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REPORT REVIEW

Background

EOC Environmental Odour Consulting Corporation (EOC) was requested by the Huron County Planning & Development - Town of Goderich (the Town) to review the report: "Odour Impact Assessment for Medical Marihuana Growing Facility 199 Anglesea Street, Goderich, Ontario- Prepared by BCX Environmental Consulting." (called OIA Report) issued in June 2020.

To support the OIA report review, two documents were also sent for evaluation:

1. ORTECH Consulting Inc: "Valley Environmental Services Inc. Odour Detection Threshold Values (ODTV) Analysis of Air Samples" prepared on June 23, 2020.
2. ORTECH Consulting Inc: "Odour Panelist Screenings with n-butanol"

According to BCX Environmental Consulting (BCX) the purpose of the study was to provide technical input to support the facility's minor variance applications.

The OIA Report includes the results of the dispersion modelling analysis performed for the Medical Marihuana Growing Facility, 11434756 Canada Ltd. (known as the facility) located at 199 Anglesea Street in Goderich, Ontario.

Dispersion modelling analyses were based on emission data obtained from one day of odour testing at the facility. The testing was performed on June 11, 2020 by Valley Environmental Inc. (Valley) and their full report, "Odour Source Testing Report" is included in the OIA Report as Appendix B.

Odour evaluation on collected by Valley samples was performed on June 12, 2020 by ORTECH Consulting Inc (ORTECH).

Two other supporting documents refer to the odour analysis performed by ORTECH Consulting Inc.

The facility is located on the east side of a multi-tenant building. The property is zoned as light Industrial M1 in the Town of Goderich Zoning-by Law No.124of 2013 (Town).

Odour testing included collection of odour samples at selected vents directly vented from inside the facility to the atmosphere through carbon filters.

The Lung odour sampling procedure was used to collect odour samples at four horizontal vents (marked in the testing report as Carbon Filters 1-4 or L-1, L-2, L-3, L-4) followed by analysis of the samples by an olfactometer in conjunction with an odour panel to determine the odour concentrations. Odour evaluations were performed the next day in the afternoon at ORTECH's facility.

The sources where the samples were collected were all point sources. No other odour sources such as fugitive sources (doors, windows, trucks) were included in the testing program.

The volumetric flowrate was determined once at each tested vent.

One field blank was collected by the end of the program and the odour concentration for that blank was reported as 125 ou. No other blanks for odour equipment collection or laboratory blanks were taken. No air blanks were introduced during panel evaluation.

Several assumptions were made in the OIA report including that odour emission rates were the same for all existing eight vents. They were reported to have odour emission rates as 101.12 ou/s per vent.

Odour emissions rates were used in dispersion modelling analysis to predict odour concentrations at selected 42 off-site sensitive receptors. One receptor was selected inside the facility at the main door of the building.

Odour dispersion modelling (AERMOD version 19191) was performed by BCX and was based on five-year (2015-2019) surface observation data from the Goderich Airport (WMO St. No. 7126100) upper air data from Detroit Airport (WMO St. No. 04830) and land use information within a three-kilometre radius from the site.

According to the BCX Report: "The Facility meets the Ministry's Odour Guideline at all off-site representative sensitive receptors and at the main entrance of main building, when the facility operates at its allowable limit of 1700 plants. Very infrequently, odours may be

noticeable on-site at the main entrance. Very infrequently, odours may also be detectable off-site to the east of Cambria Road North and to the south of Anglesea Street."

The review of the odour impact report and the supporting two documents, provided in Attachments 1,2 confirms that the dispersion modelling results are not reliable and are possibly underestimated. The odour sampling and analysis procedures did not follow the Ontario Source Testing Code (OST Code).

The assumption made in terms of odour emission rates, and the selection of sources for testing were not appropriate. Since all analyses were performed after 24 hours from collection of the samples, all odour results are considered not reliable.

Therefore, all results from the program should not have been used for the odour impact assessment.

Summary of Conclusions:

Overall, it is concluded from the review that:

All presented data in the reports are not reliable due to:

- Not following OST Code during source testing including the number of collected samples per source, odour panel evaluation timing, criteria for selection of panelists, time of the collection for the field blank, and the estimation of the odour emission rates for each individual source.

- Not testing at all individual odour sources. Only four-point sources were selected for determination the total odour emission from all eight-point sources (vents.) There is no mention of selection of the sources, which mostly were either located at the corner of the building/landlord repair shop or close to the doors. There is no indication on assumption that all eight vents would emit the same odour. No process data were provided with indication that all eight vents are covering the same area in terms of the process, number of plants, strain, and age of the plants.
- No dilution used on-site to preserve the integrity of the samples during the period between sample collection and analysis.

- Limiting the odour testing to one day with collection of only six samples (5 at the sources and one field blank)

- Not conducting the testing during hot and humid summer days, or with temperatures above 28 degree Celsius.

- Significant variation of the screening data for the panelists.

- No collection of any blanks for odour samplers used in the program.

- Reporting field blank as high as 125 ou- the odour concentration for blank was higher than the value from collected sample from the source.

The absence of raw odour panel results in the ORTECH report did not allow a complete review of the evaluation procedures and test results. No raw data for each panelist's response reported during panel evaluation and which would include their indications for guessing the correct or wrong answer were provided for the analysis. In addition, no raw data was provided during introduction of the same dilution to the same panelist.

No indication that the laboratory blank was introduced during the odour evaluation.

No data were provided for calibration of the olfactometer including date of the last calibration, velocity profile at the ports on the day of evaluation. Therefore, it was not possible to review this data and confirm that all calibration data were in place.

No indication was given of which panelists were selected for odour evaluation on June 12, 2020. Therefore, it was not possible to review individual screening data for panelists attending a session.

The Lung Sampler method was chosen for collection of odour samples from sources. It is wildly reported in scientific literature that results obtained by the Lung Sampler method are significantly lower when compared with the results of the Dilution method for sampling, therefore the results obtained by the study may underestimate the odour emission rates.

The average odour emission rate for the facility appears to be very low although the process data were not provided in the report. This would include: the age of the plants per area, strain of plants per area, number of plants per area, operation data (growing, drying, trimming areas) located below the tested vents, and other factors which might contribute to odour emissions.

The reported field blank collected outside facility was high. Therefore, there is indication that the odour is present off-site or there was possible cross contamination of the sampling equipment. The field blank was not collected according to the OST Code.

No ambient study was performed to support the source testing and dispersion modelling results.

No operation conditions, including number of present plants, their age, distribution over the area, strain, any process including drying, trimming was provided, therefore the results might not provide reliable results for maximum operating conditions.

The conclusions in this report are stated within a reasonable degree of scientific certainty.

Prepared by

Date: December 20, 2020

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ATTACHMENT 1

Report Review

Odour Impact Assessment for Medical Marijuana Growing Facility
199 Anglesea Street, Goderich, Ontario

Summary of Odour Data and Dispersion Modelling Data

Report Odour Impact Assessment for Medical Marihuana Growing Facility 199 Anglesea Street, Goderich, Ontario

June 2020

1. Introduction

The OIA report describes the results for an odour impact assessment, which was carried out at 199 Anglesea Street, Goderich, Ontario. The odour study included odour dispersion modelling predictions based on one-time odour emission tests performed at four (out of eight) selected point odour sources located at the facility. No other sources during the program were assessed. No ambient studies were performed in the vicinity of the facility. Odour testing was performed on June 11, 2020. During the program only six odour samples were collected for odour evaluations. The odour evaluation was performed on June 12, 2020 in the afternoon.

2. Summary and Conclusions

Using the dispersion modelling approach to determine off -site odour impacts is an appropriate approach. However, that approach could be supported by ambient study.

The odour emission inputs used for the dispersion modelling analysis were based on unreliable data, based on the wrong assumption that the emissions from eight sources (vents) are the same. They were reported as 101.12 ou/s per vent.

In addition, the emission rates were based on one day of sampling without consideration of all emission sources.

Sampling was performed in June when temperatures were not at their highest peak. Only four sources out of eight were tested. The limited sample collection per source did not meet the protocol described in the Ontario Source Testing Code (OST Code) for collection of the samples. Only one sample per source instead of three samples per source was collected with the exception to the one vent when two samples were collected. Samples were

collected undiluted using the Lung Sampler method, therefore they were not preserved for any odour loses.

The odour emission calculations did not follow OST Code. The assumed maximum odour emission scenario was not appropriate. The emission estimation was based on the limited number of samples. Only five samples were collected at the sources during one day of the program.

The odour testing program was not performed according to the OST Code. Therefore, BCX's statement in their OIA Report that, "The odour testing program was completed using the methodologies described in Ontario Source Testing Code" is incorrect. Thus, BCX provided misleading information in their report. The OST Code requires to collect three samples per source.

The assumption and statement, "The concentration obtained by averaging concentration from five collected odour samples is representative emission rate for all eight vents at all times with the maximum operating scenario (1700 plants)" is incorrect.

The odour emission rates are calculated by multiplying the odour detection threshold value (the geometric mean ODTV from three collected samples at the source) and measured volumetric flowrate at that source (wet basis).

All samples were evaluated the next day, in the afternoon, therefore it is expected that degradation of the samples occurred resulting in an underestimation of odour concentrations.

The odour analysis time did not meet the criteria outlined in the OST Code. The odour sampling time also did not meet OST Code Criteria.

Panelists used for odour evaluations had significant variation in the screening over a period of two years. However, no updated screening data was provided for the panelists used on June 12, 2020.

The screening procedure for the panelists used in the odour evaluation did not meet EN13725 Standard/ OST Code criteria for selection of the panelists. Also, the ORTECH approach of using only four panelists instead of eight and by using the same dilution twice to the same panelists did not meet the OST Code criteria. Therefore, the data obtained by only four panelists especially within a wide range of screening results should be considered not reliable. No screening data for the day of evaluation was provided. Therefore, it was not possible to determine if any of the panelists should be disqualified.

Operation conditions during testing were not provided, including any photographs of the inside locations close to the corresponding tested vents. The age of the plants and number of plants inside each section of the building during June 11, 2020 testing were also not provided. The strains of the cannabis present at each area were not provided as well. Therefore, it is unknown if the emission tests performed were during a worst-case operation scenario for this facility.

The result for the field blank was significantly high and was reported as 125 ou. The field blank was higher than one of the collected samples at the source. The field blank was not collected according to the OST Code.

Detailed odour panel operating procedures were provided in a separate document – "ORTECH Consulting Report: Valley Environmental Services Inc. Odour Detection Threshold Values (ODTV) Analysis of Air Samples" prepared on June 23, 2020.

The screening data for the panelists used for the program was provided by ORTECH Consulting Inc's report, "Odour Panelists Screenings with n-butanol."

Based on the review of the odour panel screening data, the panelists had a very broad screening range, with reported values over the limit (20 ppb-80 ppb) according to the EN13725 Standard. Therefore, most of the panelists listed in the report should have been excluded from the panel. The screening did not follow the EN13725 standard.

No raw data with data recorded during odour panel were provided with indication which panelists guessed for each introduced test, therefore comments are not provided for these items.

The statement in the OIA Report, "The odour samples were sent to a certified Ontario odour testing laboratory for analysis on the same day." is incorrect and misleading. The certification of the laboratory was not provided, and the samples were analyzed the next day in the afternoon. Therefore the 24 hours timeline for analysis required by the OST Code was not met.

In conclusion, the AERMOD dispersion model approach is an acceptable method, but it should be supported by an ambient odour monitoring program. All odour emission inputs used in the modelling analysis are not reliable. Therefore, the data obtained from the dispersion modelling are not valid and should not have been used for any odour impact assessments.

3. Background

The AERMOD Dispersion Model (version 19191) was used to determine off-site odour concentrations in 42 sensitive receptors and one receptor located inside the facility. The usage of dispersion models for assessing odour impact was appropriate. However, the input modelling emission data were most likely not reliable. In addition, the modelling results were not supported by any of ambient odour monitoring program such as ambient sampling at sensitive receptors, ambient observations, community odour surveys. The odour emissions used in the modelling program were based on limited odour sampling at the Facility with only testing at selected sources- vents. In general, in order to determine odour emission from any facility, all sources should be considered, and each odour source should be tested according to the OST Code. In case of this program, the odour emissions were not determined for each individual source. All collected samples were evaluated at the olfactometric laboratory, which is an appropriate method. However, during this program all evaluations did not meet OST Code criteria in terms of the time of evaluation, panelists screening procedures and number of panelists used.

4. Executive Summary

BCX stated that the, "The model predicts the facility meets the Ministry Odour Guideline at all off-site sensitive receptors and at the building main entrance, when the facility operates at its allowable limit of 1700 plants. Very infrequently, odours may be noticeable on site at the main entrance. Very infrequently odours may also be detectable off-site to the east of Cambria Road North and to the south of Anglesea Street."

Based on the review of the methodology used for the program, this statement is incorrect. The odour emissions were not estimated correctly, and not in accordance with the OST Code, therefore any data obtained by the program should not have been used for their odour impact assessment. Their filled blank which was collected inside the boundary of the facility was reported to have 125 ou, which at one point was higher than the collected sample at the source. It might indicate that either the off-site odour is well detectable (it could be shown by modelling if proper sampling and analyses were used) or it might demonstrate cross contamination of the system/samples.

The number of exact plants was not provided in the report including the number of plants per area below the tested vent. Any process data were not included in the report. All information should have been included in the report in order to determine if the testing was performed during worst case operating conditions.

5. Process Description

According to BCX's statement, "The facility consists of three sections with a total area of 18,000 square feet and maximum approved capacity of 1700 plants at any time." However,

the process data including the number of plants and their age, strain during the testing were not included in the report.

There are three sections in the building – but no mention how they correspond to the tested vents. It appears that all sampling locations are either at the corner of the building with close proximity to the landlord/shop or close to the doors.

BCX stated in their OIA report that "the carbon filters are regularly replaced." However, there is no indication of how the replacement date was established besides the recommendation of the supplier. There is no mention if any efficiency tests for the carbon filters were performed and what was the optimum time for changing them.

6. Identification of Significant Odour Sources

BCX stated that there are only eight potential odour sources at the facility. They were Identified as STCK 1, STCK 2, STCK 3, STCK 4, STCK 5, STCK 6, STCK 7, STCK8 (Table 2-1 Source and Contaminant Identification Summary). However, in the Source Test Report (Appendix B) provided by Valley the tested sources were identified as L1, L2, L3, L4. It is assumed that source marked as STCK 1 corresponds to tested source L1, STCK 2 to L2, STCK 3 to L3, STCK 4 to L4.

No other sources (doors, windows, truck) were identified as potential fugitive sources.

7. Odour Emission Estimation and Maximum Emission Scenario

According to BCX, "An odour emission inventory was developed using odour source testing data collected at the facility on June 11, 2020. A total of six odour samples including one field blank were taken from four of the eight vents. At the time of the source testing, the facility was operating at its maximum approved capacity of 1700 plants. The odour source testing program was completed using the methodologies described in the Ontario Source Testing Code. The odour samples were sent to a certified Ontario odour testing laboratory for analysis on the same day"

The above-described approach used by BCX is inacceptable based on these facts:

- Limited number of sources tested- all eight vents should be considered for testing and detailed information should be provided about the area below each ventilation system with detailed information about the number of plants, strain, and maturity

- For the collection of samples and analysis, OST Code should be followed. However, based on the review of testing protocol (Appendix B), OST Code was not followed for collection of samples and their evaluation (ORTECH documents)

- Number of present plants on June 11, 2020 with detailed information about their maturity, strain was not recorded. Therefore, it is not possible to determine that the testing was performed during actual worst-case operating scenario, when 1700 plants were present.

BCX also claimed that all samples were sent on the same day to a certified Ontario odour testing laboratory. However, ORTECH's report (see Attachment 2) did not provide any certification and clearly states that the laboratory is only approved by the Ministry to perform analysis. However, in Ontario the Ministry approves the lab analysis on individual cases, when sufficient information is provided to them such as panelists screening data, reviewing raw panelists data for their guessing and possible disqualification of the panelist, olfactometer calibration data including ports velocity profiles on the day of evaluation. None of the documents were included in ORTECH's odour evaluation report or ORTECH's screening report. The screening data for ORTECH panellists did not meet EN13725.

BCX also stated that, "The average of the 5 odour samples was assumed to be representative emission rate for all 8 vents at all times under maximum operating scenario" No rational is provided for determining the emission rates for each source. BCX did not explain what average of the five odour samples were considered.

Therefore, their statement is not correct.

8. Maximum Emission Scenario

This scenario should be correct, if number of plants, their age, strain, was recorded in the report. No process data on the day of the testing was provided. The maximum scenario should also consider the emission data obtained during testing on hot humid days. However, the testing was performed on June 11, 2020 with recorded temperatures as 18-19 degree Celsius.

9. Results

The results of the dispersion modelling were based on unreliable odour emission rates. In Table 5-1 Modelling Results Summary, the Facility Emission Rate was recorded as 808.96 ou/s. These recorded odour emissions are underestimated and not reliable, mainly

because the odour testing and evaluation was not performed according to the OST Code and with limited number of tested sources and wrong assumptions or not testing during] worst case scenario conditions.

APPENDIX B

Odour Source Testing Report- prepared by Valley Environmental Inc. Submitted on June 26, 2020

Odour Source Testing Report (later called as OST Report) was submitted by Valley Environmental Inc. (Valley) on June 26, 2020 and was a part of the OIA Report (as Appendix B).

In the Summary section of the OST Report – Table 1 – Source Testing Matrix Valley referenced OSTC Method 6 for odour testing. However, based on the review of the report the OST Code was not followed in terms of:

- The number of collected samples per source: only one sample was collected at selected source (except source L4 where 2 samples were collected). The OST Code requires to collect three samples per source.
- The time of the collection of the field blank: the blank was collected after sampling at vents, but the OST Code requires collection of the field blanks before any testing.
- The time of the collection of the samples. The time varied between 5 to 6 minutes. The OST Code requires 10 min sampling time per bag
- Odour evaluation time: samples were analyzed over 24 hours between sample collection and analyses. A separate evaluation of the ORTECH analytical report is included in this report.
- The number of panelists used for the odour evaluation: OST Code requires eight panelists- the analyses were performed with four panelists and two times introduction of the samples to the same panellist. A separate evaluation of the ORTECH analytical report is included in this report.
- The selection of panellists for odour evaluation and their screening frequency. A separate evaluation of the ORTECH screening data is included in this report.

Therefore, the data obtained during the odour testing which later were used for the input to the modelling analysis should be considered not reliable.

In the summary of the test results- Table 2, odour concentration of the field blank was reported as 125 ou, whereas odour at the sample L3-S1 was reported 122 ou. The field

blank had higher value than the value from the actual collected sample from the source. Again, the field blank was not collected according to the OSTC and indicated a high value, which might represent that the sampling methodology at the vent using the lung technique underestimated the actual odour concentration at the source, or that there was a possibility in cross contamination when the blank was collected or that the actual odour in the field is detectable.

Odour emissions were calculated for each tested vent and they were between 56.1 ou/s and 131 ou/s. There was a factor of almost three between vents. However, in the dispersion modelling input the odour emissions rates were the same for all vents with reported values of 101.12 ou/s. There is no clear explanation why assumptions were made that odour emissions at all vents are the same. No calculations were shown in the report. Please note, that the source identification in the OIA Report is different than in the OST Report.

Based on the review of the data the odour emissions at tested vents are considered to be not credible due to the fact that the OST Code was not followed during the program and the field blank exceeded the odour level of the actual collected sample.

In their section, "Discussion and Results" Valley stated" odour results for all sources were consistent in their levels of emissions, the carbon filter on the outlets reduces level of releases.
This statement is untrue and misleading. The efficiencies of the carbon filters were not studied during the June program, and samples were not collected before and after filters, therefore, the efficiencies of the filters are unknown.

Only five samples were collected at four vents and there was not enough data to show that the odour results are consistent.

All data are not reliable based on the methodology used for testing and evaluation.

In their Sampling and Analytical Procedures there is not enough information regarding selection of the points for velocity measurements and the number of vents selected for the velocity measurement. However, it is unclear how the odour emission rates were calculated for the remaining vents.

Also, Method-6 of the OST Code was referenced as for collection of the odour samples. In this method three samples are required for collection of odour at each source. Only one sample per vent (for three vents) and two samples for the fourth vent were collected, therefore the OSTC was not followed. Therefore, all results from the sampling should not have been used for the odour impact assessment as data are considered not reliable.

In their description of the undiluted lung sampling procedure- there is no indication if bags were purged before collection, and if the samples were preserved for any odour degradation. There was no indication if the collection system was cleaned between testing at different sources. There is no indication that blank was collected for odour equipment system used in the program. Therefore, it is unclear how the quality control measured were taken during the testing program.

Data Sheet and Lab Report

In their Table marked as Methods 1 through 4 the location marked as L3 was tested on June 4, 2018 whereas locations marked as L1, L2 L4 were tested on June 11, 2020. No explanation was provided in the report regarding different sampling dates with one episode almost two years apart. All testing at three sources (L1, L2, L3) was within 10 minutes whereas at source L4 it was for 20 minutes- with no explanations as to why the discrepancy was provided in the report. However, in the ORTECH laboratory report the sampling times were listed as follows:
L1-S1- n/a, L2-S2 9:22 to 9:27, L3-S3 9:47 to 9:53, L4-S4 10:22-10:27, L4-S5 10:35 to 10:40; L5-S6 10:45 to 10:51

The figure showing the sampling locations, Location L3 was located very close to the doors. Location L4 was located close to the landlord repair shop, and Location L1 and 2 in the corner of the building between landlord repair shop and doors. All tested locations were in the corner of the building and it is unknown if the area below these tested vents were occupied with plants. It is expected that the odour emissions rates for each vent might vary. However, in the modelling input all odour emissions were the same.

ATTACHMENT 2

REVIEW OF SUPPORTING DOCUMENTS

ORTECH REPORTS

Two supporting documents were sent for review as a part of the review of the OIA Report. These two reports refer to the odour analysis performed on collected samples.

1. "ORTECH Consulting Report Valley Environmental Services Inc. Odour Detection Threshold Values (ODTV) Analysis of Air Samples" prepared on June 23, 2020

2. ORTECH Consulting Inc. "Odour Panelists Screenings with n-butanol."

The Laboratory ORTECH Report does not confirm that the odour samples were evaluated within 24 hours of collection. The samples were received on June 11, 2020 but evaluated on June 12, 2020 in the afternoon. The first sample was collected on June 11, 2020 at 9:22 AM, therefore more than 24 hours had passed between sample collection and evaluation. Therefore, the odour evaluation did not meet OST Code criteria.

In their report, ORTECH stated that they used only four panelists, however the OST Code requires to use a minimum of eight panelists. ORTECH introduced the same sample twice to the same panelists to obtain eight responses. However, this approach is not according to the OST Code. No raw data were provided for the individual panelist's responses with their guessing.

ORTECH's report "Test Methodology" stated that their "panelists have been tested periodically for odour sensitivity." However, based on their screening data during 2019 there were only five - days of screenings and not all of the listed panelists participated in all sessions. In 2020, only two days of screenings were performed and not all panelists were attended for these two sessions. There was not enough screening data for all panelists listed. ORTECH did not indicate which panelists were selected for the odour evaluation, but the screening data showed a very wide range for the same panelists with the range for

some of them as maximum recorded as 117 ppm of n-butaol and minimum as 10 ppb n-butanol. The range for the panelist's selection according to the EN 13725 is 20-80 ppb. Only one panelist marked as AV did not exceed the range for the EN 13725 screening criteria.

Based on the screening data most of the panelists are considered not reliable for the odour panel evaluations. No data were provided for the actual panelists used on the day of evaluation. No screening was performed on June 12, 2020; therefore, it is unclear if the participants were withing a limit on that day. No EN 13725 standard was followed for the screening of the panelists.

Data obtained by the evaluation are considered not valid due to the time of evaluation and uncertainty in selection of the panelists and their performance on June 12, 2010.

In summary, all data obtained during the source testing including evaluation are not reliable and should not be used for the odour impact assessment.

The conclusions in this report are stated within a reasonable degree of scientific certainty.

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