# MEMORANDUM

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| **DATE:** | 2021-03-26 | **RWDI Reference No.:** 2103192 |
| **TO:** | Patricia Burton | **EMAIL:** patriciaeburton@gmail.com |
| **FROM:** | Melissa Annett | **EMAIL:** Melissa.Annett@rwdi.com |
| **RE:** | **Peer Review of Documents Prepared by Pinchin Ltd. Entegris Air Quality Peer Review****Toronto, Ontario** |

Dear Ms. Burton,

RWDIwasretainedbytheresidentsofWestHill,HighlandCreek,CentennialandWestRougeto complete a peer review of the Emission Summary and Dispersion Modelling (ESDM) Report and associatedmodellingfilespreparedbyPinchinLtd.fortheEntegrisCanadaLtd.facility,locatedat470 CoronationDriveinToronto,Ontario.RWDIreviewedtheaforementioneddocumentstodetermine whether the information provided is complete and prepared to Ministry of the Environment, ConservationandParks(MECP)standardsandcurrentindustrystandards.Thefollowingdocuments werereviewed:

* FinalEmissionSummaryandDispersionModellingReportforEntegrisCanadaLtd.dated November3,2020,preparedbyPinchinLtd.,“theESDM”;and,
* CurrentAERMOD&BPIPmodellingfiles,withfilemodificationdatesofOctober30,2020,

prepared by Pinchin Ltd., “the model”.

In addition to the above documents, the following were also considered in RWDI’s peer review:

* OntarioRegulation419/05,LocalAirQuality.(Reg.419);
* MECPGuidelineA-10:ProcedureforPreparinganEmissionSummaryandDispersion Modelling(ESDM)Report,version4.1,March2018.(GuidelineA10);
* MECPGuidelineA-11:ProcedureforPreparinganEmissionSummaryandDispersion Modelling(ESDM)Report,version3.0,February2017.(GuidelineA11);and,
* Air Contaminants Benchmarks (ACB) List: Standards, Guidelines and Screening Levels for AssessingPointofImpingementConcentrationsofAirContaminants,version2.0,April2018. (ACBList)

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# KEY CONCERNS

Processemissionsfromtheairtreatmentsystemarecalculatedusingtheidealgaslaw;theinitial emissionsarethenadjustedtotakeintoaccountthecontrolefficienciesofthethermaloxidizerand scrubber,asprovidedbytheequipmentmanufacturer.However,theESDMreportdoesnotinclude sufficientdetailtovalidatethattheemissionswerecalculatedcorrectlyusingthismethodology.

Detailed sample calculations outlining how the initial emission rate was calculated (prior to the application of controls) should be provided. In particular, details regarding the volumetric displacement of nitrogen considered in the equation, as well as the number of reactors, are needed.

Thedescriptionoftheemissioncalculationindicatesthatthenumberofreactorsisarequiredvariable intheequation;however,throughoutthereporttherearenumerousreferencestootherequipment and operations that are also ducted through the air treatment system, including material transfer operations, filtration, distillation, holding tanks, etc. Details of how the contribution from these sourceswereconsideredintheemissioncalculationisrequired.Ifnotallsourcesofemissionstothe treatmentsystemwereconsidered,theemissionsmaybeunderestimated.

Emissions from “Specific Future Processing” were simply listed as “Provided by Entegris” and could not

be validated. Detailed sample calculations and supporting information should be provided.

Emissions from by-products of combustion from the thermal oxidizer should have detailed sample calculations, including details on how the total aggregate emissions were calculated and the molecular weights used for conversion.

Overall,thecalculationofprocessemissionsdoesnothavesufficientinformationprovidedtoallowus to understand details on the process or the calculations involved so we cannot agree that the conclusionsofthereportarevalid.

# ADDITIONAL FINDINGS

In addition, the following items are more minor in nature, but they should be clarified or confirmed.

* Maintenance welding is listed in Table A1 as an insignificant source; however, the required supportinginformationtovalidatethisassessment(aslistedinTableB-3BofGuidelineA10) was notprovided;
* TheFitzmillGrindingMillislistedinTableA1asaninsignificantsource;however,grinding operations would be expected to emit particulate matter. Further detail supporting this classification should beprovided;
* TherearethreeidenticalstackslocatedontherooftopinthelocationindicatedforBoilerB1. Pleaseconfirmthatonlyoneboilerispresent;
* Naturalgasemergencygeneratorforfirepumpemissionswerecalculatedincorrectly,using output rather than fuel input, as required by the emission factor used. The emission calculation should beupdated;
* Natural gas combustion emissions from the thermal oxidizer were calculated based on a maximum heat input of 1.4 million BTU/hr; equipment specifications indicate a maximum capacity of 1.6 million BTU/hr. The emission calculation should beupdated;
* ExhaustsPE\_1toPE\_3arestatedtocollectfugitiveemissionsfromthereactionandfiltration vesselsinthelaboratoryroomoperations.Thereportlaterstatesthatallreactionvesselsare withinaclosedsystem.Iffugitiveemissionsareexpectedfromthesesources,theyshouldbe quantified;otherwisethewordingshouldbeclarified;
* The calculation of cleaning emissions were generally based on the capacity of the largest reactor vessel in a given area. However, some areas have equipment with larger capacities, such as holding tanks. Confirmation should be provided that the most conservative cleaning scenariohasbeenassessedortheemissioncalculationsshouldbeupdated;
* The dispersion modelling includes one small penthouse on the western side of the building that is not shown in Figure B2 or B3 of the ESDM and is also not visible on available aerial images of the facility. This should beupdated;
* In the dispersion model, the base heights of the sources vary by up to 3 meters. The model shouldbeupdatedwithconsistentbaseheights;and,
* TheESDMreportincludedcontaminantswithoutACBlistbenchmarksthathadpredicted concentrationsgreaterthanthedeminimisconcentration,aswellasonecontaminantwitha predicted concentration about its B2 benchmark. These contaminants were correctly submitted to the MECP for review, but no documentation has been provided to indicate whethertheMECPacceptedtheselevels.Itisourunderstandingthatthisfileisstillunder review at theMECP.

# CONCLUSIONS

RWDI reviewed the ESDM report and associated dispersion modelling to determine whether the information provided is complete and prepared to current MECP and industry standards. In general, the approach followed current MECP and industry standards; however, there are several areas where more detail or revisions are required before a formal conclusion can be reached.

Yours truly,

## RWDI AIR Inc.

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