

**CITY OF FRANKLIN, TENNESSEE
PROFESSIONAL SERVICES AGREEMENT
COF Contract No. 2018-0140**

THIS PROFESSIONAL SERVICES AGREEMENT (“Agreement”) is by and between the City of Franklin, Tennessee, hereinafter referenced as (“City”), and **BOWKER & ASSOCIATES, INC. CONSULTING ENGINEERS** hereinafter referenced as Consultant, who mutually agree as follows:

DECLARATIONS. City desires to retain Consultant to provide engineering, related technical, and other services in connection with City’s project hereinafter referenced as Project. The Project is described as follows:

**Comprehensive Assessment of Odor Emissions and Their Control in the Franklin,
TN Wastewater Collection and Treatment System**

1. SCOPE OF SERVICES. Consultant shall provide odor control services to include field data collection, laboratory testing, review and interpretation of data, and recommendations for improvement, if required, for the Project in accordance with the Scope of Services (Services) as found in Attachment A which shall be considered as an integral part hereof.
2. Consultant shall submit as a part of Attachment A an individual Fee Schedule and a Completion Schedule for the Project based on the detailed Scope of Services.
3. In event of a conflict between this Agreement and the attached document(s), this Agreement shall supersede conflicting terms and conditions.
4. Consultant shall be paid on a monthly basis for work performed based on the Fee Schedule as contained in Attachment A in the Amount Not-to-Exceed **FORTY THOUSAND SEVEN HUNDRED FORTY and 00/100 DOLLARS (\$40,740.00).**

**The Board of Mayor and Aldermen Approved this Agreement on the
_____ Day of _____ 201__.**

TERMS AND CONDITIONS FOR PROFESSIONAL SERVICES

ARTICLE 1. SERVICES. Consultant will:

- 1.1 Act for City in a professional manner, using that degree of care and skill ordinarily exercised by and consistent with standards of competent consultants using the standards in the industry:
- 1.2 Consider all reports to be confidential and distribute copies of the same only to those persons specifically designated by the City.
- 1.3 Perform all services under the general direction of a senior professional employee, licensed and/or registered in the State of Tennessee, when appropriate.
- 1.4 Designate, in writing, the sole Project representative to coordinate with City the Services to be provided, including all contact information.
- 1.5 Unless provided for in the Project Scope of Services (Attachment A), Consultant shall perform all Services with his own forces (employees). Should sub-consultants be proposed to be used in the Project, a listing of said sub-consultants with Services to be performed shall be provided. After approval of this Agreement, no substitute for sub-consultants shall be allowed unless approved by City.
- 1.6 Retain pertinent records relating to the services performed for a period of seven (7) years following the completion of the work; during this period the records shall be available for review by City at all reasonable times.

ARTICLE 2. CITY'S RESPONSIBILITIES. City, or its authorized representative, will:

- 2.1 Provide Consultant with all information regarding the Project, which is available to, or reasonably obtainable by, the City.
- 2.2 Furnish right-of-entry onto the Project site for Consultant's necessary field studies and surveys. Consultant will endeavor to restore the site to its original condition and shall remain solely liable for all damages, costs and expenses, including reasonable attorneys' fees, for failure to make such restoration.
- 2.3 Designate, in writing, the sole Project representative to coordinate with and direct the Consultant, including all contact information.
- 2.4 Guarantee to Consultant that it has the legal capacity to enter into this contract and that sufficient monies are available to fund Consultant's compensation.

ARTICLE 3. GENERAL CONDITIONS.

- 3.1 Consultant, by the performance of services covered hereunder, does not in any way assume, abridge or abrogate any of those duties, responsibilities or authorities customarily vested in other professionals or agencies participating in the Project.
- 3.2 Consultant shall be responsible for the acts or omissions of any party involved in concurrent or subsequent phases of the Project acting upon written instruction issued by the Consultant.
- 3.3 Neither City nor Consultant may assign or transfer its duties or interest in this Agreement without written consent of the other party.
- 3.4 **ALLOCATION OF RISK AND LIABILITY; GENERAL.** Considering the potential liabilities that may exist during the performance of the services of this Agreement, the relative benefits and risks of the Project, and the Consultant's fee

for the services rendered, and in consideration of the promises contained in this Agreement, the City and the Consultant agree to allocate and limit such liabilities in accordance with this Article.

- 3.5 INDEMNIFICATION. Consultant agrees to indemnify and hold City harmless from and against legal liability for all judgments, losses, damages, and expenses to the extent such judgments, losses, damages, or expenses are caused by Consultant's negligent act, error or omission in the performance of the services of this Agreement. In the event judgments, losses, damages, or expenses are caused by the joint or concurrent negligence of Consultant and City, they shall be borne by each party in proportion to its own negligence.

3.5.1 SURVIVAL. The terms and conditions of this paragraph shall survive completion of this services agreement.

- 3.6 LIMITATIONS OF RESPONSIBILITY. Consultant shall not be responsible for (a) construction means, methods, techniques, sequences, procedures, or safety precautions and programs in connection with the Project unless specifically undertaken in Attachment A, Scope of Services ; (b) the failure of any contractor, subcontractor, Consultant, or other Project participant, not under contract to Consultant, to fulfill contractual responsibilities to City or to comply with federal, state, or local laws, regulations, and codes; or (c) procuring permits, certificates, and licenses required for any construction unless such procurement responsibilities are specifically assigned to Consultant in Attachment A, Scope of Services.

ARTICLE 4. TERMINATION BY THE CITY. The City may terminate this Agreement in accordance with the following terms and conditions:

- 4.1 Termination for Convenience. The City may, when in the interests of the City, terminate performance under this Agreement with the Consultant, in whole or in part, for the convenience of the City. The City shall give written notice of such termination to the Consultant specifying when termination becomes effective. The Consultant shall incur no further obligations in connection with the work so terminated, other than warranties and guarantees for completed work and installed equipment, and the Consultant shall stop work when such termination becomes effective. The Consultant shall also terminate outstanding orders and subcontracts for the affected work. The Consultant shall settle the liabilities and claims arising out of the termination of subcontracts and orders. The City may direct the Consultant to assign the Consultant's right, title and interest under termination orders or subcontracts to the City or its designee. The Consultant shall transfer title and deliver to the City such completed or partially completed work and materials, equipment, parts, fixtures, information and Contract rights as the Consultant has in its possession or control. When terminated for convenience, the Consultant shall be compensated as follows:

- (1) The Consultant shall submit a termination claim to the City specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the City. If the Consultant fails to file a termination claim within one (1) year from the effective date

of termination, the City shall pay the Consultant the amount the City deems the Consultant is due.

- (2) The City and the Consultant may agree to the compensation, if any, due to the Consultant hereunder.
- (3) Absent agreement to the amount due to the Consultant, the City shall pay the Consultant the following amounts:
 - (a) Contract costs for labor, materials, equipment and other services accepted under this Agreement;
 - (b) Reasonable costs incurred in preparing to perform and in performing the terminated portion of the work, and in terminating the Consultant's performance, plus a fair and reasonable allowance for direct job site overhead and earned profit thereon (such profit shall not include anticipated profit or consequential damages); provided however, that if it reasonably appears that the Consultant would have not profited or would have sustained a loss if the entire Agreement would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any;

The total sum to be paid the Consultant under this Section shall not exceed the total Agreement Price, as properly adjusted, reduced by the amount of payments otherwise made, and shall in no event include duplication of payment.

- 4.2 Termination for Cause. If the Consultant does not perform the work, or any part thereof, in a timely manner, supply adequate labor, supervisory personnel or proper equipment or materials, or if it fails to timely discharge its obligations for labor, equipment and materials, or proceeds to disobey applicable law, or otherwise commits a violation of a material provision of this Agreement, then the City, in addition to any other rights it may have against the Consultant or others, may terminate the performance of the Consultant, in whole or in part at the City's sole option, and assume possession of the Project Plans and materials and may complete the work.

In such case, the Consultant shall not be paid further until the work is complete. After Completion has been achieved, if any portion of the Contract Price, as it may be modified hereunder, remains after the cost to the City of completing the work, including all costs and expenses of every nature incurred, has been deducted by the City, such remainder shall belong to the Consultant. Otherwise, the Consultant shall pay and make whole the City for such cost. This obligation for payment shall survive the termination of the Agreement.

- In the event the employment of the Consultant is terminated by the City for cause pursuant to this Section and it is subsequently determined by a Court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience under this Section and the provisions of Section 4.1 shall apply.
- 4.3 Termination for Non-Appropriation. The City may also terminate this Agreement, in whole or in part, for non-appropriation of sufficient funds to complete or partially complete the Project, regardless of the source of such funds, and such termination shall be on the terms of Section 4.1.
- 4.4 The City's rights under this Section shall be in addition to those contained elsewhere herein or provided by law.

ARTICLE 5. SCOPE OF SERVICES. Consultant shall provide the Services as described in Attachment A, Scope of Services.

- 5.1 By mutual agreement, this Agreement and scope can be amended by the parties. The scope and fee for any additional tasks or services under such amendment shall be mutually negotiated and agreed to in writing prior to beginning such additional tasks or services.
- 5.2 ENVIRONMENTAL RESPONSIBILITY.
Where drilling/sampling services are involved, the samples obtained from the Project site are the property of the City. Should any of these samples be recognized by the Consultant to be contaminated, the City shall remove them from the Consultant's custody and transport them to a disposal site, all in accordance with applicable government statutes, ordinances, and regulations. For all other samples, the Consultant shall retain them for a sixty (60)-day period following the submission of the drilling/sampling report unless the City directs otherwise; thereafter, the Consultant shall discard the samples in accordance with all federal, state and local laws.

ARTICLE 6. SCHEDULE.

- 6.1 TIME OF THE ESSENCE. The parties agree that time is of the essence with respect to the parties' performance of all provisions of the Agreement.
- 6.2 Before executing this Agreement, the Consultant shall have prepared and submitted for approval to the City a Completion Schedule for the Project with milestones for the various stages (tasks) of the Services as outlined in the Scope of Services. The Consultant shall submit and obtain the City's approval for any proposed changes to the logic, durations, sequences, or timing of tasks as approved in the Completion Schedule.
- 6.3 FORCE MAJEURE. Neither party will be liable to the other for any delay or failure to perform any of the services or obligations set forth in this Agreement due to causes beyond its reasonable control, and performance times will be considered extended for a period of time equivalent to the time lost because of such delay plus a reasonable period of time to allow the parties to recommence performance of their respective obligations hereunder. Should a circumstance of force majeure last more than ninety (90) days, either party may by written notice to the other terminate this Agreement. The term "force majeure" as used herein shall mean the following: acts

of God; strikes, lockouts or other industrial disturbances; acts of public enemies; orders or restraints of any kind of the government of the United States or of the State or any of their departments, agencies or officials, or any civil or military authority; insurrections, riots, landslides, earthquakes, fires, storms, tornadoes, droughts, floods, explosions, breakage or accident to machinery, transmission pipes or canals; or any other cause or event not reasonably within the control of either party.

- 6.4 Should City request changes in the scope, extent, or character of the Project, the fee and the time of performance of Consultant's Services as indicated in Attachment A shall be adjusted equitably.

ARTICLE 7. USE OF DOCUMENTS, DATA.

- 7.1 All Documents, including, but not limited to, reports, drawings, specifications, and computer software prepared by Consultant pursuant to this Agreement are instruments of service in respect to the Project. Consultant shall retain an ownership and property interest therein (including the right of reuse at the discretion of the Consultant) whether or not the Project is completed.

7.1.1 **USE OF DATA SYSTEMS:** Ownership, property interests and proprietary rights in data systems used by Consultant do not extend to the data created by or supplied to Consultant by the City; all rights to that data (including derivative or hidden data such as metadata) shall vest solely in City at the moment of creation.

7.1.2 **DISCLOSURE OF DOCUMENTS/DATA.** City may be required to disclose documents or data under state or federal law. City shall notify Consultant if a request for data or documents has been made and shall give Consultant a reasonable opportunity under the circumstances to respond to the request by redacting proprietary or other confidential information. Consultant waives any right to confidentiality of any document, e-mail or file it fails to clearly mark on each page as confidential or proprietary. In exchange, Consultant agrees to indemnify, defend, and hold harmless City for any claims by third parties relating thereto or arising out of (i) the City's failure to disclose such documents or information required to be disclosed by law, or (ii) the City's release of documents as a result of City's reliance upon Consultant representation that materials supplied by Consultant (in full or redacted form) do not contain trade secrets or proprietary information, provided that the City impleads Consultant and Consultant assumes control over that claim.

- 7.2 By execution of this Agreement, Consultant and his sub-consultant(s) grant the City a royalty-free, perpetual, irrevocable, and assignable license to use any and all intellectual property interest Consultant or his sub-consultant(s) possess to any drawings, details, specifications, documents, and other information created before each of their first involvement with the Project and subsequently incorporated into the Project's documents. City-furnished data that may be relied upon by Consultant is limited to the printed copies that are delivered to the Consultant pursuant to Article 2 of this Agreement. Any copyrighted electronic files furnished by City shall be used by Consultant only for the Project as described herein. City's posting

- or publication of such documents created by Consultant for City shall constitute fair use and shall not constitute an infringement of Consultant's copyright, if any.
- 7.3 Documents that may be relied upon by City are limited to the printed copies (also known as hard copies) that are signed or sealed by the Consultant. Files in electronic media format of text, data, graphics, or of other types that are furnished by Consultant to City are only for convenience of City, unless the delivery of the Project in electronic media format has been dictated in Attachment A, Scope of Services. Any conclusion or information obtained or derived from electronic files provided for convenience will be at the user's sole risk.
- 7.4 Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the party delivering the electronic files. Unless stated otherwise herein, Consultant shall not be responsible to maintain documents stored in electronic media format after acceptance by City.
- 7.5 When transferring documents in electronic media format, Consultant makes no representations as to long term compatibility, usability, or readability, of documents resulting from the use of software application packages, operating systems, or computer hardware differing from that as required of, and used by, Consultant at the beginning of this Project.
- 7.6 City may make and retain copies of Documents for information and reference in connection with use on the Project by the City, or his authorized representative. Such Documents are not intended or represented to be suitable for reuse by City or others on extensions of the Project or on any other project. Any such reuse or modifications without written verification or adaptation by Consultant, as appropriate for the specific purpose intended, will be at City's sole risk and without liability or legal exposure to the Consultant or to Consultant's sub-consultants.
- 7.7 If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- 7.8 Any verification or adaptation of the Documents for extensions of the Project or for any other project will entitle Consultant to further compensation at rates to be agreed upon by City and Consultant.

ARTICLE 8. INSURANCE.

- 8.1 During the performance of the Services under this Agreement, Consultant shall maintain the following minimum insurance:
- a) General Liability Insurance with a combined single limit of \$1,000,000 per occurrence and \$2,000,000 annual aggregate.
 - b) Automobile Liability Insurance with a combined single limit of \$1,000,000 for each person and \$1,000,000 for each accident.
 - c) Workers' Compensation Insurance Coverage A in accordance with statutory requirements and Coverage B, Employer's Liability Insurance, with a limit of \$500,000 for each occurrence.

- d) Professional Liability Insurance with a limit of \$1,000,000 annual aggregate.
- 8.2 Consultant shall add the City an additional insured on all policies unless otherwise prohibited.
- 8.3 Consultant shall, upon execution of this Agreement, furnish City certificates of insurance, which shall include a provision that such insurance shall not be canceled without at least thirty (30) days' written notice to City.
- 8.4 No insurance, of whatever kind or type is to be considered as in any way limiting other parties' responsibility for damages resulting from their activities in the execution of the Project. City agrees to include, or cause to be included, in the Project's construction contract, such requirements for insurance coverage and performance bonds by the Project's construction contractor as City deems adequate to indemnify City, Consultant, and other concerned parties against claims for damages and to insure compliance of work performance and materials with Project requirements.

ARTICLE 9. PAYMENT.

- 9.1 City will pay Consultant for services and expenses in accordance with the Fee Schedule proposal submitted for the Project as part of the Scope of Services. Consultant's invoices will be presented at the completion of the work or monthly and will be payable upon receipt. Payment is due upon presentation of invoice and is past due thirty (30) days from invoice date. City shall give prompt written notice of any disputed amount and shall pay the remaining amount.
- 9.2 Consultant shall be paid in full for all services under this Agreement, including City authorized overruns of the Project budget or unforeseen need for Consultant's services exceeding the original Scope of Services.
- 9.3 **TRAVEL; EXPENSES**
City shall reimburse reasonable expenses, including travel and meals, when specified in the Scope of Services, but only in accordance with the City's Travel and Expense Policy and Procedures Manual. The maximum amount will be applied as of the date of travel and as listed in the per diem reimbursement rates on the "CONUS" website developed by the United States General Services Administration, located at www.gsa.gov [click on 'per diem rates' under the 'etools' category].

ARTICLE 10. MISCELLANEOUS PROVISIONS

- 10.1 **EQUAL EMPLOYMENT OPPORTUNITY.** In connection with this Agreement and the Project, City and Consultant shall not discriminate against any employee or applicant for employment because of race, color, sex, national origin, disability or marital status. City and Consultant will take affirmative action to ensure that the contractor used for the Project does not discriminate against any employee and employees are treated during employment without regard to their race, age, religion, color, gender, national origin, disability or marital status. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination, rates of pay

or other forms of compensation; and selection for training, including apprenticeship.

10.1.1 Consultant shall insert the foregoing provision in all contracts relating to this Project.

10.2 TITLE VI – CIVIL RIGHTS ACT OF 1964. City and Consultant shall comply with all the requirements imposed by Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d), 49 C.F.R., Part 21, and related statutes and regulations.

10.2.1 Consultant shall insert the foregoing provision in all contracts relating to this Project.

10.3 NO THIRD PARTY RIGHTS CREATED. City and Consultant each binds itself and its successors, executors, administrators, permitted assigns, legal representatives and, in the case of a partnership, its partners, to the other party to this Agreement and to their successors, executors, administrators, permitted assigns, legal representatives and partners of such other party in respect to all provisions of this Agreement. The Services provided for in this Agreement are for the sole use and benefit of City and Consultant. Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than City and Consultant.

10.4 WARRANTIES/LIMITATION OF LIABILITY/WAIVER. City reserves all rights afforded to local governments under law for all general and implied warranties. City does not waive any rights it may have to all remedies provided by law and therefore any attempt by Consultant to limit its liability shall be void and unenforceable.

ARTICLE 11. EXTENT OF AGREEMENT:

11.1 APPLICABLE LAW/CHOICE OF FORUM AND VENUE. This Agreement is made under and will be construed in accordance with the laws of the State of Tennessee without giving effect to that state's choice of law rules. The parties' choice of forum and venue shall be exclusively in the courts of Williamson County, Tennessee. Any provision of this Agreement held to violate a law or regulation shall be deemed void, and all remaining provisions shall continue in force.

11.2 ENTIRE AGREEMENT. This Agreement, including these terms and conditions, represent the entire Agreement between City and Consultant for this Project and supersedes all prior negotiations, representations or agreements, written or oral. This Agreement may be amended only by written instrument signed by City and Consultant.

ARTICLE 12. DISPUTE RESOLUTION, BREACH.

12.1 If a dispute should arise relating to the performance of or payment for the Services under this Agreement, the aggrieved party shall notify the other party of the dispute within a reasonable time after such dispute arises. During the pendency of any dispute, the parties shall continue diligently to fulfill their respective obligations hereunder. No arbitration or mediation shall be required as a condition precedent to filing any legal claim arising out of or relating to this Agreement. No arbitration or mediation shall be binding.

12.2 BREACH. Upon deliberate breach of the Agreement by either party, the non-breaching party shall be entitled to terminate the Agreement with notice, with all of

the remedies it would have in the event of termination, and may also have such other remedies as it may be entitled to in law or in equity.

ARTICLE 13. SURVIVAL.

The provisions contained in this Professional Services Agreement shall survive the completion of or any termination of the Agreement, contract or other document to which it may accompany or incorporate by reference or which subsequently may be modified, unless expressly excepted from this Article upon consent of both parties.

BY: _____
Consultant's Signature
TITLE: _____
Date: _____

BY: _____
Dr. Ken Moore
Mayor
Date: _____

Approved as to Form:

Tiffani M. Pope, Staff Attorney

PROPOSAL

COMPREHENSIVE ASSESSMENT OF ODOR EMISSIONS AND THEIR CONTROL IN THE FRANKLIN, TN WASTEWATER COLLECTION AND TREATMENT SYSTEM

Prepared for:

CITY OF FRANKLIN WATER MANAGEMENT DEPT.
124 Lumber Drive
Franklin, TN 37064

Prepared by:

BOWKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
21 Summerfield Lane
Scarborough, ME 04074

January 2018

1. INTRODUCTION

The City of Franklin operates a wastewater treatment plant that is scheduled for an upgrade. Encroaching development around the plant has raised concerns for odor, and there have been some complaints attributed to either the wastewater treatment plant or the sewer system that collects and transmits wastewater to the plant.

The collection system includes multiple pump stations and force mains. Force mains generate more hydrogen sulfide and odor than gravity sewers because the sewage is retained in a full pipe with no opportunity for aeration. As a result, the sewage quickly becomes septic or anaerobic, favoring the generation of odorous hydrogen sulfide gas. This hydrogen sulfide gas can be released downstream of the force main discharge, or at the headworks of the plant.

The wastewater treatment plant that serves the City of Franklin uses the oxidation ditch process with no primary clarifiers. Such plants tend to have fewer odor issues than plants with primary clarifiers. However, odors can still be released from the headworks or sludge handling processes.

The following proposal is to conduct a comprehensive assessment of the wastewater collection and treatment system to provide:

1. An evaluation of the contribution of odors and hydrogen sulfide from upstream force mains and interceptors.
2. An “odor emissions inventory” of the wastewater treatment plant to provide a ranking of odor sources by their odor emission rate.
3. Odor dispersion modeling to assess the existing “odor footprint” of the treatment plant and to evaluate the effect of recommended odor control alternatives.
4. Evaluation of various odor control strategies as necessary to meet downwind objectives.
5. A report that summarizes all sampling data, presents results of dispersion modeling, and provides recommendations and cost estimate for the most cost-effective odor control strategy.

A proposed Scope of Services and Fee Estimate follow, along with a proposed Schedule and Summary of Qualifications.

2. SCOPE OF SERVICES

Task 1. Review background information and develop sampling plan

Bowker & Associates will review background information on the facilities and develop a plan to collect samples from both the wastewater collection system and treatment plant. This will include collection and field analysis of wastewater samples in the collection system, deployment of Odalogs to measure H₂S concentrations, and collection and analysis of air samples at the treatment plant to measure odor strength. The written sampling plan will be submitted to the City of Franklin for review and comment.

Task 2. Implement sampling program

The sampling plan envisioned will consist of 3 days of wastewater sampling in the collection system and 7 days of continuous H₂S measurements at multiple locations in the sewer system. We will conduct field analysis of the wastewater for sulfide, pH, oxidation-reduction potential (ORP), and temperature. A total of 8 sampling locations have been assumed for this proposal.

For the wastewater treatment plant, air samples will be collected from processes including, but not limited to:

1. Headworks
2. Screen/grit handling systems
3. Oxidation ditch surface
4. Sludge thickening exhaust
5. Sludge dewatering exhaust
6. Other sources as necessary

Air samples will be sent by overnight carrier to St. Croix Sensory in Stillwater, MN to measure the odor “concentration” in dilutions to threshold. This ASTM laboratory procedure measures the number of times the odorous sample must be diluted with odor-free air until the odor can no longer be detected. In addition, selected samples will be sent to Mayfly Laboratory in Mystic, CT to measure the concentration of reduced sulfur compounds that are responsible for the odor. This will help in determining the best technology to treat the odor, should that become necessary.

Task 3. Conduct odor dispersion modeling

Bowker & Associates will first calculate the “odor emission rate” for each process. This is simply the odor concentration multiplied by the air flow rate to estimate how many “pounds of odor” are

being released from each process. This will provide a ranking of the odor sources by how much odor they are generating.

The odor emission rates are then input into the dispersion model, along with terrain data, actual weather data, building dimensions, etc. We will use the EPA-approved AERMOD dispersion model that predicts the level of odor surrounding the plant under worst-case meteorological conditions. We also use the model to estimate how often a “target” level of odor is exceeded. The dispersion model is valuable to determine the effects of implementing various odor control strategies on odor levels around the plant. Figure 1 is an example of the output of the dispersion model.

Task 4. Evaluate odor control options

We will evaluate various odor control options for those processes deemed to have the potential to generate odors that travel off-site. The selection of the proper technology is dependent on the characteristics of the air, the air flow rate, available space, required performance, and other factors. The focus will be on technologies that are well-demonstrated, reliable, and have low O&M requirements. Alternatives such as biofiltration, carbon adsorption, and bio-scrubbing are proven technologies that are frequently used to treat wastewater odors.

Addition of chemicals to the wastewater can also provide odor reduction, and will be evaluated on a case-by-case basis. While effective and easy to implement, the recurring cost of chemical addition can become prohibitive.

For the recommended odor mitigation strategy, we will prepare estimates of the capital and operating costs.

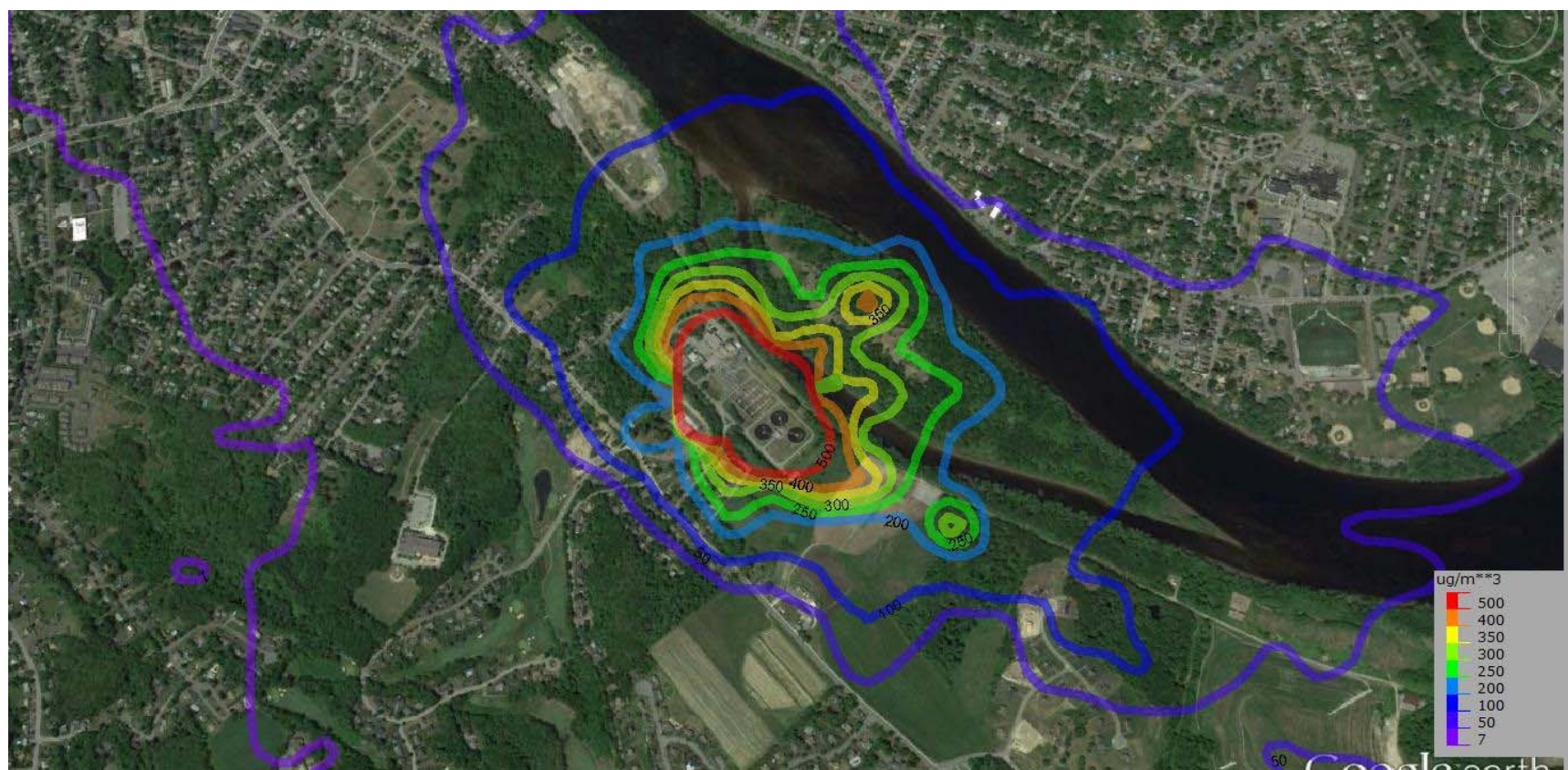
Task 5. Prepare report

Bowker & Associates will prepare a draft report for review and comment by the City of Franklin. The report will include:

1. Introduction
2. Description of facilities
3. Sampling program
4. Odor dispersion modeling
5. Evaluation of alternatives
6. Conclusions and recommendations

Upon receipt of comments, a final report will be transmitted.

FIGURE 1. EXAMPLE OF OUTPUT FROM ODOR DISPERSION MODEL SHOWING “ODOR FOOTPRINT” OF WWTP.



3. FEE ESTIMATE

Table 1 provides a breakdown of estimated fee for the tasks described above. The total cost of \$40,740.00 includes all labor, travel, and analytical expenses.

4. SCHEDULE

The major factor driving the schedule of this project is the need to conduct the sampling during peak, warm-weather conditions. Typically these conditions occur during the months of July through September. Assuming a July sampling schedule, it is anticipated that a draft report would be submitted by September 30. The project could start at any time, say March 1, 2018.

5. SUMMARY OF QUALIFICATIONS

Bowker & Associates has specialized in the control of odors from waste handling systems for 25 years, and has completed over 200 projects at wastewater pump stations, treatment plants, collection systems, and landfills. Robert Bowker is a professional engineer with over 40 years of experience in the wastewater industry, and has co-authored several EPA and WEF manuals on the subject of odors and corrosion in wastewater systems. Mr. Bowker's resume is attached.

Our full Statement of Qualifications and Experience is available upon request.

TABLE 1

FEE ESTIMATE

FRANKLIN, TN ODOR STUDY

Bowker & Associates, Inc.

January 2018

<u>Task</u>		<u>Estimated fee, \$</u>
<u>1. Review background information and develop sampling plan</u>		
<i>Labor:</i>		
R. Bowker:	12 hrs @ \$175/hr	\$ 2,100
Clerical:	2 hrs @ \$50/hr	<u>100</u>
	Subtotal Task 1	\$ 2,200.00
<u>2. Implement sampling plan for collection system and treatment plant</u>		
<i>Labor:</i>		
R. Bowker:	56 hrs @ \$175/hr	\$ 9,800
Clerical:	4 hrs @ \$50/hr	<u>200</u>
<i>Travel:</i>		
Airfare:		600
Rental car:	7 days @ \$80/day	560
Hotels:	7 nights @ \$150/night	850
Meals:	7 days @ \$50/day	<u>350</u>
<i>Analytical:</i>		
Odalogs:	8 units @ \$160/wk	1,280
Odor panel:	12 samples @ \$350 each	4,200
Reduced sulfurs:	4 samples @ \$250 each	1,000
Supplies:		500
Shipping:		<u>600</u>
	Subtotal Task 2	\$19,940.00

3. Odor dispersion modeling

Labor:

R. Bowker:	32 hrs @ \$175/hr	\$5,600
Clerical:	4 hrs @ \$50/hr	200

Weather & terrain data		<u>1,000</u>
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Subtotal Task 3	\$ 6,800.00
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4. Evaluate odor control options

Labor:

R. Bowker:	24 hrs @ \$175/hr	<u>\$ 4,200</u>
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Subtotal Task 4	\$ 4,200.00
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5. Prepare draft & final reports

Labor:

R. Bowker:	40 hrs @ \$175/hr	\$ 7,000
Clerical:	12 hrs @ \$50/hr	<u>600</u>

Subtotal Task 1	\$ 7,600
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TOTAL	\$40,740.00
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RESUME OF ROBERT BOWKER

ROBERT P. G. BOWKER, P.E.
President

TECHNICAL EXPERTISE

- Odor and corrosion control technology
- Odor emissions inventories
- Sewer corrosion assessments
- Corrosion protection systems
- Sewer rehabilitation
- Innovative technology

YEARS OF EXPERIENCE: 35

EDUCATION:

B.S. Civil Engineering, University of New Hampshire, 1973
M.S. Environmental Engineering, Cornell University, 1976

PROFESSIONAL REGISTRATION:

P.E. Sanitary Engineering - Maine, New Hampshire, Ohio

ORGANIZATIONS:

- Water Environment Federation
 - New England Water Environment Association
- Maine Wastewater Control Association
- Air and Waste Management Association
 - WEF Air Quality and Odor Control Committee

PROFESSIONAL PROFILE

Robert P.G. Bowker has over 35 years' experience in the planning, design, and operation of wastewater facilities. His career includes nine years with the U.S. Environmental Protection Agency Office of Research and Development and over 25 years as a consulting engineer. Since 1985, Mr. Bowker has specialized in the control of odors and corrosion in wastewater collection and treatment systems, solid waste processing and landfill operations, and industrial processes and waste management facilities. Mr. Bowker is considered an international expert in odor and corrosion control in waste handling systems.

HIGHLIGHTS

- Preparing, as principal author, the EPA Design Manual on Odor and Corrosion Control in Sanitary Sewers and Treatment Plants and the EPA Report to Congress on Sulfide Corrosion in Wastewater Collection and Treatment Systems.
- Contributing author of EPA Handbook on Sewer System Infrastructure Analysis and Rehabilitation.
- Conducting odor emission surveys and evaluating odor control alternatives for wastewater treatment facilities from 0.5 to 300 mgd in over 50 cities throughout the U.S., Canada, and abroad.
- Directing or participating in comprehensive sulfide monitoring and corrosion control projects in St. Petersburg, FL, Tempe, AZ, Framingham, MA, Syracuse, NY, Edmonton, Alberta, Collier County, FL, Henrico County, VA, and Woodbridge, NJ.
- Designing and providing design assistance for odor control systems in Keene, NH, Hartford, CT, Cromwell, CT, Portland, ME, Concord, NH, Fitchburg, MA, Lexington, KY, Singapore, Perth, Australia, Toronto, ON, and elsewhere.
- Contributing author of 1995 WEF MOP 22 "Odor Control in Wastewater Treatment Plants," 2001 IWA "Odours in Wastewater Treatment," and 2003 WEF "Control of Odors and Emissions from Wastewater Treatment Plants."
- Serving as independent peer reviewer for major odor/corrosion control projects in Los Angeles, CA, Washington, DC, Oakland, CA, Toronto, ON, and Santa Cruz, CA.

REPRESENTATIVE PROJECTS

Township of Woodbridge, NJ Biological Odor Control. Bowker & Associates worked with a local firm to evaluate odor emissions and their control at a large wastewater pumping station. An innovative odor containment and treatment system was conceived and designed. A biological scrubber eliminated odor complaints, and the new odor containment system greatly improved working conditions.

Oakland and Macomb Counties Odor and Corrosion Control. Bowker & Associates was a key player in the assessment of corrosion and odors in a large deep-tunnel collection system serving suburban Detroit. A variety of recommendations were developed to mitigate odor releases and control corrosion in the tunnel system, including upstream chemical addition, improved ventilation with odor treatment, and protection of the concrete with an inert lining system.

Humber WWTP Odor Control Improvements. Bowker & Associates participated in the Value Engineering Program for the proposed Humber WWTP odor control improvements in Toronto. New recommendations developed by the VE Team resulted in significant projected savings in both capital and O&M costs. Bowker & Associates was subsequently part of the design team for the improvements, which consisted largely of containment of the odors followed by treatment in organic media biofilters.

City of Los Angeles Independent Odor Control Review. Bowker & Associates, Inc. was selected by the City of Los Angeles, the State of California, and U.S. EPA to provide an independent review of the City of LA Sewer Odor Control Program as required by a Court settlement regarding sewer odor emissions. The program included extraction and treatment of sewer air with 2-stage odor control systems at seven locations.

Collier County, FL Odor/Corrosion Control Project. Bowker & Associates worked with a major national engineering firm to assess and control odors and corrosion in a large, complex wastewater collection system in Collier County, Florida. Recommendations included turbulence reduction, biological treatment of odorous air, and rehabilitation of corroded pump stations.

Lexington, KY Town Branch WWTP Odor Control Project. Bowker & Associates assisted a local engineering firm in the evaluation and design of innovative odor control improvements that included odor treatment by activated sludge diffusion and oxygen ionization.

Washington, DC Odor Control Peer Review. Bowker & Associates was selected to provide expert peer review for a comprehensive assessment of odor emissions and their control for the 350 mgd Blue Plains WWTP in Washington, DC.

Salem, MA and New Bedford, MA Odor Control Optimization Studies. Bowker & Associates conducted odor control optimization studies and fugitive odor emissions surveys at two 30 mgd wastewater treatment plants in eastern Massachusetts.

Onondaga County Odor/Corrosion Control Projects. Bowker & Associates conducted comprehensive odor and corrosion assessment and control projects for the 80 mgd Syracuse Metro WWTP as well as the Baldwinsville and Oak Orchard WWTPs operated by the County of Onondaga.

City of Edmonton Odor/Corrosion Control Projects. Bowker & Associates has worked with a large Canadian engineering firm on multiple projects involving odors and corrosion in the sewer system, treatment plant, and off-site sludge treatment/storage facility serving the City of Edmonton, Alberta.

Henrico County, VA Odor and Corrosion Control Assessment. Bowker & Associates worked with a national engineering firm to conduct a comprehensive assessment of odors and corrosion in a large wastewater collection system. Recommendations included an innovative iron-peroxide chemical addition process, a cost-saving biological scrubber system, and rehabilitation of corroded sewer lines.

City of Mamaroneck, NY Odor and Noise Control at a Solid Waste Transfer Station. Bowker & Associates worked with Webster Environmental Associates to quantify the odor and noise emissions from the waste transfer station, and assess their impact via dispersion modeling. Recommendations included use of high-velocity dispersion fans, collection and treatment of odorous air, and multiple noise control systems.

PARTIAL LIST OF PUBLICATIONS

Bowker, R.P.G., P.H. Albert, A. Dalmazzi, J. Pratt, D. Bowen, "Control of Odor Emissions from a CSO Storage Tunnel in Providence, RI", in Proceedings of WEF Odor Specialty Conference, Louisville, KY, 2012.

Bowker, R.P.G., D.J. Skibicki, J.T. Kotowski, "Innovative Odor Containment and Treatment at a Large Wastewater Pumping Station," in Proceedings of WEF Odor Specialty Conference, Charlotte, NC, 2010.

Bowker, R.P.G., et al, "Collection System Ventilation Research Report," Water Environment Research Foundation, Alexandria, VA, 2009.

Bowker, R.P.G., S. Sibold, A. Rupprecht, and J. Reish, "Magnesium Hydroxide Controls Sulfide Corrosion in Rural Pennsylvania Sewer System," in Proceedings of WEF Odor and Air Emissions Specialty Conference, Phoenix, AZ, April 2008

Bowker, R.P.G., D.A. Apgar, J. Witherspoon et al, "Minimization of Odors and Corrosion in Collection Systems," Water Environment Research Foundation, Alexandria, VA 2007.

Bowker, R.P.G., Michael A. McGinley, and James Schubert, "Analysis of Ambient Odor Data from an Industrial Area with Multiple Odor Sources," in Proceedings of WEF/A&WMA Odors and Air Emissions Specialty Conference, Bellevue, WA, April, 2004.

Bowker, R.P.G. and Robert Trueblood, "Control of ATAD Odors at the Eagle River Water and Sanitation District," in Proceedings of WEF Conference on Control of Odors and VOC Emissions, Albuquerque, NM, April, 2002.

Bowker, R.P.G. (contributing author), "Odours in Wastewater Treatment. Measurement, Modeling and Control," International Water Association, London, 2001.

Bowker, R.P.G. and B. Blades, "Optimization of Packed Bed Scrubbers to Control Odors from Solids Handling Processes," in Proceedings of WEF Specialty Conference on Odors and VOC Emissions, Cincinnati, OH, April, 2000.

Bowker, R.P.G. (contributing author), "Odor and VOC Control Handbook," McGraw-Hill, New York, 1998.

Bowker, R.P.G., "Biological Odor Control by Diffusion into Activated Sludge Basins," in Proceedings of WEF Conference on Control of Odors and VOC Emissions, Houston, TX, April, 1997.

Bowker, R.P.G. (contributing author), Manual of Practice No. 22, "Odor Control at Wastewater Treatment Facilities," Water Environment Federation, Alexandria, VA, 1995.

Bowker, R.P.G., A.A. King, and G.W. Holcomb, "U-Tube Oxygen Dissolver Controls Odors," Water Environment & Technology, 7(1):20-21, January, 1995.

Bowker, R.P.G., "Containment of Odors at Wastewater Treatment Facilities," Journal of the New England Water Environment Association, 28(2):211-220, November, 1994.

Bowker, R.P.G., "Guide to Septage Treatment and Disposal," EPA/625/R-94/002, U.S. EPA Office of Research and Development, Washington, DC, September, 1994.

Bowker, R.P.G., C.M. McGinley, N.A. Webster, "Estimating Odor Emission Rates from Wastewater Treatment Facilities," in Proceedings of WEF Conference on Odor and Volatile Organic Compound Emission Control for Municipal and Industrial Treatment Facilities, Jacksonville, FL, April, 1994.

Bowker, R.P.G., G.A. Audibert, H.J. Shah, and N.A. Webster, "Detection, Control, and Correction of Hydrogen Sulfide Corrosion in Existing Wastewater Systems," EPA 832-R-92-001, U.S. EPA Office of Water, Washington, DC, 1992.

Smith, J.M., R.P.G. Bowker, and H.J. Shah, "Handbook: Sewer System Infrastructure Analysis and Rehabilitation," EPA/625/6-91/030, U.S. EPA Office of Research and Development, Cincinnati, OH, October, 1991.

Bowker, R.P.G., J.M. Smith, and H.J. Shah, "Hydrogen Sulfide Corrosion in Wastewater Collection and Treatment Systems - Report to Congress," EPA 430/09-91-009, U.S. EPA Office of Water, Washington, DC, September, 1991

Bowker, R.P.G., Stensel, H.D., "U.S. EPA Design Manual for Phosphorus Removal," EPA/625/1-87/001, Cincinnati, Ohio, September, 1987.

Bowker, R.P.G., Smith, J.M., Webster, N.A., "U.S. EPA Design Manual for Odor and Corrosion Control in Sanitary Sewerage Systems and Treatment Plants," EPA/625/1-85/018, Cincinnati, Ohio, October, 1985.