

June 22, 2016

Mr. Jeff Gushue
Town of Yarmouth
400 Main Street
Yarmouth NS B5A 1G2

Subject: Professional Services Proposal
Monitoring and Support Services 2016 to 2017
Civic No. 2014 Lake George Road, Lake George, NS
Our ref.:21347

Dear Mr. Gushue:

As a follow-up to our May 2016 Environmental Investigation at the above-noted property, Englobe Corp. (Englobe) is pleased provide a suggested scope of work to conduct long term monitoring so that a Remedial Action Plan (RAP) can be prepared to fulfill your obligations under the Nova Scotia Environment (NSE) Contaminated Sites Regulations.

1. Description of the project

From the work conducted to date, there are impacts (metals) at Civic No. 2014 Lake George Road in surface water, soil and groundwater that exceed the NSE Tier 1 Environmental Quality Standards (EQS). Some of the impacts (surface water metals and pH) appear to originate at Civic No. 2014 Lake George Road and migrate off-site over adjacent 3rd party land owners. To date, there is insufficient information to determine if the identified surface water impacts are the result of past activities at the site or the result of natural conditions at the site. Further, insufficient information has been collected to determine if the impacts are seasonal or steady state (i.e. constant) in nature. The transport mechanism between surface water and deeper groundwater has been investigated; however, there is not enough data to confirm that impacts in the shallow and deeper groundwater are the result of surface water impacts.

We have submitted Notification Forms to NSE on your behalf for Civic No. 2014 Lake George Road, and the adjacent properties that appear to be receiving surface water (5 properties in total). Once NSE processes the Notification Forms, they will issue an Inspection Report and Directive, requiring further Investigation and a RAP. The bulk of the investigative work has been conducted in our May 20, 2016 Environmental Investigation report. Prior to developing a RAP, we recommended collecting additional data so that additional surface water and sediment delineation could be carried out to obtain a more thorough understanding of the extent of the metals impacts and seasonal data variability in the surface water, groundwater and potable water.

This additional data collection would aim to support our opinion that no further (remediation) work is required with respect to soil and groundwater at Civic No. 2014 Lake George Road, and allow us to analyze the most cost effective remedial action to address the freshwater habitat (i.e. surface water) impacts, should any be required following the monitoring.

The most recent testing at the residential homes identified an elevated arsenic concentration in potable water at Civic No. 2012 Lake George Road, although the elevated lead concentrations at Civic Nos. 2065 and 2087 Lake George Road (from February 2016 testing) were not repeated in the March 2016 samples. Further testing at these dwellings is recommended to further assess the water quality and determine if there is a transport mechanism between the surface water and potable water at these dwellings, or whether it is more likely that the elevated metals were unrelated to the Town site.

Since two rounds of analytical testing at the remainder of the homes has not revealed any drinking water concerns related to metals, we don't recommend any further testing at the dwellings other than the three noted above.

2. Description of the services and deliverables

Englobe has prepared a scope of work to assess the seasonal variability and further assess the extent of any impacts that were detected during the February and March 2016 work.

Our goals of the investigation are to:

- ▶ Assess the seasonal variability of the groundwater quality at Civic No. 2014 Lake George Road so that the onsite pathways can be closed under the NSE Contaminated Sites Regulations;
- ▶ Assess the seasonal variability of the surface water;
- ▶ Fully map the drainage pathways from the source to the downgradient receiving habitats, and establish additional surface water and sediment monitoring locations to delineate impacts;
- ▶ Identify a background wetland to evaluate surface water quality in this specific habitat;
- ▶ Assess the seasonal variability and transport mechanism between the surface water and potable water at select locations; and
- ▶ Prepare a Remedial Action Plan to address potential for human harm or ecological harm that needs to be repaired, monitored or buffered in some capacity.

Specifically, the field program will consist of:

1. Fully map the surface water features downgradient of SW1, SW2, SW6 and SW12 and assess where they discharge into Lake George and Killam Lake. We will attempt to locate a background wetland similar to those at Civic No. 2014 Lake George Road. NSE will be asked to conduct watercourse determinations where required.
2. Over four monitoring events (July, October, January and March), collect surface water samples from the existing 18 surface water and piezometer locations, add 5 additional locations and collect two duplicate samples. Sediment samples will also be collected from 6 of the surface water locations. Field parameters (temp, pH, conductivity and DO) will be recorded. Surface water samples will be analyzed for general chemistry, total suspended solids and total and

dissolved metals. Sediment samples will be tested for particle size gradation and available metals.

3. Over four monitoring events (July, October, January and March), collect groundwater samples from the 17 onsite monitor wells (and a duplicate). Field parameters (temp, pH, conductivity and DO) will be recorded and these samples will be analyzed for general chemistry and dissolved metals.
4. Over four monitoring events (July, October, January and March), collect potable water samples from the three dwellings (Civic Nos. 2012, 2065 and 2087 Lake George Road) where elevated metals concentrations have been detected during previous testing. These samples will be analyzed for general chemistry and total metals.

Following the field program, we would analyze the data for trends, summarize the methodologies and findings of the field program and prepare a Remedial Action Plan to address impacts that exceed the NSE Tier 1 EQS. If applicable based on the findings, the RAP will provide options and costs to address the impacts. On your behalf, we would submit the final RAP to NSE and also complete the NSE checklists (for the 5 affected sites) that would be required at that time (Remedial Action and Environmental Investigation checklists). If additional Notification Forms are required, we would also prepare those on your behalf.

During the course of the monitoring, we will provide support with resident concerns and questions. We will also present the findings of the monitoring and our RAP recommendations at council if required.

Since the data interpretation and findings over the course of the program will ultimately form the basis of the RAP, we cannot yet determine the exact RAP details; however, our anticipated outcomes of the testing outlined herein will likely be one of the following scenarios (or a combination):

- ▶ Do nothing - the results support no further work or data analysis.
- ▶ Do nothing – but an ecological risk assessment is required to scientifically defend this approach.
- ▶ Remediation.

3. Schedule of services and deliverables

We recommend that the monitoring commence in July, so that information is collected in the most appropriate season. We have included four monitoring events (July, October, January and March).

We can provide regular updates of field findings and tabulated data following the monitoring events. Once the final monitoring event (March 2017) is conducted, data analysis will take approximately 3 weeks and a draft report for your review will be submitted within four weeks following receipt of laboratory analytical data.

Throughout the project, we have allowed consulting time to discuss the findings with the Town, local residents and NSE.

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The NSE forms will be completed following council (Town of Yarmouth) review and acceptance of the RAP.

4. Fee proposal

Our cost proposal is provided in the attached tables. We have carried the laboratory costs (with markup) under Englobe expenses so that the Town can take advantage of our discounted rates with the laboratory.

Costs have been prepared for two in-person council briefings; however, one of these is for presenting the findings of the May 2016 Environmental Investigation Report that was not covered under the previous budget. If additional meetings are required that cannot be accommodated within the presented budget, we will prepare an additional cost proposal for your review, at the rates presented herein.

5. Closing

We look forward to being of service to you on this project. If you have any questions concerning this proposal, please do not hesitate to contact the undersigned.

Sincerely Yours,
Englobe Corp.



Aven Cole, M.Sc.E., P.Eng.
Project Manager, Environmental Engineering



Doreen Chenard, B.Sc. in Agr.
Team Leader, Environmental Engineering

Encl.

Table 1 - Fees

Project Component	Senior Project Manager (Doreen Chenard) Rate: \$115/hr		Environmental Site Professional/Project Manager (Aven Cole) Rate: \$110/hr		Field Technician (Lisa Ladouceur, Alexandra Stevenson) Rate: \$75/hr		Support Personnel/ CADD and GPS Technician Rate: \$65/hr		Admin Support Rate: \$40/hr		Total Fees
	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	
	1 Project Management (and kickoff)	2	\$ 230.00	48	\$ 5,280.00	2	\$ 150.00		\$ -		
2 Monitoring Plan Development	2	\$ 230.00	10	\$ 1,100.00		\$ -		\$ -		\$ -	\$ 1,330.00
3 2016 - 2017 Water Monitoring		\$ -		\$ -		\$ -		\$ -		\$ -	\$ -
3.1 Mob/Demob and Travel (4 Events)		\$ -		\$ -	64	\$ 4,800.00		\$ -		\$ -	\$ 4,800.00
3.2 Water Sampling, Water feature mapping, Sediment sampling		\$ -	4	\$ 440.00	88	\$ 6,600.00		\$ -		\$ -	\$ 7,040.00
3.3 Analytical Program and Data Tabulation		\$ -	8	\$ 880.00	68	\$ 5,100.00		\$ -		\$ -	\$ 5,980.00
3.4 Data Interpretation	4	\$ 460.00	16	\$ 1,760.00		\$ -	7	\$ 455.00		\$ -	\$ 2,675.00
3.5 Draft and Final Reports	4	\$ 460.00	25	\$ 2,750.00		\$ -	5	\$ 325.00	7	\$ 280.00	\$ 3,815.00
4 NSE Forms		\$ -	16	\$ 1,760.00		\$ -		\$ -		\$ -	\$ 1,760.00
5 Council Briefs (July 2016 and April 2017)		\$ -		\$ -		\$ -		\$ -		\$ -	\$ -
5.1 Preparation	3	\$ 345.00	16	\$ 1,760.00		\$ -		\$ -	5	\$ 200.00	\$ 2,305.00
5.2 Travel and Meetings		\$ -	20	\$ 2,200.00		\$ -		\$ -		\$ -	\$ 2,200.00
6 Support with Residents	4	\$ 460.00	30	\$ 3,300.00		\$ -		\$ -		\$ -	\$ 3,760.00
TOTAL FEES	19	\$ 2,185.00	193	\$ 21,230.00	222	\$ 16,650.00	12	\$ 780.00	12	\$ 480.00	\$ 41,325.00

Table 2: Expenses

Expenses	Unit Cost	Unit Quantity	Unit Measure	% Mark Up	Costs
Laboratories					
Metals Sediment (watercourses)	\$ 63.00	24	each	10%	\$ 1,663.20
Particle size	\$ 202.50	6	each	10%	\$ 1,336.50
Lab disposal fee - Sediment	\$ 2.00	24	each	10%	\$ 52.80
General Chemistry and Metals (plus Hg and total lead) - Groundwater					
lab filtration	\$ 152.00	72	each	10%	\$ 12,038.40
Lab disposal fee - Groundwater	\$ 12.00	72	each	10%	\$ 950.40
Lab disposal fee - Groundwater	\$ 2.00	72	each	10%	\$ 158.40
General Chemistry and Total Metals (plus Hg) - Surface Water					
Dissolved metals - surface water	\$ 136.00	100	each	10%	\$ 14,960.00
Total Suspended Solids - Surface Water	\$ 56.00	24	each	10%	\$ 1,478.40
Lab disposal fee - Surface Water	\$ 12.50	24	each	10%	\$ 330.00
Lab disposal fee - Surface Water	\$ 2.00	100	each	10%	\$ 220.00
General Chemistry and Metals - Potable Water					
Lab disposal fee - Potable Water	\$ 120.00	12	each	10%	\$ 1,584.00
Lab disposal fee - Potable Water	\$ 2.00	12	each	10%	\$ 26.40
SUBTOTAL					
	\$				34,798.50
Miscellaneous					
Mileage	\$ 0.52	4200	km		\$ 2,184.00
Accommodations	\$ 115.00	18	night		\$ 2,070.00
Meals	\$ 40.00	18	day		\$ 720.00
Field Equipment (GPS, pump, meters)	\$ 175.00	8	days		\$ 1,400.00
ice	\$ 4.00	20	total		\$ 80.00
Consumables (gloves, tape, etc), allow	\$ 75.00	4	each		\$ 300.00
SUBTOTAL					
	\$				6,754.00
Total Expenses					\$ 41,552.50
Total Fees (from Table 1)					\$ 41,325.00
Total Fees & Expenses (Excluding Tax)					\$ 82,877.50

Notes: