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Item No. 14.2.1
Halifax and West Community Council
May 15, 2018

TO: Chair and Members of the Halifax and West Community Council

SUBMITTED BY: ORIGINAL SIGNED
Shirley Jollimore, Chair of Western Common Advisory Committee

DATE: April 23, 2018

SUBJECT: **Further Ecological Testing on the Groundwater at the Ragged Lake Composting Facility**

ORIGIN

Motion from the March 28, 2018 Western Common Advisory Committee meeting.

LEGISLATIVE AUTHORITY

Section 5(a) of the Western Common Advisory Committee Terms of Reference:

*The Municipality's management of the Western Common will be guided by the following objectives:
(a) protection of valuable ecological and cultural assets.*

RECOMMENDATION

The Western Common Advisory Committee recommends to Halifax and West Community Council request a staff report on further ecological testing being performed on the groundwater at the Ragged Lake Composting Facility site, in concurrence with the recommendation put forward in the Stantec report, as outlined in the correspondence from Peter Lund dated March 23, 2018.

BACKGROUND

The Western Common Advisory Committee received correspondence from resident, Peter Lund dated March 23, 2018 regarding a review of groundwater and surface water quality near the Ragged Lake Composting Facility at their March 28, 2018 meeting.

DISCUSSION

The Committee discussed the details of the May 23, 2018 correspondence and Peter Lund's concern that there appeared to be gaps in the groundwater and surface water quality testing data regarding the potential impacts of leachate. As explained in Peter Lund's correspondence, that while there does not appear to be adverse effects to date, there is a potential that future adverse effects may arise. Pursuant to such, the resident concurred with the recommendation in the Stantec report that further testing be conducted at the Ragged Lake Composting Facility site. The Committee agreed that further ecological testing on the groundwater at the Ragged Lake Composting Facility site should be performed.

FINANCIAL IMPLICATIONS

The financial implications will need to be identified by staff in a future report.

RISK CONSIDERATION

Risk considerations will need to be identified by staff in a future report.

COMMUNITY ENGAGEMENT

The Western Common Advisory Committee is an advisory committee to the Halifax and West Community Council and is comprised of six members of the public and one appointed member of Halifax and West Common Council. The meetings are open to the public and the agendas and minutes are posted online in advance of the meeting.

ENVIRONMENTAL IMPLICATIONS

The environmental implications will need to be identified by staff in a future report.

ALTERNATIVES

The committee did not provide alternatives.

ATTACHMENTS

1. Correspondence from Peter Lund dated March 23, 2018

A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/cagenda.php> then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 902.490.4210, or Fax 902.490.4208.

Report Prepared by: Krista Vining, Legislative Assistant, Office of the Municipal Clerk, 902-490-6519

Peter Lund, P.Geo

Dartmouth, NS

March 23, 2018

Mayor and Halifax Regional Council
1841 Argyle Street
Halifax, NS B3J 3A5

Attention: Clerk's Office

Re: Ragged Lake Composting Facility: Review of Groundwater and Surface Water Quality

Dear Mayor and Councillors,

I have reviewed available groundwater and surface water analytical results contained in several summary reports for the purpose of determining whether the groundwater and/or surface water have been impacted over the years the aerobic composting facility has operated, currently by AIM Environmental Group, at 61 Evergreen Place in Goodwood.

I have concluded that both groundwater and surface water exhibit evidence of impacts from the operations. That is not say that there are real adverse effects to the receiving environment, however, the potential is there. The groundwater beneath the building on-site at MW-2 (as shown on Figure 1 attached) has elevated temperature, conductivity (1,100-2,900 uS/cm), Chemical Oxygen Demand (COD with values reported in the range of 80-190mg/L), Dissolved Organic Carbon (DOC) with values reported in the range of 34-64 mg/L, Total Dissolved Solids (TDS) with values of 542-1,100mg/L reported, along with elevated chloride (280-690mg/L) and iron 69-4,300ug/L. The background monitoring well MW-1 reports much lower values for these parameters (Conductivity 290-310uS/cm, COD <5-28mg/L, TDS 160-183mg/L, chloride 5-8mg/L and iron <50ug/L). The downgradient monitoring well MW-9 also reported elevated conductivity 1,200-1,700uS/cm, COD 59-210mg/L, DOC 32-64mg/L, TDS 767-1,160mg/L and iron 340-27,000ug/L. These results indicate biological activity in groundwater beneath the floor of the facility, likely attributable to leachate leakage.

The one surface water sample location SW-8 located downgradient of MW-9 and the facility reported surface water guideline exceedences of iron with values of 310-661 ug/L reported in the Stantech report. Unfortunately, one cannot read the analytical results in the Englobe report for the parameters discussed above for the groundwater (due to black highlighting, very small print size and poor quality reproduction). Based on reported elevated iron in the surface water, it is likely the other parameters are also elevated.

Deficiencies in the annual monitoring program include:

- (1) There is no upstream surface water sample. There is a ditch sample location (SW-3) which exhibits elevated parameters. There should be a sample location along the stream upgradient of the subject property, although from the description provided in Comment (6) below, this may not be easily achievable.
- (2) The surface water samples were collected twice yearly in June and December. This is not typical of when samples should be collected to provide meaningful results. Typically,

surface water samples are taken after snowmelt in the spring (April), again during low flow late summer (August) after a rainfall event and after a high rainfall event in the fall (November). There is no mention of the setting where the samples were taken, nor mention of weather conditions at the time of sampling .

- (3) There are relevant indicator parameters not measured, eg. Biological Oxygen Demand (BOD) and Dissolved Oxygen. It is obvious, from the other parameters for which there are elevated results, that there is biological activity in the groundwater from leachate escaping beneath the facility floor that could release toxins and consume oxygen required to sustain life in the receiving downstream environment.
- (4) The reports do not describe depths to groundwater, nor groundwater flow direction. I determined from one set of groundwater elevation data provided in one of the reports that groundwater flows north-northwesterly toward the unnamed stream illustrated in Figure 1 (attached). This figure was the only one available in the reports I reviewed. There is no mention of calculated groundwater flow velocities, bedrock geology and overburden type and thickness. From available mapping and embankment exposures along Evergreen Place, the bedrock is granite and the overburden is granular silty sand (highly permeable) likely thinly overlying the bedrock.
- (5) It is noted that the highly used public trail that has been in existence for decades, commonly referred to as the "Old Pipeline Road", is not shown on the figures in the report, so I plotted its approximate location on the attached Figure 1 along with culverts beneath the access road to the subject facility. Of noteworthy mention is that **the "proposed trail" shown on Map 3 of the March 6, 2018 HRM staff report corresponds to this existing well used "Old Pipeline Road"**.
- (6) There is no physical description of the receiving stream, eg. width, depth, flow and direction it flows. As a result, I visited the stream on March 20, 2018 as it flows beneath the Old Pipeline Road and found it to be continuously flowing. Attached is a photo I took of the north flowing stream. Based on topographic maps and real time Google aerial views, this stream appears to originate from a small wetland (should be verified in the field) situated at the dead end of Evergreen Place road (as illustrated on Map 3 of the HRM staff report to Regional Council dated March 6, 2018). From there the stream flows north-northeastward as shown on the attached Figure 1 and Map 3 in the staff report, then northward beneath the Old Pipeline Road (corresponding to surface water sample location SW8 I think) and from there through a moderate sized natural bog type wetland (as shown on Map 3 of staff report). From there the stream picks up outflow from Ragged Lake, then flows northwesterly to Blueberry Lake which outlets to the south into a stream that flows to Big Indian Lake, which I understand comprises the upper reaches of the Prospect River system.
- (7) Of note is that the real-time Google aerial view shows the stormwater pond at the north perimeter of the subject composting facility containing visible iron-laden silty water. Based on topographic mapping, the subject facility is situated in the headwaters of the aforementioned stream. As a result, shallow groundwater discharge to the stream from beneath the subject facility would be most impacted after a rainfall in late summer months. As mentioned earlier in this letter, no surface water samples were collected for analyses in late summer. Also of note is that there is no monitoring well positioned between the subject facility and the stream where I have GW flow arrows shown on the attached figure.

The on-site drinking water well exhibits elevated uranium which is common in the region due to uranium inherent in the granitic bedrock. The well does not appear to be impacted by the on-site composting operations, however, that is not to say it will not become impacted in the future.

I concur with the recommendation put forward by Stantech that an ecological assessment should be completed to determine whether there is an adverse effect on the receiving environment as a result of reported guideline exceedences and elevated indicator parameters in the surface water and groundwater. This assessment is particularly important considering the stream flows through a fairly moderately sized natural wetland. I understand precedent has been set in the past for the municipality to require such environmental assessments without the requirement to consult with provincial authorities.

Based on groundwater chemistry results, the groundwater beneath the site will undoubtedly remain impacted for some time into the future even if better housekeeping measures are implemented. Considering the high permeable overburden on the subject property and existing groundwater/surface water quality results, expansion of the facility will undoubtedly place greater risk to the receiving environment, considering leachate generated at the processing facility appears to be escaping to the groundwater beneath the floor of the facility.

[REDACTED]

Sincerely,

[REDACTED]

Peter Lund, P. Geo

Cc: Western Commons Advisory Committee

Five Bridges Wilderness Heritage Trust Board



Stream crossing beneath Old Pipeline Road (suspect at SW8)

