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## Clifton Associates



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**15 August 2014**

**Attention:** Residents of the Hounsfeld Heights – Briar Hill Community  
**RE:** Questions and Answers Document from the 23 May 2014 Open House Event

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### Introduction

**File CG 2430**

On behalf of Sears Canada Inc. (Sears), Clifton Associates Ltd. (Clifton) is pleased to provide the following summary document of Questions and Answers. During the Community Meeting held on 27 May 2014, Clifton and the various Stakeholder groups recorded questions that were asked of the various Stakeholders following the power point presentation. In addition, residents had also asked questions using the “quick comments” card and through email, following the meeting. Clifton has compiled the following list of questions collected from the event and is pleased to provide the subsequent answers.

If you have any additional questions or comments, or require further clarification on the responses provided below, please contact your Hounsfeld Heights – Briar Hill Plume Committee representatives, or Mr. Stephen d’Abadie of Clifton, directly ([stephen\\_dabadie@clifton.ca](mailto:stephen_dabadie@clifton.ca)).

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### Questions and Answers Summary

**Question 1 (Q1):** How much gas do you believe to be in the subsurface?

**Answer (A):** This question is difficult to answer. We know when the original tanks were installed; but, we do not know precisely when the initial release(s) started during the approximately 35 - year lifespan of the underground storage tanks (USTs). The regulations at that time were in their infancy or non-existent with respect to release detection and reporting requirements.

Regardless, the original USTs were installed in 1958. The release began in the 1970s or early 1980s, before the original USTs were removed in 1984. A second generation of USTs was installed in 1984, with the leasing of the Site to Sunoco. These USTs were removed in 1995 when Sunoco left the Site.

It is likely that during this time period, a small initial release in the system grew larger over time and may have been exacerbated by over-filling the USTs, or fuel line joint separation. We do not know the exact mechanism that created the release; however, we do know where the source area was located, and that source area has been removed.

**Q2:** How much have you recovered to date?

**A:** Since January of 2011, it is estimated that approximately 3,480 L of liquid petroleum hydrocarbon (LPH) vapour equivalent has been removed from the subsurface by the operation of the Dual Phase Vapour Extraction (DPVE) system that has also treated over 700,000 L of groundwater. In addition, prior to the activation of the DPVE system, a total of 478 L of LPH was withdrawn using a passive bailer method.

**Q3:** How long to recover the remaining product, remove the treatment plant, and restore Lion's Park?

**A:** There is currently no detectable LPH in any of the existing monitoring wells on Site; however, the DPVE system is still extracting groundwater containing dissolved phase petroleum hydrocarbons (PHCs). The DPVE system is continuing to: reduce the total amount of petroleum hydrocarbons beneath the community; keep the northern half of the plume from moving any further to the south, and causing the larger plume to be separated into two, smaller sections; and, decrease the remediation timeframe.

**Q4:** Apparently there is no free LPH left to be removed, so what is the purpose of the new boreholes to be drilled? Is it solely to check for LPH in previously inaccessible areas between the wells? If none is found in new wells this year, will the remediation project end? Is the DPVE the way to go now that LPH is said to be gone?

**A:** The purpose of the new boreholes is to better define the stratigraphy and more accurately delineate the subsurface contamination. The purpose of the new monitoring wells is to isolate stratigraphic units and better understand the location of the groundwater impacts. All this information will allow us to manage the Site more effectively and allow us to apply new remedial options more to greater success. The new remedial options will focus on the dissolved phase PHCs, if that is all that remains; or, focus on both LPH and dissolved phase PHCs, if LPH is found.

**Q5:** What is the range of estimates of the LPH originally estimated to be in place after all the work that has now been done since 1998?

**A:** It is assumed that the original release occurred prior to 1984. Since record keeping requirements were less stringent at the time; it is difficult to determine how much product was originally released. At this point, so much time has passed that the total loss has become less important.

Recovery percentages are more important for recent releases from pipeline ruptures or shipping accidents. During catastrophic releases such as these, we would calculate a maximum quantity of product based upon the container size and time of occurrence.

A long period of time has passed since the initial release. The date and specific mechanism of release is unknown. The product plume has expanded to fill pore space in the surrounding soils and dissolved into the groundwater. A very limited amount of the original fuel remains as "free-product" or, as LPH floating on the existing water table. Since the residual petroleum plume material is not comprised of LPH, it is more difficult to collect and recover.

Much of the residual product is now located in the pore space of the soils at depth or dissolved in the groundwater; it requires a different frame of reference (i.e. plume delineation) to discuss the quantity

and to judge the effectiveness of the remediation. In this frame of reference, we look to delineate the boundaries of the plume and then compare future readings against the frame of reference. Is the plume expanding, remaining stable, or shrinking? Our end goal is to define the plume boundaries and then achieve a shrinking plume.

Currently LPH is not being detected in any of the existing monitor wells. There is the potential that LPH exists in areas where we have previously not been given access and as such, these areas have not been investigated.

**Q6:** The DPVE system has recovered 2,461 litres of LPH (to 30 June 2013). What percent of the original LPH in place is this?

**A:** Since 30 June 2013, the DPVE system has recovered approximately an additional 1,000 L of LPH vapour equivalent for a total of 3,480 L. Since the total volume of the release is unknown, we cannot calculate what percentage of the total LPH this represents. Please refer to the previous question. As stated in a previous answer, we are no longer detecting LPH in any of our monitoring wells.

**Q7:** During the community meeting it was stated that more gas vapour data is to be gathered to establish how big the plume is. This was done over ten years ago, and it's telling us that nobody knows what we're dealing with. Was the gas vapour data poorly gathered in the past and is this why it is being redone?

**A:** The original soil vapour gas samples were obtained and evaluated in 2003 – 2005 per the required standards of the time. The data was gathered and assessed appropriately for the state of knowledge at the time; however, over ten years have passed since the original data was collected and technology has advanced as well. The health and safety of the area residents is paramount, so we felt it prudent to sample again, as necessary, and make sure that things have not changed.

Moving forward, soil vapour gas sampling will only be done in locations where it is determined to be necessary and will add value to our overall understanding of the Site.

In reference to the dissolved phase groundwater plume, it had been mainly delineated under older guidelines. The guidelines have changed since the original work was completed in 2005 and have become more stringent. Because of this change, levels of constituents in the groundwater that were acceptable then, are no longer sufficient to delineate the plume, and new data points are needed.

**Q8:** Why is Intrinsic still involved in Health Risk Assessment (HRA), while we're told in the info package that "the risk assessment determined that there is no health risk to the residents...?"

**A:** Alberta Environment and Sustainable Resource Development (AESRD) has requested a revised HRA to confirm that health risks are not present at the Site. In addition, since the original HRA, guidelines for determining risk levels have changed. Intrinsic's involvement will include the calculation of revised risk assessment guidelines. It is beneficial to include a firm with a significant history of knowledge on the background of the Site and who is competent in HRAs.

**Q9:** Considering that Sears is for sale, we are concerned that Sears will be bailing out of the clean-up of polluted grounds in HH-BH at some point? Is Sears allocating sufficient funding over the years to fully remediate the problem?

**A:** The changes regarding Sears are an ownership matter, not an operational matter. No matter what the makeup of the ownership of Sears, Sear's management expects the remediation efforts to continue as proposed in the Updated Site Management Plan (SMP, 2014). Sears has an obligation to the current owners of Sears and any potential new owners of Sears to disclose this information. Through disclosure, it can allocate the necessary resources to remediate the Site to applicable standards.

**Q10:** The timeframe for this project is becoming pathetically slow. Is Sears/Clifton putting enough resources to remedy the problem?

**A:** The remediation has taken a long time to complete due to Site complexities and the amount of data a site of this scale generates. If we consider the original USTs as the primary source, then a secondary source would have been the soil around the tanks in the Mall area that contained liquid. The original SMP for Hounsfield Heights was designed to first address the highest concentrations of secondary source liquids. Those soils were excavated in the area near the mall years ago.

Both the primary source (USTs) and secondary sources (soils surrounding the USTs) have been removed. With the removal of these sources, a large portion of the residual petroleum was removed.

Meanwhile, a HRA was then completed for Hounsfield Heights. The HRA determined that there was no health risk to the residents, due to a relatively impermeable layer that exists underground between the surface and the contamination zone. This layer has prevented any vapours from migrating to the surface.

A DPVE system was then constructed in Hounsfield Heights to remove LPH (a tertiary source) over the planned course of approximately 3-5 years. The DPVE system, now in its fourth year of operation, has led to the reduction of LPH to non-detectable levels.

Since the original SMP was implemented, the Alberta guidelines have changed. AESRD has now asked Sears to meet the new guidelines. Therefore, we are starting additional work in the neighbourhood. To meet these new requirements, we now need to gather additional data, which will require a new network of wells.

While all of this is on-going, we will continue to treat the groundwater for dissolved phase PHCs and keep the DPVE system operational.

The timeline may seem long; however, sub-surface remediation can be extremely difficult in densely urban areas, due to the complexities involved up to 35 m below the surface, and also due to the physical limitations at the surface.

**Q11:** Competence of operator to deal with the remediation issue is to be questioned.

**A:** Clifton has conducted environmental work for over three decades and has successfully managed numerous environmental remediation projects. Each project presents its own unique challenges that require a specific approach to solve the problem. Clifton has guided Sears in the removal of primary, secondary, and tertiary source areas. We are working with Sears on the removal of the dissolved phase plume, while addressing the new regulatory requirements.

The Manager of Clifton's Calgary Environmental Group has over 24 years of experience working on complex site assessment and remediation sites.

**Q12:** Explain the ROW access by Clifton to drill on individual properties without needing property owner permission?

**A:** The easement along the front of individual properties adjacent to the roadway (right of way, or ROW) allows access for the installation of the utilities and other installations, such as monitoring wells. This is governed by the City of Calgary By-Laws. We will make every effort to notify residents of the potential locations of the new monitoring wells. The wells will be placed between the street and the sidewalk.

This is not related to the additional well locations that Clifton is requesting of the residents within the actual yards at important data gap locations.

**Q13:** Please provide a time line for the remediation effort. It appears that Sears/Clifton would aimlessly be going about "doing work" forever, and in time losing sight of what needs to be accomplished.

**A:** A timeline to complete remediation cannot be provided at this time, as it depends on numerous factors. First of all, without access to a large portion of the Site area that is occupied by private properties, it is difficult to fully delineate and quantify the extent of the contamination. To date, with a few exceptions, we have been left to investigate the Site from City of Calgary roads and laneways.

The Updated SMP (2014) does list a variety of potential remedial options that could be applied, in tandem with the DPVE, to speed up the remediation of the Site. In addition, the newly acquired data from the proposed drilling will also allow us to propose remedial options to specifically address the residual contamination. Please see the response to Question 10. A schedule of work milestones is provided in the SMP and will be updated as required for the 2015 – 2016 period.

It should be noted that with each passing day, through the use of the DPVE, as well as the naturally occurring biodegradation of the existing PHCs, the Site is improving. There is no longer a continual source of PHCs making the problem any worse. The efforts moving forward will only reduce the total remediation time.

**Q14:** The work plan presented at the community meeting just seemed too "loosey-goosey," can you comment on this?

**A:** The structure of the community meeting limited the amount of time available to discuss the details of the Updated SMP (2014). The purpose of the meeting was to give all Stakeholders an overview of

the proposed work plan that was prepared by qualified professionals within the field of environmental consulting. The Updated SMP (2014) has also been reviewed by the various governmental Stakeholders, including AESRD, AHS, and the City of Calgary, who all assessed the technical and logical validity of the proposed work plan. We feel the proposed work plan as laid out in the Updated SMP (2014) will allow us to logically manage the Site more effectively and come to the appropriate remedial recommendations.

**Q15:** How long are new SMP activities to be before they decommission the DPVE and restore the park? There is too much waffling by saying "it depends," but in the 16 years since gas was first discovered, Clifton ought to have developed some predictive ability!

**A:** The initial intent behind the operation of the DPVE was to remove detectable LPH. Since operation of the DPVE has begun, there is no longer any detectable LPH in the existing monitoring well network. The secondary purpose of the DPVE was to continue to remove PHC contaminated groundwater, which it is currently doing. Each day the DPVE is in operation, the Site gets cleaner by removing more PHCs from the subsurface.

**Q16:** What is the total volume released?

**A:** Please see the answer to Q5.

**Q17:** What volume has been recovered?

**A:** Please see the answer to Q6.

**Q18:** In the figures presented at the community meeting, what does the black (in some cases red) diamonds with numbers represent?

**A:** The Black Diamonds with numbers presented on the figure during the public meeting represent the location of the existing monitor wells. A new Figure will be generated of the existing and new monitoring wells once all of the drilling work is complete.

**Q19:** Which is the company that does (did) ground DPVE System?

**A:** The DPVE was manufactured by a company named Ground Effects Environmental Services. The system is now operated and maintained by Clifton and Sequoia Environmental Remediation.

**Q20:** How have the concentrations changed over time?

**A:** Concentrations of PHCs within the groundwater have fluctuated over time. In some wells we have seen decreasing concentrations and others, increasing. This is due to the movement of the PHC plume through the subsurface over time, as it is carried along by the groundwater. It is safe to say that since the removal of the source material and operation of the DPVE, the total mass of PHCs related to the original release has been reduced significantly.

**Q21:** How many wells are there now?

**A:** There are currently 59 monitoring wells located throughout the Hounsfield Heights area.

**Q22:** How many wells are getting put in?

**A:** A total of new 98 monitoring wells have been proposed for the Hounsfield Heights area.

**Q23:** Are people at risk to be in their basement?

**A:** Based on the previous HRA completed for the Site, there is no health risk. Although we have data and reports that indicate that there is not any risk to human health, we want to go a step further. Working with AESRD, we are conducting additional tests to further support the data that indicates there is no risk to human health. The new Updated SMP (2014) includes additional testing methods (air, for example and the installation of new soil vapour monitoring wells, if needed) to help assure this conclusion.

**Q24:** Are the work hours during the day flexible?

**A:** Working hours will be primarily during normal business hours; however, we will attempt to accommodate any special requests, if asked. It is not our intention to interrupt the neighbourhood during the early morning, evening, or weekend hours.

**Q25:** Are you putting new wells in people's lawns?

**A:** The majority of the new monitoring wells will be installed on public property (roadways, green spaces, and easements). If residents are willing to allow access to their property for the installation of monitoring wells, we will make arrangements to install a monitoring well, if the well location will provide valuable information in an area with a data gap.

**Q26:** How many monitoring wells are planned?

**A:** Please see the answer to Q22.

**Q27:** When will all these planned wells be drilled?

**A:** We are striving to have all the decommissioning, borehole drilling, and monitoring well installation completed by the end of 2014.

**Q28:** When will the three PHC invaded strata be mapped to your satisfaction?

**A:** Following our borehole drilling and subsequent sampling events, we will determine if we have adequately delineated the groundwater plume. If the plume has been adequately delineated, we will be done with the soil boring and groundwater well installation phase of the work; that is, unless the plume continues to expand. If this round of well installation does not adequately delineate the plume to the satisfaction of Clifton and AESRD, then additional wells may be necessary in the spring of 2015.

**Q29:** Are you considering injection and producing (extraction) wells for the injection of the surfactant of some chemical to remove PHCs, and all removal of surfactant/PHC fluid?

**A:** Yes, a variety of remedial options has been, and will continue to be considered, moving forward.

**Q30:** In the 'Best Case' scenario when will all invaded strata be remediated?

**A:** We are unable determine an exact end point at this point in time. We will gather needed data, manage the risk, and continue to remediate.



**Q31:** How deep are the PHC impacts within the Site?

**A:** The impacts vary across the Site. In the Hounsfield Heights area, the impacts can be found to a maximum depth of at least 18.3 m (BH725).

**Q32:** What are some of the other remedial options?

**A:** Several other remedial options have been considered, including bioremediation, in-situ chemical oxidation, as well as additional mechanical options, such as a collection trench. There are other options available to us, such as directed groundwater recirculation, which may become more likely after we see the results of the latest round of investigation.

**Q33:** How current is the data which was presented at the community meeting?

**A:** The data presented during the community meeting was current to 2013.

**Q34:** How many monitoring wells?

**A:** Please see the answer to Q22.

**Q35:** When will the wells be drilled?

**A:** Please see the answer to Q27.

**Q36:** 1239 – 16A Street. What is the red dot in front?

**A:** Please see the answer to Q18.

**Q37:** Regarding having access to my yard-what is the advantage or disadvantage especially, with respect to the re-sale property?

**A:** We are not aware of any effects on the resale value of homes within the area related to drilling on private property. This answer would be better addressed by a qualified Realtor.

With respect to advantages or disadvantages of having access to your yard (assuming that this is to install a monitoring well), the main advantages will include a more complete picture of the plume and existing subsurface conditions. The data will allow Sears and Clifton to make better, more informed, decisions regarding the remediation of the Site. Gathering data at certain locations may allow the remedial program to be accelerated, based upon the data collected. Disadvantages will include some temporary inconvenience, short term noise, some temporary effects on the yard and/or fencing. In that case, all damages will be immediately fixed by Sears.

**Q38:** We are concerned about obtaining development permits from the City Planning Department, with respect to the contamination within the Site. Can you comment on this?

**A:** To our knowledge, the City of Calgary has not challenged any permits. We have been working with the City of Calgary on this project and will be informing the residents of any information we receive from the City pertaining to this issue. We are currently discussing the idea of tagging properties in the area; if a home is taken down or removed, Sears would be notified. This would ensure that an opportunity to collect soil and groundwater samples while the structure is removed would not be missed.



**Q39:** We are concerned about a conditional sale that may fall through due to perceived or real contamination concerns. Can you comment on this?

**A:** This question is best answered by a qualified Realtor. However, there has not been any identified risk to Hounsfield Heights' area residents from the plume. More assessment data will be collected to confirm that there is not any risk.

**Q40:** How many monitoring wells are planned?

**A:** Please see the answer to Q22.

**Q41:** When will all of the wells be in place?

**A:** Please see the answer to Q27.

**Q42:** In the "best case," when will all strata be free of HC's?

**A:** Please see the answers to Q13 and Q30.

**Q43:** Have you considered injection/producing wells to inject/retrieve a surfactant?

**A:** Please see the answer to Q29.

**Q44:** When will all invaded strata be mapped?

**A:** Please see the answer to Q28.

**Q45:** What responsibility is there for homeowners to disclose information related to the environmental concerns within the community in a property transaction?

**A:** This question is best answered by a qualified Realtor.

**Q46:** Will the PHCs within the subsurface migrate towards, and impact, the Bow River (over 1500 m away)?

**A:** This is highly unlikely. Sears will continue to monitor the movement of the plume and remediate the Site. If the plume appears to be in a position to continue to migrate to that distance, additional remedial options would be implemented to prevent this from occurring.

**Q47:** Why was the plant shutting down so often since it first begun operating?

**A:** When the DPVE system shuts down, this is a safety mechanism to keep from permanently damaging components of the system. The reason for the shutdown is then identified, and repairs made, or in the case of frequent shutdowns for the same reason, a modification to the system may be proposed to eliminate the cause of the shutdowns. The DPVE system has been continuously operating since March 2014. During the previous three years of operation, the system underwent various maintenance, repairs, and modifications due to the hydrogeologic conditions at the Site. This is normal; but, it is only non-operational while maintenance and repairs are being performed.

**Q48:** Why is air monitoring being done in my house? If we say yes, how much do we have to be involved?

**A:** Having an Indoor Air Quality assessment within your home is not a requirement and residents have every right to forgo this option. Should you want an IAQ assessment and should it be warranted, you

will be contacted and the entire process would be explained in detail, along with proper documentation provided. If contacted, your involvement would mainly entail removing some potential source areas from your home, and allowing Clifton representatives access to install and remove the air sampling equipment over a 48-hour period.

**Q49:** Can Sears sell the property and with it, the environmental liability?

**A:** No, the person responsible cannot sell the environmental liability with the property. Further questions should be directed to an environmental attorney.

**Q50:** Will the Alberta Government take over this Site?

**A:** No, the Alberta Government does not have any plans to take over the Site. In Alberta, we believe those responsible for contamination should be held liable for clean-up. To date, Sears has been cooperative working with AESRD to address this environmental concern.

**Q51:** We can't seem to find info on the Environmental Site Assessment Repository, can you create a link for the community to obtain this information?

**A:** The link to the ESAR was posted on the community website in August 2014.

**Q52:** Will AESRD accept Monitoring Natural Attenuation (MNA) as a viable remedial option at the Site?

**A:** Many remedial options are being assessed as their applicability at the Site. It is likely that an approach of multiple remedial options may be required or used at the Site, of which, MNA may be one.

**Q53:** We bought our house two years ago and there was no indication of the environmental concerns within the community; there is simply no system to find out. We feel information should be available to all potential purchasers. The City should have a document on their website. Can you comment on this?

**A:** Information is available through AESRD and the ESAR, where a Realtor can inquire on any potential environmental concerns. However, residential real estate agents often do not look into this information in as much detail as a commercial real estate agent would. This particular issue has been long term and well publicized within the community. That being said, there has never been any identified environmental risk to the residents of the Hounsfield Heights area as of the date of the Updated SMP (2014).

**Q54:** Are realtors required to disclose info on contamination?

**A:** This question is best answered by a qualified Realtor.

**Q55:** 11<sup>th</sup> Avenue and 15<sup>th</sup> Street, after the LRT was put in place, the sump pumps did not seem to work anymore, and the groundwater table was lowered.

**A:** We will keep this in mind when looking at the next data set.

**Q56:** Why did it take so long for the remediation to begin if the release was in the 1970s?

**A:** Please see the responses to Q5, Q6, and Q10.

**Q57:** Sears needs to do a better job to communicate with the community. Can you comment on this?

**A:** The revised communication plan will be much more effective and create clear lines of communication between the community, Sears, Clifton, AESRD, AHS, and the City of Calgary.

**Q58:** Have you considered using tracers at the Site to determine preferential flow paths?

**A:** Tracers have been considered; however, at this point in time, the value of using tracers to track flow pathways would not be quick or beneficial.

**Q59:** How long will it take for new monitoring wells to stabilize after they are installed?

**A:** It is anticipated that once the wells are developed after installation, they will be stable. The development of a monitoring well can take several hours to several days, depending upon how much water is produced, and stratigraphy.

**Q60:** Who can I contact if I notice wells they are damaged or broken and need repair that may pose a safety concern?

**A:** Please contact Stephen d'Abadie at [stephen\\_dabadie@clifton.ca](mailto:stephen_dabadie@clifton.ca) for any such concerns. These issues are extremely important to Sears and Clifton and will be dealt with immediately.

**Q61:** Where can I get historical reports on the work completed in the neighborhood?

**A:** Please see the answer to Q51.

**Q62:** Who is Intrinsik and what do they do?

**A:** Intrinsik is a professional services firm specializing in providing superior toxicology advice to Clients across a wide range of industries. Intrinsik is recognized as a leader in toxicology, risk assessment, and risk management consultation in Canada and around the world, covering a range of services areas from environmental to pharmaceuticals and biotechnology.

**Q63:** What is the significance of the zones presented in the figures at the community meeting? Is there any risk now? Did the guidelines go up or down?

**A:** The original significance behind the zones was to break the Site into three separate risk areas. However, these zones were never maintained in the final version of the original HRA. The zones then became a way of breaking down the Site into more manageable areas to aid in interpreting data against the Site-specific guidelines. The idea of the zones will likely be abandoned moving forward, as risks will be defined for the entire community within the Site area. We have the option to apply zones in the future if we find it useful.

As part of our new work plan, we will be gathering more information and revising our Health Risk Assessment based on the updated AESRD guidelines and procedures for risk assessment calculations. According to the data currently available to us, there is no risk to the residents within the Hounsfield Heights area.

**Q64:** Does the potential exist for our surface vegetation (grass, shrubs etc.) to have PHCs in it?

**A:** The vegetation existing within the Site area is unlikely to contain PHCs. In general, the chemical properties of PHCs prevent their uptake into the plants themselves.

**Q65:** What is the purpose behind redoing the HRA?

**A:** The purpose behind completing the revised HRA is to calculate Site-specific risk guidelines based on the updated AESRD regulatory changes and more recent risk assessment procedures. The original HRA was completed based on the 2001 AESRD Guidelines that were available at that time and is now almost ten years old.

Again, on behalf of Sears, thank you for attending the Community Meeting held on 27 May 2014.

If you have any additional questions or comments, or require further clarification on the answers provided above, please contact your Hounsfeld Heights – Briar Hill Plume Committee representatives, or Mr. Stephen d'Abadie of Clifton, directly ([stephen\\_dabadie@clifton.ca](mailto:stephen_dabadie@clifton.ca)).