NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Office of Climate, Air, & Energy, Deputy Commissioner
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Ms. Lisa F. Garcia 3/10/2023
Regional Administrator
U.S. Environmental Protection Agency, Region 2
290 Broadway, 26th Floor
New York, NY 10007-1866

Dear Administrator Garcia:

On behalf of the Governor of the State of New York, I am submitting for approval by the U.S. Environmental Protection Agency (EPA) a Source-Specific State Implementation Plan Revision (SSSR) for Ortho-Clinical Diagnostics in Greece, New York.

Title 6 of the New York Codes, Rules, and Regulations (NYCRR) contains several regulations that define Reasonably Available Control Technology (RACT) for certain categories of stationary sources. The State Facility Permit for Ortho-Clinical Diagnostics that was issued on October 31, 2022, includes conditions that establish a RACT variance for VOC process emissions.

A public notice specifying that process specific RACT determinations would be submitted to EPA as a SSSR was published in the Environmental Notice Bulletin (ENB) on September 14, 2022. A public comment period occurred from September 14, 2022, to October 26, 2022. No comments were received.

The following documents, including those that were used by the DEC to evaluate and approve RACT emission limits, are enclosed with this proposed SSSR:

1. Source Specific State Implementation Plan Revision, Ortho-Clinical Diagnostics Permit ID: 8-2628-00503, February 2023,
2. Ortho Clinical Part 228 RACT Evaluation 11- 2021v3,
3. Public Notice as published in the *Environmental Notice Bulletin* on September 14, 2022.

If you have any questions or concerns, please contact Daniel Goss, Assistant Engineer, Division of Air Resources, Bureau of Air Quality Planning, SIP Planning Section at (518) 402-8396.

Sincerely,

Christopher LaLone
Director
Division of Air Resources

Enclosures

c: R. Ruvo, EPA Region 2
K. Wieber, EPA Region 2
R. Bielawa
D. Goss

NEW YORK STATE | Department of Environmental Conservation

Source Specific State Implementation Plan Revision

ORTHO-CLINICAL DIAGNOSTICS

PERMIT ID: 8-2628-00503

APRIL 2023

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Acronyms and Abbreviations

CAA	Federal Clean Air Act
DAR	DEC Division of Air Resources
DEC	New York State Department of Environmental Conservation
EPA	United State Environmental Protection Agency
NAAQS	National Ambient Air Quality Standards
NO_X	Oxides of Nitrogen
NYCRR	New York Codes, Rules, and Regulations
RACT	Reasonably Available Control Technology
SIP	State Implementation Plan
SSSR	Source Specific SIP Revision
VOCs	Volatile Organic Compounds

Introduction

The United States Environmental Protection Agency (EPA) defines Reasonably Available Control Technology (RACT) as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.

Title 6 of the New York Codes, Rules, and Regulations (NYCRR) contains several regulations that define Reasonably Available Control Technology (RACT) for certain categories of stationary sources in New York. These regulations seek emissions reductions of nitrogen oxides (NO_x) and/or volatile organic compounds (VOCs) to help attain and/or maintain the 8-hour ozone National Ambient Air Quality Standards (NAAQS).

Depending upon the relevant RACT regulation, a source that is required to implement RACT must meet a presumptive RACT limit, meet an alternate limit determined from an approved technical analysis if reaching a presumptive RACT limit is technically or economically infeasible, or meet an approved case-by-case RACT limit for sources which do not have a presumptive RACT limit established in regulation. Individual source specific RACT determinations that are included in a facility's operating permit must be submitted to EPA as a revision to the New York State Implementation Plan (SIP) to satisfy the NO_x and/or VOC RACT requirements under sections 182 and 184 of the Clean Air Act (CAA).

The New York State Department of Environmental Conservation's (DEC's) DAR-20 guidance, titled "Economic and Technical Analysis for Reasonably Available Control Technology (RACT)," provides procedures for the economic and technical feasibility analysis that needs to be used to evaluate source-specific RACT determinations and to determine appropriate RACT emission limits. This analysis must also be completed at each renewal of the emission source owner's permit. The re-evaluation must contain the latest control technologies and strategies available for review and allow for an inflation-adjusted economic threshold.

Source-specific RACT Determination and RACT Analysis

Ortho-Clinical Diagnostics (Ortho) is a leading global provider of in vitro diagnostics, providing high-quality products and services to the global clinical laboratory and immunohematology communities. The web-based film coatings for Ortho's various diagnostic products are produced on two solvent-based film coating machines designated 71 Machine and 72 Machine, which are both subject to 6 NYCRR Part 228 for volatile organic compound (VOC) content limits in coatings as applied to paper film and coil.

The 71 Machine is currently compliant with Part 228 regulations because this coating machine's exhaust is directed to a catalytic thermal oxidizer, which is achieving greater than the required 90% removal efficiency. However, the 72 Machine's VOC-laden exhaust is currently not ducted to an add-on control technology and is emitted directly to atmosphere.

The State Facility Permit for Ortho-Clinical Diagnostics, issued on October 31, 2022, contains a permit condition (Condition 13) that establishes a VOC emission limit that exceeds the presumptive RACT limit of 0.08 lbs. VOC/ lbs. of coating applied. Specifically, the aggregate VOC emissions from four non-compliant coatings on machine 72 must not exceed 21,600 pounds per year on a 12-month rolling basis.

Facility Permit

The RACT variance permit condition is included in Appendix B. The complete State Facility Permit issued on October 31, 2022, for Ortho-Clinical Diagnostics is available at:
PERMIT

Appendix A: Technical Analyses

PARTNERS
Environmental, Safety, Engineering & Surveying
Ohio | New York | New Jersey | Colorado

6 NYCRR PART 228 REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT) EVALUATION AND VARIANCE REQUEST

Ortho Clinical Diagnostics
Building 313
513 Technology Boulevard
Rochester, New York 14626

November 2021

Prepared for:
Ortho Clinical Diagnostics
100 Indigo Creek Drive
Rochester, New York 14626

Prepared by:
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1.0 INTRODUCTION

Ortho Clinical Diagnostics (Ortho) is a leading global provider of in vitro diagnostics providing high-quality products and services to the global clinical laboratory and immunohematology communities. Ortho's Building 313, which is located at 513 Technology Boulevard (Kodak Park) in Rochester, New York, contains its patented dry slide technologies manufacturing operations. Specifically, the web-based film coatings for Ortho's various diagnostic products are produced on two solvent-based film coating machines designated 71 Machine and 72 Machine, which are both subject to 6 NYCRR Part 228 regulations for volatile organic compound (VOC) content limits in coatings as applied to paper film and coil.

During a recent review of the draft New York State Department of Environmental Conservation (NYSDEC) State Air Permit for Building 313 and a parallel internal evaluation for transferring operations of the "A1c" product line from 71 Machine to 72 Machine, it was determined that the third and final layers of A1c product coatings are above the volatile organic compound (VOC) threshold per 6 NYCRR 228-1.4 which is 0.08 lbs. VOC / lbs. of coating (as applied). Additionally, the final layers for the CKMB, BLK, and WHT product lines, which are also produced on 72 Machine, were determined to be above this threshold.

The 71 Machine is currently compliant with Part 228 regulations because this coating machine's exhaust is directed to a catalytic thermal oxidizer, which is achieving greater than the required 90% removal efficiency. This allows for otherwise "non-compliant" coatings to be run on this machine. However, the 72 Machine's VOC-laden exhaust is currently not ducted to an add-on control technology and is emitted directly to atmosphere. Therefore, the Part 228 non-compliant coatings are the subject of this RACT evaluation to determine if there are any technically and economically feasible control options to reduce VOC emissions.

As outlined in the NYCRR regulations, the three compliance plan options for these coatings are:

- Seek a Reasonably Available Control Technology (RACT) variance in accordance with 6 NYCRR 228-1.5(e); or
- Implement measures to comply with emission control requirements in accordance with 6 NYCRR 228-1.5; or
- Implement measures to comply with the compliant materials requirement in accordance with 6 NYCRR 228-1.4

Based on engineering and budgeting estimates, Ortho has decided to seek a RACT variance for the non-compliant coatings currently utilized at the facility on the 72 Machine. This RACT evaluation will demonstrate that the current coating formulations, which are individually listed in the evaluation below, should be considered RACT, as all other process changes, material (coating) substitutions, and/or add-on control technologies are considered to be not technically feasible and/or not economically feasible.

2.0 RACT EVALUATION METHODOLOGY

Per 6 NYCRR 228-1.5(e), the NYSDEC may allow surface coating processes to operate with a lesser degree of control than is required by this section, provided that a process-specific RACT demonstration has been made to the satisfaction of the Department. Such process-specific RACT demonstrations must be submitted to NYSDEC for approval as a revision to the State Implementation Plan and must address the technical and economic feasibility of:

- utilizing compliant coating(s);
- utilizing demonstrated and proven emission control technologies which would achieve the required overall removal efficiency determined pursuant to subdivision (c) of this section;
- utilizing demonstrated and proven emission control technologies which would achieve a level of overall removal efficiency less than the required level determined pursuant to 6 NYCRR 228-1.5(c); and
- utilizing demonstrated and proven production modification methods which would result in real, documented, and enforceable reductions in the VOC emissions from the process.

3.0 VOC EMISSION PARAMETERS USED TO EVALUATE RACT OPTIONS

As stated in Section 1.0 of this RACT Evaluation, Ortho operates a film coating machine, designed 72 Machine, which applies various coatings to manufacture multiple types of diagnostic test slides. The exhaust flow rate from the coater section of 72 Machine is 1,150 acfm. The dryer portion of 72 Machine has an exhaust flow rate of 3,500 acfm. Based on coating usages, production times, and engineering estimates, the worst-case coating VOC loading is approximately 21 pounds per hour of xylenes. This equates to a VOC (xylene) concentration loading of approximately 275 ppm. The primary VOC constituents in the exhaust stream of 72 Machine from the various non-compliant coating layers are ethyl alcohol, tert-butyl alcohol, and xylenes (m- and o-).

Table 3.1 below summarizes the VOC content of the non-compliant coatings versus the Part 228 limit. Table 3.2 summarizes the mass rate emissions from an hourly, potential to emit (PTE), and actual estimated annual emission standpoint for those non-compliant coatings used on 72 Machine.

Table 3.1 – Summary of VOC Content (as applied) for Non-Compliant Coatings on 72 Machine

Coating Layer	Part 228 Table D-2 VOC Content Limit for Paper Film and Foil (lb VOC/lb Coating)	Calculated VOC Content (lb VOC/lb Coating)	Compliant with Part 228 Limits (Yes/No)
Product – A1c			
20A1C1-01	0.08	0	Yes
20A1C1-02		0	Yes
20A1C1-03		**0.975**	**No**
20A1C1---		**0.264**	**No**
Product - 49CKMB			
49CKMB-31	0.08	0	Yes
49CKMB-01		0.00023	Yes
49CKMB-02		0.00023	Yes
49CKMB-03		0	Yes
49CKMB---		**0.249**	**No**
Product – 90WHT			
90WHT-01	0.08	0	Yes
90WHT-02		0	Yes
90WHT---		**0.294**	**No**
Product – 92BLK			
92BLK-01	0.08	0	Yes
92BLK-02		0	Yes
92BLK---		**0.294**	**No**

Table 3.2 - Summary of VOC Emissions for Non-Compliant Coatings on 72 Machine

Coating Layer	VOC Emission Rate Potential (lb/hr)	Coating Operation (hr/event)	Minimum Drying/Curing Time Before Next Coating Added (hr/event)	Max Number of Product Units**	Estimated Actual Annual VOC Emissions (lb/yr)	Potential to Emit VOC Emissions (lb/yr)***
Product – A1c						
20A1C1-01	0*	1	1	278	0*	0*
20A1C1-02	0*	1	24		0*	0*
20A1C1-03	7.02	1	1		175.6	1,952
20A1C1---	7.99	2.5			499.9	5,553
Product - 49CKMB						
49CKMB-31	0*	0.3	24	201	0*	0*
49CKMB-01	0*	0.4	1		0*	0*
49CKMB-02	0*	0.3	16		0*	0*
49CKMB-03	0*	0.3	1		0*	0*
49CKMB---	17.80	0.3			19.8	1,073
Product – 90WHT						
90WHT-01	0*	0.6	1	2,576	0*	0*
90WHT-02	0*	0.4	1		0*	0*
90WHT---	20.99	0.4			29.7	21,628
Product – 92BLK						
92BLK-01	0*	0.6	1	2,576	0*	0*
92BLK-02	0*	0.4	1		0*	0*
92BLK---	20.99	0.4			40.8	21,628

* - These sub layers do not contain VOCs.
** - The maximum number of product units is equal to 8,760 hours per year divided by the total hours to coat and dry/cure per product. It should be noted that this is a conservatively high value as it does not include other factors such as change out times.
*** - The potential to emit annual emissions assumes that the product (such as A1c) is manufactured continuously for 8,760 hours per year. These emission values take into account the coating timeframes for each coating layer, as well as the necessary curing/drying times prior to applying the next layer.

4.0 RACT TECHNICAL FEASIBILITY EVALUATION

The purpose of this section is to evaluate the technical feasibility of lowering VOC content/emissions in the coatings below applicability thresholds booths through the use of process/operational changes and/or material substitutions, or by controlling VOC emissions by 90% from the 72 Machine exhaust, as detailed in 6 NYCRR 228-1.5(b).

4.1 Process/Operational Change Options

The 72 Machine is Ortho's pilot coating machine for the company's research and development of new potential products, as well as small coat-to-bond material qualification experiments of an existing product line CKMB and the planned new product line A1c. This machine also manufactures a small production run of equipment diagnostic calibration slides (WHT and BLK) used for internal purposes only.

The new A1c product line was originally planned to be produced on the 71 Machine, where the VOC emissions would be sent to a catalytic thermal oxidizer. However, because Ortho could not reliably / consistently produce A1c on 71 Machine to product specifications, they switched production to 72 Machine, where they could more reliably manufacture the product due to the narrower film strip length as compared to 71 Machine.

The 72 Machine equipment design is based on state of art film manufacturing technology appropriate for the coating weight of the products and the process equipment has been optimized to minimize overspray of the coating onto the film substrate that could generate excess VOC emissions. As such, there are no other potential technically feasible process change options for the 72 Machine that would further reduce VOC emissions.

4.2 Material Substitution and Coating Formulation Change Options

The formulations for each of the Part 228 non-compliant coating layers associated with Ortho's various product lines undergoes extensive research and development to achieve the necessary performance standards of the product. This development time takes on average approximately two to three years at which time the coating formulations undergo a rigorous validation process with the Food and Drug Administration (FDA) for approval, as well as international regulatory validation. This validation process could take up to two years to obtain approval from the governing bodies. As such, these formulations have been extensively vetted including looking at potential material (solvent) substitutions.

Even if there were technically feasible material substitution options for the various Part 228 non-compliant coatings, it would require that the material change go through the extensive R&D/validation process, which would not be economically feasible.

4.3 Add-on Control Technology Options

Based on the USEPA published literature, such as Handbook of Control Technologies for Hazardous Air Pollutants (EPA/625/6-91/014), the following add-on control technologies were evaluated for technical feasibility for the VOCs in the non-compliant coatings applied at OMP:

- Thermal oxidation;
- Catalytic oxidation;
- Liquid absorption;
- Carbon adsorption;
- Condensation; and
- Biofiltration.

Each of these technologies is described in additional detail below.

Thermal Oxidation

Thermal incinerators are used to control a wide variety of continuous emission streams containing VOCs. Compared to the other techniques, thermal incineration is broadly applicable; that is, it is much less dependent on VOC characteristics and emission stream characteristics than other VOC control

technologies. Destruction efficiencies up to 99+ percent are achievable with thermal incineration. Although they accommodate minor fluctuations in flow, thermal incinerators are not well suited to streams with highly variable flow because the reduced residence time and poor mixing during increased flow conditions decreases the completeness of combustion. This causes the combustion chamber temperature to fall, thus decreasing the destruction efficiency.

The capital and annual operating costs associated with thermal oxidation (regenerative and recuperative) tend to be higher than other add-on control options, especially with dilute VOC-laden emission streams, owing to high fuel consumption. Although the concentration of VOCs in the exhaust stream from 72 Machine's coater and dryer operations is low (approximately 275 ppm at 4,650 acfm), thermal oxidation is considered to be a technically feasible add-on control option and was further evaluated for economic feasibility as found in Section 5.0 of this RACT evaluation.

Catalytic Oxidation

Catalytic incinerators are similar to thermal incinerators in design and operation except that they employ a catalyst to enhance the reaction rate. Since the catalyst allows the reaction to take place at lower temperatures, significant fuel savings may be possible with catalytic incineration. Catalytic incineration is not as broadly applicable as thermal incineration since performance of catalytic incinerators is more sensitive to pollutant characteristics and process conditions than is thermal incinerator performance.

Materials such as phosphorus, bismuth, lead, arsenic, antimony, mercury, iron oxide, tin, zinc, sulfur, and halogens in the emission stream can poison the catalyst and severely affect its performance. Liquid or solid particles that deposit on the catalyst and form a coating also reduce the catalyst's activity by preventing contact between the VOCs and the catalyst surface. Catalyst life is limited by thermal aging and by loss of active sites by erosion attrition, and vaporization. With proper operating temperatures and adequate temperature control, these processes are normally slow, and satisfactory performance can be maintained for 2 to 5 years before replacement of the catalyst is necessary.

Therefore, catalytic oxidation is considered technically feasible in controlling the 72 Machine's VOC emissions at destruction efficiency greater than 90% and was further evaluated for economic feasibility as found in Section 5.0 of this RACT evaluation.

Ducting 72 Machine Exhaust to Existing 71 Machine Catalytic Oxidizer

A potential option to control emissions from 72 Machine is to manifold the 72 Machine's exhaust into the existing catalytic oxidizer dedicated to the VOC emissions associated with 71 Machine. Based on engineering review, however, tying into the existing 71 Machine catalytic oxidizer for 72 Machine's exhaust is complicated and not recommended. Specifically, 71 Machine and 72 Machine could not operate at the same time. They are incompatible due to variances in static pressure between both machines. Additionally, the overall airflow from both 71 Machine and 72 Machine would exceed the design capacity of the catalytic oxidizer. Even though it is potentially technically feasible to run both machines separately, it would involve complicated planning for coating schedules, as well as additional overtime into off shifts. In other words, due to product demands, both coating machines are required from a business standpoint to be able to operate simultaneously, as needed.

The existing catalytic oxidizer is approximately 25 years-old and the control design is dedicated to 71 Machine operation with a single fan design and specific static pressure. Completely new air intake dampers and a VFD-type fan control regime would be required, which would also require 71 Machine controls rework and validation. The low flow requirement for 72 Machine and the distance of the duct work that would have to be installed on the roof would also require heat tracing and insulation to prevent condensation issues.

The cost would be significant, potentially equal to the one of the standalone proposals, plus the added significant risks listed above. Therefore, ducting the 72 Machine exhaust stream to the current 71 Machine catalytic oxidizer is not considered a technically feasible add-on control option and was not further evaluated for economic feasibility.

Liquid Absorption

Liquid absorption (wet scrubbing) is widely used as a raw material and/or a product recovery technique in separation and purification of gaseous streams containing high concentrations of VOCs. As an emission control technique, it is much more commonly employed for inorganic vapors (e.g., hydrogen sulfide, chlorides, etc.) than for organic vapors. Using absorption as the primary control technique for VOCs is subject to several limitations and problems. The suitability of absorption for controlling organic vapor emissions is determined by several factors; most of these factors will depend on the specific VOC in question. For example, the most important factor is the availability of a suitable solvent. The pollutant in question should be readily soluble in the solvent for effective absorption rates and the spent solvent should be easily regenerated or disposed of in an environmentally acceptable manner. Another factor that affects the suitability of absorption for organic vapor emissions control is the availability of vapor/liquid equilibrium data for the specific VOC/solvent system in question. Such data are necessary for design of absorber systems.

Another consideration involved in the application of absorption as a control technique is disposal of the absorber effluent (i.e., used solvent). If the absorber effluent containing the organic compounds is discharged to the sewer, pond, etc., the air pollution problem is merely being transformed into a water pollution problem.

Because liquid absorption is limited as an add-on control technique for VOC emissions, this control option is not considered technically feasible in controlling the mixture of VOCs in 72 Machine's operations exhaust (methyl ethyl ketone, tert-butyl alcohol, ethanol, xylenes, etc.). Therefore, liquid absorption was not further evaluated for economic feasibility.

Carbon Adsorption

Carbon adsorption is commonly employed as a pollution control and/or a solvent recovery technique. It is applied to dilute mixtures of VOC and air. Removal efficiencies of 95 to 99 percent can be achieved using carbon adsorption. The maximum practical inlet concentration is usually about 10,000 ppmv, but virtually all applications will have significantly lower concentrations. The inlet concentrations are typically limited by the adsorption capacity of the carbon bed or safety problems posed by high bed temperature produced by heat of adsorption and presence of flammable vapors.

In contrast to incineration methods whereby the VOCs are destroyed, carbon adsorption provides a favorable control alternative when the VOCs in the emission stream are valuable. High molecular weight compounds that are characterized by low volatility are strongly adsorbed on carbon. The affinity of carbon for these compounds makes it difficult to remove them during regeneration of the carbon bed. Hence, carbon adsorption is not applied to such compounds (i.e., boiling point above 400° F; molecular weight greater than about 130). Highly volatile materials (i.e., molecular weight less than about 45) do not adsorb readily on carbon; therefore, adsorption is not typically used for controlling emission streams containing such compounds. Carbon adsorption is relatively sensitive to emission stream conditions. The presence of liquid or solid particles, high boiling organics, or polymerizable substances may require pretreatment procedures such as filtration.

The adsorption of high concentrations of ketones and aldehydes onto carbon may cause fires in the media bed due to the high exothermic reaction generated during the adsorption process. Although the exhaust stream from 72 Machine for the Part 228 non-compliant coatings does not contain ketones or aldehydes, the 72 Machine does frequently coat other Part 228 compliant formulations that contain significant amounts of methyl ethyl ketone. The concentrations of methyl ethyl ketone are deemed significant enough for carbon adsorption to not be considered technically feasible. Therefore, an economic feasibility evaluation was not conducted for carbon adsorption.

Condensers

Condensation is widely used in raw material and/or product recovery devices. They are frequently applied as preliminary air pollution control devices for removing VOC contaminants from emission streams prior to other control devices such as incinerators, adsorbers, or absorbers. Condensers are also used by

themselves for controlling emission streams containing high VOC concentrations (usually >5,000 ppmv). In these cases, removal efficiencies obtained by condensers can range from 50 to 90 percent although removal efficiencies at the higher end of this scale usually require VOC concentrations of around 10,000 ppmv or greater. The removal efficiency of a condenser is highly dependent on the emission stream characteristics including the nature of the VOC in question (vapor pressure-temperature relationship) and concentration, and the type of coolant used.

Because of the low concentrations of VOCs in the 72 Machine exhaust stream (275 ppm), condensation is not considered a technically feasible add-on control option and therefore was not further evaluated for economic feasibility.

Biofiltration

Biofiltration uses microorganisms to remove VOCs from the exhaust stream. The air flows through a packed bed and the pollutant transfers into a thin biofilm on the surface of the packing material. Microorganisms, including bacteria and fungi are immobilized in the biofilm and degrade the pollutant.

The technology finds greatest application in treating malodorous compounds and water-soluble VOCs. Industries that typically employ this technology include food and animal products, off-gas from wastewater treatment facilities, pharmaceuticals, wood products manufacturing, paint and coatings application and manufacturing, and resin manufacturing and application. Compounds treated are typically mixed VOCs and various sulfur compounds, including hydrogen sulfide. Very large airflows may be treated, although a large area (footprint) has typically been required and has been one of the principal drawbacks of the technology.

One of the main challenges to optimum biofilter operation is maintaining proper and uniform moisture and VOC emission concentrations throughout the system. The air is normally humidified before it enters the bed with a watering (spray) system or some sort of humidification chamber. Properly maintained, a natural, organic packing media like peat, vegetable mulch, bark or wood chips may last for several years but engineered, combined natural organic and synthetic component packing materials will generally last much longer, up to 10 years.

Media irrigation water, although many systems recycle part of it to reduce operating costs, has a moderately high biochemical oxygen demand (BOD) and may require treatment before disposal. However, this "blowdown water", necessary for proper maintenance of any bio-oxidation system, is generally accepted by municipal publicly owned treatment works without any pretreatment.

Due to the fact that the 72 Machine VOC concentrations significantly vary from one coated product to the next, a steady feed stream for the microorganisms to live/thrive is not realistically attainable. Therefore, this technology is not considered to be technically feasible, and an economic feasibility evaluation was not performed for biofiltration.

5.0 ECONOMIC FEASIBILITY OF TECHNICALLY FEASIBLE OPTIONS

Of the potentially technically feasible process/operational changes, material substitution and coating formulation changes, and add-on control technology alternatives evaluated, thermal oxidation, catalytic oxidation, and carbon adsorption were found to be technically feasible options to reduce VOC emissions from the 72 Machine exhaust. As such, an economic evaluation was conducted to determine if any of these technically feasible options meet the RACT economic feasibility cost threshold.

Based on NYSDEC guidance document, DAR-20: Economic and Technical Analysis for Reasonably Available Control Technology (effective October 18, 2013), the cost threshold in 1994 dollars to define RACT economic feasibility for VOC emissions in marginal ozone non-attainment areas was $3,000 per ton reduced. Using the U.S. Department of Labor, Bureau of labor Statistics Inflationary Calculator, the adjusted RACT cost threshold for economic feasibility in $5,676 in November 2021 dollars.

The economic evaluation for thermal oxidation, catalytic oxidation, and carbon adsorption was conducted using the Control Technologies for Hazardous Air Pollutants Handbook (USEPA 625/6-91/014, June 1991) guidance document, as well as budgetary quotations from equipment vendors.

The table below summarizes the economic feasibility evaluation for the technically feasible alternatives. Detailed cost estimates, along with the equipment vendor budgetary quotation, for each technically feasible option evaluated can be found in Appendix D.

Table 5.1 - Summary of RACT Economic Feasibility Evaluation

Add-on Control Technology	Equipment Vendor	Installed Equipment Capital Costs	Annual Operating Costs (1)	VOC Loading (TPY)	Removal Efficiency (%)	VOC Removed (TPY)	Cost/Ton Removed	Economically Feasible
Regenerative Thermal Oxidation	Griffith Consulting, LLC	$245,897	$512,867	10.8	95	10.26	$49,987	No
Regenerative Catalytic Oxidation	Catalytic Products	$398,201	$294,092	10.8	95	10.26	$28,664	No
	Clean Air, LLC	$344,067	$335,943	10.8	98	10.58	$31,741	No
	Griffith Consulting, LLC	$341,075	$299,342	10.8	98	10.58	$28,282	No

(1) Annual operating costs include capital recovery of 10 years at 10% interest.

6.0 CONCLUSIONS AND VARIANCE REQUEST

Ortho is submitting a RACT variance for the non-compliant coatings currently utilized at the facility on the 72 Machine to address the non-compliance with 6 NYCRR Part 228.

As part of this RACT variance, potential process/operational changes, material substitution and coating formulation changes, and add-on control technology alternatives were evaluated for technical feasibility. Thermal oxidation, catalytic oxidation, and carbon adsorption add-on control technologies were determined to be technically feasible to reduce VOC emissions from the 72 Machine coating operations. None of the technically feasible options were determined to be economically feasible per the DAR-20 guidance document for RACT evaluations.

This RACT evaluation has demonstrated that the current coating formulations, which are individually listed in the evaluation (Section 3.0), should be considered RACT, as all other process changes, material (coating) substitutions, and/or add-on control technologies are considered to be not technically feasible and/or not economically feasible. Therefore, Ortho requests a RACT variance for the non-compliant coatings from the Part 228 VOC coating content limits as summarized in Table D-2 – Paper Film and Foil Coatings (6 NYCRR 228-1.4(d)(2)) for the current non-compliant coatings utilized on 72 Machine.

APPENDIX A
ADD-ON CONTROL TECHNOLOGY COST ESTIMATES

ORTHO CLINICAL RACT EVALUATION
ECONOMIC FEASIBILITY

Add-on Control Technology	Equipment Vendor	Installed Equipment Capital Costs	Annual Operating Costs	VOC Loading (TPY)	Removal Efficiency (%)	VOC Removed (TPY)	Cost/Ton Removed	Economically Feasible
Regenerative Thermal Oxidation	Griffith Consulting LLC	$245,897	$512,867	10.8	95	10.26	$49,987	No
Regenerative Catalytic Oxidation	Griffith Consulting LLC	$341,075	$299,342	10.8	98	10.58	$28,282	No
	Catalytic Products	$398,201	$294,092	10.8	95	10.26	$28,664	No
	Clean Air, LLC	$344,067	$335,943	10.8	98	10.58	$31,741	No

Client: Ortho Clinical Diagnostics
Project Number: 1648.02A
Project Description: VOC RACT Variance - Part 228
Control Equipment: Regenerative Thermal Oxidizer

Capital Costs

			Equipment Vendor: **Griffith Consulting LLC**
Direct Costs, DC			
Purchased Equipment Costs			
RTO & Auxiliary Equipment:	EC	(Based on Equipment Vendor Quotation)	$140,120
Instrumentation:	0.01 EC		$1,401
Sales Tax:	0.03 EC		$4,204
Freight	0.05 EC		$7,006
Purchased Equipment Costs, PEC	1.08 EC		$152,731
Direct Installation Costs			
Foundation and Supports:	0.08 PEC		$12,218
Erection and Handling:	0.14 PEC		$21,382
Electrical:	0.04 PEC		$6,109
Piping:	0.02 PEC		$3,055
Insulation:	0.01 PEC		$1,527
Painting:	0.01 PEC		$1,527
	0.30 PEC		$45,819
Site Preparation	SP		SP
Building	Bldg.		Bldg.
Total Direct Cost, DC	1.30 PEC + SP + Bldg.		$198,550 + SP + Bldg.
Indirect Costs, IC			
Engineering:	0.10 PEC		$15,273
Construction:	0.05 PEC		$7,637
Contractor Fee:	0.10 PEC		$15,273
Start-up:	0.02 PEC		$3,055
Peformance Test:	0.01 PEC		$1,527
Contingency:	0.03 PEC		$4,582
Total Indirect Cost, IC	0.31 PEC		$47,347
Total Capital Cost, TCC = DC + IC	1.61 PEC + SP + Bldg.		**$245,897 + SP + Bldg.**

Client: Ortho Clinical Diagnostics
Project Number: 1648.02A
Project Description: VOC RACT Variance - Part 228
Control Equipment: Regenerative Thermal Oxidizer

Annual Costs (O & M Costs)

Equipment Vendor:
Griffith Consulting LLC

Direct Annual Costs, DAC

Utilities:			***Operation Data***			
Electricity	$0.13	per kWh (10-2021 prices)	Fan:	**11.2**	kWh	$8,480
Natural Gas	$5.78	per MMBtu (10-2021 prices)	Nat Gas Consumption	**12**	MMBtu/hr	$403,953
Operating Labor (OL):			Number of Shifts/Day:	2		
Operator Labor	$12.96	per hour	Hours/Shift:	8		$9,435
Supervisory Labor	$1.94	per hour (15% of Operator Labor)	Days/Week:	7		$1,415
			Weeks/Yr:	52		
Maintenance (M):			**Operational Hrs/Yr**	**5,824**		
Labor	$14.26	per hour	Hours/Shift (OL & M):	1		$10,381
Materials	$14.26	(100% of Maintenance Labor)	**Hours/Year (OL & M):**	**728**		$10,381
Total Direct Annual Costs, DAC	DAC					$444,045

Indirect Annual Costs, IAC

Overhead:	0.60 (OL + M)	$18,968
Adminmistrative:	0.02 TCC	$4,918
Insurance:	0.01 TCC	$2,459
Property Tax:	0.01 TCC	$2,459
Capital Recovery:[1]	CRF (TCC)	$40,019
Total Indirect Annual Costs, IAC	IAC	$68,822

Total Annual Costs, TAC = DAC + IAC TAC **$512,867**

Footnote:

CRF = $i(1 + i)^n/[(1 + i)^n - 1]$ = 0.1627
where,
i = interest rate = 10 percent
n = equipment life = 10 years

Assumptions:
Conversion factor (hp-hr to kWh): 0.7459

Client: Ortho Clinical Diagnostics
Project Number: 1648.02A
Project Description: VOC RACT Variance - Part 228
Control Equipment: Regenerative Catalytic Oxidizer

Capital Costs

			Equipment Vendor: **Griffith Consulting LLC**
Direct Costs, DC			
Purchased Equipment Costs			
RTO & Auxiliary Equipment:	EC	(Based on Equipment Vendor Quotation)	$192,074
Instrumentation:	0.01 EC		$1,921
Sales Tax:	0.03 EC		$5,762
Freight	0.05 EC		$9,604
Purchased Equipment Costs, PEC	1.08 EC		$209,361
Direct Installation Costs			
Foundation and Supports:	0.08 PEC		$25,000
Erection and Handling:	0.14 PEC		$46,000
Electrical:	0.04 PEC		---
Piping:	0.02 PEC		---
Insulation:	0.01 PEC		---
Painting:	0.01 PEC		---
	0.30 PEC		$71,000
Site Preparation	SP		SP
Building	Bldg.		Bldg.
Total Direct Cost, DC	1.30 PEC + SP + Bldg.		$280,361 + SP + Bldg.
Indirect Costs, IC			
Engineering:	0.10 PEC		$20,936
Construction:	0.05 PEC		$10,468
Contractor Fee:	0.10 PEC		$20,936
Start-up:	0.02 PEC		---
Peformance Test:	0.01 PEC		$2,094
Contingency:	0.03 PEC		$6,281
Total Indirect Cost, IC	0.31 PEC		$60,715
Total Capital Cost, TCC = DC + IC	1.61 PEC + SP + Bldg.		**$341,075 + SP + Bldg.**

Client: Ortho Clinical Diagnostics
Project Number: 1648.02A
Project Description: VOC RACT Variance - Part 228
Control Equipment: Regenerative Catalytic Oxidizer

Annual Costs (O & M Costs)

Equipment Vendor:
Griffith Consulting LLC

Direct Annual Costs, DAC

Utilities:			***Operation Data***			
Electricity	$0.13	per kWh	Fan:	**14.92**	kWh	$11,296
Natural Gas	$5.78	per MMBtu	Nat Gas Consumption	**5**	MMBtu/hr	$168,314
Operating Labor (OL):			Number of Shifts/Day:	2		
Operator Labor	$12.96	per hour	Hours/Shift:	8		$9,435
Supervisory Labor	$1.94	per hour (15% of Operator Labor)	Days/Week:	7		$1,415
			Weeks/Yr:	52		
Maintenance (M):			**Operational Hrs/Yr**	**5,824**		
Labor	$14.26	per hour	Hours/Shift (OL & M):	1		$10,381
Materials	$14.26	(100% of Maintenance Labor)	**Hours/Year (OL & M):**	**728**		$10,381
Total Direct Annual Costs, DAC	DAC					$211,223

Indirect Annual Costs, IAC

Overhead:	0.60 (OL + M)	$18,968
Adminmistrative:	0.02 TCC	$6,822
Insurance:	0.01 TCC	$3,411
Property Tax:	0.01 TCC	$3,411
Capital Recovery:[1]	CRF (TCC)	$55,508
Total Indirect Annual Costs, IAC	IAC	$88,119

Total Annual Costs, TAC = DAC + IAC TAC **$299,342**

Footnote:

CRF = $i(1 + i)^n/[(1 + i)^n - 1]$ = 0.1627
where,
i = interest rate = 10 percent
n = equipment life = 10 years

Assumptions:
Conversion factor (hp-hr to kWh): 0.7459

Client: Ortho Clinical Diagnostics
Project Number: 1648.02A
Project Description: VOC RACT Variance - Part 228
Control Equipment: Regenerative Catalytic Oxidizer

Capital Costs

			Equipment Vendor: **Catalytic Products**	
Direct Costs, DC				
Purchased Equipment Costs				
RTO & Auxiliary Equipment:	EC	(Based on Equipment Vendor Quotation)	$219,900	
Instrumentation:	0.01 EC		$2,199	
Sales Tax:	0.03 EC		$6,597	
Freight	0.05 EC		$10,995	
Purchased Equipment Costs, PEC	1.08 EC		$239,691	
Direct Installation Costs				
Foundation and Supports:	0.08 PEC		$25,000	
Erection and Handling:	0.14 PEC		$46,000	
Electrical:	0.04 PEC		---	
Piping:	0.02 PEC		---	
Insulation:	0.01 PEC		---	
Painting:	0.01 PEC		---	
	0.30 PEC		$71,000	
Site Preparation	SP		SP	
Building	Bldg.		Bldg.	
Total Direct Cost, DC	1.30 PEC + SP + Bldg.		$310,691	+ SP + Bldg.
Indirect Costs, IC				
Engineering:	0.10 PEC		$23,969	
Construction:	0.05 PEC		$11,985	
Contractor Fee:	0.10 PEC		$23,969	
Start-up:	0.02 PEC		$18,000	(vendor quote)
Peformance Test:	0.01 PEC		$2,397	
Contingency:	0.03 PEC		$7,191	
Total Indirect Cost, IC	0.31 PEC		$87,510	
Total Capital Cost, TCC = DC + IC	1.61 PEC + SP + Bldg.		**$398,201**	**+ SP + Bldg.**

Client: Ortho Clinical Diagnostics
Project Number: 1648.02A
Project Description: VOC RACT Variance - Part 228
Control Equipment: Regenerative Catalytic Oxidizer

Annual Costs (O & M Costs)

Equipment Vendor:
Catalytic Products

Direct Annual Costs, DAC

Utilities:			***Operation Data***			
Electricity	$0.13	per kWh	Fan:	**14.92**	kWh	$11,296
Natural Gas	$5.78	per MMBtu	Nat Gas Consumption	**4.5**	MMBtu/hr	$151,482
Operating Labor (OL):			Number of Shifts/Day:	2		
Operator Labor	$12.96	per hour	Hours/Shift:	8		$9,435
Supervisory Labor	$1.94	per hour (15% of Operator Labor)	Days/Week:	7		$1,415
			Weeks/Yr:	52		
Maintenance (M):			**Operational Hrs/Yr**	**5,824**		
Labor	$14.26	per hour	Hours/Shift (OL & M):	1		$10,381
Materials	$14.26	(100% of Maintenance Labor)	**Hours/Year (OL & M):**	**728**		$10,381
Total Direct Annual Costs, DAC	DAC					$194,391

Indirect Annual Costs, IAC

Overhead:	0.60 (OL + M)	$18,968
Adminmistrative:	0.02 TCC	$7,964
Insurance:	0.01 TCC	$3,982
Property Tax:	0.01 TCC	$3,982
Capital Recovery:[1]	CRF (TCC)	$64,805
Total Indirect Annual Costs, IAC	IAC	$99,701

Total Annual Costs, TAC = DAC + IAC TAC **$294,092**

Footnote:

CRF = $i(1 + i)^n/[(1 + i)^n - 1]$ = 0.1627
where,
i = interest rate = 10 percent
n = equipment life = 10 years

Assumptions:
Conversion factor (hp-hr to kWh): 0.7459

Client: Ortho Clinical Diagnostics
Project Number: 1648.02A
Project Description: VOC RACT Variance - Part 228
Control Equipment: Regenerative Catalytic Oxidizer

Capital Costs

			Equipment Vendor: **Clean Air, LLC**	
Direct Costs, DC				
Purchased Equipment Costs				
RTO & Auxiliary Equipment:	EC	(Based on Equipment Vendor Quotation)	$181,400	
Instrumentation:	0.01 EC		$1,814	
Sales Tax:	0.03 EC		$5,442	
Freight	0.05 EC		$9,070	
Purchased Equipment Costs, PEC	1.08 EC		$197,726	
Direct Installation Costs				
Foundation and Supports:	0.08 PEC		$25,000	
Erection and Handling:	0.14 PEC		$46,000	
Electrical:	0.04 PEC		---	
Piping:	0.02 PEC		---	
Insulation:	0.01 PEC		---	
Painting:	0.01 PEC		---	
	0.30 PEC		$71,000	
Site Preparation	SP		SP	
Building	Bldg.		Bldg.	
Total Direct Cost, DC	1.30 PEC + SP + Bldg.		$268,726	+ SP + Bldg.
Indirect Costs, IC				
Engineering:	0.10 PEC		$19,773	
Construction:	0.05 PEC		$9,886	
Contractor Fee:	0.10 PEC		$19,773	
Start-up:	0.02 PEC		$18,000	(vendor quote)
Peformance Test:	0.01 PEC		$1,977	
Contingency:	0.03 PEC		$5,932	
Total Indirect Cost, IC	0.31 PEC		$75,341	
Total Capital Cost, TCC = DC + IC	1.61 PEC + SP + Bldg.		**$344,067**	**+ SP + Bldg.**

Client: Ortho Clinical Diagnostics
Project Number: 1648.02A
Project Description: VOC RACT Variance - Part 228
Control Equipment: Regenerative Catalytic Oxidizer

Annual Costs (O & M Costs)

Equipment Vendor:
Clean Air, LLC

Direct Annual Costs, DAC

Utilities:			***Operation Data***			
Electricity	$0.13	per kWh	Fan:	**18**	kWh	$13,628
Natural Gas	$5.78	per MMBtu	Nat Gas Consumption	**6**	MMBtu/hr	$201,976
Operating Labor (OL):			Number of Shifts/Day:	2		
Operator Labor	$12.96	per hour	Hours/Shift:	8		$9,435
Supervisory Labor	$1.94	per hour (15% of Operator Labor)	Days/Week:	7		$1,415
			Weeks/Yr:	52		
Maintenance (M):			**Operational Hrs/Yr**	**5,824**		
Labor	$14.26	per hour	Hours/Shift (OL & M):	1		$10,381
Materials	$14.26	(100% of Maintenance Labor)	**Hours/Year (OL & M):**	**728**		$10,381
Total Direct Annual Costs, DAC	DAC					$247,217

Indirect Annual Costs, IAC

Overhead:	0.60 (OL + M)	$18,968
Adminmistrative:	0.02 TCC	$6,881
Insurance:	0.01 TCC	$3,441
Property Tax:	0.01 TCC	$3,441
Capital Recovery:[1]	CRF (TCC)	$55,995
Total Indirect Annual Costs, IAC	IAC	$88,726

Total Annual Costs, TAC = DAC + IAC TAC **$335,943**

Footnote:

CRF = $i(1 + i)^n/[(1 + i)^n - 1]$ = 0.1627
where,
i = interest rate = 10 percent
n = equipment life = 10 years

Assumptions:
Conversion factor (hp-hr to kWh): 0.7459

APPENDIX B
EQUIPMENT VENDOR QUOTATIONS

Griffith Consulting, LLC.

Proposal

Direct Fired Thermal Oxidizer

Proposal 210505a-0

for

Ortho Clinical Diagnostics
Rochester, New York

May 5, 2021

Griffith Consulting, LLC.
2125 Bustard Road, Lansdale, PA 19446 ● 610-222-4530 ● fax: 610-222-4531● cgriffith@gclequipment.com

Application Description

Ortho Clinical Diagnostics operates a production plant that emits contaminated process air. The combustible compounds in the process air stream must be destroyed to meet environmental requirements. This proposal is for an economical direct-fired thermal oxidizer (DFTO) designed to meet the required 95% destruction efficiency, while operating safely and minimizing auxiliary fuel consumption.

Exhaust Stream (from customer)

Operating Parameters

Process Air Volume (SCFM)	6000
Max. Solvent Load (lb/hr)	16.39
Process Air Temperature	100°F
Inlet Pressure	2" WC
Min. Operating Temperature	600°F
VOC Destruction Efficiency	>95%

VOCs: MEK, Methanol, Ethanol, M-xyl, O-xyl, TBA, THF, IPA, Ethyl Acetate, N-decane

NOTE: The process data assumes the exhaust stream is composed only of the above referenced gaseous constituents.

72 Machine	**Solvent lb/hr**						Solvent lb/hr	Exhaust Flow	Estimated Temp.
Condition	Acetone	MEK	Ethanol	M-XYL	O-XYL	TBA	Total	CFM	°F
1			7.02				7.02	4450	72
2	0.26					8.00	8.26	3700	75
3	14.99						14.99	4450	72
4	4.47						4.47	4450	72
5	29.45	9.03		17.47			55.94	4450	72
6	2.93						2.93	4450	72
7	27.06				20.99		48.05	4450	72
8	2.93						2.93	4450	72
9	27.06				20.99		48.05	4450	72
10	4.47						4.47	4450	72
11			7.02				7.02	4450	72
12	29.45	9.03			20.99		59.46	4450	72
13						20.00	20.00	4450	72

Thermal Oxidizer Description

The proposed thermal oxidizer includes a horizontally fired burner into a horizontal oxidation chamber. The process air will enter the thermal oxidizer through a nozzle on the back of the thermal oxidizer burner. The burner will use natural gas for the fuel source to preheat the oxidizer. The burner is specially designed for use in thermal oxidizers, incinerators, and high temperature furnaces. Its flame promotes good mixing between the thermal oxidizer flue gas and the flame's products of combustion. Adequate flue gas residence time is incorporated into the thermal oxidizer design to ensure high levels of contaminant destruction. Supplemental fuel will be injected into the burner to maintain a minimum thermal oxidizer operating temperature. The process air fan will move the process air to and through the thermal oxidizer burner. The thermal oxidizer will operate near atmospheric pressure.

The thermal oxidizer will include combustion safety features such as pre-start purge, flame supervision, and high temperature limit that will limit the thermal oxidizer to a pre-set maximum temperature limit. The thermal oxidizer will include automatic temperature control that will maintain the user-selected temperature setpoint and modulate air to the thermal oxidizer. The thermal oxidizer temperature will be controlled by a temperature controller that receives input from a thermocouple located in the discharge stack of the thermal oxidizer. The control system will allow for start-up and shutdown of the thermal oxidizer, which will be initiated by a thermal oxidizer purge. The high temperature switch will ensure the oxidizer does not operate above 2000°F.

The thermal oxidizer shell will be made of carbon steel. The surface will be prepared, primed, and finish coated with high temperature paint suitable for industrial service. It will be mounted on legs and will be self-supporting. The legs will be designed to support on the rooftop structural steel.

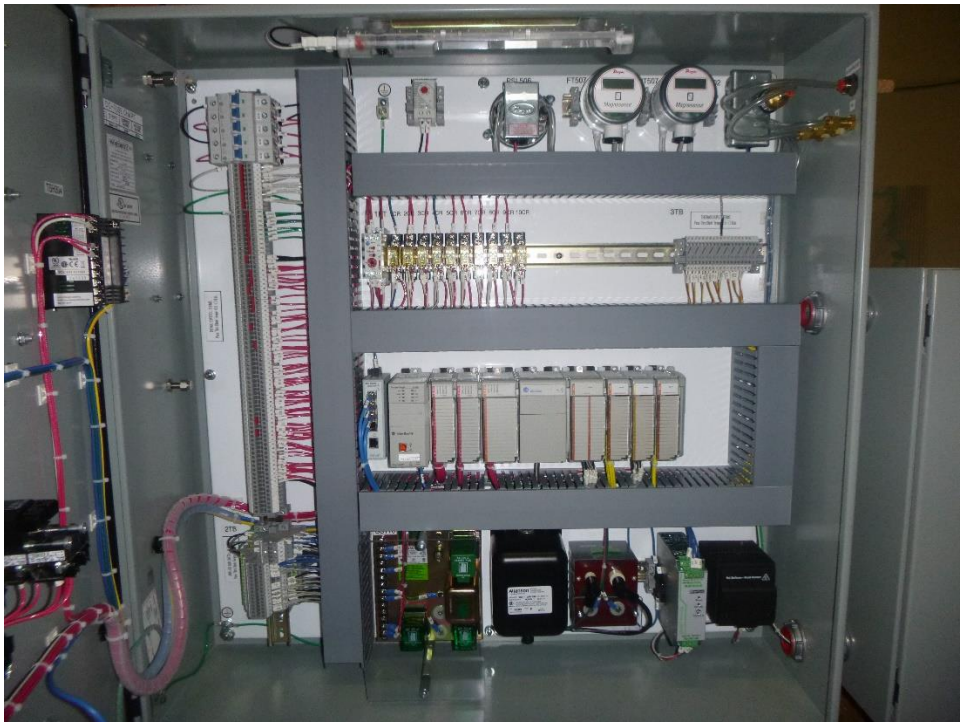
The oxidation chamber will be lined with high temperature ceramic fiber to protect the carbon steel shell. Use of ceramic fiber insulation allows for rapid heat up of the thermal oxidizer, which saves time and fuel. Soft refractory lining is installed to allow for rapid heat up without thermal shock issues that would accompany hard refractory designs. Soft refractory undergoes minimal expansion and contraction and is ideal for applications such as this that require high levels of on/off or cyclic operation or on systems that require transportability.

Control Panel

The control panel provides the primary user interface, monitors and records system parameters, processes the logic software and sequences, and supplies the safety and control signals to system components and interfacing systems.

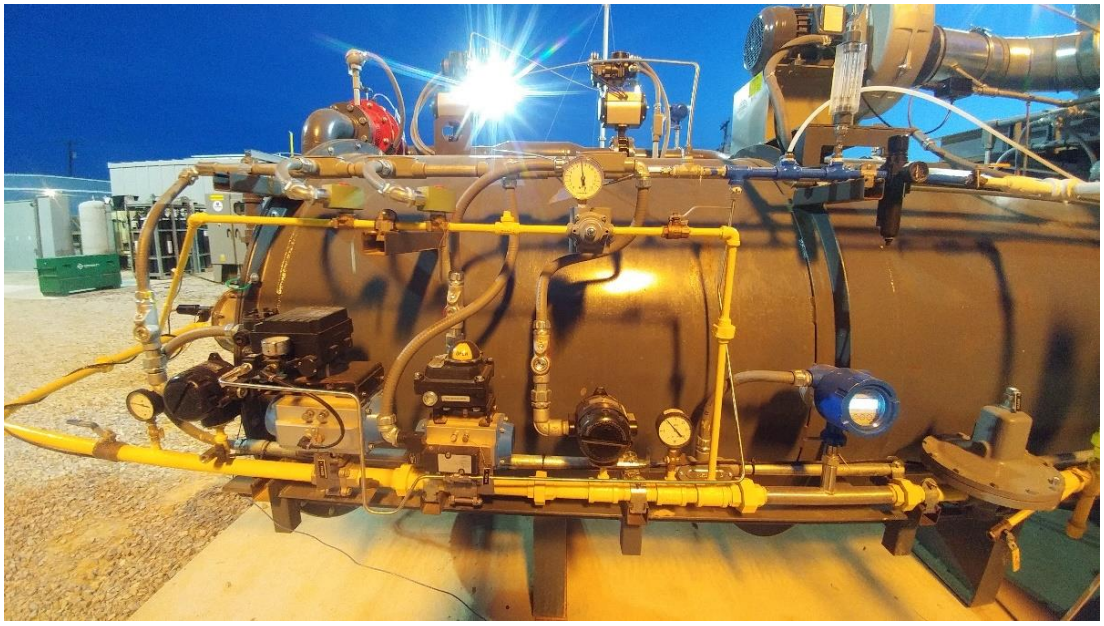
The system instrumentation inputs, user inputs, and interfacing system inputs are passed to an Allen-Bradley Programmable Logic Controller (PLC) which automatically processes the information and efficiently controls the detailed operation of the thermal oxidizer system. The PLC receives analog and discrete inputs from the various system devices and outputs analog and discrete signals to controlled devices. The program logic controls the overall system operation. All timing and alarm detection and annunciation controls reside in the PLC.

Alarms are generated by the PLC if any part of the system is found to not be operating properly. The PLC will automatically take the required level of initial control actions if a fault is detected to prevent the equipment from damage and to prevent inadvertent release of process contaminants if not properly processed through the abatement system. Separate dedicated flame safety controllers are used to control the safety features of the combustion system to reinforce the protection from risks associated with the natural gas fuel source.



Fuel Train

The fuel train provides a controllable supply of natural gas to the pilot and burner and ensures proper safety and redundant isolation of the fuel supply, as required. The fuel train is piped and wired with the requisite components to ensure that it complies with NFPA code requirements. The fuel train uses the signal it obtains from the control system to increase or decrease the natural gas pressure to the burner to control the heat input. The fuel train will completely isolate the thermal oxidizer system from the fuel supply using redundant and proven isolations when required.



Thermal Oxidizer System Details:

Orientation:	Horizontal oxidation chamber Vertical stack with 20' Discharge height
Burner capacity:	12MM Btu/hr maximum
Expected operating temperature:	~1450°F
Guaranteed VOC destruction efficiency:	95%
Preliminary footprint of T.O.:	8' x 20' x 20' H (on rooftop)
Preliminary weight of T.O. system:	12,000 lbs.

- Horizontal thermal oxidation chamber to vertical stack
  - Good offgas and burner flue gas mixing
  - Paint – high temperature black or silver
  - Sight glass to view burner flame
- Refractory lining
  - Ceramic fiber modules
- Natural gas air burner for thermal oxidation
  - Fan air switch
  - Direct spark ignition
  - Flame scanner
  - Thermal oxidizer temperature control switch
- Process air fan
  - 6000 scfm
  - TEFC 15 HP motor
- Variable frequency drive
- Natural gas control train
  - 2-3" pipe and components
  - Manual valves
  - Strainer
  - Pressure regulator
  - Pressure gauge
  - Safety shutoff-on/off valves
  - Flow control valve

- Pre-wired control cabinet
    - PLC – Allen Bradley
    - HMI – Allen Bradley
    - Honeywell Flame Safeguard with Indicating Lights
    - Temperature controller
    - High temperature limit switch
    - NEMA 4
- Type K thermocouples
- Area classification: non-hazardous
- System pre-piped and pre-wired to maximum reasonable extent

Natural Gas

- Required supply pressure: Pressure 25 psig
- Design: Natural gas: 1300 scfh
- Expected usage during normal operation: 10,000 scfh

Electric Power:

- 120 Volts/1 phase/60 Hz for panel
- 20 amp circuit for controls
- Process air fan: 460 Volts/3 phase/60 Hz: 15 HP

Scope by others:

- Installation
- Offgas shutoff valve
- Offgas supply piping
- Fuel supply and piping
- Interconnecting piping, as required
- Insulation and heat tracing, as required
- Ladders and platforms, as required
- All electrical (power and control wiring, conduits, tie-ins, terminations, etc.) installation work
- Interconnecting wiring between the motor starters and points on the thermal oxidizer, as required
- Interconnecting wiring between the control panel and points on the thermal oxidizer, as required
- Compliance testing by independent third party to establish emissions compliance, as required.
- Provide any and all local, state or federal agency permits or special clearance requirements.
- Foundation or equipment pad, installation and external insulation (if required)
- Other items not specifically stated as in GCL's scope of supply

Pricing

Complete thermal oxidizer system as described above ..... US$140,120.00

FOB, Pennsylvania shop

Freight and taxes are not included.

Schedule

Expected Delivery (FOB shop): 14-16 weeks after receipt of initial payment

This schedule is predicated on customer approval within a reasonable time frame. Delays in approval will extend the completion date by the time equal to the delay. Lengthy delays may result in rescheduling of manufacturing, which could result in a greater offset of shipping dates and increased prices as a result of raw material increases.

VALIDITY
All prices quoted herein are valid for acceptance within sixty (60) from the date of this proposal.

FREIGHT
Prices are in U. S. dollars, F.O.B. shipping point.

ACCEPTANCE
All orders are subject to acceptance by Griffith Consulting, LLC. (GCL) and availability of materials. Clerical errors are subject to correction. Ordered items may be subject to cancellation by GCL without notice.

TAXES AND FEES
All taxes including Federal, State or Local, which may become due as a result of this project shall be the purchaser's responsibility. All sales, use, excise and/or value added taxes as well as all duty, customs agent or broker fees, inspection or testing fees, air pollution permit fees, insurance, consular fees or any other tax which may be assessed by any government entity at any level shall be paid by the purchaser.

TERMS OF PAYMENT
Periodic payments will be required throughout the course of this project. Invoices shall be submitted at intervals as indicated below with payment due upon receipt. The following is the suggested payment schedule for the delivery schedule noted above:

50% due at time of issuance of purchase order by customer
30% due upon submission by GCL of drawings for approval
10% due upon shipment of thermal oxidizer
10% due upon successful start-up of thermal oxidizer (initial lighting of burner), not to exceed 60 days from shipment

Initial payment is due with the purchase order and before work commences. Other invoices are payable at Net 30 Days unless otherwise indicated. A late charge of 1½% per month will apply to all unpaid balances. If shipments are delayed by buyer, payments are due when GCL is prepared to make such shipments.

STARTUP, TRAINING, AND SERVICE TERMS

Unless otherwise noted, prices quoted do not include services. GCL can provide service technicians, engineers, and other personnel as required to support startup, training, and service of equipment and systems furnished. Personnel to support these functions can be provided at a per diem rate of $1280 per day. Travel days and stand-by time will be charged at 8 hours per day. Travel occurring outside the normal 8 hour work day shall be billed at $160.00 per hour. Overtime in excess of 8 hours per day or 40 hours per week shall be charged 150% of the base rate. Likewise, work on Saturday and Sunday shall be at 150% of the base rate. Required work on holidays shall be at 200% of the base rate. When service extends over a period of weeks, personnel are returned to their base United States location for a weekend every two weeks at customer's expense. All actual living, travel, and other related expenses associated with service shall be invoiced at actual cost.

DELIVERY

Goods shall be delivered upon reasonable notice to purchaser, F.O.B. seller's plant, and title thereto and liability for loss and damage in transit or thereafter shall pass to purchaser upon seller's deliver of good to a carrier for shipment. Claims for damages in transit must be asserted against the carrier. Within ten (10) days after receipt of shipment, purchaser must report any shortage or damage not due to carrier, otherwise claims for such shortage or damage will be deemed waived.

LIABILITY & LIMITATION ON DAMAGES

In no event shall GCL be liable for purchaser's increased manufacturing costs, loss of profits or good will or any special, indirect, incidental or consequential damages. In no event shall GCL be liable for incidental, compensatory, punitive, consequential, indirect, special or other damages. GCL's aggregate liability with respect to a defective product and any contract between GCL and purchaser shall be limited to the amount paid to GCL for that product.

ARBITRATION

Purchaser agrees that all claims, demands, disputes, controversies, and differences arising under any contract made between GCL and purchaser shall be settled exclusively by arbitration in accordance with the rules prevailing of the American Arbitration Association. Judgment on the award thus rendered shall be binding on the purchaser and may be entered in any court having jurisdiction thereof. Unless the parties agree otherwise in writing, such arbitration will be conducted in Montgomery County, Pennsylvania. In the event that GCL hires an attorney to assert any of its rights or defenses in connection herewith or to collect amount sue, Purchaser agrees to be responsible for all of GCL's legal fees and expenses as well as costs of collection.

FORCE MAJEURE

GCL shall not be responsible for default hereunder where such has been caused by an act of God, war, major disaster, terrorism, third-party criminal acts, insurrection, riot, flood, earthquake, fire, labor disturbance, labor shortages, inability to secure raw materials or failure of machinery for the manufacture of equipment, operation of statutes, laws, rules or rulings of any court or government, or any other cause beyond GCL's control.

CANCELLATIONS, CHANGES & RETURNS

All undelivered products may be canceled on purchaser only upon written approval of GCL. In the event of any cancellation by purchaser, purchaser shall pay to GCL its reasonable costs and expenses, plus GCL's usual rate of profit for similar work. Purchaser may not alter or modify its order or any part thereof without GCL's prior, written consent. GCL reserves the right to change the price, terms of payment and delivery dates for any products affected by any alterations or modification. No products

may be returned without GCL's written authorization and products may be returned only on the terms specified in such authorization.

JURISDICTION
Contracts established based on this proposal shall be governed by laws of the State of Pennsylvania, venue Montgomery County.

GUARANTEE

GCL guarantees the system to be furnished under the terms of this proposal to provide VOC emissions control as specified. Accordingly, the guarantee for operation of this system is as follows:

GCL guarantees the Thermal oxidizer quoted herein to provide the above indicated destruction of listed combustibles as specified in the Performance Data section of this proposal. If required, this destruction will be measured utilizing EPA Method 25A to evaluate concentrations entering and leaving the Thermal oxidizer. In the event the unit fails to perform at this level, GCL will at its expense, modify the system in order to cause it to meet this guarantee. GCL shall be given the opportunity to review the operation of the Thermal oxidizer and the proposed test method prior to testing. GCL shall be given the opportunity to be present at purchaser's expense during testing to ensure Thermal oxidizer is operated in accordance with recommended operational parameters. This guarantee is based on emission data and operating parameters provided by customer. If conditions vary significantly from those represented, or if different constituents are present which affect the equipment or its operation, performance will be different.

WARRANTY

GCL warrants all labor and materials for one year after date of start-up, provided routine operating and maintenance procedures are followed per GCL's operating and maintenance instructions. GCL will repair or replace, at its option, items which fail during the one year warranty period. THIS EXPRESS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESIGNATION ON THE FACE HEREOF. Replacement shall include freight to plant site.

Notification of suspected warranty problems must be made, in writing, within five (5) days upon their occurrence. GCL shall be provided access to the equipment during normal working hours to evaluate and assist in correction of any deficiencies which may exist.

Warranties for purchased items, such as instrumentation, controls, valves, etc. shall be extended by GCL to customer on the same basis as the warranty provided to GCL by the original equipment manufacturer. Upon written notification of failure of such parts, GCL shall ship replacements to the appropriate facility. A memo invoice for the price of these replacement parts shall be issued by GCL to the facility. This invoice will be canceled upon return of the defective part so GCL can process such parts for its own credit as well.

GCL shall not be responsible for pluggage, corrosion, or other damage resulting from the introduction of materials or compounds not outlined in this proposal. Likewise, GCL shall not be responsible for a loss of capacity or excess utility usage as a result of buildup or deposits of materials not specifically addressed in this proposal.

GCL will not be responsible for premature failure or damage resulting from the introduction or materials not identified by purchaser into equipment covered by this warranty. This includes materials which may plug, foul, corrode, degrade or otherwise attack components or alter system performance.

GCL will not be responsible for consequential damages. GCL will not be responsible, nor pay for repairs to the proposed system while under warranty, unless such repairs are authorized by GCL in writing prior to commencement of such repairs.

IMPLIED WARRANTY & DISCLAIMER - THE WARRANTIES FURNISHED BY SELLER AS EXPRESSLY INCLUDED HEREIN CONSTITUTE SELLER'S SOLE OBLIGATION HEREUNDER AND ARE IN LIEU OF ANY WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EVEN IN THE EVENT OF A FUNDAMENTAL BREACH BY SELLER. THERE ARE NO WARRANTIES, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

DISCLAIMER OF WARRANTIES - SELLER SHALL NOT BE LIABLE TO BUYER OR BUYER'S CUSTOMER FOR INCIDENTAL, CONSEQUENTIAL OR LIQUIDATED DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF CONTRACT GOODS, COSTS OF REPLACEMENT POWER OR CONTRACT GOODS, ADDITIONAL EXPENSES INCURRED IN THE USE OF CONTRACT GOODS OR FACILITIES, OR THE CLAIMS OF THIRD PARTIES, EVEN IF SELLER HAS BEEN ADVISED OF POSSIBILITY OF SUCH DAMAGES. THIS DISCLAIMER SHALL APPLY TO INCIDENTAL, CONSEQUENTIAL OR LIQUIDATED DAMAGES BASED UPON ANY CAUSE OF ACTION WHATSOEVER ASSERTED AGAINST SELLER, INCLUDING ONE ARISING OUT OF PRINCIPLES OF CONTRACT, ANY BREACH OF WARRANTY, EXPRESSED OR IMPLIED, GUARANTEE, EQUIPMENT OR OTHER CONTRACT GOODS LIABILITY, NEGLIGENCE, TORT, OR ANY OTHER CAUSE PERTAINING TO PERFORMANCE OR NON-PERFORMANCE TO THE PROPOSAL OR CONTRACT BY SELLER. BUYER SHALL HOLD SELLER HARMLESS FROM ANY SUCH CLAIMS BY BUYER'S CUSTOMER.

PROPOSAL FOR A
VECTOR NR-6000 CATALYTIC OXIDIZER

PROPOSAL NUMBER 21-8689 Rev 2

PRESENTED TO:

Attn: Mr. James Jackson

Ortho Clinical Diagnostics
100 Indigo Creek Drive, Rochester NY
(585) 797-5261

RE: Direct Fired Catalytic Oxidizer for VOC Abatement for Polyester Film Coating Line

PREPARED BY:

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April 30th, 2021

Contents

CATALYTIC PRODUCTS INTERNATIONAL, INC. VENDOR QUALIFICATIONS

Catalytic Products Int., Inc. was established in 1969 as a catalyst manufacturer and then started building catalytic oxidizers in the 1970's. This product line was followed by including thermal recuperative oxidizers in the 1980's and then adding regenerative thermal oxidizers in the 1990's. CPI developed thermal combustor technology around 2000 to handle very high LEL applications. Since then CPI has expanded into low emission process heating equipment, expanded the RTO line to offer full coverage from 500 to 80,000 scfm in a dual chamber RTO. CPI is an established leader in engineered air pollution abatement systems for any kind of VOC, HAP, NOX and odor abatement projects. We have a full inhouse team in our Lake Zurich, IL headquarters. We have dedicated chemical, mechanical, industrial, and electrical engineers to handle any project. Our field service technicians follow all required safety protocols while on site at customer locations.

CPI assigns a dedicated Project Manager to lead the execution of all new oxidizer projects. The Project Manager is the main interface between CPI and the customer throughout the project and commissioning.

SECTION 1a: BASIS OF DESIGN

REVISION HISTORY

- Revision 2 – Presented formal proposal for direct fired VECTOR NR-6,000 direct fired catalytic oxidizer. CPI has made allowances for customer specified 3 psig inlet gas pressure.
- Revision 1 – Submitted budgetary proposal for both direct fired VECTOR NR-6000 direct fired Catalytic Oxidizer & a Quadrant NR-6000 direct fired thermal oxidizer with operating cost comparisons.
- Revision 0 – Submitted budgetary proposal for a VECTOR SR-6000 Catalytic Oxidizer with primary heat exchanger.

PROJECT BACKGROUND

The exhaust characteristics as understood will come from a coating process on polyester film for use in the health care industry. The current data estimates a flowrate from the process at 3500 SCFM at 180 F.

CPI has been asked to size the oxidizer at 6000 SCFM at 180 F. The VOC loading has been estimated at 30 lb/hr of a mix of o-xylene, t-butyl alcohol, and acetone. The process gas is assumed to be particulate free and a minimum oxygen content of 18-20%.

Plant Information

Plant Location		Rochester, NY
Process		Exhaust from polyester film line
Existing Process Exhaust Rate	scfm	3,500
Maximum Oxidizer Exhaust Rate	scfm	6,000
Process exhaust Temperature	°F	180
Anticipated VOC Load	Lbs/hr	30
Electrical Area Classification		Unclassified
Equipment Location		Outdoors on roof
Fuel		Natural Gas
Fuel Pressure	psig	3
Electrical Requirements		480 VAC, 3-phase, 60 Hz
Compressed Air @ -40 °F dewpoint, clean and dry	psig	None required

BASIS OF RECOMMENDATION

Catalytic Products International (CPI) has worked with a variety of industries to develop a proven technique to eliminate VOC emissions from a multitude of industrial operations. Catalytic Oxidization in this application has been approved based on its ability to offer a low cost of air compliance and successful VOC abatement.

The final design engineering as noted in this proposal will incorporate all the necessary components to exceed the air compliance goals and operational requirements for Ortho Clinical Diagnostics, while using our proven and innovative design features to provide a long lasting - highly reliable system.

The **VECTOR Catalytic Oxidizer** system recommended in this proposal will allow:

- Stainless steel construction of reactor
- External 5" of insulation with galvanized cladding
- Continuous VOC destruction and odor abatement across operational range
- Compact footprint to fit on roof structure
- Skid mounted, prewired for easy installation
- Highest uptime with minimal maintenance

The VECTOR system designed for Ortho Clinical Diagnostics does will include our innovative design features allowing for **continuous VOC destruction**. The basis of the design consists of selecting the proper technology and catalyst selection for the before mentioned exhaust stream constituents and utilizing CPI's +50 years of catalytic experience to offer industry leading uptime reliability and durability while achieving a minimum +95% VOC destruction.

The system will incorporate our TSS controls to provide **fully automatic operation** of the oxidizer temperature control system. Volume will be continually monitored and adjusted via our automatic volume control system.

Each VECTOR system is designed for **simple installations**. The unit for Aunt Millie's Bakery will be designed and shipped to accommodate the simple installation. The oxidizer body will arrive as a single unit mounted on a structural frame. The gas train and combustion system will be mounted and piped on the oxidizer chassis in CPI's shop. The system will be prewired to the TSS control panel to eliminate time consuming field wiring.

Each VECTOR system is designed to allow the **highest uptime reliability with minimal maintenance**. The maintenance requirements will be fully described in the supplied operator manuals, and only includes normal fan maintenance, linkage tightening, and bearing lubrication. The system uses a few moving parts, and all of these parts are accessible from outside of the system. There is no need to enter the oxidizer for normal maintenance. The system's insulation support frame is also stainless steel to eliminate internal corrosion inside the cladding. The maintenance free Gavalume® weather covering exterior weather-tight cladding ensures a corrosion free, no maintenance skin over the reactor housing for the life of the equipment.
The VECTOR system engineered for Aunt Millie's Bakery will provide VOC destruction to + 98%. This main advantage offered in the VECTOR system allows assured compliance with minimal increase in fuel consumption. Should increases in VOC destruction ever be required, this may be accommodated by simply increasing the catalyst bed inlet temperature.

SECTION 1b: EQUIPMENT SPECIFICATIONS

VECTOR Catalytic Oxidizer

Oxidizer Maximum Process Capacity	scfm	6,000
VOC Destruction Efficiency	%	+95% *
Oxidizer Process Turndown		2:1
Catalyst Type	Ceramic Monolith	12.5 x 12.5 x 12 in a 3x3 array
Operating Temperature – Catalyst Inlet	°F	600-650
Catalyst Exit Temperature – Maximum	°F	1,100
Catalyst Space Velocity	1/h	40,000
Oxidizer Internal Reactor Housing	Material	304 S/S
Catalyst T-Bar Frames	Material	304 S/S
Inlet Connecting Duct from Booster Fan	Material	C.S.
Exhaust Stack	Material	304 S/S
Exhaust Stack Size Diameter & Discharge Height		28″ dia discharging 18′ above skid level
Booster Fan Type		Forced Draft
Booster Fan Motor Size	HP	20
Booster Fan Arrangement		1
Booster Fan Material of Construction		Mild steel
Fan Housing Insulated & Clad		Quoted as a option
Inlet Pressure Allowance for Process Exhaust Ductwork	Inches water Column	-2.0
Burner Type		Raw Gas
Burner Capacity – Installed	MMBtu/h	4.5
PLC Processor Type		Allen Bradley CompactLogix
VFD Type		AB 400
HMI Qty. & Type		(1) AB Panel View 7 Plus on main panel unless remote HMI panel
Oxidizer Skid Size		192-5/8″ Lg x 64″W x 104″ H
Approx. Oxidizer Weight	Lbs.	11,500

Utilities Required

Natural Gas Requirements	CFH	4,500
Compressed Air Requirements	CFM	None
480/3/60 Electrical Requirements	Amps	50

*95% or to lower limit of 30 ppmv as C_1

SECTION 2: OXIDIZER DESCRIPTION

VECTOR CATALYTIC OXIDIZER

The VECTOR Catalytic Oxidizer is custom-designed and manufactured to the user's exact requirements. This system has been specially designed for easy installations, simplified maintenance, industry leading uptime reliability, and the lowest overall cost for operation. VECTOR Systems achieve these goals in an integrated package and thorough innovative thermal-mechanical engineering designed to eliminate stress and fatigue. VECTOR systems are designed as a bolt together system encompassing the following assemblies:

- Oxidizer Skid Assembly (carbon steel primed and painted)
- Gas Train Rack pre-mounted onto oxidizer & pre-piped to burner
- Bolted Exhaust Stack

Each VECTOR Catalytic Oxidizer utilizes a high velocity mixing chamber at the burner, which forces flame impingement and turbulence to occur, providing excellent mixing of the air stream. This is perhaps the most underestimated part of any catalytic oxidizer, and the key design element that makes VECTOR systems unique. By designing for the highest mixing, VECTOR system can deliver the highest temperature uniformity before the catalyst bed. Temperature uniformity ensures that 100% of the catalyst is efficiently oxidizing the VOCs.

When the process stream enters the VOC catalyst bed, a catalytic reaction occurs and efficiently oxidizes the VOC's. This VECTOR system is designed to operate with a monolith catalyst product.

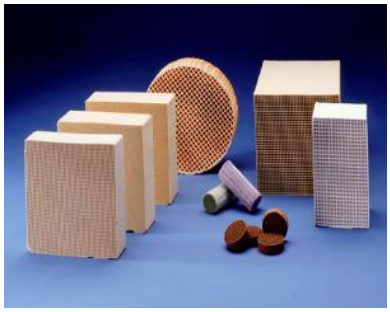
The combination of the high velocity mixing chamber, and VOC catalyst are the cornerstone the VECTOR's reactor to efficiently oxidize VOCs, even throughout the wide range of operational requirements presented by in the process application. Mixing, temperature uniformity, and air flow uniformity all add up to long lasting performance. No other manufacturer of catalytic oxidizers can incorporate the advantages of temperature uniformity before the catalyst bed and controlled thermal expansion in a user-friendly system.

The VECTOR Oxidizer will be supplied with the following:

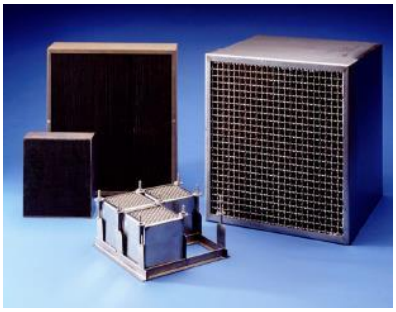
- Sand blasted, primed and epoxy coated structural steel base frame.
- 304 stainless steel preheat burner mixing and reactor chambers
- 304 stainless steel housing reinforcing
- 5" of external insulation clad with maintenance free Galvaloom clad weather covering.
- 304 stainless steel ceramic catalyst T-bar frame arrangement
- Insulated stainless steel access doors
- Painted C.S. transition connecting booster fan to oxidizer with support leg
- 304 Stainless steel exhaust stack outlet support plenum integrated into the oxidizer body, capable of supporting the exhaust stack
- Burner inspection sight glass
- Pressure measurement ports across guard bed & catalyst beds
- Bolted & insulated 304 stainless steel plug style access doors to catalyst chamber
- Dual element Type-K thermocouples mounted in:
    - Catalyst bed inlet
    - Catalyst bed outlet
- Catalyst bed differential pressure safety switch

CERAMIC MONOLITH GUARD BED & CATALYST BEDS

A specially developed catalyst is used to complete the oxidation of the VOCs. The catalytic reaction is simply the ionization of oxygen in air and hydrogen and carbon molecules in hydrocarbons (VOC's). The result is the reformation to harmless water vapor (H_2O), carbon Dioxide (CO_2) and usable heat at low temperatures. The catalytic-induced ionization level for the specified organics occurs at temperatures between 600°F and 650°F. This is sufficient to achieve conversion of VOC pollutants in excess of 95%. In order to obtain an equivalent degree of ionization with flame combustion without the use of a catalyst, air temperatures must be raised to above 1,400 °F. Therefore, catalysts reduce the energy required to destroy hydrocarbon pollutants.



Typical ceramic structure



Typical container creating the Catalyst Module

The VECTOR System will utilize a monolith precious metal catalyst for the destruction of the volatile organic compounds (VOCs) in the exhaust gas. The VOC catalyst system will be comprised of (9) 12.5" X 12.5" X 12" monolith catalyst modules in a 3 X 3 array. The total space velocity of the catalyst array is 40,000 $^{hr-1}$. This is a sufficient quantity of catalyst to achieve +95% VOC destruction in 6,000 scfm between 600° F-650 ° F inlet temperature. Each module of catalyst will be contained in a 12ga 304L stainless steel can complete with gasket assembly to ensure a leak free installation when mounted in the grid assembly.

Loading of a catalyst module

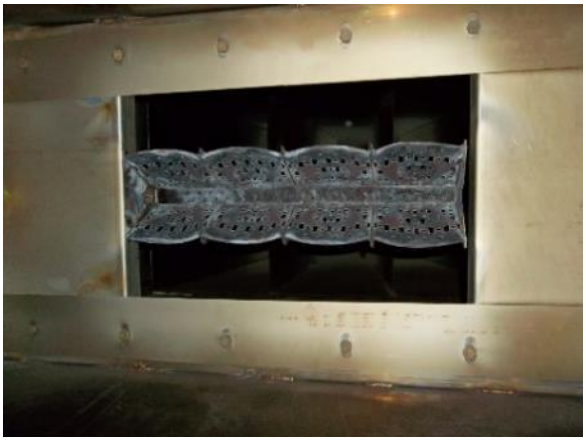
Elements loaded into grid

The catalyst system of the VECTOR Oxidizer includes:

- Ceramic Precious Metal Monolith Catalyst:
    - 9 each: 12½" x 12½" x 12"

BURNER SYSTEM

The burner will be a Maxon LV style raw gas burner. The LV burner has been specially developed for use in the VECTOR system in cooperation with Maxon. The LV is designed to promote mixing of the exhaust gasses with sufficient oxygen when fired horizontally into the burner chamber. This innovative design provides the highest degree of flame impingement and high-velocity mixing, leading to airflow and temperature uniformity for which VECTOR oxidizers are known. The LV is a special line burner that provides even heating throughout the operation range of the system to ensure reliable firing.



The Maxon LV is designed to be fired on natural gas, allows a 20:1 firing turndown with a 2:1 process turndown, requires low gas pressure, and emits low levels of combustion by-products. The Maxon burner assembly will include the following:

- LV burner system rated to 4.5 MMBTU/hr
- Fully modulating gas control valve assembly with low fire tart switch with electric operator
- Natural gas operation *sized for low 3 psig inlet gas pressure
- Single Honeywell RM7800 UV scanner for flame supervision
-

BURNER GAS TRAIN RACK

The gas train is supplied pre-mounted and pre-piped on a gas train rack on the side of the VECTOR system. It will meet NFPA-86 standards. The gas train will include the following components:

- Rack-mounted natural gas train mounted to the side of the VECTOR system
- Two main gas cocks
- Inlet gas strainer
- Low gas pressure switch
- Two automatic shut-off valves
- High gas pressure switch
- Manual pilot shut off valve
- Pilot gas regulator with interruptible pilot
- Two pilot solenoid valves
- Three pressure indication gauges with manual shut offs
- One ignition transformer pre-mounted inside a NEMA 4 enclosure
- Shop leak tested prior to shipment

MAIN PROCESS BLOWER

The fan will be an AirPro Blower size 182 BIHS, class 4, in arrangement 1 , centrifugal fan complete with skid mounting of the following equipment:

- 20 HP, 480v/3-ph/60-Hz
    - Inverter duty rated, PE, TEFC motor
- V-belt drive
- Heavy – duty all-welded mild steel construction
- Punched, Flanged inlet & outlets
- One outlet expansion joint
- Bolted access door
- Housing drain
- Ceramic shaft seal
- OSHA shaft/bearing guards
- Painted carbon steel connecting duct from booster fan discharge to oxidizer inlet.
- Blower Specifications:
    - scfm: 6,000
    - acfm: 7,401
    - temperature: 180° F
    - BHP: 18.17 (hot)
    - Installed HP: 20 (allowing sufficient duty factor)

Note: The fan is designed to provide a maximum of -2.0 W.C. of negative pressure for the incoming effluent duct, with sufficient pressure allowed to discharge at the stack.

SYSTEM CONTROL PANEL

The VECTOR comes equipped, as standard, with a special control and monitoring package called Temperature Safety System (TSS). It has been developed for the use of protecting the oxidizer, providing self-diagnostics, and allowing the most efficient operation.

The TSS-PLC panel allows the entire oxidizer system to be a one-button start/stop operation. This provides user-friendly operation that avoids costly operator errors. TSS controls the temperature programming during all phases of the oxidizer's warm up, operating, and cool down cycles. This minimizes thermal stress on components and provides long equipment life. TSS will also integrate the process with the operation of the oxidizer for safe, economical operation.
The TSS control system will include the following components:

- The main TSS panel will be NEMA-12 indoor rated Carbon Steel two door enclosure Flange mounted 480v main disconnect
- Allen-Bradley CompactLogix Processor
    - I/O as required for operation of Oxidizer, and interconnection to the process line. Control and monitoring will be provided for (1) bypass T-damper in the ductwork.
    - Remote Service Access via VPN internet broadband web port with integral Ethernet switch
- Panel mounted 12" Allen-Bradley PanelView Plus 7 HMI. The HMI will allow:
    - Oxidizer Start/Stop functions
    - Text Messaging of:
        - System status
        - First fault annunciation
        - Maintenance mode operation
    - PID Control within the MMI controlling:
        - Burner modulation
        - Booster fan volume control
    - Honeywell TVEZ EZtrend paperless data recorder that will record:
        - Catalyst inlet temperature
        - Catalyst outlet temperature
    - High temperature limit shut off
    - Honeywell RM7800 series flame safety system with continuous self-checking U.V. sensing eye
    - Voltage transformer
    - Door mounted alarm horn and flashing light
    - E-Stop push button

VOLUME CONTROL

- A variable frequency drive will be used for volume control. It will be premounted inside the TSS control cabinet will use a Variable Frequency Drive coupled with an inlet duct pressure transmitter for inlet process volume control.
- **Allen Bradley 400 Series** 20 HP Variable Frequency Drive pre-mounted inside the TSS control enclosure
- Siemens SITRANS inlet duct pressure transmitter, shipped loose for mounting inlet ductwork

EXHAUST STACK

- One (1) 28" diameter, 304 stainless steel, exhaust stack discharging 18'-0" above oxidizer base.
    - The stack includes two (2) 3" dia. test ports located 90 degrees apart.

FRESH AIR / PURGE - IDLE DAMPER

- One (1) painted carbon steel fresh air purge / idle damper assembly will be provided for mounting onto the inlet ductwork. This damper will have a modulating, direct drive actuator and weather hood with personnel protection.

MISCELLANEOUS SERVICES

STARTUP SERVICES

CPI has listed as a line item equipment commissioning and training employees in the operation of this system. One week on site has been allowed to accomplish these startup and training tasks.

The startup will only begin after the customer has confirmed readiness by filling out our supplied startup checklist. This list is a simple sheet that asks you to confirm such things as; the gas supply is ready, field electrical components have all be wired correctly, ductwork is ready, production conditions are ready, etc. Our men will perform the following steps:

- Confirm operation of all safeties
- Confirm instrument calibration
- Establish oxidizer readiness and startup on fresh air
- Balance the air volumes and flows from the source to the equipment
- Set all the system trim components
- Set all the oxidizer adjustments on production conditions
- Record pressures and volumes for insertion into the operation manual
- Verify operation via mutual acceptance of performance by both parties
- Train all necessary personnel; Training normally requires a few hours (per shift). If multiple shifts are required, our men can make extra arrangements to be on site during that particular shift.

CONTINUTED SERVICES

After sale services offered by CPI include:

- Preventive maintenance
- Annual Catalyst Testing
- Catalyst Cleaning
- Catalyst Replacement
- DRE Testing
- Continued training
- Inspection service
- Spare Parts

Continued services are offered at the standard service rates as identified in this proposal.

SECTION 3: PROJECT SUMMARY

EQUIPMENT COST

VECTOR NR-6,000 Catalytic Oxidizer:..... $ 219,900.00
Equipment Startup, commissioning & training; ..... $ 18,000.00

Project Total: ..... $ 237,900.00

Options

Option for insulation and cladding Booster Fan $2,900.00

This budgetary proposal does not include any rigging, ductwork, electrical or utility installation. Upon request, CPI can provide a turnkey proposal based on details of the install location.

PAYMENT TERMS

30%	Down payment with order
30%	Upon submission of General Arrangement and P&ID Drawings
30%	Upon ready to ship
10%	Upon completion of commissioning, or 30 days after ready to ship if delay is attributable to customer.

PROJECT SCHEDULE

Shipment in 14-16 weeks from receipt of order and down payment.

EQUIPMENT SHIPMENT

EXW, CPI Factory, unless optional price is purchased. Buyer is responsible for all shipping costs. CPI can offer other options such as FOB Destination where CPI includes the cost of freight, if requested.

The quoted prices and deliveries are subject to the attached
TERMS AND CONDITIONS and are valid for a period of 30 days

Section 4: Project Responsibilities

The following list will detail items that are required to complete the project and who is responsible to complete the project (CPI / Buyer). NOTE. CPI has quoted this using non-union personnel. All work is quoted during normal work hours, M-S 7am-7pm non-holiday. If premium time is required, CPI will provide a separate quotation.

	CPI	Buyer
Supply roof top support platform to adequately support the oxidizer		X
Unload, rig, , assemble and anchor components on platform		X
Natural gas supply piping at 4500 cfh (CatOx) at 5 psig to the oxidizer gas train inlet		X
Supply and install process ducting and process isolation dampers		X
Mount main control panel inside building supplied w/50 Amp 480V/3Ph/60Hz Electrical service. All field inter-connecting wiring to oxidizer & duct mounted devices (Bypass T-damper, fresh air damper & inlet duct pressure transmitter) and process interlock. CPI to provide conduit schedule and wire pull.		X
All required construction and/or operating permits. CPI will assist in filing and securing these permits. If special registrations (such as CE, UL, PE or others) are required, the costs for such expertise will be re-billed at cost. All fees and taxes for permits or equipment are payable by the customer.		X
Process Ductwork as required		X
Freight to site. Buyer is responsible for all shipping costs		X
Provide plant personnel and production ready conditions for startup and operator training at time of startup.		X
Startup service for any delays caused by the customer or representatives of the customer will be billed at $135.00/hr. for normal weekdays, $202.00/hr. for weekends, $270.00 for all holidays, and all expenses plus 12%.		X
Any time required for plant specific safety training to work on site over and above 1 hr will be billed at $135.00/hr		X
Third party compliance testing if required.		X

Time in excess for any delays caused by the customer or representatives of the customer will be billed at the following rates: (per man) $125.00/hr. for straight time, normal weekdays; $190.00/hr. for overtime and weekends; and holidays are $250.00/hr. Expenses will be billed plus 10%.

SECTION 5: PERFORMANCE GUARANTEE

Catalytic Products International guarantees that the VECTOR Catalytic Oxidizer system will reduce the concentration of gaseous phase hydrocarbons measured at the inlet of the oxidizer as compared to the concentration of gaseous phase, non-methane/ethane based gaseous hydrocarbons measured at the outlet (i.e.: discharge stack) of oxidizer by 95% or to a lower limit of 30 ppm volume as C_3 as verified by EPA test methods 25A (FID). This is based upon the information provided to Catalytic Products International as specified by the customer as a basis of design.

This guarantee is also conditioned that the VECTOR System and provided components are to be operated and maintained in accordance with the supplied operating and maintenance instructions. EPA-approved Test Method 25A is to be utilized for compliance testing. The above guarantee is conditioned upon simultaneous measurement of the inlet and outlet hydrocarbon solvent loadings after the deduction of any burner-generated chemical compounds such as methane or others. At all times during testing, all operating conditions are to be specified by CPI's operating instructions.

NOTE: Test methods must be of sufficient accuracy and reproducible for any and all test conditions encountered. CPI requests prior review and approval of test protocols prior to conducting any performance test.

This guarantee is also conditioned that the VECTOR Catalytic Oxidizer and provided components are to be operated and maintained in accordance with the supplied operating and maintenance instructions.

The following materials are known catalyst contaminants and if subjected to the catalyst will void its warranty. Poisoning or masking agents including, but not limited to, Lead, Mercury, Arsenic, Antimony, Zinc, Copper, Tin, Iron, Nickel, Chromium, Sulfur, Silicon, and Phosphorus, which shall be deemed to have incurred if the contents of these elements in emissions at the catalytic reactor inlet singularly or collectively exceed 2000 ppm by weight on the surface of the catalyst monolith. Halogens and Halogen containing compounds exceeding 2ppm by weight in the air stream or Sulfur containing compounds, excluding oxides of Sulfur in the air stream shall not exceed 20ppm by weight.

SECTION 6: EQUIPMENT WARRANTY

The Seller warranty to Buyer that the equipment and machinery mentioned in this proposal shall be free from defects of materials or workmanship under normal use and maintenance for a period of (1) year from date of **installation, but not to exceed 16 months from shipment**. The liability of Seller under this warranty shall be limited to the repair or replacement, at Seller's option, or any part or component which may prove to be defective under normal use, service and maintenance after Seller, in its sole discretion, determines same to be defective. This warranty is conditioned upon Buyer giving Seller immediate written notice of an alleged defect and refraining from the attempted repair of alleged defects without prior written consent of Seller. The Seller makes no warranty whatsoever with respect to accessories or components not supplied by Seller. For any components purchased by Seller for use on or in conjunction with the equipment, which is the subject of this contract, the Seller extends to the Buyer only the same warranty granted to Seller by the component vendor or manufacturer.

The performance and safety of the equipment mentioned herein is contingent upon proper installation, the use of suitable process materials, and operation and maintenance by properly trained personnel. Seller makes no warranty whatsoever as to the inclusion of the equipment supplied by Seller into Buyer's manufacturing process; Seller's warranty being limited solely to the operation of its equipment sold hereunder in accordance with the specifications, therefore.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE. IT IS EXPRESSLY AGREED THAT UNDER NO CIRCUMSTANCES SHALL THE SELLER BE HELD LIABLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES OR LOSS OF PROFIT ARISING FROM ANY CAUSE, AND SELLER'S LIABILITY SHALL BE STRICTLY LIMITED AS STATED HEREIN.

SECTION 7: TERMS and CONDITIONS

I. **ACCEPTANCE**

All sales of material or equipment by Catalytic Products International are expressly conditioned upon the terms and conditions set forth in the written order acknowledgment of Seller. Any additional or different terms of conditions set forth in the purchase order of the Buyer or any similar such communication, are hereby objected to by Catalytic Products International and shall not be binding nor effective unless assented to in writing by Catalytic Products International.

II. **CANCELLATION**

Buyer acknowledges this is custom engineered and fabricated equipment to the buyers exacting specifications. Buyer may cancel any order only by mutual agreement, and only upon written notice to Catalytic Products International, and with payment to Catalytic Products International of reasonable cancellation charges, including but not limited to (1) the proportionate contract price for all material completed, whether shipped or not, prior to notice of cancellation is received; (2) an inventory restocking fee equal to 30% of the original order including any change orders; and (3) all expenses incurred by Catalytic Products International by reason of such cancellation, including reimbursement for any charges arising from termination of sub-contract claims.

III. **DAMAGE OR LOSS**

The Company shall not be liable for damage to or loss of equipment after delivery of such equipment to the point of shipment. In the case of equipment to be installed by or under supervision of the Company, the Company shall not be liable for damage or loss after delivery by the carrier to the site of installation. If, thereafter, pending installation or completion of installation or full performance by the Company, any such equipment is damaged or destroyed by any cause whatsoever, other than by the fault of the Company, the Buyer agrees promptly to pay or reimburse to the Company, in addition to or apart from any and all other sums due or to become due hereunder, an amount equal to the damage or loss so occasioned.

IV. **DELAYED SHIPMENTS**

Quoted shipping dates are approximate. Catalytic Products International will use its best efforts to fill all orders within the time quoted. However, final shipping schedules shall be subject to any conditions that may prevent compliance with acknowledged delivery schedules. Catalytic Products International shall not be liable for failure to give notice any delay, and such delay shall not constitute grounds for cancellation.

Catalytic Products International reserves the right to store such products in a warehouse for the accounts and at the risk of the Buyer after the products or any substantial portion thereof are ready for shipment cannot be made for either of the following reasons:

(a) If CPI is prevented from making shipment or delivery in accordance with instructions of the Buyer, or
(b) By strike, boycott, natural disaster, governmental law, regulation, or circumstances beyond the control of CPI.

V. **FIELD SERVICE**

Unless otherwise noted herein, the cost of this equipment does not include service and/or installation. Field service, as stated in proper written quotation, for repair or start-up will be charged at a per diem rate plus all living and traveling expenses incurred from the time of leaving base of operations until return. Premium rate will be charged for work in excess of eight hours per day and for Saturday, Sunday, and holiday work. On start-up projects Catalytic Products International should be notified approximately thirty days prior to the start-up date, and name and title of a single authority responsible for securing and releasing personnel should be included. Catalytic Products International service representative will require time verification sheets to be approved by the Buyer's authorized representative at the completion of each day's work.

Upon request, Catalytic Products International in its discretion will furnish as an accommodation to Buyer such technical advice or assistance as is available in reference to the use of the product by Buyer. Catalytic Products International assumes no obligation or liability for the advice or assistance given or results obtained, all such advice or assistance being given and accepted at Buyer's risk.

VI. **GUARANTEE**

Material and equipment distributed by Catalytic Products International are the products of reputable manufacturers sold under their respective brand or trade names. Catalytic Products International shall use its best efforts to obtain from each manufacturer, in accordance with the manufacturer's warranty (copies of which will be furnished upon request) or customary practice, the repair or replacement of products that may prove defective in material or workmanship. The foregoing shall constitute the exclusive remedy of the Buyer and the sole obligation of Catalytic Products International. Except as to title, THERE ARE NO WARRANTIES, WRITTEN, ORAL, IMPLIED, OR STATUTORY, relating to the described material or equipment, which extends beyond that described in this paragraph. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PURPOSE SHALL APPLY. Any and all such warranties are subject to purchaser's application of purchased equipment and materials strictly and exclusively within the technical specification as defined in Catalytic Products International's order acknowledgment and general technical description.

With acknowledgment of Buyer's order, Seller assumes that Buyer has verified technical specifications as set forth in this contract and Buyer has the responsibility for correctness of said technical specifications. Unless specially noted, this proposal is not intended to exactly meet the Buyers specification and if conflict arises, this proposal takes precedence.

Performance guarantees for catalyst and systems shall be strictly and exclusively limited to those expressly stated in Seller's written order acknowledgment, and such guarantees shall only apply if catalysts were found in original and sealed factory package. Performance guarantees for heat exchangers shall be strictly and exclusively limited to those expressly stated in Seller's written order acknowledgment based on nominal (+/- 5%) efficiencies. All replacements arising from claims on guarantees as herein stated are made FOB Shipping Point (American Uniform Commercial Code) Seller's Plant.

The foregoing warranty is in lieu of and excludes all other expressed or implied warranties of merchantability or fitness for any particular use. Seller guarantees that catalysts have been given to carrier in unbroken original factory sealed package.

VII. **LIABILITY**

The Company will not be liable for any damage caused by the operation of the machinery or devices purchased whether or not operated in accordance with instructions or because of any failure to meet conditions of our guarantee. Liability under any contract shall in no case exceed the price paid for goods furnished by Catalytic Products International. In no event will Catalytic Products International be liable for consequential damages, or the failure of the Buyer to provide proper safety features for the protection of personnel in the use of operation of equipment.
Catalytic Products International's liability on any claim for loss or damage arising out of this contract or from the performance or breach thereof or connected with the supplying of material or equipment hereunder, or its sale, resale, operation or use, whether based on warranty, contract, negligence or other

grounds, shall not exceed the price allowable to such material or equipment or part thereof involved in the claim. Catalytic Products International shall not, under any circumstances, be liable for any labor charges unless agreed upon in advance in writing by Catalytic Products International.

Buyer assumes full responsibility for proper handling and storage of catalysts and equipment, after receipt from carrier, in accordance with Seller's instructions. Warranties and guarantees become void unless handling and storage was made in accordance with Seller's instructions.

VIII **PATENTS**

The Company shall hold Buyer harmless for any expense or loss resulting from infringement of patents or trademarks arising from compliance with the Buyer's designs or specifications.

IX. **PRICING**

Seller reserves the right (a) to revise any price quoted without notice to Buyer, at any time prior to acceptance of Buyer's purchase order by Seller, (b) unless otherwise noted, all prices by Catalytic Products International are subject to change without notice. Prices do not include sales, use, excise, value added, or similar taxes, and where applicable, such taxes shall be billed as a separate item and paid by the Buyer. Unless otherwise noted, all sales are made FOB Shipping Point (American Uniform Commercial Code) with no allowance for special crating, duties or fees and in all cases, title shall pass upon delivery at point of shipment and thereafter all risk of loss or damage shall be upon the Buyer.

All items shown as freight allowed pertains to particular items and quantities. Any deviation after placement of order such as changes in quality or partial release will be subject to the manufacturer's terms and conditions where applicable.

X. **RETURNED MATERIAL**

No credit will be given for returns except by specific written approval of Seller. No special designed catalyst materials or equipment may be returned. No catalyst, burner nozzle, burner block, or other parts directly exposed to flame, condensate or poisonous substances may be returned after use.

XI. **SHIPMENT**

All shipments will be made FOB Shipping Point s (American Uniform Commercial Code) Catalytic Products International factory unless otherwise specified. In the absence of specific instructions, Catalytic Products International will select the carrier. Title to the material shall pass to the Buyer upon delivery thereof by Catalytic Products International to the carrier, delivery or pick-up service. Thereupon the Buyer shall be responsible thereof. Products held for Buyer, or stored for Buyer, shall be at the risk and expense of Buyer. Claims against Catalytic Products International for shortages must be made within 48 hours after arrival of shipment at Buyer's destination.

Shipping dates are approximate and only as shows on the order acknowledgment. Shipping dates are not guaranteed. Catalytic Products International shall not be liable for delays in delivery or failure to manufacture or deliver due to causes beyond its reasonable control, including but not limited to acts of God, acts of Buyer, acts of military or civil authorities, fires, strikes, flood, epidemic, war, riot, delays in transportation or car shortages, or inability to obtain necessary labor materials, components or manufacturing facilities. In the event of any such delay, the date of delivery shall be extended for a period equal to the time lost by reason of such delay. In the event of impossibility of performance resulting from any of the above causes, Catalytic Products International shall have the right to cancel this contract without further liability to Buyer. Cancellation of any part of this order shall not affect Catalytic Products International's right to payment for any product delivered hereunder. Orders with indefinite delivery dates are accepted upon the understanding that Catalytic Products International shall have the right to fill said order as it sees fit in the course of its manufacturing schedules and to hold the goods for the Buyer's account at Buyer's expense and risk, pending receipt of definite delivery instructions.

XII. **SUPPLEMENTAL CLAUSES FOR EXPORT ORDERS**

(a)...Currency: The prices quoted herein are payable in U.S. Dollars, unless otherwise stated in written order acknowledgment.

(b)...Proof of Export: Those products which are to be purchased only for export: The Buyer agrees to furnish Catalytic Products International with proof of exportation of all or any part of such products within five months from the date of the Catalytic Products International invoices therefore, or if exportation of any part shall not have occurred within that period. Buyer agrees to pay Catalytic Products International upon demand, the amount of any manufacturer's excise tax or other tax which now or hereafter may be imposed on the sale of such products for consumption within the United States.

(c)...License and Permit Requirements:

(1)...Catalytic Products International will secure all export licenses and permits required by the United States Government and Buyer will furnish reasonable cooperation in acquiring such licenses and permits. If such licenses and permits are paid for by Buyer such payments will be added to the contract price.

(2)...Buyer will secure all licenses and permits required by the foreign government and Catalytic Products International will furnish reasonable cooperation in acquiring such licenses and permits. The delivery schedule is contingent upon securing all necessary licenses and permits.

(3)...Failure to obtain a required license or permit in sufficient time to permit delivery within the time set forth in the contract, and without the fault or negligence of the contracting parties, shall occasion an equitable adjustment in the delivery schedule.

XIII. **TAXES**

The prices shown do not include any taxes (sales, excise, use, etc...) or any government charges. Such taxes or charges applicable to the order will be paid by the Buyer except where specifically exempt by a certificate. Only when Catalytic Products International is registered to collect applicable taxes will such taxes be added to the invoice and collected by Catalytic Products International.

XIV. **NON-SOLICITATION**

Each party agrees that beginning on the contract acceptance date and for a period of twelve (12) months after final acceptance or earlier termination of this Agreement, it shall not (I) solicit, encourage, advise, induce or cause any employee of the other party [who worked directly or indirectly on the Services after the contract acceptance date] to terminate his or her employment with such party or any of its subsidiaries or Affiliates, nor provide any assistance, encouragement, information, or suggestion to any person or entity regarding the solicitation or hiring of any employee of the other party or any of its subsidiaries or Affiliates; or (ii) induce or attempt to induce any person, business or entity which is a supplier or customer of a party, or which otherwise is a contracting party with a party, to terminate any agreement with a party.

PROPOSAL
FOR

ORTHO CLINICAL DIAGNOSTICS

CATALYTIC OXIDATION SYSTEM (CATOX)

RECUPERATIVE CATOX BEING SET ON ROOF TOP. SKID MOUNTED FULLY WIRED.

PRESENTED BY

AIR CLEAR, LLC.

TABLE OF CONTENTS

SECTION 1

Summary/Brief

The following description briefly represents the catalytic oxidizer process and performance of the proposed Recuperative Catalytic Oxidizer (CATOX).

An option for providing the unit on, fully assembled (less stack) on a structural base. This option allows for the unit to be lifted into place assembled and with the electrical wiring complete. The burner gas train will be installed and wired. Please see the phot on the cover page.
This option saves days off of the field assembly work.

VOC DESTRUCTION EFFICIENCY

The CATOX proposed is capable of converting ≥98% of the H_2O_2 (hydrogen peroxide). The destruction efficiency is a function of temperature, time at temperature, turbulence combustion characteristics of the waste stream and the process flow / catalyst ratio referred to as gas hourly space velocity.

RECOMMENDED PREHEAT EFFICIENCY

Given the limited hours of operation the use of a preheater is not an economical option

OPERATING TEMPERATURE

A minimum catalyst outlet temperature of 750ºF is recommended to meet the existing 98% destruction requirements.

SPACE REQUIREMENTS

Please refer to Section 5.

WEIGHT OF EQUIPMENT

The CATOX unit is approximately 7,500 lbs. This figure is subject to change during detailed design.

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SCHEDULE FOR DELIVERY

Submittal of engineering data for approval, ARO	3	Weeks
Allotted for customer approval of engineering data, after receipt	1	Weeks
Shipment, after return receipt of approved engineering submittal data	12	Weeks
Total, ARO	16	Weeks

FAST START UP

Thermal shock is a concern because of both the expansion in the heat exchanger and the expansion of the catalyst substrate. Generally, the CATOX is ramped upward in temperature automatically by the controls. A 30 to 40 minute ramp time is acceptable.

SECTION 2

Process Design Parameters

Process Design Parameters	Average
Process Flow (SCFM)	6,000
Process Temperature (ºF)	180
Pollutant (lbs/hr):	0-50
Total Heating Value of Pollutants (BTU/lb) max	17,500
CATOX Inlet Static Pressure (WC)	- 2
Catalyst outlett Temperature (ºF) (min.)	750
Maximum Chamber Temperature (ºF)	1,200
Operation Schedule:	
(Hours/year)	40-80

PROCESS DESCRIPTION (not all items are included in this proposal, NO PREHEATER)

I.) Single or multiple emission sources can be easily controlled with a single catalytic oxidizing system, thus greatly reducing capital cost.

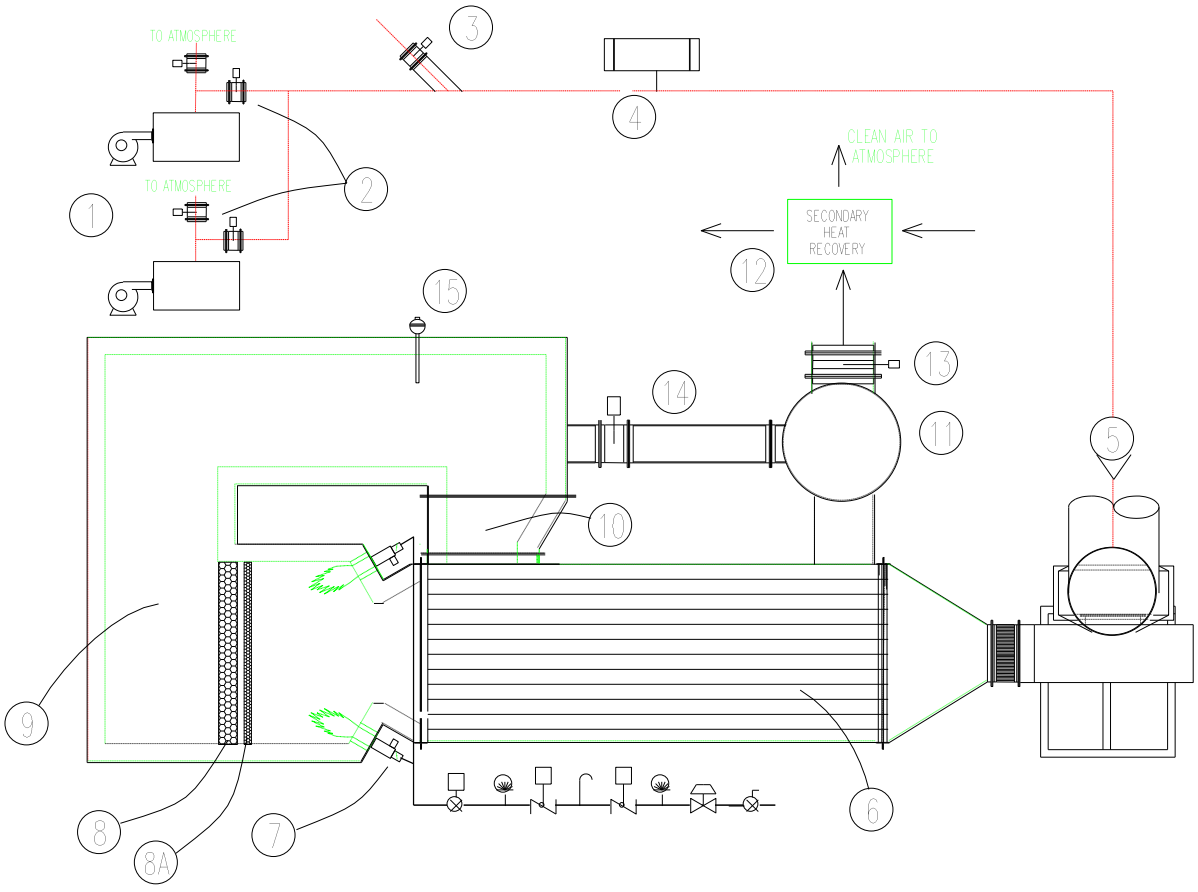
2.) A diversion damper assembly allows the oxidizer to be isolated from the process.

3.) A fresh air inlet valve introduces ambient air to the system. This, together with the diversion dampers, permits the system to be started independent of the process. Once the system is ready for operation the diversion damper closes to atmosphere and opens to the oxidizer.

4.) A pressure transmitter is used to sense static pressure in the duct. This signal is used to control the exhaust blower motor damper, thus adjusting automatically for changes in airflow.

5.) Contaminated process exhaust enters the oxidizer through the system blower. The blower and its motor push the exhaust through the oxidizer, overcoming the pressure differential of the system.

6.) The exhaust exits the blower and enters the air preheater. The preheater helps raise the process exhaust temperature by using heat from the already oxidized clean hot air (10). The contaminated and clean streams are isolated so that cross contamination does not occur.



7.) The preheated air enters the combustion chamber where a burner heats the contaminated exhaust air to the desired oxidation temperature (NA ^{0}F).

8A.) When the heated exhaust contains heavy molecular weight organics or solid inorganic particulate, a Catalyst Enhancement Grid™ is used. The grid traps these materials and prevents the catalyst from deactivating. Organics can be burnt off by raising the reactor temperature from time to time (not included).

8.) The preheated exhaust enters the catalytic reactor zone where it passes through the catalyst bed. The catalyst bed is a series of metallic oxidation catalyst blocks. Use of the catalyst allows this conversion to occur at 750 F vs. ≥1,500^{0}F for a thermal unit. This results in less fuel consumption.

9.) The reactor has factory installed insulation. This conserves heat and keeps the outside skin temperature below 150^{0}F.

10.) ~~Having been oxidized in the reactor the clean hot (750^{0}F-1,200^{0}F) air moves into the heat exchanger. Flowing counter flow to the incoming air, it "exchanges" its heat with the cooler process air. In this proposal a 0% efficient heat exchanger will preheat the incoming air to about XXX^{0}F with XX ppm XXX.~~

11.) The clean air then exits the heat exchanger into an exhaust stack and exits to the atmosphere. At this point there will be a H_2O_2 emission reduction of at least 98%.

12.) Additional savings can be achieved by using an optional second heat exchanger to preheat ambient air on cool days. This air can be used to provide heated make up air.

13.) Diversion valves direct the air through the secondary exchanger instead of the atmosphere. This is best controlled automatically by temperature.

14.) The H_2O_2 present in the exhaust give off heat as they oxidize in the reactor. On occasion, so much heat is released that, in combination with the preheater, higher temperatures than can be tolerated are generated. In these cases, an optional high temperature bypass is needed to move air directly into the stack, thus keeping the system temperatures within the design limits.

15.) Under normal conditions the burner controls the temperature. A thermocouple monitors the reactor temperature. As the temperature changes the main gas valve modulates to maintain the set point. A natural gas burner will be used to provide the heat required.

SECTION 3

CATOX Utility Requirements

Process Temperature	100 -180 ºF
CATOX Inlet Static	-3 WC @6,000 SCFM
Electric: 20 HP Process Blower & Controls	18 kW

SECTION 4

Scope of Supply

Description	Included	Excluded	Option
Skid-mounted, Pre-wired, Per-insulated, Factory-tested CATOX™	X		
Oxidation Chamber with Catalyst Support Frame	X		
Catalyst Modules JM Concat 400 cspi Metallic Blocks	X		
Catalyst Enhancement Grid™		X	
304L SS Heat Exchanger NA		X	
Manifolding and Transitions	X		
Painting, Prime and Finish Coat	X		
20 HP Fan and TEFC Motor	X		
6.0 MMBTU Natural Gas Fired Burner with Fuel Train	X		
21 Ft. Tall Exhaust Stack with Test Ports	X		
AB PLC Based Control System and NEMA 4 Control Cabinet	X		
Process Isolation & Ambient Air Inlet Dampers	X		
Variable Frequency Drive (VFD) System	X		
All Motor Starters and Local Disconnects	X		
Structural steel base; electrical work on the skid; assembly of equipment on the skid.			X
Process Ductwork		X	
Site Preparation, Foundations, Structural Steel Supports		X	
Mechanical and Electrical Installation		X	
Extension and Connection of Utilities		X	
Field Service: Erection Supervision		X	
Field Service: Start-up		X	
Field Service: Operator Training		X	
Electronic Operating and Maintenance Manual	X		
Freight (to and from)		X	
Permitting, Dispersion Analysis & Performance Testing		X	
Federal, State and Local Taxes, Fees, Abatements, and Permits		X	

NOTE: See attached pages for detail description of each item.

SECTION 5

Equipment Description

The recuperative catalytic oxidizer (CATOX) unit will be shipped pre-assembled to the fullest extent possible. All dimensions and design parameters are preliminary and are subject during final engineering. The approximate overall dimensions with fan and stack are 22' L x 8' W x 21' H (stack is from grade). Shipping costs are excluded from this budgetary quote.

Catalytic Oxidation Chamber

Fabricated from A-36 carbon steel, the oxidation chamber is internally insulated with ceramic fiber modules, of which is individually secured to the reactor. The insulation is not subject to catalytic shocking or spelling.

The reactor is designed to provide an even flow through the catalyst bed. The exterior is sandblasted, primed and painted.

The catalyst support frame is fabricated from stainless steel.

All internal insulation is ceramic fiber modules, or equal construction with integral stainless-steel reinforcement and mounting components. The combustion chamber will include a minimum 6" thickness. ***The area downstream of the burner and upstream of the catalyst is lined with 304SS.***

All work, mounting components and insulation is shop installed and fitted prior to shipment. The oxidizer is designed to provide a surface temperature of approximately 70ºF above ambient temperature during maximum operating temperature of 1200ºF.

Catalyst Modules

Precious metal catalyst on a stainless-steel substrate will be used. The modules are about 2' x 2' x 4" and weigh about 40 pounds each. The modules fit into a stainless-steel frame. The life of the catalyst varies depending on the application. In this application, the catalyst life is guaranteed for one year and has an expected life of 3-5 years. The minimum outlet temperature is 750 ºF and the maximum is 1200ºF are included.

Preheater (Heat Exchanger) Not included

~~The 0 % effective preheater is a plate type heat exchanger. The exchanger heat transfer core is made of 304L SS. Expansion is controlled internally. The heat transfer core is insulated with high temperature ceramic fiber insulation and is covered with an exterior shell of carbon steel. This method allows for a "cold" exterior flange that mounts to the "cold" flange of the oxidizer.~~

Painting

All mild steel shall be prepared (brush blast, prime top coat) or per specifications and receive one coat of prime and one coat of finish paint prior to shipment. Touch up coat shall be applied as required after the installation is complete. All OEM equipment shall retain the factory finish.

Fan and Motor

The exhaust fan will be manufactured by IAP or equal, belt driven. The fan includes inlet and outlet flanges, bolted inspection door, split housing constructions, drain, coupling, coupling guard and drive guard(s).

The motor will be 20 HP, TEFC (1.15 SF), industrial duty electric motor, designed for 460-volt, 3 phase, 60 hertz.

Burner

The burner system, rated at 6.0 million BTU, is included for maintaining the catalyst chamber temperature. The burner is designed to operate on natural gas and includes factory assembled, Factory Mutual approved gas train and required safety features.

A complete raw gas burner system, including the burner fuel trains safeguards, motorized safety shut off valves, pressure switches, regulators, test cocks and vent valves to meet Factory Mutual and / or IRI requirements.

Raw gas burners save fuel by using the O_2 in the process air for combustion in lieu of secondary combustion air that has to be heated to temperature. Very low FUEL turn-down will be accomplished by turning of the main burn and firing the pilot.

Stack with Test Ports

A 21' carbon steel stack, with two (2) 4" test ports at 90° apart for stack testing, will be provided.

Control System

Combustion controls and safeties will be hard wired per NFPA requirements. Honeywell UDC 2000 microprocessors are used to control the oxidation chamber temperature. This controller will

provide high temperature safety shut down in the event of excessive combustion or outlet temperature. The UDC features a single display, easy configuration, thermocouple fail safe and self-diagnostics.

All wiring will be identified at both ends with designations corresponding to the wiring diagrams. All wire will be stranded copper with 600-volt insulation Type MTW, THHN or THWN. Minimum size wire will be #14 AWG, which would be verified during detailed design.

The main control panel will be NEMA 4 construction. The control panel will house all relays, push buttons, and controls. A separate section will include all 460V starters, fuses and disconnects. The cabinets will be fabricated from 12-gauge mild steel, and the exterior will receive two (2) coats of finish paint, and the interior will be painted gloss white. The cabinet will have approximately 10% open area for mounting future control equipment.

All safety controls incorporated in the system are approved by insurance standards. Any additional safety control required due to local codes or regulations shall be paid for by the purchaser.

Field Services (Excluded)

These services may also be purchased separately.

(1) **Installation Supervision**
Erection supervision includes the services of a field service technician to advise on the off-loading, placement and assembly of equipment items furnished by Air Clear, LLC. The estimated time required for erection supervision for this project is one (1) man-days.

(2) **Operator Training Excluded**
Operator training includes instruction by a field service technician on the proper operation of the system. This instruction includes a review of the operations manual and "hands-on" instruction. The estimated time required for operator training for this project is one (1) man-days.

Start-Up Included
Start-up includes the services of a field service technician to check the installation and adjust the system controls for proper operation. The estimated time required for start-up for this project is one (1) day.

Field Services Summary (OPTIONAL)

The estimated total minimum required field service man-days, by AC personnel, for this project is three (3) man-days. A man-day is defined as one person for one 8-hour day, between the hours of 8:00 AM and 5:00 PM, Monday through Friday. If additional service hours or man-days are required to complete the identified field services, resulting from delays not caused by AC, the additional amount will be charged per AC's standard field service per-diem rate: $1,250 per man-day + 20% of all travel and living expenses. The field service rate for overtime work is 1.5 times the standard per-diem rate and for work performed on holidays it is 2.0 times the standard per-diem rate. Field services may also be purchased, at the per-diem rate, on an as required basis.

The unit will be factory tested at AC shop prior to shipment. There should be little time needed on site. It is possible that start up and training on this unit can be completed in one day.

Operating and Maintenance Manuals

An electronic operating and maintenance manual will be furnished.

SECTION 6

Pricing

TOTAL

One (1) CATOX system, per this proposal.

BUDGET PRICE, FOB POINT OF MANUFACTURE.....	$ 181,400.00
Optional skid base, equipment assembly and electrical work on the skid……	$ 18,670.00

Invoicing Milestones & Terms of Payment:

Thirty percent (30%) of the contract amount will be invoiced upon execution of the agreement and will be due and payable upon receipt of the invoice.

Seventy (70%) of the contract amount will be invoiced and will be due and payable upon receipt of the invoice prior to shipment. Should pre-shipment inspection not be required or should shipment be delayed, for reasons not solely attributable to the Seller, this amount will be invoiced when the equipment is ready for shipment and will be due and payable upon receipt of the invoice and prior to shipment.

SECTION 7

Work by Purchaser

The following items shall be the responsibility of the purchaser:

1.) Electrical power supply.

2.) Natural gas at 2 to 10 PSI with shut off valve piped to the pre-assembled burner train on the CATOX unit.

3.) Adequate letdown/storage area for contractors.

4.) Compliance testing by independent third party to establish oxidizer hydrocarbon destruction efficiency.

5.) Field supervisor office with telephone.

6.) Any and all permits or special clearances required by local, state or federal agencies.

7.) All tie-ins to existing process.

8.) All process exhaust fume conveying ductwork with required dampers and actuators for process exhaust control. Ductwork to be supplied to inlet flange of the oxidizer.

9.) Engineer, design and installation of concrete foundation for oxidizer, fan and stack.

10.) Shipping and installation.

11.) All scope excluded from this proposal.

SECTION 8

Guarantees

Subject to processing a stream as defined in the Process Design Parameters, Section 2 of this proposal, and to maintaining and operating the system per the manufacturer's recommended maintenance and operational procedures:

1) Emissions of VOC's will be reduced by 98% of the oxidizer inlet concentration, based on acceptable EPA testing protocol.

2) Catalyst Supplier Terms and Conditions

Emissions are to be measured at the inlet and at the outlet of the system, to establish removal efficiencies. Performance testing is to be conducted, by an independent testing company, acceptable to the Seller, the Buyer and any regulatory authority having jurisdiction. Seller's field service technician will observe the operation of the system during testing. The Buyer shall provide operating personnel, fuel, utilities and all consumables required for performance testing. Any dispersion analysis, environmental impact assessment, emission testing or similar testing or reports, which may be required for permitting, are excluded from the Seller's scope of supply. Performance requirements shall be deemed to be satisfied upon successful completion of performance testing demonstrating compliance.

Seller reserves the right to modify, adjust, repair, revise or replace the equipment and/or catalyst to comply with the performance requirements. Performance testing shall occur no later than thirty (30) days after startup. Should performance testing not occur within thirty (30) days after startup, for reasons not solely attributable to Seller, performance requirements shall be deemed to be satisfied. Should the system fail to comply with performance requirements, upon initial testing, for reasons solely attributable to Seller, Seller will be given a complete copy of the test report and reasonable time to investigate and take corrective action to modify and/or adjust the system to bring it into compliance with performance guarantees at Seller's cost.

Please refer to Section 9 of this proposal, Terms & Conditions of Sale, Articles 7.0 through 7.3 warranty conditions.

SECTION 9

TERMS AND CONDITIONS OF SALE

AIR CLEAR LLC (AC) agrees to provide to Purchaser the Product(s) and Service(s) described and defined in this proposal subject to the terms and conditions set forth hereinafter.

1.0 **TERM OF PROPOSAL**: This proposal is subject to acceptance by Purchaser within thirty (30) days from the proposal date. The proposed price is contingent on the Product(s) being manufactured and the Service(s) being provided within six (6) months after Purchaser's acceptance of this proposal.

2.0 **PROPRIETARY & CONFIDENTIAL MATERIALS**: All drawings, patterns, specifications and information included in **AC**'s proposal or contract, and all other information otherwise supplied by **AC** as to design, manufacture, erection, operation and maintenance of the equipment, shall be the proprietary and confidential property of **AC** and shall be returned to **AC** at its request. Purchaser shall have no rights in **AC**'s proprietary and confidential property and shall not disclose such proprietary and confidential property to others or allow others to use such property, except as required for the Purchaser to obtain service, maintenance, and installation for the equipment purchased from **AC**. This clause shall survive the termination of this contract and be in effect as long as the Purchaser has possession of any of **AC**'s proprietary or confidential property.

3.0 **TAXES**: The contract price is exclusive of any duties and sales, use, excise, value-added, property, and/or similar taxes, fees or permits. If the Purchaser is required, by applicable law or regulation, to pay or collect any such tax or taxes on account of this transaction, then such amount of tax shall be paid by Purchaser in addition to the contract price. **AC** shall not be responsible for any additional cost associated with the Purchaser's tax exemption certificate and the governing body's acceptance of same.

4.0 **DELIVERY**: Title to all equipment shall pass to Purchaser at the FOB point or points of shipment and risk of loss will hereafter be borne by Purchaser. **AC** shall retain a security interest in any equipment not paid for in full. If the Purchaser declines or is unable to take delivery at the time(s) specified in the proposal or contract, **AC** will have the equipment stored for Purchaser at Purchaser's risk and account, and the materials shall be considered "shipped". Purchaser shall pay storage, handling and re-handling charges and continue to make payments according to the payment terms contained herein.

5.0 **SUSPENSION**: In the event Purchaser suspends the execution of work on this contract, Purchaser shall reimburse **AC** for all costs incurred by **AC** as a result of such suspension, including, without limitation, all borrowing and opportunity costs. In the event the suspension exceeds 180 days in duration, in addition to being entitled to full reimbursement of costs as aforesaid, **AC** shall have the unqualified right to cancel the unfinished portion of the contract without liability to Purchaser of any kind. Should the contract be canceled the provisions of Article 15.0 shall apply.

6.0 **CHANGES & EXTRA WORK**: Purchaser, by written order accepted by **AC**, may make reasonable changes in the scope of the work subject to equitable adjustments in the Contract price and schedule, including an allowance for increased overhead and profit. **AC** is not obligated to incur any expense or do any work in excess of that reasonably anticipated unless the Purchaser issues a written order for such expense or work with mutually acceptable terms and conditions.

7.0 **MATERIAL WORKMANSHIP WARRANTY**: **AC** warrants that all materials and equipment which it manufactures and furnishes and work provided will be free from defects in materials and workmanship for a period of twelve (12) months after initial operation or eighteen (18) months after the first item is shipped, whichever is sooner. Initial operation is defined as the date of first mechanical operation of this system, whether or not it is connected to the process.

AC's sole obligation hereunder is to repair or replace F.O.B. point of shipment job site, any such item which, after **AC**'s inspection, proves to be defective, provided that **AC** shall not be obligated for any removal, shipping or reinstallation costs, except for technical assistance, if required.

AC's obligations hereunder are subject to the following conditions:

a.) Receipt from Purchaser within the warranty period of prompt written notice of any defect containing a full description thereof.

b.) Purchaser shall not, without **AC**'s approval, have attempted to correct the defect.

c.) Purchaser shall have installed (if applicable), operated and maintained the equipment strictly in accordance with **AC**'s operating and maintenance instructions.

d.) The effect has been caused solely by faulty materials or workmanship for which **AC** is responsible, and is not due to such things as erosion, corrosion, or deterioration resulting from the manner in which the equipment is operated.

To the extent that the materials and equipment furnished consist of products manufactured by other parties, such manufacturer's warranty is hereby assigned to Purchaser, and **AC**'s responsibility with respect to any such products shall not extend beyond the manufacturer's warranty with respect thereto.

8.0 **PATENT WARRANTY**: **AC** shall defend at its expense any suit or proceeding brought against Purchaser based on any claim that the equipment covered herein, except for equipment/material manufactured and or designed to Purchaser's specifications, infringes any United States patent issued as of the date of this proposal and pay any court imposed damages and costs finally awarded against Purchaser but not to exceed the amount theretofore paid to **AC** by Purchaser hereunder provided:

a.) **AC** is promptly notified by Purchaser in writing of such claim and

b.) **AC** is given full authority, information, and assistance by Purchaser, which **AC** deems necessary for the conduct of such defense.

AC shall have the right and option at any time in order to avoid such claims or actions and minimizes potential liability to:

a.) procure for the Purchaser the right to use the equipment, or

b.) modify the equipment so that it no longer infringes, or

c.) replace the equipment with non-infringing equipment.

9.0 **PERFORMANCE GUARANTEE**: **AC**'s sole guarantees are those contained in its proposal to Purchaser. These guarantees are contingent upon the correctness and accuracy of the information provided by the Purchaser and are based upon the operating conditions specified in **AC**'s proposal. These guarantees will be deemed satisfied by successful completion of performance tests in accordance with applicable standard procedures as specified in the proposal and in effect on the date of this proposal. Performance tests shall be conducted by the Purchaser, (unless otherwise specified in **AC**'s proposal), and witnessed (at Purchaser's option) by **AC** within thirty (30) days of the date of initial operation or within sixty (60) days of shipment, whichever is earlier, and through no fault of **AC**, the equipment shall be deemed accepted by the Purchaser and in compliance with all contractual requirements in the event the equipment fails to meet the contract performance guarantees as verified by certified test results, **AC** will supply, at its sole option, repaired or replacement parts pursuant to the delivery terms of the proposal subject to the limitations stated in Article 13.0.

10.0 **IMPLIED WARRANTIES/GUARANTEE DISCLAIMER**: The warranties/ guarantees furnished by **AC**, as expressly included herein, constitute **AC**'s sole obligation hereunder and are in lieu of any other warranties or guarantees expressed or implied, including warranties of merchantability or fitness for a particular purpose.

11.0 **DISCLAIMER OF CONSEQUENTIAL DAMAGES**: **AC** shall not be liable to Purchaser for indirect or consequential damages including, but not limited to, loss of profits or revenue, loss of use of equipment, costs of replacement power or product, additional expenses incurred in the use of equipment or facilities or the claims of third parties. This disclaimer shall apply to consequential damages based upon any cause of action whatsoever asserted against **AC**, including one arising out of any breach of Warranty, Expressed or Implied; Guarantee; Products Liability, Negligence, Tort; or any other theory of liability.

12.0 **PURCHASER'S NEGLIGENCE & INSURANCE**: **AC** shall not be responsible for losses or damages arising out of the negligence of the Purchaser or its employees, agents or architects or losses for which the Purchaser has agreed to provide insurance. In the event that both **AC** and the Purchaser are negligent and the negligence of both is approximate cause of the accident, then in such event each party will be responsible for its portion of the liability of damages (excluding consequential or indirect damages which are disclaimed by **AC**) resulting here from equal to such party's comparative share of the total negligence. Both **AC** and the Purchaser hereby agree to mutually waive any rights which each may have against the other with respect to subrogation under any policy of insurance relating to the equipment or services provided under this contract.

13.0 **LIMITATION OF LIABILITY**: In no event will **AC**'s liability to the Purchaser for any and all claims, including property damage and personal injury claims, allegedly resulting from breach of contract, tort, or any other theory of liability exceed the amount of the initial purchase price paid to **AC** prorated on a per system basis.

14.0 **DELAYS & DAMAGES - FORCE MAJEURE**: **AC** shall use reasonable efforts to meet the scheduled delivery date. However, in no event shall such delivery date be construed as being of the essence of the contract. In the event of delays or damages due to conditions beyond **AC**'s reasonable control, including, but not limited to Acts of God, Acts of Purchaser, or Purchaser's customer or of other contractors employed by Purchaser, Acts of Civil or Military Authority, priorities, fire, strikes, floods, epidemics, quarantine restrictions, war, riot, delays in transportation, or **AC**'s inability to obtain necessary labor, materials, or manufacturing facilities, the Contract dates shall be extended by an equitable adjustment in the contract delivery date.

15.0 **CANCELLATION:** Purchaser's cancellation of the contract is subject to a cancellation charge of 10% of the total price of the contract, plus **AC**'s actual expenses and expenses to which **AC** has become committed for fulfillment of the contract before notice of cancellation is received.

16.0 **PAYMENT**: Unless otherwise agreed, payment shall be as specified in the proposal and payments shall be due and payable upon presentation of an invoice. Payments not received by the due date shall be subject to a monthly interest charge at the rate of 2% per month or the maximum allowed by law, whichever is less.

In the event a retention value is required and agreed, it shall accrue interest at the rate of 1% per month on the outstanding balance until exchanged for a letter of credit or paid to **AC**. **AC** retains the unqualified option to provide Purchaser with a letter of credit in lieu of retention at any time during the performance of the contract.

In the event the product(s) are purchased for resale, the Purchaser's payment to **AC** shall not be contingent on Purchaser's receipt of payment upon resale.

16.1 DEFAULT IN PAYMENT:

a.) If any payment due to **AC** is more than thirty (30) days past due, **AC** shall have the right at its sole option to accelerate the payment of all outstanding amounts, including, but not limited to, amounts previously retained pursuant to the agreement, by notifying the Purchaser in writing that all outstanding amounts are immediately due and presenting purchaser with an invoice for said amount. If Purchaser fails to pay the accelerated schedule, **AC** shall also have the right to discontinue all work on the project without incurring any liability to Purchase for such action.

b.) In the event the total aggregate amount of delinquent payments exceeds at any point during the term of the agreement (10%) percent of the total contract amount, the Purchaser shall provide at **AC**'s request, additional collateral, including but not limited to irrevocable letters of credit, sufficient to secure payment of all contract amounts.

c.) The foregoing remedies of **AC** are in addition to all other remedies **AC** may have at law or in equity, including but not limited to the right to obtain liens on Purchaser's assets through legal or equitable proceedings.

16.2 **SECURITY AGREEMENTS**:

a.) Purchaser hereby grants to **AC** a security interest in the equipment and or materials sold hereunder to secure the purchase price of same. Purchaser shall execute any financing or other statements in filings which in **AC**'s own judgment are necessary or appropriate to evidence or perfect such security interest, which shall thereafter be filed by Purchaser with the appropriate recording officer. This contract shall constitute the security agreement between the parties and is intended to and shall afford **AC** all rights of a secured party under Article 9 of the Uniform Commercial Code.

b.) Until Purchaser has paid the full amount due and owing for any equipment of materials purchased hereunder, the Purchaser shall be prohibited from transferring such equipment or materials to any creditor of Purchaser other than **AC** unless **AC** provides its prior written consent to such transfer, such consent not to be unreasonably withheld.

c.) In the event Purchaser becomes insolvent, files for bankruptcy, or goes into receivership or liquidation, Purchaser agrees to use its best efforts and to provide all assistance requested by **AC** in order to secure **AC**'s position as a preferred creditor with respect to all amounts due to **AC**.

16.3 **PAYMENT OF RETAINED AMOUNTS**:

a.) If this contract permits Purchaser to withhold final payments, and acceptance is not based upon performance tests, such final payments shall be due and payable within thirty (30) days after the equipment is ready for operation.

b.) If such deferred payment is contingent upon tests and such tests are delayed through no fault of **AC** for more than thirty (30) days after the equipment is first ready for operation, final payment shall be due and payable upon expiration of such thirty (30) day period.

17.0 **PRICE ADJUSTMENT**: Except as noted in **AC**'s Proposal, the Contract price is firm for delivery and installation (if applicable) in accordance with the schedule therein. In the event the schedule is modified due to acts of purchaser or conditions beyond the control of **AC** and **AC**'s cost escalates, an equitable adjustment to the contract price shall be granted to **AC**.

18.0 **DIFFERING CONDITIONS**: In the event **AC** is installing the equipment and any of the conditions of the construction site at that time of erection differ materially from those evident at the time of **AC**'s prebid site visit (if applicable), Purchaser's representations, sub-surface conditions (if applicable), and conditions ordinary to similar projects, then any additional costs occasioned by such differing site conditions shall be subject to equitable adjustment to the Contract price and schedule.

The following, except as specifically waived in writing by **AC**, shall be available to **AC** throughout the duration of the work at no cost to **AC**.

a.) A safety buffer zone shall be established nominally fifty (50) feet all around the base of the structure which will be maintained free and clear of all work contractors, equipment and personnel.

b.) An adequate construction staging, lay down and material storage area for **AC**'s exclusive use shall be available adjacent to the safety buffer area. This area and the safety buffer shall be graded, leveled, well drained, even with the top of foundation and be suitable for delivery vehicles and **AC**'s equipment in all weather conditions.

c.) All weather access roads shall be made available and maintained by Purchaser from a main highway and from the railroad sidings (if applicable) to **AC**'s area and the location of constructions.

d.) Purchaser's rail siding, (if applicable), shall be available to **AC** within 300 feet, by the normal routing, from **AC**'s area.

In the event activities or operations at the site by parties other than **AC** interfere with the execution of the work, an equitable adjustment shall be made to the Contract Price and Schedule.

19.0 **UNLOADING & STORAGE**: **AC** may have certain materials or equipment delivered to the construction site prior to AC's arrival and mobilization (if applicable). Purchaser shall receive, unload and store such materials and equipment.

20.0 **PERMITS & LICENSES**: **AC** shall obtain and pay for all licenses and permits required to be obtained in its name to do business within the political jurisdiction containing the construction site. Purchaser will obtain and pay for all other licenses and permits, including any required to be obtained in the Owner's name, including any required for the construction of permanent structures, and all pollution control zoning, Federal or regional air, navigation or building permits and all other permits and licenses related to the physical work.

21.0 **OSHA - FEDERAL, STATE & LOCAL**: **AC** agrees to comply with the Federal OSHA requirements in effect as of the date of the proposal relative to the work performed hereunder. **AC'** own responsibility is limited to modification or replacement of the equipment cited as violating such standards. OSHA requirements with respect to noise are specifically excluded. Where state, local or Purchaser's safety and health requirements differ from the Federal OSHA requirements, modifications or changes in design to meet such requirement will be incorporated at Purchaser's request. Additional costs arising from such requests and from erection procedures required by state, local or Purchaser's safety and health regulators that deviate from Federal OSHA requirements will be for Purchaser's account.

22.0 **ASSIGNMENT/SUBCONTRACTS**: **AC** retains the right to assign this contract to any subsidiary of affiliated company of **AC** without the Purchaser's prior approval. All other assignments by either **AC** or Purchaser require prior written consent of the other part. **AC** may subcontract any part of the work.

23.0 **HAZARDOUS MATERIALS**: If the Purchaser's facilities contain hazardous materials, including asbestos bearing materials and any such materials are encountered, **AC** shall have no obligation to remove or remediate them in the absence of a separate agreement which includes separate consideration to **AC** for such work. If **AC** or any of its subcontractors are required to perform work within or immediately adjacent to any facilities that are determined to contain hazardous materials and/or asbestos, and the said work must be interrupted to allow for the remediation or removal of such materials by others, **AC** shall be entitled to any and all costs and other expenses associated with such interruption in work. Purchaser shall fully defend, hold harmless and indemnify **AC** and its agents from and against any claim arising out of exposure to such hazardous and/or asbestos bearing materials.

24.0 **DISPUTES:** In the event of a dispute arising hereunder, the parties will confer and attempt to amicably resolve the dispute. If after good faith negotiation the parties cannot reach agreement, then the matter will be finally resolved in accordance with the laws of the State of Delaware, USA.

25.0 **CONTRACT INTERPRETATION**: If any of the provisions of these Standard Conditions of Sale (including statements made in the proposal) conflict with any provisions in the Purchaser's documents, the former shall govern unless **AC** expressly agrees to the contrary in writing. Any contract resulting from this proposal shall be construed, and the legal regulations of **AC**' and the Purchaser shall be determined in accordance with the laws of the State of Delaware, USA. No change in or modifications of said agreement shall be binding upon the parties unless the changes or modifications shall be duly accepted in writing by the Purchaser and approved in writing by **AC**.

26.0 **SEVERABILITY**: Should any part of this agreement be declared invalid or unenforceable, such decision shall not affect the validly of any remaining portion which remaining portion shall remain in full force and effect, and **AC** shall have the right to replace the part declared invalid or unenforceable with a provision which serves as much as validly possible the same commercial purpose as the part determined to be invalid or unenforceable.

27.0 **CONTRACT DOCUMENTS**: The Contract Documents consist of this proposal, including these terms and conditions of sale, and any modifications thereof entered into, in writing, by both parties. The Contract Documents represent the entire integrated agreement between the parties hereto and supersede all prior negotiations, representations, or agreements, either written or oral, including any purchase orders, proposals or bids. The parties recognize the common practice of issuance of a purchase order by the Purchaser for purposes of contract identification and accounting convenience. In the event that the Purchaser issues a purchase order in conjunction with this transaction, it will be only for the purposes described herein, and as so limited, shall become a part of the Contract Documents.

Griffith Consulting, LLC.

TECHNICAL AND COMMERCIAL PROPOSAL

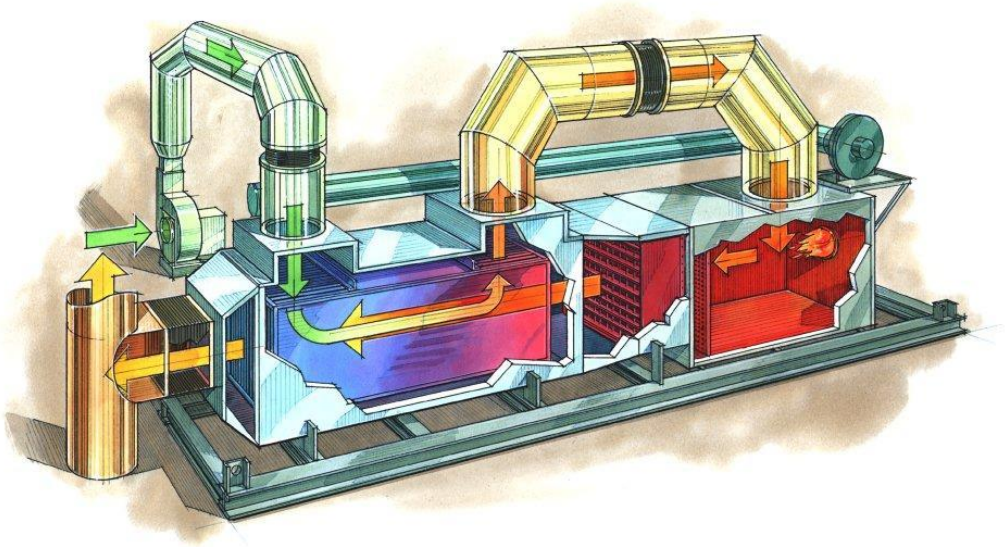
6000 SCFM
CATALYTIC OXIDATION SYSTEM

Proposal: 210422a-0

for

Ortho Clinical Diagnostics
Rochester, New York

April 22, 2021



Griffith Consulting, LLC.
2125 Bustard Road, Lansdale, PA 19446 ● 610-222-4530 ● fax: 610-222-4531● cgriffith@gclequipment.com

I. INTRODUCTION

GCL is proposing a 6000 scfm natural gas-fired catalytic oxidizer (CatOx). The 6000 scfm flow would contain a variety of VOCs.

The contaminated air stream will be preheated via a natural gas-fired burner. The system shall raise the temperature of the exhaust air to the required operating temperature of approximately 650°F. This will assure the desired destruction of the VOCs in the exhaust gas. The system shall be packaged complete with burner, insulated flue gas chambers, precious metal catalyst module, and stack with a 10' discharge height.

The Catalytic Oxidation System, designed and fabricated by GCL, is engineered to efficiently control solvent emissions from industrial processes. The system is a factory-assembled unit designed to meet performance specifications. The CatOx System shall be constructed of carbon steel and internally and/or externally insulated with ceramic fiber. A description of system components, accessories, assembly criteria, and performance specifications follows.

Catalytic oxidizers are used to convert hydrocarbons and other volatile organic compounds (VOCs) to carbon dioxide and water vapor. This occurs by heating the hydrocarbons in an oxygen rich atmosphere to a temperature that will allow the oxidation reaction to occur at a rapid rate.

Catalytic oxidizers typically operate at temperatures ranging from 500°F to 700°F. The reaction occurs rapidly on the surface of the catalyst and may require a residence time of only 0.05 seconds. This offers the advantages of a lower operating cost (less fuel) and a reduced equipment volume compared to a non-catalytic oxidizing system with the same inlet flow rate.

The catalyst media is a monolithic substrate coated with precious metals. The precious metal formulation varies with the application and may include platinum, palladium, and rhodium. The substrate is metallic. The rolled catalyst impregnated metal is caged in a flanged frame that matches the cross section of the combustion chamber. See Figure 1 for a sample catalyst bed and media structure.

Processing for the VOC-laden gas in the catalytic oxidizer occurs in the following steps:

1. The process fan imparts an induced draft to draw gases to the unit and provide the energy to force the gases through the equipment under a positive pressure. The process air flow rate is controlled with a damper to maintain a constant draft pressure at the fan inlet.

2. Dampers at fan inlet open to allow either fresh ambient air or VOC-laden air from the process into the thermal oxidizer. Fresh air is required for the heat-up and cool-down cycles of the unit. Fresh air may also be used to dilute the incoming stream in the event the VOC loading is above the 25% LEL level.

3. The combustion chamber temperature is maintained by a single burner. Air and natural gas are mixed and combusted by the burner to release heat into the combustion chamber. The burner firing rate varies with the flow and temperature of the gases entering the combustion chamber. Heat from the burner is used to heat the gases to the proper reaction temperature prior to the catalyst.

4. The hot gases then pass through the catalyst media. Here the oxidation of the VOCs occurs. Additional heat is released by the reaction that further increases the temperature of the gases. These gases are exhausted from the thermal oxidizer.

5. Exhaust gases flow to atmosphere through an exhaust stack.

Operating Parameters

Process Air Volume (SCFM)	6000
Max. Solvent Load (lb/hr)	16.39
Process Air Temperature	100°F
Inlet Pressure	2” WC
Min. Operating Temperature	600°F
VOC Destruction Efficiency	>98%

VOCs: MEK, Methanol, Ethanol, M-xyl, O-xyl, TBA, THF, IPA, Ethyl Acetate, N-decane

NOTE: The process data, presented above, assumes the exhaust stream is composed only of the above referenced gaseous constituents.

II. EQUIPMENT SPECIFICATIONS

Process Inlet Isolation Damper

The process isolation damper is utilized to isolate the CatOx from upstream equipment. This is necessary when the CatOx is in start-up and shut-down modes, or when the unit is not at the operating temperature necessary to obtain the desired destruction efficiency.

Capacity	**6000 SCFM**
Damper Diameter:	**18”**
Damper Type:	**Butterfly**
Material of Construction:	**Carbon Steel or Cast Iron**
Actuator Type:	**Pneumatic**
Actuator Manufacturer:	**Max-Air or equal**

Fresh Air Damper

The fresh air damper is utilized to modulate the flow of fresh air into the unit to allow for pre-combustion purge, dilution or cooling air as needed.

Capacity	**6000 SCFM**
Damper Diameter:	**18”**
Damper Type:	**Butterfly**
Material of Construction:	**Carbon Steel or Cast Iron**
Actuator Type:	**Pneumatic**
Actuator Manufacturer:	**Max-Air or equal**

Process Fan

The forced draft process fan is sized to allow for a fan inlet pressure of -2" W.C. and a pressure drop of approximately 3-5" W.C. across the CatOx. The process fan is supplied with an energy efficient motor, controlled by a Variable Frequency Drive. The fan is supplied with heavy-duty roller bearings with grease fittings, arrangement 10 configuration, shaft seals, and carbon steel construction.

Fan Manufacturer:	**Cincinnati Fan, or equivalent**
Expected Motor Size:	**20 HP**
Motor Type:	**High Efficiency – Inverter Duty Rated**
Fan Materials of Construction:	**Spark Resistant Wheel and Housing Base & Pedestal shall be C.S.**

Combustion Chamber

The combustion chamber utilizes a burner to bring the contaminated air up to the inlet temperature of the catalyst.

Operating Temperature Normal:	**600°F**
Shell Material:	**A36 Carbon Steel**
Insulation Material:	**10 PCF modules**

Burner

A burner will be installed in the combustion chamber. Fuel will be provided to the burner and burner pilot through a natural gas fuel train designed to NFPA standards. The fuel train will be pre-piped and pre-wired to a local junction box.

The process air fan feeds the required air to the burner.

Number Of Burners:	**1**
Approx. Rated Capacity of burner:	**5 MM Btu/hr**
Expected Fuel Consumption:	**4 MM Btu/hr**

Catalyst Bed

The catalyst bed is used to fully combust the VOCs in the contaminated gas stream. The catalyst is impregnated on a coiled corrugated metal support structure, which provides the required amount of catalyst required for destruction.

Desired Destruction Efficiency:	**>98% of VOCs**
Catalyst Bed Material of Construction:	**Spiral Wound Alloy**

Exhaust Stack

An exhaust stack shall be provided with the oxidizer to direct the clean flue gas from the oxidizer to atmosphere. The stack is supplied with test ports, to meet environmental requirements. A platform for access to the test ports and the structural support for the platform is by others.

Material of Construction:	**Insulated Carbon Steel or Stainless Steel**
Height of Stack:	**10'**
Support Method:	**Self-Supported**

System Controls / Safety Equipment

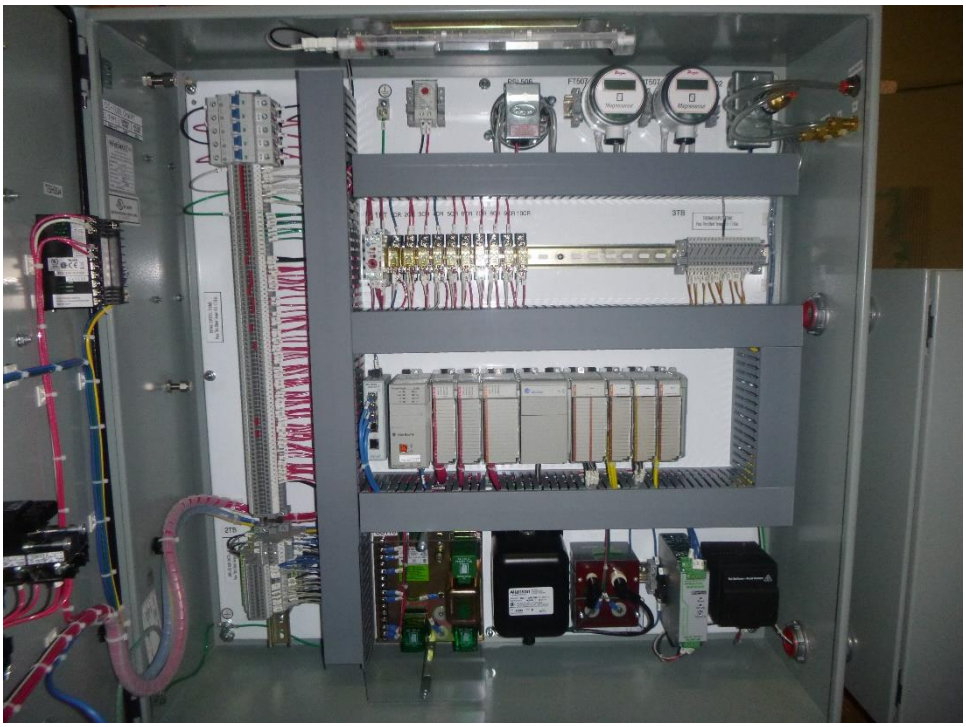
The control system will be designed, assembled, and manufactured by GCL and is fully automatic. The control shall be a fully automated, single push button operation for the entire sequence of operation for the oxidizer system. The single button start / stop design has been utilized for ease of use and to eliminate the possibility of costly operator error. The control system has been designed to provide safety control and monitoring system that is user-friendly during all periods of system operation.

The system incorporates state-of-the-art displays and graphics for operational status and troubleshooting messages. The fault indicator shall display messages defining the reason for any system or control shutdown, which minimizes the time needed to correct operation of a faulty condition and maximizing the process run time.

The PLC connects to the customer interface via an Ethernet connection.

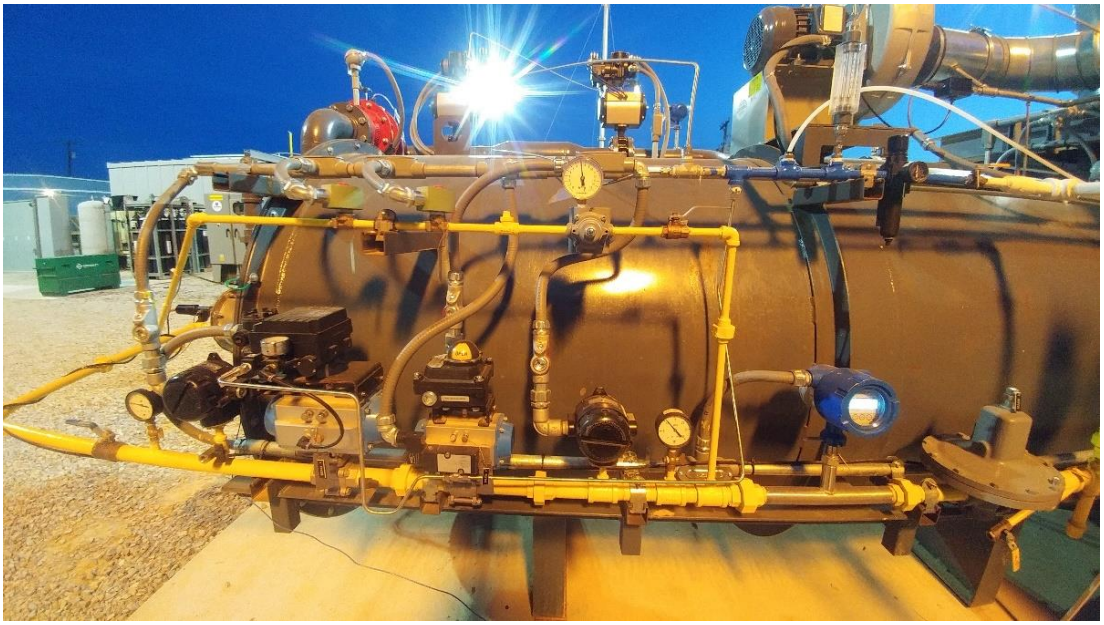
A VFD shall be provided for control of the fan speed and shall be installed in the CatOx control panel. The fan shall be installed on the skid. Interconnecting wiring for 460-volt power supply and the fan motor is included.

Control Panel Type:	**NEMA 4 (outdoor)**
Operator Interface:	**Maple Systems**
Programmable Logic Controller:	**Allen Bradley**
Flame Safety Type:	**UV scanner**
Voltage to Panel:	**460V /3 phase / 60 Hz**



Fuel Train

The fuel train provides a controllable supply of natural gas to the pilot and burner and ensures proper safety and redundant isolation of the fuel supply, as required. The fuel train is piped and wired with the requisite components to ensure that it complies with NFPA code requirements. The fuel train uses the signal it obtains from the control system to increase or decrease the natural gas pressure to the burner to control the heat input. The fuel train will completely isolate the thermal oxidizer system from the fuel supply using redundant and proven isolations when required.



Water-based Exhaust Stack (Optional)

During periods when water-based solvents are used and the catalytic oxidizer is not required to be in operation, it is recommended that the water-based exhaust be vented directly to atmosphere and not through the catalytic oxidizer. The water-based exhaust will have a relatively high dewpoint and the potential to condense through a cold catalytic oxidizer will be high. Components such as the ignitor, pilot and the interior of the oxidizer steel shell could become wet and corrode and the ceramic fiber could become wet and matted. Each time the catalytic oxidizer would need to be started, the moisture could lead to difficulty in igniting the pilot, starting the burner and bringing the oxidizer up to operating temperature as rapidly as desired.

To alleviate the difficulties associated with water build-up from the water-based exhaust, GCL recommends the inclusion of a separate 8’ cold exhaust stack, which would be located between the oxidizer fan and the oxidizer.

During periods of water-based solvent operation, the inlet damper to the fan would be open, but a discharge valve would be closed and a cold stack damper open, which would direct the flow through the fan, but up the cold exhaust stack.

During periods of VOC-based solvent operation, the inlet damper to the fan would be open, and the discharge valve would also be open, but the cold stack damper closed, which would direct the flow through the fan and the oxidizer.

UTILITY REQUIREMENTS

Compressed Air:	80 PSIG @ -40^{0}F dew point
Natural Gas:	6000 scfh @ 10 psig
Electricity:	460V @ 30 amps

III. SCOPE OF SUPPLY - GCL

The CatOx system shall include:

- One (1) Forced Draft Process Fan with Motor and VFD
- One (1) Process Isolation Damper
- One (1) Fresh Air Damper
- One (1) Refractory-Lined Carbon Steel Combustion Chamber
- Chamber mounting of components to maximum reasonable extent
- One (1) Refractory-Lined Carbon Steel or SS Stack
- One (1) Catalyst Support Frame with Catalyst Media
- One (1) NEMA 12 (indoor) Control Enclosure
- One (1) lot of Field Instrumentation for GCL supplied equipment.
- Interconnecting Ductwork between GCL Supplied Equipment.
- Interconnecting wiring for skid mounted equipment
- Interconnecting piping for skid mounted equipment
- Draft Transmitter
- One (1) Gas Train Assembly

Drawings/Documentation

- General arrangement
- P&ID
- Electrical diagrams
- Operating and Maintenance Manual

Supply by Others

The following items are to be supplied by others and are not included in GCL scope of supply:

- Demolition and excavation of site
- Any Permits, Clearances, or Licenses from any governmental agencies
- All environmental and performance testing
- All Buildings and Shelters including Motor Control Center and Control Rooms
- Excavations, grading, foundations and other civil work
- Cranes and other tools required for demolition, installation, and unloading equipment
- Any underground or imbedded materials, such as conduit and cast-in-place anchor bolts
- Shipping and receiving of materials on site
- On-Site storage of equipment and materials including protection from freezing and water damage.
- On-Site installation and assembly of all equipment.
- All support structures, access platforms, stairs, and ladders
- Design, Supply, and Installation of any Fire Protection equipment or systems.
- All area illumination and warning lighting
- All thermal Insulation or Freeze Protection
- Integration with Plant Control System and network
- 480 VAC power supply to CatOx control panel
- Supply and Installation of Motor Control Center with all required starters
- All interconnecting wiring off the skid
- All interconnecting piping off the skid
- All ductwork to the Process Forced Draft Fan Inlet
- Any electric power convenience outlets
- All testing of equipment performance
- All start-up service and expenses
- All other items not specifically called out in Supply by GCL

Optional Supply

- Operator Training Program
- Start Up Services

IV. ENGINEERING AND FABRICATION SCHEDULE

ENGINEERING AND FABRICATION SCHEDULE

Based upon current equipment and material availability, we anticipate the following schedule applying to this project:

MILESTONE	TIME	ELAPSED TIME
Drawings for approval	3-4 weeks	3-4 weeks
Approval of drawings	1 week	4-5 weeks
Fabrication	10-12 weeks	14-17 weeks
Transportation (by others)	1 day	14-17 weeks

This schedule is predicated on customer approval within the time frame noted. Delays in approval will extend the completion date by at least the time equal to the delay. Lengthy delays may result in rescheduling of manufacturing, which could result in a greater offset of shipping dates and increased prices as a result of raw material increases. Shipment timing may change depending upon shop load at the time of order.

V. EQUIPMENT QUOTATION

6000 scfm: Catalytic Oxidation System $166,360.00

Water-based Cold Stack & Dampers $25,714.00

Prices exclude all local, state, and federal taxes.

FOB: Pennsylvania shop

STARTUP, TRAINING, AND SERVICE TERMS

Unless otherwise noted, prices quoted do not include services. GCL can provide service technicians, engineers, and other personnel as required to support startup, training, and service of equipment and systems furnished. Personnel to support these functions can be provided at a per diem rate of $1280 per day. Travel days and stand-by time will be charged at 8 hours per day. Travel occurring outside the normal 8-hour work day shall be billed at $160.00 per hour. Overtime in excess of 8 hours per day or 40 hours per week shall be charged 150% of the base rate. Likewise, work on Saturday and Sunday shall be at 150% of the base rate. Required work on holidays shall be at 200% of the base rate. When service extends over a period of weeks, personnel are returned to their base United States location for one weekend every two weeks at customer's expense. All actual living, travel, and other related expenses associated with service shall be invoiced at actual cost.

VI. TERMS AND CONDITIONS

GCL, strictly for the periods stated below, subject to all standard GCL terms and conditions, will provide the following warranties:

1. Performance: GCL warrants that the Catalytic Oxidizer will provide a minimum VOC destruction efficiency of 98%
2. Material: GCL warrants that the Catalytic Oxidizer is free from defects in material and workmanship under normal use and service.

In the event the system fails to satisfy the warranty as described in Paragraph A above, GCL shall take corrective action in accordance with standard GCL's terms and conditions.

In addition to the other limitations on Seller's liability provided for herein, in no event will Seller's liability to Buyer for any and all claims, including property damage or personal injury claims, allegedly resulting from breach of contract, warranty, strict liability tort, or any other theory of liability involving this proposal or contract exceed the amount of the purchase price paid to Seller.

The performance warranty period for the system is one (1) year after shipment. The equipment warranty period is 12 months after shipment.

Catalyst performance is specifically contingent upon none of the following being present in the process exhaust: Phosphorus, Bismuth, Lead, Arsenic, Antimony, Mercury, Iron Oxide, Tin, Silicon, Zinc, Sulfur, Halogens and Inert Particulates. Exposure to excessive temperatures significantly reduces catalyst life. Hence, at no time shall the catalyst outlet temperature be permitted to exceed 1300°F.

Patent Warranty - Seller shall defend at its expense or proceeding brought against Buyer based on any claim that the equipment manufactured by Seller, except for equipment/material manufactured and/or designed to Buyer's specifications, infringes any United States patent issued as of the date of the proposal or contract provided Buyer gives to Seller immediate notice in writing of the institution of the suit or proceedings and permits Seller, through its Counsel, to defend the same and gives Seller all needed information, assistance and authority to enable Seller to do so.

On any equipment or component manufactured by others, Seller shall pass through any patent indemnity offered by said manufacturer. Seller's liability shall be limited to rendering reasonable assistance to Buyer to enforce said indemnity, which term shall not be deemed to include the payment of any fees or expenses of Buyer's legal counsel or to require Seller to institute suit or to participate in any such litigation.

Notification of suspected warranty problems must be made, in writing, within five (5) days upon their occurrence. GCL shall be provided access to the equipment during normal working hours to evaluate and assist in correction of any deficiencies which may exist.

Warranties for purchased items, such as instrumentation, controls, valves, etc. shall be extended by GCL to customer on the same basis as the warranty provided to GCL by the original equipment manufacturer. Upon written notification of failure of such parts, GCL shall ship replacements to the appropriate facility. A memo invoice for the price of these replacement parts shall be issued by GCL to the facility. This invoice will be canceled upon return of the defective part so GCL can process such parts for its own credit as well.

GCL shall not be responsible for pluggage, corrosion, or other damage resulting from the introduction of materials or compounds to the oxidizer. Likewise, GCL shall not be responsible for a loss of capacity or excess utility usage as a result of buildup or deposits of materials.

GCL will not be responsible for premature failure or damage resulting from the introduction or materials not identified by purchaser into equipment covered by this warranty. This includes materials which may plug, foul, corrode, degrade or otherwise attack components or alter system performance.

GCL will not be responsible for consequential damages. GCL will not be responsible, nor pay for repairs to the proposed system while under warranty, unless such repairs are authorized by GCL in writing prior to commencement of such repairs.

ACCEPTANCE

All orders are subject to acceptance by Griffith Consulting, LLC. (GCL) and availability of materials. Clerical errors are subject to correction. Ordered items may be subject to cancellation by GCL without notice.

TAXES AND FEES

All taxes including Federal, State or Local, which may become due as a result of this project shall be the purchaser's responsibility. All sales, use, excise and/or value added taxes as well as all duty, customs agent or broker fees, inspection or testing fees, air pollution permit fees, insurance, consular fees or any other tax which may be assessed by any government entity at any level shall be paid by the purchaser.

TERMS OF PAYMENT

Periodic payments will be required throughout the course of this project. Invoices shall be submitted at intervals as indicated below with payment due upon receipt. The following is the suggested payment schedule for the delivery schedule noted above:

50% due at time of issuance of purchase order by customer
25% due upon submission by GCL of drawings for approval
15% due upon shipment of thermal oxidizer
10% due upon successful start-up of thermal oxidizer (initial lighting of burner), not to exceed 30 days from shipment

Initial payment is due with the purchase order and before work commences. Other invoices are payable at Net 30 Days unless otherwise indicated. A late charge of 1½% per month will apply to all unpaid balances. If shipments are delayed by buyer, payments are due when GCL is prepared to make such shipments.

DELIVERY

Goods shall be delivered upon reasonable notice to purchaser, F.O.B. seller's plant, and title thereto and liability for loss and damage in transit or thereafter shall pass to purchaser upon seller's deliver of good to a carrier for shipment. Claims for damages in transit must be asserted against the carrier. Within ten (10) days after receipt of shipment, purchaser must report any shortage or damage not due to carrier, otherwise claims for such shortage or damage will be deemed waived.

LIABILITY & LIMITATION ON DAMAGES

In no event shall GCL be liable for purchaser's increased manufacturing costs, loss of profits or good will or any special, indirect, incidental or consequential damages. In no event shall GCL be liable for incidental, compensatory, punitive, consequential, indirect, special or other damages. GCL's aggregate liability with respect to a defective product and any contract between GCL and purchaser shall be limited to the amount paid to GCL for that product.

ARBITRATION

Purchaser agrees that all claims, demands, disputes, controversies, and differences arising under any contract made between GCL and purchaser shall be settled exclusively by arbitration in accordance with the rules prevailing of the American Arbitration Association. Judgment on the award thus rendered shall be binding on the purchaser and may be entered in any court having jurisdiction thereof. Unless the parties agree otherwise in writing, such arbitration will be conducted in Montgomery County, Pennsylvania. In the event that GCL hires an attorney to assert any of its rights or defenses in connection herewith or to collect amount sue, Purchaser agrees to be responsible for all of GCL's legal fees and expenses as well as costs of collection.

FORCE MAJEURE

GCL shall not be responsible for default hereunder where such has been caused by an act of God, war, major disaster, terrorism, third-party criminal acts, insurrection, riot, flood, earthquake, fire, labor disturbance, labor shortages, inability to secure raw materials or failure of machinery for the manufacture of equipment, operation of statutes, laws, rules or rulings of any court or government, or any other cause beyond GCL's control.

CANCELLATIONS, CHANGES & RETURNS

All undelivered products may be canceled on purchaser only upon written approval of GCL. In the event of any cancellation by purchaser, purchaser shall pay to GCL its reasonable costs and expenses, plus GCL's usual rate of profit for similar work. Purchaser may not alter or modify its order or any part thereof without GCL's prior, written consent. GCL reserves the right to change the price, terms of payment and delivery dates for any products affected by any alterations or modification. No products may be returned without GCL's written authorization and products may be returned only on the terms specified in such authorization.

JURISDICTION

Contracts established based on this proposal shall be governed by laws of the State of Pennsylvania, venue Montgomery County.

IMPLIED WARRANTY & DISCLAIMER - THE WARRANTIES FURNISHED BY SELLER AS EXPRESSLY INCLUDED HEREIN CONSTITUTE SELLER'S SOLE OBLIGATION HEREUNDER AND ARE IN LIEU OF ANY WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, EVEN IN THE EVENT OF A FUNDAMENTAL BREACH BY SELLER. THERE ARE NO WARRANTIES, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

DISCLAIMER OF WARRANTIES - SELLER SHALL NOT BE LIABLE TO BUYER OR BUYER'S CUSTOMER FOR INCIDENTAL, CONSEQUENTIAL OR LIQUIDATED DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF CONTRACT GOODS, COSTS OF REPLACEMENT POWER OR CONTRACT GOODS, ADDITIONAL EXPENSES INCURRED IN THE USE OF CONTRACT GOODS OR FACILITIES, OR THE CLAIMS OF THIRD PARTIES, EVEN IF SELLER HAS BEEN ADVISED OF POSSIBILITY OF SUCH DAMAGES. THIS DISCLAIMER SHALL APPLY TO INCIDENTAL, CONSEQUENTIAL OR LIQUIDATED DAMAGES BASED UPON ANY CAUSE OF ACTION WHATSOEVER ASSERTED AGAINST SELLER, INCLUDING ONE ARISING OUT OF PRINCIPLES OF CONTRACT, ANY BREACH OF WARRANTY, EXPRESSED OR IMPLIED, GUARANTEE, EQUIPMENT OR OTHER CONTRACT GOODS LIABILITY, NEGLIGENCE, TORT, OR ANY OTHER CAUSE PERTAINING TO PERFORMANCE OR NON-PERFORMANCE TO THE PROPOSAL OR CONTRACT BY SELLER. BUYER SHALL HOLD SELLER HARMLESS FROM ANY SUCH CLAIMS BY BUYER'S CUSTOMER.

Appendix B: Case-by-case Permit Conditions

Condition 13: Compliance Demonstration
Effective for entire length of Permit

Applicable Federal Requirement:6 NYCRR 228-1.5 (e)

Item 13.1:
The Compliance Demonstration activity will be performed for the Facility.

Item 13.2:
Compliance Demonstration shall include the following monitoring:
Monitoring Type: MONITORING OF PROCESS OR CONTROL DEVICE PARAMETERS AS SURROGATE
Monitoring Description:
This condition contains a RACT variance for Ortho-Clinical Diagnostics. The aggregate VOC emissions from non-compliant coatings A1c, 49CKMB, 90WHT and 92BLK on machine 72 must not exceed 21,600 pounds per year on a 12-month rolling total basis.

The facility must ensure that the coatings listed above have the same specifications as described in the RACT variance submitted November 18, 2021. To ensure approved conditions in the RACT variance are maintained, the facility shall track usage monthly and report compliance status on an annual basis. Failure to meet the pounds per year limit established for this RACT variance shall be ground for termination of the RACT variance.

An updated RACT variance request must be submitted for any changes that will increase the emission rate, including but not limited to changes to coating specification, coating machine operation parameters, or coating curing/drying time. The RACT variance evaluation must be reassessed at least once every 5 years. The facility shall submit an updated RACT variance request 5 years from November 18, 2021 or sooner and sequentially every 5 years.

Parameter Monitored: VOC
Upper Permit Limit: 21600 pounds per year
Monitoring Frequency: MONTHLY
Averaging Method: 12-MONTH TOTAL, ROLLED MONTHLY
Reporting Requirements: ANNUALLY (CALENDAR)
Reports due 30 days after the reporting period.
Subsequent reports are due every 12 calendar month(s).

Appendix C: Public Notice Documents

ENB Region 8 Completed Applications 09/14/2022

Region 8 SEQR and Other Notices

Region 8 SPDES Renewals

Monroe County

Applicant:

Ortho-Clinical Diagnostics Inc
100 Indigo Creek Dr
Rochester, NY 14626 -5101

Facility:

Ortho-Clinical Diagnostics
300 Weiland Rd (Bldg 313)
Greece, NY

Application ID:

8-2628-00503/02001

Permit(s) Applied for:

Article 19 Air State Facility

Project is Located:

Greece, Monroe County

Project Description:

The Department has made a tentative determination, subject to public comment or other information, to issue a new Air State Facility Permit for the Ortho Clinical Diagnostics Inc facility located at 513 Technology Blvd in the City of Rochester. The facility produces computer-controlled analyzers intended for the in-vitro testing of biological fluids, primarily blood.

Facility Emission Units (EU) are: O 00001: The emission unit includes emissions generated from two coating processes. O 00002: This emission unit includes emissions generated by slide assembly machines and machine slitters. O 00003: This emission unit includes emissions generated from the laser bar code etching process.

The facility is subject to National Emissions Standards for Hazardous Pollutants (NESHAPs); Area Source Standards for Plating and Polishing Operations. The affected operation is chrome conversion coating, The current permit and draft renewal permit include:

40CFR 63 Subpart WWWWWW requires that the facility implement management practices, such as minimizing bath agitation, maximize the draining of bath solution back into the tank, using tank covers, minimizing heating of bath, and minimizing spills. The facility must submit an annual compliance report to certify compliance with 40 CFR 63 Subpart WWWWWW.

Pursuant to 6 NYCRR 228-1.5(e), this draft permit revision contains a condition that allows aggregate volatile organic compound (VOC) emissions from four non-compliant coatings; not to exceed 21,600 pounds per year on a 12-month rolling total basis. Persons wishing to inspect the subject Air State Facility files, including the application with all relevant supporting materials, the draft permit, and all other materials available to the DEC (the "permitting authority") that are relevant to this permitting decision should contact the DEC representative listed below. The Draft Permit and Permit Review Report may be viewed and printed from the Department web site at: http://www.dec.ny.gov/chemical/8569.html

DEC will evaluate the application and the comments received on it to determine whether to hold a public hearing. Comments and requests for a public hearing should be in writing and addressed to the Department representative listed below. A copy of the Department's permit hearing procedures is available upon request or on the Department web site at: http://www.dec.ny.gov/permits/6234.html.

The Reasonably Available Control Technology (RACT) Analysis submitted by the facility as part of the permit application is available from the Contact person identified below. Process specific RACT determinations that are included in this permit action will be submitted to the United States Environmental Protection Agency for approval as a revision to the State Implementation Plan (SIP).

Pursuant to the requirements of Section 7(2) of the Climate Leadership and Community Protection Act (CLCPA), the Department has requested and received information regarding the project's consistency with the CLPCA.

Availability of Application Documents:

Filed application documents, and Department draft permits where applicable, are available for inspection during normal business hours at the address of the contact person. To ensure timely service at the time of inspection, it is recommended that an appointment be made with the contact person.

This project is subject to the Department's Environmental Justice Policy and an enhanced public participation plan has been prepared and accepted as a component of application completeness. As part of the plan, a document repository has been established near the project area that contains application and project related materials. Information on the repository location and other outreach components of the plan is available from the identified DEC contact.

State Environmental Quality Review (SEQR) Determination:

Project is an Unlisted Action and will not have a significant impact on the environment. A Negative Declaration is on file. A coordinated review was not performed.

SEQR Lead Agency: None Designated

State Historic Preservation Act (SHPA) Determination:

The proposed activity is not subject to review in accordance with SHPA. The application type is exempt and/or the project involves the continuation of an existing operational activity.

Coastal Management:

This project is not located in a Coastal Management area and is not subject to the Waterfront Revitalization and Coastal Resources Act.

DEC Commissioner Policy 29, Environmental Justice and Permitting (CP-29)

The proposed action is subject to CP-29. An enhanced public participation plan was submitted by the applicant and has become part of the complete application.

Opportunity for Public Comment:

Comments on this project must be submitted in writing to the Contact Person no later than *Oct 14, 2022*.

Contact:

Guillermo R Saar
NYSDEC Region 8 Headquarters
6274 E Avon-Lima Rd
Avon, NY 14414
(585)226-2466
DEP.R8@dec.ny.gov

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