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May 8, 2020
File: 1227-103.00

James Bar, Mpl, MCIP, RPP.
Senior Planner
Planning Building and Licensing Department
City of Kingston
1211 John Counter Boulevard, Kingston, ON

Subject: Comments on 2nd Response to Technical Comments,
Proposed Unity Inn & Spa, 2285 Battersea Road, Glenburnie,
Ontario K0H 1S0

Dear Mr. Bar:

Malroz Engineering Inc. (Malroz) is pleased to present our comments on the response to our draft Peer Review for the proposed Unity Inn and Spa. We were furnished with the following documents by you in response to our Peer Review and public comments:

1. *Response to 2nd Draft Technical Comments from Malroz Engineering Inc. Hydrogeological Study – Proposed Unity Farm, Inn and Spa, 2285 Battersea Road, Kingston, Ontario,* prepared by ASC Environmental Inc., dated January 27, 2020, File: ASC-458 103l.

2. *Email: 2285 Battersea Road,* from ASC Environmental Inc., dated April 20, 2020.

The purpose of this review was to evaluate responses to our Peer Review comments dated October 23, 2019, and two questions from the public in Document 2. We understand that the proponent's consultant has initiated their monitoring program including both onsite and offsite wells.

1. Comments

We have reviewed the response to our peer review and the public comments in Document 2. We offer the following comments for your review and consideration. The comments are organized in the same numbering as our original review. The italicized text is our original comment and supplemental discussion from prior review, followed by our current comment based on the proponent's response. Comments 2, 6, 7, 8 and 9 were previously resolved as noted in our October 23, 2019 letter and are not shown below. Evaluation of the public comments follows our Peer Review comments.

Servicing Options

1. *On Page 7, second-to-last paragraph of the hydrogeologic study, the consultant identifies that for the long-term provision of private on-site services from groundwater, it must be shown to be safe and sustainable. The consultant further identifies that trucking of water, to site, will be undertaken to supply water for certain aspects of the proposed development. The proponent should outline all water supply needs for the site and evaluate the provision of onsite services to support the full proposed development.*

   October 23, 2019, additional comment:

   The consultant provided additional detail on the water usage for Phase I, II and III of the development using wastewater flows from the Ontario Building Code (OBC). This included details on the initialization of water takings that are proposed to be phased in at 15,000 litres/day into storage onsite storage tanks of approximately 50,000 litres.

   Peak daily water usage from all three phases appears to total approximately 61,000 litres.

   The proponent should outline which water uses in the Theoretical Flow Calculations are part of what phase of the development.

   The Theoretical Flow Table should link the identified Building Parts to the occupancies specified in OBC Table 8.2.1.3.B. We understand the City plumbing department is evaluating the Theoretical Flows and building uses and the table may be subject to further revision based on that review.

   The spa make-up water should be included in the flows.

   Considering the Building Part in the Theoretical Flow Calculations include uses where grey water use may not be permissible, such as for potable water, it is unclear where and how grey water will be reused within the system to mitigate water takings. The consultant must detail how and where the grey water will be reused to justify whether 30% diversion and reuse is expected to be feasible.

   The net daily flow volume does not include spa make-up water, which would be supplied via the well water distribution system and should for the purposes of evaluating peak daily water usage.

   Our understanding is that the development is proposed in stages and as a result the peak daily flow contemplated in the report may not be possible until full buildout of the proposed uses in the Theoretical Flow Calculation Table. Considering the

Phasing of the development and the anticipated water demand we recommend that a monitoring program during the operations phase of the development include metering of groundwater extraction, wastewater treatment, and grey water usage, on a daily basis.

The consultant provided an updated summary table of water uses at the site. This included a further description of recycled water usage, craft winery/brewery/cidery, hotel cabins and inclusion of the spa daily make up water volume. Even without water recycling, the peak usage, for all contemplated phases of development, is reportedly below 50,000 litres per day and would not require a Permit to Take Water (PTTW). As well the consultant has indicated that the summarized water usage is not anticipated to occur each day and represents a peak water usage.

As part of the operations phase of the development the consultant has identified that metering of groundwater extraction, wastewater treatment and treated water will be completed.

The comment has been addressed.

Groundwater Quantity

3. *Section 1.4 of the hydrogeological study identifies a peak daily water demand of 75,375 litres, in accordance with the Ontario Building Code. The report further identifies that 29,960 litres per day will be recycled, resulting in a peak daily water taking from groundwater of 45,415 litres.*

   During the site visit, the proposed development was identified to include a brewery, a winery and potentially an open loop groundwater geothermal system. The hydrogeologic study considered for this review does not evaluate for a water demand beyond those outlined on Page 4, in the Table titled 'Anticipated Flow Calculations Based on Site Use for Phase 1 and Phase 2 of Development' which does not include a winery, open loop geothermal system or brewery.

   The anticipated flow calculations indicate that the spa, with bathhouse, showers and toilets, will have a demand of 150 litres per day. This appears to be low and the peak number of patrons to the spa should be re-evaluated.

   Page 37, item 8, identifies that the re-use water will supply toilets and laundry. Supporting calculations on the demand for toilet water is not provided (laundry is shown as 7,500 litres per day) and should be included.

   A Permit to Take Water (PTTW) from the MECP is required for water takings of 50,000 litres or more in any 24 hour period. As well, both closed and open-loop groundwater geothermal system can require approvals and/or licensed installers though the MECP.

Considering the site is projecting a peak of 45,415 litres per day of groundwater takings and that there are potential additional water supply needs for tubs, a brewery and winery, or other uses, the proponent should consider the requirement to obtain a PTTW and other approvals. Should additional groundwater uses beyond those identified on Page 4, in the Table titled 'Anticipated Flow Calculations Based on Site Use for Phase 1 and Phase 2 of Development', further adequate study should be undertaken.

October 23, 2019, additional comment:

Clarification was provided in comment one on the anticipated daily water takings for the proposed uses of Phases I, II and III of the development, including the spa, winery and brewery. Furthermore, the consultant identified that an open loop groundwater geothermal system is not proposed for the development.

On page 7 of the report the consultant identified that upon commencing operations, water taking will commence at approximately 25,000 litres per day. On page 2 the report identifies that initial water takings for storage purposes will be approximately 15,000 litres per day. The consultant should clarify the noted flows, though both water takings are below the volumes triggering a Permit to Take Water.

The consultant concurred where water takings are above 50,000 litres per day a PTTW is required. Considering the request for a break down in what uses are proposed for each phase of the development, it is unclear if the initial water demand, excluding the contemplated grey water re-use is anticipated to be in excess of 50,000 litres per day or not. As noted in comment one, an operations phase monitoring program should include metering of total daily water taking.

Additional description of the start up water takings was provided by the consultant. And considering the additional information provided regarding the water takings in comment one and the consultants concurrence regarding metering of water takings this comment is resolved.

4. *Page 44 recommends a groundwater monitoring program for during and post-site development. However, a detailed monitoring program was not provided in the report. The proponent should provide a proposed monitoring program for review. The monitoring program should include a protocol for responding to water taking concerns from the construction phase and operations phase of the development.*

   The consultant has provided an outline of a groundwater monitoring program during construction and post-development.

   The monitoring program should clarify which off-site properties are within the area of the program and the proposed number of wells off-site that the consultant is

proposing to monitor. We understand this may be a sub-set of representative wells in the monitoring area.

October 23, 2019, additional comment:

The consultant should identify which on-site wells will have loggers installed in them.

The monitoring program should include metering of total water takings by well, from the on-site wells on a daily basis, including the time the measurement is recorded.

The program is noted as one to two years on Page 8 and two years on page 9. Clarification is needed about whether this time period begins from initial operations, or following completion of all development phases. Considering the anticipated increase in groundwater takings as additional phases are developed, we anticipate this is two years following the final phase operation. Alternatively, it may be discontinued when superseded by a MECP mandated monitoring program, if a PTTW is subsequently issued for the water takings at site.

Consideration should be given to off-site groundwater sampling at the initiation of the monitoring program from a sub-set of off-site wells to establish baseline water quality measurements.

The consultant provided additional information regarding the metering of water during the operations of the site in comment one. Further information regarding the monitoring program was provided in the consultant's letter, including, the number of off-site wells and their general location as well as the specific on-site wells that are included in the monitoring program. Clarification that the monitoring program will continue until two years following completion of the final phase of development.

Considering the additional information provided by the consultant, the comment has been resolved.

5. *Groundwater monitoring in on-site and off-site wells was undertaken as a part of the hydrogeologic assessment. The following details should be provided in the pumping test and water level monitoring data tables (eg: Appendix F) to facilitate evaluation:*

    i. *water level measurements from a datum (eg. metres below ground, metres below top of casing, etc.),*

    ii. *depth of well,*

iii. clarification regarding the units of numbers stated in cell following "pumping started at".

October 23, 2019, additional comment:

The consultant provided additional documentation in the response report.

Table D3 should include whether the datum for water level measurements was the top of the well casing or ground surface.

The Groundwater Elevation table showing monitoring in August, September, November, December and January with data from on- and off-site wells indicates that the elevations are referenced to a geodetic datum. The consultant should clarify how the geodetic elevations were determined.

An updated Table D3 and further description on the determination of well elevations was provided. This comment has been addressed.

2. Public Comments in April 20, 2020, Email

We have reviewed the two public comments and responses from ASC and have the following comments.

ASC reports reviewing the concern with Mr. Kyle Stephenson, who is a Technical Support Services hydrogeologist at the Kingston, Eastern Region, Ministry of the Environment Conservation and Parks office. Based on the discussion with the MECP and ASC's experience, ASC report that they are unaware of uranium concerns in groundwater for the area.

ASC note that the reverse osmosis treatment was proposed for aesthetic parameters. Concentrations of sodium and chloride were observed to decrease during the 48 hour pumping test, therefore ASC report that reverse osmosis water treatment may not be required.

The recommended monitoring program includes measurement of daily totalized water takings. Further, water takings of more than 50,000 litres in a 24 hour period here would require a Permit to Take Water (PTTW) from the MECP, which the proponent has identified. Considering the nature of the proposed site operations being open to the public, we anticipate that the potable water will be a regulated drinking water system.

Considering the monitoring program, the regulatory requirements regarding water takings, and the regulation of the potable water supply, we are satisfied that the public comments have been reasonably considered and addressed.

3. Summary

Our proposal to undertake this peer review included three criteria that were to be considered:

i. *if the hydrogeological work completed by the proponent's consultant team satisfactorily evaluates groundwater quantity, quality and interference to existing or future neighbours*.

In our opinion considering the work undertaken to date, including responses to the Peer Review comments and proposed implementation of a monitoring program, the hydrogeological work completed by the proponent's consultant team has satisfactorily evaluated groundwater quantity, quality, and interference to existing or future neighbours.

ii. provide a conclusion as to whether we agree or disagree with the proponent that the hydrogeological conditions are appropriate for the proposed development water takings and servicing options.

The proponent's consultant has reasonably addressed our Peer Review comments, in our opinion. The analyses completed to date by ASC indicate that the hydrogeologic conditions are suitable for the proposed development as outlined in ASC's January 27, 2020, letter.

iii. provide a conclusion as to whether we agree or disagree with the proponent's analysis, assessment, results, conclusions and recommendations.

The proponent's consultant has reasonably assessed the site, supported their conclusions, and provided suitable recommendations for the proposed development.

4. Closure

This peer review is based on the site visit and documents provided to Malroz by the City. We recommend that the development as contemplated in ASC's January 27, 2020 letter and the associated recommendations provided in their technical reports be included as conditions as a part of the proposed development.

We remind the reader that the purpose of the peer review was to assess if the proponent has used generally accepted practices to support the conclusions of the hydrogeological study. The peer review is not an audit and as such is not intended to detect facts that were concealed, or omissions in the report. Unless otherwise stated, the peer review does

not consider local By-laws, nor does it represent a legal opinion regarding compliance with laws, regulations, and/or guidelines.

We hope this process has been helpful. Please do not hesitate to contact the undersigned if you have any questions or concerns.

Yours truly,

Malroz Engineering Inc.

PROFESSIONAL GEOSCIENTIST
JOHN ROBERT PYKE
PRACTISING MEMBER
1855
ONTARIO

per: John Pyke, P.Geo.
Environmental Geoscientist

Encl. *Email: 2285 Battersea Road,* from ASC Environmental Inc., dated April 20, 2020.

Bar,James

From: Paul <paul@ascenvironmental.ca>
Sent: Monday, April 20, 2020 3:36 PM
To: Bar,James
Cc: 'Benjamin Pilon'
Subject: FW: 2285 Battersea Road, Kingston

Good afternoon James,

Please see email below that I had sent to Ben Pilon commenting on the two questions you had forwarded for response.

Take care,

Paul N. Johnston, MSc, PEng, QP_{ESA}
President
ASC Environmental Inc.
1305 Princess Street
Kingston, ON K7M 3E3

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ASC ENVIRONMENTAL INC.

From: Paul <paul@ascenvironmental.ca>
Sent: Monday, April 20, 2020 2:56 PM
To: 'Benjamin Pilon' <ben@bpegroup.ca>
Cc: 'Brad Vanderhaar' <brad@bpedevelopment.com>
Subject: 2285 Battersea Road, Kingston

Good afternoon Ben,

Please see our response to the City's questions in red.

We understand that the City has requested a response to the following questions. Our response follows each question.

- *I note that uranium was not one of the chemical parameters tested for, at least it was not reported. I have been advised that wells of this depth should be tested for uranium.*

Speaking with Mr. Kyle Stephenson, P.Geo. from the Kingston Ministry of Environment Conservation and Parks (MECP), he indicated that the Ministry is not aware of uranium concentration concerns in groundwater in the Battersea/Unity Road area of Kingston.

ASC Environmental is also not aware of uranium concerns in the groundwater quality in the Battersea/Unity Road area of Kingston.

- *The Hydro-G study states that ``Reverse osmosis will be required to treat the elevated sodium and chloride concentrations.` You are no doubt aware that reverse osmosis produces a significant amount of waste water in the process of producing treated water. In the most efficient systems three to four litres of water are required to produce one litre of treated water. It does not appear that this waste water has been factored into the flow calculations.*

The Guidelines for Canadian Drinking Water Quality and Ontario Drinking Water Standards set an aesthetic objective of 200 mg/L for sodium. This is an aesthetic limit and not a maximum acceptable concentration (MAC) limit. The health-related limit for sodium of 20 mg/L is a "warning level" only and where this level is exceeded it is recommended the local Medical Health officer be notified in order to alert individuals with relevant medical conditions. Sodium is not toxic.

Results from test well TW 1 during the 48 hour pumping test showed sodium and chloride concentrations steadily decreasing in the water supply; with chloride concentrations below the ODWS aesthetic objective and sodium concentration just slightly above the aesthetic objective at the completion of the pumping test. With well development and use it is apparent, based on the 48 hour pumping test, that the aesthetic objective may likely be met for sodium for test well TW1.

During the pumping test, over the final 30 hours, test well TW1 showed a drawdown of only 0.1 m, indicating sufficient long term yield to support the proposed development, and therefore, with supply/storage options during off-peak times, sufficient long term water supply has been demonstrated for test well TW1, with sodium concentrations approaching aesthetic objective and chloride concentrations below the aesthetic objective. On this basis, reverse osmosis treatment may not be required where aesthetic objectives for these parameters are met.

Please contact me if you have questions.

Regards

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