. This drain was approximately 4 m in wetted width and included primarily runs, with occasional riffle and pool habitats. Water quality measurements conducted in the main drainage ditch indicate a conductivity of 720 µS/cm, DO level of 9.10 mg/L, a pH of 8.06, very turbid water and a water temperature of 19.9°C. Air temperature was 19°C. It had a mix of fine, silt substrates and exposed bedrock. In-stream vegetation was primarily emergent vegetation over silt substrates, and submerged vegetation over bedrock. This drainage ditch is located in the thicket/meadow complex, but there are several riparian trees along the east and west banks.
4 to 7	Pond	A constructed pond in the southeast corner of the site, with steep vertical banks of 0-3 m and water of unknown depth. Based on field observations, the pond appears to be a historic quarry pond. The pond is approximately 90 m at the widest point and contains some areas of narrow shelf that extend 1 – 5 m from the bank. Water quality measurements conducted in the pond indicate a conductivity of 340 µS/cm, DO level of 10.42 mg/L, a pH of 8.46, and a water temperature of 22.8°C. Air temperature was 19°C. The pond contained a narrow and shallow littoral zone containing aquatic macrophytes and algae. There were patches of trees around the perimeter of the pond. It was surrounded by agricultural field to the north, meadow to the southwest and woodland to the southeast and east.

4) *Based on the information provided in the report, SNC supports the recommendation that a DFO Request for Review is required. The information collected in the report on fish and fish habitat can be used for that review.*

Response

A Request for Review was completed and submitted to the DFO on June 20, 2016. The information package is currently under review by the DFO.

Groundwater Supply Review

1) *On page 2 of the South Nation Conservation regarding the Groundwater Supply Review, the second to last paragraph has the following comment: « There appears to be a discrepancy between the PTTW addressed in the memorandum and the PTTW registered for the site. »*

Response

The appropriate PTTW number should have been 0063-8EDMH6 and is valid until March 1st 2019. The previous PTTW # 3388-7K6PA7 was referenced in error in the memorandum.

2) *On page 2 of the South Nation Conservation under the Groundwater Supply Review section, the last paragraph has the following comment: « In general, the daily quarry dewatering rates exceed the required estimated demand for cement production. However, there are noted periods were daily dewatering rates do not meet the estimated demand. …. »*

Response

On a yearly basis the volume of water meets the new cement plant requirements. In order to ensure that the daily water requirements for the cement plant are met, Colacem will not pump the water out of the quarry as it comes in, as is the current practice, but build a reserve in the quarry. Colacem no longer believes that a groundwater well will be required to augment the water supply from the quarry.

Rachel Lee Gould, M.Sc.
Senior Project Manager

Alyson Beal, P.Eng.
Associate

RLG/AB/wlm

Attachment A: South Nation Conservation Comments

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ATTACHMENT A

South Nation Conservation Comments

SOUTH NATION
CONSERVATION
DE LA NATION SUD

Via email (Dominique.lefebvre@prescott-russell.ca) August 4, 2016

United Counties of Prescott Russell
59 Court Street, PO Box 304
L'Orignal, ON K0B 1K0

Attn: Dominique Lefebvre

Subject: **Application for Official Plan Amendment**
Environmental Impact Assessment & Hydrogeological Review
Proposed Cement Plan - Colacem Canada Inc.
County Road 17, Township of Champlain
Roll # 020900700123700

Dear Dominique,

South Nation Conservation (SNC) has received the following documents for the above-noted proposed development:

i. Environmental Impact Study. Prepared by Golder Associates. Signed and dated February 2016.
ii. Technical Memorandum – Groundwater Supply Review. Prepared by Golder Associates. Signed and dated August 28, 2015.

After review, we offer the following comments:

Environmental Impact Study

Our review focused primarily on the potential impacts to the identified watercourses and their functions.

1. It would be beneficial to clarify if the Terms of Reference received from the Township (appendix A) in 2011 are still valid.
2. What will be done with the petcoke ashes? Will they be stored on site or trucked out?
3. In Table 3 (pages 14/15), the air temperature should be noted along with the water temperature.
4. Based on the information provided in the report, SNC supports the recommendation that a DFO Request for Review is required. The information collected in the report on fish and fish habitat can be used for that review.

The report states that no residual impacts to significant natural features and functions are anticipated provided the recommendations included in the report are properly implemented. Before accepting these findings, we recommend the above points, specifically #1-3, be addressed.

Groundwater Supply Review

The following comments are provided by SNC's Hydrogeologist Michael Melaney, P.Geo.:

The purpose of SNC's review was to determine any detrimental effects of the current groundwater levels based on the proposed water supply for the proposed cement plant.

The memorandum (ii) was prepared to present an evaluation of groundwater supply which focuses on the potential of the quarry sump water meeting the water supply requirements of the proposed plant. The memorandum discusses the proposed plant water requirements, a brief geological and hydrogeological review, existing dewatering of the quarry (permit to take water, PTTW), daily dewatering records for 2012, 2013 and 2014, and a brief discussion of MOE well records and water quality.

There appears to be a discrepancy between the PTTW addressed in the memorandum and the PTTW registered for the site. This discrepancy is more of a technicality than an actual cause for concern. The discussed PTTW exceeds the estimated requirement of the cement plant by more than a factor of 11. A significant assumption of the groundwater supply review is that the water discharged from the quarry is not for the purpose of mitigating dewatering impacts. This assumption is not defined or supported with previous studies. If this is not the case, potential negative effects may occur as a significant portion of the water being discharged to a municipal drain would be diverted to the plant. This may effect infiltration (potential recharge for neighboring wells) and any associated natural features.

In general, the daily quarry dewatering rates exceed the required estimated demand for the cement production. However, there are noted periods where daily dewatering rates do not meet the estimated demand. Explanations for these periods were only postulated and not defined. Based on the limited data available for review the consultant suggested that water supplied from a drilled well may augment the required demand during these periods. However, the consultant also recognizes that MOECC would require a PTTW or amendment for that water taking. The MOECC would require a hydrogeological study (Category 2 or 3) for the water supply well to be included in the PTTW as the water taking must not adversely affect existing users or the environment. This memorandum only

suggests that the well might be an option and that more work would be required before enacting such a measure. The previous hydrogeological studies which supported the significant water takings (PTTW) were not discussed in detail. These reports would provide context to the discussed potential for a dewatering well and may provide sufficient data to support the required water taking.

This memorandum does not provide any data which could allow for analysis of effects to the local groundwater table except for the generalities of MOE well records and that the previous hydrogeological investigation conducted by Morey Houle Chevier Engineering Ltd. (1998) concluded that the quarry property has a relatively low horizontal hydraulic conductivity.

I hope this letter is to your satisfaction, but should you have any questions please do not hesitate to contact me.

Sincerely,

Mathieu Leblanc
Acting Team Lead - Planning

SNC-4387-2016