Appendix A

City Memorandum and OSE Peer Review

Memorandum

To: ***File for Diamond Pet Food Expansion Project***

From: ***Ken Zuidervaart (Director of Planning)***

Subject: ***City of Ripon's position on the OSE Peer Review Report***

Date: ***April 2, 2021***

Several comments on the Draft EIR were directed at the independence of the air quality analysis because the air quality consultant for the EIR, Yorke Engineering (Yorke), was also involved with permitting activities associated with Diamond Pet Foods. This is permissible. CEQA Guidelines Section 15084 specifies that the Lead Agency, the City of Ripon, may either prepare an EIR directly or under contract. In this instance the EIR was prepared under a contract between Ascent Environmental (Ascent) and the City. Section 15084(b) allows the use of information prepared by the applicant:

The Lead Agency may require the project applicant to supply data and information both to determine whether the project may have a significant effect on the environment and to assist the Lead Agency in preparing the draft EIR.

Section 15084(d) further defines the roles of the Lead Agency in the CEQA process:

> The Lead Agency may choose one of the following arrangements or a combination of them for preparing a draft EIR.
>
> 1) Preparing the draft EIR directly with its own staff.
> 2) Contracting with another entity, public or private, to prepare the draft EIR.
> 3) Accepting a draft prepared by the applicant, a consultant retained by the applicant, or any other person.
> 4) Executing a third party contract or Memorandum of Understanding with the applicant to govern the preparation of a draft EIR by an independent contractor.
> 5) Using a previously prepared EIR.

However, the Lead Agency is required to exercise independent judgement prior releasing the Draft EIR to the public (CEQA Guidelines Section 15084(e):

> Before using a draft prepared by another person, the Lead Agency shall subject the draft to the agency's own review and analysis. The draft EIR which is sent out for public review must reflect the independent judgment of the Lead Agency. The Lead Agency is responsible for the adequacy and objectivity of the draft EIR.

Ascent, as the City's contracted consultant, reviewed the information provided by Yorke, and the City, in its Lead Agency role, also reviewed the information, to ensure objectivity and adequacy.

Nevertheless, to provide a greater level of transparency, with respect to the air quality analyses and Odor Management Plan (OMP), the City of Ripon hired an odor specialist, Odor Science & Engineering (OSE), to review the Draft EIR's odor analysis, the odor-related technical reports, and the OMP. The purpose of this memorandum is to describe the overall results, describe the changes to the OMP that resulted from the peer-review, and to clarify the City's position regarding the recommended technical methods. The OSE report is attached to this memorandum.

In summary, while the OSE report suggests different analytical methodologies and additions to mitigation measures, its conclusions do not differ from the EIR with regard to the significance of the odor impacts of the project.

Recommendations to Enhance the OMP

The OSE report includes recommendations pertaining to the OMP. Recommendations include additional training for odor management staff, additional automatic RTO monitoring, odor management database enhancements, reporting requirements to the City, and refinements to the schedule for the manufacturer to inspect RTO equipment. Some of the recommendations identified were already included in the OMP. All of the recommendations identified, which were not already part of the OMP, have been incorporated into a revised OMP, included as Appendix A of the Final EIR. As required by CEQA, the EIR evaluates the impacts of the project on the existing environmental conditions. It should be noted that, because the existing odor complaint data suggests that current odor levels associated with DPF Ripon are relatively low compared with historic levels, and because the goal of the OMP (related to project environmental impacts) is to maintain existing odor levels after installation of the fourth production line, two of OSE's more extreme odor minimization recommendations, including applying more sophisticated odor analysis techniques and surveys, as well as alterations to the product mix, are included as measures to be considered in the OMP's Tier 3 Odor Response. Please refer to the revised OMP in Appendix A of the Final EIR for additional details.

Comments on the EIR and Odor Study Methodology

The OSE report provided comments related to the Draft EIR's analysis, as well as the analysis of the odor analysis in the Air Quality study, included as Appendix C of the Draft EIR.

Regarding the Draft EIR, the OSE report identifies alternative methods for conducting odor analyses, including odor measurement and modeling. The City concurs that these recommended methods for establishing existing odor conditions may have been appropriate as a supplemental methodology if the odor complaint data suggested that a higher level of odors was currently being generated by the facility and the areas of odor exposure were not already well-understood; however, the City believes that this approach is not appropriate at this time to evaluate the DPF-Ripon facility. Given the demonstrated effectiveness of the RTOs at reducing odor levels (compared to historic documented odor levels), the City believes that the Draft EIR's approach for establishing baseline odor conditions, which relies on a combination of odor complaint data (which provides an understanding of the actual, on-the-ground odor exposure) and measured levels of volatile organic compounds (VOCs) from the RTO exhaust, is the appropriate method. Importantly, the OSE report concludes that "based on the [Draft EIR] analysis, there should be no significant odor impacts from the addition of the fourth production line, as long as the RTOs are operating at the high performance level of which they are capable of. In light of the low level of odor complaints, this conclusion appears plausible with an effective odor management plan in place." Therefore, even if other methodologies were applied, the OSE report confirms that the overall conclusion identified in the Draft EIR for potential odor impacts would not change.

In fact, CEQA allows for the use of difference methodologies. As stated in Section 15151 of the CEQA Guidelines:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

This guideline is followed here, summarizing the points of "disagreement", even if the disagreement revolves around the approach to the analysis rather than its conclusions with respect to impact significance.

Regarding the Odor Study, OSE's comments are similar to the comments on the DEIR's methods for establishing baseline conditions. These comments are, in part, based on the limited duration of odor complaint data that was available at the time the original odor report was prepared by Yorke (April 2019). However, the Draft EIR includes updated odor complaint data that confirms the

conclusions made in the 2019 odor analysis. The Final EIR updates this information further with 24 months of odor complaint data since installation of the RTO system. As discussed above, based on the substantial decline in odor complaints since the RTO system was installed, and using the complaints as the means by which to determine there is a significant odor issue, the City believes that, given the level of odors currently generated by the DPF-Ripon, establishing an odor baseline does not require extensive measurement and modeling. Therefore, the City believes that the methods used in the Odor Study and the Draft EIR are appropriate. As mentioned above, the OSE report confirms the overall conclusion identified in the Draft EIR, and although alternate methods are identified, relying on these alternate methods would not alter the Draft EIR's conclusion related to odors and would not result in changes to the mitigation measure.

The City concludes that, with the revisions made to the OMP to incorporate OSE's recommendations, the Draft EIR's analysis is appropriate, and no additional changes (beyond those made to the OMP) are necessary. No significant new information, as defined by CEQA (Guidelines Section 15088.5) has been added to the EIR and there is no need to recirculate it for additional public comment.

Odor Science & Engineering, Inc.

REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE DIAMOND PET FOOD FACILITY IN RIPON, CALIFORNIA

Prepared for the City of Ripon

Prepared by:

Ned Ostojic, Ph.D.,P.E.

March 19, 2021

OS&E Project No. 2231-M-00

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1. INTRODUCTION

Diamond Pet Foods, Inc (DPF) operates a pet food production facility in Ripon, California. The facility was designed for a maximum of four production lines but only three lines were initially permitted by the San Joaquin Valley Air Pollution Control District (SJVAPCD). DPF is currently working on obtaining the required permits for installation of the fourth production line.

As part of that effort, DPF has retained Ascent Environmental and Yorke Engineering to prepare the required permit documentation. This report presents the results of the review of the Draft Environmental Impact Report (**DEIR**), prepared by Ascent Environmental in August 2020:

Separately, OS&E has reviewed the Odor Management Plan (**OMP**), prepared by Yorke Engineering, LLC in July of 2020 (with updates in January and March, 2021), and the "Odor Study for Pet Food Manufacturing Facility" (**Odor Study**), prepared by Yorke Engineering, LLC in May 2019.

When referring to the pages in the DEIR, the page number is the sequential number as shown on the pdf version of the document, not necessarily the pagination number shown on a printed copy of the document.

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2. REVIEW OF THE DRAFT ENVIVRONMENTAL IMPACT REPORT

The Draft Environmental Impact Report (DEIR) reviewed in this report, was prepared by Ascent Environmental, Inc in August 2020. Based on the analysis of a wide range of potential environmental impacts presented in the DEIR, odor impacts were found to be essentially the only ones with some potential significance. The analysis of the odor issues in the DEIR relied largely on the assessment provided in the odor study included in Appendix C of the document. That study ("Odor Study for Pet Food Manufacturing Facility") was prepared by Yorke Engineering, LLC in May 2019.

The DEIR presents a history of the odor abatement efforts associated with the Diamond Pet Foods (DPF) Ripon facility since it started operation in May of 2012. Initially the production exhausts were ventilated to atmosphere without control. In response to frequent odor complaints, DPF installed cold plasma and odorant injection technologies. While the odor complaints subsided, they still remained excessive, leading to installation of the RTO technology in December of 2018.

On page 61, Section 3.1-4 of the DEIR (*"Exposure of Sensitive Receptors to Odors"*), provides the following conclusion regarding the expected odor impacts from the addition of the fourth production line: "…..it is not expected that the project would result in odorous emissions that adversely affect a substantial number of people." That conclusion is based on the following premise :

1. only one confirmed odor complaint has occurred since the installation of the RTO system;
2. the incremental increase in the RTO exhausts is expected to result in less than 0.1 percent release of unabated gas.
3. the RTO system is designed to appropriately handle four production lines.

Although probably technically correct, Statement 2 above is potentially misleading, since it suggests a negligible increase in odor emissions. In reality, assuming no changes in the plant's present operating conditions, after the addition of the fourth line the odor emission rate from the RTOs would increase in direct proportion to the increase in the process exhaust flow rate supplied to the RTOs, i.e. by 33%. Whether or not such an increase would be significant (i.e. whether the increase would adversely affect a substantial number of people) depends on the current odor impacts associated with the DPF facility and the effectiveness of the RTOs.

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Figure 2-1, (reproduced Figure 3-4 from Appendix C of the DEIR - Odor Study), shows the average total odor complaints received annually with different odor abatement technologies applied at the DPF facility over the years. The figure shows a significant decrease in the frequency of odor complaints, with the total odor complaints since the installation of the RTOs shown to have averaged 27 per year.

The DEIR places much emphasis on the Odor Management Plan (Appendix D of the DEIR), as the key tool to assure absence of significant odor impacts after the installation of the fourth production line. It goes as far as stating that the only mitigation measure required would be to update the OMP every five years. Specifically,

- Section *"Impact 3.1-4: Exposure of Sensitive Receptors to Odors"* states that "Without periodic updates to the OMP, it is possible that a *significant* impact could result"(page 61)
- Section *"Mitigation Measure 3.1-4: Update the Odor Management Plan"* concludes: "Keeping the OMP updated reduces the potential for changes in technology or in agency procedures/contacts to diminish the effectiveness of the OMP; therefore, with mitigation, the impact would be *less than significant.*" (page 62)

In Table ES-1, *"Summary of Impacts and Mitigation Measures"*, (page 14), DEIR includes the following statement regarding the potential impacts related to odors: "The response program (OMP) includes three tiers of progressively rigorous actions ranging from systems checks to reduction in production up to 25% (if deemed necessary by the City). This would substantially reduce the potential impacts related to odors".

In conclusion, based on the DEIR analysis, there should be no significant odor impacts from the addition of the fourth production line, as long as the RTOs are operating at the high performance level of which they are capable of. In light of the low level of odor complaints, this conclusion appears plausible with an effective odor management plan in place.

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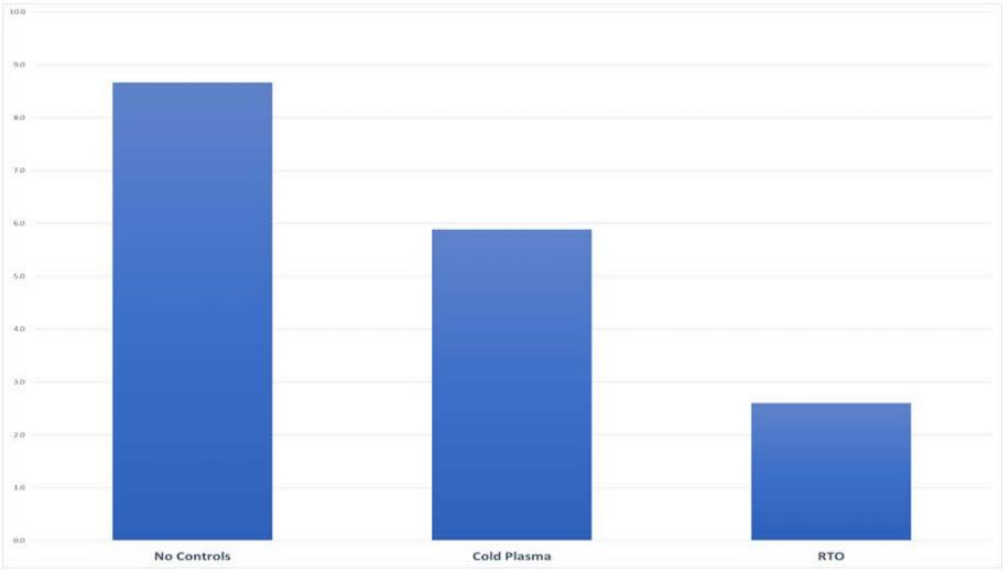

Figure 2-1. Comparison of the odor control technologies based on the average monthly odor complaints (Source: Figure 3-4, DEIR, Appendix C)

Odor Science & Engineering, Inc.

REVIEW OF THE ODOR STUDY AND THE ODOR MANAGEMENT PLAN FOR THE DIAMOND PET FOOD FACILITY IN RIPON, CALIFORNIA

Prepared for the City of Ripon

Prepared by:

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March 30, 2021

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1. INTRODUCTION

Diamond Pet Foods, Inc (DPF) operates a pet food production facility in Ripon, California. The facility was designed for a maximum of four production lines but only three lines were initially permitted by the San Joaquin Valley Air Pollution Control District (SJVAPCD). DPF is currently working on obtaining the required permits for installation of the fourth production line.

As part of that effort, DPF has retained Ascent Environmental and Yorke Engineering to prepare the required permit documentation. The principal document is the Draft Environmental Impact Report (**DEIR**), prepared by Ascent Environmental in August 2020. At the request of City of Ripon, that report was reviewed by Odor Science & Engineering (OS&E) and the findings presented in a separate March 19, 2021 OS&E report.

This report presents the results of the OS&E review of the following documents which have been incorporated in the DEIR as appendices:

1. Odor Management Plan (**OMP**), prepared by Yorke Engineering, LLC in July of 2020 and updated in a draft form in January 2021, included in the DEIR as Appendix D
2. "Odor Study for Pet Food Manufacturing Facility" – **Odor Study**), prepared by Yorke Engineering, LLC in May 2019, included in the DEIR as Appendix C.

Some of the information presented in this report was also obtained in a phone conference on January 25, 2021 with participation of Mark Ferguson, DPF plant manager, Randy Frazier of Yorke Engineering and Ken Zuidervaart of City of Ripon and in subsequent discussions with City staff.

The sections 2 and 3 of this report present the review of the OMP and the Odor Study respectively. Section 4 provides recommendations for upgrading the Odor Management Plan

When referring to the pages in the documents, the page number is the sequential number as shown on the pdf version of the document, not necessarily the pagination number shown on a printed copy of the document.

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2. ODOR MANAGEMENT PLAN

The Odor Management Plan was prepared in July of 2020 by Yorke Engineering with the purpose "to detail the specific activities, best practices, and response measures that will be implemented to prevent exposure of the public to potential odor impacts resulting from the addition of a fourth pet food production line at Diamond Pet Foods-Ripon (DPF-Ripon)." The plan was subsequently revised in January of 2021. This review is based on the revised version of the plan.

Thematically, the OMP covers five main areas:

- Discussion of the sources of the plant's odor emissions;
- Background information on the RTO technology as applied at the DPF plant;
- Routine on-site and off-site odor monitoring;
- Routine monitoring of the operation and performance of the RTO system;
- A three-tier system for responding to odor complaints;
- Training of the odor management staff.

Plant odor emissions

In Section 3, "Odor Emitting Activities", the plan provides a description of the plant production operations with comments regarding the odor emissions related to the operations.

Starting with the raw materials, the document notes that "…the particulate material from the dry raw materials has a slight odor, although these odors are generally not considered offensive. Since the particulate material has an odor, any control of particulate emissions by the use of baghouses will have the effect of containing the odors, however slight they may be. Since baghouses are installed throughout the facility, the particulate emissions from these materials are minimized, which has the side effect of containing odors as noted above."

Garbage dumpsters were identified as a potential source of odors associated with disposal of liners from the meat products received by the plant. To mitigate potential odors from the dumpsters, plant staff will expedite dumpster removal, as needed.

The production exhausts identified as principally responsible for the off-site odors were the extruder cyclones, dryer cyclones and vertical cooler cyclones.

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One of the essential elements of an effective odor remediation strategy is an odor emission inventory. This involves an inspection of the facility's ventilation system to establish how effectively the odor emissions have been contained within process exhausts and to what extent they may be escaping the facility as "fugitive emissions". Odor samples are collected from process exhausts and analyzed by dynamic dilution olfactometry in accordance with ASTM 679-04. This analysis provides odor concentration in terms of "dilutions to threshold". The rate at which odor is emitted is defined as a product of odor concentration and the volumetric flow of the odorous air (in SCFM) and is expressed in "odor units per minute". For fugitive emissions, it is necessary to measure or estimate their effective flow rate and to collect odor samples of those emissions.

Once that information is obtained, it is possible to rank the odor sources by their contribution to the facility's total odor emissions and thus develop priorities for odor mitigation. That information can also be used as input to odor dispersion models to evaluate the downwind odor impacts. For the sources with odor control equipment, the inlet and outlet odor concentration measurements provide the most direct measure of the odor control efficiency.

At this point, it is unclear what portion of the total odor emissions from the DPF facility may be contributed by the fugitive emissions from production and storage areas, which are not controlled by the RTOs. The OMP describes the odors within the production and storage areas of the plant as

"…not nearly as strong as the odors from the direct production exhausts. Generally speaking, the in-plant personnel areas have a pet food odor that is volumetrically much less than what is produced by the production operations.". "High intensity" odors were noted in the extruder room (Odor Study, page 13).

After treatment in the RTOs, the odors from the production equipment have been reduced to a level much closer to the odors in the production areas. This raises the significance of any uncontrolled production area odors relative to the remaining odors in the RTO exhausts.

An informational conference call was held on January 25, 2021 with participation of Mark Ferguson, DPF plant manager, Randy Frazier of Yorke Engineering and Ken Zuidervaart of City of Ripon. It was learned that the large room in which the dryers are located is supplied with specially treated and conditioned outside air. A portion of that air is used by the dryers and the rest serves to keep the room positively pressurized to prevent the infiltration of untreated ambient air. A similar ventilation arrangement is used in a separate room, housing the steam conditioners and extruders. Depending on the overall building ventilation, the odors from these positively pressurized areas are likely to eventually escape to the atmosphere as fugitive emissions.

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A closer analysis of this ventilation arrangement shows that, after the addition of the fourth production line, the fugitive emissions from the production areas would actually be reduced to some extent. The newly installed dryer would displace a portion of the air volume from theretofore unoccupied space in the room. This means that less air would need to be introduced into the room to keep it under positive pressure and thus less odor would ultimately be migrating from the room as fugitive emissions.

Information on the RTO technology

Section 4.4 of the OMP , "Odor Control Practices" describes the RTO system with a focus on demonstrating that the RTO technology, as used at DPF, significantly surpasses the Best Available Technology (BACT) standards set for thermal oxidation by the EPA. In particular:

- The DPF RTO combustion chamber residence time is "…is 2.33 seconds, which is over seven times the BACT-specified retention (residence) time of 0.3 seconds. With the installation of the fourth production line, the residence time in the combustion chamber will be 1.75 seconds, which is more than five times the BACT-specified minimum residence time."
- Even though the SJVAPCD required VOC destruction efficiency of 95% was exceeded at the operating temperature of 1,500 ^{o}F, DPF RTOs operate at the temperature of 1,650 ^{o}F at which a 99% VOC destruction efficiency was demonstrated.

Routine off-site and on-site odor monitoring

Off-site odor surveys

Off-site odor surveys are a key element of the OMP. In its present form, the odor surveying procedure consists of making largely qualitative odor observations at selected locations in the area surrounding the plant. To realize its full potential as an odor management tool, the procedure should be upgraded to provide a more comprehensive documentation of the plant's "odor footprint" as recommended in Section 4.

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Personal Odor Inspection

Personal Odor Inspection (POI) is also one of the key elements of the OMP. The procedure is illustrated in Figure 2-1, reproduced from the OMP. In its present form, it consists of direct sniffing of the RTO exhaust through a ½ inch stainless steel tube, which is somewhat rudimentary. To realize its full potential as an odor management tool, it should be upgraded into a more comprehensive olfactory analysis of the RTO exhausts. Specific recommendations are provided in Section 4.

Routine monitoring of the operation and performance of the RTO system

The odor management staff will conduct daily inspection of the RTO systems, including checks on the key operating parameters such as the inlet and outlet RTO temperatures, combustion chamber temperature, RTO fan drive frequency, etc. At the January 25 phone conference, it was learned that additional parameter readouts will become available such as the RTO air flow rate, a welcome addition. Visual inspection of the functioning of the RTOs, such as the rotating valves, will also be conducted

A three-tier odor complaint response

As presented in the DEIR, the centerpiece of the OMP is a three-tier odor complaint response procedure summarized in a flowchart shown in Figure 2-2 (Reproduced from the January 2021 OMP). A more detailed description of the individual actions involved in the tiers initiation and execution is provided in Section 4.0 of the January 2021 OMP. In essence the activities consist of intensified inspection of the RTOs and consultation with equipment manufacturer regarding potential options for performance enhancement. Notwithstanding any new potential performance enhancement suggestions from the manufacturer, the principal proposed remedial activities consist of

- *intensified maintenance / servicing*
- *aggressive application of the Manufacturer Automatic Maintenance Sequence* (*MAMS) procedure (discussed below)*
- *increase of the operating temperature*. As described in the OMP: "If any RTO has stronger odor than the others, operator to take appropriate measures to improve odor abatement**,** including increasing the RTO combustion temperature in 50 degree F increments (above the minimum 1,650 F minimum temperature setpoint), and retesting

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the odor using the POI procedure." (Jan. 2021 OMP, page 14). *reduce production*: "… Depending on the severity of the additional and ongoing confirmed odor complaints, the operator will meet with the City Code Compliance Division (CCD) and the City will determine if decreasing production will be beneficial. This could include a temporary reduction in production up to a maximum equivalent of 25% of the actual four-line production capacity".(Jan. 2021 OMP. Page 16)

The above tiered concept focuses almost entirely on the RTOs as the sole odor control system at the DPF plant. In evaluating that concept, it is important to be aware of the key characteristics of the RTO technology.

RTO is a very efficient and reliable odor control technology. The key design parameter affecting the performance of an RTO is the combustion chamber residence time. That is a permanent feature of an RTO and cannot be readily modified for the purpose of performance optimization. The key operating parameter is the combustion chamber temperature. The potential limitations of increasing that temperature above the already elevated 1,650 ^{o} F were discussed above. Also, as stated above, with the residence time of 2.3 seconds for three and 1.7 seconds for four production lines and the combustion chamber temperature of 1,650 ^{o}F, the RTOs at the DPF facility are already at the high end of the technology range.

RTO performance may dip briefly on occasion as a result of some process upset. It can also deteriorate gradually as a result of deteriorating condition of the heat exchange media due to adsorption of the less volatile compounds on the heat exchanger's cold face and deposition of particulate on the heat exchange media. These processes could lead to an increase in the odor emissions when the deposited materials are exposed to the hot combustion chamber exhaust in the subsequent portion of the RTO heat exchange cycle. The odors, which may result from thermal decomposition and partial oxidation of the deposited materials, often have very low odor thresholds. Those thresholds are likely to be lower than the thresholds of the odors originally emitted from the production lines. Thus, when desorbed from the heat exchange media into the "clean" RTO combustion chamber exhaust, these odors could have a disproportionate contribution to the odors eventually emitted in the RTO exhaust. This is one reason why the RTO odor removal efficiency measured directly by dynamic dilution olfactometry may be considerably different than the VOC removal efficiency.

Material deposition and carbonization could also increase the resistance to air flow and cause channeling of the air flow through the media, which could result in gradual deterioration of RTO performance over time.

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This condition can be rectified by a MAMS process, also referred to as "bakeout". In this process the RTO is taken off-line and the temperature of the heat exchange media increased to drive off the deposits. We understand the applicant plans to incorporate a MAMS process into the OMP.

Another cause of the heat exchange media deterioration could be related to thermal stress. This condition is more difficult to rectify and may require exchange of the heat exchange media.

Any signs of a short or long-term deterioration in RTO performance should be caught by an effective RTO odor and equipment monitoring program which is already a part of the OMP. We have included additional recommendations for improving the RTO odor and equipment monitoring program below. With these upgrades, which are acceptable to the applicant, the program should become a substantially better indicator of a need for remedial action than the tier system which relies entirely on odor complaints.

The frequency of odor complaints is the most important indicator of the severity of an odor problem. Unfortunately, in many cases odor complaints are not a very reliable indicator of performance of odor control equipment. As with statistical indicators in general, the reliability of the odor complaints as an indicator decreases with a decrease in the statistical sample size i.e., the frequency of complaints. This is especially true when the frequency of complaints is very low, as has been the case with the odor associated with the DPF since the installation of the RTOs. In addition, there are often delays in receiving an odor complaint. As a result, the conditions which may have caused an odor complaint may no longer be present when a follow-up investigation is conducted.

The OMP provides a following clarification of the scope of the Tier 3 response: "Until such time as the odor is *appropriately abated to the performance levels that were demonstrated by the RTO system during the period from January 2019 through December 2020*, the City and Diamond Pet Foods will meet and confer and the City will determine, depending on the severity of the odor issue, if a decrease in the actual throughput of the DPF facility by (up to) the equivalent of the capacity of one production line would be helpful in reducing odors" (emphasis added) (Jan. 2021 OMP, page 15).

Clearer and more objective standards would need to be based on the odor removal efficiency or on the maximum allowable outlet odor concentration limits measured in accordance with ASTM E679-04. VOC destruction efficiency could also be included but cannot be the primary performance standard because of a potentially significant difference between the odor and VOC removal efficiencies as discussed above.

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Aside from a reduction in production, the City and DPF could explore the benefits of reduction of the presently unquantified and uncontrolled fugitive odor emissions, and improved dispersion. These and other options are briefly reviewed below.

Fugitive odor emissions

It can be expected that any fugitive odors from the plant would generally be escaping at low elevation and have relatively low temperature. As such, those odors are more likely to be trapped within an atmospheric inversion layer, unlike the much hotter RTO exhausts which are more likely to penetrate that layer due to their thermal buoyancy . Under inversion conditions, which have historically coincided with a higher frequency of odor complaints, the fugitive odors are likely to experience poor dispersion and are thus more likely to contribute to off-site odor impacts. Therefore, some form of control of the fugitive emissions may be a more cost-effective alternative to reduced production.

Improved dispersion

The data provided in the Odor Study show historically higher frequency of odor complaints during the colder months due to thermal inversion. Thermal inversion is particularly unfavorable for cooler exhausts whose emissions may be trapped within the inversion layer. This increases the likelihood that the fugitive odor emissions from plant operations not controlled by the RTOs may be disproportionately contributing to the odor impacts under those conditions. Once the fugitive odor emissions have been quantified, an odor dispersion analysis could be used to determine potential benefits of enhanced dispersion for those emissions.

The hotter RTO exhausts have a much better chance of penetrating the inversion layer. The thermal plume rise of the RTO exhausts could be further enhanced by a taller stack and or higher discharge velocity. This option could be considered if an emission inventory shows that the low level residual odors emitted from the RTOs still represent a significant portion of the plant's total odor emissions.

Optimization of the product mix

As noted in the DEIR, there may be significant variability in the odor emission potential from different products made at the DPF plant. However, due to the fact that the pet food recipes are constantly changing on the various production lines, Diamond and Yorke have been unable to identify any specific pet food recipes that are more or less odorous than the other. DPF has stated that adjusting product runs is a time-consuming process, and given the large number of varying pet food products and varying recipes at the DPF plant, it is not feasible to optimize its product mix.

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Procedural issues

- Aside from the technical issues related to the tiered odor complaints response procedure discussed above, there are several procedural issues which could detract from the concept's practicality. Chief among them is the question of what constitutes a "confirmed" odor complaint, since that is what triggers the tiered response activities. To address this, the OMP will be revised to eliminate the distinction between "confirmed" and "unconfirmed" complaints in terms of triggering response under the OMP

No odor regulation prohibits all odors beyond a facility's fence-line. One of the main reasons why so many odor problems end up in court is the difficulty of providing a quantitative definition of what constitutes a nuisance. To a large degree, this boils down to defining an acceptable frequency of odor complaints.

The routine odor surveying procedure incorporated into the OMP could provide very helpful information for assessment of odor complaints. After that procedure is upgraded, as recommended in Section 4, the surveys will routinely document the plant's "odor footprint" under different process and meteorological conditions. If odor complaints are received from within that footprint area, they would be more likely to be related to the DPF facility. Likewise, if the complaints originated from areas outside the plant's footprint, they would be more likely not related to DPF. The quality of that assessment would be enhanced if the surveys were to be conducted or at least managed/ supervised by a third party.

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Figure OMP-1A

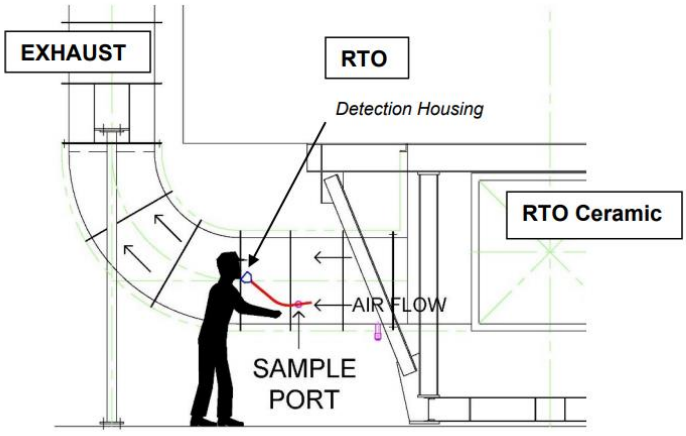
RTO Odor Sample Port Location

RTO Exhaust Odor Sampling Port

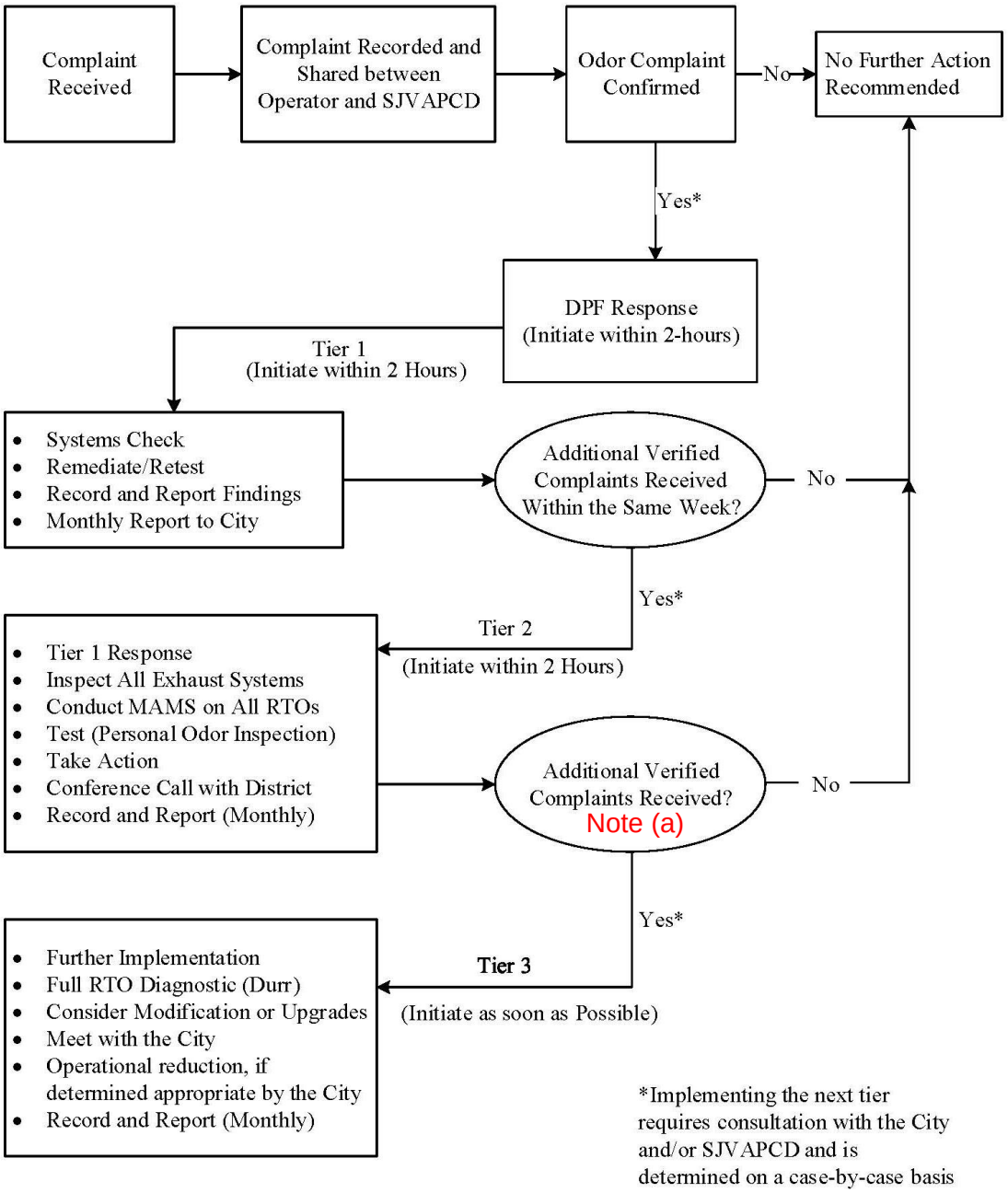
RTO Exhaust Odor Sampling Port
Close-Up View

Figure OMP-1B

RTO Odor Sample Image



Figures 2-1. a. and b. Personal Odor Inspection (Source: OMP)



a) Tier 3 is initiated if additional confirmed complaints are received after the remedial measures from Tier 1 and Tier 2 have been implemented

Figure 2-2. Progressive tier odor complaints response chart (Source: January 2021 OMP)

3. ODOR STUDY

Appendix C of the DEIR contains "Odor Study for Pet Food Manufacturing Facility", prepared in May 2019 by Yorke Engineering to be used in support of the DEIR.

The study provides a history of the odor issues associated with the DPF facility since it started operation in May of 2012. Initially the production exhausts were vented to atmosphere without control. In response to frequent odor complaints, DPF installed cold plasma and odorant injection technologies. While the odor complaints subsided, they still remained excessive, leading to installation of the RTO technology in December of 2018. The study provides a graphic summary of the average monthly complaints corresponding to the odor abatement technology, which is reproduced as Figure 2-1 in Section 2 of this report.

Of highest significance for the purpose of DEIR are the complaints received subsequent to the installation of the RTOs. The study dismisses a number of these complaints with general statements like:

"Based on a number of carefully reviewed factors, specific to eight of the 13 odor complaints, it is possible these complaints could be outliers and/or the source is mistaken"

"The SJVAPCD has developed screening distances for various potential odor sources for the California Environmental Quality Act (CEQA). For sources such as food processing facilities, feed lots, landfills, etc., receptors greater than 1 mile are not expected to experience nuisance odors".

To accomplish its stated objective, i.e. to provide support for the DEIR, the study would need to

1. document the existing odor impacts,
2. provide reliable predictions of the future impacts after the completion of the project and
3. determine whether the proposed odor mitigation measures are adequate

These objectives could be more effectively achieved with the recommendations included in this report.

The principal conclusions from the study are that the historical odor issues associated with the DPF have been resolved (page 21) and that no additional odor mitigation will be necessary for expanded operation with the fourth production line (page 7).

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These conclusions were based on the following arguments:

- Demonstrated effectiveness of the RTO technology in control of the VOC and odor emissions. The choice of this technology for DPF was influenced by "…the experience reported by the Mojave Desert Air Quality Management District (MDAQMD) in controlling odors from a pet food manufacturing facility in Victorville, CA. According to discussions between Yorke and the MDAQMD, before installation of the RTO systems, the daily odor complaints in Victorville ranged in number from double to triple digits. After the installation of the RTO system, the complaints have dropped to less than 10 a year and the MDAQMD has deemed the RTO system highly successful" (page 9)
- The RTOs installed at DPF were designed and constructed with an additional 8 ft of vertical combustion chamber volume for increased residence time and enhanced performance;
- Increased operating combustion chamber temperature of 1650^{o} F which showed increased VOC destruction efficiency of 99.8% in the January 2019 tests. For comparison, the operation at 1,500^{o} F showed an efficiency of better than 95%.
- Reduction in the odor complaints associated with DPF since the installation of the RTOs in December of 2018.

The study recognizes that most agencies measure the potential for nuisance odors based on the following four parameters:

1. frequency ,
2. intensity,
3. duration and
4. offensiveness of the odor (page13).

These parameters would therefore be best suited for documentation of the present and future environmental impacts related to odor.

The study lists a number of factors which limit or preclude direct quantification and/or documentation of these parameters by means of chemical analytical instrumentation:

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- The human sense of smell is capable of detecting odors in the parts per billion range, whereas typical instrumentation lacks this degree of sensitivity;
- Interaction among the odorous compounds: "...may be additive, synergistic, or subtractive…"

The above limitations are inconsequential because there are well established methods and procedures which rely on direct quantification and systematic documentation of odors based on human olfactory perception. These methods are well suited to provide direct assessment of the above listed four parameters related to nuisance odors. These methods include:

- Measurement of odors from industrial (and odor) odor sources using dynamic dilution olfactometry (ASTM E679-04). Highly precise direct measurements of odors are possible, obviating the need for relying on surrogate (such as VOC) measurement which suffer from a number of shortcomings, some of which are mentioned in the study.
- Direct measurement of odor intensity using a reference odor intensity scale based on n-butanol (ASTM E544-18)
- Measurement of ambient odor concentration using portable olfactometers
- Systematic off-site odor surveys establishing an "odor footprint" of the facility and documenting intensity, concentration, character, hedonic tone (degree of pleasantness) and a likely source of the odors within the footprint.

All of these methods and procedures have been used as part of developing the strategy for the above referenced odor mitigation projects in Victorville, both in the initial diagnostic phase of the odor mitigation effort and the subsequent follow-up phase.

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4. RECOMMENDATIONS

RTO is a well established and demonstrated technology capable of providing consistently high level of odor control. The key to maintaining the high performance level is a well structured odor management plan incorporating the following key elements:

- on-site and off-site odor monitoring
- routine equipment inspection and monitoring
- timely servicing and maintenance

The need for such a plan is recognized in the DEIR, which considers it the only additional remediation measure required for the installation of the fourth production line. The current plan already embodies the above elements. To accomplish a more proactive complaint response structure, the odor monitoring portion of the present plan needs to be significantly upgraded to maximize its usefulness. The following recommendations are offered for that upgrade and for the other related elements of the plan:

- Conduct training of the odor management staff in odor quantification, characterization and monitoring. This should include
    - Screening of the members of the odor monitoring team for their olfactory acuity (general sensitivity and ability to distinguish odors)
    - Training of the odor monitoring team in
        - the use of the n-butanol odor intensity scale (ASTM E544-18);
        - the use of portable olfactometers;
        - the procedure for conducting off-site odor surveys. These surveys should establish the plant's "odor footprint" and document the intensity, concentration, character and the likely source of the odors within that footprint. For the odors related to DPF, odor frequency and duration should also be documented;
        - the procedure for odor complaint follow-up;
        - the procedure for collecting of odor samples.

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- Develop a procedure for on-site olfactory analysis of odor samples collected at the RTOs and possibly other odor sources

- Conduct training of the odor monitoring team in performing this procedure

- Perform periodic tests of RTO odor removal performance by collecting the inlet and outlet odor samples for analysis by dynamic dilution olfactometry (ASTM E679-04) by a qualified olfactory laboratory. Some of the samples should be collected under "stress" conditions when one of the RTOs is taken off line during full plant production.

- Establish a way for continuous automatic monitoring of the key RTO operating parameters. The monitoring system should have full historical retrieval capability. This should make it possible to inspect these parameters for any desired time period, especially for the times immediately preceding and following the reported occurrence of the odors which resulted in odor complaints

- Identify the key operating parameters for the production lines including

    - Any equipment outages and/or interruptions in production runs
    - History of products being made on each production line

- Establish a way to readily retrieve that information for any desired period of time

- Develop a database for odor management. This database should include

    - all available information on odor complaints. At a minimum, this should include

        - the reported time of the complaint odor occurrence
        - the time the information about the odor complaint was received by DPF
        - the location where the complaint odor was detected
        - any description of the odor provided by the complainant
        - any other comments made by the complainant

    - information from the plant's meteorological station for a half an hour preceding the reported time of occurrence of the complaint odor including

        - average wind direction and standard deviation
        - average wind speed and standard deviation

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What frequently happens with the odor management plans is that they generate a great deal of potentially very useful information that remains filed away and dormant. For a plan to be effective that information needs to be used to develop performance trends and limits which would trigger remedial action rather than relying primarily on odor complaints. For that purpose, it is recommended that all pertinent information from the odor and equipment monitoring activities be periodically summarized and reported with concise summaries for review by appropriate DPF management. Appropriate summary reports should be prepared for the City as well. A recommended frequency of such reporting is monthly.

It is recommended that the RTO manufacturer conduct periodic inspection of the equipment. The findings of that inspection should be discussed with the odor management team in a form of a brief seminar intended to also provide the team with a good understanding of the workings of the RTO and of potential issues that may be encountered and should be watched for.

OS&E notes that most of the recommendations noted in this section have been accepted by DPF and will be incorporated into the OMP.

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